



GUIDING SOLUTIONS IN THE  
NATURAL ENVIRONMENT

# Natural Heritage Evaluation Shining Hill Lands City of Aurora

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*Prepared For:*

**Shining Hill Estate Collection Inc.**

*Prepared By:*

**Beacon Environmental Limited**

*Date: Project:*

**March 2021 220166**

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# 1. Introduction

Beacon Environmental Limited (Beacon) has been retained by Shining Hill Estate Collection Inc. to prepare a Natural Heritage Evaluation (NHE) for the proposed redevelopment of the Shining Hill lands municipally known as 162, 306, 370, 434 and 488 St. Johns Sideroad situated within the City of Aurora. The collective area encompassed by the lands will be referred to herein as the “subject property” and are visualized on **Figure 1**.

The subject property is located on the north side of St. John’s Sideroad and on west side of Yonge Street. The western portion of the property is within the Oak Ridges Moraine Conservation Plan (ORMCP) Area and designated as Settlement Area.

The preparation of this NHE was triggered based on the presence of natural heritage features on and adjacent to the subject property including significant woodlands, valleylands associated with Tannery Creek and wetlands. These features are also regulated by the Lake Simcoe Region Conservation Authority (LSRCA). A floodplain associated with this watercourse and its tributaries is also present.

The purpose of this report is to identify and determine the potential impact of the proposed development on the natural heritage system. This report provides a description of the physical and ecological characteristics of the subject property, their functions, significance and sensitivity. The study was completed through a review of background documents and field investigations undertaken throughout 2020.

These data were used in an analysis of natural heritage functions and features and to ensure conformity with the ORMCP, York Region Official Plan and Town of Aurora Official Plan, and the LSRCA guidelines and policies.

## 2. Methodology

To characterize natural heritage resources and functions associated with the subject property and adjacent lands, a review of available background information was undertaken and undertook seasonal field investigations. The information reviewed and surveys undertaken are summarized in the following subsections.

### 2.1 Background Review

Background documents and supporting technical documents containing information relevant to the biophysical features of the study area were gathered and reviewed. This included the following sources:

- ORMCP (2017);
- PPS (2020);
- Lake Simcoe Protection Plan (LSPP; 2009);
- Regional Municipality of York Official Plan (2016);
- City of Aurora Official Plan (2010);



- Lake Simcoe Region Conservation Authority (LSRCA) regulations (2006) and policies (2015);
- Ministry of Natural Resources and Forestry (MNRF) information;
- *Endangered Species Act* (2007);
- Natural Heritage Information Centre (NHIC) Data via the Make-A-Map application;
- Databases of the Ontario Breeding Bird Atlas (OBBA) project;
- Ontario Reptile and Amphibian Atlas (ORAA);
- SAR range maps (<https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>);
- High Resolution aerial photography of the property; and
- Natural and physical feature layers from Land Information Ontario (LIO).

Other sources of information, such as aerial photography and topographic maps, were consulted prior to commencing field assessments.

Supporting documentation prepared by other specialists on the consulting team was reviewed and are incorporated in this NHE where appropriate.

### **Desktop Species at Risk Assessment**

In preparation for on-site investigations Beacon conducted a desktop Species at Risk assessment and the following information sources were reviewed as part of the desktop screening:



- Provincially Tracked Species Layer (1 km grid) from LIO;
- Ontario Reptile and Amphibian Atlas (ORAA);
- Ontario Breeding Bird Atlas (OBBA);
- Natural Heritage Information Centre (NHIC) Data via the Make-A-Map application;
- Species at risk range maps <https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>;
- High Resolution aerial photography of the property; and
- Natural heritage and physical feature layers from Land Information Ontario (LIO), including wetlands (provincially significant and un-evaluated wetlands), watercourses with thermal regime, as well as other geospatial layers.

The information sources referenced above were reviewed in a Geographic Information System (GIS) mapping environment that Beacon uses to assess the likelihood that species at risk and other significant natural heritage features and functions are present in an area of interest. This system allows Beacon to combine the most current information provided by MNRF through the LIO portal with GIS layers from provincial floral and faunal atlases. All relevant layers can then be overlaid on the most recent high resolution ortho-imagery. The screening process helps identify areas that can then be targeted (for example, potential habitat) during field assessment to maximize the efficiency and effectiveness of on-site investigations.

During field study, staff assessed the potential for protected species of flora and fauna to occur on the subject property based on habitat presence, quantity and quality.





<b>Site Location</b>		<b>Figure 1</b>
Shining Hill Estate Collection Inc.		
		Project: 220166 Last Revised: February, 2021
Client: Shining Hill Estate Collection Inc.		Prepared by: BD Checked by: CS
	1:80,000	Inset Map: 1:80,000
Contains information licensed under the Open Government License— Ontario Orthoimagery Baselayer: 2019 (FBS)		

## 2.2 Scope of Work

The natural heritage scope of work was agreed to with LSRCA staff (email dated December 10<sup>th</sup>, 2020).

## 2.3 Field Investigations

Beacon undertook and participated in field investigations to gain an understanding of the subject property. These tasks are described below with dates provided in **Table 1**.

**Table 1. Field Survey Dates**

Task	Survey Date (all 2020)
Breeding Bird Surveys	June 16 and 25
Vegetation Communities and Flora Inventory	September 10 and 16
Bat Habitat Assessment	May 6
Amphibian Call Surveys	April 24, May 21 and June 18
Headwater Drainage Feature Assessment	April 10 and May 27
Aquatic Habitat Assessment	September 16 and 21
Feature Staking Exercise (LSRCA)	July 6, 7 and 21

### **Breeding Birds**

Breeding birds were surveyed on June 15 and 25, 2020 and commenced between 5:30 AM and 5:45 AM on days with low to moderate winds (0-3 Beaufort Scale), no precipitation, and temperatures within 5 °C of normal average temperature. The entire site was surveyed such that all singing birds could be heard or observed and recorded. That is, the surveyor is within 50 m of all parts of the site depending on habitat. All birds heard and seen were recorded in the location observed on an aerial photograph of the site.

### **Vegetation Communities and Flora**

Detailed field investigations were undertaken to document the vegetation on the subject property. Vegetation communities were mapped and described according to the Ecological Land Classification (ELC) system for southern Ontario (Lee *et al.*, 1998), which involved delineating vegetation communities on an aerial photograph of the property and recording pertinent information concerning the structure and composition of the vegetation in each community. A list of plant species observed on the property was compiled concurrently.

Additionally, a search for Butternut (*Juglans cinerea*) trees was conducted during the vegetation community survey.



## **Bat Habitat Assessment**

Detailed bat snag surveys were conducted on May 6, 2020 during leaf off conditions to determine the presence of suitable maternity roosting habitat of endangered bats within the portion of the property proposed for development. Targeted areas were surveyed based on the site plan and included crossing locations where potential wooded areas may be impacted. Candidate maternity roost habitat was identified as any treed areas and snag surveys were completed in accordance with Phase I and II of the MNRG Guelph District's 'Bat and Bat Habitat Surveys of Treed Habitats' guideline, (April 2017).

Staff reviewed the conceptual site plan available at the time of these surveys to determine which areas to capture in the snag survey. The site plan used was dated April 1, 2020 and staff focussed on proposed crossing locations and areas where woodland was proposed for removal or encroachments.

## **Amphibian Call Surveys**

Three evening visits were made to the subject property to survey for breeding amphibians. Survey locations were placed in proximity to wetland habitat that may support breeding amphibians. The surveys were conducted as per the protocol outlined in the Great Lakes Marsh Monitoring Program. Surveys consisted of auditory surveys undertaken during the prime breeding period to record calling males that are present, spread throughout the breeding season in an attempt to include the short temporal peak for each species of interest. The surveys involved visiting the site after dusk when minimum night-time air temperatures of at least 5°C during the first visit, 10°C during the second visit and 17°C during the third visit. Calling amphibians, if present, were identified to species and chorus activity was assigned a code from the following options:

- 0 No calls;
- 1 Individuals of one species can be counted, calls not simultaneous;
- 2 Some calls of one species simultaneous, numbers can be reliably estimated and shown in brackets; and
- 3 Full chorus, calls continuous and overlapping.

## **Headwater Drainage Feature Assessment**

The data for Headwater Drainage Features (HDF) were collected according to the Ontario Stream Assessment Protocol Headwater Drainage Feature Module (Stanfield *et al.* 2014), scoped for data relevance and adapted to a reach-based approach.

The features were classified according to the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and Credit Valley Conservation 2014). Aerial photograph interpretation formed the basis for the HDF assessment. The guidelines use an integrated approach for the evaluation of key attributes of drainage features including flow and feature form (combined under the term hydrology), riparian vegetation, fish and fish habitat and terrestrial habitat. The evaluation divides headwater drainage features into segments, with breaks between segments occurring where key attributes change. Following a series of seasonal assessments, each segment is assigned a rating of its functional significance of "important", "valued", "contributing" or "limited". The functional significance of all attributes of each segment is then considered to determine the recommended management option for each segment. These evaluations can lead to one of six management

recommendations – Protection, Conservation, Mitigation, Recharge Protection, Maintain or Replicate Terrestrial Linkage and No Management.

### **Aquatic Habitat Assessment**

Aquatic habitat assessments on the branches of Tannery Creek and existing pond were undertaken on September 16 & 21, 2020, to identify and assess watercourse and pond characteristics that provide habitat for the critical life processes, as outlined in the federal *Fisheries Act*. The habitat assessment details the characteristics and major physical attributes of the waterbody. The habitat assessment considers a variety of details including both flow characteristics and land influences, such as the following:

- Surrounding land use – classifies potential pollution sources and adjacent land use that may affect the water body;
- Riparian zone and canopy cover – a healthy riparian zone consists of vegetation characterized by trees, shrubs, grasses and herbaceous plants. These plants help buffer the water body from runoff, provide shade and create habitat for fish and insects;
- Stream banks – characteristics assessed include signs of erosion and bank scouring, undercut banks, evidence of the normal water mark and high water mark which indicate the water level fluctuation;
- In-stream characteristics – details include substrate type (i.e. silt, gravel, cobble), aquatic vegetation, small and large woody debris. All of these in-stream characteristics provide habitat and cover for fish species and benthic macroinvertebrates, which are an important food source for fish;
- Stream morphology – this includes the wetted width of the active channel and average wetted depth as well as a description of the stream morphology:
  - Runs - typically deep, fast moving water with little to no turbulence;
  - Riffles – shallow, fast moving water typically running over rocks. Riffles provide areas of high oxygenated waters;
  - Flats – low flowing water with a smooth un-agitated surface; and
  - Pools – deep pockets of slow moving water that provide ideal refuge habitat for fish;
- General water characteristics – water colour and clarity, presence and description of algae, and description of flow; and
- Stream physical conditions - which were inspected and documented with photographs.

### **Feature Staking**

A multi-day feature staking exercise occurred with representatives from the LSRCA, SCS Consulting, MGP and Beacon. A natural feature limit was delineated at this time and was determined by the greater of the woodland dripline or wetland limit. The top of bank was staked in one location along the existing driveway access. Stakes were labelled accordingly to track which feature was driving the staked limit at a given location.

### **Incidental Wildlife**

Wildlife observed outside of the targeted studies noted previously were recorded and may include reptiles, amphibians, mammals or invertebrates.

### 3. Policy Framework

The following natural heritage policies were reviewed in the context of the proposed development.

#### 3.1 Provincial Policy Statement (2020)

Natural Heritage Policy 2.1 of the *Provincial Policy Statement* (PPS) (MMAH 2020) provides direction to regional and local municipalities regarding planning policies for the protection and management of natural heritage features and resources for applications pursuant to the *Planning Act*. The PPS defines eight natural heritage features and provides planning policies for each. The *Natural Heritage Reference Manual* (OMNR 2010) is a technical document used to help assess the natural heritage features listed below:

- Significant wetlands;
- Significant coastal wetlands;
- Habitat of endangered or threatened species;
- Fish habitat;
- Significant woodlands;
- Significant valleylands;
- Significant Areas of Natural and Scientific Interest (ANSIs); and
- Significant wildlife habitat.

Each of these features is afforded varying levels of protection subject to guidelines, and in some cases, regulations. ANSIs and provincially significant wetlands are identified by the Ministry of Natural Resources and Forestry (MNRF), while non-provincially significant wetlands may be identified and designated by the local planning authority. Wetlands are regulated by the local conservation authority, as are most valleylands. Habitat of endangered or threatened species is subject to the *Endangered Species Act*, which is the jurisdiction of the Ministry of Environment, Conservation and Parks (MECP).

The western portion of the subject property is on the Oak Ridges Moraine (ORM) and therefore the Oak Ridges Moraine Conservation Plan (ORMCP) is the governing Provincial Plan in that area, though the eastern portion, which is off the ORM, is governed by the PPS.

#### 3.2 Oak Ridges Moraine Conservation Plan (2017)

The western portion of the subject property is located within the ORMCP Area and is designated as Settlement Area. Settlement Areas reflect existing communities, are designated for urban development, and permit a range of residential, commercial, industrial and institutional uses. The purpose of these areas is to contain urban growth by promoting efficient use of land, minimizing development impacts on ecological function of key features, and to provide for the continuation and development of urban land. Objectives of this designation include the maintenance and restoration of the health, diversity, size and connectivity of key natural heritage features and their ecological functions. Even within a Settlement Area, protection of Key Natural Heritage Features (KHNF) and Key Hydrologic Features (KHF) and their Minimum Vegetation Protection Zones (MVPZs) apply.

Section 18 of the ORMCP refers to the Settlement Area policies and states:

*(3) With respect to land in Settlement Areas, all uses permitted by the applicable official plan are permitted, subject to the provisions of this Plan that are listed in subsections 19 (3) and 31 (4).*

*(4) New lots may be created in Settlement Areas, subject to provisions of this Plan that are listed in subsections 19 (3) and 31 (4).*

Section 21 of the ORMCP requires that MVPZs be applied to the limits of KNHFs and KHF and within Settlement Area, the appropriate MVPZ can be determined through an environmental study, which may be less than those listed in the Table of Part III. This NHE comprises such an environmental study.

Under Section 22 KHNH are:

- Wetlands;
- Habitat of endangered, rare and threatened species;
- Fish habitat;
- Areas of natural and scientific interest;
- Significant valleylands;
- Significant woodlands; and
- Significant wildlife habitat, sand barrens, savannahs and tallgrass prairies.

And under Section 26 KHF are:

- Permanent and intermittent streams;
- Wetlands;
- Kettles lakes; and
- Seepage areas and springs.

Development and site alteration is generally prohibited within a KNHF, KHF and the MVPZ, with a few exceptions. An application for development or site alteration with respect to land within the minimum area of influence that relates to a KNHF, but outside the KNHF and the related MVPZ, shall be accompanied by a natural heritage evaluation under section 23.

The subject property is located within 120 m of a KNHF and KHF (i.e., wetland, watercourse, fish habitat and habitat for endangered species). As such, an NHE is required as per Section 23 (1) of the ORMCP.

Under Section 23 (1) of the ORMCP, an NHE shall:

- (a) demonstrate that the development or site alteration applied for will have no adverse effects on the key natural heritage feature or on the related ecological functions; and*
- (b) identify planning, design and construction practices that will maintain and, where possible, improve or restore the health, diversity and size of the key natural heritage feature and its connectivity with other key natural heritage features.*

The subject property has been designated to contain Landform Conservation Areas Category 1 and Category 2. As per Subsection 30(13), the provisions for lands in Category 1 and Category 2 landforms do not apply the same to lands within a Settlement Area in accordance with of the ORMCP. This clause states that:

*With respect to land in Settlement Areas, in considering applications for development or site alteration within landform conservation areas (Category 1 and 2) the approval authority shall consider the importance of adopting planning, design and construction practices that will keep disturbance to landform character to a minimum, so as to satisfy the requirements of subsections (5) to (11) if possible.*

### **3.3 Lake Simcoe Protection Plan (2009)**

The Lake Simcoe Protection Plan generally applies to the Lake Simcoe watershed and aims to protect and improve the ecological health of the watershed. The KNHF and KHF identified and protected under the Plan are consistent with those in the ORCMP. KNHF and KHF are subject to Policies 6.20 to 6.29, which only apply to areas outside of existing Settlement Areas and outside of the Greenbelt and Oak Ridges Moraine.

As the subject property is either within a Settlement Area or partially located outside a Settlement Area but within the ORCMP, there are no policies regarding the protection of KNHF and KHF.

### **3.4 Regional Municipality of York Official Plan – Office Consolidation (2019)**

The York Region Official Plan is a document that outlines the policies of the Regional Municipality of York to guide economic, environmental and community building decisions. These policies inform of the strategic decisions of York Region and its nine local municipalities and are intended to help co-ordinate planning efforts across York Region. The most recent office consolidation was revised in April 2019.

The basis of the natural environment protection system in York Region is the Regional Greenlands System. This system is comprised of KNHFs and KHFs. The function of the Greenlands System is to protect these features and appropriate adjacent lands and corridors and linkages. Development is prohibited within these features and proposed development within 120 m of KNHFs or KHFs will require an Environmental Impact Study (EIS). The western portion of the subject property is designated as Urban Area and Greenlands within the ORM, and the eastern portion of the subject property is identified as being outside the Urban Area on Map 1 – Regional Structure. The majority of the subject property is mapped as part of the Regional Greenlands System on Map 2.

Map 4 Key Hydrologic Features identifies Tannery Creek, Tannery Creek West Tributary and online waterbody on the Tannery Creek West Tributary as KHF. Map 5 Woodlands identifies woodlands on the subject property, the majority of which are associated with the watercourse corridors.

Section 2.1.9 requires that for any development within 120 m of the Regional Greenlands System within the ORCMP and LSPP, an EIS shall be prepared that meets the requirements of those provincial plans.

Section 2.2 contains specific requirements for KNHF and KHF throughout the Region, including those within the ORMCP and LSPP. The York Region Official Plan defaults to the ORMCP for lands within the plan area.



In York Region, woodlands are defined as:

*An area of land at least 0.2 hectare in area with at least:*

- a. 1000 trees of any size, per hectare;*
- b. 750 trees measuring over 5 centimetres diameter at breast height, per hectare;*
- c. 500 trees measuring over 12 centimetres diameter at breast height, per hectare; or, d. 250 trees measuring over 20 centimetres diameter at breast height, per hectare.*

*But does not include a cultivated fruit or nut orchard, a plantation established and used for the purpose of producing Christmas trees or nursery stock.*

*For the purposes of defining a woodland, treed areas separated by more than 20 metres will be considered a separate woodland. When determining the limit of a woodland, continuous agricultural hedgerows and woodland fingers or narrow woodland patches will be considered part of a woodland if they have a minimum average width of at least 40 metres and narrower sections have a length to width ratio of 3 to 1 or less. Undeveloped clearings within woodland patches are generally included within a woodland if the total area of each clearing is no greater than 0.2 hectares.*

Off the ORM significant woodland policies are presented under Policy 2.2.45 and notes these features are to be verified on a site-by-site basis along with the following criteria:

- Is 0.5 hectares or larger and:
  - Directly supports globally or provincially rare plants, animals or communities as assigned by the Natural Heritage Information Centre;
  - Directly supports threatened or endangered species, with the exception of specimens deemed not requiring protection by the Province (e.g. as is sometimes the case with Butternut); or
  - Is within 30 metres of a provincially significant wetland or wetland as identified on Map 4, waterbody, permanent stream or intermittent stream;
- Is 2 hectares or larger and:
  - Is located outside of the Urban Area and is within 100 metres of a Life Science Area of Natural and Scientific Interest, a provincially significant wetland or wetland as identified on Map 4, significant valleyland, Environmentally Significant Area, or fish habitat; or
  - Occurs within the Regional Greenlands System;
- Is south of the Oak Ridges Moraine and is 4 hectares or larger in size; and
- Is north of the Oak Ridges Moraine and is 10 hectares or larger in size.

