Final

435-451 Ridout Street, London Ontario

Preliminary Environmental Impact Study

Prepared for:

Farhi Holdings Corporation
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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

435-451 Ridout Street, London Ontario

Preliminary Environmental Impact Study

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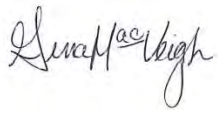

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained in 2018 by Farhi Holdings Corporation to complete a scoped Environmental Impact Study (EIS) for a proposed multi-use development on the subject property, located at 435-451 Ridout Street in London, Ontario. This EIS has been developed in accordance with the City of London's Environmental Management Guidelines (2007) and in agreement with the scoping meeting held with agency staff on September 24, 2018 (MacKay, J. Pers. Comm. 2018).

For the purposes of this report, the term "subject property" refers to the property outlined on Map 1, as owned by Farhi Holdings Corporation that are the subject of the development application and upon which studies were completed to prepare this scoped EIS. The term "study area" refers to the subject property plus lands within approximately 1km. Detailed biological surveys were undertaken by NRSI on the subject property within the late fall of 2018. Legacy data collected from background sources and agency consultation encompassed the study area to ensure that all surrounding natural features were considered.

The subject property, roughly rectangular in shape, is approximately 1.4ha in area, bordered by Harris Park to the north, Ridout Street North to the east, Queens Avenue to the south, and a small access road to the west, which borders the North Thames River (Map 1). The subject property contains parking lots, existing heritage buildings with established businesses, manicured lawn, and small cultural natural areas (Map 2). A large portion of the subject property is identified as being within the floodplain and regulated area by the Upper Thames River Conservation Authority (UTRCA). The study area is located within Ecoregion 7E.

This report summarizes the work completed and includes background species information for the subject property and study area, the results of original field surveys including vegetation communities and vascular flora, tree inventory, incidental wildlife and significant wildlife habitat assessments. This report includes identification of any sensitive and significant natural features and species in the study area and any potential constraints to the proposed development. A preliminary analysis of impacts based on the proposed site plan was completed by comparing the natural features to the proposal and following local and provincial policies and guidance. It is expected that once detailed designs, grading plans, and servicing information is known, that an addendum will be required to this EIS in order to update the impact analysis and identify further mitigation measures.

This report includes information on the health and condition of the inventoried trees on site. As a formal grading plan has not yet been developed, a retention analysis, tree protection measures and recommended compensation are not included in this report. A Tree Protection Plan will be required once the extent of grading is known.

1.1 Proposed Undertaking

Farhi Holding Corporation is proposing to create a mixed-use development, consisting of a tower with residential, hotel, office and retail space, as well as underground parking. The development plan has been created to support the Downtown Plan, The London Plan, and the Back to the River initiative. It has also been designed to maintain the existing heritage buildings with an integrated use. A significant section of the subject property (approximately 40%) that is present within the floodplain is not intended for development at this time. The site plan has been designed to minimize the impact on the subject property, as well as minimize the extent of development within the floodplain. The development includes removing a portion of the natural features on the subject property, but will be mitigating these impacts through the landscape design. The development is also proposed to stabilize both the east and south banks of Harris Park, which are currently very steep and comprised of primarily non-native plant species. The parking garage is proposed to be below the tower, within the east bank, and will be designed to be watertight to the extent of the 250-year flood line.

1.2 Project Scoping

The scope of the EIS was discussed during the Site Suitability and Issues Summary Checklist meeting held on September 24, 2018 between the UTRCA, City of London, MHBC Planning, and NRSI. It was reduced in scope due to the limited expected impacts to natural areas, the existing background information for the study area, and due to the timing requirements of the development. As a large portion of the subject property is within the flood line limit and regulation limit, the Record of Pre-consultation had indicated that the EIS be scoped with the UTRCA. Farhi Holdings engaged the UTRCA very early in the process to ensure that the development layout is accepted in principle. The Summary Checklist can be found in Appendix I. In addition, a fulsome hydrogeological assessment, was deemed necessary for the lower parking area.

A conservative approach was accepted for species that may occupy the greater study area, and several areas will therefore be assumed significant, as discussed in Section 5. In determining a study approach for the scoped EIS, existing natural heritage information was first gathered and

reviewed to identify key natural heritage features and species that are reported from, or have potential to occur, within the study area. Requests for background information were sent to the Ontario Ministry of Natural Resources and Forestry (MNRF) Aylmer District, as well as to the UTRCA on November 27, 2018. Information from the MNRF (Aylmer District) was received on January 31, 2019 (Webb, J. pers. comm.), which is included in Appendix I. Background information on the natural environmental features within the study area was gathered from the following sources:

- The London Plan (City of London 2016)
- The City of London Official Plan (City of London 1989)
- Natural Heritage Information Centre (NHIC) database (MNRF 2018a)
- Harris Park Subject Land Status Report (NRSI 2013)
- West London Dykes Subject Land Status Report (UTRCA 2015)
- Land Information Ontario (LIO) data base mapping
- Middlesex Natural Heritage System Study (Middlesex County 2014)
- The Forks Watershed Report Card (UTRCA 2017)
- Fisheries and Oceans Canada's Aquatic Species at Risk Maps (DFO 2018)
- Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al. 2008)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2018)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Butterfly Atlas (MacNaughton et al. 2018)
- Ontario Odonata Atlas (MNRF 2018b)

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (10km radius) using the various atlases listed above. The atlases provide data based on 10x10km survey squares; information on species from the square that overlaps the study area was compiled (square 17MH75 from the OBBA).

Based on these initial species lists, a number of Species at Risk (SAR) and Species of Conservation Concern (SCC) were identified as having records from within the vicinity of study area. SAR are those listed on the Species at Risk in Ontario List (MNRF 2018c). 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* (ESA), 2007, which

includes protection to their habitat, and are referred to herein as “regulated SAR”. Species considered Special Concern are included in the definition of SCC, which includes 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 the 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 the COSSARO. If these species are listed under Schedule 1 of the *Species at Risk Act* (SARA), they are protected by the federal Act, but not provincially by the ESA.

Species at Risk and Species of Conservation Concern Habitat Screening

A preliminary screening exercise was conducted on these species to identify those having suitable habitat within the subject property and overall study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (MNRF 2018c, OMNR 2000) against habitats known to occur within the subject property or adjacent lands. This was completed to ensure that the potential presence of all SAR and SCC within the subject property was adequately assessed in this EIS. The preliminary screening exercise was subsequently updated following completion of the site visits to provide a more fulsome assessment of significant species and their habitats within the subject property. The screening table is provided in Appendix II.

