October, 2022

Constraints Assessment

448 Line 2, Niagara-on-the-Lake

Prepared for

Otto and Marlene Hiebert

north-south ENVIRONMENTAL

North-South Environmental Inc. • 101B King Street West • Cambridge, Ontario • N3H 1B5

Project Study Team

North-South Environmental Inc.
Kristen Harrison – Senior Ecologist
Leanne Wallis – Senior Ecologist
Pauline Catling – Senior Ecologist
Grace Pitman - Ecologist
Devin Bettencourt – Ecologist
Taylor North - Ecologist
Benjamin Meinen – GIS Specialist

Table of Contents

List of Tables

List of Appendices

1. Introduction

North-South Environmental Inc. (NSE) has been retained to complete a Natural Heritage Constraints Assessment to inform potential development opportunities at 448 Line 2, Niagara-on-the-Lake, Ontario (herein referred to as the 'Subject Property'). The study area for the Constraints Assessment will include the Subject Property as well as natural features within 120 m of the Subject Property.

The Constraints Assessment will:

- Identify relevant policies and regulations
- Conduct a baseline data assessment
- Define the natural heritage and hydrologic systems
- Characterize the existing conditions
- Assess ecological and hydrological features and functions
- Present a constraint map, and analysis of constraints, and recommendations

The Subject Property is located at 448 Line 2 in the southwest portion of the community of Virgil, within Niagara-on-the-Lake (**Appendix 1, Figure 1**). The 1.95 ha property has a built structure of a house and two outbuildings. The property is rectangular in shape (approximately 400 m deep by 50 m wide). The buildings are located at the south end of the property. The remainder of the property is planted with conifers. The entire property is in a manicured (i.e., no natural habitat is present). No aquatic features or wetland are present.

The client is evaluating the potential of a residential subdivision development. The following Natural Heritage Constraint Analysis assesses the study area for any environmental features which may pose a constraint to development under the existing policy and legislative framework.

2. Agency Correspondence

A scoping checklist was provided by Niagara Region (A. Boudens, Senior Environmental Planner August 11, 2021). A data request was sent to the Ministry of the Environment, Conservation, and Parks (MECP) on November 17, 2021, and a response was received on February 4, 2022. Agency correspondence is included in **Appendix 2**.

3. Terms of Reference

A Terms of Reference (TOR) for the constraints analysis was drafted based on the scoping checklist provided by Niagara Region and based on Niagara Region's Environmental Impact Study Guidelines (Niagara Region January 2018). The draft TOR was submitted to Niagara Region on January 13, 2022 and approved by Niagara Region on the same date. The approved TOR is included in **Appendix 3**.

4. Policy and Legislative Framework

4.1. Species at Risk Act (2002)

The federal Species at Risk Act (SARA) prohibits the harm or destruction of Species at Risk (SAR) or their habitat in Canada.

4.1. Endangered Species Act (2007)

The provincial Endangered Species Act (ESA) protects species at risk of disappearing from Ontario. Under Section 9 of the ESA, species are afforded individual protection providing they are listed as Threatened, Endangered, or Extirpated on the Species at Risk in Ontario list. Section 10 of the ESA is in place to protect the habitat of Threatened or Endangered species. Destruction of Species at Risk and their habitats constitutes a contravention of the Endangered Species Act.

4.2. Provincial Policy Statement (2020)

Section 2 of the Provincial Policy Statement (PPS; 2020) provides direction for the wise use and management of resources, including the protection of natural areas and features. Natural heritage policies are described in Section 2.1.

Section 2.1.1 of the PPS outlines protection needs related to biodiversity and connectivity, including protection of both ecological features and function required to maintain biodiversity and functional ecological connectivity.

Section 2.1.4 lists significant natural heritage features where development and site alteration are not permitted, including:

- Significant wetlands in Ecoregions 5E, 6E, and 7E, and
- Significant coastal wetlands.

Section 2.1.5 lists significant natural heritage features were development and site alteration are not permitted, unless it has been demonstrated that there will be no negative impact on the natural features or their ecological functions, including:

- Significant woodlands in Ecoregions 6E and 7E,
- Significant valleylands in Ecoregions 6E and 7E,
- Significant wildlife habitat,
- Significant areas of natural and scientific interest, and
- Coastal wetlands in Ecoregions 5E, 6E, and 7E (that are not subject to Policy 2.1.4).

Section 2.1.7 states that development and site alteration shall not be permitted in habitat of endangered and threatened species, except in accordance with provincial and federal requirements.

Section 2.1.8 states that development and site alteration are not permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 (fish habitat) unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

4.3. Greenbelt Plan (2017)

The Greenbelt Plan area extends from Niagara Falls to Durham Region (i.e., the Golden Horseshoe) and identifies where development should not occur in order to protect agricultural lands and lands that support ecological features and functions. The Greenbelt Plan includes land designated as Protected Countryside, and lands within the Niagara Escarpment Plan Area, Oak Ridges Moraine Area and the Parkway Belt West Plan Area. The Protected Countryside is further divided into three categories: the Agricultural System, the Natural System, and Settlement Areas.

The Subject Property is within the Greenbelt Plan area. It is within a Settlement Area (Town / Village) of the Protected Countryside. The Greenbelt Plan defers policies for Settlement Areas to the jurisdiction's Official Plan(s).

4.4. Niagara Escarpment Plan (2017)

The Subject Property is not located within the Niagara Escarpment Plan area.

4.5. Niagara Region Official Plan (2014)

The policies of Niagara Region's Official Plan guide economic, environmental, and community building decisions to manage growth. The Plan establishes several land use designations and sets forth specific goals and polices applicable to each designation.

Core Natural Heritage areas are shown on Schedule C.

No Environmental Protection Area or Environmental Conservation Area is present within the study area.

4.6. Niagara-on-the-Lake Official Plan (2017)

The policies of Niagara-on-the-Lake's Official Plan guide economic, environmental, and community building decisions to manage growth. The Plan establishes several land use designations and sets forth specific goals and polices applicable to each designation.

The property is designated as low-density residential.

4.7. Niagara Peninsula Conservation Authority under O. Reg. 155/06

Ontario Regulation (O.Reg.) 155/06 under the Conservation Authorities Act gives Niagara Peninsula Conservation Authority (NPCA) the authority to regulate development, interference with wetlands and alterations to shorelines and watercourses. Generally, NPCA regulates floodplains, hazard lands, wetlands and wetland buffers.

The property is not within an NPCA regulated area.

5. Background and Secondary Source Review

The Background review undertaken to inform this constraints analysis included:

- Background searches for designated significant features (i.e., provincially significant wetlands (PSW), Areas of Natural and Scientific Interest (ANSIs), etc.), land types and landforms, and Species at Risk (SAR) or locally significant species:
    - Ministry of Natural Resources and Forestry (MNRF) / Natural Heritage Information Centre (NHIC) screening for SAR (Online; 2021);
    - Land Information Ontario mapping (Online; 2021);
    - Fisheries and Oceans Canada (DFO) Aquatic species at risk map (Online; 2021);
- Review of available background studies and species lists:
    - NPCA Natural Areas Inventory Project (2006-2009)
    - Atlas of the Breeding Birds of Ontario (Online; 2021);
    - iNaturalist (Online; 2021)
    - eBird (Online; 2021)
    - Ontario Butterfly Atlas (Online; 2021)
    - Ontario Moth Atlas (Online; 2021)
    - Ontario Reptile & Amphibian Atlas (Online; 2021)
- Review of technical guidance documents:
    - Natural Heritage Reference Manual (OMNR; 2010);
    - Significant Wildlife Habitat Technical Guide (OMNR; 2000); and
    - Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF; 2015)

6. Existing Conditions

6.1. Past and Present Land Use

The subject property is located in the southwest portion of the community of Virgil, in Niagara-on-the-Lake. The 1.95 ha property has a built structure of a house and two outbuildings. The buildings are located at the south end of the property. The remainder of the property is planted with conifers. Adjacent land use includes a residential subdivision to the east, and agricultural lands (fruit trees) / rural residential to the north, west, and south. A 1954 aerial photo shows the southern half of the property in agricultural use, and the northern half partially treed.

6.2. Physiography and Soils

The subject property is underlain by bedrock of the Queenston Formation. The Queenston Formation extends in a band from Owen Sound in the north to the Niagara River. It is comprised of shale, limestone, dolostone, and siltstone. The subject property is within the Iroquois Plain physiographic region. The Iroquois Plain extends in a band around Lake Ontario easterly to Belleville. The Iroquois plain is an undulating till plain adjacent to the ancient shoreline of glacial lake Iroquois. The subject property is underlain by coarse-textured glaciolacustrine deposits of sand, gravel, minor silt and clay (Ontario Geological Society 2003-2009, Chapman and Putnam, 1984).

6.3. Field Investigations

Ecological field investigations were conducted by NSE staff according to **Table 1**, below. Incidental species records, Species at Risk, and Significant Wildlife were recorded during all field surveys.

Table 1. Field Surveys

Date	Survey Type	Weather
November 27, 2021	• ELC • Vegetation – Fall • Bat Habitat Assessment - Reconnaissance	N/A
May 24, 2022	• ELC • Vegetation – Spring • Bat Habitat Assessment – Maternity Roost Survey • Breeding Birds – Visit 1	8 to 10˚C, sunny, light wind, no precipitation
July 8, 2022	• ELC • Vegetation – Summer • Breeding Birds – Visit 2	18 to 19˚C, cloudy, light wind, no precipitation

6.3.1. Ecological Land Classification (ELC)

Vegetation communities in the study area were assessed using the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al., 1998) by a qualified practitioner. Photos were taken to document existing conditions. Vegetation community mapping is shown in **Appendix 1, Figure 2**.

One vegetation community type and one anthropogenic area was identified on the subject property. These are described below.

Coniferous Cultural Plantation (CUP3)

This vegetation community type comprises the majority of the subject property (approximately 90%). It consists of dense planted conifers, primarily Douglas Fir (*Pseudotsuga menziesii*), with occasional Colorado Blue Spruce (*Picea pungens*) and Eastern White Pine (*Pinus strobus*). No subcanopy or understory species are present. The ground layer consists of Goldenrod (*Solidago spp*), Queen Anne's Lace (*Daucus carota*), and mosses.

Manicured

The anthropogenic community includes a manicured lawn around a residence and associated outbuildings. Planted trees are present, namely, Colorado Blue Spruce (*Picea pungens*) and mature Freeman's Maple (*Acer x freemanii*).

6.3.2. Botanical Inventory

A three-season flora inventory was conducted by a qualified vegetation ecologist to capture early, mid, and late flowering plants. The locations of any Species at Risk, provincially rare species, or regionally rare species were recorded.

A total of 66 plant species, with an additional 3 identified only to genus, were recorded on the subject property during surveys, and a list is included as **Appendix 4**.

Of the plant species documented:

- 25 (38%) are native, and 41 (62%) species are non-native
- No Species at Risk (SAR) were recorded
- No provincially rare species were recorded
- One species is regionally uncommon in Niagara Region: Virginia Creeper (*Parthenocissus quinquefolia*) in the cultural plantation and manicured area.

The Species at Risk status was determined by referencing Schedule 1 of the Species at Risk Act (federal) and O. Reg. 230/08: Species at Risk in Ontario List (provincial). The provincial conservation status of plant species was determined from the NHIC's vascular plant species list

(2022). The regional status of plant species for Niagara County was determined from the List of the Vascular Plants of Ontario's Carolinian Zone Ecoregion 7E (Oldham, 2017).

6.3.3. Wildlife

6.3.3.1. Breeding Bird Surveys

Breeding bird surveys were conducted by a qualified avian ecologist using the OBBA survey protocol (OBBA, 2001). Two visits were conducted in Spring/Summer of 2022, separated by at least 14 days. Ten-minute point counts were conducted at the same points on each visit. Breeding codes were assigned to each bird species observed using the Ontario Breeding Bird Atlas standard codes and the probability of breeding will be determined (e.g., Confirmed, Probable or Possible).

A total of 16 species of birds were noted during breeding bird surveys, 15 of which were recorded with breeding evidence, and one which was foraging (i.e., not breeding). An additional species, Field Sparrow, was recorded as an incidental outside of the breeding bird season. A full list of all bird species and breeding evidence is included as **Appendix 4**.

Of these bird species recorded:

- One species is SAR: Barn Swallow (*Hirundo rustica,* Threatened)
    - foraging over field to the north of the property. No nests found within the study area.
- One species is regionally uncommon in Niagara Region: Field Sparrow (*Spizella pusilla*)
    - not recorded during the breeding bird season and potentially was a migrant.
- One species is area-sensitive: Savannah Sparrow (*Passerculus sandwichensis*).
    - Located off-property to the north.

The Species at Risk status was determined by referencing Schedule 1 of the Species at Risk Act (federal) and O. Reg. 230/08: Species at Risk in Ontario List (provincial).

6.3.3.2. Bat Habitat Assessment

A bat habitat assessment was completed by qualified wildlife ecologists. The subject property was visited during the 'leaf-off season' on November 27, 2021 as reconnaissance on whether potential bat maternity roost habitat was present. No potential habitat was present in the coniferous cultural plantation. Some potential habitat was noted within the manicured portion of the property – namely the mature Freeman's Maple planted in the southeast corner of the subject property along Line 2 and Riesling Drive.

A maternity roost survey (snag survey) was completed on May 24, 2022 to further document potential maternity roost habitat. Two of the mature Freeman's Maples were noted as having a knothole that could provide potential maternity roost habitat. Further it was noted that the two outbuildings could potentially provide roosting habitat, though only minor openings were noted along the roofs, and it

was unclear if any access could be provided to the inside of the buildings. The house has one chimney, and this was noted as being capped and thus not providing any access for bats.

6.3.3.3. Other Wildlife (Incidental Observations)

Two additional wildlife species were recorded: Eastern Grey Squirrel (*Sciurus caroliniensis*), and Eastern Cottontail (*Sylvilagus floridanus*). Other common mobile species adapted to urban environments such as White-tailed Deer (*Odocoileus virginianus*), Coyote (*Canis latrans*), Eastern Chipmunk (*Tamias striatus*), Virginia Opossum (*Didelphis virginiana*), and Raccoon (*Procyon lotor*) are likely to be found in the study area.

6.3.4. Species at Risk

A list of SAR under the *Endangered Species Act* (2007) which could occur in the study area was gathered from a background and secondary source review, and from agency correspondence. The probability that SAR could occur in the study area was determined by identifying whether suitable habitat for those species is present in the study area.

One SAR was identified: Barn Swallow (*Hirundo rustica*). Barn Swallow was observed foraging off-property to the north. No nesting evidence or foraging evidence was recorded on the subject property.

The SAR screening table is included as **Appendix 5**.

6.3.5. Significant Wildlife Habitat

The presence or potential presence of SWH in the study area was assessed using the SWH Criteria Schedules for Ecoregion 7E (MNRF, 2015). Where ecosites or combinations of ecosites of suitable size occurred in the study area, the presence or potential presence of the necessary indicator species was evaluated. Areas of potential SWH were identified as "candidate" SWH and areas with confirmed indicator species were assessed as "confirmed SWH".

No types of confirmed SWH were identified.

Two types of candidate SWH were identified:

- Reptile Hibernacula
    - Though no snakes were observed and no hibernacula were observed, snake hibernacula can occur in a wide variety of habitats. No favourable snake hibernacula habitat is present (i.e., talus, rock piles, karst).
- Habitat for Special Concern or Provincially Rare Species
    - Though none observed, there is limited potential for Special Concern or Provincially Rare species to use the subject property (e.g., Monarch, Yellow-banded Bumblebee).

The Significant Wildlife Habitat Assessment Table is included in **Appendix 6**.

