

**ENVIRONMENTAL IMPACT ASSESSMENT
PUSLINCH WEST ESTATE SUBDIVISION**

PREPARED FOR:

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1.0 INTRODUCTION

1.1 Site Location and Purpose

Stovel and Associates Inc. (“SAI”) was retained by Cox Construction Ltd. (“Cox”), to complete a Natural Environment Impact Assessment (“EIA”) for a proposed residential development in the Township of Puslinch (“Township”). The project is referred to as Puslinch West Estate Development. The lands in question are approximately 20.8 ha in size and are located on Part of Lots 11 and 12, Concession 4.

Forestell Road abuts the property on the northern limits of the site (see Figure 1). The site also has frontage on Sideroads 10 and 12.

In the context of this report, the lands in question are referred to as the site, subject lands and subject property.

The subject land is designated Secondary Agriculture and zoned Agriculture. Lands adjacent to the subject land are designated Agriculture, Secondary Agriculture, and Core Greenland. To permit the establishment of a residential development on the subject land, an Official Plan Amendment (“OPA”) is required to change the designation from Secondary Agriculture to Country Residential.

1.2 Site History and Study Objectives

The subject property is a former licenced pit referred to as the Nigro Pit. The annual tonnage limit for the Nigro Pit was 500,000 tonnes. The pit licence was surrendered in 2017 following rehabilitation. In 2017, a rural residential severance was conditionally approved on the site (northeast corner).

The County of Wellington has examined rural residential growth as part of the Official Plan Review (Committee Report prepared by Jameson Pickard, September 12, 2024). This analysis determined that there was a need for 250 rural residential lots in Puslinch. The development of the subject lands will provide rural residential housing, including Accessory Residential Units, available to residents of the Town and County.

In 2025, Cox engaged the Township of Puslinch and County of Wellington to discuss the merits of the proposed development. Planning and technical analysis was submitted to the County for review. The County determined that additional supporting documentation was required, including the completion of an AIA (Aldo Salis, OP-2025-13, Feb. 12, 2026). The findings of these updated reports are summarized in this document. The updated reports include the following:

“Planning staff note that the following additional supporting studies and/or materials are required:

- *An Agricultural Impact Assessment that evaluates the impacts that the proposed development may have on agricultural activities in the area as outlined in section 4.6.5 of the County of Wellington Official Plan. The Provincial Guidelines may also be consulted.*
- *It is acknowledged a farm data sheet was submitted for the barn located at 4656 Sideroad 12. Please provide farm data sheets for barns located at 6649 Forestell Rd, 4642 Sideroad 10 N, 6848 Laird Rd W, 6841 Forestell Rd and for all other barns located within 1,500 m of the subject lands.*
- *A Traffic Impact Assessment in accordance with section 4.6.4 of the County of Wellington Official Plan. Please contact the Township of Puslinch to connect with their Traffic Consultant regarding further information on study requirements.*
- *An Environmental Impact Study in accordance with section 4.6.3 of the County of Wellington Official Plan.*
- *A Noise Impact Assessment*
- *A Servicing Options Assessment, in accordance with section 11.2.3 of the County of Wellington Official Plan.*
- *Please provide a copy of the previously approved Archaeological Assessment from the previous aggregate operation on the subject lands for our records.*

This EIA evaluates the impacts that the proposed development may have on environmental features and functions onsite and on adjacent lands as outlined in Section 4.6.3 of the County of Wellington Official Plan.

4.6.3 Environmental Impact Assessment

Environmental impact assessments prepared by a qualified person may be required to evaluate the impacts a proposed development may have on the natural environment and the means by which negative impacts may be reduced or eliminated. An environmental impact assessment may include some or all of the following:

- a) a description of the proposal, including a statement of purpose;*
- b) a description of the existing land use on the subject lands and adjacent lands, as well as the relevant land use regulations;*
- c) an identification of proposed land uses and activities and potential environmental impacts;*
- d) a delineation of any environmental constraint area on a site plan;*
- e) a description of the terrestrial and aquatic resources, natural and built landforms, surface and groundwater and other significant environmental features or functions on the site;*
- f) an assessment of the impact on groundwater resources and in particular existing private wells and municipal supply wells in the area;*
- g) a consideration of the need for a subwatershed study;*
- h) an assessment of the impact on groundwater resources and in particular existing private wells and municipal supply wells in the area;*
- i) a statement of the relative environmental and ecological significance of the natural features and functions affected by the proposal;*
- j) a consideration of the potential to maintain, restore or where possible, improve the long-term ecological function and biodiversity of natural heritage systems;*
- k) requirements to be addressed in Site Plans and/or Development Agreements;*
- l) a statement that there are no negative impacts on provincially significant greenland features and functions and a description of the means by which negative environmental impacts will be mitigated in other greenland areas.*
- m) a consideration of the potential for enhancement of environmental features or functions through site design alternatives;*
- n) a proposal for monitoring, where needed;*
- o) such additional concerns as a Council may consider relevant.*

The County may, in consultation with Conservation Authorities, provide consideration for a scoped environmental impact assessment format for use by proponents of development applications, which are generally minor in nature with limited potential impacts.

1.3 Study Methodology

In addition to the plans and reports that were specifically prepared for the submission of the planning applications, the following background materials were also reviewed:

- Soil data resource information which includes Ontario Soil Survey reports and mapping, the provincial digital soil resource database and information from on-site investigations.
- Aerial photography (historic and recent drone survey) with scale of 1:10,000 or smaller.
- on-line data base queries at the Ontario Natural Heritage Information Centre
- (NHIC) web site.
- on-line mapping provided by the Grand River Conservation Authority (“GRCA”) of the subject lands and adjacent lands.
- aerial photography of the subject land and surrounding area.
- County of Wellington Official Plan.
- Township of Puslinch Zoning By-law.
- Selected Atlas sources: Butterfly, Reptile and Amphibian, and Breeding Birds.

Prior to completing field investigations, relevant background data were reviewed documenting rare species in the County, the presence of significant natural heritage features onsite and within 120 m of the site, and rare species in the County of Wellington. This background data review provided requisite scoping for the environmental inventories. Based on the paucity of natural heritage features on the subject land, it was determined that a full suite of environmental inventories was not necessary; the site contains no natural, or semi-natural features and the site is currently actively cultivated for agricultural production.

The subject land is primarily disturbed and/or used for agricultural purposes. The 2025 crop was corn. The property has been cultivated for common field crop production over the past several years. There are no natural or semi-natural vegetation communities located within the area proposed to be developed. Following the 2025 harvest, the site was ploughed.

Ecological Land Classification ("ELC") System was used to describe onsite vegetation communities. Vegetation community boundaries were established on an aerial photo-mosaic base map and field checked. As documented later in this report, the only vegetation communities that were described are hedgerows and the onsite pond.

A land use survey was also conducted (2025), with additional information gathered from Google Satellite Imagery. Aerial photographic mapping and roadside images have been utilized to gain a better understanding of the ecological features and activities onsite and on adjacent lands (see Section 2.0). A site visit was completed by an ecologist on July 9th, 2025 to record breeding birds and complete a reconnaissance of the vegetation communities onsite.

1.4 Overview of Development Concept

As previously noted, the subject land is designated Secondary Agricultural (Figure 2). The subject land is zoned Agriculture (Figure 3).

The proposed development concept is comprised of 39 lots suitable for the construction of single detached dwellings (See Figure 4 below). The lots are proposed to be created through a Plan of Subdivision. The residential lots will be serviced utilizing advanced tertiary septic systems and private, drilled individual wells. A stormwater management facility will be implemented to control surface runoff. Infiltration of lot level conveyances will be implemented. Proposed lot sizes range from approximately 0.4 to 0.8 ha in size. Lot frontages range from 50-60 m, not including the lots on curves or cul de sacs. Each home is expected to have a double-car garage with additional parking for a minimum of two cars within each driveway.

The proposed development will have one entrance onto Forestell Road and one entrance on Sideroad 10. The road cross-section will utilize a urban section with pavement, curb, and gutter. The road section has been designed using a standard 20m right of way. The internal road network sets out the following:

- There is approximately 1100 m of road in the proposed subdivision;
- The roads are mainly double-loaded.
- Discussions with the municipality will be required to determine if a Park is required or if the municipality will require cash in lieu for parkland dedication.

The applications for a rezoning and draft plan of subdivision will be filed following the approval of the OPA. Groundwater Science Corp. ("GSC") completed a Preliminary Nitrate Impact and Water Supply Feasibility Study to address impacts related to servicing the proposed development. GSC determined that available well records show that the existing wells within the overall area of the site have a typical capacity of 20 L/min (or more). Similar well capacities can be expected within the development site, and a minimum capacity of 20 L/min can be set as a water supply target for residential wells at the site. Assuming a peak demand rate of 3.75 L/min for each person (as per D-5-5), each well would then theoretically support a 5+ person household. The local bedrock aquifer in this area is well known source of good quality water capable of providing adequate water quantity to residences. As far as we are aware, mutual interference is not a current issue in the area and is not expected to be an issue in the future based on typical household demand.

1.4.1 Attenuation Assessment

Based on the proposed 39 residential lot subdivision, each with individual tertiary treatment septic systems (1,000 L/day) achieving 10 mg/L nitrate concentration at the septic bed, the daily nitrate loading would be expected to be 390,000 mg/day. Assuming 0.344 m/yr recharge (to be maintained post development) over 20.9 ha, and incorporating septic volumes, total site recharge would be 235,975 L/day. Therefore, expected nitrate loading due to the proposed development would result in nitrate concentrations of 1.65 mg/L reaching the water table.

The nitrate concentration loading related to the proposed septic systems would be well below 10 mg/L reaching the shallow water table system, and likely well below any agricultural or residential fertilizer inputs that could occur in the area. We note that shallow groundwater sampling should occur at the site (per D-5-4) to establish background nitrate levels.

1.4.2 Traffic Impact Brief

Traffic associated with the proposed residential development was assessed by Paradigm Transportation Solutions Ltd. through the completion of a Traffic Impact Brief (TIB). The study evaluated anticipated traffic generation, access design, and available sight distance at the proposed site entrances.

The TIB estimates that the proposed development (39 single detached dwellings) will generate approximately 32 vehicle trips during the weekday AM peak hour and 40 vehicle trips during the weekday PM peak hour. This level of traffic corresponds to approximately one vehicle trip every two minutes during peak periods.

Based on this level of traffic generation, the study concludes that traffic from the proposed development would not be expected to significantly impact traffic operations on Forestell Road and Sideroad 10 N. Furthermore, the report concludes that the development is not forecast to significantly impact traffic operations within the surrounding road network.

A sight distance assessment was undertaken at both proposed access locations. The results indicate that the proposed street connections to Forestell Road and Sideroad 10 N provide sufficient sight distance in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads and the Township of Puslinch Entrance By-law.

The TIB identifies that removal of deciduous vegetation along Sideroad 10 N and consideration of intersection placement at the crest of the vertical curve may improve visibility for outbound motorists; however, these measures are identified as enhancements rather than requirements.

Based on the findings of the Traffic Impact Brief, no off-site transportation network improvements are required to support the proposed development

1.4.3 Noise Feasibility Study

A Noise Feasibility Study ("NFS") was completed by HGC Noise Vibration Acoustics ("HGC") in support of the application. Noise emissions from adjacent mineral aggregate operations were considered and relevant mitigation measures were reviewed, including acoustic berms/barriers and restrictions on building setbacks/building requirements, to ensure that the proposed subdivision meets relevant Ministry guidelines. No noise-related impacts on the proposed residential lots are anticipated. HGC recommended a warning clause to advise future homeowners of the presence of mineral aggregate operations in the local area.

2.0 DESCRIPTION OF THE ENVIRONMENT

2.1 Geologic Setting and Physiography

The subject land is located at the northern edge of the Paris Moraine. The surficial soils over most of the site are described as (Wentworth) Till, consisting of stone-poor, sandy silt to silty sand-textured till. The northeast corner of the site is shown to include glaciofluvial (outwash) deposits of gravel. Based on the depositional sequence and our knowledge of the area, the surficial sand/gravel deposit is expected to overlie either the till (as mapped at surface) or a sequence of fining sand/silt/clay that extends to depth.

As the site was historically a gravel pit, it is expected that most of the surficial sand/gravel has been extracted and the remaining surficial soil at the site consists of finer grained material. A review of water well records (further discussed below) indicates that in the immediate area of the site the total overburden thickness (depth to bedrock) varies between 21 and 35 m. An observation well (WWR#7417706) constructed near the site in 2022 for the City of Guelph reports the overburden sequence consists of clay to 1.8 m depth, followed by gravel to 10.4 m depth, then clay stones/silt to a depth of 27.4 m (where bedrock was encountered). Bedrock in the area is reported to consist of Guelph Formation dolostone, which is generally represented within the water well record database using “brown rock” or “brown limestone” descriptors.

2.2 Topography and Drainage

The subject land is situated on a broad, outwash plain which is part of a gravel terrace of an earlier glacial spillway. This spillway forms part of a complex network of glacial meltwater channels which interrupt the drumlinized till plain of a broad physiographic region identified as the Guelph Drumlin Field.

On the southern portion of the subject land, the irregular, hummocky topography of a recessional till moraine marks the limit of the outwash materials comprising the gravel terrace. This moraine, (Paris and Galt morainal complex) is characterized by knobs and ridges comprised of stony till materials typical of the Horseshoe Moraine physiographic region, (Chapman and Putnam, 1966). The steep, irregular slopes of this morainal area result in small, confined or enclosed basins which contain water in the spring and early summer. This restricted runoff contributes to the ground water recharge function attributed to the morainal complex.

For this review the Ontario Lidar Derived Digital Terrain Model, as available from Land Information Ontario, was examined to assess site topography of the overall area. Detailed local topography can also be examined at the Grand River Conservation Authority (GRCA) online general mapping/GIS application (available at: <https://data.grandriver.ca/applications.html>). All drainage is internalized within the site.

The existing site elevations represent the rehabilitated former pit excavation, which has a bowl-like form. The current (former dry pit floor) elevation within the eastern portion of the site is approximately 325 to 326 metres above sea level (mASL). The lowest elevations occur at the internal pond area (western portion of the site) at approximately 321 mASL. From this area, the topography rises to approximately 327 mASL along most of the site perimeter. Based on the topography of the site, all internal runoff would move to the former pit floor and/or pond and is expected to infiltrate. No significant volume of runoff is expected to enter or exit the site under current conditions.