Significant Wildlife Habitat Screening

A preliminary screening for the presence of Significant Wildlife Habitat (SWH) was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the MNRF considers significant in Ontario, as well as criteria to identify these habitats (OMNR 2000, MNRF 2015). The SWHTG groups SWH into 5 broad categories: seasonal concentration areas, rare vegetation communities, specialized wildlife habitat, habitats of Species of Conservation Concern, and animal movement corridors. Following completion of the field studies, the screening document was updated to verify which SWH types had been confirmed as present or absent, or remain as candidate habitats. The SWH screening tables are provided in Appendix III.

2.0 Relevant Policies, Legislation and Planning Studies

Natural features and species in the study area were evaluated against the relevant local, provincial and federal policies, legislation, and planning studies, to help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected. This analysis is shown in Table 1.

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation/ Plan	Description	Project Relevance

Provincial Policy Statement (OMMAH 2014).	• Issued under the authority of Section 3 of the Planning Act and came into effect on April 30, 2014, replacing the 2005 PPS (OMMAH 2005).
	• 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 (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) and associated criteria schedules (OMNR 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Based on a preliminary analysis, natural features were identified within the study area which have implications under the PPS:
		  • Habitat for Endangered and Threatened species,
		  • Significant Wildlife Habitat
		  • Fish Habitat
		  • Woodlands

Endangered Species Act (2007) and Ontario Regulation 242/08	• The ESA came into force in 2007. • The ESA prohibits killing, harming, harassing or capturing Endangered and Threatened species and protects their habitats from damage and destruction. • O. Reg 242/08 allows exemptions to the ESA as long as notice is given on the registry. Mitigation plans must be prepared to ensure impacts are mitigated and must be monitored post-construction.	• Regulated SAR were identified as having potential to occur within the study area based on the habitat present. • Field surveys determined that two cavity trees are present within the cultural woodland which may constitute habitat for roosting SAR bats. • The removal of these trees would require following the tree removal guidelines and/or discussions with MNRF, Aylmer District. • Two SAR birds may utilize the bridge off property or heritage buildings on property. • A SAR mussel has been documented off-property and its habitat is protected within the subject property.

Policy/Legislation/ Plan	Description	Project Relevance
		• SAR turtles have been documented off-property and their habitat protection does not affect the subject property.
Canadian Fisheries Act (2007)	• Manages threats to the sustainability and productivity of Canada's commercial, recreational and Aboriginal fisheries. • The Act prohibits "serious harm to fish" including destruction of habitat. • DFO has developed an online, self-assessment tool, where proponents can determine whether their projects require DFO review based on the type of water body the work is occurring in and the nature of the proposed activity.	• Development within the floodplain limit, as well as the approach to stormwater management may have implications on fish habitat within the Thames River adjacent to the subject property. • Construction activities will need to follow mitigation and best practices as per DFO recommendations to avoid serious harm.
City of London Official Plan (1989) and The London Plan (2016)	• Schedule B1 on the City of London Official Plan identifies Natural Heritage Features and B2 identifies the Natural Resources and Natural Hazards. • The City of London's new Official Plan, 'The London Plan' (2016) outlines current policies for the protection of natural features within the City of London and which represent a constraint for development. • The London Plan was adopted by Council and the Province in 2016. • Map 1 identifies Place Types within the City (Green Space, Downtown) • Map 5 identifies Natural Heritage areas. • Map 6 identifies Hazards and Natural Resources • As sections of the London Plan have been appealed, if is not yet in force, but must be considered. The City of London Official Plan (1989) is still in force.	• An EIS that was to be scoped with the UTRCA was requested due to the potential for SWH or SCC/SAR within the subject property, as well as the proximity to the floodplain and associated features. • Green space is identified on Map 1 for portion of the subject property which includes natural heritage features are areas. • Map 5 (Natural Heritage) of the London Plan shows a woodland within 120m of the subject property. • Map 6 identifies the subject property and study area as having hazards including being within the Regulatory Flood Line, Riverine Erosion Hazard Limit for Unconfined Systems, the Maximum Hazard Line, and the Conservation Authority Regulation. • Schedule B1 on the OP (1989) identifies a portion of the subject property (Thames River Valley) as being a Big Picture Meta-Core and Meta Corridor, a significant corridor, and within the Max hazard Line.
City of London Environmental Management Guidelines (2007)	• Outline policy guidelines, standards, process and procedures for the preparation and review of Environmental Impact Statements (i.e. studies), determination of buffers and setbacks, and evaluation of significant woodlands	• Environmental Management Guidelines are to be followed through the project steps including data collection standards and

Policy/Legislation/ Plan	Description	Project Relevance
		guidelines for determining setbacks and ecological buffers. • The EIS guidelines were followed, as outlined in Section 1 of the Environmental Management Guidelines.
UTRCA Regulation 157/06	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this regulation, the UTRCA has the responsibility to regulate activities in natural and hazardous areas (i.e. areas in and near rivers, streams, floodplains, wetlands, and slopes). • UTRCA regulates the development or alteration of habitats within a river valley. Where the stream has an apparent valley and stable slopes, the valley extends from the stable top of slope plus 15 m, to a similar point on the opposite side. • UTRCA requires that a Permit be required if work is to be undertaken within the Regulation Limit.	• UTRCA Regulated Areas fall within the subject property. • The Regulation identifies that "*no person shall undertake development or permit another person to undertake development in or on the areas within the jurisdiction of the Authority (UTRCA)*" such as river or stream valleys. • A permit is required from the UTRCA to undertake work within the Regulation Limit. • Farhi Holdings has worked with the UTRCA to design a development plan that is accepted in principle by the UTRCA.
Thames Valley Corridor Plan (2011)	• Recommends measures to protect and enhance the natural features within the Thames River valley in support of the City of London Official Plan. • Thames River is designated as a Canadian Heritage River. • It defines the functional limits of the Thames River, and provides visions and objectives for the corridor.	• Section 3.3 of the Plan describes various strategies for land use management and planning and states that a 100m edge zone (measured from the bank full high water mark) is to be allocated as open space for vegetated buffers, ecological enhancements and public use purposes. • Identifies the Harris Park area with potential improvements including restoration of the Thames River edge, introduction of a water's edge promenade or overlook, pathways and lighting upgrades and landscape plantings that may improve the aesthetic aspects of the Park.
City of London Tree Protection By-law (2017a)	• By-law that regulates the injuring and destruction of trees and to encourage preservation and planting on trees throughout the City of London. • Provides maps with designated Tree Protection Areas (TPA). Any tree within a TPA, regardless of species and size, is protected until such time as a permit is issued.	• The subject property is partially within a designated Tree Protection Area (Map D7) (area that is within the floodplain). • A permit is required for any clearing of trees within the subject property.

