315 Garrison Road, Fort Erie Phase II

Environmental Impact Study

Prepared for:

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

315 Garrison Road, Fort Erie Phase II

Environmental Impact Study

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by a private developer, Vijaykumar Patel, to complete an Environmental Impact Study (EIS) for the proposed development of a commercial plaza and residential townhome complex at 315 Garrison Road, Fort Erie, Ontario (Map 1).

The subject property is approximately 2.1ha in size and is bound by residential homes to the north, commercial land uses to the east and south and an abandoned building on the lot to the west. The subject property is currently characterized by natural communities including Mineral Cultural Thicket (CUT1), Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) and Mineral Cultural Meadow (CUM1). A small Cattail Mineral Shallow Marsh (MAS2-1) is present adjacent to the western subject property boundary. The subject property is located in Ecoregion 7E.

According to the Niagara Region Official Plan, the subject property falls within the Region's Core Natural Heritage System due to the presence of a Significant Woodland, which is designated as an Environmental Conservation Area by the Region (Niagara Region 2014). In accordance with the Region's Official Plan policies, an EIS is required to confirm that the woodland meets Regional criteria for the designation of Significant Woodland and demonstrate that the proposed development will not negatively impact any existing natural features within the subject property or their ecological functions. This requirement was outlined in the pre-consultation meeting notes, dated August 13, 2020. A Phase I EIS was completed for the subject property in 2020 and focused on the commercial plaza proposed in the southern portion of the subject property, fronting onto Garrison Road (NRSI 2020). The Phase 1 development is currently under construction. Phase II of the proposed development consists of a residential townhome complex in the northern portion of the subject property.

During the Phase I EIS, a previously unmapped wetland community, a small Cattail Mineral Shallow Marsh (MAS2-1), was observed adjacent to the western subject property boundary (Map 2). Niagara Region comments on the Phase I EIS identified that Niagara Peninsula Conservation Authority (NPCA) must be included in the review of any further work beyond the Phase I limits (i.e., the Phase II EIS) under Ontario Regulation 155/06.

This report contains the detailed findings of the Phase II EIS, including the characterization of existing natural features based on the results of a background review and original field surveys. The detailed characterization was used to inform an analysis of the significance and sensitivity

of natural features, the identification of any natural feature constraints in association with land use policy designations, and the assessment of potential impacts and mitigation measures associated with details of the proposed development.

2.0 Project Scoping

2.1 Study Area

For the purposes of this report, the term “subject property” refers to the lands owned by the proponent including the area where the development is proposed to occur. The term “study area” refers to the subject property, and lands surrounding the subject lands, to include adjacent lands within 120m. Additional information was collected and reviewed, as could be gathered without direct access to these areas, for the study area.

2.2 Background Information

2.2.1 Collection and Review of Background Information

Existing natural heritage information was collected and reviewed to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. The following background information sources were reviewed to provide an accurate understanding of the physical and biological attributes within the study area:

- Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF);
- Ministry of the Environment, Conservation and Parks (MECP);
- Niagara Peninsula Conservation Authority (NPCA);
- Town of Fort Erie Official Plan (2018);
- Niagara Region Official Plan (2014);
- Town of Fort Erie Natural Areas Inventory (Dougan & Associates 2003);
- NPCA Natural Heritage Areas Inventory (NPCA 2010);
- Natural Heritage Information Centre (NHIC) (MNDMNRF 2021b);
- Ontario Breeding Bird Atlas (OBBA) (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019);
- Ontario Butterfly Atlas (Macnaughton et al. 2020);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Rare Plant Atlas (Oldham 2017);
- Ontario Odonata Atlas (OOAD 2019); and
- Supplementary resources including eBird and iNaturalist.

Species lists were compiled to provide information on species reported from within the vicinity of the study area based on data available from the wildlife atlases listed above. These atlases

provide data based on 10x10km survey squares. Information on species from the survey squares that overlap with the study area (17PH6952) were compiled. These initial species lists were used to guide the scope and type of wildlife field surveys required.

Background information relating to natural heritage received from the MNDMNRF and NPCA on September 3 and October 2, 2019 have been included in this report. MECP was also consulted with regards to Species at Risk (SAR) bats within the subject property (NRSI 2020).

2.2.2 Significant Species Screening

Based on the compiled species lists for the study area, a screening exercise was completed to assess the potential for reported SAR and Species of Conservation Concern (SCC) to occur in the study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (MNDMNRF 2000, Oldham 2017 Reznicek et al. 2011) against habitats known to occur in the study area. This exercise was completed to ensure that the potential presence of all SAR and SCC within the study area was adequately assessed in this study.

Species at Risk are those listed on the SAR in Ontario List (SARO) (MNDMNRF 2021a). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed by COSSARO as Endangered or Threatened are protected by the *Endangered Species Act*, 2007 (ESA), which includes protection of their habitat, and are referred to as regulated SAR. Species listed as Special Concern are included in the definition of SCC, which comprises the following:

- Species designated provincially as Special Concern;
- Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by NHIC; and
- Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by COSSARO. If these species are listed under the Species at Risk Act (SARA) under Schedule 1, they are protected by the federal Act but not provincially by the ESA.

Full SAR/SCC screening results are provided in Appendix I.

2.2.3 Significant Wildlife Habitat Screening

A screening exercise was completed to assess the presence of Significant Wildlife Habitat (SWH) within the study area. SWH is protected under the Ontario Provincial Policy Statement (PPS) (OMMAH 2020) and is described in the MNDMNRF Significant Wildlife Habitat Technical Guide (SWHTG) (MNDMNRF 2000) as being comprised of four major categories of habitat:

- Seasonal concentration areas;
- Rare vegetation communities and specialized wildlife habitat;
- Habitats of species of conservation concern; and
- Animal movement corridors.

Specific criteria defining wildlife habitat significance for Ecoregion 7E are described in the SWHTG Addendum (MNDMNRF 2015). Individual SWH types within these four broad categories were assessed as either not present, candidate, or confirmed for the study area based on a comparison of significance criteria against information obtained from relevant background documents.

Full SWH screening results are provided in Appendix II.

2.3 Terms of Reference

Based on the findings described above, and Niagara Region comments on the Phase I EIS, a draft Terms of Reference (TOR) for the Phase II EIS was submitted to NPCA on March 10, 2021 (Appendix III). The TOR included various field surveys for newly acquired lands to the west of the subject property that were not surveyed during the Phase I EIS and were to be included in the Phase II expansion.

The draft TOR was accepted with the addition of salamander trapping surveys (Appendix III). NRSI initiated the scope of fieldwork as outlined in the approved TOR but was stopped in May 2021 when the adjacent landowner withdrew from the project.

3.0 Relevant Policies, Legislation and Planning Studies

Natural features identified during the background information review and field investigations were evaluated against relevant policies, legislation and planning studies (Table 1) to help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected.

Table 1. Relevant Policies, Legislation and Planning Studies.

Policy/Legislation/Planning Study	Description	Project Relevance

Provincial Policy Statement (OMMAH 2020)	• Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS.
	• Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'.
	• The Natural Heritage Reference Manual (MNDMNRF 2010) and the Significant Wildlife Habitat Technical Guide (MNDMNRF 2000) were prepared by the MNDMNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Several natural features were identified within the subject property as having potential implications under the PPS during the background review:
		  • Unevaluated Wetland;
		  • Significant Woodland;
		  • Candidate habitat for Threatened and Endangered Species; and
		  • Candidate Significant Wildlife Habitat (SWH).
		• Development and site alteration shall not be permitted in significant wetlands based on Policy 2.1.4.
		• Development and site alteration are not permitted in Significant Woodlands or SWH unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions based on Policy 2.1.5
		• Development and site alteration are not permitted in habitat of endangered and threatened species, except in accordance with provincial and federal requirements based on Policy 2.1.7
		• Development and site alteration are not permitted on adjacent lands to significant wetland or SWH 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 their ecological functions based on Policy 2.1.8.

Endangered Species Act, 2007	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. • Species designated as Threatened or Endangered receive legal protection under the ESA and their habitats are protected generally under the Act.	• Candidate habitat for several SAR was identified as present within the subject property based on the background review (Appendix I).

Policy/Legislation/Planning Study	Description	Project Relevance
	• The ESA prohibits killing, harming, harassing or capturing Species at Risk (SAR) and protects their habitats from damage and destruction.	
Canadian *Fisheries Act*, 1985	• Proposed amendments to the Fisheries Act were introduced in 2018 to restore lost protections and incorporate modern safeguards. On August 28, 2019, the new, "modernized" Fisheries Act came into force and includes new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. • The modernized Act provides protection for all fish and fish habitat and prohibits the harmful alteration, disruption or destruction of fish habitat • The Department of Fisheries and Oceans Canada's (DFO) Fish and Fish Habitat Protection Program ensures compliance with relevant provisions under both the Fisheries Act and the Species at Risk Act. The program reviews proposed works, undertaking and activities that may impact fish and fish habitat. • Works that are proposed in and around certain types of waterbodies may not require DFO review. Likewise, if proponents can follow all specified measures to protect fish and fish habitat outlined by DFO, review may not be necessary.	• No fish habitat is present within the subject property.
Migratory Birds Convention Act, 1994 (MBCA)	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. • The schedule of on-site work must consider MBCA windows, with timing of breeding bird season typically occurring between late March and late August; however, this is a guideline, since the MBCA applies to nesting bird species. • “Incidental take” is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service (CWS).	• Any vegetation removal required for construction of the proposed development must have regard for this legislation in the form of timing window restrictions or other suitable mitigation measures.

Policy/Legislation/Planning Study	Description	Project Relevance
Niagara Peninsula Conservation Authority (NPCA) Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 155/06)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this regulation, the NPCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes).	• An unevaluated wetland is present adjacent to the subject property.

Fort Erie Official Plan (2018)	• The general purpose of the Official Plan is to provide the Town of Fort Erie with a general policy designed to secure the health, safety, convenience and welfare of the present and future inhabitants of the Planning Area.
	• It was approved by the Region in 2011 and was most recently consolidated in 2018.
	• It is the policy of this Plan to protect and conserve significant natural heritage features and areas for the long term and also to maintain, and where possible restore or improve, diversity and connectivity of natural heritage features.
		• Several natural features were identified within the subject property or on adjacent lands as having potential implications under this policy during the background review:
		  • Unevaluated wetland;
		  • Candidate habitat for Threatened and Endangered species;
		  • Candidate habitat for Special Concern (SC) species;
		  • Candidate SWH; and
		  • Woodland.
		• Development or site alteration within or adjacent to Locally Significant Wetlands shall only be permitted if an EIS demonstrates that the development or site alteration will not result in degradation that threatens the health or integrity of the natural features or ecological functions.
		• Development or site alteration is not permitted in the Habitat of Threatened and Endangered species or Provincially Significant Wetlands (PSW). Development will only be permitted on lands adjacent to the significant habitat where an EIS demonstrates that the development or site alteration will have no negative impact on the habitat's features or functions.
		• Development may be contemplated within the significant habitat of SC species if portions of the habitat will be maintained and protected from

Policy/Legislation/Planning Study	Description	Project Relevance
		negative impact to the habitat's features and ecological functions. • Development or site alteration within or adjacent to SWH shall only be permitted if an EIS demonstrates that the development or site alteration will not result in degradation that threatens the health or integrity of the natural features or ecological functions for which the area is identified as significant in the Town's Natural Areas Inventory or that are identified as significant through the EIS. • Where development or site alteration is approved in accordance with the policies of this Plan the applicant shall submit a Tree Saving Plan maintaining or enhancing the remaining natural features and ecological functions. The Plan shall be prepared in accordance with the administrable Tree Conservation By-laws and related Environmental Impact Study and its implementation monitored by a member of the Ontario Professional Forestry Association or consultant who prepared the Environmental Impact Study.

Niagara Region Official Plan (2014)	• The Official Plan contains objectives, policies and mapping that implement the Region's approach to managing growth, growing the economy, protecting the natural environment, resources and agricultural land, and providing infrastructure.
	• It was most recently consolidated in 2014.
	• The natural heritage policy framework is based on maintaining a Healthy Landscape throughout Niagara, while giving particular attention to natural features of special significance within the broader landscape. This Core Natural Heritage System is an essential component of a Healthy Landscape.
		• Natural features were identified within the subject property or on adjacent lands as having potential implications under this policy during the background review:
		  • Environmental Conservation Area (Significant Woodland);
		  • Candidate Environmental Conservation Area (SWH and significant habitat of SC species); and
		  • Candidate Environmental Protection Area (habitat of Threatened and Endangered species).
		• Development and site alteration may be permitted without an amendment to this Plan: a) In Environmental Conservation Areas; and b) On

Policy/Legislation/Planning Study	Description	Project Relevance
		adjacent lands to Environmental Protection and Environmental Conservation Areas if it has been demonstrated that, over the long term, there will be no significant negative impact on the Core Natural Heritage System component or adjacent lands and the proposed development or site alteration is not prohibited by other Policies in this Plan. The proponent shall be required to prepare an EIS in accordance with Policies 7.B.2.1 to 7.B.2.5. • Development and site alteration shall not be permitted within Environmental Protection Areas. • Where development or site alteration is approved within the Core Natural Heritage System or adjacent lands, as set out in Table 7-1, the applicant shall submit a Tree Saving Plan maintaining or enhancing the remaining natural features and ecological functions. The Plan shall be prepared in accordance with the Regional Forest Conservation By-law and the local tree conservation by-law as appropriate and its implementation monitored by a member of the Ontario Professional Forestry Association.

4.0 Field Methods

Field surveys were undertaken within the study area to characterize natural features and identify significant and sensitive natural heritage features and species that have potential to be adversely affected by the proposed development. A total of 17 field visits were completed between August 2019 and September 2021. The field surveys that were undertaken are described in detail below and summarized in Table 2. Surveys were undertaken in accordance with provincial and local guidance documents as indicated below.

Table 2. Field Survey Summary

Survey Type	Protocol	Survey Date(s)
Vegetation Community Mapping	Ecological Land Classification for Southern Ontario (Lee et al. 1998)	August 22, 2019 September 18, 2019 March 27, 2020
Vascular Flora Inventory	Systematic area search of subject property	August 22, 2019 September 18, 2019 March 27, 2020
Wetland Boundary Delineation and Agency Review	Ontario Wetland Evaluation System (MNDMNRF 2014)	September 14, 2021
Tree Inventory	All trees inventoried as per Niagara Region and Town of Fort Erie Tree Conservation By-laws	January 9, 2020
Anuran Call Survey	Marsh Monitoring Program (BSC 2009)	April 24, 2020 May 28, 2020 June 17, 2020 April 7, 2021 May 4, 2021 June 9, 2021
Salamander Trapping Surveys	Jefferson Salamander Recovery Team (2013)	April 10, 2021 April 11, 2021 April 12, 2021 April 15, 2021 April 16, 2021
Bat Habitat Assessment	Survey Protocol for Species at Risk (SAR) Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNDMNRF 2017), MECP Survey Protocol for Maternity Roost Surveys (Forests/ Woodlands) (MECP 2020)	March 27, 2020
Passive Bat Acoustic Survey	Survey Protocol for Species at Risk (SAR) Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNDMNRF 2017), MECP Survey Protocol for Maternity Roost Surveys (Forests/ Woodlands) (MECP 2020)	June 1 – June 17, 2020

4.1.1 Vegetation Surveys

Vegetation Community Delineation

Vegetation community delineation was completed using aerial photography and thorough investigations in the field. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998).

Vascular Flora Inventory

A thorough systematic area search of the subject property was completed, focusing on confirming the presence or absence of any SAR or SCC vegetation species that were identified as having the potential to occur within the subject property.

Wetland Boundary Delineation

The wetland community boundaries were delineated and flagged by NRSI and reviewed on site by NPCA staff. Boundaries were surveyed using a Trimble SXBlue II GNSS GPS unit which is capable of mapping grade accuracy $\leq$0.5m.

Tree Inventory

A comprehensive inventory of trees within the subject property, within 5m of the subject property or with crowns overlapping the subject property, was completed by a Certified Arborist. Individual trees ≥10cm in Diameter at Breast Height (DBH) were assessed by a Certified Arborist and surveyed using a SXBlue II GNSS GPS unit.

The following information was recorded for each tree:

- species;
- Diameter at breast height (DBH);
- crown radius (m);
- general health (excellent, good, fair, poor, very poor, dead);
- potential for structural failure (improbable, possible, probable, imminent);
- tree location (on-site, boundary, off-site); and
- general comments (i.e., disease, aesthetic quality, development constraints, sensitivity to development).

The overall health and potential for structural failure of each tree was assessed using accepted arboricultural techniques. These include a visual examination of each tree for structural defects,

scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken.

4.1.2 Herpetofauna Surveys

Anuran Call Surveys

A total of 6 evening anuran call surveys were conducted at the Cattail Mineral Shallow Marsh (MAS2-1) vegetation community following the Marsh Monitoring Program protocol (BSC 2009) at 1 monitoring station (Map 2). Monitoring focused on calling anurans during 3-minute point counts, which included documenting call intensity and an estimated number of individuals.

Salamander Trapping Surveys

Surveys were conducted in accordance with the Jefferson Salamander Recovery Team's recommended protocol (Jefferson Salamander Recovery Team 2013). A total of 3 un-baited minnow traps were strategically placed in the Cattail Mineral Shallow Marsh (MAS2-1) (Map 2). The traps were set in the evening and checked the following morning for 5 trapping events during favourable weather conditions for salamander movement. Weather conditions, including air and water temperature, precipitation and cloud cover, were recorded for each trap set.

4.1.3 Mammal Surveys

Bat Habitat Assessment

A bat habitat assessment was conducted during the leaf off period to identify trees that have the potential to provide suitable roosting habitat for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) (MNDMNRF 2017). All standing live or dead trees >10cm DBH with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark were documented. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree. All Oak (*Quercus* sp.) and Maple (*Acer* sp.) trees >10cm DBH were also documented as they have the potential to provide suitable roosting habitat for Tri-colored Bat. All identified candidate roost trees were surveyed with a Trimble SXBlue II GNSS GPS unit.

Bat Acoustic Survey

Passive acoustic monitoring was conducted to assess the potential presence of bat SAR and their use of available habitats within the subject property. A total of 5 acoustic monitoring stations were placed within 10m of several clusters of candidate bat roost trees, one of which was also located along a candidate flyway/travel corridor (Map 2). Bat acoustic monitoring methodology followed the guidelines outlined within the MNDMNRF Survey Protocol for Species at Risk (SAR) Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNDMNRF 2017) and the MECP Survey Protocol for Maternity Roost Surveys (Forests/ Woodlands) (MECP 2020). Methods are described in detail in the Bat Acoustic Monitoring Report appended to the Phase I EIS (NRSI 2020).

4.1.4 Additional Wildlife

All observations of birds, mammals, herpetofauna and insects were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scats, dens, nests etc.).

4.1.5 Significant Wildlife Habitat and Species at Risk Habitat Assessments

Significant Wildlife Habitat (SWH) types and SAR habitats identified as potentially occurring within the study area (i.e., Candidate) during the background review were further assessed for their presence in the field during all surveys.

5.0 Existing Conditions

5.1 Soil, Terrain and Drainage

The physiography of the study area is dominated by the Haldimand Clay Plain (Chapman Putnam 1984). The topography of the Haldimand Clay Plain is basically flat with minor interruptions of limestone outcropping, morainic ridges, and shallow river valleys (Dougan and Assoc. 2003). The soils of this region are heavy-textured with poor, uneven drainage (Dougan and Assoc. 2003). Specifically, within the Town of Fort Erie, the dominant soils are lacustrine heavy clays, lacustrine silty clays over clay loam, clay loam till, and variable alluvial deposits on floodplains (Dougan and Assoc. 2003, OGS 2003).

Consistent with the Haldimand Clay Plain, the general topography of the study area is characterized by a relatively level landscape with a slightly elevated ridge in the north and northeast portions of the subject property. Soils in the vicinity of the study area have been identified as mainly clay loam till (Ontario Institute of Pedology 1989). Surface water appears to flow through the subject property to the south, towards Garrison Road.

5.2 Vegetation

5.2.1 Vegetation Communities

A summary of ELC communities identified within the subject property is provided below (Map 2).

Cultural Thicket Community

The Mineral Cultural Thicket (CUT1) vegetation community consists of the majority of the subject property. It is characterized by European Buckthorn (*Rhamnus cathartica*), Multiflora Rose (*Rosa multiflora*), Grey Dogwood (*Cornus racemosa*), with a sparse overstorey of Black Walnut (*Juglans nigra*), Eastern Cottonwood (*Populus deltoides*) and Hawthorn (*Crataegus spp.*).

Marsh Community

The Cattail Mineral Shallow Marsh (MAS2-1) abuts the western subject property boundary. A small portion ($3m^2$) of the $600m^2$ (0.06ha) wetland feature is located within the subject property. It is dominated by Cattail species (*Typha* sp.) and contains abundant downed woody debris. Shallow standing water is present throughout the summer.

Deciduous Forest Community

The Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) vegetation community is present in the northeast portion of the subject property. This community contains several notable trees that are large in size (DBH ranging from 51-113cm) including Bur Oak (*Quercus macrocarpa*), Pin Oak (*Quercus palustris*) and Swamp White Oak (*Quercus bicolor*). Other species include Shagbark Hickory (*Carya ovata*), a dense understorey of European Buckthorn and a ground layer of Fowl Manna Grass (*Glyceria striata*), Yellowish Enchanter's Nightshade (*Circaea lutetiana* ssp. *canadensis*) and Calico Aster (*Symphyotrichum lateriflorum* var. *lateriflorum*).

Cultural Meadow Community

The Mineral Cultural Meadow (CUM1) vegetation community is present in the southwest portion of the subject property. It is dominated by cold season grasses including Canada Bluegrass (*Poa compressa*) and Kentucky Bluegrass (*Poa canadensis*) with Canada Thistle (*Circium canadensis*), Tall Goldenrod (*Solidago altissima*) and Heath Aster (*Symphyotrichum ericoides*).

5.2.2 Vascular Flora

In total, 90 vascular flora species were observed within the subject property and accessible adjacent lands during targeted area searches and the tree inventory. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

Based on available background information, 6 vegetation SAR and 8 vegetation SCC were reported from the vicinity of the study area (MNDMNRF 2021b, MNDMNRF 2018). Appendix I provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat for 5 vegetation SAR and 5 vegetation SCC is present within the study area, but no federally or provincially significant vegetation species were observed during field investigations. Clammy Ground-cherry (*Physalis heterophylla*), a regionally rare species (Oldham 2017), was observed in the Mineral Cultural Meadow (CUM1) community.

5.2.3 Tree Inventory

In total, 121 trees were inventoried on Phase II lands, including 14 species. Of the trees inventoried and assessed, 119 are native species and 2 are non-native. A complete list of trees

inventoried, and the location of each inventoried tree is provided in the Tree Saving Plan (Appendix V).

5.3 Wildlife

5.3.1 Birds

In total, 106 bird species are reported from the study area or vicinity based on the OBBA, NHIC database and MNDMNRF background information (BSC et al. 2006, MNDMNRF 2021b, MNDMNRF 2018). The data documented by the OBBA includes those species that have been observed in the area (10x10km range), are known to nest in the area, and/or have exhibited some evidence of breeding in the area. Seventeen (17) of these species and 1 additional species were observed within the study area during surveys. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

Based on available background information, 12 bird SAR and 4 bird SCC are reported from the vicinity of the study area (BSC et al. 2006, MNDMNRF 2021b, MNDMNRF 2018). Appendix I provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat for the listed significant species is not present within the study area and no federally or provincially significant bird species were observed during field investigations. No targeted breeding bird surveys were completed. Tufted Titmouse (*Baeolophus bicolor*), a regionally rare species, was observed within the subject property outside of the breeding period and no breeding evidence was observed.

5.3.2 Herpetofauna

In total, 18 herpetofauna species are reported from the study area or vicinity based on the ORAA, NHIC database and MNDMNRF background information (Ontario Nature 2019, MNDMNRF 2021b, MNDMNRF 2018). Only 1 of these species and 1 additional species were observed within the study area during surveys. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

Based on available background information, 4 herpetofauna SAR and 2 herpetofauna SCC are reported from the vicinity of the study area (Ontario Nature 2019, MNDMNRF 2018). Appendix I provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Marginally suitable habitat for 1 SCC, Jefferson/Unisexual Salamander Complex (*Ambystoma* sp.), may be present within the Cattail

Mineral Shallow Marsh (MAS2-1) community. However, no regionally, provincially or federally significant reptile or amphibian species were observed during field surveys, including targeted salamander trapping and anuran breeding surveys.

Anuran Call Surveys

Despite suitable weather conditions on all 6 survey dates, no anurans were heard calling from the Cattail Mineral Shallow Marsh Type (MAS2-1) vegetation community during anuran call surveys. Two (2) Western Chorus Frogs (*Pseudacris triseriata*) were heard calling from a flooded section of the old asphalt area during the April 2021 survey.

Salamander Trapping Surveys

Despite suitable weather conditions on all 5 survey dates, no salamanders were captured within the Cattail Mineral Shallow Marsh Type (MAS2-1) vegetation community during salamander trapping surveys.

5.3.3 Mammals

In total, 40 mammal species are reported from the study area or vicinity based on the Ontario Mammal Atlas, NHIC database and MNDMNRF background information (Dobbyn 1994, MNDMNRF 2021b, MNDMNRF 2018). A total of 6 of these mammal species were observed within the study area. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

Based on available background information, 5 mammal SAR and 1 mammal SCC are reported from the vicinity of the study area (Dobbyn 1994, MNDMNRF 2018). Appendix I provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat for 4 mammal SAR and 1 mammal SCC is present within the study area, however, no regionally, provincially or federally significant mammal species were observed during field investigations, including passive bat acoustic surveys.