6.3.6. Significant Woodland

The Niagara Official Plan (2014), Definitions, provides the definition of a 'woodland' as "a treed area that provides environmental and economic benefits to both the private landowner and the general public such as erosion prevention, hydrologic and nutrient cycling, provision of clean air and long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities and the sustainable harvest of woodland products. It does not include a cultivated fruit or nut orchard or a plantation used for the purpose of producing Christmas trees.

Based on this criteria, the plantation meets criteria as 'woodland'.

The Niagara Official Plan (2014), Policy 7.B.1.5 provides criteria for a woodland to be considered a significant woodland.' To be considered significant woodland, a woodland must meet one or more of the criteria. These criteria, and an assessment of the plantation against these criteria, is provided in **Table 2**, below.

The plantation does not meet any of the given criteria, and therefore, is not considered a significant woodland.

Table 2. Significant Woodland Analysis of the Coniferous Cultural Plantation (CUP3)

Criteria	Assessment
Habitat for Threatened or Endangered or Special Concern Species	Does not meet criteria. Not known to be present.
Size equal to or larger than 2 hectares	Does not meet criteria.
Contains interior woodland habitat at least 100 metres from the woodland boundaries	Does not meet criteria.
Contains older growth forest and is 2 hectares or more in area	Does not meet criteria.
Overlaps or contains one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4	Does not meet criteria.
Abuts or is crossed by a watercourse or water body and is 2 hectares or more in area	Does not meet criteria.

7. Constraints Analysis

The subject property offers few constraints from a natural heritage perspective. It is a small 1.95 hectare property that consists of a house and two outbuildings on manicured grounds (comprising ~10% of the property), with the remainder consisting of planted conifers (90% of the property).

Based on background review, existing conditions, and policy review and assessment, as described, the following summary of ecological constraints is provided below in **Table 3**.

Table 3. Summary of Natural Heritage Constraints

Constraint	Assessment
Fish and Fish Habitat	None present.
Species at Risk	Present (Barn Swallow) – foraging off-property. No evidence of nesting or foraging on subject property. See **Appendix 5**.
Significant Wildlife Habitat	No confirmed SWH is present. There are two types of candidate (i.e., 'potential') SWH: Reptile Hibernacula, Habitat for Special Concern and Rare Wildlife Species. See **Appendix 6**.
Significant Woodland	None present.
Significant Valleyland	None present.
Life Science Area of Natural and Scientific Interest (ANSI)	None present.
Natural Heritage System	None present.
Savannah, Tallgrass Prairie, Alvar	None present.
Provincially Significant Wetlands or Other Wetlands	None present.
Migratory Bird Nesting Habitat	Present - the study area supports migratory birds that could be impacted by development. Avoidance and mitigation via the use of timing windows is recommended.
NPCA Regulated Area	The study area is not within an area regulated by the NPCA.
NPCA Hazard Lands	None present.

8. Conclusions and Recommendations

The subject property is a 1.95 hectare property within the community of Virgil, Niagara-on-the Lake. Its current use is as a single-residential property consisting of a house, two outbuildings, and a coniferous plantation (the latter comprising approximately 90% of the subject property).

The property is designated as 'low density residential' under the Niagara-on-the-Lake Official Plan (2017). It does not contain any environmental areas (i.e., natural heritage system, core natural heritage area, environmental protection area, environmental conservation area) as designated under the Niagara Region Official Plan (2014). No portion of the subject property is regulated under O.Reg.

155/06 by the Niagara Peninsula Conservation Authority. While it is within the Greenbelt Plan Area, it is within a Greenbelt Settle Area (Town / Village) of the Protected Countryside, and thus jurisdiction is deferred by the Greenbelt Plan to the upper tier and lower tier municipalities (i.e., Niagara Region, Niagara-on-the-Lake).

Further, the subject property has no known records of aquatic or terrestrial Species at Risk under the Species at Risk Act and the Endangered Species Act. It does not contain any known habitat protected by policy directives of the Provincial Policy Statement (2020), specifically, it does not contain significant woodland, significant valleyland, life science ANSI, savannah, tallgrass prairie, alvar, or provincially significant wetlands (or other wetlands), fish habitat, or confirmed significant wildlife habitat.

One species of SAR, Barn Swallow, was observed foraging off-property to the north. There was no evidence of nesting or foraging on the subject property.

Habitat for migratory birds is present and we would recommend timing windows for any tree / building removals to avoid or mitigate impact to migratory birds.

Two types of candidate ('potential) significant wildlife habitat were identified: reptile hibernacula (overwintering habitat) and species of Special Concern and Provincially Rare species. While neither type of SWH was confirmed, and their potential is deemed marginal, there is potential that future studies, as / if required as part of an Environmental Impact Assessment (EIA) may confirm the presence of one or both types of SWH.

Further, the bat habitat assessment identified potential maternity roost habitat within the manicured area surrounding the residence. Bats may potentially use the mature Freeman's Maples or outbuildings as roost habitat. While this habitat would not meet habitat under SWH policies for 'bat maternity roosts', if bats are present, the bats and their habitat would be protected under the Endangered Species Act. As potential use is considered low, we would recommend timing windows for any tree / building removals, such that they are removed outside of the active bat season to avoid or mitigate any impact to SAR bats. That said, during the EIA process, consultation is recommended with the MECP to confirm whether bat acoustic surveys and exit surveys are required.

In conclusion, the subject property has no identified natural heritage constraints, and only marginal potential natural heritage constraints. Additional studies related to the EIA may identify / confirm these potential natural heritage constraints.

References

Cadman, M.D. et al. (eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Port Rowan. 706 pp.

Chapman and Putnam. 1984. The Physiographic Regions of Southern Ontario.

Department of Fisheries and Oceans Canada (DFO). 2018. Aquatic Species at Risk Map. Aquatic species at risk map (dfo-mpo.gc.ca)

eBird Canada. 2021. Accessed Online: https://ebird.org/home

iNaturalist. 2021. Accessed Online: https://www.inaturalist.org

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide

Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide.

Ministry of Natural Resources (MNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. 245 pp.

Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. 38 pp.

Ministry of Natural Resources and Forestry (MNRF). 2022. Natural Heritage Information Center (NHIC). Accessed Online: https://www.ontario.ca/page/make-natural-heritage-area-map.

Ministry of Municipal Affairs and Housing. 2020. Provincial Policy Statement. 50 pp.

Niagara Peninsula Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. O. Reg. 155/06.

Niagara Peninsula Conservation Authority. 2006-2009. Natural Areas Inventory Project. Vol 1 & 2.

Niagara Escarpment Commission. 2017. The Niagara Escarpment Plan. Office Consolidation, updated May 8, 2015. 104 pp + apps and maps.

Niagara-on-the-Lake. 2017. Town of Niagara-on-the-Lake Official Plan.

Niagara Region. 2018. Environmental Impact Study Guidelines.

Niagara Region. 2014. Official Plan.

NSE. 2022. Terms of Reference. Constraints Assessment for 448 Line 2, Niagara-on-the-Lake.

Oldham, M.J. 2017. List of the Vascular Plants of Ontario's Carolinian Zone. Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario.

Oldham, M.J. and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Ontario Ministry of Natural Resources, Peterborough, Ontario.
Ontario Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. MNR, Peterborough, Ontario.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. MNRF, Peterborough, Ontario.
Ontario Ministry of Natural Resources and Forestry (MNRF). 2019. Make a Map: Natural Heritage Areas.

Ontario Moth Atlas. 2021. Accessed Online: https://www.ontarioinsects.org/moth/

Ontario Reptile & Amphibian Atlas. 2021. Accessed Online:
https://www.ontarioinsects.org/herp/index.html

Ontario Geological Society 2003. Surficial Geology of Southern Ontario. MRD 128.

Ontario Geological Society 2007. Physiography of Southern Ontario. MRD 228.

Ontario Geological Society 2009. Bedrock Geology of Ontario. MRD 126.

Ontario Butterfly Atlas. 2020. Accessed Online: http://www.ontarioinsects.org/atlas_online.htm

Ontario Endangered Species Act. 2007. Consolidation period, July 21, 2020.

APPENDIX 1 | Figures

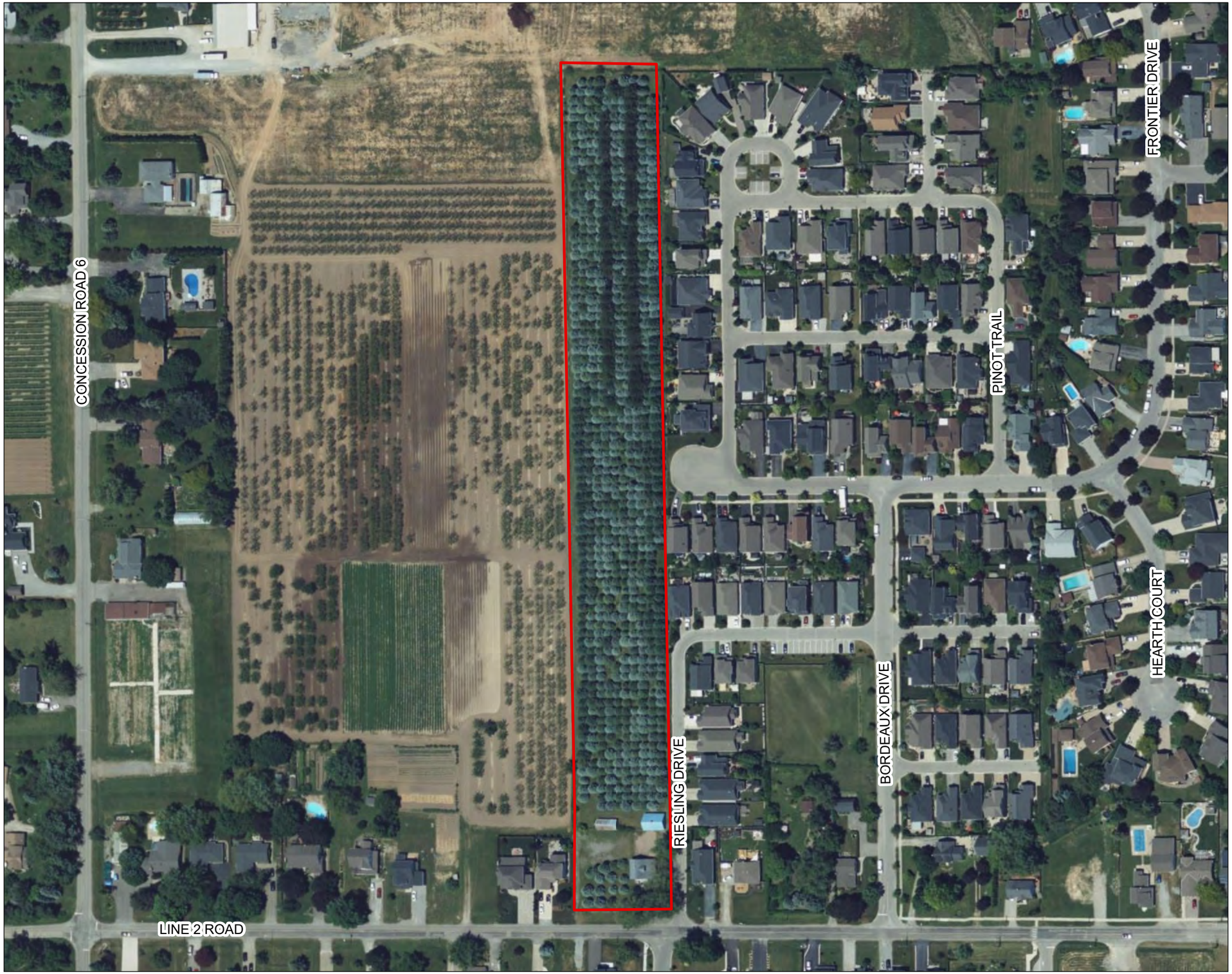


Figure 1 | Study Area
448 Line 2, Niagara-on-the-Lake

Legend

Study Area

0 50 100 Meters

Project Number	Date:	N
21-1245	2022-09-01	

north-south ENVIRONMENTAL

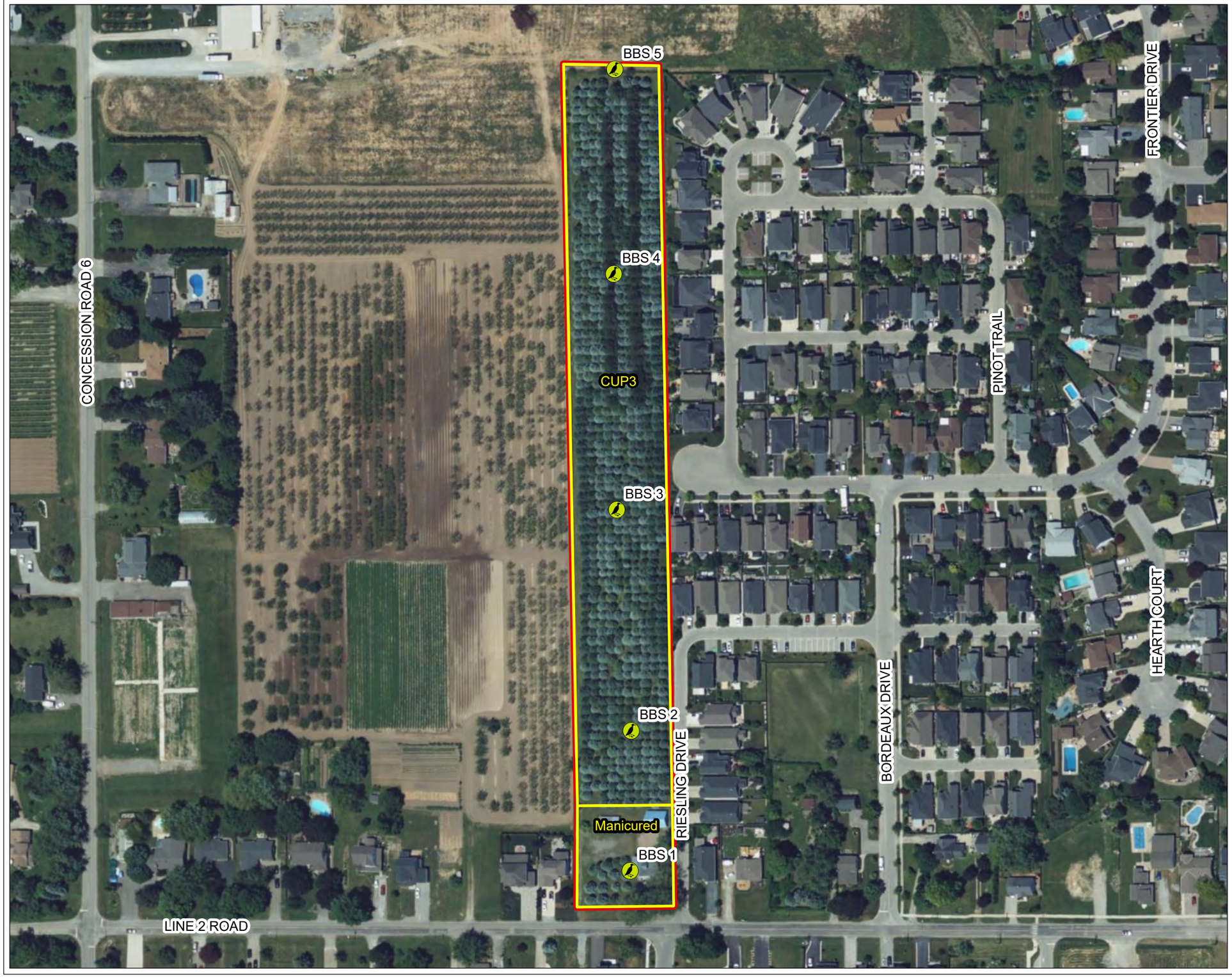


Figure 2 | ELC, Survey Locations
448 Line 2, Niagara-on-the-Lake

Legend

- Study Area
- Ecological Land Classification
- Breeding Bird Survey

Vegetation Communities

CUP3 – Coniferous Cultural Plantation

0 50 100 Meters

Project Number	Date:	N
21-1245	2022-09-01	

north-south ENVIRONMENTAL

APPENDIX 2 | Agency Correspondence

Niagara Region

Environmental Impact Study (EIS) Requirements

Proponent: Otto & Marlene Hiebert Date: August 11, 2021 File #

Property Address: 448 Line 2 Road Municipality: NOTL

Type of Application: Completed by: A. Boudens

Is the subject site **located within an Urban or Rural area?**

☒ Urban Area	☐ Rural Area	☐ Hamlet
Details:		

Is the subject site **identified in the Provincial Natural Heritage System?**

☒ No	☐ Places to Grow Act	☐ Greenbelt Plan	☐ NEC
Details (*Designations)*:			

Is the subject site **located within an identified Agricultural Area?**

☒ No	☐ Good General Agricultural Area	☐ Unique Agriculture Area
Details:		

Is the subject site **regulated by another agency?**

☒ No	☐ NPCA	☐ MECP	☐ MNRF	☐ NEC	☐ Other Please Specify:
Details:					

Was a Site Visit Conducted?