3.0 Field Methods

Field surveys were undertaken within the subject property to characterize the natural features and identify significant and sensitive features and species that have potential to be adversely affected by the proposed development.

Based on a dedicating a large portion of the floodplain and completing a landscape plan for the subject property as part of the proposed development, the field surveys were scoped to the following (Appendix I):

- Species at Risk (SAR) screening
- Significant Wildlife Habitat (SWH) screening and review in field
- Ecological Land Classification (ELC) and fall vegetation inventory
- Tree inventory of all trees greater than 10cm Diameter at Breast Height (DBH)
- Stick nest survey
- Incidental wildlife observations

A total of 3 site visits were completed between September and November 2018, which are summarized in Table 2. Surveys conducted were undertaken in accordance with provincial and local guidance documents.

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

Table 2. Field Investigations Completed Within the Subject Property

Date (2018)	Tasks Completed	Field Staff
September 24	A preliminary site visit to inform scope, photographs of site.	Gina MacVeigh, Katharina Richter
October 11	Bat cavity assessment; Significant Wildlife Habitat (SWH) screening; Ecological Land Classification (ELC) (Lee et al. 1998); vegetation inventory; tree inventory; incidental wildlife observations.	Gina MacVeigh, Jeremy Bannon
November 28	Significant Wildlife Habitat (SWH) screening; incidental wildlife observations.	Gina MacVeigh, Jeremy Bannon

3.1 Terrestrial Field Surveys

3.1.1 Vegetation Surveys

Vegetation community delineation was completed using aerial photography and through site investigations in the field on October 11. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998). Details of vegetation communities were recorded on standard data sheets including species composition, dominance, uncommon species or features, and evidence of human impact.

All observed species of vascular flora were recorded during field surveys on October 11. Additional detailed seasonal surveys were deemed unnecessary due to the simple nature of the natural features and the existing background information as identified in the Summary Checklist (Appendix I).

3.1.2 Tree Inventory

A comprehensive tree inventory was completed by an NRSI Certified Arborist and additional staff on October 11 within the subject property. Any trees with the potential to be impacted by the proposed development were identified and assessed as per the City of London's tree protection by-laws. Individual trees that were greater than or equal to 10cm in DBH were assessed by a Certified Arborist. The location of trees inventoried was surveyed using an SXBlue II GNSS GPS unit by the Certified Arborist. The following information was recorded for each tree:

- Species,
- DBH measurement (cm),
- Crown radius (metres),
- General health (excellent, good, fair, poor, very poor, dead),
- Potential for structural failure (improbable, possible, probable, imminent),
- Tree location (on-site/off-site), and,
- General comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

The overall health of each tree and the potential for structural failure was assessed based on the criteria outlined in Appendix IV. In carrying out these assessments, NRSI has exercised a reasonable standard of care, skill and diligence as would be customarily

and normally provided in carrying out these assessments. 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 IV, along with all tree inventory data.

3.1.3 Bird Surveys

As larger bird species, such as Raptors, Osprey and Bald Eagles are known to use river corridors, a stick nest survey to document any potential nesting species undertaken. The survey to identify any stick nests occurred on November 28 when there were no leaves on the trees by 2 NRSI biologists. The survey consisted of the biologists walking throughout the subject property and visually searching for stick nests within any of the trees. The chimneys of the heritage buildings were also inspected from the ground to determine the likelihood of Chimney Swift (*Chaetura pelagica*) useage during the November 28 survey. Breeding bird surveys were deemed not necessary through the scoping meeting as there was existing information from the area. It is known that Barn Swallow (*Hirundo rustica*) nest under the Queens Avenue bridge.

3.1.4 Herpetofauna Surveys

A search of the subject property to determine if hibernacula may be present, or if there are areas where hibernacula may be restored/created as part of the project was completed on October 11 and November 28. Other surveys for herpetofauna were deemed not necessary as there is existing background information.

3.1.5 Mammal Surveys

During the 2 field visits, surveys for bat roosting habitat were conducted within the subject property. Little Brown Myotis (*Myotis lucifugus*), a SAR, is known from the vicinity and roosts in tree cavities, hollows, or under loose bark, as well as within buildings (OMNR 2000). To address potential bat habitat presence within treed areas of the subject property, NRSI staff undertook an assessment of suitable tree habitat

features, including snags, cavities, exfoliating bark, and leaf clusters, in accordance with MNRF standardized protocol (OMNR 2011, MNRF 2017). The bat habitat assessment was completed during leaf-off conditions.

Information considered for cavity trees included tree species, location, DBH, canopy cover, tree height, decay class according to Watt and Caceres (1999), and number of potentially suitable cavities. Other criteria were also considered, including the use of cavities by other wildlife, the potential for cavities to be used by predators, supporting/surrounding habitat, and other characteristics which may contribute to the habitat requirements of these species, such as temperature regulation.

4.0 Existing Conditions

The existing conditions, as outlined below, summarize the findings of the 2018 field surveys, in addition to observed species during the 2013 Harris Park SLSR (NRSI 2013). Additional sources outlined below include UTRCA watershed documents, and applicable wildlife atlas data, as referenced.

4.1 Soil, Terrain and Drainage

The subject area lies within the Upper Thames River watershed, which falls under the jurisdiction of the UTRCA. The Upper Thames watershed is 3,420km^2 (UTRCA 2017), and contains 28 subwatersheds. The subject area is present within the Forks subwatershed (UTRCA 2017). As the Thames River erodes the glaciofluvial deposits, it leaves extensive alluvial deposits of sands and gravels in the floodplain. Therefore, the primary material throughout the Thames River watershed is sand, with gravel along the east and southern boundaries. Rich alluvial soil is present as small pockets in the floodplain (UTRCA 2015).

Map 6 of the London Plan (City of London 2016) indicates that there are no identified Significant Groundwater Recharge Area (SGRA) or Highly Vulnerable Aquifer area (HVA) designations within the subject property.

The topography of the eastern portion of the subject property is considerably upslope from the lower western portion, which resides within the Thames River floodplain. Disturbed, cultural natural areas are present along the transition slopes (Map 2).

4.2 Designated Natural Areas

According to The London Plan (2016), there are no designated natural areas located within the subject property or adjacent lands. Harris Park is located immediately north of the subject property, although it also does not contain any identified designated natural areas. The Thames River, a significant watercourse and valleyland, is located west of the subject property.

4.3 Vegetation

4.3.1 Vegetation Communities

The subject property consists primarily of urban land use, including 3 heritage buildings for business and private school use, and two parking lots. Limited, culturally influenced

natural areas are present along the sloped areas of the subject property, and are described as Cultural Woodland. A summary of ELC vegetation communities identified within the subject property is provided in Table 3 and are shown on Map 2. ELC data sheets are provided in Appendix V. The subject property contains 2 separate Cultural Woodland communities, one of which is an inclusion within a larger Sugar Maple forest, as originally assessed in the Harris Park SLSR (NRSI 2013), and as refined and shown on Map 2 of this report.