Bat Habitat Assessment

In total, 49 candidate bat roost trees for Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*), as well as 35 candidate bat roost trees for Tri-colored Bat (*Perimyotis subflavus*) were documented in the Cultural Thicket (CUT1) and Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) communities during the bat habitat assessment.

Details of each candidate bat roost tree, including location, tree species, height class, decay class, tree status and DBH, if applicable, is provided in the Bat Acoustic Monitoring Report appended to the Phase I EIS (NRSI 2020).

A total of 15 candidate bat roost trees with a DBH greater than 25cm and suitable roost features including cavities, loose bark, cracks and/or crevices, were documented within the Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) community. The roost tree density in this community is 29 roost trees/ha, which meets the criteria to be identified as Candidate SWH for Bat Maternity Colonies.

Bat Acoustic Survey

Passive bat acoustic monitoring completed within the subject property identified the presence of 4 species, Big Brown Bat (*Eptesicus fuscus*), Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*) and Silver-haired Bat (*Lasionycteris noctivagans*), within the subject property. All of these species are considered common in Ontario and it is not anticipated that bat SAR are using habitats within the subject property.

Although passive acoustic monitoring was conducted to assess the presence or absence of SAR bats within the subject property, the results of this study can also be used to assess the use of available habitats by non-SAR bats. The timing of recordings of bat pass sequences classified to Big Brown Bat, Silver-haired Bat, Hoary Bat and Eastern Red Bat, suggests that these species may be roosting within the vicinity of bat acoustic monitoring stations. Big Brown Bats are known to use man-made structures as roosts for maternity colonies and this species is likely using buildings within the vicinity of the subject property. The other 3 species are known as tree roost species and are anticipated to be using trees as roost sites within the subject property.

5.3.4 Butterflies

In total, 21 butterfly species are reported from the study area or vicinity based on the Ontario Butterfly Atlas, NHIC database and MNDMNRF background information (Macnaughton et al. 2021, MNDMNRF 2021b, MNDMNRF 2018). No butterfly species were observed within the study area. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

Based on available background information, 1 butterfly SAR and 1 butterfly SCC were reported from the vicinity of the study area (Macnaughton et al. 2021, MNDMNRF 2018). Appendix I

provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable foraging habitat for one butterfly SCC, Monarch (*Danaus plexippus*), is present within the study area. However, the larval host food plants that support the breeding population (e.g., *Asclepias* spp.) are not abundant within the subject property and habitats are not of sufficient size to support migrating individuals. No targeted butterfly surveys were completed. No regionally, provincially or federally significant butterfly species were observed during field investigations.

5.3.5 Odonates

In total, 15 odonate species are reported from the study area or vicinity based on the Ontario Odonate Atlas, NHIC database and MNDMNRF background information (OOAD 2019, MNDMNRF 2021b, MNDMNRF 2018). No odonate species were observed within the study area. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

Based on available background information, no odonate SAR or SCC are reported from the vicinity of the study area (OOAD 2019, MNDMNRF 2021b, MNDMNRF 2018). No targeted odonate surveys were completed. No regionally, provincially or federally significant odonate species were observed during field investigations.

5.3.6 Other Insects

In total, one other insect species, Rusty-patched Bumblebee (*Bombus afinis*), is reported from the study area or vicinity based on the NHIC database and MNDMNRF background information (MNDMNRF 2021b, MNDMNRF 2018). No targeted insect surveys were completed and no insect species were documented within the subject property during field investigations.

Based on available background information, 1 insect SAR, Rusty-patched Bumblebee, is reported from the vicinity of the study area (MNDMNRF 2018). Appendix I provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat (i.e., urban settings) for Rusty-patched Bumblebee is present within the study area, however the only known extant population of this species in Ontario is located in Pinery Provincial Park near Grand Bend. No regionally, provincially or federally significant insect species were observed during field investigations.

6.0 Significance and Sensitivity Analysis

An analysis of the significance and sensitivity of existing natural features within the subject property was completed in order to identify those features and habitats that are sensitive to disturbance. This analysis is based on the rarity or significance of features and/or associated functions/processes and/or current policies, legislation, or planning related studies. Such features and functions identified as sensitive to disturbance are further identified as 'constraints' to development, prohibiting or constraining aspects of any proposed development around or within them. The analysis is also used to identify 'opportunity' areas that have been previously disturbed or contain no natural features where potential for habitat rehabilitation or enhancement exists. Results of this analysis are provided in the following sections to inform the proposed development and assist in developing a design that will avoid and reduce impacts to natural features and their ecological functions.

6.1 Significant Wetlands

The Cattail Mineral Shallow Marsh (MAS2-1) within and adjacent to the subject property is currently unevaluated by the MNDMNRF (MNDMNRF 2021b). However, the distance to the closest wetland unit is greater than 750m, no Provincially Significant Wetlands (PSW) are located within 750m, the wetland is less than 0.5ha in size, no significant vegetation communities are present and no SAR are actively using the wetland community. Therefore, if the wetland was fully evaluated it would not meet the criteria for PSW designation.

The Niagara Region Official Plan (Niagara Region 2014) designates non-PSWs as Environmental Conservation Areas within the Region's Core Natural Heritage System (Niagara Region 2014). Development and site alteration may be permitted in Environmental Conservation Areas and on adjacent lands if it has been demonstrated that, over the long term, there will be no significant negative impact on the feature or adjacent lands (Niagara Region 2014).

The wetland is not currently designated as a Locally Significant Wetland by the Town of Fort Erie (2018) as it was previously unmapped. Development or site alteration within or adjacent to Locally Significant Wetlands may be permitted if the development or site alteration will not result in degradation that threatens the health or integrity of the natural features or ecological functions (Fort Erie 2018).

The NPCA has confirmed that the wetland feature is not regulated by NPCA under Ontario Regulation 155/06 due to the fact that it does not meet the definition of a wetland under the Conservation Authorities Act (Appendix VI). It does not contribute to the hydrological function of the watershed as it is not connected to a surface watercourse and is hydrologically isolated.

6.2 Significant Woodlands

The majority of the subject property is currently designated as a Significant Woodland by the Niagara Region (Niagara Region 2014). The Niagara Region Official Plan (Niagara Region 2014) identifies criteria for designating Significant Woodlands, which is outlined in Table 3.

Table 3. Significant Woodland Analysis.

Regional Criteria	Criteria Met (Yes/No)
Contain threatened or endangered species or species of concern.	No. Targeted surveys have been completed.
In size, be equal to or greater than: i. 2ha, if located within or overlapping Urban Area Boundaries; ii. 4ha, if located outside Urban Areas and north of the Niagara Escarpment; or iii. 10ha, if located outside Urban Areas and south of the Escarpment.	No. The subject property is located within the Urban Area Boundary and the woodland is approximately 0.51ha.
Contain interior woodland habitat at least 100m in from the woodland boundaries.	No. No interior habitat is present as the woodland is only 0.51ha.
Contain older growth forest and be 2ha or greater in area.	No. Mature trees are present but the woodland does not meet the criteria for old growth and is less than 2ha in size.
Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4.	No. No other significant natural heritage features were confirmed in the woodland.
Abut or be crossed by a watercourse or water body and be 2 or more hectares in area.	No. No watercourses or waterbodies are present.

Vegetation community boundaries were refined through this study, and the majority of the mapped Significant Woodland consists of a Mineral Cultural Thicket (CUT1) vegetation community. Therefore, the Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) community is significantly smaller than the minimum size required to qualify for significance (0.51ha). Woodland within the subject property was initially identified as significant by the Region due to the potential presence of habitat for rare species. Field surveys completed during this study confirmed the absence of rare species and their habitat within the woodland. In addition, no other significant natural heritage features have been confirmed within the woodland. Based on the SWH screening, there is potential that the woodland may provide SWH for bat maternity colonies and snake hibernaculum, but in the absence of any confirmation

this does not meet the criteria for significance. Significant Woodland is not present within the subject property (Table 3).

6.3 Significant Wildlife Habitat

Based on background information review, desktop analysis and field studies, no SWH types were confirmed in the study area. Two (2) SWH types were maintained as candidate SWH, and all other candidate SWH types were ruled out as occurring in the study area.

Development or site alteration within SWH is not permitted under the PPS or by Niagara Region and the Town of Fort Erie, unless it has been demonstrated that there will be no negative impacts on the habitat or its ecological functions (Niagara Region 2014, Town of Fort Erie 2018, OMMAH 2020).

6.3.1 Reptile Hibernaculum

The ability of reptiles to overwinter successfully in cold climates can have a large impact on population persistence (MNDMNRF 2014). For snakes, hibernation takes place in sites located below the frost line. Access to such sites may be through fissures in rock, along tree roots, or through mammal burrows. The access to these subterranean sites is much more important than the surrounding vegetation communities. For a number of species, the necessary characteristics for hibernacula are not well known and it is therefore not possible to predict with any accuracy where snakes will overwinter (MNDMNRF 2014). All vegetation communities within the study area therefore have the potential to provide overwintering sites for reptiles. However, the subject property consists of a small fragmented natural area that is completely surrounded by developed lands and is heavily degraded and impacted by non-native and invasive vegetation species. No reptiles, and only 2 amphibians, were documented within the subject property during all site visits over a 2-year period. Therefore, although it cannot be ruled out, the probability that the subject property provides SWH for reptile hibernaculum is very low.

6.3.2 Bat Maternity Colonies

Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes. Maternity colonies can be found in tree cavities, vegetation and often in buildings, however buildings are not considered to be SWH. Maternity colonies are often located in mature deciduous or mixed forest stands with greater than 10 large diameter (>25cm DBH) cavity trees per hectare. 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 per

hectare are preferred (MNDMNRF 2000). The forest community within the subject property meets the criteria required to be considered candidate SWH for Bat Maternity Colonies.

Acoustic surveys completed within the forest community indicate the potential for Big Brown Bat and Silver-haired Bat to be using the Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) community as maternity colony habitat. Big Brown Bats are known to use man-made structures as roosts for maternity colonies and this species is likely using buildings within the vicinity of the subject property. Silver-haired Bats are anticipated to be using trees as roost sites, including maternity colony roosting, within the subject property. While the Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) community may provide habitat for Silver-haired Bat maternity colonies, it is not likely to be significant habitat because it is a small fragmented natural area that is completely surrounded by developed lands and is heavily degraded and impacted by non-native and invasive vegetation species. Sites that are located within or adjacent to large areas of suitable habitat and are the least disturbed are considered more significant (MNDMNRF 2000). A low number of Silver-haired bat pass sequences were recorded during the time of night that would indicate the presence of roosting habitat during acoustic surveys, which suggests that this habitat is not likely significant.

6.4 Habitat of Endangered and Threatened Species

Based on the results of the background information review, desktop analysis and field investigations, no SAR and associated habitats were confirmed as present in the subject property.

6.5 Linkages

Maintaining connectivity among natural features across the landscape is important to allow for the dispersal of otherwise isolated populations, as well as to allow for the movement of species which require access to multiple habitat types to carry out their life processes.

The subject property is located in a fragmented urban landscape, surrounded by residential and commercial land uses and Garrison Road to the south. Natural features are present on the surrounding landscape to the east, southwest and northwest of the subject property, however, due to the urban landscape, the subject property is isolated from these features and therefore currently does not function as a significant linkage.

6.6 Summary of Natural Feature Constraints

Table 4 provides a summary of features identified as a constraint to development within the subject property.

Table 4. Natural Feature Constraints.

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations
Candidate Significant Wildlife Habitat (SWH)	• Provincial Policy Statement (OMMAH 2020) • Niagara Region Official Plan (2014) • Fort Erie Official Plan (2018)	• Candidate SWH for Bat Maternity Colony is present in the Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) community. • Candidate SWH for Reptile Hibernacula is present in all suitable areas throughout the subject property. • Development or site alteration within SWH is not permitted under the PPS or by Niagara Region unless there will be no negative impacts on the habitat or its ecological functions (Niagara Region 2014, Fort Erie 2018, OMMAH 2020).
Non-significant Wetland	• Niagara Region Official Plan (2014) • Fort Erie Official Plan (2018) • NPCA Regulations (155/06)	• An unevaluated wetland is present within the subject property. If fully evaluated, the wetland would not meet the criteria for provincial significance. • Development and site alteration may be permitted in other wetlands and on adjacent lands if there will be no significant negative impact on the feature or its ecological functions (Niagara Region 2014, Fort Erie 2018). • The wetland is not regulated by NPCA under Ontario Regulation 155/06 (Appendix VI).

7.0 Impact Analysis

7.1 Proposed Undertaking

The development of the subject property is proposed to occur in 2 phases. Phase I of the development is currently awaiting municipal approvals and consists of 2 commercial plazas and a parking area in the southern portion of the subject property. One of the buildings fronts onto Garrison Road and the other is located along the eastern property boundary (Map 3). The development is to be accessed from Garrison Road. Phase II of the proposed development is located in the northern portion of the subject property and consists of 37 townhome units to be accessed from Walden Boulevard (Map 3).

7.2 Approach to Impact Analysis

Potential impacts arising from the proposed development are determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their functions. Where the development limits overlap with the natural features or indirectly affect their functions, impacts may arise. The following is a description of the types of impacts which will be discussed.

- Direct impacts to the natural features within the subject property associated with disruption or displacement caused by the actual proposed 'footprint' of the development, including impacts caused by site grading and the installation of site servicing features.
- Indirect impacts associated with changes in site conditions such as drainage, water balance and water quantity/quality, and effects of construction on adjacent natural features.
- Induced impacts associated with post-construction use of the development such as disturbance or degradation of adjacent natural features and species habitats and created by increased human habitation/use of the area and vicinity.

This impact assessment only addresses potential impacts resulting from the proposed development associated with Phase II development plans. The Phase I impact assessment was completed as part of the Phase I EIS (NRSI 2020).

7.3 Direct Impacts

7.3.1 Vegetation Removal and Site Grading

Portions of the Mineral Cultural Meadow (CUM1) and Mineral Cultural Thicket (CUT1) communities are proposed for removal to accommodate the proposed townhomes and associated roadways (Map 3). The Mineral Cultural Thicket (CUT1) community is of low ecological value due to the presence of non-native, invasive species including European Buckthorn and Multiflora Rose. The presence of non-native and invasive species may be a direct result of the historical cultural influence within the subject property. Based on historical imagery, the Mineral Cultural Meadow (CUM1) and Mineral Cultural Thicket (CUT1) communities were previously cleared for agricultural purposes and at some point, within the last 60 years, were left fallow. A regionally rare species, Clammy Ground-cherry, was observed in the Mineral Cultural Meadow (CUM1) community. No federally or provincially significant vegetation species were observed within these communities.

The Cattail Mineral Shallow Marsh (MAS2-1) is 600m^2 (0.06ha) in size and abuts the western subject property boundary (Map 3). The proposed development will require the removal of 3m^2 (0.0003ha) of the wetland within the subject property. The wetland would not meet the province's criteria for PSW designation if fully evaluated, does not provide direct or indirect fish habitat, contain SWH or provide habitat for SAR, and does not contain significant or rare vegetation species or communities. No federally, provincially or regionally significant species were observed within the wetland. The only wildlife observed within the wetland over a 2-year period was 1 American Toad (*Anaxyrus americanus*). The wetland is not part of a wildlife corridor or linkage between larger wetlands or natural areas as it is located in a fragmented natural area that is completely surrounded by residential and commercial land uses. The wetland offers little ecological value. Therefore, the removal of a small portion of this wetland, and construction of the proposed development along its perimeter, is not likely to significantly reduce the limited ecological value or function of this community.

A Sediment and Erosion Control Plan and Spill Response Plan should be created and followed throughout construction to prevent the degradation of water quality in the Cattail Mineral Shallow Marsh (MAS2-1) community (Section 7.4).

A total of 0.17ha of the Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) is proposed for removal within the subject property (Map 3). Approximately 0.08ha of this community will be retained within the subject property along the northern subject property boundary, which will

provide a linkage corridor, approximately 12m wide, between remaining natural areas located to the east and west of the subject property, although bisected by a roadway. No federally, provincially or regionally significant vegetation or wildlife species were observed within this community. Therefore, the removal of a portion of this community, and construction of the proposed development, will reduce the size of this community but is not likely to significantly reduce the ecological value or function.

As the Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) community is identified as candidate SWH, implications of habitat removal for wildlife are discussed in Section 7.3.2.

Of the 121 trees that were inventoried in Phase II of the subject property, 99 are anticipated to be removed as a result of the proposed development. Details regarding recommended compensation for the removal of these trees is provided in the appended Tree Saving Plan (Appendix V).

7.3.2 Impacts to Wildlife and their Habitats

Candidate Bat Maternity Colonies Significant Wildlife Habitat

The proposed development will require the removal of a portion of the Fresh - Moist Oak - Maple Hickory Deciduous Forest (FOD9) community, which is candidate SWH for Bat Maternity Colonies. Although candidate bat roost trees are proposed for removal, trees with suitable roosting habitat will be retained within the subject property. Contiguous treed areas will be retained to the east and west of the subject property, which likely provide suitable bat roosting habitat and may support bat populations that are potentially currently roosting within the subject property.

It is recommended that tree removals occur outside of the bat active period (April 1 – September 30) to avoid direct impacts to bats. Construction activities should be restricted to daylight hours when possible and any artificial lighting used for construction purposes should be turned off or directed away from adjacent natural features following the completion of daily construction activities. To promote the continued use of the forest community by bats post-construction, the use of artificial lights should be avoided in locations that would cause light wash effects on the new woodland edge.

Candidate Reptile Hibernaculum Significant Wildlife Habitat

The entire subject property has been identified as candidate Reptile Hibernaculum SWH. For a number of species, the necessary characteristics of hibernacula are not well known and it is

therefore not possible to predict with any accuracy where snakes will overwinter (MNDMNRF 2014). Potential impacts to the overwintering snakes are best mitigated through avoidance of earthworks during the hibernation period. Where possible, initial grading activities should be scheduled to occur between May 15 and October 15.

Other Wildlife

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing should therefore occur outside the bird nesting season of late March to late August so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*.

7.4 Indirect Impacts

Construction of the proposed development has the potential to cause indirect impacts to adjacent natural features and functions if not mitigated appropriately. Recommended mitigation measures are provided for each potential impact below.

7.4.1 Disturbance to Adjacent Natural Features and Wildlife Habitats

Vegetation clearing and other construction activities have the potential to inadvertently destroy, damage and degrade existing vegetation along the development limits unless the development limit boundaries are clearly marked. For example, construction activities can cause scarring and decreased health of adjacent trees whose branches or root systems have been damaged by machinery or affected by construction-related dust and sedimentation. Damage to trees and other vegetation can also be caused by the compaction of soils within tree rooting zones along the new woodland edges to be created at the development limits.

Direct damage and indirect disturbances can cause stresses on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species such as Common Buckthorn. Proliferation of invasive, non-native species within natural communities decreases their ecological value such as by suppressing native species, diminishing biodiversity and reducing habitat suitability.

To limit ecological impacts during construction, clearly defined construction limits should be established to avoid unnecessary vegetation removal. Tree protection fencing should be installed and conform to municipal guidelines in terms of fencing type, signage requirements, etc. Additional details regarding recommended tree protection measures are provided in the appended Tree Saving Plan (Appendix V). Where tree protection fencing is not required along construction area limits, other forms of boundary demarcation should be used which may include silt fencing for erosion and sediment control purposes or brightly-coloured snow fencing.

Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located entirely outside the retained natural features, and preferably located as far away as possible so as to limit potential to indirectly impact the adjacent natural features.

7.4.2 Disturbance to Wildlife

Potential indirect impacts to natural features and wildlife may also arise from noise, vibrations, human presence, dust and artificial lighting associated with construction activities. These construction-related disturbances may cause wildlife to temporarily avoid the immediate area. General wildlife impacts can be mitigated by restricting the daily timing of construction activities to between 7:00 and 19:00 hrs. This timing restriction should also apply to the use of generators or pumps insofar as possible.

Light pollution can impact on wildlife predator-prey relationships in natural areas. It reduces foraging times for some species and compromises cover or species ability to remain hidden. Any artificial lighting used for construction purposes should be turned off or directed away from adjacent natural features following the completion of daily construction activities. Permanent outdoor lighting selected for the buildings and parking areas should minimize light pollution. Some ways to mitigate light pollution include:

- Eliminate the use of decorative lighting;
- Use covered bulbs that light facing downward. Ensure that the cone of light does not extend beyond the development footprint (e.g., paved surfaces) to adjacent private properties or natural areas;
- Use “warm” or filtered LEDs (CCT < 3,000 K; S/P ratio < 1.2) to minimize blue emission;
- Use motion sensors and timers to minimize unnecessary lighting; and

- Use IDA approved fixtures.

Potential indirect impacts resulting from noise and vibrations are expected to be temporary, minimal and localized during the construction of the proposed development. Significant effects on wildlife are not anticipated and it is expected that displaced wildlife species will return to the vicinity of the subject property following construction.

7.4.3 Sedimentation and Erosion

During vegetation removal and site grading activities, areas of bare soil will be exposed which have the potential to erode during rainfall events and impact adjacent natural features, including wetlands. The removal of vegetation in combination with the presence of exposed soils during construction activities may also increase the potential for stormwater flow to down-slope areas if not appropriately mitigated. Increased stormwater surface flow and erosion processes may cause the deposition of sediments onto down-slope vegetation and receiving water bodies, ultimately causing vegetation die-back or impaired health.

Soil compaction also has potential to occur as a result of heavy machinery in the area of development. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This will result in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent natural features.

In order to protect on-site natural features from potential impacts due to sediment, an Erosion and Sediment Control Plan must be developed prior to any construction activities on-site. The primary principles associated with sedimentation and erosion protection measures are to: (1) minimize the duration of soil exposure, (2) retain existing vegetation, where feasible, (3) encourage re-vegetation, (4) divert runoff away from exposed soils, (5) keep runoff velocities low, and (6) trap sediment as close to the source as possible.

The following general recommendations should be implemented to mitigate erosion and sedimentation impacts:

- Installation of silt fencing along the construction limits in all locations where run-off will discharge to adjacent lands or on-site natural features.
- Erosion and Sediment Control measures must be regularly inspected and repaired or replaced in a timely manner. Accumulated sediment must be removed immediately.

- Placement of topsoil and seeding of all graded areas not subject to active construction within 30 days. A native seed mix, appropriate to the site conditions, should be applied in areas adjacent to existing natural features.

It is also recommended that topsoil piles be located away from adjacent natural features and that silt fencing be installed around piles to prevent off-site migration of water-borne sediments.

The impact resulting from soil compaction can be mitigated by restricting the use of construction vehicles and equipment to the construction footprint, and by locating material stockpile and equipment storage locations away from the natural features.

7.4.4 Water Quality

The greatest potential for water quality impacts associated with the proposed development relate to contamination of the Cattail Mineral Shallow Marsh (MAS2-1) community. In general, indirect water quality impacts from construction may occur through faulty construction equipment. Machinery should arrive on site in clean condition and be checked and maintained free of fluid leaks. Machinery must be refueled, washed and serviced a minimum of 30m from waterbodies so as to prevent contamination by deleterious substances. Fuel and other construction related materials should also be located away from waterbodies. A Spill Response Plan should be developed prior to commencement of construction. This plan should provide a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. A spill kit must also be kept on site at all times and on-site workers must be trained in the use of this kit and be fully aware of the Spill Response Plan.

A Sediment and Erosion Control Plan should be created and followed throughout construction to prevent the degradation of water quality in the Cattail Mineral Shallow Marsh (MAS2-1) community.

7.5 Induced Impacts

Establishment of the proposed development will increase the potential for human disturbances to the adjacent natural features if not appropriately mitigated. In particular, the development may lead to increased human access to the Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) community to the east and west of the subject property, with associated potential for habitat degradation (e.g., vegetation trampling or damage, littering, wearing of informal paths and associated soil erosion). Increased human population in the immediate vicinity will also

increase the potential for human-subsidized mammals, such as domestic cats and Northern Raccoon (*Procyon lotor*), to access surrounding natural areas. Easier access provided to these animal groups may impact nesting success and direct mortality among certain wildlife species, such as passerine birds, amphibians and reptiles.

It is recommended that permanent chain-link fencing with no gates be established along the rear and/or sides of lots located adjacent to retained natural features. Installation of permanent fencing with no gates is anticipated to represent an effective deterrence to human encroachment from these lots and the dumping of refuse or garden waste from the rear or sides of these lots into the adjacent natural areas.

7.6 Restoration and Enhancement

Details regarding recommended compensation for tree removal as a result of the proposed development is provided in the Tree Saving Plan (Appendix V). The recommendations outlined in the Tree Saving Plan are aimed at restoring tree cover and contributing toward compensation tree planting requirements. Species used for compensation plantings should be native to Niagara Region and not include any species that are listed as introduced, or locally, provincially or federally significant.

8.0 Monitoring

Pre-, during, and post-construction monitoring is required as a means to ensure that adjacent natural features are not impacted throughout all stages of property development.

8.1 Pre-Construction Monitoring

Prior to any construction activity on-site, including vegetation clearing and grubbing, on-site inspections of the following should be undertaken to ensure proper installation:

- Sediment and erosion control measures (e.g., silt fencing) as confirmed by an environmental inspector; and
- Tree and natural area protection measures, including proper installation of tree protection fencing as confirmed by a certified arborist or environmental inspector.