Policy 2.2.47 prescribes a vegetation protection zone of no less than 10 m from the dripline of significant woodlands outside of the provincial plan areas.

Furthermore, as per the York Region Official Plan, for the purposes of defining a woodland, treed areas separated by more than 20 m will be considered a separate woodland. When determining the limit of a woodland, continuous agricultural hedgerows and woodland fingers or narrow woodland patches will be considered part of a woodland if they have a minimum average width of at least 40 m and narrower sections have a length to width ratio of 3 to 1 or less.

### 3.5 Town of Aurora Official Plan (2010)

The Official Plan for the Town of Aurora (September 2010) implements both regional and provincial planning directives and provides policies and guidance regarding local land use.

Schedule A Structure Plan identifies the western portion of the subject property as falling within the Northwest Aurora Planning Area (OPA No. 37) and designated as Suburban Residential, Core Area Open Space and Supporting Area Open Space. The eastern portion of the subject property designated as Existing Major Institutional, Existing Commercial and Greenlands System (Environmental Protection and Private Parkland). Schedule B Secondary Plan Areas designates the western portion of the property as falling within a secondary plan area (OPA 48).

Schedule E Environmental Designations off ORM identifies Environmental Protection, Watercourse, Waterbodies, and Significant Forest on the eastern portion of the subject property. Schedule E1 Environmental Designations on ORM identifies ORM – Endangered, Rare and Threatened Species, Watercourse, Woodlands, Wetlands, and associated MVPZ of 30 m.

Schedule H Site Specific Policy Areas identifies the western portion of the subject property as part of Site Specific Policy Area 4 and the eastern portion as part of Site Specific Policy Areas 8 and 14.

Chapter 12 of the Town's Official Plan establishes a linked Greenlands System that includes policies and mapping that protects and complements KNHFs and KHF.

Section 12.5 outlines the policies and permitted uses for lands with Environmental Protection Designation. Environmental Protection Areas are a component of the Town's Greenland System and no new development or site alteration is permitted within these areas. Any development or site alteration proposed within 120 m of natural heritage features requires demonstration that there will be no negative impacts on the natural features or on their ecological functions. Where any policies of the Official Plan are in conflict with the ORCMP, the more restrictive policy shall apply.

Section 12.6.1 b) states that the minimum vegetation protection zone for all key natural heritage features, key hydrologic features and woodlots shall be established by an EIS, subject to the approval of Council, in consultation with any relevant agency.

#### ***3.5.1 Amendment No. 48 to the Town of Aurora Official Plan Regarding the Oak Ridges Moraine Conservation Plan***

The subject property is also subject to Official Plan Amendment 48 (OPA #48) to the Town of Aurora Official Plan, which went into effect on October 22, 2003. The purpose of OPA #48 was to bring the Town of Aurora's Official Plan in conformity with the ORMCP, which came into effect on November 16, 2001 under O. Reg. 140/02.

## **3.6 Lake Simcoe Region Conservation Authority Regulations (2006) and Guidelines (2015)**

### **3.6.1 Conservation Authorities Act (Ontario Regulation 179/06)**

The LSRCA regulates hazard lands, including creeks, valleylands, shorelines, and wetlands along with their applicable setback areas. The subject area contains several areas of valleyland, watercourse and wetland that are regulated by this authority.

Any site alteration or development within regulated areas may require a permit from the LSRCA.

### **3.6.2 LSRCA Watershed Development Policies**

The LSRCA's Watershed Development Policies aim to protect the environmental integrity of the Lake Simcoe watershed through implementation of the Regulation as well as providing technical review support to their member municipalities.

Policies provide direction regarding valleyland, watercourse and wetland protection, Environmentally Significant Areas, stormwater management, floodplain management, hazard lands; as well as guidance on plan review and approvals.

Generally, the LSRCA directs development away from: regulatory floodplains; Environmentally Significant Areas; wetlands; Areas of Natural and Scientific Interest; significant woodlands; significant valleylands; sensitive and/or significant wildlife habitat(s); habitats of endangered or threatened species; areas of unstable slopes; and fish habitat.

In general, all new development shall be setback a minimum distance of 30 metres from the normal high watermark of Lake Simcoe and the edge of low flow channels of all watercourses. Additionally, where there is a defined top of bank/slope, development shall generally be located no closer than 15 metres from the top of bank/slope. Exceptions may be permitted within existing settlement areas or where lot sizes are restricted.

LSRCA requires a 30 m minimum buffer from all other wetlands for all new development unless it can be demonstrated that the hydrological function of adjacent lands has been evaluated and it has been demonstrated through the submission of a hydrologic study to the satisfaction of the LSRCA that there will be no negative impacts on the wetland as a result of the proposed development.

### **3.6.3 Ecological Offsetting Plan (2017)**

The LSRCA recently adopted Ecological Offsetting Plan (2017) states:

*Development proposals that will result in the loss of wetland and/or woodland natural heritage features, despite having followed the mitigation hierarchy (Avoid, Minimize, Mitigate), will be required to compensate for the loss of these features.*

Further, the following conditions must first be satisfied through an approved NHE prior to the approval of any development which proposes compensation for the loss of wetland or woodland feature:

- *Demonstrate conformity with applicable provincial, regional and local plans, including the Oak Ridges Moraine Conservation Plan, Greenbelt Plan, Lake Simcoe Protection Plan, and Official Plans.*
- *Satisfy the “no negative impact test” for the loss of natural heritage feature to ensure consistency with the Provincial Policy Statement (PPS).*
- *Assess the impacts to natural heritage features such as wetlands, woodlands, and watercourses, as well as their associated vegetation protection zones.*
- *Demonstrate that the mitigation hierarchy steps of avoiding, minimizing and mitigating have been followed and that compensation is the only viable option to address impacts to natural heritage features.*
- *Include a preliminary Ecological Offsetting Strategy (EOS) that describes, in concept, how the loss of natural heritage feature will be compensated for. This would include identifying the feature to be removed, location where it will be replaced and general principles for feature creation.*

In general, compensation projects should be within the same subwatershed as the proposed feature loss, preferably within public ownership, and contribute to or expand the NHS as defined by the municipalities in their official plans or as identified in LSRCA’s “Natural Heritage System and Restoration Strategy for the Lake Simcoe Watershed” (2018). In most instances, compensation projects will be required to recreate similar features to those that are lost. However, in some situations, it may be more appropriate for ecological offsetting to include alternative compensation projects that result in an equivalent ecological gain. Once developed, the Ecological Offsetting Strategy (EOS) shall include a monitoring component to ensure the successful installation of the agreed upon compensation project.

A preliminary EOS will be required for the loss of a natural feature as part of any EIS or NHE while a detailed EOS will be required as a condition of draft approval for the related plan of subdivision or plan of condominium.

### **3.7 Endangered Species Act (2007)**

The provincial *Endangered Species Act* (2007) primarily protects species listed as endangered or threatened by the Committee on the Status of Species at Risk in Ontario (COSSARO). Regulated species are protected under the ESA, as is their habitat. Depending on the time of a species’ listing, habitat is protected either under a General Habitat protection provision or a species-specific regulation.

The *Endangered Species Act* (Section 9) generally prohibits the killing or harming of an r endangered or threatened species, as well as the destruction of its habitat. Permitting may be required under Section 17(2)(c) of the ESA for works within regulated habitat.

Seasonally appropriate field investigations are necessary to determine the presence or absence of regulated species.

## 4. Existing Conditions

The subject property totals an area of approximately 49 ha and is generally situated northwest of the intersection of Yonge Street and St. John's Sideroad in the Town of Aurora (**Figure 2**). A number of outbuildings and structures associated with the former Dunin Residence (future school campus) are situated within the property limits, along with extensive areas of woodland and wetland in the west and a wooded valleyland system in the east.

The results of the field studies are visually depicted on **Figure 2** and are described in greater detail below within the sections of respective disciplines.

### 4.1 Aquatic Resources

The subject property is situated within the East Holland River subwatershed of Lake Simcoe, originating on the Oak Ridges Moraine and draining approximately 245 km to Lake Simcoe (LSRCA 2010). The subwatershed supports a range of thermal regimes from coldwater to warmwater. Coldwater reaches are typically associated with the upper reaches of the system as they exit the moraine and then transition to a warmwater system in the main branch of the East Holland River (LSRCA 2010). The subject property is located in the Tannery branch of the East Holland River Subwatershed. Multiple branches of Tannery Creek are located across the subject property and are visualized on **Figure 2**.

The East Holland River Subwatershed Plan (2010) identifies that historically coldwater salmonid species have been captured in the vicinity of the subject property, however many of these records are dated and may no longer reflect current conditions. Multiple barriers to fish passage are also located across the subject property and are detailed in the following sections.

#### 4.1.1 Headwater Drainage Feature Assessment

Field investigations confirmed that no headwater drainage features are present on site.

#### 4.1.2 Tannery Creek West Tributary

The Tannery Creek West Tributary flows across the subject property from northwest to southeast (**Figure 2A**). This section of tributary is contained almost entirely within the boundary of the ORMCP Area, with exception of approximately 140 meters upstream of St John's Sideroad. This tributary is considered coldwater within the property boundary and converges with Tannery Creek south of St. John's Sideroad.

Upon entering the subject property at the northwest corner, the Tannery Creek West Tributary flows southeast through an area of mature cedar swamp. Contained within the boundary of this wetland community, the tributary exhibits a high degree of sinuosity. Channel substrate within the cedar wetland is composed of sand, gravel, and clay. Instream cover is provided by a combination of woody debris and undercut banks (**Photograph 1**). Riparian growth within the cedar swamp is composed primarily of mature tree species with very little overhanging vegetation or growth along the banks. At the



downstream end of the wetland there is a corrugated steel pipes (CSP) to support an existing trail crossing.

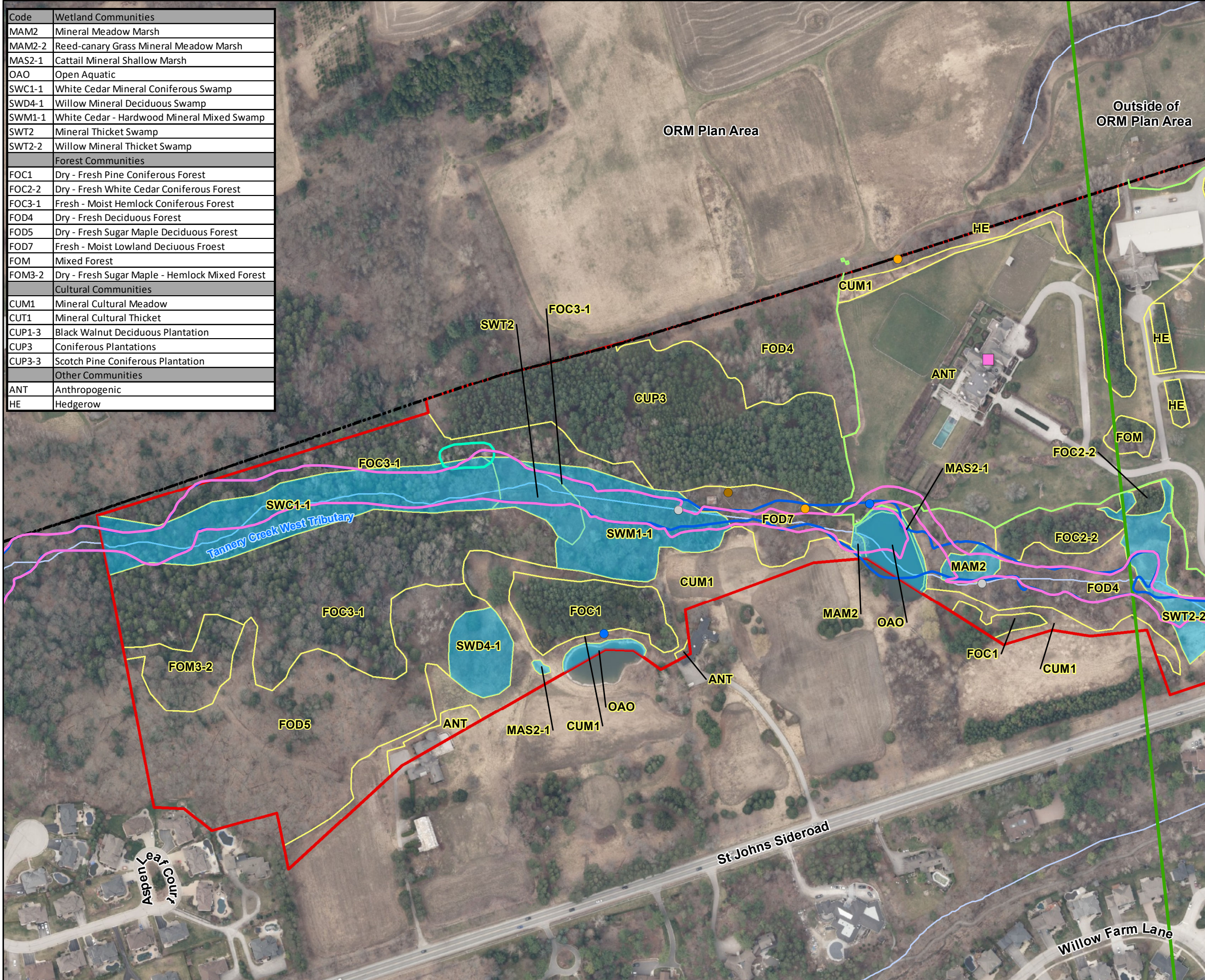


**Photograph 1. Tannery Creek West Tributary – Woody Debris and Undercut Banks (September 16, 2020)**

As the tributary flows out of the wetland into a deciduous forest, overhanging vegetation and riparian undergrowth become more abundant (**Photograph 2**). Channel substrate downstream of the wetland are composed of sand, gravel, clay, and cobble. Groundwater staining and watercress (*Nasturtium officinale*), a groundwater indicator, were noted at multiple locations along the channel. Morphology of the tributary becomes much more channelized, dominated by slow flowing runs and pools. Instream cover is provided by entangled woody debris, exposed roots, and undercut banks.



Code	Wetland Communities
MAM2	Mineral Meadow Marsh
MAM2-2	Reed-canary Grass Mineral Meadow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
OAO	Open Aquatic
SWC1-1	White Cedar Mineral Coniferous Swamp
SWD4-1	Willow Mineral Deciduous Swamp
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp
SWT2	Mineral Thicket Swamp
SWT2-2	Willow Mineral Thicket Swamp
Forest Communities	
FOC1	Dry - Fresh Pine Coniferous Forest
FOC2-2	Dry - Fresh White Cedar Coniferous Forest
FOC3-1	Fresh - Moist Hemlock Coniferous Forest
FOD4	Dry - Fresh Deciduous Forest
FOD5	Dry - Fresh Sugar Maple Deciduous Forest
FOD7	Fresh - Moist Lowland Deciduous Forest
FOM	Mixed Forest
FOM3-2	Dry - Fresh Sugar Maple - Hemlock Mixed Forest
Cultural Communities	
CUM1	Mineral Cultural Meadow
CUT1	Mineral Cultural Thicket
CUP1-3	Black Walnut Deciduous Plantation
CUP3	Coniferous Plantations
CUP3-3	Scotch Pine Coniferous Plantation
Other Communities	
ANT	Anthropogenic
HE	Hedgerow



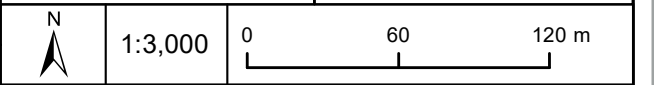
Shining Hill Estate Collection Inc.

- Legend**
- Study Area
  - Staked Dripline (LSRCA, July 21, 2020)
  - Long Term Stable Top of Slope (Soil Engineers Ltd. 2020)
  - Watercourse (MNR 2019)
  - Staked Dripline (LSRCA 24 Aug 2015)
  - Staked Top of Slope (LSRCA 24 Aug 2015)
  - Chimney Crayfish Locations
  - ELC Communities
  - Municipal Boundary (MNR 2019)
  - Regional Floodline (LSRCA)
  - Proposed Regional Floodline (Schaeffers Consulting Engineers, 2020)
  - Nesting Chimney Swift
  - Wetlands (Beacon 2020)
  - Amphibian Monitoring Locations
  - Culvert Location
  - Oak Ridges Moraine Boundary (MNR 2020)

- Butternut Locations**
- Category 1
  - Category 2

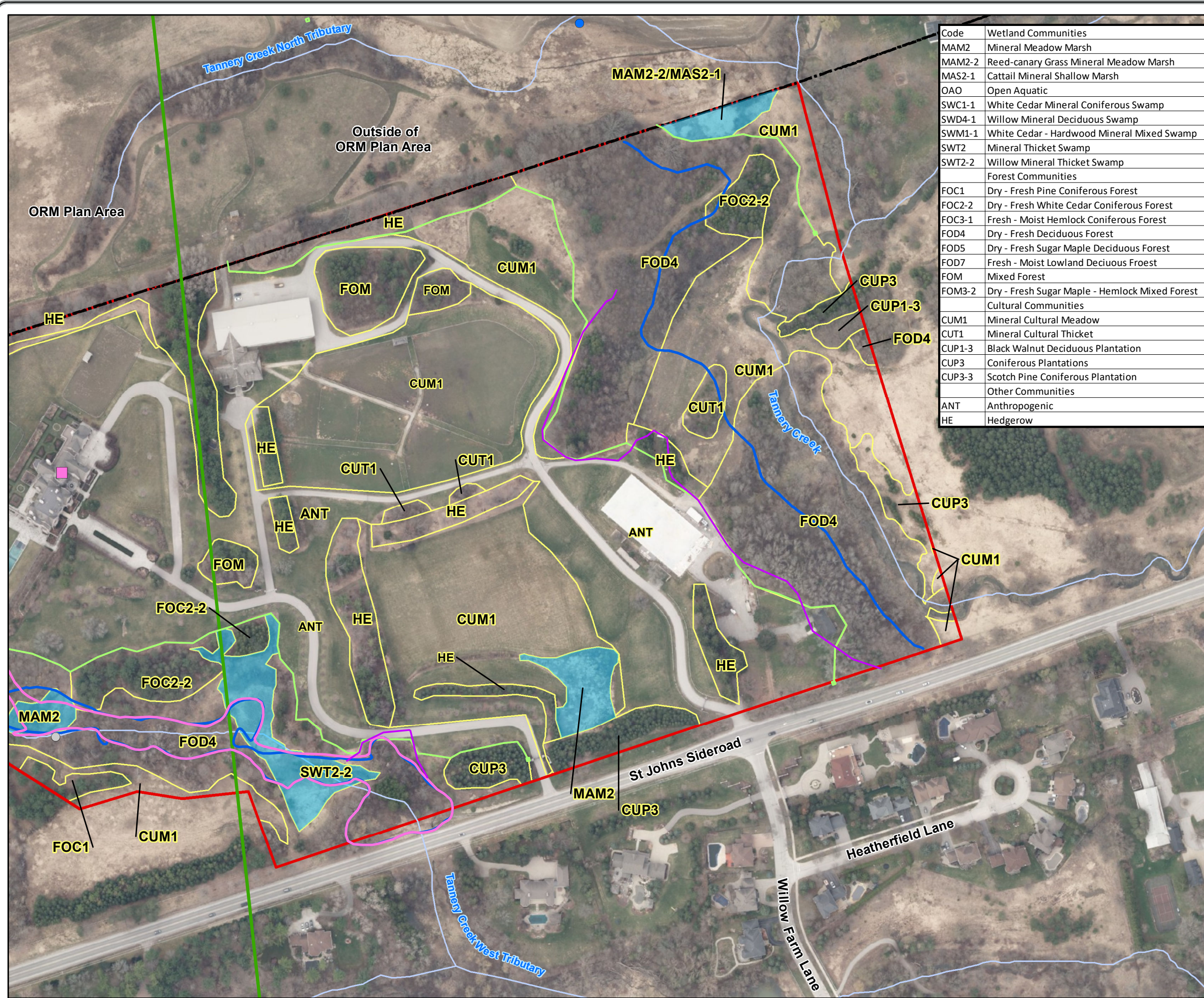
**BEACON ENVIRONMENTAL** Project: 220166  
Last Revised: March, 2021