☐ Yes Date: August 3, 2021

☒ No Staff Member: A. Boudens

Details:

Ecological Land Classification (ELC) Vegetation Communities identified on Mapping:

TAG

Natural Heritage features identified or likely to exist:

Environmental Protection Area (EPA)

	Feature	Located **On** and/or **Adjacent** Subject Property	Details
☐	Provincially Significant Wetland (PSW)	☐ On ☐ Adjacent ☐ Both	Name:
☐	Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI)	☐ On ☐ Adjacent ☐ Both	Name:
☐	Significant Habitat of Threatened or Endangered Species	☐ On ☐ Adjacent ☐ Both	Species:
☐	Key Natural Heritage features within the Greenbelt Natural Heritage System	☐ On ☐ Adjacent ☐ Both	Feature:

Environmental Conservation Area (ECA)

	Feature	Located **On** and/or **Adjacent** Subject Property	Details
☒	Significant Woodlands Potential - To be determined by completion of Constraints Analysis	☒ On ☐ Adjacent ☐ Both	Criteria: ☐ Significant Wildlife Habitat ☐ ANSI ☐ Other ☐ Environmentally Sensitive Area ☐ Interior Habitat ☐ Old Growth ☐ Rare Species ☐ Size: ☐ Water ☐ Wetland
☒	Significant Wildlife Habitat	☐ On ☐ Adjacent ☐ Both	Details: Potential
☒	Significant Habitat of Species of Concern	☐ On ☐ Adjacent ☐ Both	Species: Potential
☐	Significant Valleylands	☐ On ☐ Adjacent ☐ Both	Details:
☐	Other Evaluated Wetland *(Non-Provincially Significant)*	☐ On ☐ Adjacent ☐ Both	Name:

☐	Regionally Significant Life Science ANSI	☐ On ☐ Adjacent ☐ Both	Name:
☐	Publicly Owned Conservation Lands	☐ On ☐ Adjacent ☐ Both	Details:
☐	☐ Savannah ☐ Tallgrass Prairie ☐ Alvar ☐ Dune	☐ On ☐ Adjacent ☐ Both	Details:
☐	Regional Local Amendment	☐ On ☐ Adjacent ☐ Both	Details:

Fish Habitat

	Feature	Located **On** and/or **Adjacent** Subject Property	Details
☐	Fish Habitat ☐ Reach (Watercourse) ☐ Area (Pond/Lake)	☐ On ☐ Adjacent ☐ Both	Fish Habitat Classification: (identified by MNRF) ☐ 1: Critical ☐ 2: Important ☐ 3: Marginal Details:

Candidate Significant Wildlife Habitat *(Study must determine presence/absence)*

Seasonal Concentration Areas of Animals:

☐ Waterfowl Stopover and Staging Areas (Terrestrial and Aquatic)	☐ Colonially Nesting Bird Breeding Habitat (Bank and Cliff/ Tree/ Shrub/ Ground)	☐ Reptile Hibernacula
☐ Shorebird Migratory Stopover Area	☐ Turtle Wintering Area	☐ Deer Winter Congregation Area
☐ Raptor Wintering Area	☐ Bat Hibernacula	☐ Deer Yarding Area
☐ Landbird Migratory Stopover Area	☒ Bat Maternity Colonies	
☐ Migratory Butterfly Stopover Area	☐ Bat Migratory Stopover Area	

Rare Vegetation Communities:

☐ Cliff and Talus Slope	☐ Old Growth Forest	☐ Other
☐ Sand Barren	☐ Savannah	
☐ Alvar	☐ Tallgrass Prairie	

Specialized Habitat for Wildlife:

☐ Waterfowl Nesting Area	☐ Woodland Raptor Nesting Habitat	☐ Seeps and Springs
☐ Bald Eagle and Osprey Nesting, Foraging, Perching Habitat	☐ Turtle Nesting Areas	☐ Amphibian Breeding Habitat – Woodland and Wetland

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

☐ Marsh Bird Breeding Habitat	☐ Shrub/Early Successional Bird Breeding Habitat	☒ Special Concern and Rare Wildlife Species
☐ Open Country Bird Breeding Habitat	☐ Terrestrial Crayfish	☐

Animal Movement Corridors

☐ Amphibian Movement Corridors	☐ Bat Migratory Stopover Area	☐ Deer Movement Corridors

Has the property been identified as a Groundwater Protection Area (HVA)?

☒ Yes
☐ No
Details: Groundwater Protection Quality

Additional Comments/Details:

Aerial Map:

Required Field Surveys

(Any relevant information gathered from existing studies conducted within the last 5 years should be discussed to determine whether they are suitable to replace some of the requirements below)

	Field Surveys	General Timing Window	Protocol	Notes
☒	Ecological Land Classification (ELC) mapping, including soils	Spring to Fall (i.e., generally May to October)	Ecological Land Classification for Southern Ontario (Lee et al., 1998)	Undertake ecological land classification down to eco-element (vegetation type).
☒	Botanical Inventory (floral species list)	☒ Single Season	Systematic searches	Must be completed for each ELC community, with particular attention to presence/absence and habitat for rare (local and S1-S3) species and SAR.
		☐ Two Season (Spring/Summer and Fall)		
		☐ Three Season (Spring/Summer/Fall)		
		☐ Other		
☒	Breeding Birds	• Between May 24th and July 10th; • Two surveys spaced 10 days apart; • Anytime between dawn and 5 hours after dawn.	Ontario Breeding Bird Atlas – Guide for Participants (2001)	• Counts should *not* be done if it is raining, there is thick fog, or if winds are greater than 19km/hr; • If unseasonably warm or cold conditions are encountered in the spring, survey dates may need to be adjusted.

☐	Amphibians: Frogs and Toads	Three rounds of surveys between the following dates at least 15 days apart: ➢ April 15th – April 30th (when night-time air temp exceeds 5ºC) ➢ May 15th – May 30th (when night-time air temp exceeds 10ºC) ➢ June 15th – June 30th (when night-time air temp exceeds 17ºC)	Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Environment Canada, 2008)	• Dates provided as a guideline, as air temperature and lack of wind are the most important variables; • If unseasonably warm or cold conditions are encountered in the spring, survey dates may need to be adjusted; • Favourable conditions consist of nights that are damp, foggy or have light rain falling. Persistent or heavy rainfall and nights with strong winds are to be avoided; • Surveys can begin half hour after sunset and end before midnight; • Each station is surveyed for three minutes; • Additional amphibian breeding habitat surveys may be required based on the results of the calling surveys.
☒	Bats	Spring, Fall or Winter (i.e., both leaf-off and leaf-on periods)	Criteria from the *Significant Wildlife Technical Guide (MNRF 2000)* in conjunction with methods outlined by MNRF Guelph District (*Recommended Approach for Surveying Buildings and Survey method for SAR Bats within Treed Habitats – Please contact MECP for protocols and field data sheets)*	• Surveys to identify potentially suitable habitat should be completed prior to June; • If suitable maternity roost habitat is identified, separate acoustic surveys in the month of June may be recommended by MECP; • Please contact the MECP for protocols, field data sheets, and guidance.

☐	Deer	Variable depending on survey effort	• Some information pertaining to the habitat specification of winter deer yards is available in the *Forest Management Guidelines for the Provisions of White-tailed Deer Habitat;* • More information pertaining to protocols that can be used to monitor deer populations is available in the *Wildlife Monitoring Programs and Inventory Techniques for Ontario.*	• Correspondence with the MNRF is required in order to confirm survey protocols and details on the evaluation of winter deer yards; • To confirm the presence of deer migration corridors, transects can be completed in order to evaluate the use of habitat in relation to a study area.
☐	Meander Belt Study	Variable	Meander Belt Width Delineation Protocol (Toronto and Region Conservation Authority, Revised 2004)	
☐	Migratory Bird Survey	Spring Surveys (March to May) and Fall Surveys (August to October)	Bird and Bird Habitats: Guidelines for Wind Power Projects (MNRF, 2011)	

☐	Fisheries Assessment	☐ Headwater Drainage Features Assessment	Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC & TRCA, 2013)	• Habitat assessments follow the methods outlines in the OSAP Protocol; • Aquatic habitat characterization should identify potential baseflow sources, barriers to fish migration and general habitat quality; • Physical stream measurements should be identified (width, height, length); • Identify any evidence of upwelling or groundwater concentration (may require a late fall/early winter site visit); • Fisheries inventories should be completed in the spring to ensure any fish usage of intermittent or ephemeral systems is identified. Inventories of permanent features may occur throughout the spring and summer. Habitat assessments and detailed habitat mapping should be completed during snow/ice free conditions; • Surveys should be completed within spring and fall, as these seasons capture the most diverse community assemblages.
		☐ Habitat Characterization	Ontario Stream Assessment Protocol – *Version 10.0* (Ontario, 2017); Environmental Guide for Fish and Fish Habitat (MTO, 2009)	
		☐ Fisheries Assessment	Ontario Stream Assessment Protocol – Version 10.0 (Ontario, 2017)	
☐	Raptor Nests	Between March 23rd and April 23rd, prior to "leaf out"	Forest Raptors & Their Nests in Central Ontario: A guide to Stick Nests & Their Users (Ontario, 1998)	• Surveys should consist of a thorough investigation of potentially suitable habitat searching for active or inactive stick nests and evidence of raptor activity.
☒	Species at Risk Screening	Variable	☐ DFO ☒ MECP	• Contact applicable agencies for survey requirements. All agency correspondence must be included in the EIS.

☐	Marsh Birds	• Between May 20th and July 5th; • Two surveys spaced 10 days apart; • Morning or Evening, must remain consistent for both visits; • Morning surveys can begin 30 min before sunrise and end no later than 10 am; Evening surveys can begin no earlier than 4 hours before sunset and must be completed by dark.	Marsh Monitoring Participant's Handbook for Surveying Marsh Birds (Environment Canada, 2008)	• Each station is surveyed for 15 minutes; • Surveys should be undertaken in weather that is favourable for surveying birds: *good visibility, warm temperatures (at least 16°C), no precipitation and little or no wind.*
☐	Water Balance	Variable	Wetland Water Balance Monitoring Protocol (Toronto and Region Conservation Authority, 2016)	
☐	Wetland Evaluation	Variable	Ontario Wetland Evaluation System - Southern Manual (Ontario, 2013)	Any proposed refinements to Provincially Significant Wetland boundaries require approval from the MNRF. Please include all correspondence as an appendix in the EIS.
☐	Wildlife Movement Survey (e.g. Road Mortality)	Variable	Environmental Guide for Mitigating Road Impacts to Wildlife (MTO, 2017)	

☐	Salamanders	Early Spring – between late-March to mid-April, immediately following snow melt and/or the first spring rains	Wildlife Monitoring Programs and Inventory Techniques for Ontario	Surveys can consist of one or more of the following three techniques: • Visual Surveys completed in the evenings during the period specified. A visual inspection of the habitat, including carefully overturning and replacing potential cover can be included as part of this survey. Egg mass surveys can also be completed during daylight hours; • Fine mesh dipnets can be used to catch amphibians. Capture occurs by sweeping or churning the water. *Correspondence with the MNRF/MECP prior to survey commencement recommended as permits may be required*; • Pitfall or funnel traps, often in association with drift fences, are the most common way of trapping terrestrial amphibians. Traps should be checked daily, before noon to minimize mortality. *Correspondence with the MNRF/MECP prior to survey commencement recommended as permits may be required.*
☐	Tree Saving Plan	Variable	Section 1.36 of the Niagara Region's Tree and Forest Conservation By-law (By-law No. 30-2008)	• All requirements listed in the identified protocol must be included for a Tree Saving Plan to be deemed complete.

☐	Snakes	• Spring, Summer and Fall; • most likely to be observed under cover objects in the morning after cool evenings when they seek out their area and try and maintain their body temperatures.	• Survey Protocol for Ontario's Species at Risk Snakes (MNRF, 2016) and/or Milksnake Protocol (MNRF, 2013) is recommended for species that are not at risk; • Wildlife Monitoring Programs and Inventory Techniques for Ontario.	• Visual surveys should be completed by overturning all objects that provide cover (i.e., large branches, logs, rocks, etc.). Objects should be returned, to the extent possible, to their original positions; • Roadside surveys can also be used; • Artificial cover boards can be installed recognizing that it takes time for the boards to be used as habitat; • Contact the MECP for protocols related to SAR snakes.
☐	Turtles	• Early Spring • Between 8 am and 5 pm on sunny days when the air temperature is at least 10 °C; • Between 8 am and 5 pm on partially cloudy or overcast days when air temperatures are greater than 15 °C, and greater than water temperatures	• Wildlife Monitoring Programs and Inventory Techniques for Ontario (MNRF, 1997) • Occurrence Survey Protocol for Blanding's Turtle in Ontario (MNRF, 2013)	• Visual surveys of ponds or wetlands; • Searching for basking turtles is the most effective method of confirming presence of turtles within suitable habitat; • In open water wetlands, surveys can be completed from the shoreline using binoculars to scan the perimeter of the shoreline and potential basking sites; • Basking surveys should be surveyed from the sunlit side as this is the side that turtles are most likely to be located; • In wetlands that lack large pools of open water, surveys should consist of using evenly spaced transects or aerial surveys to cover all areas of the wetland; and • Surveying roads with sandy and gravely shoulders near wetlands during the late May to early July nesting season may also be undertaken.

What must be included in an EIS?

The EIS should focus on the significant natural heritage features and/or hydrological features and functions for which the area was designated, and any additional natural heritage or hydrological features identified on site. It should identify, describe and delineate these features and their ecological and hydrological functions in order to avoid impacts to them. However, it should also address the site's setting in the broader landscape and its role in, and linkages to, broader natural heritage and hydrologic systems. It should assess any unavoidable impacts of the proposed development, indicating the magnitude and implications of those impacts, recommend mitigation measures to reduce negative impacts, identify opportunities for restoration or enhancement of natural heritage features which may also help offset negative impacts, recommend further study, monitoring, and provide recommendations on proceeding with the proposed development, including conditions to be attached to any approvals.