8.2 Construction-Stage Monitoring

Construction monitoring is the responsibility of the proponent and is tied to the specific undertaking. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits.

The following measures are recommended during construction and will be the responsibility of the environmental inspector, unless otherwise indicated:

- Pruning of any limbs or roots (of trees to be retained) disrupted during construction, as completed by a certified arborist;
- Maintaining, and where necessary, repairing or replacing silt fencing, other sediment and erosion control measures, and tree protection fencing; and
- Monitoring compliance of construction personnel toward adherence of required restrictions/limitations on personnel and vehicle access in natural features, machinery fueling locations and equipment/stockpile locations away from natural features.

8.3 Post-Construction Monitoring

The post-construction period is assumed to begin once 90% build-out of the residential complex has occurred. The following post-construction monitoring measures should be completed:

- Inspections for post-construction disturbance within the subject property. This includes ensuring no disturbance has occurred within retained natural features within the subject

property or features adjacent to the subject property (i.e., dumping of yard waste along rear/side lot fencing).

The details of this monitoring plan will be refined during the detailed design stage of the development application process in conjunction with agency staff.

9.0 Summary

Natural Resource Solutions Inc. was retained by a private developer, Vijaykumar Patel, to complete an EIS for the proposed development of a commercial plaza and residential townhome complex at 315 Garrison Road in Fort Erie, Ontario. This EIS characterized the natural heritage features within the subject property through a comprehensive background information review and field survey program. Field survey data was assessed against applicable municipal and provincial policy and guidance documents for the determination of significant features and functions. Several significant features were identified within the subject property including candidate SWH and a wetland community.

Recommendations have been provided to minimize impacts and mitigate potential negative effects caused by the proposed development. These include recommendations to mitigate direct, indirect and induced impacts that may arise through construction and post-construction human use of the proposed development.

Monitoring measures have been provided as required by the EIS findings. These include a plan to monitor the integrity of protected features and significant habitat functions through the pre-construction, construction and post-construction phases. Corrective mitigation strategies will be determined and employed, in consultation with regulatory agencies, if required.

10.0 References

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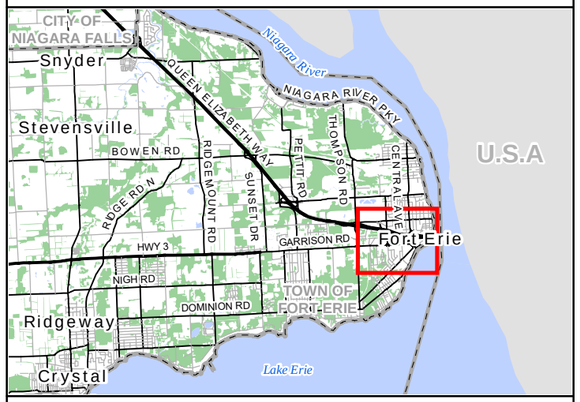
Maps

Map 1

315 Garrison Road, Fort Erie

Subject Property and Natural Features



Legend

- Subject Property
- Utility Line
- Highway
- Primary Road
- Secondary Road
- Resource / Recreation / Other
- Railway
- Provincially Significant Wetland (PSW)
- Other Wetland (Non-PSW)
- Wooded Area
- Deer Wintering Area (Stratum 2)
- Waterfowl Winter Concentration Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2319A
Date: October 28, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:8,500

0 100 200 300 400 500 Metres

N

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4752650 4752600 4752550 4752500 4752450

WALDEN BLVD

MATHER BLVD

GARRISON RD

FOD9

BAT-002

BAT-003

BAT-004

BAT-001

BAT-005

SAL-001

SAL-002

SAL-003

MAS2-1

ANR-001

CUT1

CUM1

Asphalt

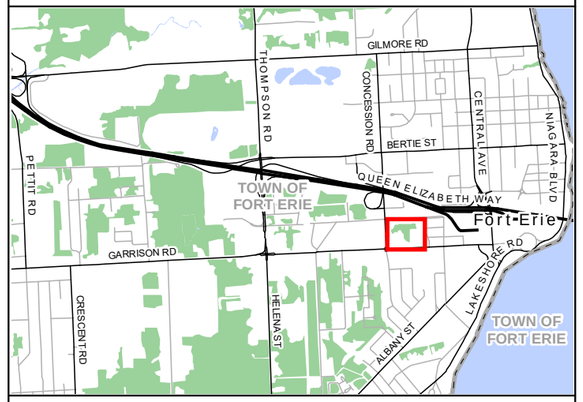
Phase II
(Proposed)

Phase I
(Developed)

Map 2

315 Garrison Road, Fort Erie

Monitoring Stations and Vegetation Communities



Legend

- Phase I (Developed)
- Phase II (Proposed)
- Anuran Call Station (ANR)
- Salamander Monitoring Station (SAL)
- Bat Acoustic Monitoring Station (BAT)
- Surveyed Wetland (NRSI September 2021)
- Ecological Land Classification (ELC)
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
- (FOD9) Fresh-Moist Oak-Maple-Hickery Deciduous Forest Ecosite
- (MAS2-1) Cattail Mineral Shallow Marsh Type
- ELC Inclusion

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2319A
Date: January 28, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

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4752650 4752600 4752550 4752500 4752450

WALDEN BLVD

MATHER BLVD

FOD9

MAS2-1

Phase II
(Proposed)

CUT1

Asphalt

CUM1

Phase I
(Developed)

GARRISON ROAD
REGIONAL ROAD 3

GARRISON RD

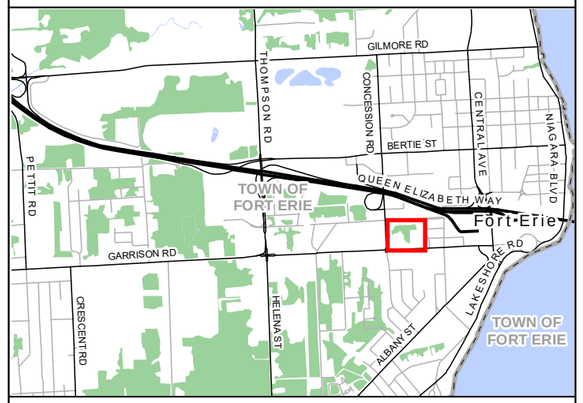
669200 669250 669300 669350 669400 669450

Path: X:\2319_GarrisonAve_FtErie_SSA\NRSI_2319_Map3_ConceptPlan_1K_2022_01_28_GCS.mxd

Map 3

315 Garrison Road, Fort Erie

Concept Plan



Legend

- Phase I (Developed)
- Phase II (Proposed)
- Proposed Site Plan
- Existing Features
- Surveyed Wetland (NRSI September 2021)
- Ecological Land Classification (ELC)
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
- (FOD9) Fresh-Moist Oak-Maple-Hickery Deciduous Forest Ecosite
- (MAS2-1) Cattail Mineral Shallow Marsh Type
- ELC Inclusion

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2319A
Date: January 28, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

0 10 20 30 40 50 60 Metres

N

Appendix I

Species at Risk and Species of Special Concern Screening Table

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[1]	COSEWIC[2]	SARA[2]	Background Source	Habitat Preference[3,4,5,6]	Suitable Habitats within Subject Property	Rationale	NRSI Observed
Vascular Plants										
Panax quinquefolius	American Ginseng	S3	END	E	Schedule 1	MNDMNRF 2018	Deep leaf litter in rich, moist deciduous woods, especially on rocky, shaded cool slopes in sweet soil	Yes	Deciduous woods are present within the subject property. This species was not observed during targeted surveys.	No
Oenothera gaura	Biennial Gaura	S3				MNDMNRF 2021b	River banks, roadsides, fields, vacant lots.	Yes	Roadsides and vacant lots are present within the subject property. This species was not observed during targeted surveys.	No
Carya laciniosa	Big Shellbark Hickory	S3				MNDMNRF 2021b	River banks and rich floodplain and wet lowland decicuous forests, often on clayey or loamy soils.	Yes	Deciduous woods are present within the subject property. This species was not observed during targeted surveys.	No
Nyssa sylvatica	Black Gum	S3				MNDMNRF 2021b	Moist to wet forests or wet depressions in forests, borders of swamps (even with tamarack), shores, typically in acid, often sandy, soils; less commonly in drier sites.	Yes	Deciduous woods are present within the subject property. This species was not observed during targeted surveys.	No
Juglans cinerea	Butternut	S3?	END	E	Schedule 1	MNDMNRF 2018	Stream banks, swamps, and upland beech-maple, oak-hickory, and mixed hardwood stands.	Yes	Suitable hardwood stands are present within the subject property. This species was not observed during targeted surveys.	No
Ptelea trifoliata	Common Hop-tree	S3	SC	T	Schedule 1	MNDMNRF 2018	Forested to open dunes along Lake Michigan; sandy fields and knolls; fencerows and dry bluffs or banks; rarely in moister sites along rivers and edges of floodplain forests.	No	No sandy areas or shoreline dunes are present within the subject property.	No
Cornus florida	Eastern Flowering Dogwood	S2?	END	E	Schedule 1	MNDMNRF 2018	Dry (usually oak) to rich deciduous forests, especially on hillsides and river banks; rarely recorded with tamaracks.	Yes	Deciduous forest is present within the subject property. This species was not observed during targeted surveys.	No
Arisaema dracontium	Green Dragon	S3	SC	SC	Schedule 1	MNDMNRF 2018	Grows in somewhat wet to wet deciduous forests along streams, particularly maple forest and forest dominated by Red Ash and White Elm trees.	No	No watercourses are present within the subject property.	No
Morus rubra	Red Mulberry	S2	END	E	Schedule 1	MNDMNRF 2021b	Floodplains, river bottoms, and swamps.	No	No floodplains, rivers or swamps are present within the subject property.	No
Chimaphila maculata var. maculata	Spotted Wintergreen	S1	END	E	Schedule 1	MNDMNRF 2018, MNDMNRF 2021b	Deciduous forests of several kinds, often with some conifers, but especially under oaks on sandy soils, as on forested dunes.	Yes	Deciduous forest is present within the subject property. This species was not observed during targeted surveys.	No
Hibiscus moscheutos ssp. moscheutos	Swamp Rose-mallow	S3	SC	SC	Schedule 1	MNDMNRF 2018	Marshes, open river bottoms, and often adjacent disturbed ground.	Yes	A small marsh is present within the subject property. This species was not observed during targeted surveys.	No

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[1]	COSEWIC[2]	SARA[2]	Background Source	Habitat Preference[3,4,5,6]	Suitable Habitats within Subject Property	Rationale	NRSI Observed
Eurybia divaricata	White Wood Aster	S2	THR	T	Schedule 1	MNDMNRF 2018	Open, dry deciduous forests that are dominated by Sugar maple and American beech trees.	Yes	Deciduous forest is present within the subject property. This species was not observed during targeted surveys.	No
Glycyrrhiza lepidota	Wild Licorice	S3				MNDMNRF 2021b	Forests, ranging from dry oak-hickory to rich beech-maple	Yes	Forest is present within the subject property. This species was not observed during targeted surveys.	No
Spiranthes ochroleuca	Yellow Nodding Ladies' Tresses	S2				MNDMNRF 2021b	Typically in moist to dryish sandy, acid soils, including ditches, old sand pits, and open savannas	No	No sand pits or savannas are present within the subject property.	No
Birds										
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	Schedule 1	MNDMNRF 2018	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30 ha of forest	No	Suitable habitat size is not present. The subject property contains a portion of a deciduous forest that is only 0.5ha in size.	No
Riparia riparia	Bank Swallow	S4B	THR	T		MNDMNRF 2018	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	No	No exposed banks or bluffs are present within the subject property.	No
Hirundo rustica	Barn Swallow	S4B	THR	T		BSC et al. 2006, MNDMNRF 2018	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water	No	No structures are present within the subject property. However, structures adjacent to the subject property may provide suitable nesting habitat.	No
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	BSC et al. 2006, MNDMNRF 2018	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha	No	No grasslands are present within the subject property.	No
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	Schedule 1	MNDMNRF 2018	Mature deciduous woodland of Great Lakes- St. Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha)	No	Suitable habitat size is not present. The subject property contains a portion of a deciduous forest that is only 0.5ha in size.	No
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	BSC et al. 2006, MNDMNRF 2018	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water	No	No buildings are present within the subject property. This species is not likely to nest in hollow trees when more suitable habitat is present nearby, possibly within the study area.	No
Chordeiles minor	Common Nighthawk	S4B	SC	T	Schedule 1	MNDMNRF 2018	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs	No	Open ground is present within the subject property. However only a small area of marginal habitat is present.	No
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	BSC et al. 2006, MNDMNRF 2018	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	No	No grasslands or meadows of suitable size are present within the subject property.	No

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[1]	COSEWIC[2]	SARA[2]	Background Source	Habitat Preference[3,4,5,6]	Suitable Habitats within Subject Property	Rationale	NRSI Observed
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		BSC et al. 2006, MNDMNRF 2018	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks	No	Deciduous forest within the subject property is not of suitable size or structure (contains thick understory).	No
Rallus elegans	King Rail	S2B	END	E	Schedule 1	MNDMNRF 2018	Large, shallow, fresh water marshes, shrubby swamps, marshy borders of lakes and ponds with abundant vegetation; an 'edge' species; territories are 0.3 to 0.5 ha; loss of large marshes in the south is limiting to this species	No	No suitable marshes or bodies of water are present within the subject property.	No
Lanius ludovicianus (ssp. migrans)	Loggerhead Shrike	S2B	END	E	Schedule 1	MNDMNRF 2021b	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat	No	No pasture or farmland is present within the subject property.	No
Colinus virginianus	Northern Bobwhite	S1	END	E	Schedule 1	MNDMNRF 2018	Grassland, prairie or hay fields with woody cover in form of thickets, tangles of vines, shrubs; fence rows or woodland edges; cropland growing corn, soybeans or small grains and clover or grass; well-drained sandy or loamy soil; pond edges	No	No grasslands or cropland is present within the subject property.	No
Protonotaria citrea	Prothonotary Warbler	S1B	END	E	Schedule 1	MNDMNRF 2018	Area sensitive species preferring 100 ha of flooded or swampy woodlands with standing or flowing water and more than 25% canopy cover with numerous stumps and snags; stream borders or flooded bottomlands; soft, dead trees with dbh >10 cm; Carolinian species	No	Suitable habitat size is not present. The subject property contains a portion of a deciduous forest that is only 0.5ha in size.	No
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1	BSC et al. 2006	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory	No	Suitable habitat size is not present. The subject property contains a portion of a deciduous forest that is only 0.5ha in size.	No
Hylocichla mustelina	Wood Thrush	S4B	SC	T		BSC et al. 2006, MNDMNRF 2018	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	No	Deciduous forest is present within the subject property but it is not suitable due to human disturbance.	No
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	BSC et al. 2006, MNDMNRF 2018	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	No	Thicket is present within the subject property but no suitable watercourses or waterbodies are present.	No
Herpetofauna										
Emydoidea blandingii	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	THR	T	Schedule 1	MNDMNRF 2018, Ontario Nature 2019	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	No suitable marshes, watercourses or waterbodies are present within the subject property. No suitable nesting habitat is present.	No
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	Schedule 1	MNDMNRF 2018	Sandy upland fields, pastures, savannahs, sandy beaches; dry open oak-pine-maple forest with sandy soils; prefer forest areas > 5ha	No	Suitable habitat size is not present. The subject property contains a portion of a deciduous forest that is only 0.5ha in size.	No

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[1]	COSEWIC[2]	SARA[2]	Background Source	Habitat Preference[3,4,5,6]	Suitable Habitats within Subject Property	Rationale	NRSI Observed
Anaxyrus fowleri	Fowler's Toad	S2	END	E	Schedule 1	MNDMNRF 2018	Restricted in Ontario to shores of Lake Erie; requires sandy soils for burrowing to escape sun; hibernates during winter in burrows >1m deep in sand; suitable areas are along shorelines, river valleys or beaches that provide adequate insect supply; requires shallow water for breeding	No	The Lake Erie shoreline is approximately 800m away from the subject property.	No
Ambystoma sp. (genetics unknown)	Jefferson/ Unisexual Salamander Complex	S2				Ontario Nature 2019	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	Yes	The wetland may provide marginally suitable habitat within the subject property. No salamanders observed during salamander breeding surveys.	No
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	MNDMNRF 2018	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	No	No suitable marshes, watercourses or waterbodies are present within the subject property. No suitable nesting habitat is present.	No
Clemmys guttata	Spotted Turtle	S3	END	E	Schedule 1	MNDMNRF 2018	Unpolluted, shallow bodies of water such as streams, ponds, wet meadows, marshes or swamps with aquatic vegetation, logs or clumps of vegetation for basking; nest is dug near water in fine-textured soil (e.g. sand) or moss; vulnerable to factors affecting water quality, vegetation composition and structure; average home range size 3.7 ha	No	No suitable marshes, watercourses or waterbodies are present within the subject property. No suitable nesting habitat is present.	No
Mammals										
Myotis leibii	Eastern Small-footed Myotis	S2S3	END			MNDMNRF 2018	Hibernates in cool caves and abandoned mines; roosts in rocky habitats including talus slopes and open rock barrens. May also roost in man-made structures, however, very rarely; foraging habitat poorly understood in Ontario. Within the United States of America, it feeds primarily in forests, but also over waterbodies, within riparian forests, and occasionally open fields.	Yes (Foraging Habitat Only)	No structures or rocky habitats are present within the subject property. Forest within the subject property may provide foraging habitat. Species was not documented during bat acoustic surveys.	No
Urocyon cinereoargenteus	Gray Fox	S1	THR	T	Schedule 1	Dobbyn 1994	Hardwood forests with a mix of fields and woods; swamps; wooded, brushy or rocky habitats; woodland farmland edge; old fields with thickets; dens in hollow log or tree; individual has numerous winter dens throughout its range which is > 40 ha	No	Hardwood forest is present within the subject property but is small in size and isolated within an urban setting.	No
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	Dobbyn 1994, MNDMNRF 2018	Hibernates in cool, humid caves and abandoned mines; uses caves, quarries, tunnels, hollow trees or tree cavities, or buildings for roosting and maternity colonies; forages over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Yes	Forest within the subject property contains trees with suitable roosting habitat. Forest edges may provide foraging habitat. Species was not documented during bat acoustic surveys.	No
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1	MNDMNRF 2018	Hibernates in cool, humid caves and abandoned mines; uses hollow trees or tree cavities, loose bark, or buildings for roosting and maternity colonies; forages within treed habitats over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Yes	Forest within the subject property contains trees with suitable roosting habitat. Forest edges provide suitable foraging habitat. Species was not documented during bat acoustic surveys.	No

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[1]	COSEWIC[2]	SARA[2]	Background Source	Habitat Preference[3,4,5,6]	Suitable Habitats within Subject Property	Rationale	NRSI Observed
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	Dobbyn 1994, MNDMNRF 2018	Hibernates in cool, humid caves and abandoned mines; maternity colony and roosting habitat poorly understood in Ontario. Elsewhere within its range, this species has been documented to use dead/dying leaf clusters, arboreal lichens and epiphytes, or buildings for roosting and maternity colonies; forages over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Yes	Forest within the subject property contains trees with suitable roosting habitat. Forest edges provide suitable foraging habitat. Species was not documented during bat acoustic surveys.	No
Microtus pinetorum	Woodland Vole		SC	SC	Schedule 1	Dobbyn 1994, MNDMNRF 2018	Mature deciduous forest in the Carolinian forest zone, with loose sandy soil and deep humus; grasslands, meadows and orchards with groundcover of duff or grass	Yes	Deciduous forest and meadow are present within the subject property.	No
Insects										
Danaus plexippus	Monarch	S2N, S4B	SC	SC	Schedule 1	MNDMNRF 2018, MacNaughton et al. 2021	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Yes	Common Milkweed is present within the subject property but not in high abundance. Species not observed during surveys.	No
Bombus afinis	Rusty-patched Bumble Bee	S1	END	E	Schedule 1	MNDMNRF 2018	Open habitat such as mixed farmland, oak savannah, urban settings, and sand dunes.	No	Open habitat is present within the subject property but this species is only known to occur in Pinery Provincial Park within Ontario.	No
Pieris virginiensis	West Virginia White	S3	SC	SC		MNDMNRF 2018	Mesic hardwood or hardwood-northern conifer-mixed forests on rich soils, including hardwood swamps. An important feature is plentiful suppply of the foodplants, generally toothworts	No	Toothworts are not present within the subject property and no swamps are present.	No

[1]MNRF 2021a, [2]Governemnt of Canada 2021, [3]MNRF 2000, [4]Michigan Flora Online 2011, [5]Oldham and Brinker 2009, [6]Riley 1989