The expected future stormwater management plan will provide a more detailed analysis of overland flow at the site and provide recommendations as needed to maintain on-site recharge. It is noted that the maintenance of site recharge is an expected stormwater management plan target, which may be achieved using the on-site internal pond as an LID style enhanced recharge feature.

Properties to the immediate west, northwest, north and east of the site are also currently operating or former gravel pits, with similar enclosed drainage patterns and internal ground surface elevations.

Based on the extensive monitoring program undertaken during pit extraction, no groundwater related impacts, or changes in groundwater conditions, due to pit operations were identified at the PSW system near the site.

A headwaters portion of Irish Creek are mapped as beginning in the PSW south of the site, at a (wetland) elevation between approximately 322 to 324 mASL. The creek drains this wetland area and flows west across Sideroad 10 North, with the closest reach of the creek at approximately 320 m. The closest portion of the PSW drained directly by Irish Creek is shown at distances of more than 125 m.

2.3 Hydrogeologic Setting

For this assessment groundwater elevation and flow direction mapping was developed based on the results of the 15-year long Nigro Pit monitoring program. Although this water level data is not current, the long-term record is useful on a preliminary basis to help establish conditions at the site.

As shown, the shallow groundwater flow direction under both high and low water table conditions is generally east to west across the site, then southwest toward the Irish Creek system. The Significant Wetland area at the southeast corner of the site represents a local water table high, driven by local runoff retention and infiltration recharge at the wetland.

Shallow groundwater elevations within the site range from approximately 322 to 325 mASL under high water table conditions, to 320 to 323 mASL under low water table conditions. Comparing water table elevations as observed from 1997 to 2012 to the wetland and creek elevations, it appears that groundwater discharge to the wetland/creek system to the south and southwest occurs seasonally (i.e. during high water table conditions only).

Based on the site characteristics the development area will have a groundwater recharge function, supporting the west/southwest shallow groundwater flow system that can contribute seasonally to the Provincially Significant Wetland and creek system. It is expected that recharge maintenance would be a development design target to continue to support this flow system.

GRCA online mapping indicates the average annual recharge rate at the site is on the order of 344 mm/yr and runoff rate is 0 mm/yr, which is considered reasonable given the surficial soils, vegetative cover and topography. In addition, a downward gradient potential is mapped at the site, with potentiometric (bedrock aquifer) head values of between approximately 304.7 to 314 mASL reported. The difference in water levels between the water table and bedrock aquifers supports the interpreted system separation that is associated with the confining overburden sequence.

2.4 Biologic Resources

The local area is within Site District 6-1; the Huron-Ontario section of the Great Lakes Forest Region (Rowe, 1972). The predominant vegetation type noted in Site District 6-1 is lowland red and silver maple swamp forest. Pockets of upland hardwoods occur at several locations. These forests are generally small and disturbed. Most of the better-drained upland sites have been cleared for farming, with only the low-lying, wetter sites remaining in a relatively natural, undisturbed state (Klinkenberg, 1984). Natural upland forest cover in the Huron-Ontario section is generally dominated by sugar maple, American beech, basswood, white ash, white oak, bur oak, eastern hemlock and white pine.

Wellington County is estimated to have approximately 18.2% forest cover (Riley and Mohr, 1994), while Puslinch Township has 32.1% forest cover (MNR - Forest Resource Inventory, 1983).

Background mapping also shows the Oil Well Bog Little Tract Area of Natural Scientific Interest (ANSI), associated with the wetland complex, southwest of the site.

Background information was reviewed to determine the presence of significant wildlife habitat and species at risk. The results of the screening process are set out in Appendix B and Appendix C.

Figure 5 illustrates the location of natural heritage features on lands beyond the 120 m adjacent land area.

A small, unclassified wetland is located approximately 15-20 m south of the site. This wetland is less than 0.3 ha in size and is surrounded (on three sides) by active farmland. The intervening lands between the

wetland and the subject land is treed. The subject land drains away from the wetland and contributes little (if any) surface water to catchment area for this wetland.

2.5 Site Environs

The subject property is a rehabilitated pit. The lands are currently cultivated for common field crop production (corn in 2025). A small pond remains on the site in the northwest portion. The pond depth is estimated to be 3-4 m and was created by extraction below the water table.

There are no natural or semi-natural vegetation communities on the subject property. Figure 6 illustrates the vegetation communities as per the ELC system. The units are described below.

Hedgerows (TAGM5)

Hedgerows are located along the southern perimeter of the site. The hedgerows are inconsistent in density, ranging from densely grouped trees to scattered clumps of trees/shrubs. Species encountered include: Manitoba maple, white ash, basswood, white spruce, white pine and eastern white cedar. Common buckthorn is prevalent.

Pond (OAW) and Cultural Meadow (CUM)

An open water pond is located in the northwest corner of the site. This pond was created by extraction below the water table. The substrate of the pond is mainly silt and silty fine sand.

The pond edges and adjacent cultural meadow are starting to be colonized by reed canary grass, field horsetail, cattails and red-osier dogwood. The cultural meadow was recently grubbed. While walking the pond edge, several American toads and leopard frogs were noted.

Agricultural Land (OAGM1)

Most of the site is comprised of land used for the cultivation of common field crops. The eastern extent of the site had scattered pockets of shrubs and small trees, but these were removed in 2025 to allow for more cultivation at the site. Remnant piles of scrub remain on the site. The perimeter of the farm fields consists of weedy species (American thistle, wild carrot, teasel, plantain, hawkweed, dames rocket, dandelion white sweet clover, black medic) and common field grasses such as timothy, orchard grass, foxtail and quackgrass.

Background aerial photography of the site illustrates a tableland shrub community (THDM2-6) in the eastern portion. This community was dominated by common buckthorn, with other species including Manitoba maple, white ash, red-osier dogwood and weedy herbaceous species. The site was cleared in 2025 and following local drainage improvements, this area will be cultivated in the 2026 growing season.

2.6 Birds and Mammals

A bird survey was completed on July 9, 2025 (5:30 – 6:30 am; winds were light (10-15 km/h from the SW, weather was overcast 50%). The following species were recorded:

- American Crow (*Corvus brachyrhynchos*)
- American Goldfinch (*Spinus tristis*)
- American Robin (*Turdus migratorius*)
- Barn Swallow (*Hirundo rustica*)
- Black-capped Chickadee (*Poecile atricapillus*)
- Carolina Wren (*Thryothorus ludovicianus*)
- Chestnut-sided Warbler (*Setophaga pensylvanica*)
- Field Sparrow (*Spizella pusilla*)
- Northern Cardinal (*Cardinalis cardinalis*)
- Northern Flicker (*Colaptes auratus*)
- Red-winged Blackbird (*Agelaius phoeniceus*)
- Kildeer (*Charadrius vociferus*).

The barn swallow was identified flying over the fields. As there are no structures on the site, it is assumed that the barn swallow had a nest on an adjacent property within a barn/shed. Mallard ducks (*Anas platyrhynchos*) and Canada geese (*Branta canadensis*) were noted in the pond and on the adjacent farmland.

White-tailed deer tracks were observed throughout the southern portion of the farm field. Grey squirrels were observed in the southern hedgerow.

3.0 IMPACT ASSESSMENT

3.1 Significant Natural Heritage Features

Background environmental resource mapping was consulted to determine if significant natural heritage features are mapped on the site or within 120 metres of the site (i.e. adjacent lands).

MNR mapping illustrates the distribution of evaluated/unevaluated wetlands and ANSI's in proximity to the site. A small unevaluated wetland has been mapped approximately 15 – 20 m south of the site. A significant wetland has been mapped over 120 m southeast of the site. Recent aerial photography illustrates that the closest portion of this wetland has been converted to farmland.

There are no other significant natural heritage features (significant wetland, significant wildlife habitat, significant woodland, significant ANSI or habitat for threatened or endangered species) within 120 m of the site. Therefore, additional impact assessment as per the requirements of Section 4.1 of the PPS 2024 are not required.

The subject property does not contribute surficial drainage to the offsite significant wetlands. All water is internalized to the site. The site has a distinctive "bowl-shape" created by the prior aggregate extraction activity.

3.2 Core Greenland and Greenland Features

Figure 3 identifies the Greenlands System in proximity to the subject property, The Greenland System is a composite of many natural heritage features, flood prone areas and hazardous lands. The boundaries of many natural heritage features overlap and inter-relationships frequently exist between these areas. The system is divided into two broad categories: Core Greenlands and Greenlands.

"The Greenlands System will be maintained or enhanced. Activities which diminish or degrade the essential functions of the Greenlands System will be prohibited. Activities which maintain, restore or, where possible, enhance the health of the Greenlands System will be encouraged where reasonable".

"While the Greenlands System designated on Schedule B is based on those features that have been mapped at a municipal scale, 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 linkage between and among natural heritage features and areas, surface water features and ground water features."

5.4 CORE GREENLANDS

"Within the Greenlands System certain areas have greater sensitivity or significance. These areas are identified in policy and protected. These areas have been included in the "Core" Greenlands designations and include:

- provincially significant wetlands
- all other wetlands;
- habitat of endangered or threatened species and fish habitat; and
- hazardous lands" (Page 52, Wellington County Official Plan, December 2025)

There are no Core Greenlands or Greenlands mapped on the subject property.

There is one small, unclassified wetland mapped approximately 15 – 20 metres south of the subject property. This feature is designated Core Greenland. The proposed development will not result in a direct or indirect impact on this unevaluated wetland. No vegetation removal will result and the surface drainage from the site does not contribute to this wetland. Standard mitigative measures, such as silt fencing, will be recommended to ensure no negative impacts. Standard rear yard setback of 6 m will be incorporated into the proposed development. This will ensure a setback of over 20 m to this unevaluated wetland. The rear yard setback will be implemented via the site-specific ZBA that will be submitted by the proponent later.

There are no Greenlands mapped on the site, or within 120 metres of the subject property.

3.3 Recommendations for Conditions of Draft Plan Approval

The subject lands do not contain any natural or semi-natural heritage systems. There are, however, perimeter hedgerow features that provide aesthetic benefits. The perimeter plantings could be enhanced through the incorporation of native tree and shrub plantings and the removal of buckthorn and other non-native species. A list of preferred native trees and shrubs should be developed for inclusion within the development plan as part of a condition for draft plan approval.

Silt fencing will be installed around the proposed development. Silt fencing along the southern limits, in proximity to the offsite, small wetland is recommended. Given the lack of natural features on the subject property, environmental monitoring (beyond the requirement to monitor the silt fencing) is not recommended.

3.4 Net Effects

Table 1 provides the results of a net effects analysis for the proposed development. Through the implementation of native tree/shrub plantings, it is concluded that the proposed development could have a net benefit to the local ecological community.

Table 1: Net Results of Ecological Impact Assessment

Anticipated Impact	Key Natural Heritage Sensitivity	Magnitude, Duration and Frequency of impact	Avoidance / Mitigation Strategy	Residual Impact	Enhancement Strategy	Net Ecological Result
DIRECT: Tree and vegetation removal	No significant water features onsite. There is an onsite pond.	N/A	N/A	None	Planting of native trees and shrubs	Net positive impact
INDIRECT: Temporary disturbance of wildlife	No significant features onsite. No tree removal to occur.	N/A	N/A	None	None	No net impact
INDIRECT: Alterations to water balance and drainage patterns	No significant habitat onsite. Site is a farm field.	N/A	Stormwater strategy to balance water.	None	None	No net impact
INDIRECT: Sedimentation and erosion	No significant water features onsite.	From Start of development until finish.	Use of heavy duty silt fence. Erosion and sedimentation plan.	No significant impact	None	No net impact
CUMULATIVE: Land Use Transition and Human Encroachment	No significant features onsite.	N/A	N/A	None	None needed.	No cumulative impact on significant natural heritage features and functions.

4.0 CONCLUSIONS

Stovel and Associates Inc. (“SAI”) was retained by Cox Construction Ltd. (“Cox”), to complete an Environmental Impact Assessment (“EIA”) of a proposed residential development in the Township of Puslinch (Puslinch). The proposed development is a Country Residential Development and was assessed based on the related policy structure. The EIA was scoped given that the site is a former gravel pit with no natural heritage attributes and there are no provincially significant natural heritage features onsite or within 120 m of the site.

The project is referred to as Puslinch West Estate Development. The lands in question are approximately 20.8 ha in size and are located on Part of Lots 11 and 12, Concession 4, in the Township of Puslinch, County of Wellington.

The subject land is mainly used for agriculture. The site includes cultivated agricultural lands, a pond, and perimeter hedgerows.

The site is designated Secondary Agriculture and does not include any natural or semi-natural environmental communities. There are no significant natural heritage features onsite or within 120 m of the site. Approximately 15-20 m south of the site, there is an unevaluated wetland. This wetland is designated Core Greenland. No impacts on this adjacent wetland are anticipated to occur because of the proposed development. There will be no negative impacts on provincially significant Greenland features and functions, because of the proposed development.

Relevant guidelines and planning policies were considered in the preparation of this EIA. Background documentation, including environmental mapping, was supplemented by data collected through reconnaissance investigations of the site and a site survey completed by an ecologist. Based on this information, it was concluded that the proposed development will not impact adjacent environmental features.

The proposed development is consistent with the relevant planning policy framework set out in the PPS, 2024 and conforms to the County of Wellington Official Plan Policy 4.6.3.

Robert Stovel

ROBERT P. STOVEL, MCIP, RPP, P.AG.



Base Map Source:

Source: Esri/Vector, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Powered by Esri.