The key components of an EIS include:

- A biophysical and/or hydrologic inventory and analysis, including a description and analysis of the aquatic and terrestrial settings, as well as hydrological conditions such as surface and groundwater features and functions;
- A description of the ecological and hydrological functions served and required by the natural heritage features and/or hydrologic features;
- A description of the linkages between and among natural features and areas, surface water features and ground water features both on the site and in the surrounding area;
- A description of the proposed undertaking;
- Identification of constraints and opportunities;
- Mapping;
- Identification and analysis of potential direct, indirect and cumulative impacts from the proposed activities on the ecological and/or hydrological functions identified;
- The development of appropriate development modifications, recommendations, mitigation measures and enhancement opportunities;
- An assessment of the significance of the cumulative net environmental impacts expected over the long term after theses measures have been implemented;
- The recommendation and description of monitoring needs and programs; and
- Recommendations regarding possible residual impacts, including recommendations for proceeding with the development as proposed or modified.

Steps involved in the environmental impact study process:

Step 1: Determining EIS Requirements
- 1.1 Initial Screening to Determine if an EIS is Required, or if EIS Requirement can be Waived
- 1.2 Pre-consultation and Scoping (This EIS Scoping Checklist satisfies this step)

Step 2: Terms of Reference (Next Step!)
Step 3: Constraints Analysis
Step 4: Ecological Impact Assessment
Step 5: Recommendations and Conclusion

Please refer to the Niagara Region's Environmental Impact Study Guidelines for a detailed description of each step.

Preliminary Screening for Species at Risk

To: **Species at Risk (MECP)**

From: North-South Environmental Inc.

Date: November 17, 2021

Re: **Species at Risk Records Request – 448 Line 2 Rd., Niagara-on-the-Lake, Ontario.**

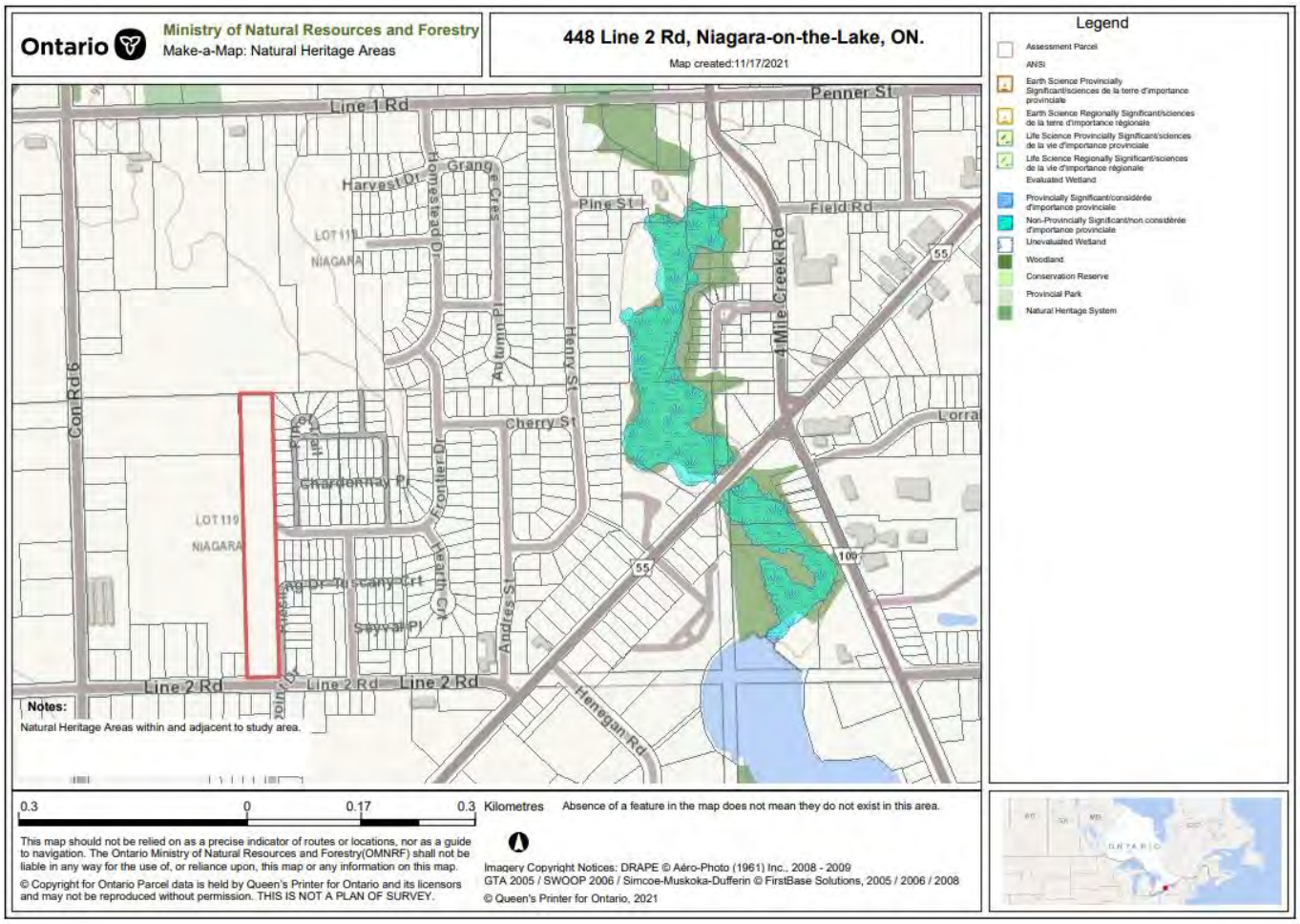
Property Information

Study Area: 448 Line 2 Rd., Niagara-on-the-Lake, Ontario

Municipality: Niagara on the Lake

Figure 1. Map of 448 Line 2 Rd., Niagara-on-the-Lake study area located within red outline

Figure 2: Natural Heritage Areas present within study area and adjacent lands



Land Designations

Areas of Natural and Scientific Interest (ANSI)

There are no Life Science ANSIs within the Subject Area.

Wetlands

There are no wetlands within the Subject Area. A non-provincially significant wetland, known as the Virgil Conservation Area Wetland Complex, is located to the east of the Subject Property.

Fish Habitat

There is no fish habitat within the Subject Property. A warm thermal regime creek known as Four Mile Creek is located to the east of the Subject Property, with fish species present.

Significant Valleylands

There are no significant valleylands found within the study area.

Woodlands

There is an unnatural/planted wooded area within the Subject Property, but no woodlands. According to NHIC, there are woodlands to the east of the Subject Property bordering the Virgil Conservation Area Wetland Complex.

Species at Risk or Locally Significant Species

Table 1. List of Locally Significant and/or SAR Species records from Subject Property and adjacent surrounding area.

Species at Risk		
Species	**Source**	**Status**
Plants		
Kansas Hawthorn *Crataegus coccinioides*	NHIC	SARO - N/A COSEWIC - N/A SARA - N/A
Insects		
Monarch *Danaus plexippus*	Butterfly Atlas (2014)	SARO- SC COSEWIC- END SARA- SC
Amphibians		
Western Chorus Frog *Pseudacris triseriata pop. 2*	ORRA (1995)	SARO- NAR COSEWIC- THR SARA- THR
Reptiles		
Midland Painted Turtle *Chrysemys picta marginat*	NHIC, ORRA (2013)	SARO- N/A COSEWIC- SC SARA- N/A
Northern Map Turtle *Graptemys geographica*	ORRA (2009)	SARO- SC COSEWIC- SC SARA- SC

Species at Risk		
Species	**Source**	**Status**
Snapping Turtle *Chelydra serpentina*	ORRA (2012)	SARO- SC COSEWIC- SC SARA- SC
Eastern Milksnake	ORRA (2014)	SARO- NAR COSEWIC- SC SARA- SC
Birds		
Bobolink *Dolichonyx oryzivorus*	OBBA	SARO- THR COSEWIC- THR SARA- THR
Chimney Swift *Chaetura pelagica*	OBBA, eBird 2013	SARO - THR COSEWIC - THR SARA - THR
Eastern Meadowlark *Sturnella magna*	NHIC, OBBA, eBird (1984)	SARO - THR COSEWIC - THR SARA - THR
Eastern Wood-pewee *Contopus virens*	OBBA, eBird (2005)	SARO - SC COSEWIC - SC SARA - SC
Bank Swallow *Riparia riparia*	OBBA, eBird 2021	SARO - THR COSEWIC - THR SARA - THR
Barn Swallow *Hirundo rustica*	OBBA, eBird (2020)	SARO - THR COSEWIC - THR SARA - THR
Wood Thrush *Hylocichla mustelina*	OBBA	SARO - SC COSEWIC - THR SARA - THR
Mammals		
Eastern Small-footed Myotis *Myotis leibii*	N/A	SARO- END COSEWIC- N/A SARA- N/A
Little Brown Myotis *Myotis lucifugus*	N/A	SARO- END COSEWIC- END SARA- END
Northern Long-eared Myotis *Myotis septentrionalis*	N/A	SARO- END COSEWIC- END SARA- END

[1]Source of species: NHIC = Natural Heritage Information Centre data; Butterfly Atlas = Ontario Butterfly Atlas; OBBA = Ontario Breeding

Bird Atlas; ORAA = Ontario Reptile and Amphibian Atlas
[2]Conservation Status: SARA = Status under federal Species at Risk Act; ESA = Status under provincial Endangered Species Act; COSEWIC = The Committee on the Status of Endangered Wildlife in Canada

References

Atlas of the Breeding Birds of Ontario. 2021. Accessed Online: https://www.birdsontario.org/atlas/

iNaturalist. 2021. Accessed Online: https://www.inaturalist.org

eBird Canada. 2021. Accessed Online: https://ebird.org/home

Land Information Ontario. 2019. GeoHub. Aquatic resource area line segment. Accessed Online: https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=43.573810%2C-79.601882%2C14.68

Ontario Butterfly Atlas. 2021. Accessed Online: http://www.ontarioinsects.org/atlas_online.htm

Ontario Moth Atlas. 2021. Accessed Online: https://www.ontarioinsects.org/moth/

Ontario Ministry of Natural Resources and Forestry (MNRF). 2021. Natural Heritage Information Center (NHIC). Accessed Online: https://www.ontario.ca/page/make-natural-heritage-area-map

Ontario Reptile & Amphibian Atlas. 2021. Accessed Online: https://www.ontarioinsects.org/herp/index.html

MECP SARB Review: Information Request 448 Line 2, Niagara-on-the-Lake

Species at Risk (MECP) <SAROntario@ontario.ca>

Fri 2022-02-04 9:18 AM

To: Devin Bettencourt <dbettencourt@nsenvironmental.com>

3 attachments (180 KB)

Bat Survey Standards Note 2021.pdf; Treed Habitats - Maternity Roost Surveys.docx; SAR Bat Building Exit and Roost Survey Protocols.docx;

Hi Devin,

The Ministry of Environment, Conservation and Parks (MECP), Species at Risk Branch (SARB) has reviewed the subject property located at 448 Line 2, Niagara-on-the-Lake and found one additional Species at Risk (SAR) occurrences which needs to be considered as part of your species list.

- Red-headed Woodpecker (*Melanerpes erythrocephalus*).

While this review represents MECP's best currently available information, it is important to note that a lack of information for a location does not mean that SAR or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in areas not previously surveyed. On-site assessments will need to be conducted to better verify site conditions, identify and confirm presence of SAR and/or their habitats.

As of January 26, 2022, Red-headed Woodpecker and its habitat receive protection under the *Endangered Species Act, 2007* (ESA). Proponents currently undertaking activities that impact the species or its habitat need to either seek a permit or an agreement in order to avoid contravening the ESA. Note that the ESA allows existing ESA permit and agreement holders to continue to operate for 12 months after a species is listed, providing them with time to seek amendments to existing permits or agreements (see section 8.2). Please also note that a proposal was posted on the Environmental Registry (#019-4280) to allow the use of existing conditional exemptions for select newly-listed species. The Environmental Registry posting will be updated when a decision has been made.

For interest sake there are a number of historic (1800's) observations of Timber Rattlesnake (*Crotalus horridus)* nearby one of which is from the war of 1812 and the comments states: reported snake bite, soldier bitten in face and died during War of 1812, reported as climbing a limestone face.

The 2021 Bat Survey Standards Note and its related protocols have been attached for your use and reference.

SARB requests that you include the coordinates of the subject property in either GPS or Latitude and Longitude in any future requests you submit failure to do so could result in delays in reviewing your request.

It is the responsibility of the proponent and their consultant to ensure that SAR are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out on the site. If the proposed activities can not avoid impacting protected species and their habitats then the proponent will need to apply for a authorization under the Endangered Species Act.

Regards,

Shamus Snell

A/ Management Biologist
Species at Risk Branch
Ministry of Environment, Conservation and Parks
Email: shamus.snell@ontario.ca

From: Devin Bettencourt <dbettencourt@nsenvironmental.com>
Sent: February 3, 2022 1:53 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Re: Preliminary Screening: Information for 448 Line 2, Niagara-on-the-Lake, Ontario.

Hello,

I just wanted to take a moment to follow-up on my previous request for a species at risk (SAR) records to complete a background review for a constraints assessment for a proposed development project for 448 Line 2 Rd. Niagara-on-the-Lake, Ontario. I have attached the Preliminary Screening document containing project background to this email (e.g., Map of Subject Property, surrounding Natural Heritage Features, and SAR screening).

Thank you,

Devin Bettencourt

north-south ENVIRONMENTAL
www.nsenvironmental.com
Devin Bettencourt
Junior Ecologist
P: 905-854-1112 • Ext. 211

From: Devin Bettencourt
Sent: November 17, 2021 3:20 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Preliminary Screening: Information for 448 Line 2, Niagara-on-the-Lake, Ontario.

Good afternoon,

I am reaching out on behalf of North-South Environmental Inc., an environmental consulting firm, to request species at risk (SAR) records to complete a background review for a constraints assessment for a proposed development project for 448 Line 2 Rd. Niagara-on-the-Lake, Ontario. The Subject Property is approximately 1.95 ha. Please refer to the attached Preliminary Screening document for more details (e.g., Map of Subject Property, surrounding Natural Heritage Features, and SAR screening list).

Thank you,

Devin Bettencourt

north-south ENVIRONMENTAL

Devin Bettencourt
Junior Ecologist

101B King Street West
Cambridge ON • N3H 1B5
www.nsenvironmental.com

dbettencourt@nsenvironmental.com
P: 905-854-1112 • Ext. 211
F: 905-954-0001

Bat Survey Standards Note 2021

The purpose of this note is to support compliance with Ontario's *Endangered Species Act, 2007* (ESA) by providing consistent and practical survey guidance for species at risk bats.

Where a project or activity is planned in a manner that pro-actively avoids adverse effects to bats (does not contravene s. 9 or s. 10 of the ESA), there is no need to conduct species at risk bat surveys. For more information on the interpretation of ESA s. 9 and s. 10 prohibitions, see Policy Guidance on Harm and Harass under the Endangered Species Act | Ontario.ca and Categorizing and Protecting Habitat under the Endangered Species Act | Ontario.ca, respectively. Ultimately, it is the proponent's responsibility to assess potential impacts of their planned activity on species at risk bats and take the appropriate steps to achieve compliance with the ESA.

Hibernacula

- Avoidance considerations: Tree clearing activities located more than 200 m from hibernacula entrances are considered unlikely to damage or destroy hibernacula. Activities producing loud noises and/or vibrations (e.g., blasting, drilling, movement of heavy equipment, etc.) that occur more than 500 m from a bat hibernaculum are unlikely to harm or harass hibernating bats.
- Protocol here (in Appendix A): https://www.ontario.ca/page/bats-and-bat-habitats-guidelines-wind-power-projects#section-4.
- Important additions and exceptions to the above protocol:
    - Bat surveys and analysis should be conducted by a person experienced with determining presence/absence of *species at risk* bats.
    - The statements *"Visual and acoustic monitoring surveys only need to be conducted until evidence of bat presence is found. Should evidence be found on the initial surveys, then further monitoring is not required"* require qualification: Identification of species at risk bats through acoustic monitoring will be necessary under a permitting scenario. The total number of passes/calls recorded for each at risk bat species over the 10 acoustic monitoring nights should be used by the proponent to assess the impact of any work or activity on the hibernacula.