Table 3. Vegetation Communities Identified within the Subject Property

ELC Type	ELC	Environmental Characteristics
Cultural		
CUW1	Cultural Woodland (Southern site)	The center of the subject property contains a 0.21 hectare culturally influenced wooded feature that is bound by parking lots to the north and south, Harris Park Gate to the west and the Blythe Academy to the east. The community is only present on the steep north-facing slope, and contains many planted and invasive species. The canopy contains no dominant species, with small areas of Hedge Maple (*Acer campestre*), Manitoba Maple (*Acer negundo*), Common Hackberry (*Celtis occidentalis*), Norway Spruce (*Picea abies*), Austrian Pine (*Pinus nigra*), and Norway Maple (*Acer platanoides*). Understorey species include European Buckthorn (*Rhamnus catthartica*), Virginia Creeper (*Parthenocissus inserta*), and Multiflora Rose (*Rosa multiflora*). Groundcover contains many invasive and non-native species, including Garlic Mustard (*Alliaria petiolata*), Awnless Brome (*Bromus inermis*), and several goldenrod (*Solidago*) species. Aside from larger DBH trees inventoried in the western extent of this polygon, the majority of species are considered planted, escaped, or invasive. The assemblage of trees does not match any described ELC community, which shows how disturbed this community is. Notable dumping and unauthorized public use were documented within the community.
CUW1	Cultural Woodland Inclusion (Northern site)	The northeast corner of the property contains the southern extent of a previously identified FOD5-1 Sugar Maple forest, as outlined in the Harris Park SLSR (NRSI 2013) and is located along the west-facing slope, ascending from the floodplain. This community contains a canopy consisting of some planted individuals along the southern and western extent, including Thornless Honey Locust (*Gleditsia triacanthos* var. *inermis*), as well as native Black Walnut (*Juglans nigra*), Manitoba Maple (*Acer negundo*), and Sugar Maple (*Acer saccharum* ssp. *saccharum*). The understorey contains these species, as well as an escaped community of Redbud (*Cercis canadensis*). The ground cover contains Garlic Mustard, Lily-of-the-Valley (*Convallaria majalis*), and Zig-zag Goldenrod (*Solidago flexicaulis*). This community contained fewer documented cultural influences and contained a more functioning natural community, however the southern portion of the property contained a higher portion of invasive and non-native species. Specific to the subject property, and just beyond, included Redbud and Canada Yew (*Taxus canadensis*), both species believed to be associated with landscaping of the subject property and the adjacent Eldon House.

4.3.2 Vascular Flora

During the described field visits, 63 species were recorded within the subject. A complete list of these species is appended to this report (Appendix VI). Approximately 54% of the vascular plant species observed are considered non-native species. No plant species are reported from NHIC atlas data, as well as no additional plant SAR or SCC were provided by the MNRF Aylmer District (Webb, J. pers. comm. 2019).

Canada Redbud, which is considered Extirpated from Ontario (SX), was noted growing within the Cultural Woodland Inclusion. This species has escaped from the gardens at Eldon House, so this observation is also not considered significant.

4.3.3 Tree Inventory

In total, 105 trees were inventoried, comprised of 23 species. Of the trees inventoried and assessed, 49 (46.6%) are native species and 56 (53.3%) are non-native. A complete list of trees inventoried is provided in Appendix V and tree locations within the subject property are shown on Map 3.

Table 4 provides a list of tree species inventoried within the subject property, whether they are native or non-native and their overall health.

Table 5 provides a summary of the overall health of trees inventoried within the subject property, along with their potential for structural failure. The majority of the trees inventoried are in fair health with an improbable potential for structural failure.

Table 4. Summary of Inventoried Trees

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
Red Maple	*Acer rubrum*		1					1
Sugar Maple	*Acer saccharum* ssp. *saccharum*	1		1				2
American Basswood	*Tilia americana*			1				1
Freeman's Maple	*Acer* X *freemanii*			5				5
Manitoba Maple	*Acer negundo*			3	4	10		17
Sycamore	*Platanus occidentalis*			1				1
Common Hackberry	*Celtis occidentalis*	1	1	6	1			9
Eastern Cottonwood	*Populus deltoides*			2		1		3
Black Walnut	*Juglans nigra*		2	1				3
Redbud	*Cercis canadensis*		1	4				5
Canada Yew	*Taxus canadensis*		2					2
Total		**2**	**7**	**24**	**5**	**11**		**49**
Non-Native Species								
Norway Maple	*Acer platanoides*		4	14		2		20
Norway Spruce	*Picea abies*			3				3
Small Leaf Linden	*Tilia cordata*			1				1
English Oak	*Quercus robur*		2	3				5
Austrian Pine	*Pinus nigra*			3	2		3	8
Hedge Maple	*Acer campestre*		1	3	1			5
Colorado Spruce	*Picea pungens*		1	7				8
Sweet Cherry	*Prunus avium*			1				1
White Mulberry	*Morus alba*				2			2
Thornless Honey Locust	*Gleditsia triacanthos* var. *inermis*		1					1
London Plane-Tree	*Platanus* X *acerifolia*		1					1
Golden Weeping Willow	*Salix alba* var. *vitellina*				1			1
Total		**0**	**10**	**35**	**6**	**2**	**3**	**56**
Overall Total		**2**	**17**	**59**	**11**	**13**	**3**	**105**

Table 5. Overall Health of Trees Inventoried

Potential for Structural Failure Rating	Overall Condition						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable	2	17	51	0	0	0	70
Possible	0	0	8	5	3	3	19
Probable	0	0	0	6	9	0	15
Imminent	0	0	0	0	1	0	1
Total	2	17	59	11	13	3	105

4.4 Birds

A total of 93 species are reported from the vicinity of the study area based on the OBBA (BSC 2009), MNRF background information (Webb, J. pers. comm. 2019), and the NHIC database (MNRF 2018a). The data found in the OBBA includes those species that have been observed in the area (10 x 10km range), are known to nest in the area, and/or have exhibited some evidence of breeding in the area. The NHIC results are based on 1km x 1km squares, and the MNRF (2018a) data are based on species reported within Middlesex County. Very low species diversity was observed during field visits, which is not uncommon given the timing, with a total of 4 species documented within the subject property. No stick nests were observed within the subject property throughout the field visits. An Osprey nest is present on a light post in the ball park to the northwest of the subject property. The chimneys of the heritage building within the subject property were determined to not provide suitable nesting habitat for Chimney Swift.