Client: Shining Hill Estate Collection Inc. Prepared by: BD  
Checked by: CS



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Code	Wetland Communities
MAM2	Mineral Meadow Marsh
MAM2-2	Reed-canary Grass Mineral Meadow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
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SWC1-1	White Cedar Mineral Coniferous Swamp
SWD4-1	Willow Mineral Deciduous Swamp
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp
SWT2	Mineral Thicket Swamp
SWT2-2	Willow Mineral Thicket Swamp
Forest Communities	
FOC1	Dry - Fresh Pine Coniferous Forest
FOC2-2	Dry - Fresh White Cedar Coniferous Forest
FOC3-1	Fresh - Moist Hemlock Coniferous Forest
FOD4	Dry - Fresh Deciduous Forest
FOD5	Dry - Fresh Sugar Maple Deciduous Forest
FOD7	Fresh - Moist Lowland Deciduous Forest
FOM	Mixed Forest
FOM3-2	Dry - Fresh Sugar Maple - Hemlock Mixed Forest
Cultural Communities	
CUM1	Mineral Cultural Meadow
CUT1	Mineral Cultural Thicket
CUP1-3	Black Walnut Deciduous Plantation
CUP3	Coniferous Plantations
CUP3-3	Scotch Pine Coniferous Plantation
Other Communities	
ANT	Anthropogenic
HE	Hedgerow

<b>Existing Conditions</b>	<b>Figure 2B</b>
Shining Hill Estate Collection Inc.	
<b>Legend</b>	
<span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px;"></span>	Study Area
<span style="border-bottom: 2px solid green; width: 20px; display: inline-block;"></span>	Staked Dripline (LSRCA, July 21, 2020)
<span style="border-bottom: 2px solid purple; width: 20px; display: inline-block;"></span>	Long Term Stable Top of Slope (Soil Engineers Ltd. 2020)
<span style="border-bottom: 2px solid blue; width: 20px; display: inline-block;"></span>	Watercourse (MNR 2019)
<span style="border: 1px solid cyan; display: inline-block; width: 15px; height: 10px;"></span>	Chimney Crayfish Locations
<span style="border: 1px solid yellow; display: inline-block; width: 15px; height: 10px;"></span>	ELC Communities
<span style="border-bottom: 2px dashed black; width: 20px; display: inline-block;"></span>	Municipal Boundary (MNR 2019)
<span style="border-bottom: 2px solid blue; width: 20px; display: inline-block;"></span>	Regional Floodline (LSRCA)
<span style="border-bottom: 2px solid pink; width: 20px; display: inline-block;"></span>	Proposed Regional Floodline (Schaeffers Consulting Engineers, 2020)
<span style="background-color: lightblue; display: inline-block; width: 15px; height: 10px;"></span>	Wetlands (Beacon 2020)
<span style="color: blue;">●</span>	Amphibian Monitoring Locations
<span style="color: grey;">●</span>	Culvert Location
<span style="color: pink;">■</span>	Nesting Chimney Swift
<span style="border: 2px solid green; display: inline-block; width: 15px; height: 10px;"></span>	Oak Ridges Moraine Boundary (MNR 2020)
<b>Butternut Locations</b>	
<span style="color: brown;">●</span>	Category 1
<span style="color: orange;">●</span>	Category 2
Project: 220166 Last Revised: March, 2021	
Client: Shining Hill Estate Collection Inc.	Prepared by: BD Checked by: CS
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**Photograph 2. Tannery Creek West Tributary – Abundant Riparian Growth (September 16, 2020)**

Upon exiting the forest, the Tannery Creek West Tributary flows directly into a large online pond. The pond is bordered predominantly by agricultural land to the southwest and manicured lawn to the northeast. The pond was constructed by damming the downstream end of the tributary. Water level within the pond is maintained by a surface level drainpipe which outlets downstream through a CSP (**Photograph 3**). Online ponds and surface drains both influence coldwater tributaries negatively by increasing temperatures downstream of their location. The design of the outlet structure (i.e., gabion baskets) also represents a year-round barrier to fish passage (**Photograph 4**). The outlet of the pond is stabilized with retaining walls and several gabion baskets and sits approximately three meters below the water level of the pond.





**Photograph 3. Tannery Creek West Tributary – Online pond Drainpipe (September 16, 2020)**



**Photograph 4. Tannery Creek West Tributary – Pond Outlet Pipe (September 16, 2020)**

Downstream of the pond, a variety of abundant grasses and shrubs dominate the riparian area of the tributary. Channel substrates are composed of equal mixture of sand, gravel, and clay. **Figure 2A**



identifies a historic farm crossing which is piped through a 0.65 m CSP with a 0.25 m perch on the downstream end (**Photograph 5**). This perched culvert represents a potential barrier to fish passage. Instream cover within this section of tributary exists primarily in the form of woody debris and refuge pools. The Tannery Creek West Tributary eventually flows offsite beneath St. Johns Sideroad.



**Photograph 5. Tannery Creek West Tributary – Perched Culvert (September 16, 2020)**

#### **4.1.3 Tannery Creek**

Tannery Creek flows northwards through the eastern portion of the subject property (**Figure 2A**). Within the property boundary, it is considered a coldwater watercourse (MNRF 2010). Instream cover is provided by a mix of woody entanglement, overhanging vegetation, and undercut banks. Throughout the subject property the riparian area is predominantly forest with some sections that abut cultural meadow. Tannery Creek exhibits a meandering pool, run sequence within a defined channel. Substrate within the tributary is a mix of sand, silt, detritus, and gravel. Evidence of erosion was noted throughout this section of Tannery Creek including slumping banks, pockets of sediment deposition within the bends of the channel, and exposed tree roots along the banks (**Photograph 6**). Wetted widths of the main tributary were notably wider than those of the contributing western branch, reaching widths of approximately 5.0 meters. Tannery Creek flows offsite to the east, before traversing the northern property boundary. Immediately downstream of the property, Tannery Creek converges with the Tannery Creek North Tributary (**Figure 2A**). It is at this confluence that the thermal regime of Tannery Creek shifts from coldwater to a warmwater designation (MNRF 2010).



**Photograph 6. Tannery Creek – Erosion Along Creek Bend (September 21, 2020)**

## 4.2 Vegetation Communities

General vegetation communities were mapped and described according to the ELC system for southern Ontario (Lee *et al.* 1998) and are illustrated on **Figure 2** along with the LSRCA staked limit. The limit of the natural feature was staked with the TRCA and is represented by the greater of the woodland dripline and wetland limit (**Figure 2**).

Large portions of the subject property were characterized as Anthropogenic (ANT) based on the current and recent historical usage for residential use. The ANT area includes large manicured lawn areas as well as paved driveways and parking areas associated with the existing buildings (**Photograph 7**). Ornamental garden vegetation planted around the residence was included. Anthropogenic areas do not represent formal vegetation communities per the ELC methodology however are described here as a reflection of the land use.

A number of Hedgerow (HE) features were also delineated and also are not included in the ELC methodology. Hedgerows varied in age and composition and included segments dominated by deciduous and others entirely coniferous. Species present included Sugar Maple (*Acer saccharum*), White Pine (*Pinus strobus*), Scots Pine (*Pinus sylvestris*), White Spruce (*Picea glauca*), Norway Spruce (*Picea abies*), White Ash (*Fraxinus americana*) and American Basswood (*Tilia americana*). The two east-west running hedgerow units straddling the northern property boundary contain some of the most mature trees at this location and consisted of predominantly Sugar Maple, Red Oak (*Quercus rubra*), Bur Oak (*Quercus macrocarpa*) and Black Cherry (*Prunus serotina*), whereas in contrast, the other hedgerow units were composed of younger specimens.





**Photograph 7. Existing Dwelling and Future School Structure (September 10, 2020)**

#### **4.2.1 Cultural Communities**

Large portions of the subject property were characterized as a form of cultural community, defined as areas either arising from or maintained from human activity. Typically, a high proportion of non-native species are found within cultural areas.

##### **Mineral Cultural Meadow (CUM1)**

Six separate meadow communities (some are former horse pastures) were encountered and were characterized based on the dominant composition of densely growing forbs and cool season grasses. Plant identified within the meadow communities included asters (*Symphyotrichum cordifolium*, *S. ericoides*, *S. lateriflorum*, *S. novae-angliae*), goldenrods (*Solidago canadensis*, *S. altissima*), Black Knapweed (*Centaurea nigra*), Common Milkweed (*Asclepias syriaca*), Ragweed (*Ambrosia artemesifolia*), Wild Bergamot (*Monarda fistulosa*), Mullein (*Verbascum thapsus*) and a variety of grasses including Timothy (*Phleum pratense*), Smooth Brome (*Bromus inermis*), Kentucky Bluegrass (*Poa pratense*), Orchard Grass (*Dactylis glomerata*) and Quackgrass (*Elymus repens*). Meadow diversity was relatively rich and included a number of other species such as Queen Anne's Lace (*Daucus carota*), Evening Primrose (*Oenothera biennis*), Bull Thistle (*Cirsium vulgare*) and plantains (*Plantago major*, *P. lanceolata*). An extensive patch of Michigan Lily (*Lilium michiganense*) was present within the northeastern meadow community, situated within the eastern valley feature.

### **Mineral Cultural Thicket (CUT1)**

The thicket communities on the subject property were generally composed of a mix of species also found in the nearby Cultural Meadow communities, as well as Manitoba Maple (*Acer negundo*), Staghorn Sumac (*Rhus typhina*), willow species (*Salix* spp.), Wild Red Raspberry (*Rubus idaeus* ssp. *strigosus*), hawthorn species (*Crataegus* sp.), and European Buckthorn (*Rhamnus cathartica*).

### **Black Walnut Deciduous Plantation (CUP1-3)**

This plantation type occurred in only one location on the subject property along the eastern border. Planted Black Walnut (*Juglans nigra*) dominated the canopy in rows. This species is fairly well documented for its natural herbicide (Juglone), accordingly little else was noted growing within this area.

### **Scots Pine Coniferous Plantation (CUP3-3)**

This community occurred along the eastern portion of the property and extended off site to the east. The only trees found within this canopy were Scots Pine (*Pinus sylvestris*) that, at the time of survey, were roughly 15-30 years old. Some canopy gaps occurred sporadically, which was densely filled in with Tall Goldenrod.

### **Coniferous Plantation (CUP3)**

The CUP3 communities occurred on two locations across the subject property and were generally composed of evidently planted coniferous tree species. The two southeastern CUP3 communities were situated on either side of the existing driveway along St. John's Sideroad and were composed of densely planted Colorado Blue Spruce (*Picea pungens*) and White Spruce (*Picea glauca*), along with areas dominated by Scots Pine and White Pine (*Pinus strobus*).

The remaining CUP3 community was situated west of the future school location, and contained individual components that varied in composition and age though have been characterized as one larger coniferous plantation block. The southeastern portion of the plantation was composed of mature White Pine trees (**Photograph 8**) and represents the oldest portion of the plantation area. In addition to areas dominated by Scots Pine, other blocks within the CUP3 contained areas that were almost entirely composed of planted White Spruce (*Picea glauca*) with lesser occurrences of successional Eastern White Cedar (*Thuja occidentalis*), Sugar Maple (*Acer saccharum*) and White Ash (*Fraxinus americana*).



Photograph 8. White Pine Dominated Plantation CUP3 (January 3, 2020)

#### **4.2.2 Woodland Communities**

Woodland communities were identified on the subject property and include areas that are dominated by trees of varying composition, age and form. These are described in greater detail below.

##### **Dry-Fresh Pine Coniferous Forest (FOC1)**

This FOC1 community occurred in one location in the western wooded block and was dominated by Austrian Pine (*Pinus nigra*), with lesser amounts of White Spruce and White Pine. The lower vegetation layers were relatively dense and included Pagoda Dogwood, young White Ash, Heart-leaved Aster (*Symphotrichum cordifolium*) and Orchard Grass.

##### **Dry-Fresh White Cedar Coniferous Forest (FOC2-2)**

Wooded areas dominated by Eastern White Cedar (*Thuja occidentalis*) were characterized as FOC2-2 communities. These occurred in two separate locations on the subject property and both had a dense canopy of this species with lesser occurrences of others such as Black Walnut, White Ash, Scots Pine and White Pine. Choke Cherry (*Prunus virginiana*) was abundant in the understory.

##### **Fresh-Moist Hemlock Coniferous Forest (FOC3-1)**

A relatively large portion of the western wooded block was characterized as a FOC3-1 community based on the prevalence of Eastern Hemlock (*Tsuga canadensis*). Other tree species found within this unit



were Sugar Maple and American Beech (*Fagus grandifolia*). Lower botanical layers were rich and included Field Horsetail (*Equisetum arvense*), Dwarf Horsetail (*Equisetum scirpoides*), along with a number of fern species such as Marginal Wood Fern (*Dryopteris marginalis*), Christmas Fern (*Polystichum acrostichoides*) and Oak Fern (*Gymnocarpium dryopteris*).

Portions of this community abutted the Tannery Creek West tributary and contained patches of Orange Jewelweed (*Impatiens capensis*) and Spotted Joe-pye Weed (*Eutrochium maculatum*) along the flowing watercourse.

#### **Dry-Fresh Deciduous Forest (FOD4)**

Dry-Fresh Deciduous woodland (FOD4) units were characterized based on a variable deciduous canopy and occurred in two locations on the subject property. The eastern valleyland corridor was classified as an FOD4 unit (**Photograph 9**) and was situated on a downslope towards Tannery Creek with a canopy composed of Black Walnut (*Juglans nigra*), Manitoba Maple, extensive dead White Ash as well as sparse Colorado Blue Spruce, Scots Pine and Black Locust (*Robinia pseudoacacia*). Shrubs were common in the understorey and were particularly dense where the canopy was lost due to dead ash trees, including Pagoda Dogwood, European Buckthorn and hawthorne species. Ground cover that was commonly noted included Creeping Charlie (*Glechoma hederaceae*), Zigzag Goldenrod (*Solidago flexicaulis*), Garlic Mustard (*Allaria petiolata*), Rose Balsam (*Impatiens balsamifera*) and Stinging Nettle (*Urtica dioica*).



**Photograph 9. Easternmost FOD4 Community (September 16, 2020)**

The FOD4 unit west of the school location was a younger successional community bordered by coniferous plantation and mature deciduous hedgerow. Composition included Trembling Aspen (*Populus tremuloides*), American Basswood (*Tilia americana*), Sugar Maple, White Ash and Paper Birch



(*Betula papyifera*). The coniferous trees within this unit were predominantly Scots Pine. A number of spring ephemerals were noted here including Bloodroot (*Sanguinaria canadensis*), White Trillium (*Trillium grandifolia*), Jack in the Pulpit (*Podophyllum peltatum*), Wild Sarsaparilla (*Aralia nudicaulis*) and Canada Mayflower (*Maianthemum canadensis*).

### **Dry-Fresh Sugar Maple Deciduous Forest (FOD5)**

One upland woodland community was dominated by Sugar Maple and was therefore characterized as an FOD5 (**Photograph 10**). In addition to Sugar Maple, lesser amounts of Manitoba Maple were noted along the community edge, as well as American Elm (*Ulmus americana*) and Paper Birch (*Betula papyifera*). The ground cover vegetation included Red and White Baneberry (*Actaea rubra*, *A. pachypoda*), Twisted Rose Stalk (*Streptopus lanceolatus*), Blue Cohosh (*Caulophyllum thalictroides*), Wild Sarsaparilla, Wild Ginger (*Asarum canadense*) and ferns including Ostrich Fern (*Matteuccia struthiopteris*), Christmas Fern and Lady Fern (*Athyrium filix-femina*).



**Photograph 10. Sugar Maple Dominated FOD5 (September 10, 2020)**

### **Fresh-Moist Lowland Deciduous Forest (FOD7)**

This community was on either side of the Tannery Creek West Tributary in within the western woodland block and was composed of White willow trees, White and Green Ash, as well as Balsam Poplar (*Populus balsamifera*).

### **Mixed Forest (FOM)**

Three Mixed Forest (FOM) communities were situated outside of the staked feature limit, generally within the already developed areas. Composition included a number of relatively young species or those in poor condition including Manitoba Maple, Austrian Pine (*Pinus nig*), American Elm (*Ulmus americana*), White Ash, Scots Pine and White Pine. Understorey was generally dense with European Buckthorn along with Staghorn Sumac along the exterior limits. Grape Vine (*Vitis riparia*) cover was noted throughout the FOM units.

### **Dry-Fresh Sugar Maple – Hemlock Mixed Forest (FOM3-2)**

This community was similar to the adjacent FOD5 unit dominated by Sugar Maple, however this area was separately delineated due to the introduction of Eastern Hemlock (*Tsuga canadensis*) trees and Yellow Birch (*Betula allegheniensis*).

### **4.2.3 Wetland Communities**

Wetland communities are established based on the 50% rule whereby staff assessed the relative abundance of wetland versus terrestrial plant species. This determination is based on percentage cover as opposed to species richness.

### **Mineral Meadow Marsh (MAM2)**

Three MAM2 units were located on the subject property. One of these was not captured in the LSRCA feature staking exercise and is therefore outside of the staked feature limit.

Species composition contained a high abundance of Reed Canary Grass (*Phalaris arundinacae*) as well as other wetland plants including Curly Dock (*Rumex crispus*), Elecampane (*Inula helenium*), Purple-stemmed Aster (*Symphotrichum puniceum*), Panicked Aster (*S. lanceolatum*) and Grass-leaved Goldenrod (*Euthamia graminifolia*). The easternmost MAM2 that was not included in the feature staking contained a number of willow shrubs including Missouri Willow (*Salix eriocephala*) and Sandbar Willow (*Salix interior*).

The MAM2 community adjacent to the open pond contained a slightly different species composition including Boneset (*Eupatorium perfoliatum*), Jewelweed (*Impatiens capensis*), Water Plantain (*Alisma plantago-aquatica*) and Bald Spikerush (*Eleocharis erythropoda*).

### **Reed Canary Grass and Cattail Mineral Meadow Marsh (MAM2-2)/MAS2-1**

This community forms part of a larger wetland complex extending off site to the north and west. Composition included typical meadow marsh species such as Reed Canary Grass, Boneset, Elecampane and sedges (*Carex* spp.) as well as extensive patches of cattails.



### **Open Aquatic (OAO)**

The pond south of the future school location was characterized as an open aquatic community based on its depth exceeding 2 m (**Photograph 12**). Some aquatic vegetation was noted including pondweed (*Potamogeton* sp.), Common Duckweed (*Lemna minor*) and Watercress (*Nasturtium officinale*) along the northwestern inlet.