Appendix II
Significant Wildlife Habitat Screening Tables

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. 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[cxlviii] Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	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"[ccxi] • Any mixed species aggregations of 100[l] or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • 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). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	No fields are present within the subject property. Blue-winged Teal has been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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	Canada Goose Cackling Goose Snow Goose Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter	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). Information Sources • 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[i] or more of listed species for 7 days[i], results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • 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). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	No suitable marshes, watercourses or other waterbodies of suitable size are present within the subject property. Canada Goose and Blue-winged Teal have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, 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 a SWH. Information Sources • 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 Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000[l] 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[l] 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[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #8 provides development effects and mitigation measures.	No suitable wetlands, watercourses or other waterbodies with suitable shoreline habitat are present within the subject property. Spotted Sandpiper has been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 > 20ha[cxlviii, cxlix] with a combination of forest and upland[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] 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 aviable for roosting[cxlix] Information Sources • OMNRF Districts • Natural clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from CAs • Results of Christmas Bird Counts	Studies confirm the use of these habitats by: • One or more Short-eared Owls, or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds[l]. • 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"[ccxi] • SWHMIST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	Woodlands are present within the subject property however the required size of associated upland habitat is not present. The subject property is approximately 800m from the nearest large water body. Red-tailed Hawk, Northern Harrier and American Kestrel have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Hibernacula					
Rationale: Bat hibernacula, are rare habitats in all Ontario landscapes.	Big Brown Bat Eastern Pipistrelle/Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered The locations of bat hibernacula are relatively poorly known. Information Sources • 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[i]. • The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, i]. for the development types and 1000m for wind farms [ccv]. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the[ccv]."Bats and Bat Habitats: Guidelines for Wind Power Projects" [ccv] • SWHMIST[cxlix] Index #1 provides development effects and mitigation measures.	None of the listed ecosites are present within the subject property. Big Brown Bat and Tri-colored Bat have been observed within the subject property or vicinity (Dobbyn 1994). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 building [sxxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii]. • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]. • 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[ccx]. Information Sources • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts	Maternity Colonies with confirmed use by: • >10 Big Brown Bats[i] • >5 Adult Female Silver-haired Bats[i] • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[i]. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv]. • SWHMIST[cxlix] Index #12 provides development effects and mitigation measures.	Deciduous forest (FOD) is present in the subject property and contains greater than 10/ha large diameter wildlife trees. Big Brown Bat and Silver-haired Bat have been observed within the subject property or vicinity (Dobbyn 1994). Bat acoustic surveys detected both Big Brown Bat and Silver-haired Bat call sequences during the maternity period. Due to the urban nature of the subject property, it is assumed that Big Brown Bat is not using the subject property as maternity roost habitat, but is likely roosting in nearby anthropogenic structures. Silver-haired Bat may be using the FOD vegetation community as maternity roost habitat. **Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: ELC Community Classes: SW, MA, OA and SA ELC Community Series: FEO and BOO Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH Information Sources • EIS studies carried out by Conservation Authorities • Field naturalists clubs • OMNRF Ecologist or Biologist • Natural Heritage Information Centre (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant[j]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[j]. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – Apr)[cvii]. Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	No suitable waterbodies are present within the subject property. Midland Turtle and Snapping Turtle have been observed within the subject property or vicinity (Ontario Nature 2019). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Reptile Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	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 in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. 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. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from CAs • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • 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)[i]. • 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 30m buffer is the SWH[i]. • SWHMIST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula.	Suitable habitat for snake hibernacula may be present in upland habitats within the subject property. No targeted reptile surveys were completed. **Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]. • Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] 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[ccvii]. • 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"[ccxi]. • SWHMIST[cxlix] Index #4 provides development effects and mitigation measures.	No exposed soil banks or structures are present within the subject property. Northern Rough-winged Swallow and Cliff Swallow have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 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. Information Sources • Ontario Breeding Bird Atlas[ccv], 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 CAs • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other list species. • The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[cc, ccvii]. • Confirmation of active colonies must 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 • SWHMIST[cxlix] Index #5 provides development effects and mitigation measures.	No swamps are present within the subject property. Great Blue Heron and Green Heron have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • 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, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i]. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[i]. • Presence of 5 or more pairs for Brewer's Blackbird[i]. • The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii]. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #6 provides development effects and mitigation measures.	No islands, peninsulas or watercourses are present within the subject property. None of the listed species have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie[cxlix]. • 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 [xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • 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 [cxlviii, cxlix]. • 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 [xxxvii, xxxviii, xxxix, xl, xli]. Information Sources • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur[xl, xlii]. • 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 White Admiral's is to be considered significant[i]. • SWHMIST[cxlix] Index #16 provides development effects and mitigation measures.	The subject property is approximately 800 m from the Lake Erie shoreline. The small CUM community within the subject property does not provide enough resources for large congregations of butterflies as a stopover area. Monarch and Red Admiral have been observed within the subject property or vicinity (MacNaughton et al. 2019). **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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.on.ec.gc.ca/wildlife_e.html All migrant raptors 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 need to be >5 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie or Ontario are more significant[cxlix]. • Sites have a variety of habitats: forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates[i]. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #9 provides development effects and mitigation measures.	The subject property is approximately 800 m from the Lake Erie shoreline but the forest within the subject property is approximately 0.5 ha in size. Much larger forested areas are present approximately 500 m to the southwest of the subject property. **Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
Rationale: 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 to reduce or avoid the impacts of winter conditions [cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations (CUP) smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha[i]. • Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant[i]. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • 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[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • SWHMIST[cxlix] Index #2 provides development effects and mitigation measures.	The woodlot within the subject property is 0.5 ha in size and does not meet the size requirements. No Deer Winter Congregation Areas have been mapped by the MNRF in this area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • 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[lxxviii] • SWHMIST[cxlix] Index #21 provides development effects and mitigation measures.	None of the listed ELC Communities are present. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Sand Barrens					
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 lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	A sand barren area >0.5ha in size Information Sources • 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[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp)[i]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	None of the listed ELC Communities are present. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 7E	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Indicator Species:** 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 7E[cxlix]	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5ha in size[lxxv]. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie[cxcix]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Staff • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five **Alvar indicator species**[lxxv] at a candidate Alvar site is Significant • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMIST[cxlix] Index #17 provides development effects and mitigation measures.	None of the listed ELC Communities are present. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
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 overstorey 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 >0.5ha Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Districts • Field naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii]. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities [cxlviii] (cut stumps will not be present) • Determine ELC Vegetation Type for forest area containing the old growth characteristics[lxxviii]. • SWHMIST[cxlix] Index #23 provides development effects and mitigation measures.	Old growth forest is not present within the subject property. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
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)[cc].	No minimum size to site[j] Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location data available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present[j]. Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #18 provides development effects and mitigation measures.	None of the listed ELC Communities are present. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
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)[cc].	No minimum size to site[j]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Centre (NHIC has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present[j]. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation Type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #19 provides development effects and mitigation measures.	None of the listed ELC Communities are present. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. 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[cxlviii]. The OMNRF/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	No other rare vegetation communities are present within the subject property. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All 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: 120m[cxlix] from a wetland (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards[j], or, • Presence of 10 or more nesting pairs for listed species including Mallards[j]. • 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"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMIST[cxlix] Index #25 provides development effects and mitigation measures.	One small wetland feature (MAS2) extends slightly to within the subject property boundary. However, the feature does not meet the size requirements to provide significant nesting area habitat. Wood Duck, Mallard and Blue-winged Teal has been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these 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). Information Sources • Natural Heritage Information Center (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 format and does not include all the habitat. • Nature Counts, Ontario Nest Records Scheme data • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH[ccvii], maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi, ccvii]. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • 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[ccvii]. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #26 provides development effects and mitigation measures.	Forest is present within the subject property. However, it is not adjacent to a watercourse or waterbody. None of the listed species have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats 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 combined >30ha or with >4ha of interior habitat[lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • 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 Coopers 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. Information Sources • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of habitat is the SWH[ccvii].(the 28ha 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[ccvii]. • Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH[ccvii]. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii]. • 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. • SWHMIST[cxlix] Index #27 provides development effects and mitigation measures.	Forest is present within the subject property. However, it is only 0.5 ha in size. No interior forest habitat is present. Cooper's Hawk and Sharp-shinned Hawk have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] 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 are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • 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 Center (NHIC) Field naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles[l] • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	The subject property does not contain suitable soils adjacent to any of the listed ecosites. Midland Turtle and Snapping Turtle have been observed within the subject property or vicinity (Ontario Nature 2019). **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. 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[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv]. <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists 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[i] seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat[cxlviii]. • SWHMIST[cxlix] Index #30 provides development effects and mitigation measures.	Seeps and springs are not present within the subject property. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx]. 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[cxlviii]. Information Sources • 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/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. • A combination of observational study and call count surveys [cviii] will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area[lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi]. 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. • SWHMIST[cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat may be present within the MAS2-1 feature adjacent to the subject property. Anuran call surveys and salamander breeding surveys confirmed the absence of this SWH. Blue-spotted Salamander, Spring Peeper and Wood Frog have been observed within the subject property or vicinity (Ontario Nature 2019). **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
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 (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m^2 (about 25m diameter)[ccvii] supporting high species diversity are significant: some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats[clxxxiv]. • 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. Information Sources • 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 CAs	Studies confirm: • Presence of breeding population of 1or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 breeding individuals (adults and eggs masses)[lxxi, lxxiii] or 2 or more of the listed frog/toad species with Call Level of 3. or; Wetland with confirmed breeding Bullfrogs are significant[l]. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys cviii to determine breeding/larval stages will be required during the spring (May March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/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. • SWHMIST[cxlix] Index #15 provides development effects and mitigation measures.	A small wetland feature (MAS2-1) is present in the Cultural Thicket community within the subject property. Anuran call surveys and salamander breeding surveys confirmed the absence of this SWH. American Toad, Blue-spotted Salamander, Spring Peeper, Northern Leopard Frog, Green Frog, Bullfrog and Wood Frog have been observed within the subject property or vicinity (Ontario Nature 2019). **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 >30ha[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix]. • Interior forest habitat is at least 200m from forest edge habitat[clxiv]. 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 CAs	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[l]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[l]. • Conduct field investigations in early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[cclxi] • SWHMIST[cxlix] Index #34 provides development effects and mitigation measures.	Forest (FOD) is present within the subject property. However, it is only 0.5 ha in size. No interior forest habitat is present. Yellow-bellied Sapsucker, Veery. Ovenbird and Scarlet Tanager have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding 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[cxxiv]. • 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. Information Sources • OMNRF Districts and wetland evaluations • Field naturalist clubs • Natural Heritage Information Centre (NHIC) • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]	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[i]. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[i]. • 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"[ccxi] • SWHMIST[cxlix] Index #35 provides development effects and mitigation measures	None of the listed ELC communities are present within the subject property. American Bittern and Green Heron have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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) >30ha[clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. 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)[i]. 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. Information Sources • Agricultural land classification maps Ministry of Agriculture • Local birder clubs • Ontario Breeding Bird Atlas[ccv] • EIS Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species[i]. • 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"[ccxi] • SWHMIST[cxlix] Index #32 provides development effects and mitigation measures	No suitable grassland areas are present within the subject property. Upland Sandpiper, Vesper Sparrow, Northern Harrier and Savannah Sparrow have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species.	Large natural field areas succeeding to shrub and thicket habitats >10ha[clxiv] 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)[i]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species[clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[i]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[i]. • 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"[ccxi] • SWHMIST[cxlix] Index #33 provides development effects and mitigation measures.	Shrub communities are present within the subject property. However, they are not associated with large natural field areas and are only approximately 1.6 ha in size. Brown Thrasher, Field Sparrow, Black-billed Cuckoo, Eastern Towhee and Willow Flycatcher have been observed within the subject property or vicinity (BSC et al. 2006). **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [Ccii]	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crawfish 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) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • 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 marsh meadow or terrestrial sites[cci]. • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the large 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 [cci] • SWHMIST[cxlix] Index #36 provides development effects and mitigation measures.	A small wetland feature (MAS2-1) extends slightly to within the subject property. No evidence of terrestrial crayfish was observed during field investigations. **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species. • NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • 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 neess to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat for foraging habitat. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Refer to Species at Risk and Species of Conservation Concern screening table for details. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 Blue-spotted Salamander Spotted Salamander Four-toed Salamander Gray Treefrog Northern Leopard Frog Pickerel Frog Western Chorus Frog	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[clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi] Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. Information Sources • MNRF District Office • Natural Heritage Information Centre NHIC • Reports and other information available from CAs • 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[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix of woodland habitat and with gaps <20m[cxlix] • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMIST[cxlix] Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat (Wetland) SWH is not present within the subject property. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 7E.

	Wildlife Habitat and Species	Candidate SWH			Confirmed SWH	Study Area
		Ecosites	Habitat Description	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
EcoDistrict						
7E-2	Bat Migratory Stopover Area Rationale: Stopover areas for long distance migrant bats are important during fall migration. Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types		• Long distance migratory bats typically migrate during late summer and early fall migrating summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. • This is the only known bat migratory stopover habitats based on current information. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University of Waterloo, Biology Department	• Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv]. • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHMIST[cxlix] Index #38 provides development effects and mitigation measures	The subject property is not located on Long Point. **Not SWH**

Appendix III
Terms of Reference

NIAGARA PENINSULA CONSERVATION AUTHORITY

250 Thorold Road West, 3rd Floor, Welland, Ontario L3C 3W2
Telephone 905.788.3135 | Facsimile 905.788.1121 | www.npca.ca

March 26, 2021

Our File No.: PLOTH202100284

BY E-MAIL ONLY

Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON
N2L 3X2

Attention: Brett Woodman, M.E.S. Senior Manager

Subject: Terms of Reference Review
315 Garrison Rd.
Fort Erie Phase 2, EIS

The NPCA has reviewed the application submitted for review of a Terms of Reference in support of a Planning Act Application for 315 Garrison Rd. The NPCA has reviewed the Terms of Reference submitted by Natural Resource Solutions Inc. (NSRI) dated March 10, 2021, mapping of the subject property and proposed development submitted by NSRI, Project 2319A dated February 17, 2021, and an Environmental Impact Study submitted by NRSI dated October 2020. The NPCA offers the following comments:

NPCA Policies

The NPCA regulates watercourses, flood plains (up to the 100 year flood level), Great Lakes shorelines, hazardous land, valleylands, and wetlands under *Ontario Regulation 155/06* of the *Conservation Authorities Act*. The NPCA's *Policies, Procedures and Guidelines for the Administration of Ontario Regulation155/06 and Land Use Planning Policy Document* (NPCA policies) provides direction for managing NPCA regulated features.

The following times should be added to assist the proponent in satisfying criteria:

1. Based on the design, it appears that permission to remove a wetland will be required to support the proposed development. The EIS should demonstrate that the form and function of the wetlands proposed to be negatively impacted are not irreplaceable. It must be demonstrated through an EIS that the wetland form and function can be maintained or enhanced elsewhere within the subwatershed or planning area; and the wetland is **NOT**:
    a. part of a Provincially Significant Wetland,
    b. located within a floodplain or riparian community,
    c. part of a Provincially or municipally designated natural heritage feature, a significant woodland, or hazard land, significant wildlife habitat,

d. confirmed habitat for a Provincially or regionally significant species as determined by the Ministry of Natural Resources and Forestry or as determined by the municipality,
e. part of an ecologically functional corridor or linkage between larger wetlands or natural areas,
f. part of a groundwater recharge area, or
g. a groundwater discharge area associated with any of the above.

2. The proposed ToR satisfies some of the above criteria however further studies will be required to be included to assist in meeting NPCA policy. For example, salamander studies should be part of the study and should be initiated immediately to catch the currently anticipated peak (today likely). A waterbalance also will be required in order to understand the hydrology and ecohydrology of the wetland in question.
3. The EIS should demonstrate that the footprint and alignment of the proposed development or site alteration has avoided losses to wetlands, and the interference of wetland functionality has been minimized and mitigated to the greatest extent possible.
4. The EIS should identify and demonstrate (to the satisfaction of NPCA staff) that existing best management practices and technologies are utilized to effectively mitigate impacts to the wetland feature including its hydrology and ecology.
5. Where unavoidable, intrusions on hydrologic or ecological functions are demonstrated to be unable to be avoided, minimized or mitigated then the proponent must compensate (reconfigure) the residual impacts. The proponent is required to compensate (reconfigure) the same type of wetland features that are lost (i.e., a destroyed MAS2-1 must be compensated with a MAS2-1 that is demonstrated to be equivalent in form, function and area or greater) and should be in the same subwatershed or planning area and meet NPCA Policy 8.2.2.8.
6. When the decision to compensate has been made by NPCA staff, the proponent is required to demonstrate that they own lands where a wetland will be created. The proponent must demonstrate to the satisfaction of NPCA staff that the newly created wetland form and function is equivalent or better than the wetland impacted and that the newly created wetland will be in place in perpetuity. Generally, restoring existing wetlands on the landscape is not accepted, however where a reasonable case can be made for wetlands in need of restoration (usually they are severely negatively impacted) can be evaluated case by case.
7. The wetland compensation plan/proposal should demonstrate the best management practices. For example, the following guidelines may be beneficial to assist in informing compensation approaches. Please note that, NPCA staff offer the following resources as guidelines materials only that may benefit the approach and assist the proponent in their understanding of the typical process.
    a. Guidelines for Determining Ecosystem Compensation (TRCA 2018) https://s3-ca-central-1.amazonaws.com/trcaca/app/uploads/2019/11/27105627/TRCA-Guideline-for-Determining-Ecosystem-Compensation-June-2018_v2.pdf
    b. Achieving Net Gains Through Ecological Offsetting – Draft for Discussion (NVCA 2019) https://www.nvca.on.ca/Shared%20Documents/NVCA_Policy_Guidelines_for_Achieving_Ecological_Net_Gains_FOR_DISCUSSION_2019.pdf

Note: Salamander studies are required, it is suggested that these studies be undertaken immediately to meet the timing window.

Sincerely,

Jessica Abrahamse, M.E.S.
Watershed Planner, NPCA
(905) 788-3135, ext. 235

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

March 10, 2021 Project 2319A

Vijkumar Patel
9245529 CANADA INC.
100 Matheson Blvd. East Unit 102
Mississauga ON L4Z 2G7

Dear Mr. Patel

RE: Garrison Rd., Fort Erie Phase 2 Environmental Impact Study Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide you with the following Terms of Reference (TOR) for an Environmental Impact Study (EIS) for the proposed Phase 2 development of your property at 315 Garrison Road, Fort Erie. The Phase 1 development is currently awaiting municipal approvals and will consist of a commercial block fronting on to Garrison Avenue. The Phase 2 proposal, for which this TOR has been developed, is for a residential development at the north end of the property which will be accessed from Walden Boulevard. It is understood that you have also acquired the northern portion of the property immediately to the west of 315 and that it is being included in the Phase 2 proposal. This work plan has been prepared based on the findings of the Phase 1 EIS along with relevant on-line natural heritage information for the property and vicinity.

The Phase 1 EIS identified a small wetland within a larger cultural thicket. This wetland area abuts the western property boundary of 315. As it was not previously documented, the Niagara Peninsula Conservation Authority (NPCA) regulatory mapping did not cover this study area. Based on the presence of this wetland feature, Ontario Regulation 155/06 now applies

Proposed Approach

Phase 2: Terms of Reference and Preliminary Background Review

This Terms of Reference has been developed based on the results of the Phase 1 EIS and a detailed background review. All available existing background natural environment information for the study area and adjacent lands has been collected and reviewed. This includes data from the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC), Town of Fort Erie Official Plan (Town of Fort Erie 2018) and Schedule C of the Niagara Regional Official Plan (Niagara Region 2014).

A Species at Risk (SAR) and Species of Conservation Concern (SCC) screening exercise, which includes any SAR and SCC species identified through the listed natural heritage information sources, has also been completed to inform this TOR and is provided in Appendix II of the EIS (enclosed). This involved cross-referencing the preferred habitats for reported SAR and SCC against habitats known to occur in the study area based on the Phase 1 EIS.

A screening exercise has also been completed to assess the potential presence for Significant Wildlife Habitats (SWH) within the study area and is provided in Appendix III of the EIS. This screening exercise was based on Ecological Land Classification (ELC) mapping vegetation and

wildlife survey results and used discrete significance criteria established by the MNRF (MNRF 2015).

Phase II: Preparation of Environmental Impact Study

Field Surveys

Field inspections of the biological features on the newly acquired lands to the west of 315 will be carried out during the 2021 field season. This includes detailed inventories of wildlife and vegetation through specific surveys as follows:

- Mapping of vegetation communities using the Ecological Land Classification (ELC) methods for southern Ontario (Lee et al. 1998),
- 2 season vascular flora inventory (spring and summer);
- 3 evening amphibian call surveys (April 1-15, May 1-15 and June 1-15);
- Wetland delineation with NPCA staff;
- Assessment of any Significant Wildlife Habitat (SWH) and Species at Risk (SAR) habitat within the subject property; conducted in conjunction with other field investigations; and
- Incidental observations of all wildlife, including direct observations, as well as signs such as dens, tracks, scat, etc. will be recorded during all field investigations.

Natural Feature Constraints Assessment

The results of the field surveys will be combined with the background information to provide a detailed summary of the existing natural features that occur in and within approximately 120 m of the subject property. This will include detailed vegetation community descriptions and mapping, and summaries of wildlife species present within the subject property and adjacent areas.

Buffers or appropriate mitigation will be identified for specific natural features or habitats. All other aspects of natural feature significance or sensitivity identified through the field surveys will be incorporated into this constraints assessment.

Impact Analysis, Mitigations, and Other Recommendations

An impact analysis will be completed based on the proposed site plan for the development. The analysis will consider potential direct (e.g., habitat removal) and indirect (e.g., construction-related impacts, hydrological) impacts on the existing natural features. The impact analysis will be prepared based on details of the proposed development, including grading details if available. NRSI will incorporate and summarize the results of any other pertinent reports (e.g. Stormwater) and overlay the conceptual Site Plan with the results of the vegetation characterization to inform the impact analysis.

Recommendations will be provided to avoid, or otherwise minimize or mitigate adverse impacts to natural features associated with the proposed development.

Should you have any questions or comments regarding this proposal, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.

Brett Woodman
Senior Manager

Encl. 315 Garrison Road, Fort Erie EIS (2020)

Appendix IV

Species Reported from Study Area and Observations

Legend: Wildlife Species Lists

Provincial Ranks								
SRANK								
S1	Critically Imperiled	**S4**	Apparently Secure	**S#?**	Uncertain Rank	**SNR**	Unranked	**NP**	Not Provided
S2	Imperiled	**S5**	Secure	**SX**	Presumed Extirpated	**SU**	Unrankable		
S3	Vulnerable	**S#S#**	Status is Between Ranks	**SH**	Possibly Extirpated (Historical)	**SNA**	Not Applicable		
Breeding Status Qualifiers									
B	Breeding	**N**	Non-breeding	**M**	Migrant				
SARO									
END	Endangered	**SC**	Special Concern	**DD**	Data Deficient				
THR	Threatened	**NAR**	Not at Risk	**EXP**	Extirpated				
Federal Ranks									
COSEWIC and SARA									
E	Endangered	**SC**	Special Concern	**NS**	No Status	**N-A**	Non-Active	**EX**	Extirpated
T	Threatened	**NAR**	Not at Risk	**DD**	Data Defficient	**X**	Extinct		
SARA Schedule									
Schedule 1	Extirpated, Endangered, Threatened, Special Concern Species officially protected under SARA								
Schedule 2	Endangered, Threatened species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Schedule 3	Special Concern species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Regional Status									
NPCA Status									
VC	Very Common	**O**	Occasional	**R**	Rare	**I**	Introdroduced		
C	Common	**U**	Uncommon	**EX**	Extirpated				
Other									
Bird Breeding Evidence Codes									
OB	Observed								
PO	Possible								
PR	Probable								
CO	Confirmed								

Plant Species Reported From the Study Area

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Niagara	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data
		MNRF 2021a	MNRF 2021a	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Oldham 2017	MNRF 2021b		
Pteridophytes	**Ferns & Allies**									
Dryopteridaceae	**Wood Fern Family**									
Dryopteris carthusiana	Spinulose Wood Fern	S5					C		X	
Isoetes x robusta	*(Isoetes echinospora X Isoetes septentrionalis)*	SNA								
Dicotyledons	**Dicots**									
Aceraceae	**Maple Family**									
Acer platanoides	Norway Maple	SE5					IX		X	
Acer saccharinum	Silver Maple	S5					X		X	
Acer x freemanii	Freeman's Maple	SNA					hyb		X	X
Anacardiaceae	**Sumac or Cashew Family**									
Rhus typhina	Staghorn Sumac	S5					C		X	
Toxicodendron radicans	Poison Ivy	S5							X	
Apiaceae	**Carrot or Parsley Family**									
Daucus carota	Wild Carrot	SE5					IC		X	
Apocynaceae	**Dogbane Family**									
Apocynum cannabinum var. cannabinum	Hemp Dogbane	S5					C		X	
Araliaceae	**Ginseng Family**									
Hedera helix	English Ivy	SE1					IR		X	
Asclepiadaceae	**Milkweed Family**									
Asclepias syriaca	Common Milkweed	S5					C		X	
Asteraceae	**Composite or Aster Family**									
Ambrosia artemisiifolia	Common Ragweed	S5					C		X	
Bidens frondosa	Devil's Beggarticks	S5					C		X	
Centaurea jacea	Brown Knapweed	SE5					IU		X	
Eupatorium perfoliatum	Common Boneset	S5					C		X	
Euthamia graminifolia	Grass-leaved Goldenrod	S5					C		X	
Helianthus grosseserratus	Saw-toothed Sunflower	SE1?							X	
Rudbeckia triloba	Brown-eyed Susan	SE4					IR		X	
Solidago canadensis var. canadensis	Canada Goldenrod	S5					C		X	
Solidago nemoralis	Gray-stemmed Goldenrod	S5							X	
Solidago rugosa	Rough-stemmed Goldenrod	S5					C		X	
Symphyotrichum lateriflorum	Calico Aster	S5					C		X	
Symphyotrichum novae-angliae	New England Aster	S5					C		X	
Symphyotrichum pilosum var. pilosum	Old Field Aster	S5					C		X	
Symphyotrichum urophyllum	Arrow-leaved Aster	S4					U		X	
Boraginaceae	**Borage Family**									
Hackelia virginiana	Virginia Stickseed	S5					U		X	
Campanulaceae	**Bellflower Family**									
Lobelia inflata	Indian-tobacco	S5					C		X	
Celastraceae	**Staff-tree Family**									
Celastrus scandens	Climbing Bittersweet	S5					C		X	
Clusiaceae	**St. John's-wort Family**									
Hypericum perforatum	Common St. John's-wort	SE5					IC		X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Niagara	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data
Cornaceae	**Dogwood Family**									
Cornus racemosa	Gray Dogwood	S5					C		X	
Dipsacaceae	**Teasel Family**									
Dipsacus fullonum	Common Teasel	SE5					IC		X	
Elaeagnaceae	**Oleaster Family**									
Elaeagnus umbellata	Autumn Olive	SE3					IU		X	
Fabaceae	**Pea Family**									
Glycyrrhiza lepidota	Wild Licorice	S3					H	X		
Melilotus albus	White Sweet-clover	SE5					IC		X	
Robinia pseudoacacia	Black Locust	SE5					IC		X	
Fagaceae	**Beech Family**									
Quercus bicolor	Swamp White Oak	S4					C		X	X
Quercus macrocarpa	Bur Oak	S5					U		X	X
Quercus palustris	Pin Oak	S4					C		X	X
Quercus rubra	Northern Red Oak	S5					C		X	X
Geraniaceae	**Geranium Family**									
Geranium maculatum	Spotted Geranium	S5					C		X	
Juglandaceae	**Walnut Family**									
Carya cordiformis	Bitternut Hickory	S5					C		X	X
Carya ovata var. ovata	Shagbark Hickory	S5							X	X
Juglans nigra	Black Walnut	S4?					C		X	X
Lamiaceae	**Mint Family**									
Clinopodium vulgare	Field Basil	S5					C		X	
Lythraceae	**Loosestrife Family**									
Lythrum salicaria	Purple Loosestrife	SE5					IC		X	
Moraceae	**Mulberry Family**									
Morus rubra	Red Mulberry	S2	END	E	E	Schedule 1	R	X		
Oleaceae	**Olive Family**									
Fraxinus pennsylvanica	Green Ash	S4					C		X	
Ligustrum vulgare	European Privet	SE5					IC		X	
Onagraceae	**Evening-primrose Family**									
Circaea canadensis ssp. canadensis	Canada Enchanter's Nightshade	S5							X	
Epilobium coloratum	Purple-veined Willowherb	S5					C		X	
Oenothera gaura	Biennial Gaura	S3					R	X		
Oxalidaceae	**Wood Sorrel Family**									
Oxalis stricta	Upright Yellow Wood-sorrel	SE5					C		X	
Polygonaceae	**Smartweed Family**									
Persicaria virginiana	Virginia Smartweed	S4					C		X	
Rumex crispus	Curly Dock	SE5					IC		X	
Pyrolaceae	**Wintergreen Family**									
Chimaphila maculata	Spotted Wintergreen	S2	END	T	T	Schedule 1	R	X		
Rhamnaceae	**Buckthorn Family**									
Frangula alnus	Glossy Buckthorn	SE5					IC		X	
Rhamnus cathartica	Common Buckthorn	SE5					IC		X	
Rosaceae	**Rose Family**									
Agrimonia gryposepala	Hooked Agrimony	S5					C		X	
Crataegus sp.	Hawthorn sp.								X	X
Crataegus monogyna	English Hawthorn	SE4					IC		X	
Crataegus punctata	Dotted Hawthorn	S5					C		X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Niagara	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data
Crataegus succulenta	Fleshy Hawthorn	S5							X	
Fragaria virginiana	Wild Strawberry	S5					C		X	
Geum canadense	White Avens	S5					C		X	
Geum laciniatum	Rough Avens	S4					C		X	
Geum urbanum	Wood Avens	SE3					IR		X	
Prunus serotina	Black Cherry	S5					C		X	X
Prunus virginiana	Choke Cherry	S5					C		X	
Pyrus communis	Common Pear	SE4					IC		X	X
Rosa multiflora	Multiflora Rose	SE5					IC		X	
Rubus hispidus	Bristly Dewberry	S4					C		X	
Rubus occidentalis	Black Raspberry	S5					C		X	
Salicaceae	**Willow Family**									
Populus deltoides	Eastern Cottonwood	S5					C		X	X
Populus tremuloides	Trembling Aspen	S5					C		X	X
Salix cinerea	European Gray Willow	SE1?					IR		X	
Salix eriocephala	Heart-leaved Willow	S5					C		X	
Solanaceae	**Nightshade Family**									
Physalis heterophylla	Clammy Ground-cherry	S4					R		X	
Ulmaceae	**Elm Family**									
Ulmus americana	American Elm	S5					C		X	X
Vitaceae	**Grape Family**									
Parthenocissus vitacea	Thicket Creeper	S5					C		X	
Vitis riparia	Riverbank Grape	S5					C		X	
Monocotyledons	**Monocots**									
Araceae	**Arum Family**									
Arisaema triphyllum	Jack-in-the-pulpit	S5					C		X	
Cyperaceae	**Sedge Family**									
Carex blanda	Woodland Sedge	S5					C		X	
Carex gracillima	Graceful Sedge	S5					C		X	
Carex lupulina	Hop Sedge	S5					C		X	
Carex vulpinoidea	Fox Sedge	S5					C		X	
Juncaceae	**Rush Family**									
Juncus tenuis	Path Rush	S5					C		X	
Juncus torreyi	Torrey's Rush	S5					U		X	
Liliaceae	**Lily Family**									
Asparagus officinalis	Garden Asparagus	SE5					IC		X	
Orchidaceae	**Orchid Family**									
Epipactis helleborine	Eastern Helleborine	SE5					IC		X	
Liparis liliifolia	Purple Twayblade	S2S3	THR	T	T	Schedule 1	H	X		
Spiranthes ochroleuca	Yellow Ladies'-tresses	S2					R	X		
Poaceae	**Grass Family**									
Dichanthelium implicatum	Slender-stemmed Panicgrass	S5							X	
Glyceria striata	Fowl Mannagrass	S5					C		X	
Phragmites australis ssp. australis	European Reed	SE5					IC		X	
Sporobolus vaginiflorus	Sheathed Dropseed	S5							X	
Typhaceae	**Cattail Family**									
Typha latifolia	Broad-leaved Cattail	S5					C		X	
TOTAL								**6**	**90**	**14**