During surveys completed for the Harris Park SLSR (NRSI 2013), NRSI observed a total of 36 species. Of these 36 species, 2 species of threatened species were observed: Barn Swallow (*Hirundo rustica*) and Chimney Swift.

Background information (MNRF 2019, BSC 2009) and SAR and SCC screening indicated that 5 significant bird species are reported from within the study area that have potentially suitable habitat (Appendix VII). No birds were listed within the NHIC data atlas. Of these 5 species, 2 have potentially suitable habitat within the subject property.

4.5 Herpetofauna

A total of 27 species are reported from the vicinity of the study area based on the Ontario Reptile and Amphibian Atlas (Ontario Nature 2018) and NHIC (MNRF 2018a). No herpetofauna species were observed during the 2018 field season primarily due to the timing as well as limited habitat present within the subject property. A list of all species found within the study area, including those found during the Harris Park SLSR (NRSI 2013) is found in Appendix VIII.

Background information indicated that 7 of the species that are reported within the study area are SAR or SCC (Appendix II). Based on the SAR/SCC screening, no suitable habitat is present within the subject property for any of these species, although suitable

habitat has the potential to occur within the adjacent Thames River and opportunities for restoration should be considered.

No species were observed associated with any areas of land, and none were observed within the subject property. The search of the subject property found no suitable hibernacula areas. The adjacent Thames River may provide suitable hibernacula within the banks for some species, as well as potential suitable nesting habitat for turtles.

During surveys completed for the Harris Park SLSR (NRSI 2013), a Northern Map Turtle (*Graptemys geographica*) was observed within the Thames River. This species is considered special concern both provincially and federally, and as such is protected under the PPS through SWH as a SCC (OMMAH 2014).

4.6 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994) and background information from MNRF, 24 mammal species are reported from within 10km of the subject property. During the field surveys, 5 mammal species were documented within the subject property: Northern Racoon (*Procyon lotor*), Eastern Chipmunk (*Tamias striatus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Eastern Cottontail (*Sylvilagus floridanus*), and Woodchuck (*Marmota* monax). Appendix IX provides a complete list of mammal species reported from the study area.

An assessment of trees which could provide bat roosting habitat was conducted during the leaf-off stages (October and November 2018). It was determined that 2 trees which could provide suitable bat roosting habitat are present trees along the western edge of the southern community. The 2 identified trees are shown on Maps 3 and 4, and are large Common Hackberries with potentially suitable cavities and cracks. No suitable habitat was observed in the northern community, and none was observed in any inventoried isolated tree. Suitable roosting habitat may be present within trees in the woodlands off the property.

Appendix II (SAR screening) provides a summary of significant mammal species reported from the study area vicinity, their current status ranks, and preferred habitats.

4.7 Additional Wildlife

No Lepidoptera or Odonata species were observed during the field visits, which was expected due to the timing of the surveys. A list of Lepidoptera and Odonata species reported from the study area are attached to the report (Appendix X and XI, respectively). A total of 57 butterfly species are reported from the study area based on the Butterfly Atlas (TEA 2018). This includes several SCC, as listed in Appendix II. Based on the presence of Common Hackberry within the subject property, Hackberry Emperor (*Asterocampa celtis*) and Tawny Emperor (*Asterocampa clyton*) may be found within the subject property.

A total of 19 odonates are reported from the study area based on the Odonata Atlas (MNRF 2018b). None of the species are considered significant.

4.8 Aquatic Habitat and Species

As the Thames River was outside of the subject property, no specific surveys were completed as part of this EIS. The existing conditions data is taken from the Harris Park SLSR (NRSI 2013) and additional background information received from the MNRF Aylmer District (Webb, J., pers. comm. 2019).

The information collected from the DFO, UTRCA, and the MNRF has been included in Appendix XII, along with the complete list of fish, freshwater mussels, and benthic invertebrate sampling records from the study area, provided by UTRCA (Schwindt, J. pers. comm. 2013).

A total of 17 fish species are reported from UTRCA sampling records from Harris Park and Gibbons Park, which is found approximately 750m upstream of Harris Park. These fish species that have been observed are common to the Thames River and not at risk. The background information indicates that 2 SAR fish, Black Redhorse (*Moxostoma duquesnei*) and Silver Shiner (*Notropis photogenis*), are present within the Thames River study area. Black Redhorse and Silver Shiner are both listed as threatened provincially and are afforded protection through the ESA. Background information also indicated that Wavy-rayed Lampmussel (*Lampsilis fasciola*) may be present within the study area (north branch of the Thames River). Wavy-rayed Lampmussel is considered threatened provincially and is protected under the ESA. It also has specific habitat defined under O.Reg 242/08 section 23.9. It is considered special concern federally.

The substrates within the Thames River adjacent to the subject property, based on the visual habitat assessment within the Harris Park SLSR (NRSI 2013), would provide suitable habitat for the for Wavy-rayed Lampmussel.

The UTRCA has also conducted benthic invertebrate collections within the Thames River within the study area. The site downstream of Blackfriar's bridge has been sampled yearly from 2004 (current to 2013) and the number of families found ranged from 10 to 22, with stream health varying from poor to fair.

5.0 Significance and Sensitivity of Natural Features

Natural features that are sensitive to disturbance are identified based on the rarity or significance of the feature or its functions. These areas are identified as "constraints" and are discussed in the context of natural heritage policies governing their protection. Conversely, opportunities for development may occur outside of these natural environment constraints within the subject property. Results of this analysis have been provided as input to the proposed development plan in order to avoid or reduce impacts to natural features and functions. A summary of this analysis for the subject property is discussed below.

5.1 Significant Valleylands

The Thames River is considered significant. The majority of the study area falls within the significant valleyland corridor. Enhancement opportunities are expected through the remediation/restoration of the lower dedicated parkland area.

5.2 Fish and Fish Habitat

The Thames River, immediately adjacent to the subject property, provides fish habitat.

5.3 Significant Wildlife Habitat

Based on a detailed background information review, desktop analysis, and field studies, the subject property is not expected to contain any SWH. No SWH was confirmed during field surveys, however candidate SWH is discussed below. SWH may also be present on a broader scale within the Thames River and the overall study area. Full results of the SWH assessment are discussed below and provided in Appendix II.

5.3.1 Seasonal Concentration Areas

Wildlife seasonal concentration areas are defined as areas where animals occur in relatively high densities for all, or portions, or their life cycle (OMNR 2000). These areas are generally relatively small in size, particularly when compared to areas used by these species during other times of the year.