LEGEND

 SITE LOCATION

 CITY OF GUELPH

**SITE LOCATION MAP
FIGURE 1**

*PT LOT 11 and 12 CON 4
TOWNSHIP OF PUSLINCH
COUNTY OF WELLINGTON*

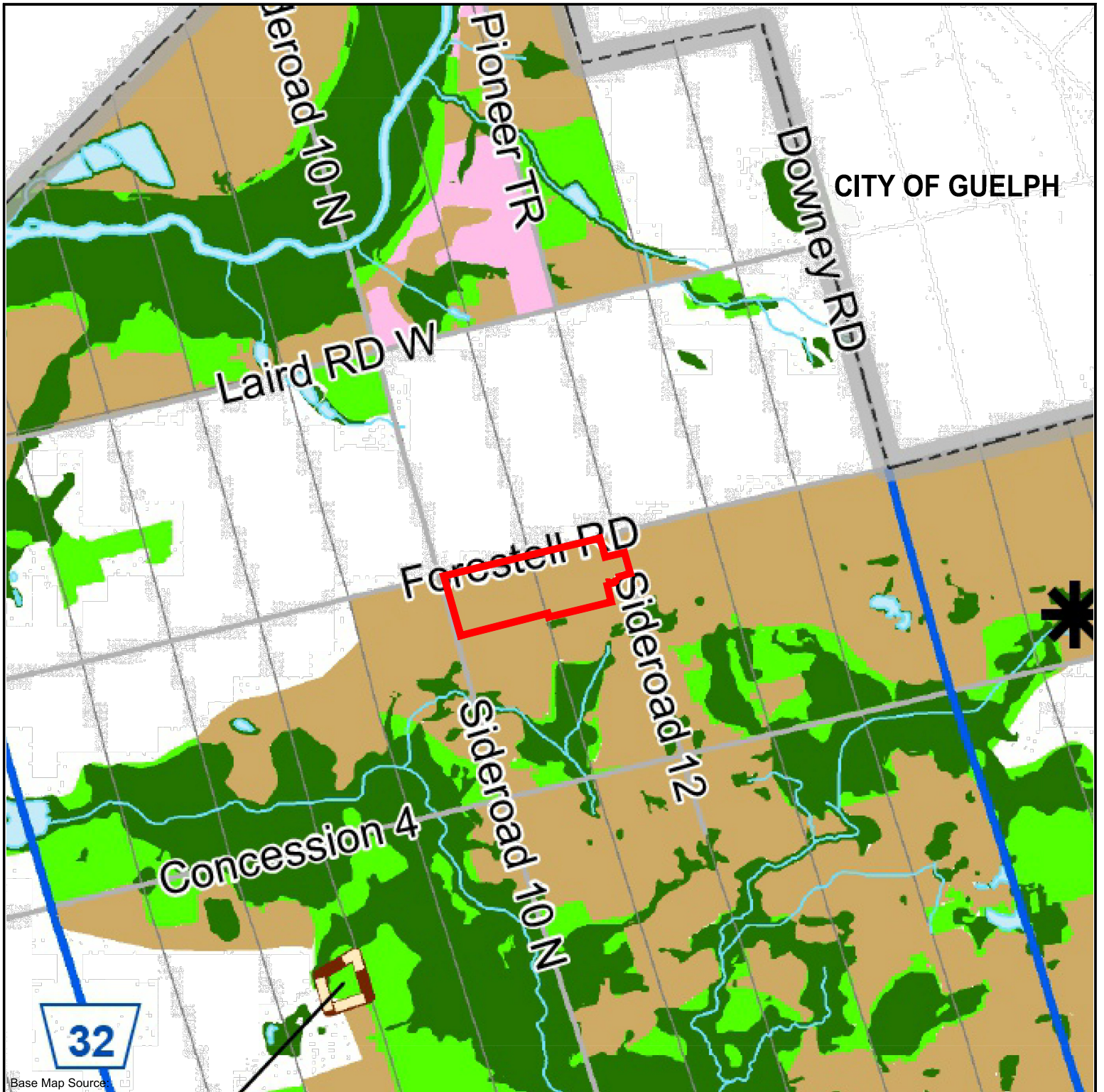
SAI
PLANNING. AGROLOGY.
ENVIRONMENTAL.

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Fergus, Ontario
N1M 1T9
T: 519-766-8042
E: stovel.associates@outlook.com



DATE:
31-Mar-26

FILE:
Puslinch West Estate
Development



Base Map Source:

LEGEND

- | | |
|--|--|
| <p>The Greenlands System</p> <ul style="list-style-type: none"> Core Greenlands Greenlands Earth Science ANSI <p>The Rural System</p> <ul style="list-style-type: none"> Prime Agricultural Secondary Agricultural Hamlet Area Secondary Urban Centre Mineral Aggregate Area Recreational Rural Employment Area Country Residential Policy Area Regionally Significant Economic Development Study Area | <p>Other</p> <ul style="list-style-type: none"> Landfill Site Proposed Interchange Proposed Major Roadways County Roads Provincial Highway Railways Waterbody Watercourse <p><small>Mineral Aggregate Resources are identified on Schedule D of the Official Plan. Licensed Aggregate Operations are identified on Appendix 2 of the Official Plan.</small></p> |
|--|--|

SITE LOCATION

*PT LOT 11 and 12 CON 4
TOWNSHIP OF PUSLINCH
COUNTY OF WELLINGTON*

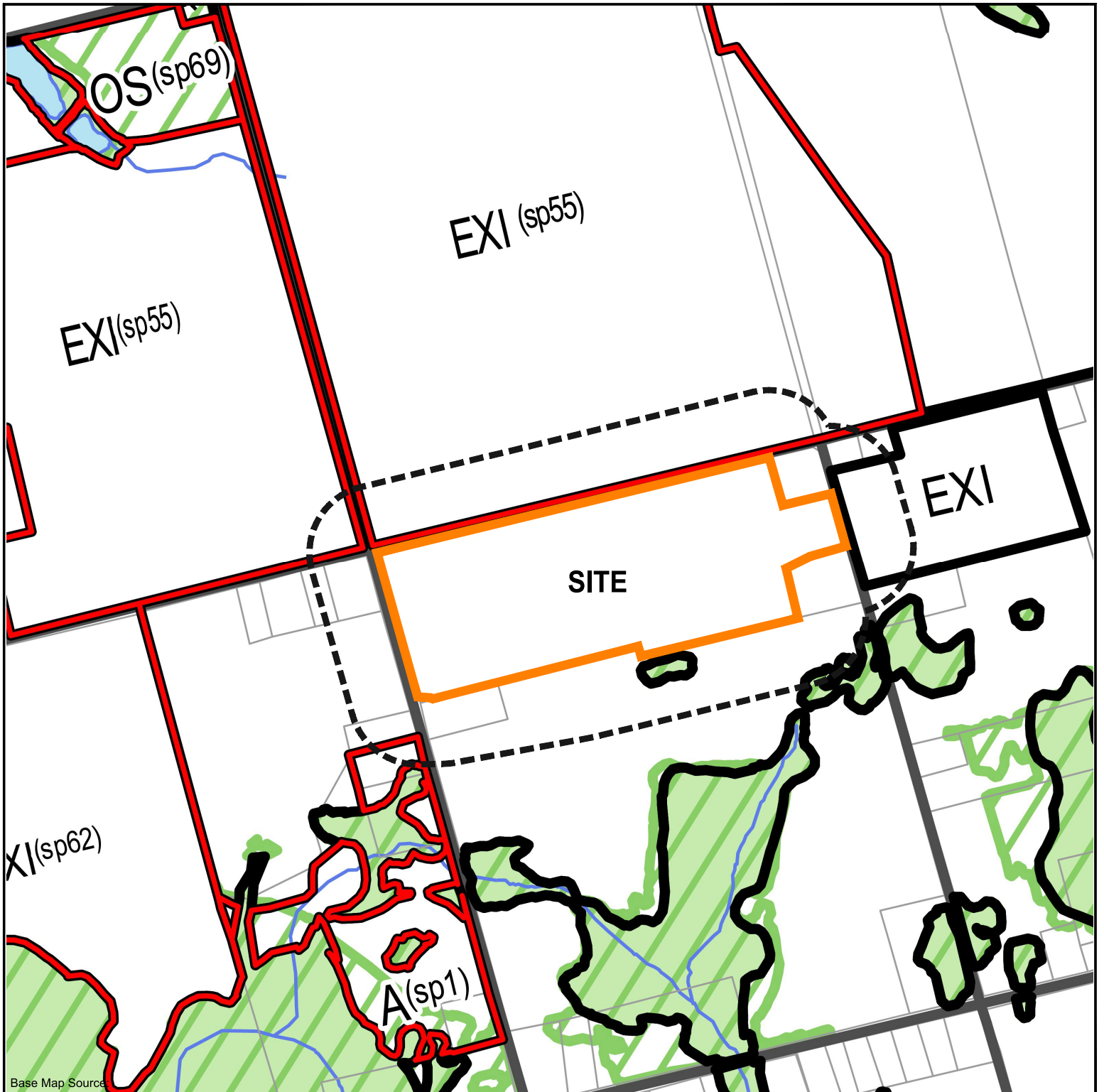
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DATE:
21-Nov-25

FILE:
Puslinch West Estate
Development



Base Map Source

LEGEND

-  SITE LOCATION
-  120 m Study Area
-  Site Specific Exemption
-  Zoning Limits
-  Environmental Protection Overlay
-  Natural Environment

Zone Descriptions

- A Agricultural
- AC Agricultural Commercial
- C Commercial
- CMU Core Mixed Use
- DI Disposal Industrial
- EXI Extractive Industrial
- FD Future Development
- HC Highway Commercial
- HR Hamlet Residential
- I Institutional
- IND Industrial
- NE Natural Environment
- OS Open Space
- RC Resort Commercial
- RR Resort Residential
- RUR Rural Residential
- UR Urban Residential
- F- Aberfoyle Flood Plain Overlay
- (sp#) Site Specific Exemption
- (h#) Holding Provision
- (t#) Temporary Zone

Puslinch Schedule 'A' Zoning By-law No. 023

Figure 3

*PT LOT 11 and 12 CON 4
TOWNSHIP OF PUSLINCH
COUNTY OF WELLINGTON*

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ENVIRONMENTAL.

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DATE:
15-Dec-25

FILE:
Puslinch West Estate
Development

**PUSLINC WEST DEVELOPMENT
CONCEPT PLAN**

Figure 4
Cox Construction Limited

PT LOT 11 and 12 CON 4
TOWNSHIP OF PUSLINC
COUNTY OF WELLINGTON

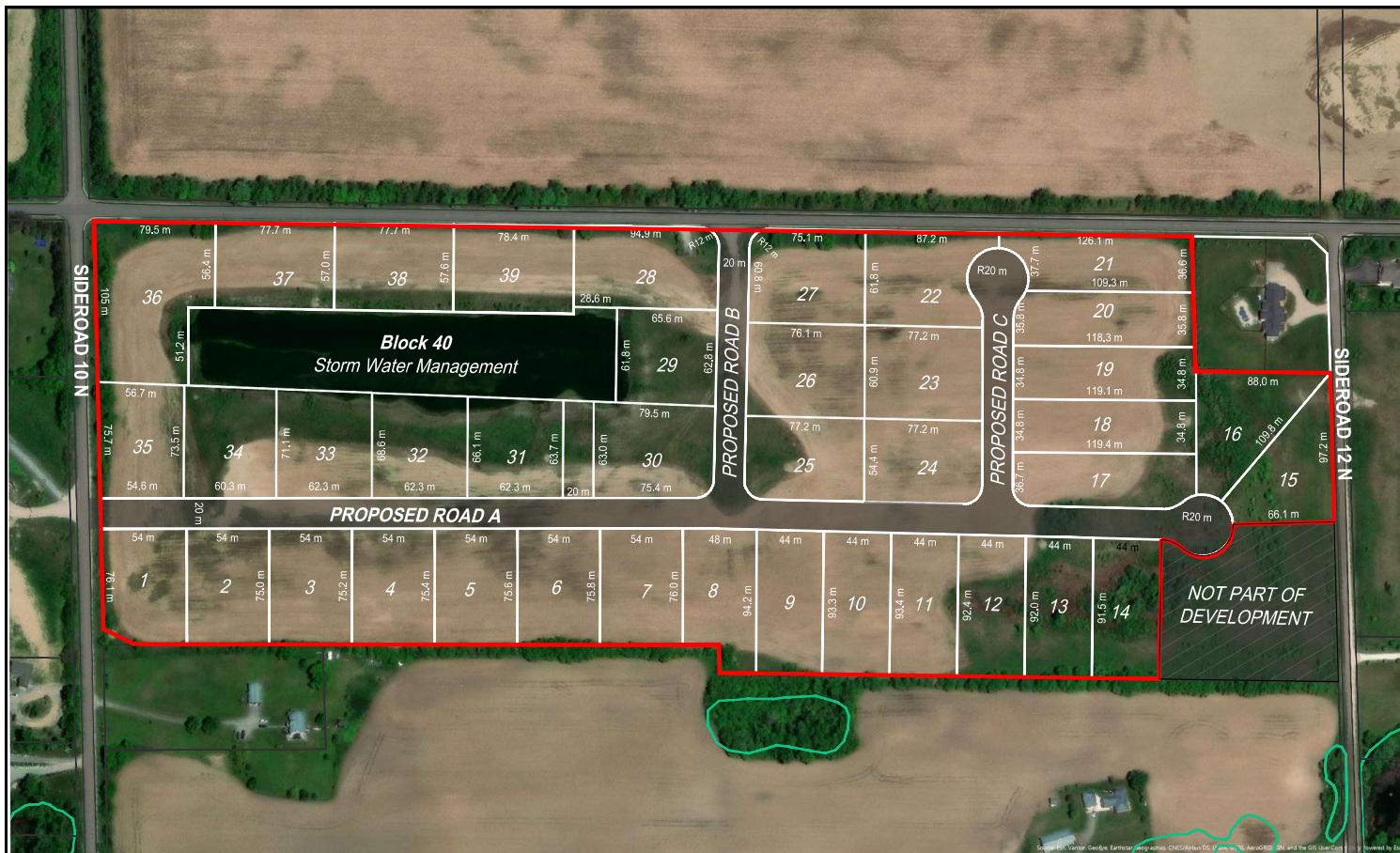
KEYMAP (NOT TO SCALE)



- NOTES
1. THIS IS NOT A PLAN OF SURVEY.
 2. ALL MEASUREMENTS SHOWN ARE IN METRES.
 3. THE SITE IS CURRENTLY ZONED A (AGRICULTURE).
 4. THE SITE IS DESIGNATED SECONDARY AGRICULTURAL.