Treed Habitats (Maternity and Day Roosts)

- Avoidance considerations: If a proposed activity will avoid impairing or eliminating the function of habitat for supporting bat life processes (e.g. remove, stub, etc. a small number of potential maternity or day roost trees in treed habitats) but the timing of tree removal will avoid the bat active season (April 1 – September 30 in Southern Ontario / May 1 to August 31 in Northern Ontario), then there is no need to conduct species at risk bat surveys of treed habitats. The damage and destruction assessment may vary geographically as the availability of other nearby maternity and day roost trees differs across the province of Ontario. For further guidance please contact SAROntario@ontario.ca.
- Protocol attached: "Treed Habitats – Maternity Roost Surveys"
- Important additions and exceptions to this protocol:

- In Step 1, the Ecological Land Classification (ELC) codes listed are meant to provide guidance, however any area with suitable roost trees should be considered potential maternity or day roost habitat. In areas where ELC is unavailable, the project area will need to be mapped by a qualified professional experienced in ecosite classification.
- There are numerous peer-reviewed publications demonstrating that trees measuring less than 25 cm DBH (diameter at breast height) support maternity and day roosts of little brown myotis, northern myotis and tri-colored bat. Detailed descriptions of tree species, size and age composition and physical attributes are very helpful for evaluating the value of specific treed habitats to species at risk bats.
- Step 2: Snag Density Calculations – Field visits to determine the best locations for deploying Acoustic Monitoring Systems are encouraged. However, snag density may also be calculated by following methods in Step 5: Detailed Mapping of Snag/Cavity Trees and does not necessarily need to precede acoustic monitoring (Steps 3 and 4).
- Note that Step 5: Detailed Mapping of Snag Cavity Trees is important to quantify the magnitude of impacts to bat species at risk under an ESA permitting scenario. This information may also be used to inform activity alternatives that reduce and/or completely avoid impacts to bat species at risk.
- For large projects impacting greater than 10 ha of treed habitat, we recognize following this protocol is likely not feasible. In these situations, we fully expect clients to apply some method of sampling/sub-sampling landscapes, where ELC plots, snag density calculations, and acoustic monitoring occur in randomly selected or representative locations. Information obtained from the sample may then be extrapolated to the entire project footprint to inform the evaluation of project alternatives and the final impact assessment. In cases where acoustic monitoring surveys are not performed, MECP will assume species at risk bat presence in all habitats containing potentially suitable roost trees.

Buildings and Other Anthropogenic Structures (Maternity and Day Roosts)

- If a proposed activity or project will remove or alter an anthropogenic structure in a way that would negatively affect use of the structure by species at risk bats then bat surveys are warranted. This applies whether the structure provides potential species at risk bat habitat, or was known to provide bat habitat historically. Apply professional experience to judge whether any anthropogenic structure has the potential to provide bat maternity or day roost habitat.
- Protocol attached: “SAR Bat Building Exit and Roost Survey Protocols”
    - This protocol provides minimum survey effort expectations. Surveyors may discover multiple pre- and post-volant surveys are necessary to collect accurate abundance estimates at exit points as the time when pups become volant, weather and other variables may be difficult to predict.

Maternity Roost Surveys (Forests/Woodlands)

Until comprehensive approved habitat guidance is developed for little brown myotis and northern myotis the following section outlines a recommended approach for surveying maternity roosts. Much of the information presented in this section comes from MNRF's *Bat and Bat Habitat: Guidelines for Wind Power Projects* (2011). Underlined text represents new information obtained from experts and recent scientific literature. This methodology may be considered for any development type to verify occupancy of bat maternity roosts within woodlands.
Mist netting and radio telemetry work should be considered as a last resort and is only permitted if the additional work is deemed necessary by the MNRF.

STEP 1: Identify Potential Maternity Roost Habitat

Ecological Land Classification (ELC) is an effective tool for identifying potential maternity roost habitats. As little brown myotis and northern myotis are known to form roosts in forests and swamps (Foster and Kurta, 1999), maternity roost habitat may include the following ELC communities:

0#Deciduous Forests (FOD)
0#Mixedwood Forests (FOM)
0#Coniferous Forests (FOC)
0#Deciduous Swamp (SWD)
0#Mixedwood Swamps(SWM)
0#Coniferous Swamps (SWC)

In central and northern Ontario (boreal forest) the following codes apply:
0#G/B015-019 Very Shallow: Dry to Fresh: Mixedwood/hardwood
0#G/B023-028 Very Shallow: Humid: Conifer/Mixedwood
0#G/B039-043 Dry, Sandy: Hardwood/Mixedwood
0#G/B054-059 Dry to Fresh: Coarse: Mixedwood/Hardwood
0#G/B069-076 Moist, Coarse:Mixedwood/Hardwood
0#G/B087-092 Fresh, Clayey: Mixedwood/hardwood
0#B103-108 Fresh, Silty to Fine Loamy: Mixedwood/Hardwood
0#B118-125 Moist. Fine: Mixedwood/Hardwood
0#B130-133: Swamps

STEP 2: Snag Density Calculations

Snag density is an indicator of high quality potential maternity roost habitat. When using an ELC-based method, snag density is calculated using the following procedure:

0#Select random plots across the represented area of the ELC plot.
0#Survey fixed area 12.6m radius plots (equates to 0.05ha)
0#Measure the number of snags/cavity trees ≥25cm dbh in each plot
0#Use the formula πr^2 to determine number of snags per hectare
0#Survey a minimum of 10 plots for sites ≤10 hectares and add another plot for each extra hectare up to a maximum of 35 plots.
0#Surveys are best conducted during the leaf-off period (i.e., fall to early spring) so viewing of tree cavities and crevices is not obscured by foliage.

Map locations where each snag density plot is calculated.

Record the snag density for each ELC plot.

STEP 3: Selection of Acoustic Monitoring Locations

If maternity roost habitat is identified using ELC, acoustic monitoring is recommended to determine if little brown myotis and/or northern myotis are recorded in the area.

If the snag density is calculated to be ≥10 snags/hectare then this ELC polygon should be considered high quality potential maternity roost habitat.

All high quality maternity roost habitat should be monitored to ensure full coverage of the ELC polygon.

Recommend positioning acoustic monitoring stations within 10m of a candidate roost tree. Multiple stations may be required to cover the area adequately. Most broadband acoustic detectors have a microphone range of 20-30m therefore full coverage would require 4 stations/hectare.

The best candidate roost trees are selected according to the following criteria (in order of importance):

0#Tallest snag/cavity tree
0#Exhibits cavities or crevices most often originating as cracks, scars, knot holes or woodpecker cavities
0#Has the largest diameter breast height (>25cm diameter at breast height)
0#Is within the highest density of snags/cavity trees (e.g., cluster of snags)
0#Has a large amount of loose, peeling bark
0#Cavity or crevice is high in snag/cavity tree (>10m)
0#Tree species that provide good cavity habitat (e.g., white pine, maple, aspen, ash, oak)
0#Canopy is more open (to determine canopy cover, determine the percentage of the ground covered by a vertical projection of the outermost perimeter of the natural spread of the foliage of trees); and
0#Exhibits early stages of decay (decay Class 1-3; refer to Watt and Caceres 1999).

STEP 4: Acoustic Field Data Collection

Monitoring in Ontario should occur in the evenings between June 1 and June 30. If activity is not observed at the site on the initial visit, a minimum of 10 visits should take place to confirm that the site is not maternity roost habitat.

Acoustic monitoring should begin at dusk and continue for 5 hours, for up to 10 nights, or until the maternity roost habitat is confirmed.

Surveys should occur on warm/mild nights (i.e., ambient temperature above approximately 10°C) with low winds and no precipitation.

Acoustic monitoring should use modern broadband bat detectors (these may be automated systems in conjunction with computer software analysis packages or manual devices) with condenser microphones.

Acoustic monitoring systems should allow the observer to determine the signal to noise ratio of the recorded signal (e.g., from oscillograms or time-amplitude displays). These systems provide information about signal strength and increase the quality and accuracy of the data being analyzed.

Microphones should be positioned to maximize bat detection (e.g., microphone(s) situated away from nearby obstacles to allow for maximum range of detection, microphone(s) angled slightly away from the prevailing wind to minimize wind noise).

It is recommended that the same brand and/or model acoustic recording system be used throughout the survey (if multiple devices are required), as the type of system may influence detection range/efficiency. If different systems must be used, this variation should be quantified.

Information on the equipment used should be recorded, including information on all adjustable settings (e.g., gain level), the position of the microphones, dates and times by station when recoding was conducted.

STEP 5: Detailed Mapping of Snag/Cavity Trees

The following considerations are recommended to identify the presence of potential maternity roost habitat:

The presence of SAR bats through acoustic monitoring

Quality of potential habitat through snag density

Potential habitat as a whole (e.g., through ELC polygon delineation)

Where proponents intend to build within the potential habitat as a whole it is recommended that proponents map the location of the highest quality habitat by delineating locations of candidate roost trees.

The following procedure is recommended for mapping maternity roost habitat:

0#All surveys should be done during leaf-off

0#All surveys should be conducted with binoculars

0#Walk transects 20m apart throughout the entire polygon in open woodlands with good visibility

0#Walk transects 5m apart throughout the entire polygon in woodlands with coniferous understory or poor visibility

0#Plot all snags/cavity trees using a GPS and noting characteristics (refer to criteria in STEP 3)

0#Conduct surveys only on days with no precipitation and not after recent snowfall

After the snags/cavity trees are mapped and the best quality trees are identified (refer to criteria in Step 3), bat habitat eco-elements (e.g., clusters of the best quality trees) may be identified and may assist in determining if avoidance of those eco-elements is appropriate to address negative impacts.

July 26, 2018

Use of Buildings by Species at Risk Bats
Survey Methodology

This survey methodology is adapted from the methodology described in the MNRF publication “Bats and Bat Habitats: Guidelines for Wind Power Projects” (July 2011), with appropriate modifications for surveying a building. The methodology consists of an “Exit Survey”, whereby use of a building is surveyed by detecting bats as they exit the structure in the early evening to forage.

Buildings that have the potential to be used as maternity roosts by bats should be monitored for evidence of Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis and Tri-colored bats through exit surveys, as follows:

- Bat surveys and data analysis should be conducted by a qualified professional with experience in bat identification and monitoring.
- For presence/absence exit surveys should be conducted during the month of **June**. July is less suitable, but surveys can be done to the end of July if necessary. Caution proponents conducting maternity surveys into mid – late July, as maternity colonies begin to disperse at this point and the risk of false negative increases.
- If the intent of the survey is also to determine numbers then a pre-volant survey should be conducted in June and a post-volant survey in early to mid-July. Refer to the Ontario protocol for citizen science for exit surveys for recommended time periods
- Investigate structures and conduct a preliminary survey prior to conducting exit surveys to identify exit points (i.e., peak of roof, vents near roofline, under soffit or where fascia meets roofline, etc.).
- Several surveyors may be needed to cover all possible exits. Where it is not feasible to have multiple surveyors monitoring all exit points, infrared cameras may be supplemented to monitor some exit points.
- A hand held heterodyne bat detector should be used in conjunction with visual surveys assist in a more accurate count of bats exiting the building. The bat detector should be set between **40-45 kHz** for myotis species.
- Full spectrum acoustic monitoring equipment should be used to identify the species of bats.
- A hand-held counter may be useful for each observer to track the number of bats observed.
- Each candidate roost should be monitored on two separate evenings under appropriate weather conditions (i.e., temperature **above 15 degrees Celsius, when sky is 3 or less and wind code is 2 or less,** as described in the table below)**.**

SKY	WIND

CODE	DESCRIPTION
1	Clear-Clear to a few clouds
2	Partly Cloudy-Clouds but variable sky conditions
3	Cloudy-Mostly cloudy or overcast
4	Drizzle-Light intermittent rain
5	Showers-Steady soaking rain
6	Thunderstorms-Rain with thunderstorms

CODE	DESCRIPTION	~Speed
0	Smoke rises vertically	<2 km/h
1	Wind direction shown by smoke drift	2-5 km/h
2	Wind felt on face; leaves rustle	6-12 km/h
3	Leaves, small twigs in constant motion	13-19 km/h
4	Raises dust and loose paper; small branches move	20-29 km/h
5	Small trees in leaf sway; crested wavelets on inland waters	30-38 km/h

Sky codes of 1 – 3 and wind codes 0-2 are best. Surveying when codes are higher, may be deemed inconclusive resulting in the need for further studies.

- Prepare for exit counts before sunset. Surveyors should be positioned for easy viewing of bats exiting. The best position is to have the bats silhouetted against the sky.
- Bats typically begin exiting approximately 30 minutes after sunset but surveyors should be ready to start the survey by sunset.
- Count each bat that exits the structure. Continue the survey for one hour after the first emergence or longer if bats continue to emerge. Record the total number of bats observed exiting. It is important to note that many bats will be heard on the heterodyne detector and not visually observed but they can be included in the count if the surveyor is confident that the bat is exiting and not flying by.
- The total number of bats **counted exiting** provide an estimate of colony size (if multiple openings, add estimates from each opening for total estimate). Any bats observed re-entering the structure should be recorded.

Information that should be collected:

- Date
- Start and end time of survey
- Temperature
- Wind and sky condition
- Species present
- # of exit points monitored
- Numbers counted
- Names of surveyors

Option B –Roosting Estimates

Where direct access to the structure is available and a count of the bats can be conducted without handling (i.e., bats in bat box can be counted by shining a flashlight inside and counting), these roost estimates may be completed during daylight in June.

Count the number of bats present in the roost. Record the total number of bats counted.

Determine the species (if you cannot determine the species visually you may need to leave an acoustic detector overnight to verify species).

Recommend taking photographs of groups of bats to allow for more accurate counts.

From:	Boudens, Adam
To:	Leanne Wallis
Cc:	Alderman, Aimee; Karlewicz, Lori; Lampman, Cara
Subject:	RE: 448 Line 2, Niagara on the Lake - Terms of Reference - Draft for Review
Date:	Thursday, January 13, 2022 12:11:24 PM
Attachments:	image003.png 448 Line 2 Terms of Reference DRAFT Jan 12 2022.pdf 448 Line 2, NOTL_ Niagara Region EIS Scoping Checklist.pdf

Hi Leanne,

Environmental Planning staff have reviewed the Terms of Reference prepared for the subject lands located at 448 Line 2, NOTL, and offer no objection to the proposed scope of work.

Please don't hesitate to contact me with any questions or concerns as you prepare the Constraints Analysis.

Kind regards,
Adam

Adam Boudens
Senior Environmental Planner/Ecologist

Planning and Development Services, Niagara Region
1815 Sir Isaac Brock Way, P.O. Box 1042
Thorold, ON L2V 4T7
Phone: **905-980-6000 ext. 3770** Toll-free: 1-800-263-7215
Adam.Boudens@niagararegion.ca

From: Leanne Wallis <lwallis@nsenvironmental.com>
Sent: Thursday, January 13, 2022 9:25 AM
To: Boudens, Adam <Adam.Boudens@niagararegion.ca>
Subject: 448 Line 2, Niagara on the Lake - Terms of Reference - Draft for Review

Good morning Adam-

NSE has prepared a draft Terms of Reference for the constraints assessment at 448 Line 2, Niagara on the Lake. We have based this on the scoping checklist previously provided by Niagara Region (attached for convenience), and based on a review of the EIS

guidelines for Niagara Region.