### **Cattail Mineral Shallow Marsh (MAS2-1)**

This wetland community was noted and encircled the OAO pond southwest of the large home (**Photograph 11**). Cattail species dominated and a few others were noted including Bittersweet Nightshade (*Solanum dulcamara*), Purple Loosestrife (*Lythrum salicaria*) and Water Plantain.



**Photograph 11. View of OAO and MAS2-1 Communities (September 10, 2020)**

### **White Cedar Mineral Coniferous Swamp (SWC1-1)**

This community generally followed the western portion of the Tannery Creek West Tributary and was dominated by Eastern White Cedar trees (**Photograph 12**). Other trees included Yellow Birch and Eastern Hemlock, which were noted sporadically and ground cover included Sensitive Fern, Enchanter's Nightshade, Jewelweed, Purple-stemmed Aster and an extensive area of Dwarf Horsetail (*Equisetum scirpoides*). The eastern portions of this community contained a large patch of American Golden Saxifrage (*Chrysosplenium americanum*).



Photograph 12. Swamp Dominated by Eastern White Cedar (FOC1-1; September 10, 2020)

#### **Willow Mineral Deciduous Swamp (SWD4-1)**

One SWD4-1 unit was noted in the western portion of the property and extended southward from the upland woodland block. The canopy was entirely dominated by White Willow (*Salix alba*).

#### **White Cedar Hardwood Mineral Mixed Swamp (SWM1-1)**

The sole SWM1-1 community formed an eastern extension of the SWC1-1 unit described above and included a canopy of Eastern White Cedar, Green Ash, Yellow Birch, willows (*S. alba*, *S. fragilis*) with a substantial amount of downed and accumulated woody debris. Plant species included Sensitive Fern, Coltsfoot (*Tussilago farfara*), Field and Water Horsetail (*Equisetum arvense*, *E. fluviatile*), Softstem Bulrush (*Schoenoplectus tabernaemontani*), Blue and White Vervain (*Verbena hastata*, *V. urticifolia*) as well as a number of sedge species (*Carex crinata*, *C. retrorse*, *C. gracilima*, *C. lacustris*, *C. stipata*, *C. vulpanoides*). A swamp thicket inclusion was noted within the SWM1-1 and was represented by a centrally situated patch of Red-osier Dogwood (*Cornus stolonifera*) and Missouri Willow. A small number of Blue Cardinal Flower (*Lobelia siphilitica*) were located here.

#### **Willow Mineral Thicket Swamp (SWT2-2)**

This unit was captured by the LSRCA feature staking exercise and is situated south of the school block. Willow shrubs dominated this unit along with a small number of Swamp White Oak (*Quercus bicolor*), Scots Pine and Manitoba Maple trees.

### 4.3 Botanical Inventory

A total of 294 plant taxa were observed on the subject property (**Appendix B**) with approximately 71% being native species. This relatively high number of plant species is largely attributed to the mixture of vegetation communities discussed in the previous section whereby a number of wetland and woodland types have been identified, as well as an extensive anthropogenic area with introduced and maintained vegetation. Plant types recorded included trees, shrubs, woody vines, graminoids and non-graminoid herbaceous species.

The only plant species afforded with protection under the ESA was the Butternut (*Juglans cinerea*) tree which is discussed in greater detail under Section 4.6 of this report. The majority of native plant species are ranked provincially as S5 (Secure) with the exception of following species that are ranked provincially as S4 (Apparently Secure): Arrow-leaved Aster (*Symphyotrichum urophyllum*), American Beech (*Fagus grandifolia*), Swamp White Oak (*Quercus bicolor*), Showy Tick-trefoil (*Desmodium canadense*), Wild Leek (*Allium tricoccum*), Michigan Lily (*Lilium michiganse*), White and Green Ash (*Fraxinus americana*, *F. pennsylvanica*), Black Walnut, Long-headed Anemone (*Anemone cylindrica*) and American Golden-saxifrage (*Chrysosplenium americanum*).

Species that are considered rare or uncommon per the Lake Simcoe State of the Watershed report (2003) or York Region plant list prepared by Steve Varga (2005) are presented below in **Table 2** as well as if they are situated within otherwise constrained lands. The ‘U’ represents uncommon and R1-R10 is a local rarity status (1-10 denotes the number of stations at which the named species was found during the 2005 study).

**Table 2. Rare and Uncommon Plant Species**

Plant Species	S Rank (Provincial)	Lake Simcoe (State of the Watershed 2003)	York Region (Varga\ 2005)	Inside Protected Feature Limit?
Northern Arrowhead, <i>Sagittaria cuneata</i>	S5	R	R5	Yes
Hairy Sweet Cicily, <i>Osmorhiza claytonii</i>	S5		U	Yes
Hemp Dogbane, <i>Apocynum cannabinum</i>	S5		U	Yes
Wild Calla, <i>Calla palustris</i>	S5		U	Yes
Woodland Sunflower, <i>Helianthus divaricatus</i>	S5	R		Yes
Tall Blue Lettuce, <i>Lactuca biennis</i>	S5		U	Yes
Early Goldenrod, <i>Solidago juncea</i>	S5		R6	In part
Smooth Aster, <i>Symphyotrichum laeve</i>	S5	R	R2	In part
Arrow-leaved Aster, <i>Symphyotrichum urophyllum</i>	S4		U	In part
Blue Cohosh, <i>Caulophyllum thalictroides</i>	S5		R	Yes
Virginia Stickseed, <i>Hackelia virginiana</i>	S5		R8	In part



Plant Species	S Rank (Provincial)	Lake Simcoe (State of the Watershed 2003)	York Region (Varga\ 2005)	Inside Protected Feature Limit?
Cut-leaved Toothwort, <i>Cardamine concatenata</i>	S5	R	R3	Yes
Great Blue Lobelia, <i>Lobelia siphilitica</i>	S5		U	Yes
Grey Dogwood, <i>Cornus racemosa</i>	S5		U	Yes
Swamp Dodder, <i>Cuscuta gronovii</i>	S5		U	Yes
White Bear Sedge, <i>Carex albursina</i>	S5		U	Yes
Fringed Sedge, <i>Carex crinita</i>	S5		U	Yes
Plantain-leaved Sedge, <i>Carex plantaginea</i>	S5		U	Yes
Showy Tick-trefoil, <i>Desmodium canadense</i>	S4		R1	Yes
Swamp Red Currant, <i>Ribes triste</i>	S5		U	Yes
Black Walnut, <i>Juglans nigra</i>	S4?	R	R	In part
Wild Bergamot, <i>Monarda fistulosa</i>	S5		U	In part
Michigan Lily, <i>Lilium michiganense</i>	S4		U	Yes
Common Evening Primrose, <i>Oenothera biennis</i>	S5		U	In part
Smooth Serviceberry, <i>Amelanchier laevis</i>	S5		U	Yes
Swamp Rose, <i>Rosa palustris</i>	S5	R	R7	Yes
Common Bedstraw, <i>Galium aparine</i>	S5		U	Yes
Sandbar Willow, <i>Salix interior</i>	S5		U	Yes
American Golden-saxifrage, <i>Chrysosplenium americanum</i>	S4	R	R6	Yes
White Turtlehead, <i>Chelone glabra</i>	S5		U	Yes
Long-spurred Violet, <i>Viola rostrata</i>	S5		U	Yes

All of the of the uncommon and rare species encountered on the property are situated either entirely or partly within the staked natural features (woodlands, wetlands, or valley limit).

The rare or uncommon species listed in **Table 2** are primarily ranked provincially as S5 (Secure) with the exception of Arrow-leaved Aster, Showy Tick-trefoil, Black Walnut, Michigan Lily, and American Golden-saxifrage which are ranked provincially as S4 (Apparently Secure).

#### 4.4 Breeding Birds

A total of 49 breeding bird species was recorded on the property during the 2020 breeding season with an additional one species noted as foraging only (**Appendix C**). The wide variety of vegetation communities discussed in the preceding sections contributed to the relatively high diversity of birds observed at this location. Avian observations were distributed throughout the study area with higher densities within the woodland, valleyland and habitat transitions. The anthropogenic and manicured areas produced the fewest number of breeding species and territories.

Many of the species were common birds that are frequently found in disturbed rural and urbanizing environments. The following species were recorded with more than five separate singing males or territories: Song Sparrow (*Melospiza melodia*), Red-winged Blackbird (*Agelaius phoeniceus*), Black-capped Chickadee (*Poecile atricapillus*) and Baltimore Oriole (*Icterus galbula*). Other species with multiple territories on the subject property included: Mourning Dove (*Zenaida macroura*), Northern Cardinal (*Cardinalis cardinalis*), European Starling (*Sturnus vulgaris*), Savannah Sparrow (*Passerculus sandwichensis*), Common Yellowthroat (*Geothlypis trichas*) and House Wren (*Troglodytes aedon*).

A number of species typically closely associated with woodlands were recorded within the forests on the subject property and included Rose-breasted Grosbeak (*Pheucticus ludovicianus*), Red-tailed Hawk (*Buteo jamaicensis*), Red-bellied Woodpecker (*Melanerpes carolinus*), Great Crested Flycatcher (*Myiarchus crinitus*), Pileated Woodpecker (*Dryobates pileatus*) and two species of nuthatch – Red-breasted Nuthatch (*Sitta canadensis*) and White-breasted Nuthatch (*Sitta carolinensis*).

In addition to the woodland species, the wetland communities on the subject property supported several species that typically rely on or are closely associated with wetland habitats to fulfill their life cycle. Such species included: Yellow Warbler (*Setophaga petechia*), Common Yellowthroat, Red-winged Blackbird, Green Heron (*Butorides virescens*), Mallard (*Anas platyrhynchos*) and Great Blue Heron (*Ardea herodias*). The Great Blue Heron was only foraging in the open pond community as this species breeds colonially in conspicuous heronries which were absent on the subject property.

The anthropogenic and open parts of the subject property supported species that are typically found in either open field or disturbed habitats, often in close association with human habitat. These birds included Killdeer (*Charadrius vociferus*), House Sparrow (*Passer domesticus*), Chimney Swift (*Chaetura pelagica*), Cliff Swallow (*Petrochelidon pyrrhonota*), Barn Swallow (*Hirundo rustica*) and Eastern Phoebe (*Sayornis phoebe*). The latter four species exploit breeding opportunities presented by anthropogenic structures such as barns, bridges or sheds.

Area-sensitive birds are those that require larger tracts of suitable habitat in which to breed or are those that have a higher breeding success in larger areas of suitable habitat. Seven such species were recorded. Five of these were considered to be forest-sensitive species: Hairy Woodpecker (*Leuconotopicus villosus*), Red-breasted Nuthatch, White-breasted Nuthatch, American Redstart (*Setophaga ruticilla*) and Pileated Woodpecker. The remaining two species are considered grassland area-sensitive species and were Savannah Sparrow and Bobolink (*Dolichonyx oryzivorus*).

A group of Wild Turkey (*Meleagris gallopavo*) were observed roaming the subject property and likely breed.

Two nesting species from the 2020 breeding bird season are afforded with protection under the ESA based on their designation as threatened species. These are Barn Swallow and Chimney Swift and are described in greater detail under Section 4.6.

No species considered S1 through S3 (Critically Imperiled through Vulnerable) using the provincial ranks were recorded. All species are either S4 (Apparently Secure) or S5 (Secure).

## 4.5 Amphibian Call Surveys

Two areas of suitable amphibian habitat were identified and were surveyed during the 2020 breeding season. The following species were recorded in the two open water communities west of the school:

Green Frog (*Lithobates clamitans*), American Toad (*Anaxyrus americana*) and Gray Treefrog (*Hyla versicolor*).

## 4.6 Other Wildlife

Any wildlife species observed on the subject property during field investigations not considered within the preceding sections of this report were recorded as incidental observations.

Mammal species documented from the property include: Eastern Cottontail (*Sylvilagus floridana*), Red Squirrel (*Tamiasciurus hudsonicus*) and Gray Squirrel (*Sciurus carolinensis*). A Muskrat (*Ondatra zibethicus*) lodge was also present in the pond by the future school, and two individuals of this species were noted. Extensive evidence of both Eastern Coyote (*Canis X latrans*) and White-tailed Deer (*Odocoileus virginianus*) was also observed.

Other common mammal species that are likely present on and adjacent to the subject property though were not directly observed include Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*) and/or Red Fox (*Vulpes vulpes*).

Three species of reptile were observed on the subject property, Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) and Dekay's Brownsnake (*Storeria dekayi*).

Beyond the amphibian species encountered vocalizing during call surveys (Section 4.5), both Red-backed Salamander (*Plethodon cinereus*) and Eastern Newt (*Notophthalmus viridescens*) were observed by Beacon staff in the western woodland block.

### 4.6.1 Chimney Crayfish

One area with concentrations of chimney-shaped burrows likely belonging to the Chimney (or Digger) Crayfish (*Fallicambarus fodiens*) were observed in the western section of the subject property partially within swamp communities (i.e., SWC1-1 and SWT2 units) as shown in **Figure 2A**. There are two terrestrial crayfish species in Southern Ontario: Chimney Crayfish and Meadow (or Devil) Crayfish (*Cambarus diogenes*). The distribution of Chimney Crayfish extends north to the southeastern shores of Georgian Bay and east to the northeast shore of Lake Scugog, whereas the distribution of Meadow Crayfish is limited to the Niagara Peninsula as well as the northeastern shoreline of Lake Erie (Hamr 2006).

The Chimney Crayfish is presently ranked in the NHIC database as “G5” – secure and common globally; “N3” – vulnerable at moderate risk of extinction nationally; and “S4” – apparently secure but uncommon at the provincial level. It is not designated as a SAR by MECP; therefore, it is not afforded any specific protection under the ESA. Colonies can trigger Significant Wildlife Habitat designation.

## 5. Natural Feature Assessment

The following sections address the presence or absence of various classes of natural heritage features as well as landform conservation and hazards.



## 5.1 Provincially Significant Wetlands

There are no designated Provincially Significant Wetlands (PSW) on the subject property. The nearest PSW is over 420 m away to the east.

The feature staking exercise with LSRCA delineated part of the wetland communities on the subject property where these areas represented the outer edge of a community and were further refined subsequently through the implementation of ELC methodology. Botanical composition and characterization of the identified wetlands is provided under Section 4.2 and visualized on **Figure 2**, with the outermost wetland limit shown on **Figure 3**.

## 5.2 Significant Valleylands

Valleyland limits were determined through geotechnical work conducted by Soil Engineers Ltd. (2020 and 2021). The long-term stable top of slope was calculated along the western edge of the eastern valley, as well as the northern edge of the southern valley unit.

The LSRCA staked the physical top of slope along the southern portion of the existing driveway during field study however the determination of the valley limits was generally established through the aforementioned geotechnical study where the LTSS represents the outermost limit.

The York Region Official Plan defines Significant Valleylands as being a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. On the ORM significant valleylands are defined through application of the ORMCP technical paper. Both of the valley features within the subject property are characterized as significant valleylands.

## 5.3 Significant Woodlands

The western portion of the subject property is situated within the ORMCP area, therefore woodlands within this area are tested for significance based on the application of Technical Paper 7 of the ORMCP. The western woodland block satisfies the ORMCP significant woodland criteria as the woodland is greater than 4 ha in size and is located within the Settlement Area land use designation.

The woodlands east of the ORMCP area are considered significant if the Regional criteria are satisfied. Woodlands within the staked valley associated with Tannery Creek within the eastern section of the subject property, and the woodland corridor south of the future school (i.e., associated with the Tannery Creek West Tributary) satisfy Regional criteria, as the woodlands are greater than 0.5 ha and are within 30 m of wetlands and intermittent/permanent stream.

One of the hedgerow communities along the northern property boundary was captured within the feature staking exercise. However, this staked hedgerow is not considered part of the woodland as per the York Region Official Plan as it is less than 40 m in average width, with a greater than 3 to 1 length to width ratio. The hedgerow excluded from the significant woodland analysis is depicted on **Figure 3**.

Staked woodlands on the subject property, with the exception of the northern hedgerow, satisfy the above-mentioned significant woodland criteria.

## 5.4 Watercourses and Fish Habitat

Multiple branches of Tannery Creek transect the subject property and are identified on **Figure 2** and **3**.

## 5.5 Significant Wildlife Habitat

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (OMNRF 2015) provide guidance for the Significant Wildlife Habitat (SWH) designation for the four categories of SWH outlined in the Significant Wildlife Habitat Technical Guide and its Appendices (OMNR 2000). Very few municipalities have provided their own thresholds for the suggested criteria but some have, and in many cases the thresholds are higher than that suggested for use by MNRF.

Regarding these guidelines the Province notes that:

*They are advisory only and may be updated as technology or techniques improve. They provide information to assist in understanding the policy. They do not add to or detract from policy. Except as otherwise specified (e.g. where requirements are established by legislation or regulation), they do not represent the only acceptable approaches.*

Perhaps the greatest challenge in applying these guidelines is that functional thresholds for the criteria are generally absent. Two examples are provided here to illustrate the challenge. In the first example, a single pair of Eastern Wood-Pewee (*Contopus virens*, a special concern species) nesting in an orchard might trigger SWH designation (again only presence is required according to the guidance). However, the habitat may be less than optimal in terms of area or habitat quality and the number of pairs (one) might indicate only a transient occupation of unproductive habitat. A municipality might elect to include thresholds of: “10 ha of suitable good quality habitat occupied by multiple pairs”. A second example might be the roadside-nesting of a Snapping Turtle. This could trigger the SWH designation. However, the habitat is artificially maintained, is less than optimal in terms of location and it might actually operate as a “sink” for the species whereby road mortality of adults and hatchlings exceeds the productivity of the site. In some cases in Ontario ecological consultants have provided thresholds for the various criteria to assist municipalities in the designation of SWH (e.g. Peel Region); that is not the case in the Town of Aurora or the Region of York.

The criteria provided by MNRF for SWH is simply the presence of Chimney Crayfish or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. However, firstly, some chimneys are not occupied (they may have been at some point, but chimneys alone are not indicative of occupied habitat and crayfish move around. Secondly, these animals also move around on an annual basis. Thirdly, an appropriate threshold for significance (e.g., “ten occupied burrows”) has not been created by the municipality and in its absence Beacon staff have provided their professional opinion as to whether or not the mere presence of a few chimneys, used or empty, rises to the test of SWH.

The PPS defines significant wildlife habitat as follows:



Shining Hill Estate Collection Inc.