LEGEND

- LANDS SUBJECT TO OPA
- WETLAND



Description	Lots / Blocks	Area
Low Density Residential	1 - 39	16.9
Storm Water Management	40	1.7
Road Network		2.3
TOTAL		20.9

LOT No.	SIZE (ha)	FRONTAGE (m)
1-7	0.41	54.0
8	0.41	48.0
9-14	0.41	44.0
15	0.41	24.5
16	0.44	23.0
17	0.41	36.7
18 & 19	0.42	34.8
20	0.42	35.8
21	0.42	37.7
22	0.46	61.8
23	0.47	60.9
24	0.42	54.4
25	0.42	54.4
26	0.47	60.9
27	0.46	60.8
28	0.50	53.6
29	0.42	62.8

LOT No.	SIZE (ha)	FRONTAGE (m)
30	0.48	63.0
31	0.41	62.3
32	0.42	62.3
33	0.44	62.3
34	0.44	60.3
35	0.41	54.6
36	0.74	79.5
37	0.44	77.7
38	0.44	77.7
39	0.45	78.4



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12/15/2025

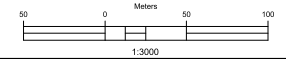


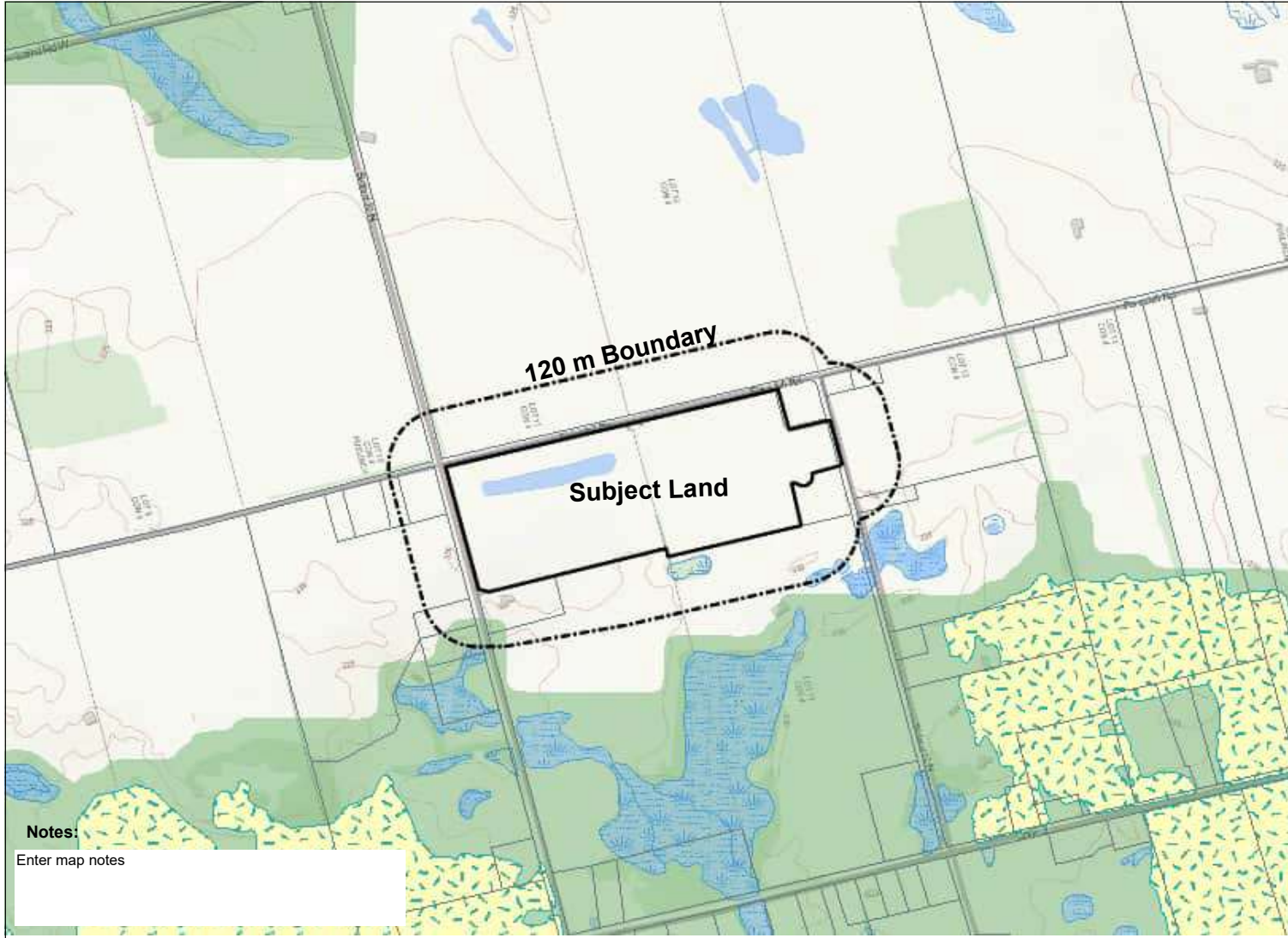


Figure 5 - Natural Heritage Features

Map created:12/15/2025

Legend

- Assessment Parcel
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'importance provinciale
- Life Science Regionally Significant/sciences de la vie d'importance régionale
- Evaluated Wetland
- Provincially Significant/considérée d'importance provinciale
- Non-Provincially Significant/non considérée d'importance provinciale
- Unevaluated Wetland
- Conservation Reserve
- Provincial Park
- Natural Heritage System



Notes:
Enter map notes

0.6 0 0.32 0.6 Kilometres Absence of a feature in the map does not mean they do not exist in this area.

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources(OMNR) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.
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GTA 2005 / SWOOP 2006 / Simcoe-Muskoka-Dufferin © FirstBase Solutions, 2005 / 2006 / 2008
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Vegetation Community Descriptions

- OAGM1 - Annual Row Crop
- OAW - Pond (Open Water)
- TAGM5 - Medium Mineral Fencerow Type
- THDM2 - 6 - Buckthorn Deciduous Shrub Thicket Type



ELC MAP

Figure 6

5338 WELLINGTON RD 125
 PT LOT 11 and 12 CON 4
 TOWNSHIP OF PUSLINCH
 COUNTY OF WELLINGTON

KEYMAP (NOT TO SCALE)



NOTES

1. THIS IS NOT A PLAN OF SURVEY.
2. THE SITE IS CURRENTLY ZONED M4 (EXTRACTIVE INDUSTRIAL).
5. THE SITE IS DESIGNATED SECONDARY AGRICULTURAL.

Legend

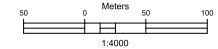
- Site Location
- 120m Site Boundary
- Limit of Vegetation Unit
- Wetland (GRCA)

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 ENVIRONMENTAL

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 Fergus ON
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 E: stovel.associates@outlook.com



3/31/2026



Source: Esri, Vantor, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Powered by Esri

Appendix A: Wildlife Species List – Birds and Survey Route

Species	Count	B.E.	Species	Count	B.E.
Prairie Warbler †					
Black-throated Green Warbler					
Canada Warbler §					
Scarlet Tanager					
Northern Cardinal	✓	§			
Rose-breasted Grosbeak					
Indigo Bunting					
American Goldfinch	✓	§			

Atlas Checklist - Region 10

Atlasser's name: CHRIS HART

Location: NIGRO PIT - Pt. Lot 11, 12
CON. 4, TSP. PUSLINCH

Atlas square: 1.7 TNJ 59

Day: 09 Month: 07 Year: 2025 Start time (24h): 07:15 End time (24h): 08:30 Duration (min): 075

Procedure: Single location Travelling count Area search Entire square

Incidental observations: Check if start time or duration are unknown.

Complete checklist: No Yes

Atlas point counts: No Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.	Species	Count	B.E.
Canada Goose			Pied-billed Grebe		
Mute Swan			Red-necked Grebe †		
Trumpeter Swan			Rock Pigeon (Feral Pigeon)		
Wood Duck			Mourning Dove		
Blue-winged Teal ‡			Yellow-billed Cuckoo		
Northern Shoveler ‡			Black-billed Cuckoo		
Gadwall ‡			Common Nighthawk ‡		
American Wigeon ‡			Eastern Whip-poor-will ‡		
Mallard			Chimney Swift §		
American Black Duck			Ruby-throated Hummingbird		
Northern Pintail ‡			King Rail †		
Green-winged Teal			Virginia Rail		
Redhead †			Sora		
Lesser Scaup ‡			Common Gallinule ‡		
Hooded Merganser			American Coot ‡		
Common Merganser ‡			Sandhill Crane ‡		
Ruddy Duck ‡			Killdeer §		
Ring-necked Pheasant ‡			Upland Sandpiper †		
Ruffed Grouse			American Woodcock		
Wild Turkey			Wilson's Snipe ‡		

† Provincially Rare: extra documentation required for ALL breeding records
 ‡ Regionally Rare: extra documentation required for ALL breeding records
 § Species of Interest: extra documentation required for CONFIRMED breeding records only

BREEDING EVIDENCE (B.E.) CODES

OBSERVED
 X Observed but not in suitable nesting habitat

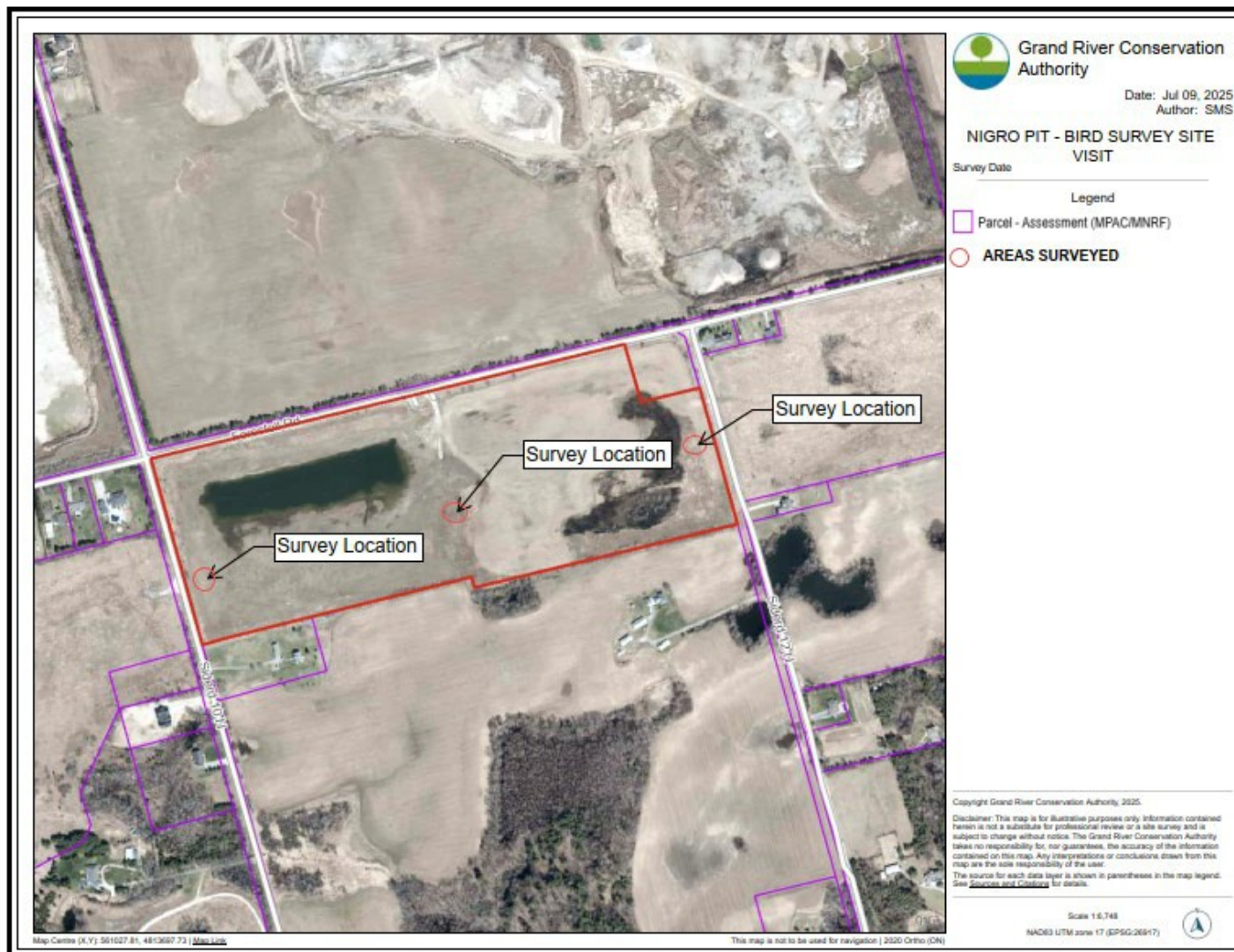
POSSIBLE BREEDING
 H In suitable nesting habitat in breeding season
 S Singing/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
 M Multiple (≥7) individuals singing/calling/drumming heard on the same date and in the same square
 P Pair observed together in suitable nesting habitat
 T Presumed territory = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
 D Display involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
 V Visiting a probable nest site in suitable habitat

CONFIRMED BREEDING
 A Agitated behaviour or alarm call of an adult
 B Brood patch or cloacal protuberance on an adult
 N Nest-building by wrens or woodpeckers
 NB Nest building, including carrying nesting material (except wrens and woodpeckers)
 DD Distraction display, attempt to draw attention away from nest/young by feigning injury or other distraction
 NU Empty nest used during atlas survey period, or identifiable egg shells
 FY Recently fledged or downy young incapable of sustained flight
 AE Adult occupying, leaving or entering a probable nest site or behaviour suggesting an occupied nest
 FS Adult carrying a fecal sac
 CF Adult carrying food for young
 NE Nest containing one or more eggs
 NY Nest with one or more young (seen or heard)

NICFO #17 (09-07-25)