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	NPCA Status	OBBA	NHIC Data	MNRF SAR List	NRSI Observed
		MNDMNRF 2021a	MNDMNRF 2021a	Government of Canada 2021	Government of Canada 2021	NPCA 2010	BSC et al. 2006	MNDMNRF 2021b	MNDMNRF 2018	
Anatidae	**Ducks, Geese & Swans**									
Branta canadensis	Canada Goose	S5				VC	CO			
Aix sponsa	Wood Duck	S5				U	PR			
Anas platyrhynchos	Mallard	S5				C	CO			
Anas discors	Blue-winged Teal	S4				R	CO			
Odontophoridae	**New World Quails**									
Colinus virginianus	Northern Bobwhite	S1	END	E	Schedule 1	EX			X	
Phasianidae	**Partridges, Grouse & Turkeys**									
Phasianus colchicus	Ring-necked Pheasant	SNA				I, R	CO			
Meleagris gallopavo	Wild Turkey	S5				U	CO			
Columbidae	**Pigeons & Doves**									
Columba livia	Rock Pigeon	SNA				VC	CO			
Zenaida macroura	Mourning Dove	S5				VC	CO			X
Cuculiformes	**Cuckoos & Anis**									
Coccyzus americanus	Yellow-billed Cuckoo	S4B				U	PO			
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B				U	PO			
Caprimulgidae	**Goatsuckers**									
Chordeiles minor	Common Nighthawk	S4B	SC	SC	Schedule 1	R			X	
Apodidae	**Swifts**									
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	U	PO		X	
Trochilidae	**Hummingbirds**									
Archilochus colubris	Ruby-throated Hummingbird	S5B				U	PR			
Rallidae	**Railes, Gallinules & Coots**									
Rallus elegans	King Rail	S2B	END	E	Schedule 1				X	
Gruidae	**Cranes**									
Grus canadensis	Sandhill Crane	S5B				R	PR			
Charadriidae	**Plovers**									
Charadrius vociferus	Killdeer	S5B, S5N				C	CO			
Scolopacidae	**Waders**									
Bartramia longicauda	Upland Sandpiper	S4B				R	PR			
Scolopax minor	American Woodcock	S4B				U	CO			
Actitis macularia	Spotted Sandpiper	S5				C	CO			

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	NPCA Status	OBBA	NHIC Data	MNRF SAR List	NRSI Observed
Laridae	**Gulls, Terns & Skimmers**									
Larus delawarensis	Ring-billed Gull	S5B, S4N				VC				X
Phalacrocoracidae	**Cormorants**									
Phalacrocorax auritus	Double-crested Cormorant	S5B	NAR	NAR		VC				X
Ardeidae	**Herons & Bitterns**									
Botaurus lentiginosus	American Bittern	S4B				R	PO			
Ardea herodias	Great Blue Heron	S4B				U	PO			
Butorides virescens	Green Heron	S4B				U	CO			
Cathartidae	**Vultures**									
Coragyps atratus	Black Vulture	SNA								X
Cathartes aura	Turkey Vulture	S5B				U	CO			X
Accipitridae	**Hawks, Kites, Eagles & Allies**									
Circus cyaneus	Northern Harrier	S4B	NAR	NAR		R	CO			
Accipiter striatus	Sharp-shinned Hawk	S5	NAR			U	CO			
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR		U	CO			
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR		U	CO			
Strigidae	**Typical Owls**									
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR		U	PR			
Bubo virgianus	Great Horned Owl	S4				U	CO			
Asio otus	Long-eared Owl	S4				R	PR			
Alcedinidae	**Kingfishers**									
Megaceryle alcyon	Belted Kingfisher	S4B				U	PR			
Picidae	**Woodpeckers**									
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	END	Schedule 1	R	CO			
Melanerpes carolinus	Red-bellied Woodpecker	S4				U	PR			X
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B				O	PO			
Dryobates pubescens	Downy Woodpecker	S5				C	CO			X
Dryobates villosus	Hairy Woodpecker	S5					CO			
Colaptes auratus	Northern Flicker	S4B				C	CO			X
Falconidae	**Caracaras & Falcons**									
Falco sparverius	American Kestrel	S4				U	CO			
Tyrannidae	**Tyrant Flycatchers**									
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		C	PR		X	
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	Schedule 1	R			X	
Empidonax alnorum	Alder Flycatcher	S5B				U	PO			
Empidonax traillii	Willow Flycatcher	S5B				U	PR			
Empidonax minimus	Least Flycatcher	S4B				U	PO			
Sayornis phoebe	Eastern Phoebe	S5B				C	PR			
Myiarchus crinitus	Great Crested Flycatcher	S4B				C	PR			
Tyrannus tyrannus	Eastern Kingbird	S4B				C	CO			
Laniidae	**Shrikes**									
Lanius ludovicianus	Loggerhead Shrike	S2B	END	E (ssp. *migrans*)	Schedule 1			X		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	NPCA Status	OBBA	NHIC Data	MNRF SAR List	NRSI Observed
Vireonidae	**Vireos**									
Vireo flavifrons	Yellow-throated Vireo	S4B				R	PR			
Vireo gilvis	Warbling Vireo	S5B				C	PR			
Vireo olivaceus	Red-eyed Vireo	S5B				C	CO			
Corvidae	**Crows & Jays**									
Cyanocitta cristata	Blue Jay	S5				VC	CO			X
Corvus brachyrhynchos	American Crow	S5B				C	CO			X
Alaudidae	**Larks**									
Eremophila alpestris	Horned Lark	S5B				C	PR			
Hirundinidae	**Swallows**									
Progne subis	Purple Martin	S4B				VC	CO			
Tachycineta bicolor	Tree Swallow	S4B				VC	CO			
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B				U	CO			
Riparia riparia	Bank Swallow	S4B	THR	T		VC			X	
Petrochelidon pyrrhonota	Cliff Swallow	S4B				U	CO			
Hirundo rustica	Barn Swallow	S4B	THR	T		VC	CO		X	
Paridae	**Chickadees & Titmice**									
Poecile atricapillus	Black-capped Chickadee	S5				C	CO			X
Baeolophus bicolor	Tufted Titmouse	S4				R	CO			X
Sittidae	**Nuthatches**									
Sitta carolinensis	White-breasted Nuthatch	S5				U	CO			X
Certhiidae	**Creepers**									
Certhia americana	Brown Creeper	S5B				U	PO			
Troglodytidae	**Wrens**									
Troglodytes aedon	House Wren	S5B				C	CO			X
Thryothorus ludovicianus	Carolina Wren	S4				U	CO			X
Turdidae	**Thrushes**									
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR		U	CO			
Catharus fuscescens	Veery	S4B				U	PO			
Hylocichla mustelina	Wood Thrush	S4B	SC	T		U	PR		X	
Turdus migratorius	American Robin	S5B				VC	CO			X
Mimidae	**Mockingbirds, Thrashers & Allies**									
Dumetella carolinensis	Gray Catbird	S4B				C	CO			
Toxostoma rufum	Brown Thrasher	S4B				U	CO			X
Mimus polyglottos	Northern Mockingbird	S4				U	CO			
Sturnidae	**Starlings**									
Sturnus vulgaris	European Starling	SNA				VC	CO			X
Bombycillidae	**Waxwings**									
Bombycilla cedrorum	Cedar Waxwing	S5B				C	CO			

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	NPCA Status	OBBA	NHIC Data	MNRF SAR List	NRSI Observed
Passeridae	**Old World Sparrows**									
Passer domesticus	House Sparrow	SNA				VC	CO			
Fringillidae	**Finches & Allies**									
Carpodacus mexicanus	House Finch	SNA				C	CO			X
Carpodacus purpureus	Purple Finch	S4B				O	PO			
Spinus tristis	American Goldfinch	S5B				C	CO			X
Parulidae	**Wood Warblers**									
Seiurus aurocapillus	Ovenbird	S4B					PO			
Vermivora cyanoptera	Blue-winged Warbler	S4B				U	CO			
Protonotaria citrea	Prothonotary Warbler	S1B	END	E	Schedule 1	R			X	
Geothylpis trichas	Common Yellowthroat	S5B				C	PR			
Setophaga citrina	Hooded Warbler	S4B	NAR	NAR	Schedule 1	R	CO			
Setophaga ruticilla	American Redstart	S5B				U	CO			
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	Schedule 1	R			X	
Setophaga petechia	Yellow Warbler	S5B				C	CO			
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	R	PR		X	
Emberizidae	**New World Sparrows & Allies**									
Pipilo erythrophthalmus	Eastern Towhee	S4B				U	PR			
Spizella passerina	Chipping Sparrow	S5B				C	CO			X
Spizella pusilla	Field Sparrow	S4B				U	CO			X
Pooecetes gramineus	Vesper Sparrow	S4B				U	PR			
Passerculus sandwichensis	Savannah Sparrow	S4B				VC	PR			
Melospiza melodia	Song Sparrow	S5B				VC	CO			X
Melospiza georgiana	Swamp Sparrow	S5B				U	PO			
Junco hyemalis	Dark-eyed Junco	S5B								X
Cardinalidae	**Cardinals, Grosbeaks & Allies**									
Piranga olivacea	Scarlet Tanager	S4B				U	PR			
Cardinalis cardinalis	Northern Cardinal	S5				C	CO			X
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B				C	CO			
Passerina cyanea	Indigo Bunting	S4B				C	CO			
Icteridae	**Blackbirds**									
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	U	CO		X	
Agelaius phoeniceus	Red-winged Blackbird	S4				VC	CO			X
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	U	CO		X	
Quiscalus quiscula	Common Grackle	S5B				VC	CO			X
Molothrus ater	Brown-headed Cowbird	S4B				VC	CO			X
Icterus spurius	Orchard Oriole	S4B				U	PO			
Icterus galbula	Baltimore Oriole	S4B				C	CO			
						Total	**98**	**1**	**14**	**28**

Herpetofauna Species Reported From the Study Area

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	Ontario Reptile and Amphibian Atlas	NHIC Data	MNRF SAR List	NRSI Observed
Turtles									
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	X		X	
Chrysemys picta marginata	Midland Painted Turtle	S5		SC		X			
Clemmys guttata	Spotted Turtle	S3	END	E	Schedule 1			X	
Emydoidea blandingii	Blanding's Turtle (*Great Lakes/St Lawrence population*)	S3	THR	T	Schedule 1	X		X	
Snakes									
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	Schedule 1			X	
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	Schedule 1	X			
Storeria dekayi dekayi	Northern Brownsnake	S5	NAR	NAR		X			
Storeria occipitomaculata	Northern Red-bellied Snake	S5				X			
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5				X			
Salamanders									
Ambystoma sp.	Jefferson/Blue-spotted Salamander Complex	S2				X			
Ambystoma laterale	Blue-spotted Salamander	S4				X			
Plethodon cinereus	Eastern Red-backed Salamander	S5				X			
Toads and Frogs									
Anaxyrus fowleri	Fowler's Toad	S2	END	E	Schedule 1	X		X	
Anaxyrus americanus	American Toad	S5				X			X
Pseudacris triseriata pop. 1	Western Chorus Frog *(Carolinian Pc*	S4	NAR	NAR					X
Pseudacris crucifer	Spring Peeper	S5				X			
Lithobates catesbeiana	American Bullfrog	S4				X			
Lithobates clamitans melanota	Northern Green Frog	S5				X			
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR		X			
Lithobates sylvaticus	Wood Frog	S5				X			
					Total	**17**	**0**	**5**	**2**

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	Ontario Mammal Atlas	NHIC Data	MNRF SAR List	NRSI Observed
		MNDMNRF 2021a	MNDMNRF 2021a	Government of Canada 2021	Government of Canada 2021	Dobbyn 1994	MNDMNRF 2021b	MNDMNRF 2018	
Didelphimorphia	**Opossums**								
Didelphis virginiana	Virginia Opossum	S4				X			
Insectivora	**Shrews and Moles**								
Blarina brevicauda	Northern Short-tailed Shrew	S5				X			
Condylura cristata	Star-nosed Mole	S5				X			
Parascalops breweri	Hairy-tailed Mole	S4				X			
Sorex cinereus	Masked Shrew	S5				X			
Sorex fumeus	Smoky Shrew	S5				X			
Chiroptera	**Bats**								
Eptesicus fuscus	Big Brown Bat	S4				X			X
Lasionycteris noctivagans	Silver-haired Bat	S4				X			X
Lasiurus borealis	Eastern Red Bat	S4				X			X
Lasiurus cinereus	Hoary Bat	S4				X			X
Myotis leibii	Eastern Small-footed Myotis	S2S3	END					X	
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	X		X	
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1			X	
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	X		X	
Lagomorpha	**Rabbits and Hares**								
Lepus europaeus	European Hare	SNA				X			
Sylvilagus floridanus	Eastern Cottontail	S5				X			
Rodentia	**Rodents**								
Castor canadensis	Beaver	S5				X			
Erethizon dorsatum	Porcupine	S5				X			
Glaucomys volans	Southern Flying Squirrel	S4	NAR	NAR		X			
Marmota monax	Woodchuck	S5				X			
Microtus pennsylvanicus	Meadow Vole	S5				X			
Microtus pinetorum	Woodland Vole	S3?	SC	SC	Schedule 1	X		X	
Napaeozapus insignis	Woodland Jumping Mouse	S5				X			
Ondatra zibethicus	Muskrat	S5				X			
Peromyscus leucopus	White-footed Mouse	S5				X			
Peromyscus maniculatus	Deer Mouse	S5				X			
Rattus norvegicus	Norway Rat	SNA				X			
Sciurus carolinensis	Eastern Gray Squirrel	S5				X			X
Tamiasciurus hudsonicus	Red Squirrel	S5				X			

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	Ontario Mammal Atlas	NHIC Data	MNRF SAR List	NRSI Observed
Tamias striatus	Eastern Chipmunk	S5				X			
Zapus hudsonius	Meadow Jumping Mouse	S5				X			
Carnivora	**Carnivores**								
Canis latrans	Coyote	S5				X			
Mephitis mephitis	Striped Skunk	S5				X			
Mustela erminea	Ermine	S5				X			
Mustela frenata	Long-tailed Weasel	S4				X			
Mustela vison	American Mink	S4				X			
Procyon lotor	Northern Raccoon	S5				X			X
Urocyon cinereoargenteus	Grey Fox	S1	THR	T	Schedule 1	X			
Vulpes vulpes	Red Fox	S5				X			
Artiodactyla	**Deer and Bison**								
Odocoileus virginianus	White-tailed Deer	S5				X			
					Total	**38**	**0**	**5**	**6**

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	NPCA Status	Butterfly Atlas	NHIC Data	MNRF SAR List	NRSI Observed
		MNDMNRF 2021a	MNDMNRF 2021a	Government of Canada 2021	Government of Canada 2021	NPCA 2010	Macnaughton et al. 2020	MNDMNRF 2021b	MNDMNRF 2018	
Papilionidae	**Swallowtails**									
Papilio glaucus	Eastern Tiger Swallowtail	S5				C	X			
Papilio polyxenes	Black Swallowtail	S5				C	X			
Pieridae	**Whites and Sulphurs**									
Colias eurytheme	Orange Sulphur	S5				C	X			
Colias philodice	Clouded Sulphur	S5				C	X			
Pieris rapae	Cabbage White	SNA				I	X			
Pieris virginiensis	West Virginia White	S3		SC					X	
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**									
Celastrina neglecta	Summer Azure	S5				C	X			
Lycaena phlaeas	American Copper	S5				R	X			
Satyrium acadica	Acadian Hairstreak	S4				R	X			
Satyrium calanus	Banded Hairstreak	S4				C	X			
Satyrium liparops	Striped Hairstreak	S5				U	X			
Satyrium titus	Coral Hairstreak	S5				R	X			
Nymphalidae	**Brush-footed Butterflies**									
Danaus plexippus	Monarch	S2N, S4B	SC	E	Schedule 1	C	X		X	
Nymphalis antiopa	Mourning Cloak	S5				C	X			
Phyciodes cocyta	Northern Crescent	S5				C	X			
Phyciodes tharos	Pearl Crescent	S4				**C**	X			
Polygonia comma	Eastern Comma	S5				C	X			
Polygonia comma	Eastern Comma/Hop	S5					X			
Speyeria cybele	Great Spangled Fritillary	S5				C	X			
Vanessa atalanta	Red Admiral	S5				C	X			
Vanessa cardui	Painted Lady	S5				H	X			
						Total	**21**	**1**	**3**	**0**

Odonate Species Reported From the Study Area

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA Schedule	NPCA Status[4]	Odonate Atlas	NHIC Data	MNRF SAR List[7]	NRSI Observed
		MNDMNRF 2021a	MNDMNRF 2021a	Government of Canada 2021	Government of Canada 2021	NPCA 2010	OOAD 2019	MNDMNRF 2021b	MNDMNRF 2018	
Calopterygidae	**Broadwinged Damselflies**									
Calopteryx maculata	Ebony Jewelwing	S5					X			
Coenagrionidae	**Narrow-winged Damselflies**									
Enallagma carunculatum	Tule Bluet	S5				C	X			
Enallagma civile	Familiar Bluet	S5				C	X			
Enallagma signatum	Orange Bluet	S4				C	X			
Ischnura posita	Fragile Forktail	S4				C	X			
Ischnura verticalis	Eastern Forktail	S5				C	X			
Aeshnidae	**Darners**									
Anax junius	Common Green Darner	S5				C	X			
Libellulidae	**Skimmers**									
Erythemis simplicicollis	Eastern Pondhawk	S5				C	X			
Libellula luctuosa	Widow Skimmer	S5				C	X			
Libellula pulchella	Twelve-spotted Skimmer	S5				C	X			
Pantala flavescens	Wandering Glider	S4				U	X			
Perithemis tenera	Eastern Amberwing	S4				C	X			
Plathemis lydia	Common Whitetail	S5				C	X			
Sympetrum vicinum	Yellow-legged (Banded) Meadowhawk	S5				C	X			
Tramea lacerata	Black Saddlebags	S4				C	X			
					Total	**14**	**15**	**0**	**0**	**0**

Appendix V
Tree Saving Plan

315 Garrison Road, Fort Erie

Tree Saving Plan

Prepared for:

Vijaykumar Patel
100 Matheson Blvd east Unit 102
Mississauga ON L4Z 2G7

Project No. 2319 | February 2022

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

315 Garrison Road, Fort Erie

Tree Saving Plan

Project Team

Brett Woodman	Project Advisor, Senior Terrestrial Biologist, Certified Arborist
Jeremy Bannon	Project Manager, Terrestrial and Wetland Biologist, Certified Arborist
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Report submitted on February 4, 2022

Jeremy Bannon

Project Manager

Terrestrial Biologist, Certified Arborist

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List of Appendices

Maps

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by a private developer, Vijaykumar Patel, to complete a Tree Saving Plan in tandem with an Environmental Impact Study (EIS) for the proposed development of a commercial plaza and residential townhome complex at 315 Garrison Road, Fort Erie, Ontario (Map 1).

The following Tree Savings Plan is a resubmission to account for additional tree removals needed to incorporate the revised proposed residential development plan. Additional development has been proposed in the northern portion of the subject property and will consist of 37 townhome units and a private road coming south from Walden Boulevard. The proposed private road has been designed to ensure minimal impact to some of the property's mature oak and hickory trees in the northern edge of the site.

The Tree Savings Plan was conducted in accordance with the Niagara Region By-Law No. 30-2008. This by-law states *that "no person through their own actions or through any other person shall injure or destroy any tree located in Woodlands"*, where woodlands of 1 hectare or more are protected, and are defined as:

- 1,000 trees, of any size, per hectare;
- 750 trees, measuring over 5cm in DBH,
- 500 trees, measuring over 12cm in DBH, or
- 250 trees, measuring over 20cm in DBH.

According to the Niagara Region Official Plan, the subject property falls within the Region's Core Natural Heritage System due to the presence of a Significant Woodland, which is designated as an Environmental Conservation Area by the Region (Niagara Region 2014).

If an owner wishes to destroy or injure a tree in a regulated woodland, then the work must be categorized into one of the exemptions outlined in the By-Law. Section 4.4c of the By-Law states an exemption is made *"as a requirement in a Tree Saving Plan approved and included in a site plan control agreement or subdivision agreement entered into under Sections 41 and 51 of the Planning Act"*. This Tree Saving Plan aims to satisfy this condition.

This report provides the findings of the tree inventory, analysis of preliminary construction plans against the overall health and the structural integrity (referring to the potential for structural

failure) of trees, protection measures for trees to be retained, and recommended mitigation and compensation measures. The tree data and mapping has been compared to the layout of the proposed site plan. Map 1 shows the tree inventory data overlaying the proposed site plan. This plan shows the proposed site plan, and inventoried trees. The existing overall health and/or potential for structural failure was compared to the layout to determine which existing trees would be impacted by the proposed undertaking. Avoidance, mitigation, and protection measures for trees were examined to determine which trees would be impacted and which could be retained. In the case of trees requiring removal, compensation for removal is discussed.

This report summarizes the following:

- findings of the tree inventory,
- assessment of overall health and potential for structural failure of inventoried trees, and
- tree retention analysis based on the preliminary site plan, and, recommended tree protection, mitigation and compensation measures.

2.0 Tree Inventory and Methodology

A comprehensive inventory of trees ≥10cm in Diameter at Breast Height (DBH) with the potential to be impacted by the proposed development was completed by the Certified Arborist on January 9, 2020. The location of inventoried trees was surveyed using an SXBlue II GNSS GPS unit by the Certified Arborist and are shown on Map 1. A complete list of the trees that were assessed and their overall health and potential for structural failure is included in Appendix I.

The following information was recorded for each tree:

- species,
- DBH,
- crown radius (metres),
- general health (excellent, good, fair, poor, very poor, dead),
- potential for structural failure (improbable, possible, probable, imminent),
- tree location (on-site, boundary, off-site) and,
- general comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

The overall health and potential for structural failure of each tree was assessed based on the criteria outlined in Appendix II. The assessments have been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility, and third-party liability can be found in Appendix III.

3.0 Summary of Tree Inventory Findings

In total, 133 trees were inventoried, including 14 species. Of the trees inventoried and assessed, 131 are native species and 2 are non-native. A complete list of trees inventoried is provided in Appendix I and tree locations within the subject property are shown on Map 1.

Appendix IV provides a list of tree species inventoried within the subject property, whether they are native or non-native and their overall health, as well as a summary of the overall health of trees inventoried within the subject property, along with their potential for structural failure. A majority of the trees inventoried are in Fair health with an improbable potential for structural failure.

4.0 Tree Removal and Retention Analysis

Tree removal and retention was based on two considerations:

1) Trees identified as having a probable or imminent potential for structural failure or poor or very poor health, or identified as dead: The removal of these trees may be recommended for safety, especially if they are located within striking distance of a component of the proposed development, roads or buildings.
2) Trees that require removal based on the extent of proposed site grading: The location of inventoried trees was compared to the location of the site plan, as shown on Map 1 (Quartek Group 2020).