**Legend**

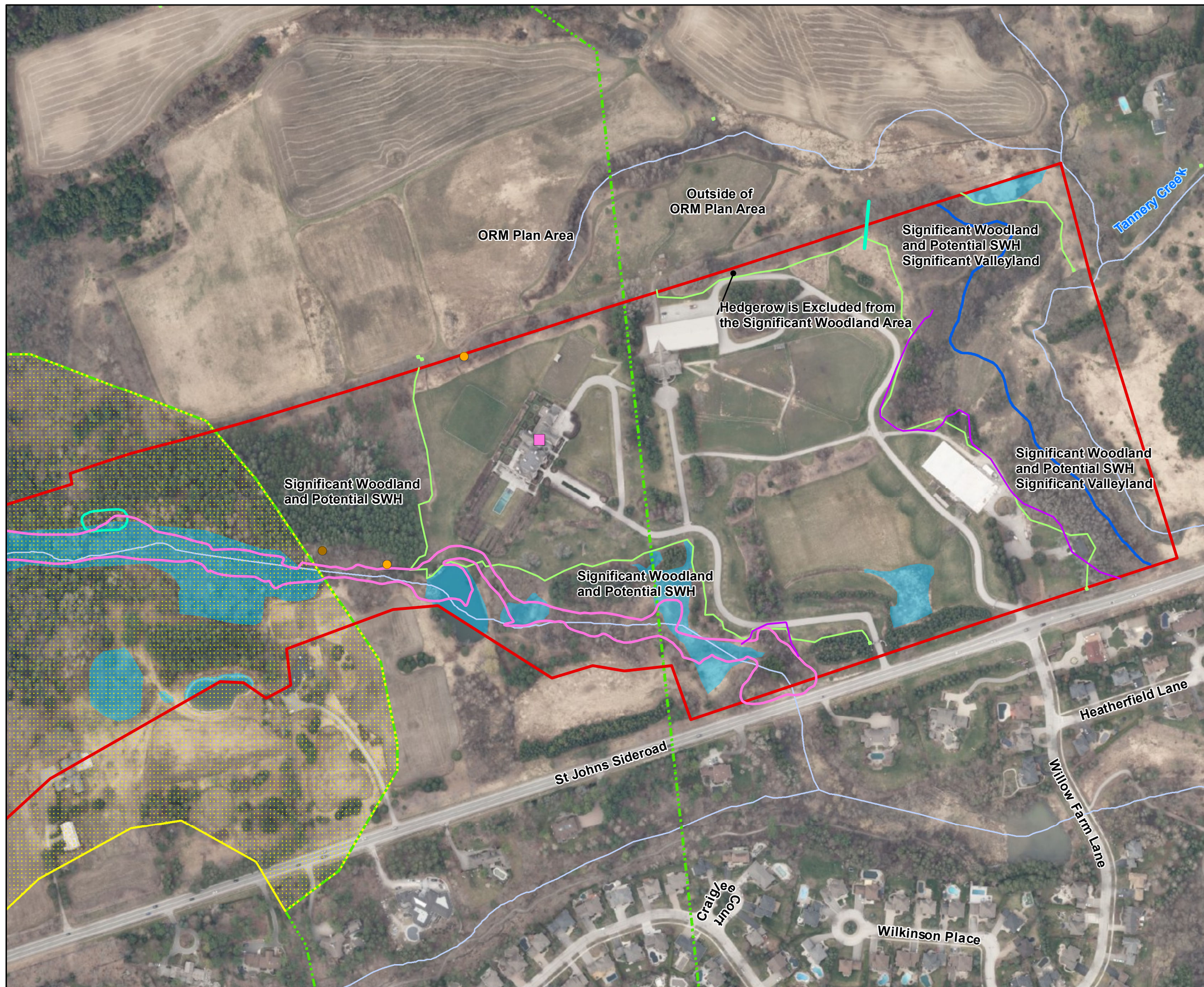
- Study Area
- Staked Dripline (LSRCA, July 21, 2020)
- Outfall and Stormwater Management Pipe Locations (SCS 2021)
- Long Term Stable Top of Slope (Soil Engineers Ltd. 2020)
- Proposed Regional Floodline (Schaeffers Consulting Engineers, 2020)
- Watercourse (MNRF 2019)
- Chimney Crayfish Locations
- Wetlands (Beacon 2021)
- Regional Floodline (LSRCA)
- Nesting Chimney Swift

**Butternut Locations**

- Category 1
- Category 2

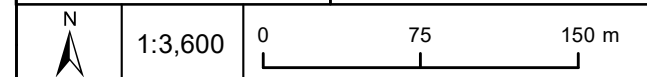
**Landform Conservation Area**

- Complex Landform (ORM Category 1)
- Moderately Complex Landform (ORM Category 2)



**BEACON ENVIRONMENTAL** Project: 220166  
Last Revised: March, 2021

Client: Shining Hill Estate Collection Inc. Prepared by: BD  
Checked by: CS



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*Significant: means:*

*d) In regard to other features and areas, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.*

According to the *Significant Wildlife Habitat Technical Guidelines* (MNRF 2000), there are four broad categories of SWH:

- Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities or Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern; and
- Animal Movement Corridors.

Within each of the above general categories, there are multiple types of SWH, each of which are intended to capture a specialized type of habitat that may or may not be captured by other existing feature-based categories (e.g., significant wetlands, significant woodlands).

The following SWH sub-categories have been considered for this location:

### **Raptor Wintering Area**

The subject property does not represent raptor wintering habitat.

### **Bat Maternity Colonies**

Candidate SWH under this category includes forested and swamp ecosites similar to the MNRF methodology discussed under Section 4.6. Habitat criteria includes mature deciduous or mixed forest stands exceeding 10 ha with suitable trees containing cavities. The eastern valley corridor is under the 10 ha threshold (approximately 6 ha) whereas the western woodland block exceeds 10 ha and is potential SWH.

### **Deer Winter Congregation Areas**

Although numerous separate deer tracks were observed throughout the property area, this area is not considered a deer winter congregation area, since it is not considered as such by MNRF (MNRF deer wintering areas on LIO mapping).

### **Woodland Raptor Nesting Habitat**

Breeding bird surveys in 2020 on the subject property revealed one breeding pair of Red-tailed Hawk. This species is common and widespread species and thus we do not consider the subject property candidate SWH in this category.

### **Amphibian Breeding Habitat (Woodland)**

Amphibian breeding surveys in 2020 revealed the presence of Green Frog, American Toad and Gray Treefrog, presumed to be breeding in the western as well as Eastern Newt and Red-backed Salamander incidental observations. The confirmed SWH definition for the woodland category notes that the presence of a breeding population of one or more of the listed newt/salamander species or two or more of the listed frog species with at least 20 or more individuals or full chorus vocalizations. One of the listed newt species (i.e., Eastern Newt) and one of the listed frog species (i.e., Gray Treefrog) were recorded, and therefore does not support the confirmed definition. The western woodland is considered potential SWH based on this category.

### **Special Concern and Rare Wildlife Species**

A number of specialized habitats are described under this general heading including marsh, open country, and early successional shrublands. The category of special concern and rare wildlife species includes species that are quite rare and have experienced significant population declines in Ontario. This includes S1-S3 and SH wildlife per the NHIC. Two Eastern Wood-Pewee pairs were present as a breeding species on the subject property with one territory in the eastern valley and the other in the western woodland. This bird species is relatively common and widespread, on this basis and in our professional opinion, the presence of two Eastern Wood-Pewee should not confer SWH status. Regardless its habitat is being protected.

### **Terrestrial Crayfish**

The suggested criteria for SWH is the presence of one or more individuals of Chimney Crayfish or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. Chimneys were identified and are situated well within the protected swamp feature. This colony is potential SWH.

### **Summary**

In summary, this analysis has considered that there are three potential Significant Wildlife Habitat types on the property: Amphibian Breeding habitat (western forest), Terrestrial Crayfish (western forest) and Bat Maternity Colonies (western forest, southern woodland and eastern wooded valley). All of these areas are being protected.

## **5.6 Endangered or Threatened Species**

As described in the preceding sections, Beacon staff conducted both desktop and on-site investigations to assess whether any endangered or threatened species were likely to occur on or adjacent to the subject property. **Table 2** provides Beacon's assessment based on the results of field investigations combined with knowledge of the habitat preferences and natural history of the species being considered.

**Table 3. Endangered or Threatened Species**

Species	Status on SARO List	Were Species and/or Habitat Documented during on-site Assessment?
<b>Vascular Plants (Dicots)</b>		
Butternut, <i>Juglans cinerea</i>	END	<b>Yes</b> , a targeted search for Butternut trees ( <i>Juglans cinerea</i> ) was conducted. This species is a provincially and nationally endangered tree species that, while still relatively common in southern Ontario, has been listed because the population has been declining due to the presence of a Butternut Canker disease. Specimens located are depicted on <b>Figure 2</b> . Details on the Butternut Health Assessment (BHA) are provided below.
<b>Reptiles and Amphibians</b>		
Blanding’s Turtle, <i>Emydoidea blandingii</i>	END	<b>No</b> , although there are wetland, aquatic and adjacent terrestrial communities present on the subject property, this species has not been reported within 5 km of the subject property according to records from NHIC; note that the ORAA grid square for Blanding’s Turtle that is within 5 km of the subject property is based on NHIC records for Blanding’s Turtle that are greater than 7 km from the property.
Jefferson Salamander, <i>Ambystoma jeffersonium</i>	END	<b>No</b> , although there are wetland and aquatic communities present on and adjacent to the subject property, this species has not been reported within 4 km of the subject property according to ORAA records.
<b>Birds</b>		
Bank Swallow, <i>Riparia riparia</i>	THR	<b>No</b> , suitable habitat is absent on the subject property as vertical exposed banks (suitable habitat) are not present at this location. Breeding bird surveys did not record any foraging birds of this species.
Barn Swallow, <i>Hirundo rustica</i>	THR	<b>Yes</b> , a comprehensive habitat assessment was undertaken for this species and an active nest was identified during the first breeding bird survey. The structure was subsequently removed. These birds construct conspicuous mud-based nests on the exterior of structures.
Chimney Swift, <i>Chaetura pelagica</i>	THR	<b>Yes</b> , this species was noted as likely breeding within the future SAS building on the subject property, shown on <b>Figure 2</b> .
Bobolink, <i>Dolichonyx oryzivorus</i>	THR	<b>No</b> , this species was not recorded during breeding bird surveys.
Eastern Meadowlark, <i>Sturnella magna</i>	THR	<b>No</b> , Eastern Meadowlark were not present on the property or in the vicinity during breeding bird surveys.
Cerulean Warbler, <i>Setophaga cerulea</i>	THR	<b>No</b> , there is no suitable habitat and Cerulean Warblers were absent on the property and in the vicinity during breeding bird surveys.
Acadian Flycatcher, <i>Empidonax virescens</i>	END	<b>No</b> , there is marginal habitat and Acadian Flycatchers were absent on the property and in the vicinity during breeding bird surveys.
<b>Aquatic Species</b>		



Species	Status on SARO List	Were Species and/or Habitat Documented during on-site Assessment?
Redside Dace, <i>Clinostomus elongatus</i>	END	<b>No</b> , the watercourses on the subject property flow eastward towards Tannery Creek. Correspondence with the MECP confirmed no Redside Dace habitat within the property limits.
<b>Mammals</b>		
Little Brown Myotis, <i>Myotis lucifugus</i>  Northern Myotis, <i>Myotis septentrionalis</i>  Eastern Small-footed Myotis, <i>Myotis leibii</i>	END	<b>No</b> , habitat is not present within the proposed development area. Although candidate ELC communities (FOM, FOD4) are present, they do not provide suitable roosting habitat. The buildings do not provide suitable habitat.  Suitable habitat is present in the forest communities associated with the Tannery Creek corridors to the east and west based on ecological community (woodland and swamp).
Tri-colored Bat, <i>Perimyotis subflavus</i>	END	<b>No</b> , although there were potential roost trees recorded during the bat habitat assessment this species has a low likelihood of occurrence in the urban landscape. The buildings do not provide suitable habitat.

Key: SARO Species at Risk in Ontario ListEN: Endangered; ; THR Threatened; ORAA Ontario Reptile and Amphibian Atlas; NHIC Natural Heritage Information Centre

### **Butternut**

This tree species is protected under the provincial ESA and associated Exemption Regulation 242/08 section 23.7. Documented occurrences are shown on **Figure 2**. The species can be damaged or removed if the criteria under the Regulation are achieved (i.e., removal of ten or fewer Category 2 trees), or if the criteria are not achieved then an Overall Benefit Permit (or the new compensation permit process) is required under the ESA. Compensation for the removal of trees is required, which typically involves planting, tending and monitoring of replacement Butternut trees and associated companion trees.

When found, the species is assessed with a Butternut Health Assessment (BHA) by a qualified Butternut Health Assessor as either:

- Category 1 – Non-retainable (no protection is given);
- Category 2 – Retainable;
- Category 3 – Potentially Archivable (may be useful in determining sources of resistance to Butternut canker); or
- Cultivated – Having been planted or actively in a cultivated/residential location.

Furthermore, as per section 23.7 (4) of Regulation 242/08, any Category 1 Butternut trees may be killed, harmed, or taken without further process or documentation (unless the results of an MNRF examination of the trees indicate that the activity is not eligible for the regulation). On this basis, only Category 2 and Category 3 trees are protected by the ESA.

A BHA was undertaken on the Butternut trees on the subject property during the vegetation community and flora inventory field surveys. Three Butternut trees were identified on the subject property, with two of the three trees assessed as Category 2 (i.e., retainable) as presented on **Figure 2**. The results of the BHA were provided to MECP on February 17, 2021.

## 5.7 Significant Areas of Natural and Scientific Interest (ANSIs)

None are present on the subject property.

## 5.8 Landscape Connectivity

Landscape connectivity and natural linkages have become common parlance when discussing environmental planning. The idea is that variously sized habitat patches, so-called ‘core’ natural areas, and supporting features are linked by natural corridors in an often-fragmented landscape of land uses. Current planning policy typically includes provisions for the maintenance of such corridors. For example, as in section 2.1.2 of the Provincial Policy Statement (MMAH 2020):

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

The Tannery Creek valley feature to the east of the subject property provides connectivity within the local landscape, as it provides a continuous treed conduit for the movement of both aquatic and urban-tolerant terrestrial species. This north-south linkage for movement will be maintained post development and will observe an increase in area with the implementation of plantings associated with an edge management plan to be established at the detailed design stage.

Similarly, the forested area in the western portion of the property, as well as the riparian corridor in the south along St. John’s Sideroad provide a movement corridor for wildlife which will be maintained in the post development condition. As with the valley feature associated with Tannery Creek, the buffer to these areas will be planted which will result in an increase in overall area.

## 5.9 Landform Conservation Area

Both Category 1 (*complex landform*) and Category 2 (*moderately complex landform*) landform conservation areas as described in the ORMCP are situated in the westernmost portion of the subject property, well within the outermost feature limit (woodland).

## 5.10 Hazard Limits

Floodplains are present on the subject property in associated with Tannery Creek and are visualized on **Figure 2** and **3**. The eastern valleyland floodplain has been obtained from the LSRCA whereas the southern floodplain represents engineered linework of the proposed regional floodline location (Schaeffers Consulting Engineering 2020).

The LTSS marks the valley edge in two locations and has been provided by Soil Engineers Ltd. (2021).

## 6. Proposed Development

The proposed Draft Plan of Subdivision for the subject property is illustrated in **Figure 4** and proposes to develop the lands to accommodate 88 single-detached dwellings, a mid/high rise residential building (Block 89), the St. Anne’s School (Block 90), a neighbourhood park (Block 91) and a natural heritage system. The St. Anne’s School location will be housed within the existing residence. Primary access is provided off of St. John’s Sideroad via Street A.

Additional components of the proposed development include a neighbourhood park, and an extensive natural heritage system, which will be conveyed to the Town and provide opportunities to enhance the Towns trail system.

## 7. Potential Impacts and Mitigation

The following sections present some of the key potential impacts of the proposed development and identify mitigation opportunities and compensation measures to be utilized to minimize the adverse effects of the project.

### 7.1 Impact Assessment

Background review and field investigations identified that the subject property consists of a predominantly anthropogenic tableland area in addition to a large woodland block in the west and wooded valleyland feature in the east. South of the development block along St. John’s Sideroad is composed of a mixed riparian woodland, wetland and thicket complex that is partially within the floodplain and entirely within the staked feature.

Constraints to development were identified through field studies conducted by Beacon as well as other members of the consulting team (**Figure 2**). A feature staking exercise with the LSRCA delineated the natural feature limit throughout the property and has been overlain with the Long-Term Stable Top of Slope (LTSS) which was determined through a geotechnical study conducted by Soil Engineers Ltd. (2021).

A regional floodline from the LSRCA and proposed regional floodline (Schaeffers Consulting Engineers 2020) have also been mapped. The staked feature limit represents the outermost constraint through the majority of the property development area.

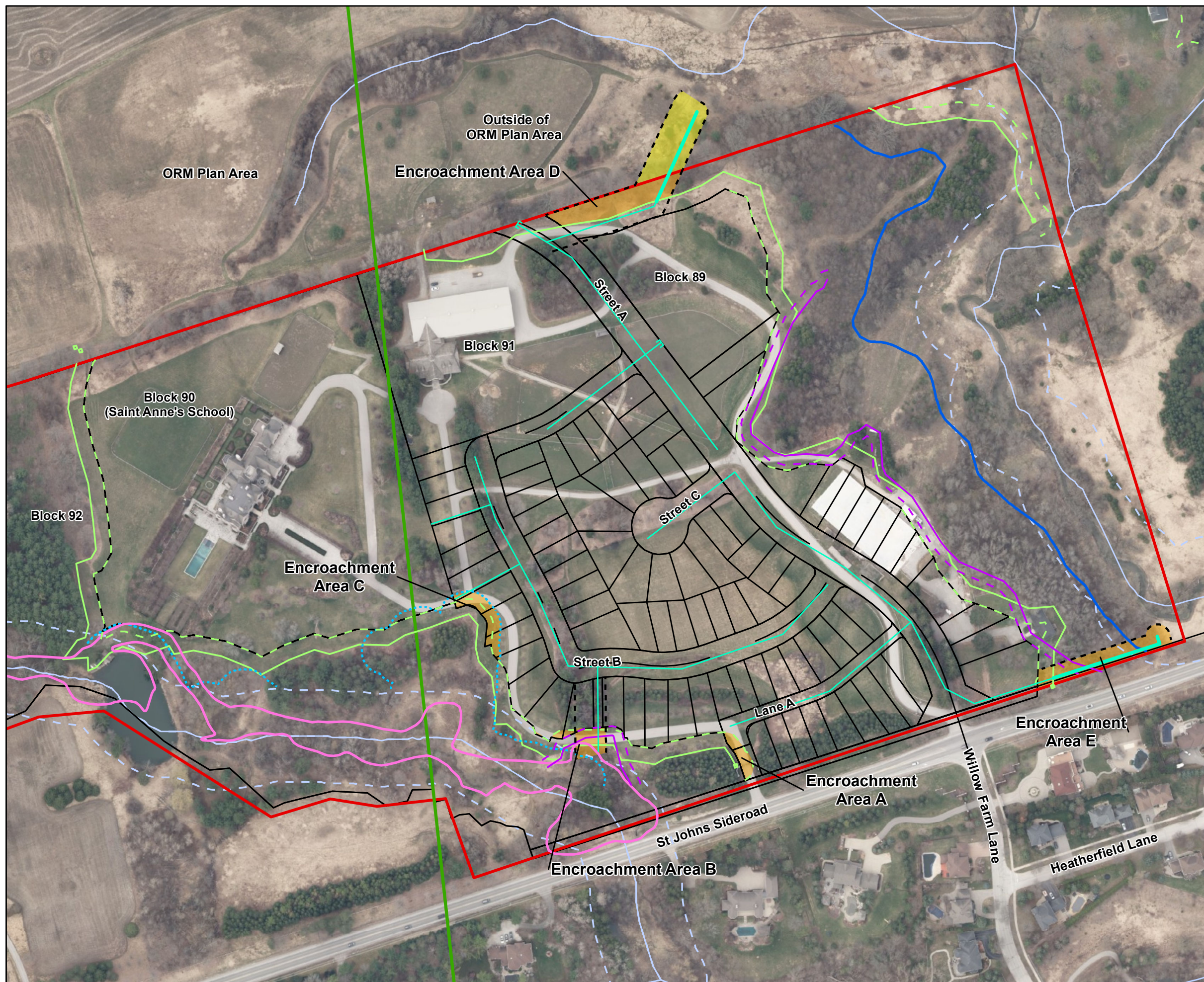
The summary of natural heritage features and hazard limits is shown on **Figure 3**. In order to establish the development limit, a 10 m setback was applied to the staked feature limit per LSRCA and Regional policies, 15 m on wetland communities and a 6 m setback was applied to the LTSS based on the minimum access/erosion allowance from the Ministry of the Environment (MOE), which has been supported by the geotechnical team (Soil Engineers Ltd. 2021). Tannery Creek was determined to be a coldwater watercourse as well and is prescribed a 30 m buffer, though the watercourse is located well within the other noted constraints. Buffers and setbacks are discussed in greater detail below and depicted on **Figure 4**.