Species	Count	B.E.	Species	Count	B.E.	Species	Count	B.E.	Species	Count	B.E.
Wilson's Phalarope †			Downy Woodpecker			Red-breasted Nuthatch			Vesper Sparrow		
Spotted Sandpiper			Hairy Woodpecker			White-breasted Nuthatch			Savannah Sparrow		
Ring-billed Gull ‡			Pileated Woodpecker			Brown Creeper			Song Sparrow		
Herring Gull ‡			Northern Flicker	✓	S	Blue-gray Gnatcatcher			Lincoln's Sparrow ‡		
Caspian Tern ‡			American Kestrel §			House Wren			Swamp Sparrow		
Black Tern †			Merlin			Winter Wren			Eastern Towhee §		
Common Loon ‡			Peregrine Falcon ‡			Sedge Wren ‡			Bobolink §		
Double-crested Cormorant ‡			Eastern Wood-Pewee §			Marsh Wren			Eastern Meadowlark §		
American Bittern ‡			Acadian Flycatcher †			Carolina Wren	✓	S	Orchard Oriole		
Least Bittern †			Alder Flycatcher			European Starling			Baltimore Oriole		
Great Blue Heron §			Willow Flycatcher			Gray Catbird			Red-winged Blackbird	✓	S
Green Heron §			Least Flycatcher			Brown Thrasher			Brown-headed Cowbird		
Black-crowned Night-Heron †			Eastern Phoebe			Northern Mockingbird			Common Grackle		
Turkey Vulture			Great Crested Flycatcher			Eastern Bluebird			Ovenbird		
Osprey			Eastern Kingbird			Veery			Louisiana Waterthrush †		
Northern Harrier			Yellow-throated Vireo			Hermil Thrush ‡			Northern Waterthrush		
Sharp-shinned Hawk ‡			Blue-headed Vireo			Wood Thrush §			Golden-winged Warbler †		
Cooper's Hawk			Warbling Vireo			American Robin	✓	S	Blue-winged Warbler		
Northern Goshawk ‡			Red-eyed Vireo			Cedar Waxwing			Black-and-white Warbler		
Bald Eagle ‡			Blue Jay			House Sparrow			Nashville Warbler		
Red-shouldered Hawk ‡			American Crow	✓	S	Evening Grosbeak ‡			Mourning Warbler		
Broad-winged Hawk			Fish Crow †			House Finch			Common Yellowthroat		
Red-tailed Hawk			Common Raven			Purple Finch ‡			Hooded Warbler ‡		
Eastern Screech-Owl			Black-capped Chickadee	✓	S	Red Crossbill ‡			American Redstart		
Great Horned Owl			Tufted Titmouse ‡			White-winged Crossbill ‡			Cerulean Warbler †		
Barred Owl ‡			Horned Lark §			Pine Siskin ‡			Northern Parula ‡		
Long-eared Owl ‡			Northern Rough-winged Swallow			American Goldfinch			Magnolia Warbler		
Short-eared Owl †			Purple Martin ‡			Grasshopper Sparrow §			Blackburnian Warbler		
Northern Saw-whet Owl ‡			Tree Swallow			Chipping Sparrow			Yellow Warbler		
Belted Kingfisher			Bank Swallow §			Clay-colored Sparrow ‡			Chestnut-sided Warbler	✓	S
Yellow-bellied Sapsucker ‡			Barn Swallow §	✓	S	Field Sparrow §	✓	S	Black-throated Blue Warbler		
Red-headed Woodpecker †			Cliff Swallow §			Dark-eyed Junco ‡			Pine Warbler		
Red-bellied Woodpecker			Golden-crowned Kinglet			White-throated Sparrow			Yellow-rumped Warbler		



Appendix B: Significant Wildlife Habitat Screening

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area	
		ELC Codes	Ecosite	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)						
<u>Rationale:</u> Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1	- Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	<p>Fields with sheet water during Spring (mid March to May).</p> <ul style="list-style-type: none"> Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. Reports and other information available from Conservation Authorities (CAs) Sites documented through waterfowl planning processes (eg. EHJV implementation plan) Field Naturalist Clubs Ducks Unlimited Canada Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area 	<p>Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</p> <ul style="list-style-type: none"> Any mixed species aggregations of 100 or more individuals required. The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat. Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). 	<p>Site is former gravel pit that has been rehabilitated to agriculture. A small section of the western portion of the former pit was flooded in 2026. No evidence of waterfowl observed. A small pond exists in northwest corner of the site. No evidence of waterfowl observed.</p> <p>Not SWH</p>

Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)

<p><u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.</p>	<p>Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback</p>	<p>MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7</p>	<ul style="list-style-type: none"> • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Environment Canada • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes. • Ducks Unlimited projects • NHIC Waterfowl Concentration Area 	<p>Studies carried out and verified presence of:</p> <ul style="list-style-type: none"> • Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. • The combined area of the ELC ecosites and a 100m radius area is the SWH. • Wetland area and shorelines associated with sites may be significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power." • Annual Use of Habitat as documented from Information Sources or Field Studies. 	<p>Site is former gravel pit that has been rehabilitated to agriculture. A small portion of the western portion of the former pit was flooded in 2026. No evidence of waterfowl observed. A small pond exists in northwest corner of the site. No evidence of waterfowl observed.</p> <p>Not SWH</p>
--	--	---	---	---	---

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area	
		ELC Codes	Ecosite Habitat Criteria and Information Sources			Criteria for Consideration
Wildlife Habitat: Shorebird Migratory Stopover Area						
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBS1 BBT1 SDO1 SDT1 MAM2 MAM4 MAM5	BBO2 BBS2 BBT2 SDS2 MAM1 MAM3	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines are important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> Western hemisphere shorebird reserve network. CWS Ontario Shorebird Survey. Bird Studies Canada Ontario Nature NHIC Shorebird Migratory Concentration Area	Studies confirming: Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".	Site is former gravel pit that has been rehabilitated to agriculture. A small section of the western portion of the former pit was flooded in 2026. A small pond exists in northwest corner of the site. No evidence of waterfowl observed. Not SWH
Wildlife Habitat: Raptor Wintering Area						

<p>Rational: Sites used by multiple species, a high number of individuals and used annually are most significant</p>	<p>Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl</p> <p>Special Concern: Short-eared Owl Bald Eagle</p>	<p>Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW</p>	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha with a combination of forest and upland. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting</p> <p><u>Information Sources</u> OMNRF Ecologist or Biologist Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area Data from Bird Studies Canada</p>	<p>Studies confirm the use of these habitats by: One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species. A site should be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds The habitat area for an eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</p>	<p>No woodland or meadow areas of suitable size are not present on the subject property. Not SWH.</p>
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Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH	Confirmed SWH	Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Bat Hibernacula					
<u>Rationale</u> Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> OMNRF for possible locations and contact for local experts NHIC Bat Hibernaculum Ministry of Northern Development and Mines for location of mine shafts. University Biology Departments with bat experts.	All sites with confirmed hibernating bats are SWH. The habitat area includes a 200m radius around the entrance of the hibernaculum for most. Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects".	Suitable habitat not present within the subject property. Not SWH.
Wildlife Habitat: Bat Maternity Colonies					
<u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. Female Bats generally prefer wildlife (snags) in early stages of decay. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. <u>Information Sources</u> OMNRF for possible locations.	Maternity Colonies with confirmed use by: ->10 Big Brown Bats ->5 Adult Female Silver-haired Bats The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Eco-element containing the maternity colonies. Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects"	Suitable habitat not present within the subject property. Not SWH.

			University Biology Departments with bat experts.		
--	--	--	---	--	--

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH	Confirmed SWH	Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specified ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. <u>Information Sources</u> OMNR for possible locations. University of Waterloo, Biology Department	Long Point has been identified as a significant stopover habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration. The confirmation criteria and habitat areas for this SWH are still being determined.	Suitable habitat not present within the subject property. Not SWH.
Wildlife Habitat: Turtle Wintering Area					
<u>Rationale:</u> Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> EIS studies carried out by Conservation Authorities. OMNRF ecologist or biologist NHIC	Presence of 5 over-wintering Midland Painted Turtles is significant. One or more Northern Map Turtle or Snapping Turtle over-wintering within wetland is significant. The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May). Congregation of turtles is more common where	Potential turtle overwintering habitat could exist onsite. No turtles were observed in 2025. No turtles observed during Sept. – Oct. surveys. Not SWH

				wintering areas are limited and therefore significant.	
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Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area
		ELC Codes	Ecosite Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Snake Hibernaculum					
<p><u>Rationale:</u> Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant</p>	<p><u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern:</u> Milksnake Eastern Ribbonsnake <u>Lizard:</u> <u>Special Concern:</u> (Southern Shield population): Five-lined Skink</p>	<p>For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator.</p> <p>For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3</p>	<p>For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.</p> <p>Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line.</p> <p>Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.</p> <p>Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures ccciii.</p> <p>Information Sources In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). Reports and other information from CAs. NHIC OMNRF ecologist or biologist may be aware of locations of wintering skinks</p>	<p>Studies confirming: Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). <u>Note:</u> If there are Special Concern Species present, then site is SWH <u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH. Presence of any active hibernaculum for skink is significant.</p>	<p>No potential snake hibernaculum habitat found within proposed development area of the site.</p> <p>Not SWH.</p>
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					

<p><u>Rationale:</u> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.</p>	<p>Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)</p>	<p>Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1</p>	<p>Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> Reports and other information available from CAs Ontario Breeding Bird Atlas Bird Studies Canada</p>	<p>Studies confirming: Presence of 1 or more nesting sites with 8 or more cliff-swallow pairs and/or rough-winged swallow pairs during the breeding season. A colony identified as SWH will include a 50m radius habitat area from the peripheral nest. Field surveys to observe and count swallow nests are to be completed during the breeding season Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"</p>	<p>No banks and slopes occur on the subject property. Not SWH.</p>
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Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH		Habitat Criteria and Information	Confirmed SWH	Study Area
		ELC Codes	Ecosite Codes	Criteria for Consideration	Criteria for Consideration	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)						
Rationale: Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM5 SWD1 SWD3 SWD5 SWD7	SWM3 SWM6 SWD2 SWD4 SWD6 FET1	Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. Most nests in trees are 11 to 15m from ground, near the top of the tree. <u>Information Sources</u> Ontario Breeding Bird Atlas, colonial nest records. Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). NHIC Mixed Wader Nesting Colony Aerial photographs can help identify large heronries Reports and other information available from CAs MNRF District Offices	Studies confirming: Presence of 5 or more active nests of Great Blue Heron or other listed species. The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15 ha with a colony is the SWH. Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells	Suitable habitat is not present within the subject property or adjacent lands. Not SWH
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)						
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)	MAM1 – 6	Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> Ontario Breeding Bird Atlas, rare/colonial species records. Canadian Wildlife Service Reports and other information available from CAs NHIC Colonial Waterbird Nesting Area MNRF District Offices	Studies confirming: Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. Presence of 5 or more pairs for Brewer's Blackbird. Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island	Suitable habitat is not present on the subject property or adjacent lands. The onsite pond does not provide islands or peninsulas. Not SWH

		MAS1 – 3 CUM CUT CUS		<3.0ha with a colony is the SWH. Studies would be done during May/June when actively nesting. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	
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Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH	Confirmed SWH	Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each land class: Field: CUM CUS CUT Forest: FOC FOM FOD CUP	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. <u>Information Sources</u> NHIC Agriculture Canada Conservation Authorities	Studies confirm: The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.	The subject property or adjacent lands are not located within 5km of Lake Ontario. Not SWH
Wildlife Habitat: Landbird Migratory Stopover Areas					

<p><u>Rationale:</u> Sites with a high diversity of species as well as high number are most significant</p>	<p>All migratory songbirds. All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)</p>	<p>All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p>	<p>Woodlots need to be >10 ha in size and within 5km of Lake Ontario. If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant. Sites have a variety of habitats, forest, grassland and wetland complexes. The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds. These features located along the shore and located within 5km of Lake Ontario are Candidate SWH. <u>Information Sources</u> Bird Studies Canada Ontario Nature</p>	<p>Studies confirm: Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</p>	<p>The subject property and adjacent lands are not located within 5km of Lake Ontario. Not SWH</p>
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Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area
		ELC Codes	Ecosite Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Deer Yarding Areas					
<p><u>Rationale:</u> Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer.</p>	White-tailed Deer	<p>Note: OMNRF to determine this habitat.</p> <p>ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC.</p> <p>Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT</p>	<p>Deer yarding areas or winter concentration areas are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual". Woodlots with high densities of deer due to artificial feeding are not considered to be significant.</p>	<p>Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH.</p> <p>Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNR offices or via Land Information Ontario (LIO).</p> <p>Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNR is responsible for completing these field investigations.</p>	<p>Deer overwintering habitat has not been mapped within or adjacent to the subject property by the MNR.</p> <p>Not SWH</p>
Wildlife Habitat: Deer Winter Congregation Areas					

<p><u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer may congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.</p>	<p>White-tailed Deer</p>	<p>All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.</p>	<p>Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. Woodlots with high densities of deer due to artificial feeding are not significant.</p> <p><u>Information Sources</u> MNRF District Offices</p>	<p>Studies confirm: Deer management is an MNRF responsibility. Deer winter congregation areas considered significant will be mapped by MNRF. Use of the woodlot by white-tailed deer will be determined by MNRF. All woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR. Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys, or a pellet count deer density survey.</p>	<p>Deer overwintering habitat has not been mapped within or adjacent to the subject property by the MNR.</p> <p>Not SWH</p>
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Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Study Area	
	ELC Codes	Ecosite Series	Habitat Description	Detailed Information and Sources	Criteria for Consideration	Assessment Details
Cliff and Talus Slopes						
Rationale: Cliffs and Talus Slopes are rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> The Niagara Escarpment Commission has detailed information on location of these habitats. OMNRF District NHIC has location information on their website Conservation Authorities	Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	Vegetation community is not present within the subject property and adjacent lands. Not SWH	
Sand Barrens						
Rationale: Sand barrens are rare in Ontario and may support rare species.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area >0.5ha in size. <u>Information Sources</u> OMNRF Districts. NHIC has location information on their website Conservation Authorities	Confirm any ELC Vegetation Type for Sand Barrens. Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics).	Vegetation community is not present within the subject property and adjacent lands. Not SWH	
Alvar						

<p>Rationale: Alvars are rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and localized north of the Palaeozoic-Precambrian contact.</p>	<p>ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E</p>	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Vegetation cover varies from patchy to barren with a less than 60% cover.</p>	<p>An Alvar site > 0.5 ha in size. <u>Information Sources</u> Alvars of Ontario (2000), Federation of Ontario Naturalists. Ontario Nature - Conserving Great Lakes Alvars. NHIC Conservation Authorities</p>	<p>Field studies identify four of the five Alvar indicator species at Candidate Alvar site is Significant. Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses.</p>	<p>Vegetation community is not present within the subject property or the adjacent lands. Not SWH</p>
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Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E (continued)

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Study Area	
	ELC Codes	Ecosite Series	Habitat Description	Detailed Information and Sources	Criteria for Assessment	
Old Growth Forest						
<p><u>Rationale:</u> Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by wildlife species.</p>	<p>Forest Community Series: FOD FOC SWD SWM</p>	<p>FOM SWC</p>	<p>Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.</p>	<p>Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest.</p> <p>Information Sources OMNRF Forest Resource Inventory mapping OMNRF Forester, Ecologist or Biologist Conservation Authorities Sustainable Forestry License (SFL) companies will possibly know locations through field operations. Municipal forestry departments</p>	<p>Field Studies will determine: If dominant tree species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat. The stand will have experienced no recognizable forestry activities. The area of Forest Ecosites combined to make up the stand is the SWH. Determine ELC Vegetation Type for forest stand</p>	<p>Vegetation community is not present within the subject property and the adjacent lands.</p> <p>Not SWH</p>
Savannah						
<p><u>Rationale:</u> Savannahs are rare habitats in Ontario.</p>	<p>TPS1 TPW1 CUS2</p>	<p>TPS2 TPW2</p>	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p>	<p>No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p>Information Sources NHIC OMNRF Ecologists Conservation Authorities</p>	<p>Field studies confirm one or more of the Savannah indicator species. Area of the ELC Ecosite is the SWH. Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.).</p>	<p>Vegetation community is not present within the subject property and the adjacent lands.</p> <p>Not SWH</p>
Tallgrass Prairie						