Turtle Wintering Area

Turtles hibernate over the winter in Ontario, often communally. For most turtles, wintering areas are in the same general area as their core habitat and the water must be deep enough to avoid freezing over completely, and have soft mud substrates to burrow

into (MNRF 2015). Identification of a turtle wintering area is determined by the presence and number of individuals observed in suitable habitats in early spring and/or late fall (MNRF 2015). No suitable habitat was found within the subject property but portions of the Thames River adjacent to the property may provide suitable habitat, and turtle species have been reported in background data (NHIC 2018a, Ontario Nature 2018, NRSI 2013).

5.3.2 Rare Vegetation

No rare vegetation communities are found within the subject property. The Redbud community discussed in Section 4.3.1 is an escaped population from landscaping stock and does not qualify.

5.3.3 Specialized Wildlife Habitat

Osprey nests are considered SWH, but nests located on man-made objects are not to be included as SWH (MNRF 2015), therefore this nest site is not significant.

Candidate SWH is also identified within the Harris Park SLSR (NRSI 2013) for an area of sand deposits immediately downstream of Blackfriar's Bridge on the west bank (north of the subject property). No turtle nests were observed, so the SWH could not be confirmed.

5.3.4 Habitat for Species of Conservation Concern

No SCC were observed within the subject property.

Although it was not observed during field work associated with the Harris Park SLSR (NRSI 2013), the UTRCA indicated that habitat for Eastern Wood-pewee should be protected regardless of whether the species was observed or not (Creighton pers. comm. 2013). Eastern Wood-pewee is found in forests and forest edges, as well as parks (OMNR 2000). Habitat for Eastern Wood-pewee was identified in Harris Park as candidate SWH (Eastern Wood-pewee), which extends onto the subject property as shown on Map 4. The southern cultural woodland community on the subject property does not provide suitable habitat for Eastern Wood-pewee as it is so highly disturbed.

Common Nighthawk, which is considered special concern provincially and therefore its habitat is considered SWH, prefers open ground, clearings in dense forests, open woodlands and flat gravel roofs for habitat (OMNR 2000). It may have marginal habitat

provided from the one heritage building with the flat roof top, and is shown as candidate SWH (Common Nighthawk) on Map 4.

Northern Map Turtle, which had been observed during the Harris Park inventory (NRSI 2013), is considered a SCC. Northern Map Turtle is a highly aquatic species, but females may move up to 700m away from the water to find suitable nest sites (Harding 1997). The SWH for this species is shown on Map 4 and was mapped as the Thames River and 15m on either side of the river to allow for basking and nesting sites in the Harris Park SLSR (NRSI 2013).

5.3.5 Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (OMNR 2000). The potential for animal movement corridors to occur in the subject property is contingent on confirming Amphibian Breeding Habitat (Wetland) SWH or Deer Wintering Habitat SWH (MNRF 2015); neither of these confirmed habitats were identified within the subject property and as such the SWH type is not present.

5.4 Habitat of Endangered and Threatened Species

No Endangered or Threatened Species were observed within the subject property.

Confirmed habitat for Barn Swallow exists adjacent to the subject property on the Queen Street bridge over the Thames River and is shown on Map 4.

As noted in Section 4.6, 2 potentially suitable bat cavity trees were documented within the subject property (Map 4).

5.5 Linkages

Linkages are continuous, often linear bands of vegetation in the landscape which provide opportunities to connect natural features. They are important within the natural heritage system to provide cover for wildlife movements and dispersal of otherwise isolated populations.

The Thames River Corridor represents a significant linkage for both terrestrial and aquatic organisms between habitat patches. A key ecological goal of the Thames Valley Corridor Plan (City of London 2011) is to preserve, enhance and create ecological

corridors and linkages between natural features in order to establish a continuous corridor along the Thames River and enhance linkages to tributary watersheds.

6.0 Impact Analysis and Recommendations

The proposed undertaking is described in Section 1.1 of this report. This preliminary EIS has been prepared for the subject property with reference to the development site plan which is based largely on adhering to the floodplain limit to the extent possible and that aligned with the original layout that was accepted, in principle, by the UTRCA. A Preliminary Grading Plan, Stormwater Management Strategy, Hydrological Investigation and Geotechnical Investigation have yet to be finalized based on the most recent design. The development plan is indicated on Map 5.

The development footprint includes the removal of a large portion of the CUW1 inclusion and part of the CUW1 area.

The following recommendations are provided for the landscape plan.

- The inclusion of a diversity of native trees and shrubs in the landscape design will improve diversity within the adjacent natural features. All species should be native to Middlesex County, commercially available and suited to early succession conditions. A mixture of caliper, potted and plug stock is recommended, with native companion seed mix. Guidance for species selection is outlined in the *Guide to Plant Selection for Natural Heritage Areas and Buffers* (City of London 1994).
- Consider wetland creation.
- Consider the inclusion of wildlife habitat features such as bat boxes.
- Include educational signage to foster nature appreciation and respect.

A preliminary analysis has been conducted for the subject site based on the site development plan and basic understanding of the proposed works. Stormwater management will need to consider the Thames River and the floodplain, as well as the One River Environmental Assessment (if finalized at the time).

6.1 Approach to Impact Analysis

Potential impacts arising from the proposed development are determined by comparing the details of the proposed development with the characteristics of the existing natural features and their functions. Where the development proposal overlaps with the natural

features or their buffers, 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 study area associated with disruption or displacement caused by the actual proposed 'footprint' of the undertaking.
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality.
- Induced and cumulative impacts associated with impacts after the development is constructed such as subsequent demand on the resources created by increased habitation/use of the area and vicinity over time.

6.2 Evaluations of the Potential Effects, Mitigation and Net Effects

Impacts, mitigation measures and net effects are detailed in Table 5. The table details the impact of all components of the proposed development.

Table 6. Impact Assessment and Net Effects

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Land Use Impacts					
Land use designation	Direct & Indirect	Cultural Woodlands & Groundwater resources	-Change in land use will not significantly change the current use or impact on natural heritage features	-Completion of an EIS -Use of Environmental Management Guidelines -Use of Best Management Practices	With the completion of an EIS and the use of the Environmental Management Guidelines, changes in land use designation can be completed without net impact to natural heritage features. Only significant natural feature identified is the Thames River. **Low**
Development design and location	Direct	Cultural Woodlands	-Removal of CUW features -General impacts as a result of urbanization	-See above -Permit from UTRCA required for development in floodplain. -Landscape Design	See above. Features on site are cultural woodlands with an abundance of invasive species. **Low**
Increased Edge effects	Direct	Cultural Woodlands	-Adjacent FOD5-1 could be impacted by the removal of CUW1. The development plan includes removal of the CUW1 inclusion	-An Erosion and Sediment Control (ESC) plan is recommended to be prepared to help control and reduce the sediment load of runoff which may flow towards nearby regulated water features. -Regular monitoring of sediment fences and other ESC measures, particularly following large rain events.	With the landscape plan after construction, removal of invasive species, the remediation of this Brownfield site, and the limited habitat function provided by the CUW1 there is expected