We would appreciate your review and commentary as to whether Niagara Region is in agreement with the scope of work.

Have a great day,
Leanne

north-south ENVIRONMENTAL
101B King Street West
Cambridge ON • N3H 1B5
www.nsenvironmental.com

Leanne Wallis, B.A.
Senior Ecologist
lwallis@nsenvironmental.com
P: 905-854-1112 • Ext. 201

From: Leanne Wallis
To: "adam.boudens@niagararegion.ca"
Subject: 448 Line 2, Niagara on the Lake - Terms of Reference - Draft for Review
Date: Thursday, January 13, 2022 9:25:00 AM
Attachments: image001.png
448 Line 2 Terms of Reference DRAFT Jan 12 2022.pdf
448 Line 2, NOTL _ Niagara Region EIS Scoping Checklist.pdf

Good morning Adam-

NSE has prepared a draft Terms of Reference for the constraints assessment at 448 Line 2, Niagara on the Lake. We have based this on the scoping checklist previously provided by Niagara Region (attached for convenience), and based on a review of the EIS guidelines for Niagara Region.

We would appreciate your review and commentary as to whether Niagara Region is in agreement with the scope of work.

Have a great day,
Leanne

north-south ENVIRONMENTAL
101B King Street West
Cambridge ON • N3H 1B5
www.nsenvironmental.com

Leanne Wallis, B.A.
Senior Ecologist
lwallis@nsenvironmental.com
P: 905-854-1112 • Ext. 201

APPENDIX 3 | Terms of Reference

January 2022

448 Line 2, Niagara-on-the-Lake, ON.

Terms of Reference for Natural Heritage Constraints Assessment

Prepared for

Otto and Marlene Hiebert

north-south ENVIRONMENTAL

North-South Environmental Inc. • 101B King Street West • Cambridge, Ontario • N3H 1B5

Project Study Team

North-South Environmental Inc.
Kristen Harrison – Project Manager
Leanne Wallis – Senior Ecologist
Devin Bettencourt – Junior Ecologist

Table of Contents

List of Figures

Approved Terms of Reference for Natural Heritage Constraint Assessment for 448 Line 2, Niagara-on-the-Lake, Ontario.

1. Introduction

1.1. Overview

North-South Environmental Inc. (NSE) has been retained to complete a Natural Heritage Constraints Assessment to inform potential development opportunities at 448 Line 2, Niagara-on-the-Lake, Ontario (herein referred to as the 'Subject Property'). The purpose of the Constraints Assessment is to:

- Identify relevant policies and regulations
- Conduct a literature review and baseline data assessment
- Define the natural heritage and hydrologic systems
- Characterize the existing conditions
- Assess ecological and hydrological features and functions
- Present a constraint map, and analysis of constraints, and recommendations

The Terms of Reference (ToR) presented here will ensure that the Constraint Assessment satisfies the Niagara Region Environmental Impact Study Guidelines (2018). The ToR defines the necessary studies to be completed to support characterization of the Subject Property and inform the analysis of potential constraints. In preparing the ToR, NSE conducted a preliminary review of natural heritage features on and adjacent to the Subject Property based on background resources, including:

- Niagara-on-the-lake Official Plan Schedules
- Land Information Ontario (LIO)
- Species databases (Natural Heritage Information Centre (NHIC), iNaturalist, eBird, Ontario Breeding Bird Atlas, Ontario Reptile and Amphibian Atlas, Ontario Butterfly Atlas, and Ontario Moth Atlas)
- Aerial imagery of the study area

Additionally, relevant policies have been reviewed, most importantly the Niagara-on-the-Lake Official Plan (2017) and the Provincial Policy Statement (PPS) (2020). Other legislation reviewed included the *Species at Risk Act* (2002), *Endangered Species Act* (2007).

1.2. Study Area

The study area for the Constraints Assessment will include the Subject Property as well as natural features within 120 m of the Subject Property (see **Figure 1**). The area of the Subject Property is approximately 1.95 ha. The Constraints Assessment will inform potential development opportunities for the Subject Property.

Figure 1. Subject Property Boundary

2. Constraints Assessment Table of Contents

2.1. Introduction

The introduction will give a brief overview of the study area, the proposed development and the triggers for a Constraints Assessment. The introduction will include:

- Description of the Subject Property (e.g., natural features and areas, land covers, existing hard surfaces, buildings, etc.);
- Site context and study area; and
- A map of the Subject Property with recent aerial imagery.

2.2. Policy and Legislative Framework

This section will provide a detailed overview of the federal, provincial and municipal policies and legislation as well as NPCA policies and regulations which apply to the Subject Property.

2.3. Baseline Data Assessment

A review of background materials pertaining to the natural heritage features and functions in the study area will be completed. Background sources will include, but will not necessarily be limited to:

- The Natural Heritage Information Centre (NHIC) Natural Heritage Areas mapping application provided by the Ontario Ministry of Natural Resources and Forestry (MNRF)
- Geospatial data from Land Information Ontario (LIO)
- Species atlases and citizen science databases including: Atlas of the Breeding Birds of Ontario (OBBA), iNaturalist, eBird, Ontario Reptile & Amphibian Atlas (ORRA), Ontario Butterfly Atlas (OBA), and Ontario Moth Atlas (OMA)

NSE may consult with NPCA, MNRF and MECP to obtain information about natural heritage features in the study area.

2.4. Defining the Natural Heritage and Hydrologic Systems

This section will provide detailed descriptions of the natural heritage features and hydrologic features and functions in the study area. Information provided in this section will be based on a combination of baseline data assessment, as described above, and field investigations, as described in the following sections.

2.5. Existing Conditions

2.5.1. Site Overview

The physical setting of the site; past and present land use; and its physiography, geology, and surficial soils will be discussed.

2.5.2. Biophysical Inventory

The completion of biophysical inventory to describe vegetation communities and wildlife presence on the Subject Property or adjacent lands will include field Vegetation Communities (Ecological Land

Classification), Botanical Inventory, Breeding Bird Surveys and Bat Habitat Assessment. A detailed description of methods used for fieldwork undertaken will be discussed.

2.5.2.1. Vegetation Communities and Botanical Inventory

NSE will assess vegetation communities in the study area using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al., 1998). Concurrently, a single-season botanical inventory will be conducted. A map of vegetation communities and a species list that occur within the Subject Property will be provided in the appendix. Any SAR, provincially rare species, or locally significant species observed will be documented.

2.5.2.2. Wildlife and Wildlife Habitat

Bat Habitat Assessment

NSE will conduct Bat Habitat assessment during 'leaf-off' conditions in October/November 2021 to assess potential maternity roosting habitat for bats and will inform whether acoustic surveys for baths will be required. If Bat Habitat assessment indicated suitable habitat exists to support bat maternity habitat, acoustic surveys may be required.

Breeding Bird Survey

NSE will conduct Breeding Bird surveys using the Ontario Breeding Bird Atlas protocol to develop a list of birds which breed in the study area. Any SAR, provincially rare species, or locally significant species observed will be documented. Two visits will be conducted in Spring/Summer of 2022, separated by at least 14 days. Five-minute point counts will be conducted at the same points on each visit. Breeding codes will be assigned to each bird species observed using the Ontario Breeding Bird Atlas standard codes and the probability of breeding will be determined (e.g., Confirmed, Probable or Possible).

Other Wildlife Surveys

No other formal wildlife surveys are proposed as there is only a limited amount of habitat present. All wildlife observed incidentally during field investigations will be documented and included in the constraints assessment.

Species at Risk and Species at Risk Habitat

NSE will complete a SAR screening for the study area and provide the screening table as an appendix to the Constraints Assessment. The SAR screening will involve compiling a list of SAR with potential to occur within the study area based on the background resources described above. Habitat requirements for these species will be determined from authoritative sources and the probability that SAR could occur in the study area will be assessed. If SAR are confirmed to occur in the study area or

are determined to have a high probability of occurrence, regulated habitat for these species will be clearly identified.

Significant Wildlife Habitat

NSE will complete a SWH screening for the study area using the SWH Criteria Schedules for Ecoregion 7E (MNRF, 2015) and will be provided as an appendix to Constraint Assessment. The SWH screening will involve identifying indicator species, vegetation communities and other features in the study area which satisfy the criteria for candidate SWH. If candidate SWH is identified, appropriate mitigation measures will be discussed with the assumption that this wildlife habitat could be present adjacent to the subject property.

Aquatic Habitat Assessment

No surveys needed as there are no known aquatic features within the Subject Property or adjacent lands.

2.5.2.3. Natural Hazards

If applicable, natural hazards (e.g., hazard lands, floodplains, etc.) will be discussed here.

2.6. Assessment of Features and Functions

This section will identify and characterize natural heritage and hydrologic features and functions within the study area.

2.7. Constraints Map

The constraints map will identify any applicable natural heritage constraints and buffer requirements and regulated areas.

2.8. Constraints Analysis and Recommendations

Constraints and opportunities for development on the Subject Property will be assessed. This will include recommendations for minimum buffer zones and / or setbacks around natural heritage features. This section will provide a discussion of the constraints map and identify differing levels of constraints.

References

Cadman, M.D. et al. (eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Port Rowan. 706 pp.

Niagara-on-the-Lake (NOTL). 2017. Town of Niagara-on-the-Lake Official Plan. As Amended to July 17, 2017.

Niagara Region. 2018. Environmental Impact Study Guidelines.

Niagara Region. 2014. Official Plan.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide

Ministry of Municipal Affairs and Housing. 2020. Provincial Policy Statement. 50 pp.

Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide.

Ministry of Natural Resources (MNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. 245 pp.

Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. 38 pp.

Ministry of Natural Resources and Forestry (MNRF). 2022. Natural Heritage Information Center (NHIC). Accessed Online: https://www.ontario.ca/page/make-natural-heritage-area-map.

APPENDIX 4 | Species Lists

A4-1. Plant Inventory List.

Phylo Order	Family Scientific	Scientific Name	Common Name	Introduced	G Rank	S Rank	COSEWIC	SARO	SARA	CUP3	Manicured	Niagara (2017)
740	Sapindaceae	*Acer platanoides*	Norway Maple	TRUE	GNR	SNA				x		IX
740	Sapindaceae	*Acer x freemanii*	Freeman's Maple	FALSE	GNA	SNA					x	hyb
883	Lamiaceae	*Ajuga reptans*	Creeping Bugleweed	TRUE	GNR	SNA				x		IR
770	Brassicaceae	*Alliaria petiolata*	Garlic Mustard	TRUE	GNR	SE5				x		IC
	Amaranthaceae	*Amaranthus sp.*	Amaranth	FALSE						x		
904	Asteraceae	*Ambrosia artemisiifolia*	Common Ragweed	FALSE	G5	S5				x	x	C
904	Asteraceae	*Ambrosia trifida*	Great Ragweed	FALSE	G5	S5				x		C
904	Asteraceae	*Arctium minus*	Common Burdock	TRUE	GNR	SNA					x	IC
856	Apocynaceae	*Asclepias syriaca*	Common Milkweed	FALSE	G5	S5				x	x	C
574	Asparagaceae	*Asparagus officinalis*	Garden Asparagus	TRUE	G5?	SNA				x		IC
603	Poaceae	*Bromus inermis*	Smooth Brome	TRUE	G5	SNA				x		IC
655	Juglandaceae	*Carya ovata var. ovata*	Shagbark Hickory	FALSE	G--T5	S5					x	C
878	Bignoniaceae	*Catalpa speciosa*	Northern Catalpa	TRUE	G4?	SNA					x	IR
795	Caryophyllaceae	*Cerastium arvense*	Field Chickweed	FALSE	G5	S4				x	x	
606	Papaveraceae	*Chelidonium majus*	Greater Celadine	TRUE	GNR	SNA				x		IC
797	Amaranthaceae	*Chenopodium album*	Common Lamb's-quarters	TRUE	G5	SNA				x		IC
904	Asteraceae	*Cichorium intybus*	Wild Chicory	TRUE	GNR	SNA				x		IC
716	Onagraceae	*Circaea canadensis subsp. canadensis*	Canada Enchanter's Nightshade	FALSE	G5TNR	S5				x		C
904	Asteraceae	*Cirsium arvense*	Canada Thistle	TRUE	G5	SNA				x	x	IC
904	Asteraceae	*Cirsium vulgare*	Bull Thistle	TRUE	GNR	SNA				x		IC
603	Poaceae	*Dactylis glomerata*	Orchard Grass	TRUE	GNR	SNA				x	x	IC
916	Apiaceae	*Daucus carota*	Wild Carrot	TRUE	GNR	SNA				x	x	IC
603	Poaceae	*Elymus repens*	Quackgrass	TRUE	GNR	SNA				x	x	IC
561	Orchidaceae	*Epipactis helleborine*	Braod-leaved Helleborine	TRUE	GNR	SNA				x		IC
904	Asteraceae	*Erigeron canadensis*	Canada Horseweed	FALSE	G5	S5					x	C
866	Oleaceae	*Fraxinus americana*	White Ash	FALSE	G5	S4				x		C
866	Oleaceae	*Fraxinus pennsylvanica*	Red Ash	FALSE	G5	S4				x		C
852	Rubiaceae	*Galium mollugo*	Smooth Bedstraw	TRUE	GNR	SNA				x	x	IC
643	Rosaceae	*Geum aleppicum*	Yellow Avens	FALSE	G5	S5				x		C
883	Lamiaceae	*Glechoma hederacea*	Ground-ivy	TRUE	GNR	SNA					x	IC
904	Asteraceae	*Hieracium sp.*	Hawkweed	FALSE	GNR	S?				x	x	
686	Hypericeae	*Hypericum perforatum subsp. perforatum*	Common St. John's-wort	TRUE	GNR	SE5				x		IC
655	Juglandaceae	*Juglans nigra*	Black Walnut	FALSE	G5	S4?				x		C
655	Juglandaceae	*Juglans regia*	English Walnut	TRUE	GNR	SNA				x		
904	Asteraceae	*Lactuca serriola*	Prickly Lettuce	TRUE	GNR	SNA					x	IC
640	Fabaceae	*Melilotus albus*	White Sweet-clover	TRUE	G5	SNA					x	IC