<p>Rationale: Tallgrass Prairies are rare habitats in Ontario.</p>	<p>TPO1 TPO2</p>	<p>A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.</p>	<p>No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u> OMNR Districts NHIC Conservation Authorities</p>	<p>Field studies confirm one or more of the Prairie indicators Species.</p> <p>Area of the ELC Ecosite is the SWH Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics).</p>	<p>Vegetation community is not present within the subject property and the adjacent lands.</p> <p>Not SWH</p>
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Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E (continued)

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Criteria for Consideration	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	The OMNR/NHIC will have current listing for vegetation communities. <u>Information Sources</u> NHIC OMNRF Conservation Authorities	Field studies should confirm ELC Vegetation Type. Area of the ELC Vegetation Type polygon is the SWH.	No other rare vegetation communities are present within the subject property or adjacent lands. Not SWH

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E

	Wildlife Species	Candidate SWH			Confirmed SWH	Study Area
		ELC Codes	Ecosite	Habitat Information Sources	Criteria and Criteria for Consideration	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area						
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All habitats adjacent to these wetland Ecosites Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes lands adjacent to Provincially Significant Wetlands	upland habitats located adjacent to these wetland Ecosites are small wetlands (0.5ha) within 120m of each individual wetland where waterfowl nesting is known to occur. Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.	A waterfowl nesting area extends 120m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur. Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> Ducks Unlimited staff may know the locations of particularly productive nesting sites. OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. Reports and other information available from CAs	Studies confirmed: Presence of 3 or more nesting pairs for listed species excluding Mallards, or Presence of 10 or more nesting pairs for listed species including Mallards. Any active nesting site of an American Black Duck is considered significant. Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m from the wetland and will provide enough habitat for waterfowl to successfully nest.	Suitable habitat is not present within the subject property or adjacent lands. Not SWH
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat						

<p>Rationale: Nest sites are uncommon in Eco-region 6E are used annually by these species.</p>	<p>Osprey Special Concern: Bald Eagle</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands</p>	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super-canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).</p> <p><u>Information Sources</u> NHIC MNRF will list known nesting locations. Nature Counts, Ontario Nest Records Scheme data. OMNRF Districts Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented Reports and other information available from CAs.</p>	<p>Studies confirm the use of these nests by: One or more active Osprey or Bald Eagle nests in an area. Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is Important. For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not Significant. Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August.</p>	<p>Suitable habitat not present onsite or on adjacent lands. There are no watercourses within 120m of the site. Not SWH</p>
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Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH			Confirmed SWH Criteria for Consideration	Study Area Assessment Details
		ELC Codes	Ecosite	Habitat Criteria and Information Sources		
Wildlife Habitat: Woodland Raptor Nesting Habitat						
Rationale: Nests sites for these species are rarely identified. These area- sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat Interior habitat determined with a 200m buffer. Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> OMNRF Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario. Bird Studies Canada Reports and other information available from CAs	Studies confirm: Presence of 1 or more active nests from species list is considered significant. Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH. Barred Owl – a 200m radius around the nest is the SWH. Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH. Sharp-shinned Hawk – a 50m radius around the nest is the SWH. Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.	Suitable habitat is not present within the subject property or adjacent lands. Not SWH	
Wildlife Habitat: Turtle Nesting Area						

<p>Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.</p>	<p>Midland Painted Turtle Special Concern Northern Map Turtle Snapping Turtle</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1</p>	<p>Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. NHIC</p>	<p>Studies confirm: Presence of 5 or more nesting Midland Painted Turtles One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. The area or collection of sites within an area of exposed mineral soils where the turtle's nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. Travel routes from wetland to nesting area are to be considered within the SWH. Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.</p>	<p>Suitable habitat is not present within the subject property and adjacent lands. Not SWH</p>
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Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH			Confirmed SWH Criteria for Consideration	Study Area Assessment Details
		ELC Codes	Ecosite	Habitat Criteria and Information Sources		
Wildlife Habitat: Seeps and Springs						
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Seeps are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. <u>Information Sources</u> Topographical Map Hydrological surveys conducted by CAs and MOE Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: Presence of a site with 2 or more seeps/springs should be considered SWH. The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat.	Adjacent lands provide potential seepage areas. Wild Turkeys sighted. Candidate SWH on Adjacent Lands.	
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)						
Rationale: These habitats are important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	Presence of a wetland, pond or woodland pool (including vernal pools) >500m ² (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. <u>Information Sources</u> Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records OMNRF District OMNRF wetland evaluations	Studies confirm: Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. A combination of observational study and call count surveys will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. The habitat is the woodland area plus a 230m radius of woodland area.	No suitable amphibian breeding habitat exists onsite. Potential offsite habitat exists beyond 120m from the proposed development. Not SWH	

			CWS Amphibian Road Call Survey	If a Wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.	
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Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species	Candidate SWH	Habitat Criteria and Information Sources	Confirmed SWH Criteria for Consideration	Study Area Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically, these wetland ecotones will be isolated (>120m) from woodland ecotones, however larger wetlands containing predominantly aquatic species (e.g. Bullfrog) may be adjacent to woodlands.	Wetlands >500m ² (about 25m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRFP mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> Ontario Herpetofaunal Summary Atlas (or other similar atlases) CWS Amphibian Road Surveys. OMNRF Districts and wetland evaluations Reports and other information available from CAs.	Studies confirm: Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. The ELC ecotone wetland area and the shoreline are the SWH. A combination of observational study and call count survey will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered.	Suitable habitat does not exist onsite. Onsite pond is well separated from wetland and woodland systems. Not SWH
Woodland Area-Sensitive Bird Breeding Habitat					

<p>Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for a sensitive interior forest song birds.</p>	<p>Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler</p>	<p>All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p>	<p>Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. Interior forest habitats are at least 200m from forest edge habitat. Information Sources CWS Reports and other information available from CAs.</p>	<p>Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. Conduct field investigations in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</p>	<p>Suitable habitat is not present within the subject property and adjacent lands. Not SWH</p>
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Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area	
		ELC Codes	Ecosite	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat						
<u>Rationale:</u> Wetlands for these bird species are typically productive and rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan <u>Special Concern:</u> Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1		Nesting occurs in wetlands All wetland habitat is to be considered if there is shallow water with emergent aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> OMNRF (wetland evaluations). NHIC Reports and other information available from CAs. Ontario Breeding Bird Atlas.	Studies confirm: Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species. Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. Area of the ELC ecosite is the SWH Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".	Suitable habitat is not present within the subject property and adjacent lands. Not SWH
Wildlife Habitat: Open Country Bird Breeding Habitat						
<u>Rationale:</u> This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow <u>Special Concern:</u> Short-eared Owl	CUM1 CUM2		Large grassland areas (includes natural and cultural fields and meadows) >30 ha. Grasslands not cultivated agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years). Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.	Field Studies confirm: Presence of nesting or breeding of 2 or more of the listed species. A field with 1 or more breeding Short-eared Owl is to be considered SWH. The area of SWH is the contiguous ELC ecosite field areas. Conduct field investigations of the most likely areas in spring and early summer when birds	Suitable habitat is not present within the subject property and adjacent lands. Not SWH

		<p>The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</p> <p><u>Information Sources</u> Agricultural land classification maps, OMAFRA. Ontario Breeding Bird Atlas. Reports and other information available from CAs.</p>	<p>are singing and defending their territories.</p> <p>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</p>	
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Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area	
		ELC Codes	Ecosite Codes	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat						
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined over the past 40 years based on CWS (2004) trend records.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2		Large field areas succeeding to shrub and thicket habitats >10ha in size. Shrub land or early successional fields, not cultivated agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or live-stock pasturing in the last 5 years). Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> Agricultural land classification maps, OMAFRA Ontario Breeding Bird Atlas Reports and other information available from CAS	Field Studies confirm: Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. The area of the SWH is the contiguous ELC ecosite field/thicket area. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	Suitable habitat is not present within the subject property and adjacent lands. Not SWH
Wildlife Habitat: Terrestrial Crayfish						
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish: (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish: (<i>Cambarus Diogenes</i>)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM		Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u>	Studies Confirm: Presence of 1 or more individuals of species listed on their burrows in suitable marsh meadow or terrestrial site. Area of ELC Ecosite. Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult.	Suitable habitat is not present within the subject property and adjacent lands. Not SWH

			Information sources from reports such as: "Conservation Status of Freshwater Crayfishes".		
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Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E (continued)

	Wildlife Species	Candidate SWH		Confirmed SWH	Study Area
		ELC Codes	Ecosite Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
Rationale: These species are rare or have experienced population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the NHIC.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosite. <u>Information Sources</u> NHIC (Special Concern and Provincially Rare, S1-S3, SH) species lists with element occurrences data. NHIC. Ontario Breeding Bird Atlas.	Studies Confirm: Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat.	No species of special concern or provincially rare species (S1-S3) found onsite. Not SWH.

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E

	Wildlife Species	Candidate SWH	Confirmed SWH	Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Criteria for Consideration	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species.	Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH . <u>Information Sources</u> · MNRF District Office · NHIC · Reports and other information available from CAs	Field Studies to be conducted at the time of year when species are expected to be migrating or entering breeding sites. Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m. Shorter corridors are more significant than longer corridors, however, amphibians must be able to get to and from their summer and breeding habitat.	No habitat onsite. Site is isolated from potential corridor habitat, connecting upland terrestrial habitat. Not SWH.
Wildlife Habitat: Deer Movement Corridors					

<p>Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.</p>	<p>White-tailed Deer</p>	<p>Corridors may be found in all forested ecosites.</p>	<p>Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH. A deer wintering habitat identified by the OMNRF will have corridors that the deer use during fall migration and spring dispersion. Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).</p> <p><u>Information Sources</u> MNR District Office NHIC Reports and other information available from CAs</p>	<p>Studies to be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. Corridors should be at least 200m wide with gaps <20m.</p>	<p>Not SWH</p>
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Appendix C: Species at Risk Screening

Taxon	Common Name	Scientific Name	Endangered Species Act ¹	Species at Risk Act (Sch 1) ²	COSEWIC ³	Provincial (SRank) ⁴	Habitat Requirements ⁵	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Amphibian	Jefferson salamander	Ambystoma jeffersonianum	END	END	END	S2	In Ontario, Jefferson salamander is found only in southern Ontario, along southern portions of the Niagara Escarpment and western portions of the Oak Ridges Moraine. Jefferson salamander prefers moist, well-drained deciduous and mixed forests with a closed canopy. It overwinters underground in mammal burrows and rock fissures, and moves to vernal pools and ephemeral wetlands in the early spring to breed. Breeding ponds are typically located in or near to forested habitats, and contain submerged debris (i.e., sticks, vegetation) for egg attachment sites. Ephemeral breeding pools need to have water until at least mid-summer (mid to late July) (Jefferson Salamander Recovery Team 2010).	None	There is no potential habitat onsite.
Amphibian	Jefferson X Blue-spotted salamander, Jefferson genome dominates	Ambystoma hybrid pop. 1	—	—	—	S2	In Ontario, Jefferson x blue-spotted salamander prefers moist, well-drained deciduous and mixed forests with a closed canopy. It overwinters underground in mammal burrows and rock fissures, and moves to vernal pools and ephemeral wetlands in the early spring to breed. Breeding ponds are typically located in or near to forested habitats, and contain submerged debris (i.e., sticks, vegetation) for egg attachment sites. Ephemeral breeding pools need to have water until at least mid-summer (mid to late July) (Jefferson Salamander Recovery Team 2010).	None	There is no potential habitat onsite.
Amphibian	Western chorus frog - Great Lakes St. Lawrence / Canadian Shield population	Pseudacris triseriata	—	THR	THR	S3	In Ontario, habitat of this amphibian species typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding (Environment Canada 2015).	None	Low potential habitat onsite.
Arthropod	Black dash	Euphyes conspicua	—	—	—	S3	This small skipper primarily inhabits large graminoid meadow marshes, but can also be found in open areas along small streams. The main larval host is tussock sedge (<i>Carex stricta</i>) (Layberry et al. 1998).	None	There is no potential habitat onsite.

Arthropod	Monarch	<i>Danaus plexippus</i>	SC	SC	END	S2N, S4B	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (<i>Asclepias</i> spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	None	No Monarchs were observed onsite during the survey.
Arthropod	Rusty-patched bumble bee	<i>Bombus affinis</i>	END	END	END	S1	In Ontario, rusty-patched bumble bee is found in areas from the southern Great Lakes – St. Lawrence forest region southwards into the Carolinian forest. It is a habitat generalist, but it is typically found in open habitats, such as mixed farmland, savannah, marshes, sand dunes, urban and lightly wooded areas. It is cold-tolerant and can be found at high elevations. Most recent sightings in Ontario have been in oak savannah habitat with well-drained, sandy soils and moderately open canopy. It requires an abundance of flowering plants for forage. This species most often builds nests underground in old rodent burrows, but also in hollow tree stumps and fallen dead wood (Colla and Taylor-Pindar 2011). The only recent sightings in Ontario are from the Pinery Provincial Park.	None	This species is only known to occur within Pinery Provincial Park in southwestern Ontario.
Arthropod	West Virginia white	<i>Pieris virginiensis</i>	SC	—	—	S3	In Ontario, west Virginia white is found primarily in the central and southern regions of the province. This butterfly lives in moist, mature, deciduous and mixed woodlands, and the caterpillars feed only on the leaves of toothwort (<i>Cardamine</i> spp.), which are small, spring-blooming plants of the forest floor. These woodland habitats are typically maple-beech-birch dominated. This species is associated with woodlands growing on calcareous bedrock or thin soils over bedrock (Burke 2013).	None	There were no toothwort host plants observed on the site or in the study area. In addition, this species has only been historically recorded in the region (Jones et al. 2019).
Arthropod	Yellow-banded bumble bee	<i>Bombus terricola</i>	SC	SC	SC	S2	This species is a forage and habitat generalist. Mixed woodlands are commonly used for nesting and overwintering, but it also occupies various open habitats including native grasslands, farmlands and urban areas. It is an early emerging species, making it likely an important pollinator of early blooming wild flowering plants (e.g., wild blueberry) and agricultural crops (e.g., apple). Nest sites are mostly abandoned rodent burrows (COSEWIC 2015).	None	Field edges and roadsides on the site and in the study area may provide suitable foraging habitat. The swamps and forests offsite and in the study area may also provide habitat for nesting and overwintering.