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
			within the subject property and part of CUW1. These features are comprised of invasive species and provide limited opportunities.	-Landscape design should use native species -A certified arborist should be on site to determine the best approach to protecting the trees to be retained in the CUW inclusion along the northern subject property boundary. Tree protection fencing should be erected.	to be low to no net impacts. **Low**
Interruption or change of surface water and ground-water flows (water balance)	Direct and Indirect	Thames River floodplain and Thames River	-Changes to water balance, increased runoff	-Studies/discussions will be required in order to ensure the floodplain storage capacity is maintained. Flooding of the lower area may need to be part of final design. Expected that less than 2 feet of excavation in new park space (dedicated area) will result in "net 0" flood water displacement. -Opportunity to remove non-natural fill materials through excavation of the bank. - On-site drainage and SWM should be appropriately designed to maintain water balance to the degree possible. -Any changes in runoff or water storage should consider impacts to the nearby Thames River and overall floodplain, and be approved by the UTRCA.	This potential impact will be further discussed through the hydrogeology team members. Net impact is not expected to be significant if the drainage plan considers water balance and the floodplain capacity of the Thames River is maintained. **Low**
Increased hard surface/decreased in infiltration	Direct	Thames River floodplain	-Changes to surfaces to become impervious can result in changes in components of the water balance.	-Consideration of LID measures where feasible -Use of infiltration measures where feasible	This potential impact will be further discussed through the hydrogeology team members as part of the SWM/drainage plan. **Low**

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Interruption of Corridors	Indirect	Thames River Corridor	-Development can create barriers to wildlife movement. -Removal of CUW1	-Removal of CUW1 will follow timing windows and best management practices. -Tree preservation plan will ensure that the adjacent woodland features are not degraded.	No wildlife corridor is present on site. **Low**
Flora	Direct	CUW1	-Removal of flora	-Landscape Design/Plan to use native species	There are no significant species and many non-native species, so impact is very low. **Low**
Specialized Wildlife Habitat	Direct	Thames River floodplain Bat habitat trees (candidate)	-Removal of candidate bat habitat trees	-Tree preservation plan will ensure that adjacent features are not degraded. -Opportunity to use bat boxes on site.	**Low**
Habitat for SCC	Direct and Indirect	Cultural Woodlands, flat roof top of heritage building	-Marginal suitable habitat may exist within the cultural woodland inclusion for Eastern Wood-pewee -Flat roof tops, as found on the heritage buildings on the subject property, can provide suitable nesting habitat for Common Nighthawk.	-Follow best management practices for removal of woodland features. Follow TPP. -Removal of trees should occur outside of the active breeding season approximately April 1 to August 31 for bird species in open habitats (CWS 2017a,b). -When necessary, nest surveys should be completed on roof structures by a qualified biologist within 48hrs of the initialization of construction	As these areas are highly disturbed, and a larger forested community is present to the north, and since no individuals were observed, impacts to these species are expected to be avoided if removal occurs outside of the active breeding bird season. **Low**

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Habitat of Endangered or Threatened Species	Direct	Cultural Woodland	-Two potential bat cavity trees were identified within the CUW feature. These cavities could contain SAR bats during nesting season.	-Removal of trees if required as part of the development or restoration, should be completed outside of the bat timing windows (April 1 to September 30), as per the bat timing windows.	Impacts to these species are expected to be avoided if best management practices are followed. **Low**
Construction Impacts					
Site grading, during construction activities (erosion from runoff and sedimentation)	Indirect	Thames River	-Potential for soil erosion and sedimentation into the Thames River	-An Erosion and Sediment Control (ESC) plan is recommended to be prepared to help control and reduce the sediment load of runoff which may flow towards nearby regulated water features. -Regular monitoring of sediment fences and other ESC measures, particularly following large rain events. Prepare an emergency response plan. -Re-establishing vegetative cover in disturbed areas following the completion of the construction work is recommended. -Monitoring of construction activities to ensure no additional ESC concerns. -Implement sediment control measure at the discharge point of any dewatering systems for servicing trenches/excavations. -Runoff and erosion will particularly require monitoring through any work proposed for the currently vegetated slope.	With the preparation of an approved ESC plan, emergency response plan and with regular monitoring, the impacts from erosion and sediment can be eliminated. Net impact to the Thames River is expected to be low. **Low**

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Compaction of soils within tree rooting zones	Direct and Indirect	Isolated trees, cultural woodlands, adjacent FOD feature.	-Soil instability -Reduced ability to absorb nutrients	-Prepare a tree management plan as the subject property is within the Tree Protection area. Trees recommended for retention will require protection. Further mitigation measures for tree protection fencing measures will be included with the Tree Preservation Plan.	Tree management plan will include details of where protection fencing should be included. This fencing will be effective in protecting against compaction to root zones of the trees that are reserved within the plan. Net impact expected to be **Low** but further mitigation measures will be provided in the TPP.
Site clearing and vegetation removal	Direct and Indirect	Isolated trees, cultural woodlands; soil stabilization; water management through uptake	-Disruption to migratory birds and their nests -Soil instability, resulting in erosion and sedimentation -Tree removal -Disruption to local wildlife -Potential impact to bats The development plan includes removal of the CUW1 inclusion within the subject property and part of CUW1.	-Vegetation removal is recommended to occur outside of the breeding and nesting season for migratory birds, approximately April 1 to August 31 for bird species in open habitats (CWS 2017a,b), as well as outside of the active bat season (April 1 to September 30). -Stabilize soils following vegetation removal and grading, by seeding the area with appropriate cover crop (i.e. Annual Rye, *Lolium multiflorum*) to reduce the potential for sedimentation and erosion. Maintain vegetation wherever possible. -Prepare a tree management plan as the subject property is within the Tree Protection area. Trees recommended for retention will require protection. Further mitigation measures for tree protection	With the timing windows followed, and best management practices applied, the tree/vegetation removal will not have negative impacts to nesting birds. The removal of the degraded and invasive species dominated CUW1 will be addressed as part of the landscape plan. **Low**