Of the 133 trees inventoried, 111 are anticipated to be removed. This comprises 46 Hawthorns (*Crataegus* sp.), 5 Eastern Cottonwood (*Populus deltoides*), 11 Black Walnut (*Juglans nigra*), 3 Black Cherry (*Prunus serotina*), 4 Bur Oak (*Quercus macrocarpa*), 2 Common Pear (*Pyrus communis),* 2 Freeman's Maple (*Acer* x *freemanii*), 8 Pin Oak (*Quercus palustris)*, 1 Shagbark Hickory (*Carya ovata*), 1 Red Oak (*Quercus rubra)*, 1 Swamp Oak (*Quercus bicolor)*, 14 Trembling Aspen (*Populus tremuloides)*, 11 White Elm (*Ulmus americana)* and 3 Bitternut Hickory (*Carya cordiformis*).

All trees proposed for removal are located entirely on the subject property, with the exception of one boundary tree (Bur Oak) in the northern edge of the site. Removal or impact of boundary, off-site, or municipal trees will require the written permission of all owners involved. If the main stem of any tree is located on multiple properties, all owners of those properties must be consulted before any tree removal or impact occurs.

5.0 Tree Protection Measures and Recommended Mitigation

5.1 Prior to Construction

A combined erosion and sediment control (ESC) fence and tree protection fence (TPF) is recommended where trees are situated adjacent to the northern limit of disturbance (Map 1). The location of TPF is to be stated in the Tree Saving Plan according to the Region's bylaw (Region of Niagara 2008). Specifications for TPF are not outlined in the by-law, but should take the general form of 1200mm paige-wire fencing, combined with the necessary ESC fencing. The location of TPF has been outlined on Map 1, and must be installed prior to the commencement of any construction activities.

Prior to works commencing on-site, fence installation and location is to be inspected by a Certified Arborist and/or the on-site Environmental Inspector. Signage indicating the purpose of TPF will be attached every 15m or less.

The Tree Saving Plan is to be reviewed and approved by the Township and Region. Upon approval of the Tree Saving Plan, and prior to any on-site works (i.e. rough grading, tree removal), a qualified environmental consultant is to submit written verification to the Region that all of the recommended tree protection measures have been installed in accordance with the Tree Saving Plan.

Three trees within the protected area behind the TPF will require removal. This tree should be removed prior to installation of the TPF under the supervision of a Certified Arborist familiar with this plan. Removal of this tree prior to TPF installation is necessary to allow for TPF installation itself, ensure the TPF is not damaged during the felling process, and allow greater felling options to avoid damaging nearby trees to be retained. This work should be documented, with any inadvertent damage to trees to be retained reported and, if necessary, compensated for.

5.2 During Construction

Temporary TPF is to be maintained by the Developer during the entire construction period to ensure that trees being retained and their root systems are protected. At no time during construction may the TPF be damaged, dismantled, moved, or altered in any way, and at no time may any construction crew, machinery, or process be allowed behind the TPF. Grading cuts and foundation construction within the development limit must respect the integrity of the TPF by ensuring stabilization of the ground that it is erected in.

TPF maintenance is the responsibility of the Developer, and the limits and purpose of the TPF should be described to all construction parties and contractors prior to them working on-site. Fencing inspections should be completed at regular, but unscheduled intervals during the proposed construction. If the TPF is documented to be dismantled, moved or altered in any way, construction activities will immediately be stopped and the Township and Region will be notified.

5.3 Post-Construction

It is recommended that the TPF be removed upon completion of all construction activities and adjacent areas are stabilized with a vegetative cover (i.e. sod) to the satisfaction of the Environmental Inspector or qualified biologist. A Certified Arborist should complete a post-construction inspection of all trees proposed for retention. Any inadvertent damage should be documented and reported, and suitable mitigation will be recommended. Mitigation may take the form of pruning for minor damage, or removal and compensation for more major structural issues. Watering and pruning of newly planted trees will be carried out by the owner/contractor as required during the warranty period (approximately 2 years).

5.4 Mitigation

The removal of 111 trees is required to implement the proposed plan. This includes 76 trees in Fair to Excellent condition. These trees should be compensated at a 2:1 ratio at a location to be determined at the detailed design stage.

Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during any construction stage must be pruned using proper arboricultural techniques. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, it is recommended that the owner remove and replace the tree at their own expense at a 2:1 ratio. Any damage to a tree that has not been approved through the acceptance of this report must be reported to the Township and Region. Replacement species are to be reviewed by a Certified Arborist.

The recommendations provided below are aimed at restoring tree cover within the subject property and contributing toward compensation tree planting requirements. Species used for compensation plantings should be native to Niagara Region and not include any species that are listed as introduced, or locally, provincially or federally significant.

It is recommended that the following criteria be followed during the development of any planting plans:

- The plan should be developed by, or reviewed and approved by a Certified Arborist;
- The plan should include hardy, native tree species where feasible that are known to thrive in more urban conditions (i.e. compacted soil, drought, high salt tolerance),
- Include a diversity of trees from several genus to increase disease and pest tolerance and discourage monocultures (no more than 30% from a single genus, 10% from a single species),
- Include a watering and monitoring plan for 2 years following planting,
- Trees should be replaced if they are documented to have died within the 2-year monitoring plan,
- Trees should be provided with appropriate soil types and soil volumes; and
- Spacing of plant material should account for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.

6.0 References

Dunster, J. A. 2009. Tree Risk Assessment in Urban Areas and the Urban/Rural Interface: Course Manual. Pacific Northwest Chapter, International Society of Arboriculture, Silverton, Oregon.

Dunster, J. A., E. T. Smiley, N. Matheny, and S. Lily. 2013. Tree Risk Assessment Manual. International Society of Arboriculture, Champaign, Illinois.

Niagara Region. 2014. Niagara Region Official Plan.

Region of Niagara. 2008. By-law No. 30-2008: A By-law to Prohibit or Regulate the Harvesting, Destruction or Injuring of Trees in Woodlands in the Regional Municipality of Niagara and to Repeal By-law 47-2006, as Amended.

Appendix I
Tree Inventory Data

315 Garrison Road Tree Saving Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1	Eastern Cottonwood	*Populus deltoides*	Native	1	23	3.0	Improbable	Fair	Remove	Lean south.
2	Eastern Cottonwood	*Populus deltoides*	Native	1	15	2.0	Improbable	Fair	Remove	Asymmetrical crown west.
3	Eastern Cottonwood	*Populus deltoides*	Native	1	49	5.0	Improbable	Good	Remove	
4	Black Walnut	*Juglans nigra*	Native	1	48	6.0	Improbable	Fair	Remove	Good form.
5	Hawthorn species	*Crataegus sp.*	Native	3	18+13+11.3	3.0	Improbable	Fair	Remove	
6	Hawthorn species	*Crataegus sp.*	Native	2	12+11.5	3.0	Possible	Poor	Remove	
7	Hawthorn species	*Crataegus sp.*	Native	1	14	3.0	Improbable	Fair	Remove	
8	Hawthorn species	*Crataegus sp.*	Native	1	14	3.0	Improbable	Fair	Remove	
9	Hawthorn species	*Crataegus sp.*	Native	4	14	3.0	Improbable	Fair	Remove	
10	Hawthorn species	*Crataegus sp.*	Native	2	12+11.3	2.5	Possible	Poor	Remove	Dead and broken branches.
11	Hawthorn species	*Crataegus sp.*	Native	1	13	3.0	Improbable	Fair	Remove	Dead codominant leader.
12	Hawthorn species	*Crataegus sp.*	Native	1	10	4.5	Possible	Poor	Remove	Major lean east.
13	Hawthorn species	*Crataegus sp.*	Native	2	15.5+13.1	4.0	Improbable	Fair	Remove	Codominant stems; broken branches.
14	Hawthorn species	*Crataegus sp.*	Native	2	14+16	5.0	Possible	Poor	Remove	Major lean south east.
15	Hawthorn species	*Crataegus sp.*	Native	1	11	5.0	Improbable	Fair	Remove	Codominant leaders; broken branches.
16	Hawthorn species	*Crataegus sp.*	Native	1	10.7+10.3	5.0	Probable	Poor	Remove	Major dieback.
17	Hawthorn species	*Crataegus sp.*	Native	1	10	3.5	Improbable	Fair	Remove	Asymmetrical crown west.
18	Hawthorn species	*Crataegus sp.*	Native	1	13	3.0	Possible	Poor	Remove	Asymmetrical crown east; galleries
19	Hawthorn species	*Crataegus sp.*	Native	1	10	3.0	Improbable	Fair	Remove	Lean east.
20	Eastern Cottonwood	*Populus deltoides*	Native	1	27	3.0	Improbable	Fair	Remove	Minor vines; good form
21	Black Walnut	*Juglans nigra*	Native	1	49	6.0	Improbable	Good	Remove	Healthy open crown.
22	Black Walnut	*Juglans nigra*	Native	1	45	5.0	Improbable	Good	Remove	Virginia creeper around base; good form.
23	Trembling Aspen	*Populus tremuloides*	Native	1	21	3.0	Improbable	Fair	Retain	On east facing slope.
24	Black Walnut	*Juglans nigra*	Native	1	60	7.0	Improbable	Good	Remove	Good form.
25	Black Cherry	*Prunus serotina*	Native	1	39	6.0	Probable	Very Poor	Remove	Dead branches; gummosis; vines.
26	Black Walnut	*Juglans nigra*	Native	1	39	6.0	Improbable	Good	Remove	One branch growing into dead Ash.
27	Trembling Aspen	*Populus tremuloides*	Native	1	10	1.5	Improbable	Good	Remove	Minor vine; small dead branch.
28	Trembling Aspen	*Populus tremuloides*	Native	1	11	3.5	Improbable	Good	Remove	Small dead branches.
29	Black Cherry	*Prunus serotina*	Native	3	27	4.0	Probable	Very Poor	Remove	Large dead branches.
30	Bitternut Hickory	*Carya cordiformis*	Native	1	17	3.0	Improbable	Excellent	Remove	No apparent problems.
31	Black Cherry	*Prunus serotina*	Native	1	18	2.5	Possible	Poor	Remove	Leaning east; dieback.
32	Trembling Aspen	*Populus tremuloides*	Native	1	23	5.0	Possible	Fair	Remove	Crown leaning south.
33	Hawthorn species	*Crataegus sp.*	Native	1	13	2.0	Probable	Very Poor	Remove	Dead top.
34	Hawthorn species	*Crataegus sp.*	Native	1	13	4.0	Probable	Very Poor	Remove	Major lean south.
35	Trembling Aspen	*Populus tremuloides*	Native	1	12	3.0	Improbable	Fair	Remove	Small dead branches.
36	Trembling Aspen	*Populus tremuloides*	Native	1	16	2.0	Possible	Very Poor	Remove	Broken top; vines.
37	Hawthorn species	*Crataegus sp.*	Native	1	15	4.0	Improbable	Fair	Remove	Minor dieback.
38	Hawthorn species	*Crataegus sp.*	Native	1	10	4.0	Possible	Fair	Remove	Major lean west.
39	Hawthorn species	*Crataegus sp.*	Native	1	11	3.0	Improbable	Fair	Remove	Minor dieback.
40	Hawthorn species	*Crataegus sp.*	Native	1	14	3.0	Probable	Very Poor	Remove	Large dead stems.
41	Hawthorn species	*Crataegus sp.*	Native	1	16	3.0	Improbable	Fair	Remove	Water sprouts.
42	White Elm	*Ulmus americana*	Native	1	24	5.0	Improbable	Fair	Remove	Slightly suppressed historically by adjacent Ash.
43	Bur Oak	*Quercus macrocarpa*	Native	1	16	2.5	Improbable	Good	Retain	Small dead branch.
44	White Elm	*Ulmus americana*	Native	1	11	2.0	Improbable	Fair	Remove	Broken branch.
45	Bur Oak	*Quercus macrocarpa*	Native	1	81	11.0	Improbable	Good	Retain	Dieback; majority of crown to north.
46	Bur Oak	*Quercus macrocarpa*	Native	1	49	6.0	Improbable	Good	Retain	Asymmetrical crown south.
47	Hawthorn species	*Crataegus sp.*	Native	1	11	1.0	Possible	Very Poor	Remove	Broken top.
48	White Elm	*Ulmus americana*	Native	1	11	2.0	Improbable	Good	Remove	Located bottom of slope.
49	Bur Oak	*Quercus macrocarpa*	Native	1	49	6.0	Improbable	Good	Remove	Healthy crown.
50	Bur Oak	*Quercus macrocarpa*	Native	1	70	5.0	Possible	Dead	Remove	Large dead tree with exfoliating bark providing potential bat habitat.

315 Garrison Road Tree Saving Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
51	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	56	7.0	Improbable	Good	Retain	Good form.
52	Hawthorn species	*Crataegus sp.*	Native	1	15	3.0	Improbable	Fair	Retain	
53	White Elm	*Ulmus americana*	Native	1	13	3.0	Improbable	Good	Remove	Historically suppressed by dead Ash.
54	Trembling Aspen	*Populus tremuloides*	Native	1	29	5.0	Improbable	Fair	Remove	Minor dieback.
55	Trembling Aspen	*Populus tremuloides*	Native	1	38	5.0	Improbable	Good	Remove	Minor dieback.
56	White Elm	*Ulmus americana*	Native	1	14	5.0	Possible	Fair	Remove	Leaning over northeast.
57	White Elm	*Ulmus americana*	Native	1	13	3.0	Improbable	Fair	Remove	Branch rub with leaning elm.
58	Hawthorn species	*Crataegus sp.*	Native	1	15	3.0	Improbable	Fair	Remove	Dieback.
59	Trembling Aspen	*Populus tremuloides*	Native	1	27	4.0	Improbable	Fair	Remove	Dieback.
60	Trembling Aspen	*Populus tremuloides*	Native	1	24	5.0	Improbable	Good	Remove	Minor dieback.
61	Hawthorn species	*Crataegus sp.*	Native	1	13	3.0	Improbable	Fair	Remove	Small dead branches.
62	Trembling Aspen	*Populus tremuloides*	Native	1	25	4.0	Improbable	Fair	Remove	Minor dieback.
63	Trembling Aspen	*Populus tremuloides*	Native	1	19	4.0	Improbable	Fair	Remove	Minor dieback; small dead branches.
64	Trembling Aspen	*Populus tremuloides*	Native	1	19	4.0	Improbable	Fair	Remove	Minor dieback.
65	Trembling Aspen	*Populus tremuloides*	Native	1	21	4.0	Improbable	Fair	Remove	Small dead branches; asymmetrical crown east.
66	Pin Oak	*Quercus palustris*	Native	1	94	7.0	Possible	Good	Retain	Can be pruned for improbable; asymmetrical crown north; large dead branches.
67	Pin Oak	*Quercus palustris*	Native	1	60	6.0	Possible	Fair	Retain	Large dead branch requires pruning.
68	Hawthorn species	*Crataegus sp.*	Native	1	16	2.5	Possible	Poor	Retain	Dead branches.
69	Pin Oak	*Quercus palustris*	Native	1	39	5.0	Improbable	Fair	Retain	Minor dieback.
70	Freeman's Maple	*Acer X freemanii*	Native	1	37	7.0	Improbable	Good	Remove	Minor dieback.
71	Pin Oak	*Quercus palustris*	Native	1	45	3.0	Improbable	Fair	Retain	Minor dead branches; small cavity.
72	Eastern Cottonwood	*Populus deltoides*	Native	1	51	5.0	Improbable	Good	Remove	
73	Bitternut Hickory	*Carya cordiformis*	Native	1	20	6.0	Improbable	Good	Remove	1 sided edge tree
74	Hawthorn species	*Crataegus sp.*	Native	1	14	3.0	Improbable	Poor	Remove	
75	Hawthorn species	*Crataegus sp.*	Native	1	11	2.5	Improbable	Poor	Remove	
76	White Elm	*Ulmus americana*	Native	1	20	5.5	Improbable	Good	Remove	
77	Freeman's Maple	*Acer X freemanii*	Native	5	56+18+17	6.5	Improbable	Good	Remove	
78	Black Walnut	*Juglans nigra*	Native	1	11	2.0	Improbable	Excellent	Remove	
79	Hawthorn species	*Crataegus sp.*	Native	4	14+13+12	3.5	Possible	Fair	Remove	
80	Hawthorn species	*Crataegus sp.*	Native	3	13+12+11	3.0	Improbable	Fair	Remove	
81	Hawthorn species	*Crataegus sp.*	Native	2	11+9	4.0	Improbable	Poor	Remove	
82	Hawthorn species	*Crataegus sp.*	Native	2	15+14	4.0	Possible	Very Poor	Remove	
83	Black Walnut	*Juglans nigra*	Native	1	30	5.0	Improbable	Excellent	Remove	
84	Hawthorn species	*Crataegus sp.*	Native	1	14	4.5	Improbable	Fair	Remove	
85	Hawthorn species	*Crataegus sp.*	Native	1	10	2.0	Improbable	Poor	Remove	
86	Black Walnut	*Juglans nigra*	Native	1	46	6.0	Improbable	Excellent	Remove	
87	Black Walnut	*Juglans nigra*	Native	1	47	7.5	Improbable	Excellent	Remove	
88	Hawthorn species	*Crataegus sp.*	Native	2	12+5	2.5	Possible	Poor	Remove	
89	Hawthorn species	*Crataegus sp.*	Native	2	11+10	2.5	Improbable	Fair	Remove	
90	Common Pear	*Pyrus communis*	Non-Native	2	20+15	3.0	Improbable	Very Poor	Remove	
91	Hawthorn species	*Crataegus sp.*	Native	1	10	3.0	Improbable	Poor	Remove	
92	Hawthorn species	*Crataegus sp.*	Native	1	15	4.0	Improbable	Very Poor	Remove	
93	Hawthorn species	*Crataegus sp.*	Native	2	12+4	2.5	Possible	Poor	Remove	
94	Hawthorn species	*Crataegus sp.*	Native	2	11+10	2.0	Possible	Very Poor	Remove	Partially uprooted.
95	Hawthorn species	*Crataegus sp.*	Native	2	12+9	4.0	Improbable	Poor	Remove	
96	Hawthorn species	*Crataegus sp.*	Native	1	11	2.0	Improbable	Poor	Remove	
97	Hawthorn species	*Crataegus sp.*	Native	4	12+11+11	3.0	Possible	Poor	Remove	
98	Hawthorn species	*Crataegus sp.*	Native	4	14+10+7	4.0	Improbable	Poor	Remove	
99	Hawthorn species	*Crataegus sp.*	Native	2	10+10	3.5	Improbable	Poor	Remove	
100	Hawthorn species	*Crataegus sp.*	Native	1	14	2.0	Improbable	Poor	Remove	

315 Garrison Road Tree Saving Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
101	Common Pear	*Pyrus communis*	Non-Native	1	23	4.0	Improbable	Fair	Remove	
102	Swamp White Oak	*Quercus bicolor*	Native	1	39	6.5	Possible	Very Poor	Remove	Significant decay on main stem.
103	Hawthorn species	*Crataegus sp.*	Native	1	10	2.0	Improbable	Poor	Remove	
104	Pin Oak	*Quercus palustris*	Native	1	17	4.0	Improbable	Fair	Retain	
105	Bur Oak	*Quercus macrocarpa*	Native	1	102	9.0	Possible	Good	Retain	Pruning would acheive improbable potential for structural failure.
106	Bur Oak	*Quercus macrocarpa*	Native	1	67	8.0	Improbable	Fair	Retain	
107	Red Oak	*Quercus rubra*	Native	1	69	7.0	Improbable	Fair	Retain	
108	Black Walnut	*Juglans nigra*	Native	1	40	7.0	Improbable	Good	Remove	
109	Black Walnut	*Juglans nigra*	Native	1	37	6.5	Improbable	Good	Remove	
110	Bur Oak	*Quercus macrocarpa*	Native	1	60	9.5	Improbable	Fair	Remove	
111	Pin Oak	*Quercus palustris*	Native	1	30	6.0	Improbable	Excellent	Remove	
112	White Elm	*Ulmus americana*	Native	1	15	4.0	Improbable	Good	Remove	
113	Pin Oak	*Quercus palustris*	Native	1	32	5.0	Improbable	Good	Remove	
114	Red Oak	*Quercus rubra*	Native	2	29+27	5.0	Possible	Very Poor	Remove	
115	Trembling Aspen	*Populus tremuloides*	Native	1	24	4.0	Improbable	Fair	Remove	
116	Pin Oak	*Quercus palustris*	Native	1	108	10.0	Possible	Very Poor	Remove	Main stem hollow with substantial callus.
117	Pin Oak	*Quercus palustris*	Native	1	23	5.0	Improbable	Excellent	Remove	
118	Pin Oak	*Quercus palustris*	Native	1	29	5.0	Improbable	Good	Remove	Fort placed around base.
119	Pin Oak	*Quercus palustris*	Native	1	46	6.0	Improbable	Excellent	Remove	
120	Pin Oak	*Quercus palustris*	Native	1	27	5.0	Improbable	Excellent	Remove	
121	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	11	2.0	Improbable	Good	Remove	
122	Pin Oak	*Quercus palustris*	Native	1	29	5.5	Improbable	Good	Remove	Codominant stems at 5m.
123	Bur Oak	*Quercus macrocarpa*	Native	1	51	9.0	Improbable	Fair	Remove	partly suppressed with minor lean.
124	Pin Oak	*Quercus palustris*	Native	1	65	6.5	Improbable	Excellent	Retain	
125	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	33	5.0	Improbable	Excellent	Retain	
126	Bur Oak	*Quercus macrocarpa*	Native	1	92	9.0	Possible	Poor	Retain	
127	Bur Oak	*Quercus macrocarpa*	Native	1	56	8.0	Improbable	Fair	Retain	
128	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	27	6.0	Improbable	Fair	Retain	Partly suppressed.
129	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	36	5.5	Improbable	Good	Retain	
130	Bur Oak	*Quercus macrocarpa*	Native	1	112	11.0	Improbable	Good	Retain	

Appendix II
Tree Health and Potential for Structural Failure Assessment Criteria

Tree Health Assessment Criteria

Assessment Criteria	Definition[1]
Excellent	Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree.
Poor	Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown imbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.
Dead	Represents a tree that exhibits no sign of new growth, including buds, foliage, or shoot growth. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.

[1] (Dunster 2009)

Potential for Structural Failure Assessment Criteria

Assessment Criteria*	Definition[1]
Improbable	The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
Possible	Failure could occur, but it is unlikely during normal weather conditions within the specified time frame.
Probable	Failure may be expected under normal weather conditions within the specified time frame.
Imminent	Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for an assessor to encounter, and it may require immediate action to protect people from harm.
*A specified time frame of 1 year will be used when assessing potential for structural failure.	

[1] (Dunster et al. 2013)

Appendix III
Conditions of Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations as they existed at the time of the site inspection of the Client's property in the Town of Fort Erie and the trees situated thereon by NRSI and upon information provided by the Client to NRSI. The opinions in this assessment are given based on observations made and using generally accepted professional judgment, however, because trees are living organisms and subject to change, damage and disease, the results, observations, recommendations, and analysis as set out in this assessment are valid only at the date any such observations and analysis took place. No guarantee, warranty, representation or opinion is offered or made by NRSI as to the length of the validity of the results, observations, recommendations and analysis contained within this assessment. As a result, the Client shall not rely upon this assessment, save and except for representing the circumstances and observations, analysis and recommendations that were made as at the date of such inspections. It is recommended that the trees discussed in this assessment should be re-assessed periodically, where required (i.e. within 1 year).

Further Services

Neither NRSI, nor any assessor employed or retained by NRSI (the "Assessor") for the purpose of preparing or assisting in the preparation of this assessment shall be required to provide any further consultation or services to the Client, save and except as already carried out in the preparation of this assessment and including, without limitation, to act as an expert witness or witness in any court in any jurisdiction unless the Client has first made specific arrangements with respect to such further services, including, without limitation, providing the payment of the Assessor's regular hourly billing fees.

NRSI accepts no responsibility for the implementation of all or any part of the assessment, unless specifically requested to examine the implementation of such activities recommended herein. In the event that inspection or supervision of all or part of the implementation is requested, that request shall be in writing and the details agreed to in writing by both parties.

Assumptions

The Client is hereby notified and does hereby acknowledge and agree that where any of the facts and information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, the Client and/or third parties and unless otherwise set out within this assessment, NRSI will in no way be responsible for the veracity or accuracy of any such information and further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property, which is the subject of this assessment is in full compliance with all applicable federal, provincial, municipal and local statutes, regulations, by-laws, guidelines and other related laws. NRSI explicitly denies any legal liability for any and all issues with respect to non-compliance with any of the above-referenced statutes, regulations, by-laws, guidelines and laws as it may pertain to or affect the Property to which this assessment applies.

Restriction of Assessment

The assessment carried out was restricted to the Property as identified within this report, as well trees with the potential to be impacted by the development. No assessment of any other trees has been undertaken by NRSI. NRSI is not legally liable for any other trees on the Property except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, or any other property not covered or referenced in this assessment.

Professional Responsibility

In carrying out this assessment, NRSI and any Assessor appointed for and on behalf of NRSI to perform and carry out the assessment has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out this assessment. The assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage (during the leaf-on period), the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the assessment, none of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy, no guarantees are offered, or implied, that these trees, or all parts of them will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to property and persons in the event of adverse weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by NRSI or its directors, officers, employers, contractors, agents or Assessors for:

a) any legal description provided with respect to the Property;
b) issues of title and or ownership respect to the Property;
c) the accuracy of the Property line locations or boundaries with respect to the Property; and
d) the accuracy of any other information provided to NRSI by the Client or third parties;
e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and
f) the unauthorized distribution of the assessment.