Shining Hill Estate Collection Inc.

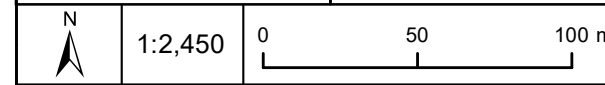
Legend

- Study Area
- Staked Dripline (LSRCA, July 21, 2020)
- Staked Dripline + 10 m
- Proposed Development
- Outfall and Stormwater Management Pipe Locations (SCS 2021)
- Construction Disturbance Area
- Long Term Stable Top of Slope (Soil Engineers Ltd. 2020)
- Long Term Stable Top of Slope + 6 m
- Proposed Regional Floodline (Schaeffers Consulting Engineers, 2020)
- Watercourse (MNR 2019)
- Watercourse + 30 m
- Wetlands + 15 m
- Regional Floodline (LSRCA)
- Oak Ridges Moraine Boundary (MNR 2020)
- Encroachment (Aurora) : (0.34 ha)
- Encroachment (Newmarket) : (0.13 ha)



**BEACON ENVIRONMENTAL** Project: 220166  
 Last Revised: March, 2021

Client: Shining Hill Estate Collection Inc. Prepared by: BD  
 Checked by: CS



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 Orthoimagery Baselayer: 2019 (FBS)



The western portion of the property is within the ORMCP area and will undergo minimal site alteration as existing structure will remain and will undergo internal and operational changes as opposed to exterior development. The existing structure is slated to be converted to private school and no alteration in proximity to the natural heritage system is proposed in that area. On this basis, the three Butternut trees identified on the subject property will not be affected by the proposed development.

East of the ORMCP limit, the proposed development represents a change in land use and increase in density. This involves the addition of a roadway bisecting this portion of the property to provide access to single detached dwellings, a mid/high rise condominium as well as a neighborhood park.

Potential adverse effects associated with the proposed development could include the following:

- Direct loss of vegetation and wildlife habitat (hedgerows, woodlots, agricultural fields buildings, gardens etc.);
- Wetland removal;
- Encroachment into natural features and buffers;
- Changes in hydrology associated with increase in impervious surfaces;
- Soil or sediment compaction and/or mobilization; and
- Anthropogenic disturbance (noise, light etc.) to the natural system in the post development condition.

### **Removal of Vegetation**

Vegetation removal to accommodate the proposed development is concentrated in the eastern portion of the property where the residential portion of the site plan occurs. West of this, the current dwelling will be shifted towards a school usage and therefore minimal vegetation loss is anticipated.

As noted under Section 4.2, the tableland portion of the property is largely occupied by anthropogenic and cultural communities including hedgerows, meadows and relatively small and young mixed forest units and natural vegetation communities are largely being protected.

As per the accompanying arborist report prepared by Beacon (2021, a total of 1,492 trees are proposed for removal. This total consists of 1,321 trees measuring 5 cm diameter at breast height (DBH) or greater that are proposed for removal to accommodate the development, and an additional 171 trees that are recommended for removal due to their condition (i.e., potential risk, declining, death imminent, or dead). A total of 588 trees are recommended for preservation.

### **Wetland Removal**

The proposed development results in the removal of a marsh wetland unit (MAM2) situated along the southern portion of the subject property. The unit is approximately 0.2 ha in area and was caused by earthworks associated with the driveway construction. It is composed of a variety of obligate and facultative wetland plants outlined in greater detail under Section 4.2.3.

### **Increase in Impervious Surfaces**

The current site condition includes impervious surfaces associated with the existing hardscape on the subject property including dwellings, barns, outbuildings along with their associated driveways. The proposed development plan represents an expansion of impervious surfaces in the eastern portion of the property with the bulk of the area outside of the natural features and associated buffers proposed to be impervious.

Based on the hydrogeological study conducted by Golder (2021), the land use changes associated with the proposed development will result in an 117% increase in runoff and 42% decrease in infiltration if unmitigated.

### **Soil Mobilization**

Construction works such as grading, grubbing and excavation can cause the movement of sediment into the valleyland or riparian woodland corridor along the eastern edge and southern limits, respectively.

### **Anthropogenic Effects on Wildlife**

The effects of noise and light on wildlife are very difficult to quantify. Noise, in particular, may be a reason why landscape-level effects are known to occur within urban matrices even as natural areas are set aside. The effects of these stressors are difficult to identify however remain important to consider in the context of large-scale developments in proximity to natural areas. A certain amount of existing noise and light pollution exists on the subject property based on the proximity of roadways and the existing use in some areas. Despite this, the valley system hosts a number of uncommon plant species and area sensitive bird species. The proximity of new development up against the valley edge has the potential to represent an increase in noise and light effects.

The addition of a vertical building (Block 89) adjacent to a wooded valleyland feature has the potential to impact songbirds that are at risk of window collisions, particularly during migration. Bird strikes can occur when daytime flying birds are present in a natural area (foraging, breeding, migrating) and do not perceive large panes of glass as a solid object (because they can see through them), or when the glazing reflects vegetation. In these cases, birds may fly into the glass and suffer fatal injuries. The reflection of adjacent vegetation creates an illusion that the natural system continues when it in fact does not. Window strikes contribute to declines in avian populations and are a particular issue with glass adjacent to a treed corridor or valley feature.

As the proposed development accommodates more human activity than the existing use, it could potentially increase the risk of encroachments into the adjacent natural area such as trail creation and waste dumping. Novel and uncontrolled access into a natural system can result in direct effects on flora and fauna and garbage deposited into the valley. Non-native invasive plant species are also spread in this manner, and overuse can result in physical damage and degradation of the natural system that is being protected from development.

Generally speaking, and without any mitigative measures it can be anticipated that dumping of waste into natural areas, novel vertical buildings and poorly planned lighting could be negative effects on the natural system.



## 7.2 Recommended Mitigation Measures

The following section identifies mitigation measures to minimize effects of the project.

The proposed development is situated within an area that has been transformed over time to a largely urbanized landscape, which inevitably reduces natural heritage functions of any particular site within that larger landscape area. However, these kinds of landscape level changes cannot be wholly mitigated on a site-by-site basis, and a shift in the natural heritage values towards an urban tolerant system will continue to occur. Despite the recommendation of the numerous mitigation measures in this section, impacts such as a general trend towards urbanization can not be addressed at the site level.

### **Mitigation by Design**

As the KNHF/KHF features and functions of the subject property are largely contained within the adjacent lands and along the eastern edge of the subject property, it is anticipated that the site-specific effects have largely been mitigated by the design of the development plan. The maintenance of a contiguous natural corridor is proposed through this built-up valley corridor. The development is proposed within in area that has been previously altered and is currently represented by residential use.

### **Feature Buffers**

The following buffers (or MVPZs) have generally been applied:

Staked dripline to woodland	10 m
Wetlands	15 m
Long-term stable slope	6 m (Soil Engineers Ltd. 2021).
Tannery Creek	30 m

The objective of a buffer is to insulate the natural system from the proposed site alteration and the application of these buffers will further remove the natural system from the proposed future site condition which is particularly imperative in the east where site alteration is proposed.

### **Woodland Buffers**

In many jurisdictions a 10 m dripline buffer is added to woodlands when they are being retained in the face of adjacent land use change or land development. Seldom are these buffers expanded due to attributes of the feature. Even on the Oak Ridges Moraine, within settlement areas buffers are often reduced from the Oak Ridge Moraine Conservation Plan prescribed 30 m to 10 m from dripline. Although not explicitly adopted by Ontario municipalities, the guidelines provided through the Carolinian Canada Committee (2003) in their Draft Guidelines for Environmental Impact Statements are often used as a reference. Their generic buffer guidelines, based on best available science at the time, are 10 m buffers for woodlands measured from the dripline.

In summary, although there are some exceptions, the standard woodland buffer in many southern Ontario jurisdictions has become 10 m on dripline.

In 2012, Beacon authored a report entitled “*Ecological Buffer Guideline Review*” (Beacon 2012) that was prepared for a consortium of conservation authorities led by Credit Valley Conservation. The purpose of the literature review was to provide a summary of the current state of understanding on the effectiveness of various buffer treatments on a variety of natural heritage features and functions and provide a summary of buffer recommendations across various municipalities. The findings of that comprehensive review are helpful to provide an overview of buffer science as it relates to woodland. The following summary of the literature review is excerpted from that document:

*Water Quantity Functions: No empirical or technical evidence is available to support this function for upland woodland or forest buffers.*

*Screening of Human Disturbance / Changes in Land Use: Most readily measurable effects of immediate human disturbance (e.g., trampling, dumping of waste, yard extensions, spray or road salts) are documented as occurring within the first 10 m to 20 m of the forest edge, but can extend up to 50 m. Responses of wildlife species to human-related disturbances in adjacent lands have been documented to be limited within the first few metres for some species in some situations, but have also been documented as extending into the wooded feature dozens and hundreds of metres. Based on this edge effect an appropriate buffer for the direct disturbances may be in the range of 10 m to 20 m, additional buffer width for screening impacts of human disturbances for wildlife would need to consider the species or guilds being targeted for protection, the land use context, the vegetative structure of the buffer, and possibly the natural heritage system context in which the given feature is located.*

*Core Habitat Protection: Zones to provide additional rooting area for large trees along the edges of wooded features may range from 3 to 12 m, while edge effects range from a few to about 100 m on average for abiotic and biotic impacts that are indirectly related to anthropogenic activities.*

*As with riparian and wetland buffers, it is important to consider site-specific factors (e.g., local hydrologic dynamics, soils, slopes, woodland / forest type and size), species and functions which the buffer is expected to protect, as well as land use context as part of buffer determination.*

The staked significant woodland on the subject property should have a no development buffer of 10 m width measured from the dripline. This proposed buffer takes account of the proposed adjacent land uses as detailed in the preceding paragraphs. Casual trails (with pervious surfaces) could be placed within this buffer but impervious graded trails should be outside. No grading should occur within the buffer other than minor “feather grading” in the outside 5 m, where necessary. Existing trails may be utilized where they fall within buffers.

### Physical Top of Bank

On the subject property the valleyland functions are closely related to the same functions associated with woodland it is therefore appropriate that the buffer is largely related to the dripline forest buffer. There is also a 6 m buffer to the long term stable slope (Soil Engineers Ltd. 2021).

### Wetland Buffers

Wetland buffers need to be based on the attributes and functions of the wetlands. Generally the provision of water to wetlands is not a buffer issues but rather is related to the management of water resources through the surface water and hydrogeology investigations, as is the case in this project. After this buffers may be related to the sensitivities of the functions in a particular wetland. On the subject property there are no functions or attributes that would drive the buffer to be greater than 15 m. For example sensitive wildlife species are generally absent from the wetland areas which more closely resemble forested lands rather than open water marsh for example. An exception might be the on-line pond associated with the school block. It is understood that this pond is being removed as part of a different development application.

### Tannery Creek

Typical buffers for the protection of aquatic resources are 15 m for warm water systems and 30 m for cold water systems unless any particular site specific conditions indicate that more is required. In this case the 30 m cold water buffer has been applied, and there are no site-specific conditions that would drive a wider buffer.

### Encroachment into Natural Feature and Buffers

The total encroachment area associated with the proposed development is about 0.34 ha (**Figure 4**). The bulk of this is represented by temporary disturbance associated with the proposed stormwater management infrastructure and are visualized as Encroachment Area B, D and E on **Figure 4**. The proposed outfall construction will be open cut and therefore will necessitate a wider swath of construction disturbance in order to install. The northern pipe requires 0.25 ha of site alteration to install, whereas the southeastern pipe requires 0.11 ha and the southwestern requires 0.04 ha within the natural system. Much of the northern and southeastern encroachment area is within the staked feature limit.

It is our understanding that the finalized stormwater management plan will involve the pipes terminating in a headwall and plunge pool structure, which has not been included in this report. The footprint of this permanent infrastructure will be considered at the next stage of design.

Other than for stormwater infrastructure, the proposed setbacks have been reduced in two other locations. Encroachment Area C represents an area where the buffer has been reduced to 6 m and therefore represents an encroachment into the buffer of 0.05 ha. Encroachment Area A is situated along St. John's Sideroad and represents a buffer reduction down to 3 m on the dripline. Compared to if the full 10 m buffer was applied here, a buffer area of 0.02 ha has been lost. Given the nature of the habitat involved and the physical areas it is not anticipated that there will be a measurable negative response to these variations in buffer width.

### Fencing Installation

A fence is to be built to current municipal standards between the subject property and natural feature boundary. Fence installation serves multiple benefits to the natural system including mitigating against rear-year dumping of waste and minimizes the flow of people and their companion animals into natural areas by serving as a physical barrier.



### **Tree Replacement**

Tree compensation outside natural features and associated buffers are determined in accordance with Town of Aurora tree compensation requirements. Details with respect to tree compensation for the removal of 1,492 trees are presented in the arborist report prepared by Beacon (2021) for the subject property.

### **Ecological Offsetting Plan**

The LSRCA's Ecological Offsetting Policy requires a replacement value of 3:1 for the wetland area, plus 1:1 for the vegetation protection zone of 15 m on the wetland. This strategy will be implemented to account for the loss of a 0.2 ha MAM2 community and is proposed to be completed as a condition of approval.

### **Land Dedication**

It is our understanding that the proponent will be conveying the staked feature and associated buffer to public authority to proceed with this submission to ensure the protection of features in perpetuity.

### **Buffer Planting Plan**

A buffer planting plan is to be prepared at the detailed design stage. The addition of a planted buffer area will further bolster the utility of the buffer distance to protect the natural feature from potentially adverse impacts associated with the proposed redevelopment, in addition to increasing overall naturalized cover area.

Species should be selected that are appropriate to the natural system at this location and are native, self sustaining species.

### **Stormwater Management and LID Measures**

The Functional Servicing and Stormwater Management Report prepared by SCS (2021) outlined a number of possible Low Impact Development (LID) measures that are suited for this location to facilitate infiltration. On site infiltration will take place where possible (where pervious surfaces remain) and will additionally involve a bioswale along Street D, a catch basin infiltration system associated with the future dwellings and a rear yard infiltration trench on most lots. An underground storage cistern is also proposed under the neighborhood park to ensure quantity control.

Further details on LID measures beyond the conceptually described will follow as the designs progress. Groundwater monitoring is ongoing and will continue into the summer of 2021 (Golder 2021) and will further inform the suitability of the noted measures. The ongoing works from Golder include a catchment specific water budget for the southern riparian staked feature along St. John's Sideroad and for the wetland situated in the northeastern portion of the subject property.

The proposed LID mitigation scheme is estimated to result in a site wide infiltration gain of approximately 23%, as compared to the projected infiltration reduction of 42% in the unmitigated condition (Golder 2021).

The hydrogeological study (Golder 2021) additionally notes that LID features to enhance post-development infiltration rates will be implemented for the school block and the mid/high rise residential block that were not included in their report.

### **Timing of Vegetation Removal**

The federal *Migratory Birds Convention Act* (1994) and provincial *Fish and Wildlife Conservation Act* protect the nests, eggs and young of most bird species from harm or destruction. As the breeding bird season in southern Ontario is generally from April to August, the clearing of vegetation (including grasses and shrubs) should occur outside of these periods. For any proposed clearing of vegetation within these dates, or where birds may be suspected of nesting outside of typical dates, an ecologist should undertake detailed nest searches immediately prior to site alteration to ensure that no active nests are present.

### **Bird Strikes**

The risk of bird strikes for local birds can be significantly reduced by treating windows located closer than 20 m to and facing the woodland. These can be comprised of non-reflective glass so that the birds will not confuse the green reflection in the glass for real vegetation. For migratory birds, buildings that have some type of patterning or design elements that “break up” a sheer glass surface are thought to present less of a risk. Additionally, cost effective and easily implemented measures such as window decals may be included to further reduce the potential risk of avian collisions.

It is recommended that bird friendly glazing and collision deterrents be considered and integrated into the architectural design of the future Block 89 building given the mid/high rise if it is located within 20 mm of the dripline. This pertains to the eastern edge and possibly the northern side.

### **Directional Lighting**

To the extent possible given security and safety issues the future configuration of lighting associated with the proposed development should be downturned and pointed away from the natural system.

### **Sediment and Erosion Control**

Any grading or site alteration related activities should be confined to the established limit of development as shown on **Figure 3**. Temporary construction fencing at the development limit should be regularly inspected and maintained in good working order throughout the construction period. Fencing should be removed upon completion of construction after exposed soils have been stabilized. Standard Best Management Practices, including the provision of sediment control measures, should also be employed during the construction process. An Erosion and Sediment Control Plan will be prepared for the subject property.

### **Tree Inventory and Protection Plan**

There is potential for damage to occur to trees slated for retention during construction if proper precautions and protection measures are not implemented. Trees can be negatively impacted through

grade changes, soil compaction, root cutting, and mechanical damage to trunks and branches resulting from the operation of construction equipment.

Tree Protection Zones (TPZs) should be established on the ground consistent with tree protection fencing as outlined in the accompanying arborist report (Beacon 2021) prior to the start of construction and shall remain in good condition throughout the duration of all site work. No grading, soil disturbance or surface treatments shall occur within the TPZ. No equipment or materials shall be stored inside the TPZ. If grading or site alteration is required within the TPZs and ISA certified arborist should be consulted. Where trees have been identified for retention, tree protection fencing will be erected and maintained throughout the duration of all construction activity. There shall be no disturbance within the tree protection zone. Further details on this are found within the arborist report and are to be adhered to.

### **Fisheries Protection**

Construction works such as grading, grubbing and excavation have the potential to result in the movement of sediment into the onsite watercourses. A sediment control plan should be prepared for the construction phase of the development and approved by the LSRCA, prior to the start of construction works. General elements of the sediment and erosion control plan should focus on preventing erosion and include, but not be limited to the following:

- Where the contract does not require work in a watercourse or within the valley lands, equipment should not be operated within such areas;
- All erosion and sediment control measures should be integrated with a construction operation schedule as determined by the Contractor(s). Operations near any watercourse should not commence until temporary erosion and sediment control measures have been installed;
- Temporary erosion and sediment control measures should be maintained and kept in place until all work near a watercourse has been completed and stabilized;
- Temporary control measures should be removed at the completion of the work but not until permanent erosion control measures, as specified in the contract, have been established. This may necessitate removal by others;
- The Contractor should monitor the erosion and sediment control measures and if the measures are found to be ineffective, the Contractor should immediately make changes in order to control erosion and sediment; and
- Standard Best Management Practices should also be employed during the construction process.

## **8. Net Effects**

The primary loss will be a limited number and diversity of urban tolerant species of wildlife associated with the anthropogenic lands. It is not anticipated that the buffer impingements will result in a measurable ecological response.

The removal of a small area of rather dry wetland that has developed as a result of driveway construction will require a compensation agreement to be resolved to the satisfaction of LSRCA.