Bird	Bald eagle	<i>Haliaeetus leucocephalus</i>	SC	—	NAR	S2N, S4B	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	None	There are no lakes or large rivers on the site to provide suitable habitat for this species. In addition, no individuals were observed during field surveys.
Bird	Bank swallow	<i>Riparia riparia</i>	THR	THR	THR	S4B	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	None	There is no potential habitat onsite.
Bird	Barn swallow	<i>Hirundo rustica</i>	SC	THR	SC	S4B	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared right-of-ways, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 1999).	None Onsite	Barn swallow were observed flying over the site during field surveys. There are no barns onsite. On offsite lands wooden barns exist and these structures may be provide suitable habitat.
Bird	Black tern	<i>Chlidonias niger</i>	SC	—	NAR	S3B	In Ontario, black tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes greater than 20 ha in area and which are not surrounded by wooded area. Black terns are sensitive to the presence of agricultural activities. The black tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black terns also require posts or snags for perching (Weseloh 2007).	None	There are no suitable marshes on the site or in the study area to provide suitable breeding habitat. In addition, no individuals were observed during field surveys.

Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	THR	S4B	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	None	No bobolink were observed onsite. There is no potential suitable nesting habitat on site.
Bird	Canada warbler	<i>Cardellina canadensis</i>	SC	THR	SC	S4B	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	None	No suitable habitat onsite. No individuals were observed during field surveys.
Bird	Eastern meadowlark	<i>Sturnella magna</i>	THR	THR	THR	S4B	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2003). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	None	No Eastern meadowlark were observed during the 2025 survey. There is no potential suitable nesting habitat onsite.
Bird	Eastern wood-pewee	<i>Contopus virens</i>	SC	SC	SC	S4B	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	None	No Eastern wood-pewee were observed during the 2025 survey. There is no potential habitat onsite.

Bird	Golden-winged warbler	Vermivora chrysoptera	SC	THR	THR	S4B	In Ontario, golden-winged warbler breeds in regenerating scrub habitat with dense ground cover and a patchwork of shrubs, usually surrounded by forest. Their preferred habitat is characteristic of a successional landscape associated with natural or anthropogenic disturbance such as rights-of-way, and field edges or openings resulting from logging or burning. The nest of the golden-winged warbler is built on the ground at the base of a shrub or leafy plant, often at the shaded edge of the forest or at the edge of a forest opening (Confer et al. 2011).	None	Site is an agricultural field. No suitable habitat onsite.
Bird	Grasshopper sparrow pratensis subspecies	Ammodramus savannarum (pratensis subspecies)	SC	SC	SC	S4B	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g., Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	None	Site is an agricultural field. No suitable habitat onsite.
Bird	Henslow's sparrow	Ammodramus henslowii	END	END	END	SHB	In Ontario, Henslow's sparrow breeds in large grasslands with low disturbance, such as lightly grazed and ungrazed pastures, fallow hayfields, grassy swales in open farmland, and wet meadows. Preferred habitat contains tall, dense grass cover, usually over 30 cm high, with a high percentage of ground cover, and a thick mat of dead plant material. Henslow's sparrow generally avoids areas with emergent woody shrubs or trees, and fence lines. Areas of standing water or ephemerally wet patches appear to be important. This species breeds more frequently in patches of habitat greater than 30 ha and preferably greater than 100 ha (COSEWIC 2011).	None	Site is an agricultural field. No suitable habitat onsite.
Bird	Red-headed woodpecker	Melanerpes erythrocephalus	END	END	END	S4B	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Smith et al. 2000).	None	Site is an agricultural field. No suitable habitat onsite.

Bird	Wood thrush	<i>Hylocichla mustelina</i>	SC	THR	THR	S4B	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	None	Site is an agricultural field. No suitable habitat onsite.
Mammal	Eastern small-footed myotis	<i>Myotis leibii</i>	END	—	—	S2S3	This species is not known to roost within trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing (Humphrey 2017).	None	Site is an agricultural field. No suitable habitat onsite.
Mammal	Gray fox	<i>Urocyon cinereoargenteus</i>	THR	THR	THR	S1	While the Ontario range of this species extends across much of southern and southeastern Ontario, the only known population in the province is on Pelee Island, with very rare sightings elsewhere in the province at points close to the border with the United States. This species inhabits deciduous forests and marshes and will den in a variety of features including rock outcroppings, hollow trees, burrows or brush piles, usually where dense brush provides cover and in close proximity to water. This species is considered a habitat generalist (COSEWIC 2015).	None	This species is currently only known to occur on Pelee Island.
Mammal	Little brown myotis	<i>Myotis lucifugus</i>	END	END	END	S3	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	None	Site is an agricultural field. No suitable habitat onsite.

Mammal	Northern myotis	Myotis septentrionalis	END	END	END	S3	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	None	There is no potential habitat onsite.
Mammal	Tri-colored bat	Perimyotis subflavus	END	END	END	S3?	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	None	There is no potential habitat onsite.
Mammal	Woodland vole	Microtus pinetorum	SC	SC	SC	S3?	In Ontario, woodland vole is associated with mature deciduous forests with soft, often sandy soils and a deep litter and humic layer, suitable for burrowing. Common associates include oaks, hickory, black walnut, American beech and tulip tree. This species is often found at woodland edges near roads, railway tracks and field edges. Woodland vole is restricted to the Carolinian forest zone (COSEWIC 2010).	None	There is no potential habitat onsite.
Reptile	Blanding's turtle - Great Lakes / St. Lawrence / Lawrence population	Emydoidea blandingii	THR	END	END	S3	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers, but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2016).	None	There is no potential habitat onsite.

Reptile	Eastern ribbonsnake - Great Lakes population	<i>Thamnophis sauritus</i>	SC	SC	SC	S4	In Ontario, eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds (COSEWIC 2012).	None	There is no potential habitat onsite.
Reptile	Midland painted turtle	<i>Chrysemys picta marginata</i>	—	SC	SC	S4	In Ontario, painted turtles use waterbodies, such as ponds, marshes, lakes and slow-moving creeks, with a soft bottom and abundant basking sites and aquatic vegetation. This species hibernates on the bottom of waterbodies (Ontario Nature 2018).	Possible	There is low potential habitat onsite. No individuals were observed during field survey.
Reptile	Milksnake	<i>Lampropeltis triangulum</i>	NAR	SC	SC	S4	In Ontario, milksnake uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	None	There is no potential habitat onsite.
Reptile	Northern map turtle	<i>Graptemys geographica</i>	SC	SC	SC	S3	In Ontario, the northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	None	There is no potential habitat onsite.
Reptile	Snapping turtle	<i>Chelydra serpentina</i>	SC	SC	SC	S4	In Ontario, snapping turtle uses a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	Yes	Site is an agricultural field. There is low potential habitat onsite. No turtles observed.

Vascular Plant	American chestnut	<i>Castanea dentata</i>	END	END	END	S1S2	In Ontario, American chestnut occurs in mixed or deciduous forests in the Carolinian zone (Farrar 1995). It is often found in communities with dense canopy cover and often associated with oak and maple. This tree grows primarily on acidic, sand or gravel soils (Boland et al. 2012).	None	No American Chestnut trees onsite.
Vascular Plant	American ginseng	<i>Panax quinquefolius</i>	END	END	END	S2	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in well-drained soils of glacial origin that have a neutral pH (ECCC 2018).	None	There is no potential habitat onsite.
Vascular Plant	American hart's-tongue fern	<i>Asplenium scolopendrium</i>	SC	SC	SC	S3	In Ontario, hart's-tongue fern grows on thin calcareous soils on or near dolomitic limestone of the Niagara Escarpment, and occasionally on open talus/scree slopes. Most populations are found on steep, moderately moist slopes that face north to northeast and are under a hardwood canopy cover (Environment Canada 2013).	None	There is no potential habitat onsite.
Vascular Plant	Black ash	<i>Fraxinus nigra</i>	END (temporary suspension of protection until Jan 2024)	—	THR	S3	Found throughout Ontario in moist ecosystems; commonly found in northern swampy woodlands (MNR 2018). This species is commonly associated on mucky or peaty soils and is considered a facultative wetland species (Reznicek et al. 2011).	None	There is no potential habitat onsite.
Vascular Plant	Butternut	<i>Juglans cinerea</i>	END	END	END	S2?	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	None	No Butternut trees observed onsite.
Vascular Plant	False hop sedge	<i>Carex lupuliformis</i>	END	END	END	S1	In Ontario, false hop sedge occurs in marshes, riverine swamps, borders of vernal pools, and wet depressions of forests. It occasionally occurs in shallow water or very wet floodplain forests. Usually grows under a moderately open canopy but can tolerate high levels of sunshine. Substrates are calcareous or neutral and include moist wet mucks, silt loams, or alluvial deposits with a sandy texture (Environment Canada 2014).	None	There is no potential habitat onsite.
Vascular Plant	Ram's-head lady's-slipper	<i>Cypripedium arietinum</i>	—	—	—	S3	Ram's-head lady's-slipper can be found in moist coniferous swamps, dry sandy woods and limestone barrens (Oldham and Brinker 2009).	None	There is no potential habitat onsite.

Appendix D: NHIC Data

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
967237	SPECIES	American Burying Beetle	Nicrophorus americanus	SH	EXP	EXP	17NJ6013	
967237	SPECIES	Midland Painted Turtle	Chrysemys picta marginata	S4		SC	17NJ6013	
967237	SPECIES	Barn Swallow	Hirundo rustica	S4B	SC	SC	17NJ6013	
967237	SPECIES	Golden-winged Warbler	Vermivora chrysoptera	S3B	SC	THR	17NJ6013	
967237	SPECIES	Eastern Meadowlark	Sturnella magna	S4B,S3N	THR	THR	17NJ6013	
967237	SPECIES	Bobolink	Dolichonyx oryzivorus	S4B	THR	SC	17NJ6013	
967237	SPECIES	Wood Thrush	Hylocichla mustelina	S4B	SC	THR	17NJ6013	
967237	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17NJ6013	
967237	SPECIES	Grasshopper Sparrow	Ammodramus savannarum	S4B	SC	SC	17NJ6013	
967237	SPECIES	Snapping Turtle	Chelydra serpentina	S4	SC	SC	17NJ6013	
967247	SPECIES	American Burying Beetle	Nicrophorus americanus	SH	EXP	EXP	17NJ6113	
967247	SPECIES	Black Ash	Fraxinus nigra	S4	END	THR	17NJ6113	
967247	SPECIES	Midland Painted Turtle	Chrysemys picta marginata	S4		SC	17NJ6113	
967247	SPECIES	Eastern Meadowlark	Sturnella magna	S4B,S3N	THR	THR	17NJ6113	
967247	SPECIES	Bobolink	Dolichonyx oryzivorus	S4B	THR	SC	17NJ6113	
967247	SPECIES	Wood Thrush	Hylocichla mustelina	S4B	SC	THR	17NJ6113	
967247	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17NJ6113	
967247	SPECIES	Grasshopper Sparrow	Ammodramus savannarum	S4B	SC	SC	17NJ6113	
967247	SPECIES	Eastern Milksnake	Lampropeltis triangulum	S4	NAR	SC	17NJ6113	
967247	SPECIES	Snapping Turtle	Chelydra serpentina	S4	SC	SC	17NJ6113	

Appendix E: Resume & Qualifications - Christopher J. Hart

CHRISTOPHER J. HART, M.Sc., M.L.A., OALA, CSLA

204-470 Wellington St
Kitchener, Ontario N2H 5L5
Tel: 519-574-5357
Email: hart.c3j@gmail.com

BIOGRAPHICAL INFORMATION: ENVIRONMENTAL BIOLOGIST/PROJECT MANAGER

Chris Hart is an Environmental Biologist and an experienced Project Manager who has worked with Conservation Authorities, Ministry of Natural Resources & Forestry and Environmental Consultants for over 20 years. Chris has experience with both qualitative and quantitative botanical field studies for scientific research (phytogeography and species typing) and habitat characterization for environmental planning projects and restoration projects. Chris is a specialist in the use of native plants and the management of natural areas for environmental restoration and habitat mitigation for a wide range of habitat types; he has specialized in wetland habitat.

Through a progressive range of regional projects Chris has been able to develop a truly regional perspective that lends itself to watershed and ecosystem restoration. Chris has 26 years of experience with the Public Interest Advisory Committee of the Niagara Escarpment Commission and understands the unique planning issues of the Niagara Escarpment Plan Area and the Ontario Greenbelt. Chris has experience with land development planning and design and N.E.C. Plan Amendment Applications as well as development peer reviews for conservation authorities and municipalities.

Chris has worked with E.A., E.I.S. and N.E.T.R. projects as a proponent and reviewer for 15 years. He has undertaken many field studies of both aquatic and terrestrial environments using recognized scientific protocols and those of the MNR for S.A.R. He is primarily a botanist but can undertake wildlife studies for Breeding Birds, small mammals, bats and amphibians and reptiles for the provision of full E.I.S. reports. He has experience with radio-telemetry tracking of S.A.R. turtles, use of PIT Tags and data loggers. While not certified as an arborist Chris undertakes tree inventories and writes tree management plans.

Chris has a keen interest in natural heritage systems and natural areas management. He has experience with Environmental Restoration, Hydrology, Conservation Biology, Landscape Ecology, Ecological Land Classification (E.L.C.), Wetland Delineation (O.W.E.S.) and GIS analysis (ArcGIS). Chris is recognized for his writing ability, for every level of comprehension from the lay public to government scientists and managers. He is an able presenter and is comfortable meeting the public as well as providing presentations at conferences and large public open houses.