Third Party Liability

This assessment was prepared by NRSI exclusively for the Client. The contents reflect NRSI's best assessment of the trees situated on the Property in light of the information available to it at the time of preparation of this assessment. Any use which a third party makes of this assessment, or any reliance on or decisions made based upon this assessment, are made at the sole risk of any such third parties. NRSI accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use or reliance of this assessment by any such party.

General

Any plans and/or illustrations in this assessment are included only to help the Client visualize the issues in this assessment and shall not be relied upon for any other purpose.

This report shall be considered as a whole, no sections are severable, and the assessment shall be considered incomplete if any pages are missing.

Appendix IV
Tree Data and Summary Tables

Summary of Inventoried Trees

Potential for Structural Failure Rating	Overall Condition						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable	12	30	46	11	2	0	101
Possible	0	2	5	11	7	1	26
Probable	0	0	0	1	5	0	6
Imminent	0	0	0	0	0	0	0
Total	**12**	**32**	**51**	**23**	**14**	**1**	**133**

Overall Health of Trees Inventoried

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
Bitternut Hickory	*Carya cordiformis*	2	1					3
Black Cherry	*Prunus serotina*				1	2		3
Black Walnut	*Juglans nigra*	4	6	1				11
Bur Oak	*Quercus macrocarpa*		6	4	1		1	12
Eastern Cottonwood	*Populus deltoides*		2	3				5
Freeman's Maple	*Acer* X *freemanii*		2					2
Hawthorn species	*Crataegus* sp.			20	21	7		48
Pin Oak	*Quercus palustris*	5	4	4		1		14
Red Oak	*Quercus rubra*			1		1		2
Shagbark Hickory	*Carya ovata* var. *ovata*	1	3	1				5
Swamp White Oak	*Quercus bicolor*					1		1
Trembling Aspen	*Populus tremuloides*		4	10		1		15
White Elm	*Ulmus americana*		4	6				10
Total		12	32	50	23	13	1	131
Non-Native Species								
Common Pear	*Pyrus communis*			1		1		2
Total		0	0	1	0	1	0	2
Overall Total		**12**	**32**	**51**	**23**	**14**	**1**	**133**

Maps

Map 1. Tree Inventory and Protection Plan

Tree Number	Common Name	Scientific Name	Native/ Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1	Eastern Cottonwoo	*Populus deltoides*	Native	23.4	1	3.0	Improbable	Fair	Remove	Lean south.
2	Eastern Cottonwoo	*Populus deltoides*	Native	15.0	1	2.0	Improbable	Fair	Remove	Asymmetrical crown west.
3	Eastern Cottonwoo	*Populus deltoides*	Native	48.5	1	5.0	Improbable	Good	Remove	
4	Black Walnut	*Juglans nigra*	Native	48.4	1	6.0	Improbable	Fair	Remove	Good form.
5	Hawthorn species	*Crataegus sp.*	Native	18+13+11.5	3	3.0	Improbable	Fair	Remove	
6	Hawthorn species	*Crataegus sp.*	Native	12+11.5	2	3.0	Possible	Poor	Remove	
7	Hawthorn species	*Crataegus sp.*	Native	14.2	1	3.0	Improbable	Fair	Remove	
8	Hawthorn species	*Crataegus sp.*	Native	14.3	1	3.0	Improbable	Fair	Remove	
9	Hawthorn species	*Crataegus sp.*	Native	14.0	4	3.0	Improbable	Fair	Remove	
10	Hawthorn species	*Crataegus sp.*	Native	12+11.3	2	2.5	Possible	Poor	Remove	Dead and broken branches.
11	Hawthorn species	*Crataegus sp.*	Native	13.3	1	3.0	Improbable	Fair	Remove	Dead codominant leader.
12	Hawthorn species	*Crataegus sp.*	Native	10.2	1	4.5	Possible	Poor	Remove	Major lean east.
13	Hawthorn species	*Crataegus sp.*	Native	15.5+13.1	2	4.0	Improbable	Fair	Remove	Codominant stems; broken branches.
14	Hawthorn species	*Crataegus sp.*	Native	14+16	2	5.0	Possible	Poor	Remove	Major lean south east.
15	Hawthorn species	*Crataegus sp.*	Native	10.8	1	5.0	Improbable	Fair	Remove	Codominant leaders; broken branches.
16	Hawthorn species	*Crataegus sp.*	Native	10.7+10.3	1	5.0	Probable	Poor	Remove	Major dieback.
17	Hawthorn species	*Crataegus sp.*	Native	10.2	1	3.5	Improbable	Fair	Remove	Asymmetrical crown west.
18	Hawthorn species	*Crataegus sp.*	Native	12.5	1	3.0	Possible	Poor	Remove	Asymmetrical crown east; galleries
19	Hawthorn species	*Crataegus sp.*	Native	10.3	1	3.0	Improbable	Fair	Remove	Lean east.
20	Eastern Cottonwoo	*Populus deltoides*	Native	26.9	1	3.0	Improbable	Fair	Remove	Minor vines; good form
21	Black Walnut	*Juglans nigra*	Native	48.5	1	6.0	Improbable	Good	Remove	Healthy open crown.
22	Black Walnut	*Juglans nigra*	Native	45.0	1	5.0	Improbable	Good	Remove	Virginia creeper around base; good form.
23	Trembling Aspen	*Populus tremuloides*	Native	20.7	1	3.0	Improbable	Fair	Retain	On east facing slope.
24	Black Walnut	*Juglans nigra*	Native	59.9	1	7.0	Improbable	Good	Remove	Good form.
25	Black Cherry	*Prunus serotina*	Native	39.0	1	6.0	Probable	Very Poor	Remove	Dead branches; gummosis; vines.
26	Black Walnut	*Juglans nigra*	Native	39.4	1	6.0	Improbable	Good	Remove	One branch growing into dead Ash.
27	Trembling Aspen	*Populus tremuloides*	Native	10.1	1	1.5	Improbable	Good	Remove	Minor vine; small dead branch.
28	Trembling Aspen	*Populus tremuloides*	Native	10.9	1	3.5	Improbable	Good	Remove	Small dead branches.
29	Black Cherry	*Prunus serotina*	Native	26.7	3	4.0	Probable	Very Poor	Remove	Large dead branches.
30	Bitternut Hickory	*Carya cordiformis*	Native	17.1	1	3.0	Improbable	Excellent	Remove	No apparent problems.
31	Black Cherry	*Prunus serotina*	Native	18.1	1	2.5	Possible	Poor	Remove	Leaning east; dieback.
32	Trembling Aspen	*Populus tremuloides*	Native	23.1	1	5.0	Possible	Fair	Remove	Crown leaning south.
33	Hawthorn species	*Crataegus sp.*	Native	13.3	1	2.0	Probable	Very Poor	Remove	Dead top.
34	Hawthorn species	*Crataegus sp.*	Native	13.2	1	4.0	Probable	Very Poor	Remove	Major lean south.
35	Trembling Aspen	*Populus tremuloides*	Native	12.4	1	3.0	Improbable	Fair	Remove	Small dead branches.
36	Trembling Aspen	*Populus tremuloides*	Native	15.6	1	2.0	Possible	Very Poor	Remove	Broken top; vines.
37	Hawthorn species	*Crataegus sp.*	Native	15.1	1	4.0	Improbable	Fair	Remove	Minor dieback.
38	Hawthorn species	*Crataegus sp.*	Native	10.2	1	4.0	Possible	Fair	Remove	Major lean west.
39	Hawthorn species	*Crataegus sp.*	Native	11.1	1	3.0	Improbable	Fair	Remove	Minor dieback.
40	Hawthorn species	*Crataegus sp.*	Native	13.6	1	3.0	Probable	Very Poor	Remove	Large dead stems.
41	Hawthorn species	*Crataegus sp.*	Native	16.4	1	3.0	Improbable	Fair	Remove	Water sprouts.
42	White Elm	*Ulmus americana*	Native	24.3	1	5.0	Improbable	Fair	Remove	Slightly suppressed historically by adjacent Ash.
43	Bur Oak	*Quercus macrocarpa*	Native	15.5	1	2.5	Improbable	Good	Retain	Small dead branch.
44	White Elm	*Ulmus americana*	Native	11.4	1	2.0	Improbable	Fair	Remove	Broken branch.
45	Bur Oak	*Quercus macrocarpa*	Native	80.5	1	11.0	Improbable	Good	Retain	Dieback; majority of crown to north.
46	Bur Oak	*Quercus macrocarpa*	Native	48.6	1	6.0	Improbable	Good	Retain	Asymmetrical crown south.
47	Hawthorn species	*Crataegus sp.*	Native	10.6	1	1.0	Possible	Very Poor	Remove	Broken top.
48	White Elm	*Ulmus americana*	Native	11.3	1	2.0	Improbable	Good	Remove	Located bottom of slope.
49	Bur Oak	*Quercus macrocarpa*	Native	49.3	1	6.0	Improbable	Good	Remove	Healthy crown.
50	Bur Oak	*Quercus macrocarpa*	Native	70.0	1	5.0	Possible	Dead	Remove	Large dead tree with exfoliating bark providing potential bat habitat.
51	Shagbark Hickory	*Carya ovata var. ovata*	Native	56.0	1	7.0	Improbable	Good	Retain	Good form.
52	Hawthorn species	*Crataegus sp.*	Native	14.8	1	3.0	Improbable	Fair	Retain	
53	White Elm	*Ulmus americana*	Native	12.8	1	3.0	Improbable	Good	Remove	Historically suppressed by dead Ash.
54	Trembling Aspen	*Populus tremuloides*	Native	29.2	1	5.0	Improbable	Fair	Remove	Minor dieback.
55	Trembling Aspen	*Populus tremuloides*	Native	37.8	1	5.0	Improbable	Good	Remove	Minor dieback.
56	White Elm	*Ulmus americana*	Native	14.4	1	5.0	Possible	Fair	Remove	Leaning over northeast.
57	White Elm	*Ulmus americana*	Native	13.3	1	3.0	Improbable	Fair	Remove	Branch rub with leaning elm.
58	Hawthorn species	*Crataegus sp.*	Native	15.1	1	3.0	Improbable	Fair	Remove	Dieback.
59	Trembling Aspen	*Populus tremuloides*	Native	27.0	1	4.0	Improbable	Fair	Remove	Dieback.
60	Trembling Aspen	*Populus tremuloides*	Native	24.3	1	5.0	Improbable	Good	Remove	Minor dieback.
61	Hawthorn species	*Crataegus sp.*	Native	13.2	1	3.0	Improbable	Fair	Remove	Small dead branches.
62	Trembling Aspen	*Populus tremuloides*	Native	24.5	1	4.0	Improbable	Fair	Remove	Minor dieback.
63	Trembling Aspen	*Populus tremuloides*	Native	19.0	1	4.0	Improbable	Fair	Remove	Minor dieback; small dead branches.
64	Trembling Aspen	*Populus tremuloides*	Native	19.2	1	4.0	Improbable	Fair	Remove	Minor dieback.
65	Trembling Aspen	*Populus tremuloides*	Native	20.8	1	4.0	Improbable	Fair	Remove	Small dead branches; asymmetrical crown east.
66	Pin Oak	*Quercus palustris*	Native	93.8	1	7.0	Possible	Good	Retain	Can be pruned for improbable; asymmetrical crown north; large dead branches.
67	Pin Oak	*Quercus palustris*	Native	60.3	1	6.0	Possible	Fair	Retain	Large dead branch requires pruning.
68	Hawthorn species	*Crataegus sp.*	Native	16.0	1	2.5	Possible	Poor	Retain	Dead branches.
69	Pin Oak	*Quercus palustris*	Native	38.8	1	5.0	Improbable	Fair	Retain	Minor dieback.
70	Freeman's Maple	*Acer X freemanii*	Native	37.2	1	7.0	Improbable	Good	Remove	Minor dieback.
71	Pin Oak	*Quercus palustris*	Native	45.0	1	3.0	Improbable	Fair	Retain	Minor dead branches; small cavity.
72	Eastern Cottonwoo	*Populus deltoides*	Native	51.0	1	5.0	Improbable	Good	Remove	
73	Bitternut Hickory	*Carya cordiformis*	Native	20.0	1	6.0	Improbable	Good	Remove	1 sided edge tree
74	Hawthorn species	*Crataegus sp.*	Native	14.0	1	3.0	Improbable	Poor	Remove	
75	Hawthorn species	*Crataegus sp.*	Native	11.0	1	2.5	Improbable	Poor	Remove	
76	White Elm	*Ulmus americana*	Native	20.0	1	5.5	Improbable	Good	Remove	
77	Freeman's Maple	*Acer X freemanii*	Native	56+18+17	5	6.5	Improbable	Good	Remove	
78	Black Walnut	*Juglans nigra*	Native	11.0	1	2.0	Improbable	Excellent	Remove	
79	Hawthorn species	*Crataegus sp.*	Native	14+13+12	4	3.5	Possible	Fair	Remove	
80	Hawthorn species	*Crataegus sp.*	Native	13+12+11	3	3.0	Improbable	Fair	Remove	
81	Hawthorn species	*Crataegus sp.*	Native	11+9	2	4.0	Improbable	Poor	Remove	
82	Hawthorn species	*Crataegus sp.*	Native	15+14	2	4.0	Possible	Very Poor	Remove	
83	Black Walnut	*Juglans nigra*	Native	30.0	1	5.0	Improbable	Excellent	Remove	
84	Hawthorn species	*Crataegus sp.*	Native	14.0	1	4.5	Improbable	Fair	Remove	
85	Hawthorn species	*Crataegus sp.*	Native	10.0	1	2.0	Improbable	Poor	Remove	
86	Black Walnut	*Juglans nigra*	Native	46.0	1	6.0	Improbable	Excellent	Remove	
87	Black Walnut	*Juglans nigra*	Native	47.0	1	7.5	Improbable	Excellent	Remove	
88	Hawthorn species	*Crataegus sp.*	Native	12+5	2	2.5	Possible	Poor	Remove	
89	Hawthorn species	*Crataegus sp.*	Native	11+10	2	2.5	Improbable	Fair	Remove	
90	Common Pear	*Pyrus communis*	Non-Native	20+15	2	3.0	Improbable	Very Poor	Remove	
91	Hawthorn species	*Crataegus sp.*	Native	10.0	1	3.0	Improbable	Poor	Remove	
92	Hawthorn species	*Crataegus sp.*	Native	15.0	1	4.0	Improbable	Very Poor	Remove	
93	Hawthorn species	*Crataegus sp.*	Native	12+4	2	2.5	Possible	Poor	Remove	
94	Hawthorn species	*Crataegus sp.*	Native	11+10	2	2.0	Possible	Very Poor	Remove	Partially uprooted.
95	Hawthorn species	*Crataegus sp.*	Native	12+9	2	4.0	Improbable	Poor	Remove	
96	Hawthorn species	*Crataegus sp.*	Native	11.0	1	2.0	Improbable	Poor	Remove	
97	Hawthorn species	*Crataegus sp.*	Native	12+11+11	4	3.0	Possible	Poor	Remove	
98	Hawthorn species	*Crataegus sp.*	Native	14+10+7	4	4.0	Improbable	Poor	Remove	
99	Hawthorn species	*Crataegus sp.*	Native	10+10	2	3.5	Improbable	Poor	Remove	
100	Hawthorn species	*Crataegus sp.*	Native	14.0	1	2.0	Improbable	Poor	Remove	
101	Common Pear	*Pyrus communis*	Non-Native	23.0	1	4.0	Improbable	Fair	Remove	
102	Swamp White Oak	*Quercus bicolor*	Native	39.0	1	6.5	Possible	Very Poor	Remove	Significant decay on main stem.
103	Hawthorn species	*Crataegus sp.*	Native	10.0	1	2.0	Improbable	Poor	Remove	
104	Pin Oak	*Quercus palustris*	Native	17.0	1	4.0	Improbable	Fair	Retain	
105	Bur Oak	*Quercus macrocarpa*	Native	102.0	1	9.0	Possible	Good	Retain	Pruning would acheive improbable potential for structural failure.
106	Bur Oak	*Quercus macrocarpa*	Native	67.0	1	8.0	Improbable	Fair	Retain	
107	Red Oak	*Quercus rubra*	Native	69.0	1	7.0	Improbable	Fair	Retain	
108	Black Walnut	*Juglans nigra*	Native	40.0	1	7.0	Improbable	Good	Remove	
109	Black Walnut	*Juglans nigra*	Native	37.0	1	6.5	Improbable	Good	Remove	
110	Bur Oak	*Quercus macrocarpa*	Native	60.0	1	9.5	Improbable	Fair	Remove	
111	Pin Oak	*Quercus palustris*	Native	30.0	1	6.0	Improbable	Excellent	Remove	
112	White Elm	*Ulmus americana*	Native	15.0	1	4.0	Improbable	Good	Remove	
113	Pin Oak	*Quercus palustris*	Native	32.0	1	5.0	Improbable	Good	Remove	
114	Red Oak	*Quercus rubra*	Native	29+27	2	5.0	Possible	Very Poor	Remove	
115	Trembling Aspen	*Populus tremuloides*	Native	24.0	1	4.0	Improbable	Fair	Remove	
116	Pin Oak	*Quercus palustris*	Native	108.0	1	10.0	Possible	Very Poor	Remove	Main stem hollow with substantial callus.
117	Pin Oak	*Quercus palustris*	Native	23.0	1	5.0	Improbable	Excellent	Remove	
118	Pin Oak	*Quercus palustris*	Native	29.0	1	5.0	Improbable	Good	Remove	Fort placed around base.
119	Pin Oak	*Quercus palustris*	Native	46.0	1	6.0	Improbable	Excellent	Remove	
120	Pin Oak	*Quercus palustris*	Native	27.0	1	5.0	Improbable	Excellent	Remove	
121	Shagbark Hickory	*Carya ovata var. ovata*	Native	11.0	1	2.0	Improbable	Good	Remove	
122	Pin Oak	*Quercus palustris*	Native	29.0	1	5.5	Improbable	Good	Remove	Codominant stems at 5m.
123	Bur Oak	*Quercus macrocarpa*	Native	51.0	1	9.0	Improbable	Fair	Remove	partly suppressed with minor lean.
124	Pin Oak	*Quercus palustris*	Native	65.0	1	6.5	Improbable	Excellent	Retain	
125	Shagbark Hickory	*Carya ovata var. ovata*	Native	33.0	1	5.0	Improbable	Excellent	Retain	
126	Bur Oak	*Quercus macrocarpa*	Native	92.0	1	9.0	Possible	Poor	Retain	
127	Bur Oak	*Quercus macrocarpa*	Native	56.0	1	8.0	Improbable	Fair	Retain	
128	Shagbark Hickory	*Carya ovata var. ovata*	Native	27.0	1	6.0	Improbable	Fair	Retain	Partly suppressed.
129	Shagbark Hickory	*Carya ovata var. ovata*	Native	36.0	1	5.5	Improbable	Good	Retain	
130	Bur Oak	*Quercus macrocarpa*	Native	112.0	1	11.0	Improbable	Good	Retain	
131	White Elm	*Ulmus americana*	Native	18.0	1	3.0	Improbable	Fair	Remove	
132	White Elm	*Ulmus americana*	Native	49.0	1	9.0	Improbable	Fair	Remove	
133	Bitternut Hickory	*Carya cordiformis*	Native	10.0	1	1.5	Improbable	Excellent	Remove	

Map 1

315 Garrison Road

Tree Savings Plan

Legend

- Subject Property
- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Tree Protection Fence
- Proposed Site Plan
- Existing Features
- Existing Lot Lines

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2319
Date: February 4, 2022

NAD83 - UTM Zone 17
Size: 24x36"
1:400

0 4 8 12 16 20 24 Meters

N

Migratory Birds Convention Act

1. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act (MBCA)*, 1994, which is regulated by the Canadian Wildlife Service (CWS).
2. Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults.
3. Vegetation clearing is recommended to occur outside the bird nesting season (April 1 – August 31) so as to limit disturbances to nesting activities of birds within the proposed work zone.
4. Specific to simple habitats*, if vegetation clearing cannot be avoided during the bird nesting season, a qualified biologist will be retained to carry out a nest search ahead of clearing activities within the work zone.
5. Nest areas will be identified in the field. There shall be no construction activity in identified nesting areas until sign-off is obtained from the biologist.
6. Areas identified as having no bird nesting activity can be cleared; however, clearing must occur within 48 hours of nest searching. If vegetation clearing is not performed within 48 hours, additional nest searches must be conducted.
*Simple habitats are characterized by the CWS as habitats consisting of urban parks with isolated trees, vacant lots with few possible nest sites, a previously cleared area, or a structure such as a bridge, tower, or building, and specifically excludes meadows. More information is available at (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html).

Species at Risk (SAR) Bat Habitat

1. The destruction of Species at Risk (SAR) bats and their habitat is prohibited under the *Endangered Species Act (ESA)*, 2007.
2. Vegetation clearing has the potential to directly impact bat roosting habitat.
3. Tree removal should occur outside of the active roosting season (April 1 to September 30) to avoid destruction of potential bat habitat, and therefore contravention of the ESA.
4. Any vegetation removal that has the potential to impact SAR bat habitat requires prior correspondence with the Ministry of the Environment, Conservation and Parks (MECP).

Fish and Wildlife Conservation Act

1. The provincial *Fish and Wildlife Conservation Act (FWCA)* , 1997, provides protection for certain bird species, not protected under the MBCA (i.e., raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (Vulpes vulpes) and Striped Skunk (Mephitis mephitis).
2. Construction activities, especially vegetation clearing and site grading, have the potential to directly impact nesting birds not protected under the MBCA, including raptors, and den sites for furbearing mammals.
3. The timing of construction activities must have consideration for species covered under the FWCA. Similar to the recommendations noted under the MBCA, vegetation clearing is recommended to occur outside the general bird nesting season (April 1 – August 31); however, raptors and other birds may nest during other periods of the year.
4. If any bird nests are encountered, regardless of the time of year, a qualified biologist will be retained to carry out a nest search prior to vegetation removal or grubbing to confirm if the nest is active.
5. Nest areas will be identified in the field. There shall be no construction activity in identified nesting areas until sign-off is obtained from the biologist.

Appendix VI

Niagara Peninsula Conservation Authority Wetland Policy Analysis

Subject: RE: 315 Garrison Road (Site Visit Follow-Up for Surveyed Wetland)
From: Jessica Abrahamse <jabrahamse@npca.ca>
Date: 1/13/2022, 9:19 AM
To: Brett Woodman <bwoodman@nrsi.on.ca>
CC: Amy Reinert <areinert@nrsi.on.ca>, Susan Smyth <ssmyth@quartekgroup.com>, Adam Aldworth <aaldworth@npca.ca>

Good Morning Brett,

Happy New Year to you as well!

I believe Amy provided a response to the memo you had sent in for the technical memo in a separate email, so this email is to address 315 Garrison Rd.

Please find the below comments based on the analysis of NPCA staff with regards to the unevaluated wetland pockets discovered during the EIS surveys being undertaken in support of developing the property at 315 Garrison Rd.

NPCA staff have reviewed the Wetland Analysis Letter Report prepared by NRSI and dated December 6, 2021. Extensive characterization of the form and function of the wetland has been completed over a 2 year period and involved consultation with NPCA staff on additional study requirements and agreement on a Terms of Reference for the study of the unevaluated wetland. The wetland is characterized as a cattail marsh that is 0.06 ha in size and isolated from the larger watershed. The closest mapped surface watercourse is located approximately 775 m southeast of the wetland. The NRSI report has also provided an analysis of the wetlands as they pertain to the Ontario Wetland Evaluation System and note that the wetlands are located >750 m from the nearest wetland complex, are small in size (<0.5 ha) and do not provide significant wildlife habitat or habitat for species of concern or species at risk.

NPCA staff are satisfied that due to the small size (0.06 ha) and isolation of this wetland that no hydrologic connection exists between this wetland and a surface water feature, and therefore this wetland does not meet the Conservation Authority's Act definition of wetland clause b) *"directly contributes to the hydrological function of a watershed through a connection with a surface watercourse"*.

These conclusions are site specific in nature and additional characterization of wetland hydrology may be required in other circumstances. Should unevaluated wetlands be discovered through detailed characterization of a site, the applicant and/or their consultants are encouraged to contact the NPCA as soon as possible to determine any additional requirements that the NPCA may have to characterize unevaluated wetlands. For further information on unevaluated wetlands within the NPCA's jurisdiction please see NPCA Policy 8.1.2.3 *Unevaluated Wetlands*.

With Best Regards,

Jessica Abrahamse M.E.S.
Watershed Planner

250 Thorold Road West, 3rd Floor
Welland, On
L3C 3W2
(905) 788-3135 Ext. 235
jabrahamse@npca.ca
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NPCA Mapping Tool

inquiries or complaints due to staff restrictions and remote work locations. Updates with regards to NPCA operations and activities can be found on our website at www.npca.ca/our-voice, the NPCA Facebook page at https://www.facebook.com/NPCAOntario and on Twitter at https://twitter.com/NPCA_Ontario.

For more information on Permits, Planning and Forestry please go to the Permits & Planning webpage at https://npca.ca/administration/permits.

For mapping on features regulated by the NPCA please go to our GIS webpage at https://gis-npca-camaps.opendata.arcgis.com/ and utilize our Watershed Explorer App or GIS viewer.

To send NPCA staff information regarding a potential violation of Ontario Regulation 155/06 please go to the NPCA Enforcement and Compliance webpage at https://npca.ca/administration/enforcement-compliance.