Phylo Order	Family Scientific	Scientific Name	Common Name	Introduced	G Rank	S Rank	COSEWIC	SARO	SARA	CUP3	Manicured	Niagara (2017)
650	Moraceae	*Morus alba*	White Mulberry	TRUE	GNR	SNA				x	x	IC
671	Oxalidaceae	*Oxalis stricta*	European Wood-sorrel	FALSE	G5	S5					x	C
636	Vitaceae	*Parthenocissus quinquefolia*	Virginia Creeper	FALSE	G5	S4?				x	x	U
407	Pinaceae	*Picea pungens*	Blue Spruce	TRUE	G5	SNA				x	x	
904	Asteraceae	*Pilosella aurantiaca*	Orange Hawkweed	TRUE	GNR	SNA				x		IU
904	Asteraceae	*Pilosella piloselloides*	Tall Hawkweed	TRUE	GNR	SNA				x		
407	Pinaceae	*Pinus resinosa*	Red Pine	FALSE	G5	S5				x		IR
407	Pinaceae	*Pinus strobus*	Eastern White Pine	FALSE	G5	S5				x		C
870	Plantaginaceae	*Plantago lanceolata*	English Plantain	TRUE	G5	SNA				x	x	IC
870	Plantaginaceae	*Plantago major*	Common Plantain	TRUE	G5	SNA				x	x	IC
603	Poaceae	*Poa nemoralis*	Eurasian Woodland Bluegrass	TRUE	GU	SNA				x		IC
603	Poaceae	*Poa pratensis*	Kentucky Bluegrass	FALSE	G5	S5				x	x	
643	Rosaceae	*Potentilla recta*	Sulphur Cinquefoil	TRUE	GNR	SNA					x	IC
643	Rosaceae	*Prunus cerasifera*	Cherry Plum	TRUE	GNR	SNA				x		IR
	Pinaceae	*Pseudotsuga menziesii*	Douglas Fir	FALSE						x		
647	Rhamnaceae	*Rhamnus cathartica*	European Buckthorn	TRUE	GNR	SNA				x	x	IC
739	Anacardiaceae	*Rhus typhina*	Staghorn Sumac	FALSE	G5	S5					x	C
643	Rosaceae	*Rosa multiflora*	Multiflora Rose	TRUE	GNR	SNA				x		IC
783	Polygonaceae	*Rumex crispus*	Curled Dock	TRUE	GNR	SNA				x		IC
603	Poaceae	*Setaria pumila subsp. pumila*	Yellow Foxtail	TRUE	GNRTNR	SE5				x		IC
860	Solanaceae	*Solanum dulcamara*	Bittersweet Nightshade	TRUE	GNR	SNA				x	x	IC
904	Asteraceae	*Solidago canadensis*	Canada Goldenrod	FALSE	G5	S5				x	x	
904	Asteraceae	*Solidago sp.*	Goldenrod	FALSE	GNR	S?				x	x	
904	Asteraceae	*Symphyotrichum novae-angliae*	New England Aster	FALSE	G5	S5				x		C
904	Asteraceae	*Symphyotrichum pilosum*	Old Field Aster	FALSE	G5	S5				x		
904	Asteraceae	*Taraxacum officinale*	Common Dandelion	TRUE	G5	SNA				x	x	IC
640	Fabaceae	*Trifolium pratense*	Red Clover	TRUE	GNR	SNA				x		IX
640	Fabaceae	*Trifolium repens*	White Clover	TRUE	GNR	SNA				x	x	IX
871	Scrophulariaceae	*Verbascum thapsus subsp. thapsus*	Great Mullein	TRUE	GNR	SE5				x		IC
640	Fabaceae	*Vicia sp. cf americana var. americana*	Vetch sp							x		
640	Fabaceae	*Vicia cracca*	Tufted Vetch	TRUE	GNR	SNA				x	x	IC
636	Vitaceae	*Vitis riparia*	Riverbank Grape	FALSE	G5	S5				x	x	C

A4-2. Wildlife List.

Taxa	Scientific Name	Common Name	Exotic	G Rank	S Rank	Bird Breeding	COSEWIC Status	SARA	SARO	Area Sensitive	CUP3	Manicured	Niagara (2010)
Bird	*Spinus tristis*	American Goldfinch		G5	S5B	PO				FALSE	x	x	C
Bird	*Turdus migratorius*	American Robin		G5	S5B	C				FALSE	x	x	C
Bird	*Hirundo rustica*	Barn Swallow		G5	S4B	O	SC	THR	THR	FALSE	x		C
Bird	*Poecile atricapillus*	Black-capped Chickadee		G5	S5	PO				FALSE	x	x	C
Bird	*Cyanocitta cristata*	Blue Jay		G5	S5	PO				FALSE		x	C
Bird	*Branta canadensis*	Canada Goose		G5	S5	O				FALSE	x		C
Bird	*Spizella passerina*	Chipping Sparrow		G5	S5B	PO				FALSE	x		C
Bird	*Quiscalus quiscula*	Common Grackle		G5	S5B	C				FALSE	x	x	C
Bird	*Junco hyemalis*	Dark-eyed Junco		G5	S5B	PO				FALSE	x	x	C
Bird	*Spizella pusilla*	Field Sparrow		G5	S4B	O				FALSE		x	U
Bird	*Haemorhous mexicanus*	House Finch	SE	G5	SNA	PO				FALSE	x	x	C
Bird	*Passer domesticus*	House Sparrow	SE	G5	SNA	PO				FALSE	x	x	C
Bird	*Charadrius vociferus*	Killdeer		G5	S5B, S5N	PO				FALSE	x		C
Bird	*Zenaida macroura*	Mourning Dove		G5	S5	PO				FALSE	x	x	C
Bird	*Cardinalis cardinalis*	Northern Cardinal		G5	S5	PO				FALSE	x		C
Bird	*Agelaius phoeniceus*	Red-winged Blackbird		G5	S4	PO				FALSE	x		C
Bird	*Passerculus sandwichensis*	Savannah Sparrow		G5	S4B, S3N	PO				TRUE	x		C
Bird	*Melospiza melodia*	Song Sparrow		G5	S5B	PO				FALSE	x		C
Mammal	*Sylvilagus floridanus*	Eastern Cottontail		G5	S5					FALSE	x		
Mammal	*Sciurus carolinensis*	Eastern Gray Squirrel		G5	S5					FALSE	x		

APPENDIX 5 | Species At Risk Screening Table

Species at Risk							
Species	**Source**	**Status**	**Habitat Description**	**Habitat Present on Site**	**Surveys Conducted**	**Probabilty of Occurrence and Rationale**	**Potential to be Impacted by Proposed Activities**
Plants							
Butternut *Juglans cinerea*	iNaturalist	SARA-END ESA- END	Deciduous forests with moist, well-drained soil. Often found along streams and on well drained gravel sites. (OMNR, 2013)	NO - No deciduous forest present.	Three flora surveys	NONE	NONE - Species is not present.
Eastern Flowering Dogwood *Cornus florida*	iNaturalist	SARA-END ESA- END	Sandy, deciduous woods (NHIC, 2022)	NO - No deciduous forest present.	Three flora surveys	NONE	NONE - Species is not present.
Cucumber Tree *Magnolia acuminata*	iNaturalist	SARA-END ESA- END	Rich, deciduous woods (NHIC, 2022)	NO - No deciduous forest present.	Three flora surveys	NONE	NONE - Species is not present.
Insects							
Monarch *Danaus plexippus*	Butterfly Atlas (2014)	SARO- SC COSEWIC- END SARA- SC	Breeding habitat is confined to where milkweed grows, since the leaves of these plants are the sole food of the caterpillars. Different species of milkweed grow in a variety of environments, including meadows, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairies, river banks, irrigation ditches, arid valleys and south facing hillsides. Nectaring habitat ranges from native grasslands to home gardens with adult butterflies nectaring on a wide variety of flowers including Goldenrods, Asters and Milkweeds. (Environment Canada 2014)	MARGINAL- Common Milkweed present on the Subject Site and adjacent lands in low abundance.	Three incidental wildlife surveys	POSSIBLE - While not observed, the larval host plant is present in low abudance, and there are nectaring plants present, though these are limited	LOW - There is some potential for adult or larval Monarch to be impacted by the proposed development during land clearing. There is also potential for post-development reduction in habitat, though habitat loss can be mitigated, or habitat can actually be enhanced post-construction with design considerations.
Yellow-banded Bumblebee *Bombus terricola*	iNaturalist	SARO- SC COSEWIC- END SARA- SC	Species nests in holes in the ground, is a habitat generalist. (Government of Ontario, 2022)	MARGINAL- Nectaring species are in low abundance, property is relatively small.	Three incidental wildlife surveys	POSSIBLE - While not observed, there are nectaring plants present, though these are limited	LOW - There is some potential for Yellow-banded Bumblebee to be impacted by the proposed development during land clearing. There is also potential for post-development reduction in habitat, though habitat loss can be mitigated, or habitat can actually be enhanced post-construction with design considerations.
Amphibians							
Western Chorus Frog *Pseudacris triseriata pop. 2*	ORRA (1995)	SARO- NAR COSEWIC- THR SARA- THR	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools (OMNR 2000).	NO- No wetlands are present on the Subject Property. The nearest waterbody is over half a kilometer away.	Three incidental wildlife surveys	NONE	NONE - Species is not present.
Reptiles							

Midland Painted Turtle *Chrysemys picta marginat*	NHIC, ORRA (2013)	SARO- N/A COSEWIC- SC SARA- N/A	Quiet, warm, shallow water with abundant aquatic vegetation such as ponds, large pools, streams, ditches, swamps, marshy meadows; eggs are laid in sandy places, usually in a bank or hillside, or in fields; basks in groups; not territorial (OMNR 2000).	NO- No wetlands present on the Subject Property.	Three incidental wildlife surveys	NONE	NONE - Species is not present.
Northern Map Turtle *Graptemys geographica*	ORRA (2009)	SARO- SC COSEWIC- SC SARA- SC	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water; home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas; aquatic corridors (e.g. stream) are required for movement; not readily observed (OMNR 2000).	NO- No wetlands present on the Subject Property.	Three incidental wildlife surveys	NONE	NONE - Species is not present.
Snapping Turtle *Chelydra serpentina*	ORRA (2012)	SARO- SC COSEWIC- SC SARA- SC	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha (OMNR 2000).	NO- No wetlands present on the Subject Property.	Three incidental wildlife surveys	NONE	NONE - Species is not present.
Eastern Milksnake	ORRA (2014)	SARO- NAR COSEWIC- SC SARA- SC	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites (OMNR 2000).	YES- Adjacent habitats include farmlands and meadow. Outbuildings are present.	Site Recon/ Fall Flora	LOW - Habitat is marginal, and limited. Species is uncommon on the local landscape. Not encountered incidentally during field surveys.	LOW - Species is unlikely to be present.
Birds							
Bobolink *Dolichonyx oryzivorus*	OBBA	SARO- THR COSEWIC- THR SARA- THR	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha (OMNR 2000).	NO- No habitat on the subject property. Adjacent habitats include farmland,; however this is primarily plantation, orchard, tree farm and vineyard. No open fields exists within 120m that would satisfy the size requirements of this species.	Two breeding bird surveys	NONE	NONE - Species is not present.

Chimney Swift *Chaetura pelagica*	OBBA, eBird 2013	SARO - THR COSEWIC - THR SARA - THR	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water (OMNR 2000).	YES- Residence on Subject Property and adjacent lands have chimneys.	Two breeding bird surveys	LOW - The chimney on the subject property is capped. Limited breeding habitat present (mature trees). Species not observed as a breeder or as a forager during site visits.	LOW - Species is unlikely to be present. Trees are recommended to be removed outside of the active bird season.
Eastern Meadowlark *Sturnella magna*	NHIC, OBBA, eBird (1984)	SARO - THR COSEWIC - THR SARA - THR	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size (OMNR 2000).	NO- No habitat on the subject property. Adjacent habitats include farmland,; however this is primarily plantation, orchard, tree farm and vineyard. No open fields exists within 120m that would satisfy the size requirements of this species.	Two breeding bird surveys	NONE	NONE - Species is not present.
Eastern Wood-pewee *Contopus virens*	OBBA, eBird (2005)	SARO - SC COSEWIC - SC SARA - SC	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks (OMNR 2000).	NO - No forest is present.	Two breeding bird surveys	NONE	NONE - Species is not present.
Bank Swallow *Riparia riparia*	OBBA, eBird 2021	SARO - THR COSEWIC - THR SARA - THR	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence (OMNR 2000).	Two breeding bird surveys	Two breeding bird surveys	NONE	NONE - Species is not present.
Barn Swallow *Hirundo rustica*	OBBA, eBird (2020)	SARO - THR COSEWIC - THR SARA - THR	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water (OMNR 2000).	YES- Outbuildings and a residence are present on the Subject Property and building occurs on adjacent lands within 120m.	Two breeding bird surveys. Barn Swallow observed foraging over the field north of the subject property.	**CONFIRMED (off-property)** - No evidence or breeding use on the subject property. Foraging individuals were observed within 120 m of the subject property, but not on the subject property.	LOW - No confirmed breeding habitat is present on the subject property. No expected impact to foraging individuals that may occasionally use the subject property. Recommended mitigation (timing window) will avoid active bird season.
Wood Thrush *Hylocichla mustelina*	OBBA	SARO - SC COSEWIC - THR SARA - THR	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m (OMNR 2000).	NO - No forest is present.	Two breeding bird surveys	NONE	NONE - Species is not present.
Mammals							

Eastern Small-footed Myotis *Myotis leibii*	Bat Conservation International Mapping	SARO- END COSEWIC- N/A SARA- N/A	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests (OMNR 2000).	YES- Buidlings exist on the Subject Property that may be suitable roosting habitat or for maternity colonies.	Bat Habitat Assessment (Maternity Roosts)	LOW-Potential habitat in two outbuildings on the subject property, though only minor gaps present along the roof line and uncertain if bats could gain entry.	LOW - Species is unlikely to be present. Buildings are recommended to be removed outside of the active bat season.
Little Brown Myotis *Myotis lucifugus*	Bat Conservation International Mapping	SARO- END COSEWIC- END SARA- END	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges (OMNR 2000).	YES- Buidlings and trees exist on the Subject Property that may be suitable roosting habitat or maternity colonies.	Bat Habitat Assessment (Maternity Roosts)	LOW-Potential habitat in two outbuildings on the subject property, though only minor gaps present along the roof line and uncertain if bats could gain entry. Two mature Freeman's Maples present that could provide maternity roost habitat.	LOW - Species is unlikely to be present. Buildings and trees are recommended to be removed outside of the active bat season.
Northern Long-eared Myotis *Myotis septentrionalis*	Bat Conservation International Mapping	SARO- END COSEWIC- END SARA- END	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy (OMNR 2000).	YES- Buidlings and trees exist on the Subject Property that may be suitable roosting habitat or maternity colonies.	Bat Habitat Assessment (Maternity Roosts)	LOW-Potential habitat in two outbuildings on the subject property, though only minor gaps present along the roof line and uncertain if bats could gain entry. Two mature Freeman's Maples present that could provide maternity roost habitat.	LOW - Species is unlikely to be present. Buildings and trees are recommended to be removed outside of the active bat season.