WORK EXPERIENCE:

Present) Independent Environmental Consultant

(12_2021) Chris provides consulting services for natural heritage assessment, management and environmental planning projects. He undertakes ELC Studies, Wetland Delineation, Woodland Delineation, Breeding Birds, Wetland Birds, Amphibian call monitoring and Botanical inventories. He works as a sub-consultant on consulting teams to provide technical support as an ecologist and environmental planner. He provides design services for environmental restoration, habitat mitigation and enhancement. Chris is affiliated with SAI Planning Consultants and provides scientific support to them on an ongoing basis.

12_2021) Lincoln Environmental Consulting – Ecologist

(12_2020) Chris provides management support to the Environmental Science and Planning group at LEC. This group provides consulting services for natural heritage assessment / management and environmental planning. Chris undertakes landscape analysis, natural habitat assessment and planning policy analysis. Chris also works on consulting teams to provide technical support as an ecologist and environmental planner for EA, EIS and NETR (aggregate license) projects. He contributes design services for environmental restoration, habitat mitigation and enhancement.

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- 12_2020) Independent Environmental Consultant**
- (12_2015)** Chris provided consulting services for natural heritage assessment, management and environmental planning projects. He undertook ELC Studies, Wetland Delineation, Woodland Delineation, Breeding Birds, Wetland Birds, Amphibian call monitoring, Botanical inventories. He worked as a sub-consultant on consulting teams to provide technical support as an ecologist and environmental planner. He provided design services for environmental restoration, habitat mitigation and enhancement.
- 2017) Professor at Fanshawe College, London - 2017)**
Chris was a part-time Professor in the School of Design at Fanshawe College. He taught courses in Professional Practice and Presentation Skills.
- 12_2015) Senior Ecologist/Project Manager - Manager of Natural Science Services (AET Group Inc.)**
- (03_2011)**- Provided consulting services for natural heritage assessment and management, recreational systems, parkland development, cultural heritage resources, sustainable communities and social marketing practices. Chris worked with green infrastructure projects that provided recreation opportunities through trail access and linear corridors that linked SWM facilities with ESAs, parkland and other public lands. Chris was involved in all phases of project management and contract administration. Other project work included renewable Energy, ARA License Natural Environment Studies, Land Development EIS and monitoring of environmental effects. Other responsibilities included report writing, junior staff supervision and business development. (*Position was terminated when Environmental Group was closed by AET Group Inc. in 2016*)
- 10_2010) Planning Ecologist – Project Coordinator (Greenlands Centre Wellington – Contract)**
- (08_2008)**- Development of a Landscape Analysis for the Township of Centre Wellington incorporating urban green infrastructure, cultural heritage features, trails and recreational greenways. This project involved the sourcing and analysis of all relevant policy with respect to municipal and environmental planning at local, watershed and provincial levels. This project included a study of all urban and near-urban natural heritage features in detail with recommendations for planting and other habitat enhancement including management of invasive species, retirement of cultural landscapes, enhancement and restoration of stream corridors and strategic reforestation. Also produced was a set of "Development Guidelines for Sustainable Rural Communities".
- 06_2008) Area Biologist (Ontario Ministry of Natural Resources & Forestry- Contract)**
- (04_2007)**- Management and participation in a wide range of conservation programs involving fish and wildlife, species at risk, and land stewardship for rural lands. Coordinated the Canada Ontario Agreement program funding for environmental enhancement projects oriented to Great Lakes water quality enhancement. Undertook environmental restoration projects in rural and urban environments with private landowners and volunteers for municipal lands. Supervised and trained seasonal staff in field and administrative procedures. Represented MNR on technical and management committees involving regional municipalities and local conservation authorities. Field work included botanical studies, mapping and assessment of SAR habitat, radio-telemetry tracking of S.A.R.turtles and creation, maintenance and monitoring of turtle nesting habitat. Design projects included gravel pit restoration with S.A.R. turtle nesting habitat, pilot wetland creation and enhancement and stream corridor erosion control and reforestation.
- 03_2007) Ecologist/Project Manager (Maitland Valley Conservation Authority - Contract)**
- (12_2006)**- Developed and delivered a program for the promotion and implementation of environmental conservation projects for rural municipalities involving parks natural areas and water courses. Encouraged the protection, conservation, enhancement and restoration of these features. Also provided a new focus to promote energy efficient and sustainable landscapes with private rural landowners. Sourced funding and managed a wide variety of community environmental enhancement / restoration projects.

- 09_2006) Ecologist/Project Manager (Grand River Conservation Authority - Contract)
(01_2006-** Coordinated a project involving the development of Grand River watershed regional trail systems. Responsibilities included renewing the administrative structure of the Grand Valley Trail Association, developing a feasible 5-year strategic plan, promoting new trails and trail linkages within the Grand Valley and to other external regional trail systems. Maintained liaison with planners and recreational specialists in all municipalities involved including Ministry of Health Promotion and Trail Groups.
- 01_2006) Sustainable Landscape Specialist (Maitland Valley Conservation Authority - Contract)
(02_2005-** Developed and delivered educational materials and program workshops to teach the principles of environmental stewardship of natural areas and wildlife habitat enhancement on rural lands. Conducted farm tours and created environmental farm plans based on current best management practices and the principles of conservation biology and restoration ecology.
- 02_2005) Ecologist/Project Manager (Ecoplans Ltd. - Contract)
(02_2004** As a Biologist and Environmental Planner provided project management on development related projects by providing landscape analysis, field studies and planning solutions.
- Project management, Environmental Assessment and Environmental Impact Studies
 - Biological field studies (ELC, G.I.S.), sub-watershed analysis, wetland delineation
 - Design for environmental restoration and mitigation of development impacts
- 01_2004) Ecologist/Project Manager (Conestoga-Rovers & Associates - Full Time)
(12_1999-** Provided design and management solutions on a project basis for the environmental cleanup of contaminated sites, design of mitigation and treatment wetlands at landfill sites and for agricultural runoff, stream channel bioengineering and erosion control.
- Project management, natural science field studies (ELC, G.I.S.), monitoring studies for Conformance reports, Environmental Assessment, Environmental Impact Studies
- 12_1999) Independent Ecologist/Project Manager and Contractor
(06_1996-** Independent consulting Ecologist and specialty landscape contractor for environmental restoration, site reclamation, stream geomorphic analysis for fisheries habitat and bioengineering design, stream channel and ravine stabilization with bioengineering design, and conservation lands master planning. Continued many ongoing projects for Cumming Cockburn Ltd.
- 06-1996) Senior Environmental Scientist / Landscape Architect (Cumming Cockburn Ltd. - Full Time)
(11_1995-** Project management for a wide variety of projects involving new residential development throughout Ontario, urban infrastructure, storm water management and erosion control.
- Project management, Environmental Assessment, Environmental Impact Studies
 - Bioengineering designs, urban storm water naturalization design, tree saving plans
 - Water quality monitoring net design, data analysis, report writing, public information centers
 - Sub-watershed planning
- 11_1995) Ecologist (Maitland Valley Conservation Authority - Full Time)
(05_1991-** Ecologist with a focus on landscape restoration and rural community development for the creation of public greenways, naturalized parks, wetland/wildlife pilot projects in Huron and Perth Counties (swamp restoration, agricultural drain habitat enhancement, millpond habitat enhancement); sourced grant funding and managed community projects
- Coordinated public planting programs for parks, greenway reforestation and renaturalization
 - Secured grant funding, scheduled projects, sourced and requisitioned plants and supplies
 - Conservation lands master planning including design for reforestation and renaturalization
 - Large river channel manipulation for construction of fisheries habitat and stone placement

EDUCATION

- M.L.A. University of Guelph, S.E.D.R.D., (Landscape Architecture/Planning))
 M.Sc. University of Waterloo, Ecology (Botany/Limnology/Toxicology)
 B.E.S. University of Waterloo, Joint Honours Geography/Biology

Courses: Low Impact Development - design course by Credit Valley Conservation, 2015
O.B.B.N. – Benthic Invertebrate Identification, 2014
O.M.N.R. - Aboriginal Relations Management Consultation, 2008
St. John's Ambulance - CPR/First Aid Level II, 2013, (Certificate)
O.M.N.R. - Ecological Land Classification System for Ontario, 2002, (Certificate)
O.M.N.R. - Ontario Wetland Evaluation System Training, 2001, (Certificate)
Wilfrid Laurier School of Business & Economics – Small Business Management, 1999

MEMBERSHIPS

- Ontario Association of Landscape Architects, Full Member (1992-current), Councilor (2013-2017); Secretary (2015-16); Treasurer (2016-17)
- Ontario Nature
- Field Botanists of Ontario
- Society of Canadian Ornithologists

PRESENTATIONS

- "Green Infrastructure and Active Lifestyles in Rural Ontario"
Presented at the Grey to Green Conference
Toronto, August 2014
- "Planning for Green Infrastructure in Rural Communities"
A tour presented for the Ontario Association of Landscape Architects in Elora and Fergus, ON
August 2014
- "A Landscape Analysis of the Township of Centre Wellington"
Presented to Heritage Elora,
November 2009
- "Sustainable Landscape Management"
A workshop prepared and presented under contract to the Ecological
Farmers Association of Ontario, Winter 2006
- "The Milton Mill Pond – Historic Mill Pond Restoration"
Presented at the 14th Annual Conference of the Society for Ecological Restoration
October, 2002, Niagara Falls, Canada.
- "Completing Ontario's Greenways"
Presented jointly with Bryan Howard, Ontario Ministry of Natural Resources, at the Ontario Parks Heritage
Symposium, Heritage Resources Center
March, 1994, University of Waterloo, Canada.
- "Wooded Swampland Restoration with Hydroperiod Control"
Presented jointly with Jane Bowles, Ph.D., University of Western Ontario, at the 54th Midwest Fish and
Wildlife Conference - "In Pursuit of Ecosystem Integrity"
December, 1992, Toronto, Canada
- "Wooded Swampland Restoration"
Presented at the 4th Annual Conference of the Society for Ecological Restoration
August, 1992, University of Waterloo, Canada

Appendix F: Resume & Qualifications – Robert P. Stovel

ROBERT P. STOVEL, M.Sc., RPP, MCIP, P.Ag.

EDUCATION

M.Sc, Rural Planning, University of Guelph, 1988.

B.A. Geography, (Resources Management), Wilfrid Laurier University, 1986.

MEMBERSHIPS

Member of the Ontario Institute of Agrologists.
Member of the Ontario Professional Planners Institute and the Canadian Institute of Planners.
Member of the Ontario Stone, Sand and Gravel Association.

POSITIONS HELD

1995 - Present: Stovel and Associates Inc., Fergus, Ontario - President.

1993 - 1995: Ecological Services For Planning Ltd., Guelph, Ontario - Senior Project Manager.

1988 - 1992: Ecological Services For Planning Ltd., Guelph, Ontario - Environmental Planner.

1986 - 1987: Environmental Consultant. Waterloo, Ontario.

EXPERIENCE

- extensive project experience in environmental assessments, environmental management plans and ecological enhancement plans in Ontario. These projects have required considerable government and non-government agency liaison, interdisciplinary team coordination and the integration of a variety of scientific disciplines.

Environmental Assessments

- prepared the ecological and agricultural components for municipal road projects in King Township and the City of Stratford.
- prepared agricultural impact assessments for provincial road projects in the County of Essex and the County of Peterborough.
- coordinated environmental assessment projects for waste management master plans in Victoria County, Essex County, Peterborough County and the Regional Municipality of Haldimand-Norfolk (agricultural component).
- prepared route selection reports for the proposed development of an 8" pipeline in Orillia. This project received provincial approval at the Ontario Energy Board in 1994.
- managed the environmental constraint mapping and geotechnical selection component of Ontario Hydro's construction of a 500 kV transmission line from Lennox to Bowmanville. This transmission line was constructed in 1992.

Environmental Inventories and Monitoring

- designed and implemented wetland vegetation monitoring programs for proposed aggregate and estate residential developments.
- designed a transplanting and propagation plan for *Carex jamesii*.
- completed the required seminar on the Ontario Wetland Evaluation System and the Wetland Environmental Impact Study; Technical Manual.
- completed surveys for the following wetlands: Orangeville Reservoir Wetland Complex, Hayesland-Christie Wetland Complex, Dalrymple Lake Wetland Complex, Star Wetland Complex, Eramosa River-Blue Springs Creek Wetland Complex, Orillia Filtration Swamp, Philips Lake Wetland Complex, Mossington Park Wetland Complex, Cranberry/Oil Well Bog, Humber River Marshes Wetland Complex, Speed River Wetland Complex and the Beaverton River Wetland Complex.
- managed deer wintering surveys in Ramara Township, Carden Township, Erin Township and Puslinch Township.
- coordinated fisheries inventories for coldwater and warmwater systems in Ontario (e.g., Eramosa River, Speed River, West Credit River, Dalrymple Lake, Warnock Lake, Caledon Creek, Greenock Creek and Spencer Creek).
- prepared terrestrial enhancement plans for a deer wintering area in Puslinch Township.
- completed forestry evaluations for woodland areas in Wellington County, Simcoe County and the Regional Municipalities of York, Peel and Hamilton-Wentworth.
- managed bird surveys in various Southern Ontario municipalities.
- coordinated vegetation surveys for alvar communities in Simcoe County, Victoria County and the Regional Municipality of Hamilton-Wentworth.
- completed vegetation management plan for alvar communities and upland forest communities for a proposed quarry in the Regional Municipality of Hamilton-Wentworth.

Subwatershed Planning

- participated in subwatershed planning studies in Laurel Creek, Grindstone Creek and Nichol Drain No. 2.
- completed historic vegetation mapping programs in Caledon Creek Subwatershed.

Aggregate Applications

- certified to prepare site plans under Section 8.4 of the Aggregate Resources Act.
- assisted in the preparation of environmental plans and agricultural rehabilitation plans for the proposed Batterman Pit (Grey County), Puslinch Pit, Caledon Sand & Gravel Inc. Pit and Shoemaker Pit.
- conducted environmental evaluations and agricultural appraisals for various aggregate operations in southern Ontario.

- assisted in the preparation of Environmental Impact Studies for the proposed expansions of the Ospringe Pit, the Darrington Pit and Flamboro Quarries.
- prepared Level 1 & 2 Natural Environment and Environmental Impact Statements for aggregate developments in Simcoe County, Wellington County and the Regional Municipalities of York, Halton, Waterloo and Hamilton-Wentworth. These reports were prepared in accordance with the policy requirements of the Aggregate Resources Act (Technical Study Requirements), Wetland Policy Statement, Provincial Policy Statement and/or local/regional Official Plans.
- prepared applications for Certificate of Approvals for pit and quarry operations in southern Ontario.