From: Brett Woodman <bwoodman@nrsi.on.ca>
Sent: January-10-22 10:48 AM
To: Jessica Abrahamse <jabrahamse@npca.ca>
Cc: Amy Reinert <areinert@nrsi.on.ca>; Susan Smyth <ssmyth@quartekgroup.com>
Subject: Re: 315 Garrison Road (Site Visit Follow-Up for Surveyed Wetland)

Hi Jessica,

Happy New Year. Hope you had a good break.

I am following to see if you have had a chance to review the technical memo that Amy submitted last month.

The project team is hoping to submit the Garrison Rd. Phase 2 application to the Town in the coming weeks. My understanding is that the Town and Region are looking for your sign-off regarding the wetland feature on the neighboring property. Ideally, we could provide your response with our submission.

Please let me know if you have any questions.

Regards,

Brett

Brett Woodman M.E.S. Senior Manager
Terrestrial Biologist and Certified Arborist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON N2L 3X2
(p) 519-725-2227 Ext. 412 (f) 519-725-2575
(m) 519-580-0098
(w) www.nrsi.on.ca (e) bwoodman@nrsi.on.ca
@nrsinews Natural Resource Solutions Inc.
Over 20 years of environmental consulting excellence

On 12/6/2021 1:42 PM, Amy Reinert wrote:

> Hi Jessica,
>
> Please see attached for NRSI's technical memo regarding the wetland feature located at

315 Garrison Road, Fort Erie. This memo contains the results of a background information review and field studies which were used to characterize the wetland and complete a NPCA wetland policy analysis.

If NPCA agrees that the wetland is not regulated by NPCA under Ontario Regulation 155/06, please provide written confirmation that can be forwarded to the Region and Town. Alternatively, please let us know if you require any more information or have any questions.

Thank you,

Amy

Amy Reinert M.Env.Sc.
Terrestrial and Wetland Biologist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON N2L 3X2
(p) 519-725-2227 Ext. 264 (f) 519-725-2575
(w) www.nrsi.on.ca (e) areinert@nrsi.on.ca
@nrsinews Natural Resource Solutions Inc.
Over 20 years of environmental consulting excellence

On 10/6/2021 3:29 PM, Jessica Abrahamse wrote:

> Hi Susan,
>
> Please give me a call at your earliest convenience. The best way to reach me is
>
> With Best Regards,
>
> Jessica Abrahamse M.E.S.
> Watershed Planner
>
> 250 Thorold Road West, 3rd Floor
> Welland, On
> L3C 3W2
> (905) 788-3135 Ext. 235
> jabrahamse@npca.ca
> www.npca.ca
> NPCA Mapping Tool
>
> Thank you for your email. Due to the COVID-19 pandemic, the NPCA has taken mea
>
> For more information on Permits, Planning and Forestry please go to the Permits
>
> For mapping on features regulated by the NPCA please go to our GIS webpage at h
>
> To send NPCA staff information regarding a potential violation of Ontario Regul
>
> -----Original Message-----
> From: Susan Smyth <ssmyth@quartekgroup.com>
> Sent: October-05-21 3:57 PM
> To: Adam Aldworth <aaldworth@npca.ca>; Jessica Abrahamse <jabrahamse@npca.ca>;
> Cc: Amy Reinert <areinert@nrsi.on.ca>; Brett Woodman <bwoodman@nrsi.on.ca>
> Subject: 315 Garrison Road (Site Visit Follow-Up for Surveyed Wetland)
>
> Good Afternoon,

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

December 6, 2021 Project No. 2319

Jessica Abrahamse
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, On
L3C 3W2

Dear: Jessica Abrahamse

RE: 315 Garrison Road, Fort Erie, Ontario
Wetland Analysis

Introduction

Natural Resource Solutions Inc. (NRSI) was retained to complete an Environmental Impact Study (EIS) to support the proposed development of a commercial plaza and residential townhome complex at 315 Garrison Road, Fort Erie, Ontario (Map 1).

The subject property is approximately 2.1ha in size and is bounded by residential homes to the north, commercial land uses to the east and south and an abandoned building on the lot to the west. The subject property is currently characterized by natural communities including Mineral Cultural Thicket (CUT1), Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) and Mineral Cultural Meadow (CUM1). A small Cattail Mineral Shallow Marsh (MAS2-1) is present adjacent to the western subject property boundary.

A Phase I EIS was completed for the subject property in 2020 and focused on the commercial plaza proposed in the southern portion of the subject property fronting onto Garrison Road (NRSI 2020). During the Phase I EIS, a previously unmapped wetland community, a small Cattail Mineral Shallow Marsh (MAS2-1), was observed adjacent to the subject property boundary (Map 2). As this wetland feature was previously undocumented and there are no other regulated features on-site, the Niagara Peninsula Conservation Authority (NPCA) was not included in the original agency review. Niagara Region comments on the Phase 1 EIS identified that NPCA must be included in the review of any further work beyond the Phase 1 limits. Prior to the initiation of the Phase II EIS, NRSI was informed that the adjacent landowner had joined the team and that the Phase II expansion would include the property to the west. This proposed expansion was to include much of the wetland. From the out-set, the proposal was to re-locate this wetland elsewhere within the subject property in accordance with NPCA policies. A draft Terms of Reference (TOR) was submitted to NPCA on March 10, 2021. The draft TOR was accepted with the addition of a salamander trapping study. NRSI initiated the scope of work as outlined in the TOR but were stopped in May 2021 when the adjacent landowner had withdrawn from the project.

The current Phase II of the proposed development consists of a residential town home complex in the northern portion of the subject property. The proposed development will require the removal of the 3m^2 (0.0003ha) of the Cattail Mineral Shallow Marsh (MAS2-1) that is present within the subject property.

This technical memo contains the results of the background information review and field studies which were used to characterize the Cattail Mineral Shallow Marsh (MAS2-1) and complete a NPCA wetland policy analysis.

Methods

Background Information Collection and Review

Existing natural heritage information was collected and reviewed to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. The following background information sources were reviewed to provide an accurate understanding of the physical and biological attributes within the study area:

- Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF);
- Ministry of the Environment, Conservation and Parks (MECP);
- Niagara Peninsula Conservation Authority (NPCA);
- Town of Fort Erie Official Plan (2018);
- Niagara Region Official Plan (2014);
- Town of Fort Erie Natural Areas Inventory (Dougan & Associates 2003);
- NPCA Natural Heritage Areas Inventory (NPCA 2010);
- Natural Heritage Information Centre (NHIC) (MNDMNRF 2021b);
- Ontario Breeding Bird Atlas (OBBA) (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019);
- Ontario Butterfly Atlas (Macnaughton et al. 2021);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Rare Plant Atlas (Oldham 2017);
- Ontario Odonata Atlas (OOAD 2019); and
- Supplementary resources including eBird and iNaturalist.

Species lists were compiled to provide information on species reported from within the vicinity of the study area based on data available from the wildlife atlases listed above. These atlases provide data based on 10x10km survey squares. Information on species from the survey squares that overlap with the study area (17PH6952) were compiled. These initial species lists were used to guide the scope and type of wildlife field surveys required.

Significant Species Screening

Based on the compiled species lists for the study area, a screening exercise was completed to assess the potential for reported SAR and Species of Conservation Concern (SCC) to occur in the study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (MNDMNRF 2000, Oldham 2017, Reznicek et al. 2011) against habitats known to occur in the study area. This exercise was completed to ensure that the potential presence of all SAR and SCC within the study area was adequately assessed in this study.

Species at Risk are those listed on the SAR in Ontario List (SARO) (MNDMNRF 2021a). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed by COSSARO as Endangered or Threatened are protected by the Endangered Species Act, 2007 (ESA), which includes protection of their habitat, and are referred to as regulated SAR. Species listed as Special Concern are included in the definition of SCC, which comprises the following:

- Species designated provincially as Special Concern;
- Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by NHIC; and
- Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by COSSARO. If these species are listed under the Species at Risk Act (SARA) under Schedule 1, they are protected by the federal Act but not provincially by the ESA.

Full SAR/SCC screening results are provided in Appendix I.

Significant Wildlife Habitat Screening

A screening exercise was completed to assess the presence of Significant Wildlife Habitat (SWH) within the study area. SWH is protected under the Ontario Provincial Policy Statement (PPS) (OMMAH 2020) and is described in the MNDMNRF Significant Wildlife Habitat Technical Guide (SWHTG) (MNDMNRF 2000) as being comprised of four major categories of habitat:

- Seasonal concentration areas;
- Rare vegetation communities and specialized wildlife habitat;
- Habitats of species of conservation concern; and
- Animal movement corridors.

Specific criteria defining wildlife habitat significance for Ecoregion 7E are described in the SWHTG Addendum (MNDMNRF 2015). Individual SWH types within these four broad categories were assessed as either not present, candidate, or confirmed for the study area based on a comparison of significance criteria against information obtained from relevant background documents.

Full SWH screening results are provided in Appendix II.

Field Methods

A total of 17 field visits were completed between August 2019 and September 2021. The field surveys that were undertaken are described in detail below and summarized in Table 1. Surveys were undertaken in accordance with provincial and local guidance documents as indicated below.

Table 1. Field Survey Summary.

Survey Type	Protocol	Survey Date(s)
Vegetation Community Mapping	Ecological Land Classification for Southern Ontario (Lee et al. 1998)	August 22, 2019 September 18, 2019 March 27, 2020
Vascular Flora Inventory	Systematic area search of subject property	August 22, 2019 September 18, 2019 March 27, 2020
Wetland Boundary Delineation and Agency Review	Ontario Wetland Evaluation System (MNDMNRF 2014)	September 14, 2021
Bat Habitat Assessment	Survey Protocol for Species at Risk (SAR) Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNDMNRF 2017)	March 27, 2020
Passive Bat Acoustic Survey	Survey Protocol for Species at Risk (SAR) Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNDMNRF 2017)	June 1 – June 17, 2020
Anuran Call Survey	Marsh Monitoring Program (BSC 2009)	April 24, 2020 May 28, 2020 June 17, 2020 April 7, 2021 May 4, 2021 June 9, 2021
Salamander Breeding Surveys (Trapping)	Jefferson Salamander Recovery Team (2013)	April 10, 2021 April 11, 2021 April 12, 2021 April 15, 2021 April 16, 2021

Vegetation Surveys

Vegetation community delineation was completed using aerial photography and thorough investigations in the field. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998).

The wetland boundaries were delineated and flagged by NRSI and reviewed on site by NPCA staff. Boundaries were surveyed using a Trimble SXBlue II GNSS GPS unit which is capable of mapping grade accuracy ≤0.5m.

All observed species of vascular flora within the subject property were recorded during spring, summer and fall vascular flora inventories conducted in conjunction with vegetation community delineations.

Bat Habitat Assessment

A bat habitat assessment was conducted during the leaf off period to identify trees that have the potential to provide suitable roosting habitat for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) (MNDMNRF 2017). All standing live or dead trees >10cm Diameter at Breast Height (DBH) with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark were documented. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each

candidate roost tree. All Oak (*Quercus* sp.) and Maple (*Acer* sp.) trees >10cm DBH were also documented as they have the potential to provide suitable roosting habitat for Tri-colored Bat. All identified candidate roost trees were surveyed with a Trimble SXBlue II GNSS GPS unit.

Bat Acoustic Survey

Passive acoustic monitoring was conducted to assess the potential presence of bat SAR and their use of available habitats within the subject property. Five (5) acoustic monitoring stations were placed within 10m of several clusters of candidate bat roost trees, one of which was located near the Cattail Mineral Shallow Marsh (MAS2-1) community (Map 2). Bat acoustic monitoring methodology followed the guidelines outlined within the MNDMNRF Survey Protocol for Species at Risk (SAR) Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNDMNRF 2017).

Anuran Call Surveys

Six (6) evening anuran call surveys were conducted at the Cattail Mineral Shallow Marsh (MAS2-1) vegetation community following the Marsh Monitoring Program protocol (BSC 2009) at 1 monitoring station over 2 years (Map 2). Monitoring focused on calling anurans during 3-minute point counts, which included documenting call intensity and an estimated number of individuals.

Salamander Breeding Surveys

Surveys were conducted in accordance with the Jefferson Salamander Recovery Team's recommended protocol. Three (3) un-baited minnow traps were strategically placed in the Cattail Mineral Shallow Marsh (MAS2-1) (Map 2). The traps were set in the evening and checked the following morning for 5 trapping events during favourable weather conditions for salamander movement. Weather conditions, including air and water temperature, precipitation and cloud cover, were recorded for each trap set.

Additional Wildlife

All observations of birds, mammals, herpetofauna and insects were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scats, dens, nests etc.).

Significant Wildlife Habitat and Species at Risk Habitat Assessments

Significant Wildlife Habitat (SWH) types and SAR habitats identified as potentially occurring within the study area (i.e., Candidate) during the background review were further assessed for their presence in the field during all surveys.

Existing Conditions

Vegetation Communities

The Cattail Mineral Shallow Marsh Type (MAS2-1) abuts the western subject property boundary. A small portion ($3m^2$) of the $600m^2$ (0.06ha) wetland feature is located within the subject property. It is dominated by Cattail species (*Typha* sp.) and contains abundant downed woody debris. Shallow standing water is present throughout the summer.

The wetland is located within the Mineral Cultural Thicket Ecosite (CUT1) vegetation community which is characterized by European Buckthorn (*Rhamnus cathartica*), Multiflora Rose (*Rosa multiflora*), Grey Dogwood (*Cornus racemosa*), with a sparse overstorey of Black Walnut (*Juglans nigra*), Eastern Cottonwood (*Populus deltoides*) and Hawthorn (*Crataegus spp.*).

Vascular Flora

In total, 88 vascular flora species were observed within the subject property and accessible adjacent lands during vascular flora inventories. Based on available background information, 6 vegetation SAR and 8 vegetation SCC were reported from the vicinity of the study area (MNDMNRF 2021b, MNDMNRF 2018). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat for the listed significant species is not present within the wetland. Suitable habitat for 5 vegetation SAR and 5 vegetation SCC is present within the subject property, but no federally, provincially or regionally significant vegetation species were observed during targeted field investigations.

Birds

In total, 106 bird species are reported from the study area or vicinity based on the OBBA, NHIC database and MNDMNRF background information (BSC et al. 2006, MNDMNRF 2021b, MNDMNRF 2018). A total of 24 of these species and 4 additional species were observed within the study area.

Based on available background information, 12 bird SAR and 4 bird SCC are reported from the vicinity of the study area (BSC et al. 2006, MNDMNRF 2021b, MNDMNRF 2018). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat for the listed significant species is not present within the wetland or subject property. One regionally rare species, Tufted Titmouse (*Baeolophus bicolor*), was observed within the subject property outside of the breeding period and no breeding evidence was observed. No other federally, provincially or regionally significant bird species were observed during field investigations. No targeted breeding bird surveys were completed.

Herpetofauna

In total, 18 herpetofauna species are reported from the study area or vicinity based on the ORAA, NHIC database and MNDMNRF background information (Ontario Nature 2019, MNDMNRF 2021b, MNDMNRF 2018). Only 1 of these species and 1 additional species were observed within the study area.

Based on available background information, 4 herpetofauna SAR and 2 herpetofauna SCC are reported from the vicinity of the study area (Ontario Nature 2019, MNDMNRF 2021b, MNDMNRF 2018). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Marginally suitable habitat for 1 SCC, Jefferson/Unisexual Salamander Complex (*Ambystoma* sp.), may be present within the wetland. No regionally, provincially or federally significant reptile or amphibian species were observed during field investigations, including targeted salamander surveys.

<u>Anuran Call Survey Results</u>

Despite suitable weather conditions on all 6 survey dates, no anurans were heard calling from the Cattail Mineral Shallow Marsh Type (MAS2-1) vegetation community during anuran call surveys. Two (2) Western Chorus Frogs (*Pseudacris triseriata*) were heard calling from a flooded section of the old asphalt area during the April 2021 survey.

Salamander Breeding Survey Results

Despite suitable weather conditions on all 5 survey dates, no salamanders were captured within the Cattail Mineral Shallow Marsh Type (MAS2-1) vegetation community during salamander breeding surveys.

Mammals

In total, 40 mammal species are reported from the study area or vicinity based on the Ontario Mammal Atlas, NHIC database and MNDMNRF background information (Dobbyn 1994, MNDMNRF 2021b, MNDMNRF 2018). A total of 6 of these mammal species were observed within the study area.

Based on available background information, 5 mammal SAR and 1 mammal SCC are reported from the vicinity of the study area (Dobbyn 1994, MNDMNRF 2018). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. No suitable habitat for the listed significant species is present within the wetland. Suitable habitat for 4 mammal SAR and 1 mammal SCC is present within the study area, however, no regionally, provincially or federally significant mammal species were observed during field investigations, including bat acoustic surveys.

Bat Habitat Assessment Results

The bat habitat assessment identified the presence of 49 candidate bat roost trees for Little Brown Myotis and Northern Myotis, as well as 35 candidate bat roost trees for Tri-colored Bat throughout the subject property. Several candidate roost trees for Little Brown Myotis and Northern Myotis were identified within the vicinity of the wetland.

Passive Bat Acoustic Survey Results

Passive bat acoustic monitoring completed within the subject property identified the presence of 4 species, Big Brown Bat (*Eptesicus fuscus*), Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*) and Silver-haired Bat (*Lasionycteris noctivagans*) within the subject property. All of these species are considered common in Ontario and it is not anticipated that bat SAR are using habitats within the subject property. The Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) within the subject property remains as candidate SWH for Bat Maternity Colonies due to the timing of recorded Big Brown Bat and Silver-haired Bat calls in this community.

Butterflies

In total, 21 butterfly species are reported from the study area or vicinity based on the Ontario Butterfly Atlas, NHIC database and MNDMNRF background information (Macnaughton et al. 2021, MNDMNRF 2021b, MNDMNRF 2018). No butterfly species were observed within the study area.

Based on available background information, 1 butterfly SAR and 1 butterfly SCC were reported from the vicinity of the study area (Macnaughton et al. 2021, MNDMNRF 2018). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable foraging habitat for one butterfly SCC, Monarch (*Danaus plexippus*), is present within the study area, however no larval host food plants that would support a breeding population (e.g., *Asclepias* spp.) or habitats of sufficient size to support migrating individuals is present. No targeted butterfly surveys were completed. No suitable habitat is present within the wetland. No regionally, provincially or federally significant butterfly species were observed during field investigations.

Odonates

In total, 15 odonate species are reported from the study area or vicinity based on the Ontario Odonate Atlas, NHIC database and MNDMNRF background information (OOAD 2019, MNDMNRF 2021b, MNDMNRF 2018). No odonate species were observed within the study area.

Based on available background information, no odonate SAR or SCC are reported from the vicinity of the study area (OOAD 2019, MNDMNRF 2021b, MNDMNRF 2019). No targeted odonate surveys were completed. No regionally, provincially or federally significant odonate species were observed during field investigations

Other Insects

In total, 1 other insect species, Rusty-patched Bumblebee (*Bombus afinis*), is reported from the study area or vicinity based on the NHIC database and MNDMNRF background information (MNDMNRF 2021b, MNDMNRF 2018). No insect species were documented within the subject property during field investigations.

Based on available background information, 1 insect SAR, Rusty-patched Bumblebee, is reported from the vicinity of the study area (MNDMNRF 2018). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Suitable habitat (i.e., urban settings) for Rusty-patched Bumblebee is present within the study area, however the only known extant population of this species in Ontario is located in Pinery Provincial Park near Grand Bend. No suitable habitat is present within the wetland. No targeted insect surveys were completed. No regionally, provincially or federally significant insect species were observed during field investigations.

Wetland Significance and Sensitivity Analysis

Wetland Significance

The Cattail Mineral Shallow Marsh (MAS2-1) within and adjacent to the subject property is currently mapped as unevaluated by the MNDMNRF (MNDMNRF 2021b). However, the distance to the closest wetland unit is greater than 750m, no Provincially Significant Wetlands (PSW) are located within 750m, the wetland is less than 0.5ha in size, no significant vegetation communities are present and no SAR are actively using the wetland community. Therefore, if the wetland was fully evaluated it would not meet the criteria for PSW designation.

Significant Wildlife Habitat

Based on background information review, desktop analysis and field studies, no SWH types were confirmed in the study area. Reptile Hibernaculum and Bat Maternity Colony SWH were maintained as candidate SWH within the subject property, and all other candidate SWH were ruled out. No SWH remains as candidate or was confirmed within the Cattail Mineral Shallow Marsh (MAS2-1) community.

Habitat of Endangered and Threatened Species

Based on the results of the background information review and field investigations, no SAR and associated habitats were confirmed as present in the subject property, including the Cattail Mineral Shallow Marsh (MAS2-1) community.

Ecological Significance

The Cattail Mineral Shallow Marsh (MAS2-1) does not meet the criteria to be designated a PSW, it is not located within a floodplain or riparian community and is not hydrologically connected to any other waterbodies or watercourses. The wetland does not provide direct or indirect fish habitat, contain SWH or provide habitat for SAR, and does not contain significant or rare vegetation species or communities. No federally, provincially or regionally significant species were observed within the wetland. The only wildlife observed within the wetland during all surveys over a 2 year period was 1 American Toad (*Anaxyrus americanus*). The wetland is not part of a wildlife corridor or linkage between larger wetlands or natural areas as it is located in a fragmented natural area that is completely surrounded by residential and commercial land uses. The wetland offers little ecological value.

Wetland Policy Analysis

The Conservation Authorities Act defines wetlands as "*land that:*

> *a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface;*
>
> *b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse;*
>
> *c) has hydric soils, the formation of which has been caused by the presence of abundant water; and,*
>
> *d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause c) or d).*"

The Cattail Mineral Shallow Marsh (MAS2-1) meets all of the above criteria of a wetland regulated by NPCA except criteria b). The wetland is not connected to a surface watercourse and is hydrologically isolated (Map 1). No natural feature mapping indicates the presence of a connection between the wetland and a surface watercourse. All site visits, which occurred over the course of two years and during all seasons, confirmed the absence of any surface water connection as no evidence of potential discharge from the wetland (e.g., topography, erosion, channels) was observed.

Therefore, the Cattail Mineral Shallow Marsh Type (MAS2-1) is not a wetland that is regulated by NPCA under Ontario Regulation 155/06. If you agree with this determination, please provide written sign-off that can be forwarded to the Region and Town. Alternatively, please let us know if you have any questions.

Sincerely,
Natural Resource Solutions Inc.

Amy Reinert
Terrestrial and Wetland Biologist

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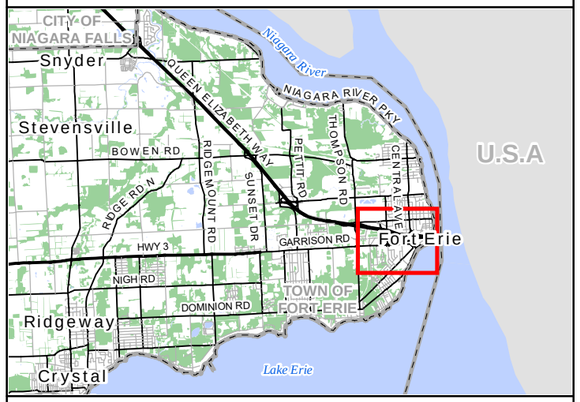
Maps

Map 1

315 Garrison Road, Fort Erie

Subject Property and Natural Features



Legend

- Subject Property
- Utility Line
- Highway
- Primary Road
- Secondary Road
- Resource / Recreation / Other
- Railway
- Provincially Significant Wetland (PSW)
- Other Wetland (Non-PSW)
- Wooded Area
- Deer Wintering Area (Stratum 2)
- Waterfowl Winter Concentration Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2319A
Date: October 28, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:8,500

0 100 200 300 400 500 Metres

N

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4752650 4752600 4752550 4752500 4752450

WALDEN BLVD

MATHER BLVD

FOD9

BAT-002

BAT-003

BAT-004

BAT-001

BAT-005

SAL-003

SAL-001

SAL-002

MAS2-1

ANR-001

CUT1

CUM1

Asphalt

Manicured

Manicured

GARRISON RD

669200 669250 669300 669350 669400 669450

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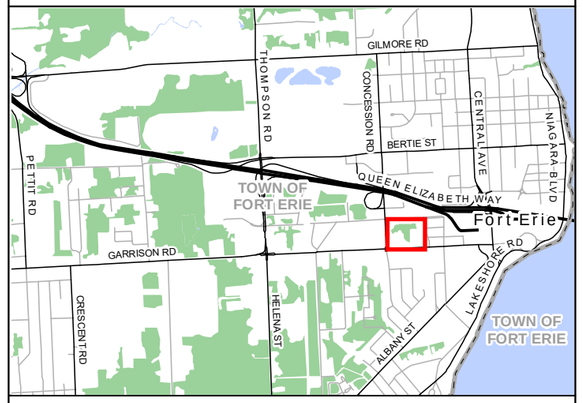
Map 2

315 Garrison Road, Fort Erie

Monitoring Stations and Vegetation Communities



Legend

- Subject Property
- (A) Anuran Call Station (ANR)
- (S) Salamander Monitoring Station (SAL)
- (B) Bat Acoustic Monitoring Station (BAT)
- Surveyed Wetland (NRSI September 2021)
- Ecological Land Classification (ELC)
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
- (FOD9) Fresh-Moist Oak-Maple-Hickery Deciduous Forest Ecosite
- ELC Inclusion
- (MAS2-1) Cattail Mineral Shallow Marsh Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2319A
Date: December 3, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

N

0 10 20 30 40 50 60 Metres