After mitigation the natural heritage system will be maintained and protected.

## 9. Policy Conformity

The natural heritage policy framework with respect to the subject property was detailed under Section 3 of this report.

### 9.1 Provincial Policy Statement

Policy 2.1 of the PPS provides direction to regional and local municipalities regarding planning policies specifically for the protection and management of natural heritage features and resources.

Section 2.3 of the PPS provides direction to the planning authority with respect to natural heritage features and functions.

Within the PPS, natural heritage features listed and identified on the subject property are:

- Significant wetlands – not present;
- Habitat of endangered or threatened species - as discussed in Sections 4.6;
- Fish habitat – present in Tannery Creek which is protected;
- Significant woodlands – present and protected;
- Significant valleylands – present and protected;
- Significant Areas of Natural and Scientific Interest (ANSIs) – not present; and
- Significant wildlife habitat- present within the wooded areas as Candidate SWH.

The wooded area on and adjacent to the subject property and the valleylands adjacent to the subject property are both part of the regions and municipality's NHS and have been staked by the LSRCA. The only permanent development proposed within these areas is stormwater management infrastructure and are otherwise will be adequately insulated from the proposed development with the application of and adherence to feature buffers. Any identified impacts to these features will be mitigated by implementing the recommendations in Section 9.2.

Habitat of endangered or threatened species was identified and will be addressed through the ESA below.

### 9.2 Oak Ridges Moraine Conservation Plan

The subject property is located on the ORMCP area and is within a Settlement Area land use designation. Given the location within an ORM Settlement Area, all uses permitted in the Official Plan will be permissible.

As required by Section 22 of the ORMCP, this NHE has conducted a review of the subject property and on lands within 120 m of the subject property in order to determine if KNHFs or KHFs are present. A significant woodland is present in the western and southern portion of the property. The significant

woodland, in addition to wetlands in the south, fish habitat associated with Tannery Creek and potential SWH represent the KNHF/KHFs within the ORMCP area portion of the property.

The proposed re-development within the ORMCP plan area is being converted to a school. Site alteration is not proposed on the ORMCP lands and therefore there will be no negative impacts on the Plan area.

Landform Conservation areas are confined to the extreme westernmost portion of the property and no site alteration is proposed within either category of Landform Conservation area.

### **9.3 Lake Simcoe Protection Plan**

The LSPP generally defers to local Official Plans for lands within Settlement or Urban areas, such as the case with the subject property.

### **9.4 York Region Official Plan**

The Regional Official Plan identifies the subject property as being both within Urban Area and the Regional Greenlands System.

This EIS is in conformity with Section 2.2.5 of the York Region Official Plan that requires an EIS for development or site alteration within 120 m of a KNHF or KHF.

The treed areas outside of the ORMCP lands were assessed for significance based on the Regional policies and the eastern woodland corridor satisfies the significant woodland criteria based on size and continuity with Tannery Creek. The significant woodland is generally coincident with the Regional Greenland System boundary and in accordance with section 2.2.4, there will be no development or site alteration within the Greenlands System.

Tannery Creek is a coldwater watercourse and will receive a 30 m buffer. The watercourse is greater than 30 m away from site alteration at all points.

### **9.5 Town of Aurora Official Plan**

The eastern treed valleyland is described as an EPA and captures hazard lands, natural features and their associated buffers. The boundaries of EPA's are approximate and minor adjustments are permitted through the preparation of an environmental study along with public agency consultation to ensure the appropriateness of any adjustments. An environmental study is also required for proposed site alteration within 120 m of an EPA and is to be used to determine the appropriate buffers.

Section 12.6.1 b) of the Aurora Official Plan notes that appropriate setbacks are to be determined through the preparation of an environmental report. This report has discussed the application of a 10 m setback to the staked feature limit, 15 to wetlands and 6 m to the geotechnical limit. The coldwater watercourse is set inside these noted constraints and will receive a greater than 30 m setback at all points. Minor intrusions are proposed into the feature limits and setbacks in associated with the

stormwater management infrastructure and two pinch-points. With the implementation of the provided mitigation measures, no negative impact occur on the EPA lands.

## **9.6 Lake Simcoe Region Conservation Authority**

The components of the project discussed throughout this report were scoped with the LSRCA. The agency was on site along with Beacon staff to conduct a feature staking exercise in July 2020. Regulated features were identified and include wetlands, watercourses and valleylands.

A permit will be required prior to undertaking work on the subject property as the proposed development plan is within the LSRCA regulated area.

An Ecological Offsetting Strategy (EOS) will be developed to address the removal of a wetland unit that is approximately 0.2 ha in area at a 3:1 ratio as well as a 1:1 ratio for a 15 m buffer. It is recommended that this be addressed as a condition of approval.

## **9.7 Endangered Species Act**

Habitat for endangered bats species may be present in the woodland communities. The staked woodland communities are protected. The stormwater management infrastructure extends though habitat that has been flagged as potential suitable habitat for endangered bat studies and will need to be addressed through seasonal snag surveys (leaf-off period) and possible acoustic monitoring (June) following this submission. The results of that exercise will be provided in as an addendum to this NHE and MECP will be consulted to ensure the ESA is respected.

Three Butternut trees were identified on the subject property, with two located within the staked western significant woodland feature, and the third located within the northernmost hedgerow north of the school. As mentioned in Section 9.1 of this report, there is no site alteration or development proposed surrounding the future private school, on this basis, there will no impacts to the Butternut trees as a result of the proposed development.

Barn Swallow nesting was identified in one of the structures on the subject property during the first breeding bird survey however the structure had been demolished prior to the second survey. The status of that nest is unknown at the time of demolition.

Chimney Swift were recorded nesting within the existing dwelling on the subject property which will be converted to the St. Anne's School location. This building will be retained and unaltered in the post development condition and therefore no further efforts are required.

## **10. Summary**

Beacon has reviewed the existing natural heritage policies as they pertain to the subject property. A field program was developed to understand the site conditions, context and function with respect to natural heritage features. Natural features were described and a feature staking exercise took place to



outline the feature limit which was predominantly composed of woodland and wetlands. The western half of the property is on the ORM.

Natural heritage features were identified through Beacon’s field program and through consultation with other members of the consulting team and included significant woodlands, significant valleylands, wetland units, coldwater watercourse with fish habitat (Tannery Creek) and habitat for endangered or threatened species (Chimney Swift, Butternut, potential bat habitat).

The proposed development encompassed the future St. Anne’s School location in the west and separate residential subdivision in the east, with natural heritage features straddling the east, west and south. An impact analysis of the proposed development was provided and identified impacts including tree removal, an increase in impervious surfaces and habitat intrusions associated with the stormwater management infrastructure. To address and offset the identified impacts in Section 7.1, mitigation measures were proposed including LID measures, an edge management plan, tree replacement plantings, vegetation removal timing windows and architectural recommendations to reduce the likelihood of avian collisions on new vertical surfaces. Many of these are to be refined at the detailed design stage.

The proposed development of the subject property demonstrates compliance with the relevant policies of the PPS, ORMCP, Region of York, Town of Aurora and the regulations of the LSRCA.

For the stormwater outfall locations bat snag surveys will be conducted in the leaf off period to assess for potential habitat of endangered bats in order to ensure conformity with the ESA. Consultation with the MECP will follow as needed and will be provided as an addendum to this report.

We trust that this information meets your needs at this time. Should you have any questions or require any additional information please contact the undersigned at

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A Geotechnical Investigation and Slope Stability Assessment for Proposed Residential Development. Shining Hill Phase 3 Aurora – 162 St. John’s Sideroad. January 2021.
- Soil Engineers Ltd. 2021  
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- Stanfield L., Del Giudice L., Bearss E., and Morodvanschi E. 2014. Ontario Stream Assessment Protocol Section 4: Module 10: Assessing Headwater Drainage Features.
- Toronto and Region Conservation Authority and Credit Valley Conservation. 2014.  
Evaluation, Classification and Management of Headwater Drainage Features Guidelines
- Town of Aurora. 2010.  
Official Plan. Town of Aurora. September 27, 2010.



# Appendix A

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## LSRCA Correspondence

**From:** [Jessica Chan](#)  
**To:** [Chana Steinberg](#)  
**Cc:** [Brian Henshaw](#); [Dave Ruggle](#)  
**Subject:** RE: Terms of Reference - Shining Hill - Aurora and Newmarket - BEL 220166  
**Date:** Thursday, December 10, 2020 12:11:19 PM

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Good afternoon Chana,

The provided Terms of Reference below is acceptable with the following additions/clarifications:

- Ensure the vegetation communities are evaluated using the first approximation of ELC (Lee et al., 1998).
- Ensure 3 breeding amphibian surveys are conducted as per the Marsh Monitoring Program protocol. Observational salamander surveys may be required if potential habitat exists in the study area. Include completed field sheets as an appendix.
- Ensure 3 dawn breeding bird surveys are conducted under appropriate conditions and record all occurrences and breeding behaviors. Include completed field sheets as an appendix.
- Screen for significant wildlife habitat as per the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E.
- Identify any ecological linkages or movement corridors within the study area. Demonstrate how connectivity within and between natural heritage and hydrologic features will be maintained and, where possible, improved or restored to allow for the effective dispersal and movement of plants and animals.
- Provide a general description of the methodology, dates, timing, and locations of completed field surveys.
- Complete a catchment-based water balance for the study area to assess how existing drainage conditions and moisture regimes that support sensitive hydrologic features (e.g. wetland, woodlands, watercourse) may be impacted by the proposed development. Demonstrate how current hydrologic inputs will be maintained post-development. Please note, the water balance assessment may also be a requirement under other provincial policies, therefore the NHE/EIS should coordinate with/summarize the water balance work undertaken by others.
- Map the following information on current high quality ortho-air photos:
  - 1) ELC vegetation communities, natural heritage and hydrologic features and their associated VPZs, and the proposed development and anticipated limit of disturbance (e.g. grading limits); and,
  - 2) ELC vegetation communities, survey locations, other environmental features (e.g. linkages, wildlife corridors, seeps, springs, stick nests, wildlife habitat, rare species, invasive species, etc.), and existing structures and/or trails.

Please let me know if you have any questions.

Best,

**Jessica Chan, B.Sc.(Env.)**

Natural Heritage Ecologist

**Lake Simcoe Region Conservation Authority**

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Newmarket, Ontario L3Y 3W3  
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Facebook: LakeSimcoeConservation

**Please note:** the LSRCA Board of Directors approved a change to our Fee Policy. The new fees will take effect on January 1, 2019. Please click [here](#) for the new fee schedule.

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**From:** Chana Steinberg <csteinberg@beaconenviro.com>  
**Sent:** December 6, 2020 7:08 PM  
**To:** Jessica Chan <J.Chan@lsrca.on.ca>  
**Cc:** Brian Henshaw <bhenshaw@beaconenviro.com>  
**Subject:** Terms of Reference - Shining Hill - Aurora and Newmarket - BEL 220166

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Hi Jessica:

As you know, we have been retained to provide natural heritage support and prepare a natural heritage evaluation (NHE) for the Shining Hill lands in both Aurora and Newmarket – see attached for reference. You will recall we were on site previously and completed a feature staking exercise. The western portion of these lands are situated on the Oak Ridges Moraine.

We endeavor to prepare separate NHE reports (one for the Aurora lands, one for the Newmarket lands) with the following key components:

1. Background/Context;
2. Natural Heritage Policy Review;
3. Identification of Natural Heritage Features and Functions;
4. Description of the Proposed Development;
5. Impact Identification and Analysis integrating groundwater and surface water findings;
6. Mitigation and Net Effects;
7. Policy Conformity; and
8. Conclusion/Recommendations.

The above noted analysis will include a review and integration of work prepared by other members of the consulting team including a discussion on surface water management, hydrogeology and geotech. Beacon will also be preparing the arborist/tree inventory component of this work as well as the landscape and restoration services as the project advances.

The following field program was proposed and has been completed to date:



1. Breeding Bird Surveys;
2. Ecological Land Classification;
3. Botanical inventory including Butternut search;
4. Headwater Drainage Feature Assessment and Aquatic Habitat Assessment;
5. Screening for ESA wildlife;
6. Breeding amphibian surveys; and
7. Bat Snag and Acoustic Surveys (at proposed road crossing locations).

Please advise if you are in agreement with the above noted work plan.

All the best,

***Chana Steinberg, B.Sc. (Hons.) / Ecologist***

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**To protect our staff, families, clients and the greater community all Beacon staff are working remotely. We will continue to provide timely communications *via* email and telephone and are committed to providing the highest level of service possible during this challenging time.**

# Appendix B

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## Vascular Plant List

# Appendix B

## Vascular Plant List

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
Aceraceae	<i>Acer negundo</i>	Manitoba Maple			S5			N
	<i>Acer platanoides</i>	Norway Maple			SE5			I
	<i>Acer rubrum</i>	Red Maple			S5			N
	<i>Acer saccharinum</i>	Silver Maple			S5			N
	<i>Acer saccharum</i>	Sugar Maple			S5			N
Alismataceae	<i>Sagittaria cuneata</i>	Northern Arrowhead			S5	R	R5	N
Amaranthaceae	<i>Amaranthus albus</i>	White Amaranth			SE5			I
Anacardiaceae	<i>Rhus typhina</i>	Staghorn Sumac			S5			N
	<i>Toxicodendron radicans</i>	Poison Ivy			S5			N
Apiaceae	<i>Aegopodium podagraria</i>	Goutweed			SE5			I
	<i>Cicuta bulbifera</i>	Bulbous Water-hemlock			S5			N
	<i>Osmorhiza claytonii</i>	Hairy Sweet Cicely			S5		U	N
	<i>Sium suave</i>	Common Water-parsnip			S5			N
Apocynaceae	<i>Apocynum androsaemifolium</i>	Spreading Dogbane			S5			N
	<i>Apocynum cannabinum</i>	Hemp Dogbane			S5		U	N
	<i>Asclepias incarnata</i>	Swamp Milkweed			S5			N
	<i>Asclepias syriaca</i>	Common Milkweed			S5			N
	<i>Vinca minor</i>	Lesser Periwinkle			SE5			I



Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	Vincetoxicum rossicum	European Swallowwort			SE5			I
Araceae	Arisaema triphyllum	Jack-in-the-pulpit			S5			N
	Calla palustris	Wild Calla			S5		U	N
Araliaceae	Aralia nudicaulis	Wild Sarsaparilla			S5			N
Aristolochiaceae	Asarum canadense	Canada Wild-ginger			S5			N
Asteraceae	Achillea millefolium	Common Yarrow			SE5?			I
	Ageratina altissima	White Snakeroot			S5			N
	Ambrosia artemisiifolia	Common Ragweed			S5			N
	Ambrosia trifida	Great Ragweed			S5			N
	Arctium lappa	Great Burdock			SE5			I
	Arctium minus	Common Burdock			SE5			I
	Bidens cernua	Nodding Beggarticks			S5			N
	Bidens frondosa	Devil's Beggarticks			S5			N
	Centaurea nigra	Black Knapweed			SE5?			I
	Cichorium intybus	Wild Chicory			SE5			I
	Cirsium arvense	Canada Thistle			SE5			I
	Cirsium vulgare	Bull Thistle			SE5			I
	Echinacea purpurea	Eastern Purple Coneflower			SE1			I
	Erigeron annuus	Annual Fleabane			S5			N
	Erigeron canadensis	Canada Horseweed			S5			N
	Erigeron philadelphicus	Philadelphia Fleabane			S5			N
Eupatorium perfoliatum	Common Boneset			S5			N	
Eurybia macrophylla	Large-leaved Aster			S5			N	

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod			S5			N
	<i>Eutrochium maculatum</i>	Spotted Joe Pye Weed			S5			N
	<i>Helianthus divaricatus</i>	Woodland Sunflower			S5	R		N
	<i>Helianthus tuberosus</i>	Jerusalem Artichoke			SU			N
	<i>Inula helenium</i>	Elecampane			SE5			I
	<i>Lactuca biennis</i>	Tall Blue Lettuce			S5		U	N
	<i>Lactuca serriola</i>	Prickly Lettuce			SE5			I
	<i>Leucanthemum vulgare</i>	Oxeye Daisy			SE5			I
	<i>Matricaria discoidea</i>	Pineappleweed			SE5			I
	<i>Rudbeckia hirta</i>	Black-eyed Susan			S5			N
	<i>Solidago altissima</i>	Tall Goldenrod			S5			N
	<i>Solidago caesia</i>	Blue-stemmed Goldenrod			S5			N
	<i>Solidago canadensis</i>	Canada Goldenrod			S5			N
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod			S5			N
	<i>Solidago juncea</i>	Early Goldenrod			S5		R6	N
	<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Glandular Sow-thistle			SE5			I
	<i>Symphotrichum ericoides</i>	White Heath Aster			S5			N
	<i>Symphotrichum laeve</i>	Smooth Aster			S5	R	R2	N
	<i>Symphotrichum lanceolatum</i>	Panicled Aster			S5			N
	<i>Symphotrichum lateriflorum</i>	Calico Aster			S5			N
	<i>Symphotrichum novae-angliae</i>	New England Aster			S5			N
	<i>Symphotrichum puniceum</i>	Purple-stemmed Aster			S5			N
	<i>Symphotrichum urophyllum</i>	Arrow-leaved Aster			S4		U	N

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	Tanacetum vulgare	Common Tansy			SE5			I
	Tragopogon dubius	Yellow Goatsbeard			SE5			I
	Tussilago farfara	Coltsfoot			SE5			I
Balsaminaceae	Impatiens capensis	Spotted Jewelweed			S5			N
Berberidaceae	Berberis thunbergii	Japanese Barberry			SE5			I
	Caulophyllum thalictroides	Blue Cohosh			S5		R	N
	Podophyllum peltatum	May-apple			S5			N
Betulaceae	Alnus incana ssp. rugosa	Speckled Alder			S5			N
	Betula alleghaniensis	Yellow Birch			S5			N
	Betula papyrifera	Paper Birch			S5			N
	Carpinus caroliniana	Blue-beech			S5			N
	Ostrya virginiana	Eastern Hop-hornbeam			S5			N
Boraginaceae	Echium vulgare	Common Viper's Bugloss			SE5			I
	Hackelia virginiana	Virginia Stickseed			S5		R8	N
	Myosotis laxa	Small Forget-me-not			S5			N
	Myosotis scorpioides	True Forget-me-not			SE5			I
	Myosotis stricta	Upright Forget-me-not			SE4			I
	Myosotis sylvatica	Woodland Forget-me-not			SE4			I
Brassicaceae	Alliaria petiolata	Garlic Mustard			SE5			I
	Barbarea vulgaris	Bitter Wintercress			SE5			I
	Cardamine concatenata	Cut-leaved Toothwort			S5	R	R3	N
	Hesperis matronalis	Dame's Rocket			SE5			I
	Nasturtium officinale	Watercress			SE			I



Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	<i>Thlaspi arvense</i>	Field Pennycress			SE5			I
Campanulaceae	<i>Campanula rapunculoides</i>	Creeping Bellflower			SE5			I
	<i>Lobelia siphilitica</i>	Great Blue Lobelia			S5		U	N
Caprifoliaceae	<i>Lonicera tatarica</i>	Tatarian Honeysuckle			SE5			I
	<i>Sambucus racemosa</i>	Red Elderberry			S5			N
	<i>Viburnum acerifolium</i>	Maple-leaved Viburnum			S5			N
	<i>Viburnum lentago</i>	Nannyberry			S5			N
	<i>Viburnum opulus</i>	Cranberry Viburnum			S5			N
Caryophyllaceae	<i>Silene vulgaris</i>	Bladder Champion			SE5			I
Chenopodiaceae	<i>Chenopodium album</i>	Common Lamb's-quarters			SE5			I
Clusiaceae	<i>Hypericum perforatum</i>	Common St. John's-wort			SE5			I
Cornaceae	<i>Cornus alternifolia</i>	Alternate-leaved Dogwood			S5			N
	<i>Cornus racemosa</i>	Grey Dogwood			S5		U	N
	<i>Cornus rugosa</i>	Round-leaved Dogwood			S5			N
	<i>Cornus sericea</i>	Red-osier Dogwood			S5			N
Cucurbitaceae	<i>Echinocystis lobata</i>	Wild Cucumber			S5			N
Cupressaceae	<i>Thuja occidentalis</i>	Eastern White Cedar			S5			N
Cuscutaceae	<i>Cuscuta gronovii</i>	Swamp Dodder			S5		U	N
Cyperaceae	<i>Carex albursina</i>	White Bear Sedge			S5		U	N
	<i>Carex arctata</i>	Drooping Woodland Sedge			S5			N
	<i>Carex bebbii</i>	Bebb's Sedge			S5			N
	<i>Carex blanda</i>	Woodland Sedge			S5			N

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	Carex crinita	Fringed Sedge			S5		U	N
	Carex gracillima	Graceful Sedge			S5			N
	Carex intumescens	Bladder Sedge			S5			N
	Carex lacustris	Lake Sedge			S5			N
	Carex lupulina	Hop Sedge			S5			N
	Carex pensylvanica	Pennsylvania Sedge			S5			N
	Carex plantaginea	Plantain-leaved Sedge			S5		U	N
	Carex radiata	Eastern Star Sedge			S5			N
	Carex retrorsa	Retrorsed Sedge			S5			N
	Carex stipata	Awl-fruited Sedge			S5			N
	Carex stricta	Tussock Sedge			S5			N
	Carex vulpinoidea	Fox Sedge			S5			N
	Eleocharis erythropoda	Red-stemmed Spikerush			S5			N
	Schoenoplectus acutus	Hard-stemmed Bulrush			S5			N
	Schoenoplectus tabernaemontani	Soft-stemmed Bulrush			S5			N
	Scirpus atrovirens	Dark-green Bulrush			S5			N
	Scirpus cyperinus	Common Woolly Bulrush			S5			N
Dennstaedtiaceae	Pteridium aquilinum	Bracken Fern			S5			N
Dryopteridaceae	Cystopteris bulbifera	Bulblet Bladder Fern			S5			N
	Dryopteris carthusiana	Spinulose Wood Fern			S5			N
	Dryopteris cristata	Crested Wood Fern			S5			N
	Dryopteris intermedia	Evergreen Wood Fern			S5			N

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	<i>Dryopteris marginalis</i>	Marginal Wood Fern			S5			N
	<i>Gymnocarpium dryopteris</i>	Common Oak Fern			S5			N
	<i>Matteuccia struthiopteris</i>	Ostrich Fern			S5			N
	<i>Onoclea sensibilis</i>	Sensitive Fern			S5			N
	<i>Polystichum acrostichoides</i>	Christmas Fern			S5			N
Elaeagnaceae	<i>Elaeagnus umbellata</i>	Autumn Olive			SE3			I
Equisetaceae	<i>Equisetum arvense</i>	Field Horsetail			S5			N
	<i>Equisetum fluviatile</i>	Water Horsetail			S5			N
	<i>Equisetum scirpoides</i>	Dwarf Scouring-rush			S5			N
Euphorbiaceae	<i>Acalypha rhomboidea</i>	Common Three-seeded Mercury			S5			N
Fabaceae	<i>Amphicarpaea bracteata</i>	American Hog-peanut			S5			N
	<i>Desmodium canadense</i>	Showy Tick-trefoil			S4		R1	N
	<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil			SE5			I
	<i>Medicago lupulina</i>	Black Medick			SE5			I
	<i>Melilotus albus</i>	White Sweet-clover			SE5			I
	<i>Trifolium pratense</i>	Red Clover			SE5			I
	<i>Vicia cracca</i>	Tufted Vetch			SE5			I
Fagaceae	<i>Fagus grandifolia</i>	American Beech			S4			N
	<i>Quercus bicolor</i>	Swamp White Oak			S4			N
	<i>Quercus macrocarpa</i>	Bur Oak			S5			N
	<i>Quercus rubra</i>	Northern Red Oak			S5			N
Geraniaceae	<i>Geranium robertianum</i>	Herb-Robert			S5			N
Grossulariaceae	<i>Ribes americanum</i>	American Black Currant			S5			N
	<i>Ribes triste</i>	Swamp Red Currant			S5		U	N



Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
Hydrophyllaceae	Hydrophyllum virginianum	Virginia Waterleaf			S5			N
Iridaceae	Iris versicolor	Harlequin Blue Flag			S5			N
Juglandaceae	Juglans cinerea	Butternut	END	END	S2?			N
	Juglans nigra	Black Walnut			S4?	R	R	N
Juncaceae	Juncus bufonius	Toad Rush			S5			N
	Juncus dudleyi	Dudley's Rush			S5			N
	Juncus tenuis	Path Rush			S5			N
Lamiaceae	Glechoma hederacea	Ground-ivy			SE5			I
	Leonurus cardiaca	Common Motherwort			SE5			I
	Lycopus americanus	American Water-horehound			S5			N
	Mentha canadensis	Canada Mint			S5			N
	Monarda fistulosa	Wild Bergamot			S5		U	N
	Prunella vulgaris	Common Self-heal			S5			N
Lemnaceae	Lemna minor	Small Duckweed			S5?			N
Liliaceae	Allium tricoccum	Wild Leek			S4			N
	Asparagus officinalis	Garden Asparagus			SE5			I
	Convallaria majalis	European Lily-of-the-valley			SE5			I
	Lilium michiganense	Michigan Lily			S4		U	N
	Maianthemum canadense	Wild Lily-of-the-valley			S5			N
	Maianthemum racemosum	Large False Solomon's Seal			S5			N
	Maianthemum stellatum	Star-flowered False Solomon's Seal			S5			N
	Streptopus lanceolatus	Rose Twisted-stalk			S5			N
	Trillium erectum	Red Trillium			S5			N

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	<i>Trillium grandiflorum</i>	White Trillium			S5			N
Lythraceae	<i>Lythrum salicaria</i>	Purple Loosestrife			SE5			I
Malvaceae	<i>Malva neglecta</i>	Common Mallow			SE5			I
Nymphaeaceae	<i>Nymphaea odorata</i>	Fragrant Water-lily			S5			N
Oleaceae	<i>Fraxinus americana</i>	White Ash			S4			N
	<i>Fraxinus pennsylvanica</i>	Red Ash			S4			N
	<i>Syringa vulgaris</i>	Common Lilac			SE5			I
Onagraceae	<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Canada Enchanter's Nightshade			S5			N
	<i>Epilobium ciliatum</i>	Northern Willowherb			S5			N
	<i>Epilobium hirsutum</i>	Hairy Willowherb			SE5			I
	<i>Oenothera biennis</i>	Common Evening-primrose			S5		U	N
Orchidaceae	<i>Epipactis helleborine</i>	Broad-leaved Helleborine			SE5			I
Orobanchaceae	<i>Epifagus virginiana</i>	Beechdrops			S5			N
Oxalidaceae	<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel			S5			N
Papaveraceae	<i>Sanguinaria canadensis</i>	Bloodroot			S5			N
Pinaceae	<i>Larix decidua</i>	European Larch			SE2			I
	<i>Picea abies</i>	Norway Spruce			SE3			I
	<i>Picea glauca</i>	White Spruce			S5			N
	<i>Picea pungens</i>	Blue Spruce			SE1			I
	<i>Tsuga canadensis</i>	Eastern Hemlock			S5			N
Plantaginaceae	<i>Plantago lanceolata</i>	English Plantain			SE5			I
	<i>Plantago major</i>	Common Plantain			SE5			I
Poaceae	<i>Agrostis stolonifera</i>	Creeping Bentgrass			SE5			I

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	<i>Bromus inermis</i>	Smooth Brome			SE5			I
	<i>Calamagrostis canadensis</i> var. <i>canadensis</i>	Bluejoint Reedgrass			S5			N
	<i>Dactylis glomerata</i>	Orchard Grass			SE5			I
	<i>Echinochloa crus-galli</i>	Large Barnyard Grass			SE5			I
	<i>Elymus repens</i>	Quackgrass			SE5			I
	<i>Festuca rubra</i>	Red Fescue			S5			N
	<i>Glyceria grandis</i>	Tall Mannagrass			S5			N
	<i>Glyceria striata</i>	Fowl Mannagrass			S5			N
	<i>Miscanthus sinensis</i>	Chinese Silvergrass			SE1			I
	<i>Phalaris arundinacea</i>	Reed Canarygrass			S5			N
	<i>Phleum pratense</i>	Common Timothy			SE5			I
	<i>Phragmites australis</i> ssp. <i>australis</i>	European Reed			SE5			I
	<i>Poa compressa</i>	Canada Bluegrass			SE5			I
	<i>Poa palustris</i>	Fowl Bluegrass			S5			N
	<i>Poa pratensis</i>	Kentucky Bluegrass			S5			N
Polygonaceae	<i>Persicaria lapathifolia</i>	Pale Smartweed			S5			N
	<i>Rumex crispus</i>	Curled Dock			SE5			I
Potamogetonaceae	<i>Potamogeton crispus</i>	Curly-leaved Pondweed			SE5			I
Primulaceae	<i>Lysimachia ciliata</i>	Fringed Yellow Loosestrife			S5			N
Ranunculaceae	<i>Actaea pachypoda</i>	White Baneberry			S5			N
	<i>Actaea rubra</i>	Red Baneberry			S5			N
	<i>Anemone cylindrica</i>	Long-headed Anemone			S4		R8	N



Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	<i>Anemone quinquefolia</i>	Wood Anemone			S5			N
	<i>Aquilegia canadensis</i>	Red Columbine			S5			N
	<i>Caltha palustris</i>	Yellow Marsh Marigold			S5			N
	<i>Hepatica acutiloba</i>	Sharp-lobed Hepatica			S5			N
	<i>Ranunculus acris</i>	Common Buttercup			SE5			I
	<i>Ranunculus sceleratus</i>	Cursed Buttercup			S5			N
	<i>Thalictrum dioicum</i>	Early Meadow-rue			S5			N
Rhamnaceae	<i>Rhamnus cathartica</i>	European Buckthorn			SE5			I
Rosaceae	<i>Agrimonia gryposepala</i>	Hooked Agrimony			S5			N
	<i>Amelanchier laevis</i>	Smooth Serviceberry			S5		U	N
	<i>Crataegus punctata</i>	Dotted Hawthorn			S5			N
	<i>Fragaria vesca</i>	Woodland Strawberry			S5			N
	<i>Fragaria virginiana</i>	Wild Strawberry			S5			N
	<i>Geum aleppicum</i>	Yellow Avens			S5			N
	<i>Geum canadense</i>	Canada Avens			S5			N
	<i>Geum urbanum</i>	Wood Avens			SE3			I
	<i>Malus pumila</i>	Common Apple			SE4			I
	<i>Potentilla recta</i>	Sulphur Cinquefoil			SE5			I
	<i>Prunus avium</i>	Sweet Cherry			SE4			I
	<i>Prunus serotina</i>	Black Cherry			S5			N
	<i>Prunus virginiana</i>	Chokecherry			S5			N
	<i>Rosa multiflora</i>	Multiflora Rose			SE5			I
	<i>Rosa palustris</i>	Swamp Rose			S5	R	R7	N
	<i>Rubus allegheniensis</i>	Allegheny Blackberry			S5			N
<i>Rubus idaeus</i>	Red Raspberry			S5			N	

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
	Rubus occidentalis	Black Raspberry			S5			N
	Rubus odoratus	Purple-flowering Raspberry			S5			N
	Sorbus aucuparia	European Mountain- ash			SE4			I
	Spiraea alba	White Meadowsweet			S5			N
Rubiaceae	Galium aparine	Common Bedstraw			S5		U	N
	Galium mollugo	Smooth Bedstraw			SE5			I
	Galium trifidum	Three-petalled Bedstraw			S5			N
	Galium triflorum	Three-flowered Bedstraw			S5			N
Salicaceae	Populus balsamifera	Balsam Poplar			S5			N
	Populus deltoides	Eastern Cottonwood			S5			N
	Populus grandidentata	Large-toothed Aspen			S5			N
	Populus tremuloides	Trembling Aspen			S5			N
	Salix alba	White Willow			SE4			I
	Salix amygdaloides	Peach-leaved Willow			S5			N
	Salix bebbiana	Bebb's Willow			S5			N
	Salix discolor	Pussy Willow			S5			N
	Salix eriocephala	Cottony Willow			S5			N
	Salix interior	Sandbar Willow			S5		U	N
	Salix petiolaris	Meadow Willow			S5			N
Salix x fragilis	(Salix alba X Salix euxina)			SNA			I	
Saxifragaceae	Chrysosplenium americanum	American Golden- saxifrage			S4	R	R6	N
	Tiarella cordifolia	Heart-leaved Foamflower			S5			N

Family	Scientific Name	Common Name	COSEWIC	SARO	SRank	Lake Simcoe (State of the Watershed, 2003)	YORK (Varga 2005)	Native or Invasive Status
Scrophulariaceae	<i>Chelone glabra</i>	White Turtlehead			S5		U	N
	<i>Linaria vulgaris</i>	Butter-and-eggs			SE5			I
	<i>Verbascum thapsus</i>	Common Mullein			SE5			I
	<i>Veronica officinalis</i>	Common Speedwell			SE5			I
Solanaceae	<i>Solanum dulcamara</i>	Bittersweet Nightshade			SE5			I
Thelypteridaceae	<i>Thelypteris palustris</i>	Marsh Fern			S5			N
Tiliaceae	<i>Tilia americana</i>	Basswood			S5			N
	<i>Tilia cordata</i>	Little-leaved Linden			SE1			I
Typhaceae	<i>Typha angustifolia</i>	Narrow-leaved Cattail			SE5			I
	<i>Typha latifolia</i>	Broad-leaved Cattail			S5			N
	<i>Typha x glauca</i>	( <i>Typha angustifolia</i> X <i>Typha latifolia</i> )			SNA			N
Ulmaceae	<i>Ulmus americana</i>	White Elm			S5			N
	<i>Ulmus pumila</i>	Siberian Elm			SE3			I
Urticaceae	<i>Laportea canadensis</i>	Canada Wood Nettle			S5			N
	<i>Pilea pumila</i>	Dwarf Clearweed			S5			N
	<i>Urtica dioica</i>	Stinging Nettle			S5			N
Verbenaceae	<i>Phryma leptostachya</i>	Lopseed			S4S5			N
	<i>Verbena hastata</i>	Blue Vervain			S5			N
	<i>Verbena urticifolia</i>	White Vervain			S5			N
Violaceae	<i>Viola rostrata</i>	Long-spurred Violet			S5		U	N
	<i>Viola sororia</i>	Woolly Blue Violet			S5			N
Vitaceae	<i>Parthenocissus vitacea</i>	Thicket Creeper			S5			N
	<i>Vitis riparia</i>	Riverbank Grape			S5			N



# Appendix C

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## Breeding Bird List

## Appendix C

### Breeding Bird List

Common Name	Scientific Name	Status					Number of Pairs/Territories
		National Species at Risk COSEWICa	Species at Risk in Ontario Listing a	Provincial breeding season SRANK b	Regional Status	Area-sensitive (OMNR)c	
Great Blue Heron	<i>Ardea herodias</i>			S4			1 - foraging
Green Heron	<i>Butorides virescens</i>			S4			1
Canada Goose	<i>Branta canadensis</i>			S5			1
Mallard	<i>Anas platyrhynchos</i>			S5			1
Red-tailed Hawk	<i>Buteo jamaicensis</i>			S5			1
Wild Turkey	<i>Meleagris gallopavo</i>			S5			1
Killdeer	<i>Charadrius vociferus</i>			S5			3
Mourning Dove	<i>Zenaida macroura</i>			S5			4
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	S4			1
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>			S4			1
Downy Woodpecker	<i>Dryobates pubescens</i>			S5			1
Hairy Woodpecker	<i>Dryobates villosus</i>			S5		A	1
Northern Flicker	<i>Colaptes auratus</i>			S4			1
Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5		A	1
Eastern Wood-Pewee	<i>Contopus virens</i>	SC	SC	S4			2
Eastern Phoebe	<i>Sayornis phoebe</i>			S5			2
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			S4			2
Eastern Kingbird	<i>Tyrannus tyrannus</i>			S4			1
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>			S4			1
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	S4			1
Blue Jay	<i>Cyanocitta cristata</i>			S5			2
American Crow	<i>Corvus brachyrhynchos</i>			S5			2

Common Name	Scientific Name	Status					Number of Pairs/Territories
		National Species at Risk COSEWICa	Species at Risk in Ontario Listing a	Provincial breeding season SRANK <sup>b</sup>	Regional Status	Area-sensitive (OMNR)c	
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5			5
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S5		A	1
White-breasted Nuthatch	<i>Sitta carolinensis</i>			S5		A	1
House Wren	<i>Troglodytes aedon</i>			S5			4
American Robin	<i>Turdus migratorius</i>			S5			6
Gray Catbird	<i>Dumetella carolinensis</i>			S4			2
Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5			2
European Starling	<i>Sturnus vulgaris</i>			SE			5
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5			2
Yellow Warbler	<i>Setophaga petechia</i>			S5			1
American Redstart	<i>Setophaga ruticilla</i>			S5		A	1
Common Yellowthroat	<i>Geothlypis trichas</i>			S5			4
Northern Cardinal	<i>Cardinalis cardinalis</i>			S5			6
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			S4			1
Indigo Bunting	<i>Passerina cyanea</i>			S4			4
Chipping Sparrow	<i>Spizella passerina</i>			S5			2
Savannah Sparrow	<i>Passerculus sandwichensis</i>			S4		A	5
Song Sparrow	<i>Melospiza melodia</i>			S5			8
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	S4		A	1
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4			7
Common Grackle	<i>Quiscalus quiscula</i>			S5			3
Brown-headed Cowbird	<i>Molothrus ater</i>			S4			3
Baltimore Oriole	<i>Icterus galbula</i>			S4			5
House Finch	<i>Haemorhous mexicanus</i>			SNA			2
Purple Finch	<i>Haemorhous purpureus</i>			S4			1
American Goldfinch	<i>Spinus tristis</i>			S5			5
House Sparrow	<i>Passer domesticus</i>			SNA			2



Field Work Conducted On: *June 16 & 25, 2020*

Number of Species: 49

Number of (provincial and national) Species at Risk: 4 - Eastern Wood-Pewee, Barn Swallow, Chimney Swift & Bobolink

Number of S1 to S3 Species: 0

Number of Area-sensitive Species: 6 - Hariry Woodpecker, Red-breasted Nuthatch, White-breasted Nuthatch, American Redstart, Savannah Sparrow, Bobolink

#### KEY

a COSEWIC = Committee on the Status of Endangered Wildlife in Canada

a Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario)

END = Endangered, THR = Threatened, SC = Special Concern

<sup>b</sup> SRANK (from Natural Heritage Information Centre) for breeding status if:

S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure)

SNA (Not applicable... 'because the species is not a suitable target for conservation activities'; includes non-native species)

<sup>c</sup> Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.