APPENDIX 6 | Significant Wildlife Habitat Assessment Table

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Terrestrial) **Rationale:** Habitat important to migrating waterfowl.	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 Plus evidence of annual spring flooding from meltwater or run-off within these Ecosites. Fields with seasonal flooding and waste grains in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee areas may be important to Tundra Swans.	• Fields with sheet water during Spring (mid-March to May) • 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 <u>Information Sources</u> • 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 • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	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" • Any mixed species aggregations of 100 or more individuals required • The flooded field ecosite habitat plus a 100-300m radius, 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) • SWH MIST Index #7 provides development effects and mitigation measures.	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Aquatic) **Rationale:** 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.	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan 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 Ruddy Duck	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• 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). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • 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 identified within the SWHTG Appendix K are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWH MIST Index #7 provides development effects and mitigation measures.	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach area, bars and seasonally flooded, muddy and un-vegetated shoreline habitats • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely 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 SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Centre (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 (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring 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" • SWH MIST Index #8 provides development effects and mitigation measures.	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Raptor Wintering Area **Rationale:** Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	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. Bald Eagle: Forest Community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors • Raptor wintering (hawk/owl) 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 and large trees and snags available for roosting <u>Information Sources</u> • OMNRF Ecologist or Biologist • Naturalist clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Results of Christmas Bird Counts • Reports and other information available from Conservation Authorities	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 of the listed hawk/owl species. •To be significant a site must beused 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” •SWHMiST Index #10 and #11 provides development effects and mitigation measures.	ABSENT - The study area does not comprise both forest and upland open habitat communities. None of the indicator species were observed in the study area.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula **Rationale**: Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR3 CCA1 CCA2 (Note: buildings are not considered 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 • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH • The area includes 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms • 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" • SWH MIST Index #1 provides development effects and mitigation measures.	ABSENT – No caves, mine shafts, underground foundations or karst present in the study area. Though buildings are present, they are not considered SWH.
Bat Maternity Colonies **Rationale:** Known locations of forested bat maternity colonies are 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 prefer wildlife trees (snags) in early stages if decay, class 1-3 or class 1 or 2 • 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 and contact for local experts • University Biology Departments with bat experts.	• Maternity colonies with confirmed use by: o >10 Big Brown Bats o >5 adult female Silver-haired Bats • The area of habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement 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" • SWH MIST Index #12 provides the development effects and mitigation measures.	ABSENT – No forest or swamp communities are present in the study area. Though two planted trees were observed with knotholes on manicured grounds, these are not part of a forest and thus not considered candidate SWH.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Turtle Wintering Areas **Rationale:** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	**Special Concern:** Midland Painted Turtle Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: SW, MA, OA and SA; FEO and BOO. Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat.	• For most turtles, wintering areas are in the same general areas as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Overwintering sites are permanent water bodies, large wetlands and bots or fens with adequate dissolved oxygen. • Manmade 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. • Field naturalists clubs. • OMNRF ecologist or biologist • NHIC	• Presence of five overwintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle overwintering within a wetland is significant. • The mapped ELC ecosite area with the overwintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are overwintering is the SWH. • Overwintering areas may be identified by searching for congregations (basking areas) of turtles on warm, sunny days during the fall (September to October) or spring (March to May). Congregation of turtles is more common where wintering areas are limited and therefore significant. • SWH MIST Index #28 provides development effects and mitigation measures for turtle wintering habitat	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Reptile Hibernaculum **Rationale:** Generally sites are the only known sites in the area. Sites with the highest number of individuals are	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **Special Concern:** Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line • 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. <u>Information Sources</u> • 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 available from Conservation Authorities. • Field Naturalist Clubs • University herpetologists • Natural Heritage Information Centre (NHIC)	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) • NOTE: If there are Special Concern Species present, then site is SWH • NOTE: 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 30 m radius area is the SWH • SWH MIS Index #13 provides development effects and mitigation measures for snake hibernacula.	**CANDIDATE** – No snakes were observed anywhere in the study area, however, there is potential for them to be present. No ideal habitat is present (i.e. there are no rock piles, rock fissures, or crumbling foundations), however, snake hibernacula can be present in various habitats with features permitting snakes to move below the frost line (e.g. animal burrows)

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially -Nesting Bird Breeding Habitat (Bank and Cliff) **Rationale:** 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 population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	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	• 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 Conservation Authorities • Ontario Breeding Bird Atlas • Bird Studies Canada NatureCounts http://www.birdscanada.org/birdmon • Field Naturalist Clubs	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 nests • 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” • SWH MIST Index #4 provides development effects and mitigation measures.	ABSENT – None of the indicator species were observed in the study area. There are no suitable exposed banks, bluffs or cliffs in the study area.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 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 15 m 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 (OMNRF). • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from Conservation Authorities. • MNRF District Offices • Field Naturalist Clubs.	Studies confirming: • Presence of 2 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 • SWH MIST Index #5 provides development effects and mitigation measures.	ABSENT – No indicator species or nests were observed in the study area during breeding bird surveys Swamp ecosites are not present.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially -Nesting Bird Breeding Habitat (Ground) **Rationale:** Colonies are important to local bird population, 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 MAS1 – 3 CUM CUT CUS	• 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 Conservation Authorities. • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices. • Field Naturalist Clubs	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 radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3 ha 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" • SWH MIST Index #6 provides development effects and mitigation measures.	ABSENT – No indicator species or nests belonging to any of the listed bird species were identified in the study area during breeding bird surveys and no suitable habitat is present.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely 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 landclass: FIELD: CUM, CUT, CUS FOREST: FOC, FOD, FOM, CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	• 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 Erie or 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> • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days the 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. • SWH MIST Index #16 provides development effects and mitigation measures.	ABSENT – The study area is not 10 ha in size, does not contain fields. Though it does contain plantation and is within 5 km of Lake Ontario, it does not meet criteria for SWH.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptor species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Woodlots >5 ha in size and within 5 km of Lake Erie and Lake Ontario. If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat • If multiple woodlands are located along the shoreline those woodlands <2 km from Lake Erie and 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 within 5 km of Lake Erie and Lake Ontario are Candidate SWH. <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and field naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 species and with at least 10 bird species 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 (Mar.-May) and fall (Aug.-Oct.) migration using standardized assessment techniques. Evaluation to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #9 provides development effects and mitigation measures.	ABSENT – The study area does not contain forest or swamp.

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the southern areas of Eco-region 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions	White-tailed Deer	All forested Ecosites with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area, woodlots >50 ha • Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands • Large woodlots >100 ha and up to 1,500 ha are known to be used annually by densities of deer that range from 0.1-0.5 deer/ha • Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	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 MNRF • Studies should be complete4d during winter (Jan./Feb.) when >20 cm of snow is on the ground using aerial survey techniques, ground road surveys, or a pellet count deer survey • SWH MIST Index #2 provides development effects and mitigation measures	ABSENT – OMNRF has not mapped any deer wintering congregation areas in the study area.

Specialized Habitat for Wildlife					
Habitat Type	**Wildlife Species**	**Candidate SWH**		**Confirmed SWH**	**Assessment of Habitat in Study Area**
		ELC Ecosite Codes	**Habitat Criteria and Information Sources**	**Defining Criteria**	
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 upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 NOTE Includes adjacency to Provincially Significant Wetlands	• A waterfowl nesting area extends 120 m from a wetland (>0.5 ha) or a wetland (>0.5 ha) and any small wetlands (0.5 ha) within 120 m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur • Upland areas should be at least 120 m wide so that predators such as raccoons, skunks and foxes have difficulty finding nests • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites • MNRF Wetland Evaluations for indication of significant waterfowl nesting habitat • Reports and other information available from Conservation Authorities	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 boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest • SWH MIST Index #25 provides development effects and mitigation measures.	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Specialized Habitat for Wildlife

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat **Rationale**: Nest sites are fairly uncommon in Eco -region 7E and are used annually by the se species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey SPECIAL CONCERN Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	• 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) <u>Information Sources</u> • NHIC compiles all known nesting sites for Bald Eagles in Ontario • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat • Nature Counts, Ontario Nest Records Scheme data. • OMNRF District. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented • Reports and other information available from Conservation Authorities. • Field Naturalists clubs	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 300 m 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 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800 m is dependent on sight 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 early March to mid-August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #26 provides development effects and mitigation measures	ABSENT – No Osprey or Bald Eagle nests were documented in the study area and no large watercourses or waterbodies are present.

Specialized Habitat for Wildlife

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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 >30 ha with > 4 ha of interior habitat. Interior habitat determined with a 200 m 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 Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of one or more active nests from species list is considered significant • Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha areaof habitat is the SWH. The 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest. • 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 early 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. • SWH MIST Index #27 provides development effects and mitigation measures	ABSENT – Though coniferous plantation is present it does not meet size and shape criteria as candidate SWH.

Specialized Habitat for Wildlife

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Turtle Nesting Areas **Rationale:** These habitats are rare and when identified will often be the only breeding site for local populations of turtles	**Special Concern:** Midland Painted Turtle Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1	• 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 is 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> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Centre (NHIC). • Field naturalist clubs.	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles. • One ore more Northern Map Turtles or Snapping Turtles nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30 to 100 m 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 as part of the 30 to 100 m area of habitat. • 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. • SWH MIST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Specialized Habitat for Wildlife

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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 Salamanders	Seeps/springs are areas where groundwater comes to the surface. Often they 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 support a variety of plant and animal species. <u>Information Sources</u> • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and MOECC. • Field Naturalists Clubs and landowners. • 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 an ELC forest ecosite or an ecoelement within 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 • SWH MIST Index #30 provides development effects and mitigation measures	ABSENT - No seeps / springs were recorded during field surveys.
Amphibian Breeding Habitat (Woodland). **Rationale:** These habitats are extremely 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) >500 m2 (about 25 m diameter) within or adjacent (within 120 m) 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 • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts and wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	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 egg 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 (Mar.-Jun.) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands • The habitat is the wetland area plus a 230m radius of woodland area. 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. • SWH MIST Index #14 provides development effects and mitigation measures	ABSENT – No swamp or forest ecosites are present in the study area.

Specialized Habitat for Wildlife

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Wetlands) **Rationale:** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bullfrog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF 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) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations. • Reports and other information available from Conservation Authorities	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 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 ecosite wetland area and the shoreline are the SWH • 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 wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWH MIST Index #15 provides development effects and mitigation measures.	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Specialized Habitat for Wildlife

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Area - Sensitive Bird Breeding Habitat **Rationale:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	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 Pileated Woodpecker **Special Concern:** Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha • Interior forest habitat is at least 200 m from forest edge habitat Information Sources: • Local birder clubs. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species • Reports and other information available from Conservation Authorities.	Studies confirm: • 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" • SWH MIST Index #34 provides development effects and mitigation measures HABITATS OF SPECIES OF CONSERVATION CONCERN	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Marsh Breeding Bird Habitat **Rationale:** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: all SW, MA and CUM1 sites	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as 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 District and wetland evaluations. • Field Naturalist clubs • Natural Heritage Information Centre (NHIC) Records. • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 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" • SWH MIST Index #35 provides development effects and mitigation measures	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Habitat Type	**Wildlife Species**	**Candidate SWH**		**Confirmed SWH**	**Assessment of Habitat in Study Area**
		ELC Ecosite Codes	**Habitat Criteria and Information Sources**	**Defining Criteria**	
Open Country Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern:** Short-eared Owl	CUM1 CUM2	• Large grassland areas (includes natural and cultural fields and meadows) >30 ha • Grasslands not Class 1 or 2 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. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species <u>Information Sources</u> • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • EIS Reports and other information available from Conservation Authorities	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 Owls 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 are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • SWH MIST Index #32 provides development effects and mitigation measures	ABSENT - None of the indicator species were observed in the study area during the breeding season (one Field Sparrow was recorded in November 2021) and the ecosite types are not present.
Shrub/Early Successional Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Species: Brown Thrasher Clay-coloured Sparrow Common Species: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	• Large field areas succeeding to shrub and thicket habitats >10 ha in size • Shrub land or early successional fields, not class 1 or 2 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, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities	Field studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species • A habitat 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” • SWH MIST Index #33 provides development effects and mitigation measures	ABSENT - None of the indicator species were observed in the study area during the breeding season (one Field Sparrow was recorded in November 2021) and the ecosite types are not present.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Habitat Type	**Wildlife Species**	**Candidate SWH**		**Confirmed SWH**	**Assessment of Habitat in Study Area**
		ELC Ecosite Codes	**Habitat Criteria and Information Sources**	**Defining Criteria**	
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish; (*Cambarus diogenes*)	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish	• Wet meadow and edges of shallow marshes (no minimum size) 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> • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF, March, 1998	Studies confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites • Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult • SWH MIST Index #36 provides development effects and mitigation measures	ABSENT - None of the indicator species were observed in the study area and the ecosite types are not present.
Special Concern and Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1, S2, S3, SH) plant and animal species. Lists of these species are tracked by the NHIC	All plant and animal element occurrences (EOs) within a 1 km or 10 km grid. Older EOs 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 Ecosites <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas • Expert advice should be sought as many of the rare spp. Have little information available about their requirements	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 be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWH MIST Index #37 provides development effects and mitigation measures	**CANDIDATE** - None were recorded, though there is limited potential for Species of Special Concern or provincially rare species to use the subject property (e.g. Monarch, Yellow-banded Bumblebee)

Rare Vegetation Communities					
Rare Vegetation Community	**ELC Ecosite Codes**	**Candidate SWH**		**Confirmed SWH**	**Assessment of Habitat in Study Area**
		Habitat Description	**Detailed Information and Sources**	**Defining Criteria**	
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3 m 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 Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes • SWH MIST Index #21 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites are present in the study area.
Sand Barren **Rationale:** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%	Sand barrens typically are exposed sand, generally sparsely vegetated and caused by a lack of moisture, periodic fires and erosion. 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%.	• A sand barren area >0.5 ha in size <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • SWH MIST Index #20 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites are present in the study area.

Rare Vegetation Communities

Rare Vegetation Community	ELC Ecosite Codes	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		Habitat Description	**Detailed Information and Sources**	**Defining Criteria**	
Alvar **Rationale:** Alvars are extremely rare habitats in Ecoregion 7E.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Indicator Species:** Carex crawei Panicum philadelphicum Eleocharis compressa Scutellaria parvula Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 7E	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 plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover	• An Alvar site >0.5 ha in size • Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie <u>Information Sources</u> • Alvars of Ontario (Federation of Ontario Naturalists, 2000) • Conserving Great Lakes Alvars (Ontario Nature) • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Field studies identify that four of the five **Alvar Indicator Species** at a Candidate Alvar Site is significant • Site must not be dominated by exotic of introduced species (<50% vegetative cover are exotic spp.) • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses • SWH MIST Index #17 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites or indicator species are present in the study area.

Rare Vegetation Communities

Rare Vegetation Community	ELC Ecosite Codes	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		Habitat Description	Detailed Information and Sources	Defining Criteria	
Old Growth Forest **Rationale:** Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	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.	• Woodland area is >0.5 ha <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Districts • Field Naturalist Clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations • Municipal forestry departments	Field studies will determine: • If dominant tree species of the forest are >140 years old, then the area containing these trees is SWH • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) • The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH • Determine ELC vegetation types for the forest area containing the old growth characteristics • SWH MIST Index #23 provides development effects and mitigation measures	ABSENT – Woodland area not is >30 hectares in size without including the adjacent plantation. No forest communities with frequent old growth trees, snags, canopy gaps or multi-layered canopy structure were identified.
Savannah **Rationale:** Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25-60% In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).	• No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right-of-ways are not considered SWH <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	Field studies confirm: • One or more of the Savannah indicator species listed in Appendix N should be present. Note: savannah plant spp. List from Ecoregion 7E should be used. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • SWH MIST Index #18 provides development effects and mitigation measures.	ABSENT – None of the listed Ecosites are present in the study area.

Rare Vegetation Communities

Rare Vegetation Community	ELC Ecosite Codes	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		Habitat Description	Detailed Information and Sources	Defining Criteria	
Tallgrass Prairie **Rationale:** Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A tallgrass prairie has ground cover dominated by prairie grasses. An open tallgrass prairie habitat has <25% tree cover. In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).	• No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right-of-ways are not considered SWH <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	Field studies confirm: • One or more of the Prairie indicator species listed in Appendix N should be present. Note: savannah plant spp. List from Ecoregion 7E should be used. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • SWH MIST Index #19 provides development effects and mitigation measures.	ABSENT – None of the listed Ecosites are present in the study area.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which depend on the habitat for survival.		Provincially rare (S1, S2, S3) vegetation communities are listed in Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000). 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.	• ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000). • MNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000). • Area of the ELC Vegetation Type polygon is the SWH. • SWH MIST Index #37 provides development effects and mitigation measures.	ABSENT - No provincially rare vegetation communities (listed in Appendix M of the SWHTG) are present in the study area.

Animal Movement Corridors

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment of Habitat in Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors **Rationale:** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog 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 in Table 1.1	• Movement corridors between breeding habitat and summer habitat • Movement corridors must be determined when amphibian breeding habitat is confirmed as SWH (Amphibian Breeding Habitat, Wetland) <u>Information Sources</u> • MNRF District Office. • Natural Heritage Information Centre (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs	• Field Studies must 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 • SWH MIST Index #40 provides development effects and mitigation measures	ABSENT - Amphibian breeding habitat was not confirmed as SWH and thus, movement corridors, if present, are not considered SWH.