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
			These features are comprised of invasive species and provide limited habitat opportunities.	fencing measures will be included with the TPP.	
Scarring and damage to vegetation by machinery	Direct	Isolated trees, cultural woodlands	-Scarring and damage from construction vehicles is possible to natural features if not properly identified and secured.	-Install silt fencing at grading limits to demarcate construction zone and establish separation to adjacent natural features. -Develop and implement an ESC plan.	Silt fencing and protective fencing will protect the natural areas/ trees. Further mitigation measures to be provided within the TPP. **Low**
Decreased health of vegetation from dust and sedimentation	Indirect	Natural features to north, Thames River, isolated trees within subject property	-Dust on vegetation can lead to reduced photosynthesis and temperature regulation	-Ensure dry unvegetated conditions are "soaked" to reduce dust disturbance. If dust does accumulate on adjacent vegetation, hose washing is suitable outside of peak daylight hours. -Prepare an ESC plan and follow best management practices.	If ESC plan is prepared and followed, and includes regular monitoring, the impacts from dust and sedimentation can be mitigated. **Low**
Disturbance of wildlife from machinery equipment noise, traffic	Indirect	Adjacent Lands, Thames River, Harris Park	-Construction noise can displace wildlife. Impact to this is expected to be minimal given the highly disturbed areas (parkland)	-Follow noise by-laws for the City of London	As the area is primarily manicured lawn, the net impacts to wildlife is not expected. **Low**
Introduction of non-native species	Indirect	Adjacent lands	-Introduction of non-native species	-Follow the goals outlined within the London Invasive Plant Management Strategy (2017b)	The landscape plan will include native species. The CUW that are on

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
				-Follow City of London's Clean Equipment Protocol to minimize risk of spreading invasive species. -Avoid or minimize the introduction of fill to the site to prevent introduction of invasive species.	site are comprised primarily of invasive or introduced species. No net impact is expected and may be a net benefit as removing large amount of non-native species on site. **None**
Drainage of Wetlands	N/A	N/A	-N/A	-N/A	No wetland on site.
Fragmentation of habitat and linkages	Indirect	Cultural woodlands, Thames River	-Removal of cultural woodlands may cause fragmentation of habitat and linkages, although the woodlands are already very degraded and the Thames River itself acts as a linkage.	-Prepare a TYPP and use native species within the Landscape plan.	The area is already heavily used through the parking lot and Harris Park. **Low**
Fish Habitat	Indirect	Thames River	-Potential for Serious Harm to fish and fish habitat under Section 35 of the *Fisheries Act.*	-A proponent led self-assessment should be completed for the proposed works for areas within the high-water mark of the Thames River. If there is potential for the works to cause serious harm, the project will be submitted to DFO for a site-specific review. -Follow ESC plan.	If best management practices are followed, the net impact will be **Low**. Works occurring below the high-water mark of the Thames River, have a higher probability of requiring a DFO review

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
					and potential *Fisheries Act* Authorization.
Building Construction/ activity on building roof tops	Direct	Potential habitat for Common Nighthawk	- Birds may use roof structures for nesting, which can be disrupted	-When possible, construction should occur outside of the breeding and nesting season for migratory birds, approximately April 1 to August 31. -When necessary, nest sweeps should be completed on roof structures by a qualified biologist within 48hrs of the initialization of construction	Through mitigation measures and best management practices applied there is expected to be no net impact. **None**
Stormwater Management Development Impacts					
Location of facility	N/A	N/A	Details are unknown.	-To be determined, if applicable.	**TBD**
Change and/or Loss of Habitat	N/A	N/A	N/A	-To be determined, if applicable.	**TBD**
Erosion and sedimentation related to construction	Indirect	Thames River	-Potential for soil erosion and sedimentation on the Thames River.	-Develop and implement an ESC plan that includes multi-barrier approaches. -Regular monitoring of the construction activities and the ESC measures. -Work within the dry.	With an approved ESC plan, and regular monitoring, the impacts from erosion and sediment can be eliminated. **None**
Alterations to surface water flow patterns and groundwater properties	Direct and Indirect	Groundwater resources, Thames River	-Changes to water balance, increased runoff	-Standard mitigations measures relating to erosion and sediment control are recommended during and after construction.	**TBD**
Stream Morphology	N/A	N/A	N/A	-N/A	N/A
Discharge Outlet Configuration	N/A	N/A	Details are unknown	-To be determined, if applicable.	**TBD**

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Impact on receiving watercourse	Indirect	Thames River	-Urban stormwater can have impacts on the quality and quantity of receiving watercourse	-Ministry of Environment, Conservation and Parks water quality guidelines are available and will be applied to any SWM design plans. -Water quality will also follow any recommendations within the One River Class EA, if available at the time.	**TBD**
Roads and Utility Corridor Impacts					
Width of Road (species movement)	N/A	N/A	-N/A	-N/A	Roads as part of the development plan are limited to areas where they already occur.
Mortality of Wildlife	N/A	N/A	-N/A	-N/A	Mortality of wildlife not expected as no new roads are planned
Drainage	Indirect	Groundwater resources	-Changes to water balance	-Appropriately designed SWM and drainage on-site to maintain the water balance to acceptable standards. -Use of LID measures proposed to capture and infiltrate runoff, thereby reducing the variation between pre-development and post-development conditions.	This potential impact will be further discussed through the SWM/drainage plan. Net impact is not expected to be significant if the Drainage plan considers water balance and the capacity of the Thames River is maintained.
Microclimate	N/A	N/A	-N/A	-N/A	N/A
Salt damage					
Noise					
Heavy Metals					
Road dust					
Wind effects					

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Parks/Recreational/ Cultural Impacts					
Increased recreational use	Induced	Adjacent natural areas, dedicated Parkland	-Not expected to be any potential impacts as Harris Park is already a park feature	-Increased pathways and lighting if required. -Improve connection to Harris Park	Area is already frequented since it is Harris Park and trails already exist along the Thames River. Dedicated parkland will be a net improvement.
Compaction of soils/ trampling of vegetation	Induced	Adjacent natural areas	-Invasive species establishment -Reduced water uptake, reduced community vigor	-Trails -Fencing if required	Due to the highly utilized park and urban area, there is not expected to be a net impact. **Low**
Disturbance to wildlife	Induced	Natural area ecological function, urban wildlife	-Bird, bat, and urban mammal populations may be disturbed and leave the area	-Dedicated parkland may create wildlife habitat -Educational signage to inform park users of natural heritage features and functions and request respect	Due to the highly utilized park and urban area, there is not expected to be a net impact to wildlife.
Change in cultural values (aesthetics, education)	N/A	N/A	-N/A	-N/A	**N/A**
Archaeological resources	N/A	N/A	-N/A	-N/A	**N/A**
Land Use Management					
Property maintenance Yard waste disposal	Induced	Local environment	-Potential impact to parks, greenspaces, naturalized or restoration areas -No additional impact from domestic pets anticipated	-Implement Best Management Practices for lighting infrastructure to effectively direct light and minimize disruption to local wildlife. -Limit use of commercial fertilizers in landscaped areas.	With the use of best management practices following provincial laws as they relate to pesticides and using native species within the landscaping there will

Source of Potential Impact	Direct or Indirect Impact	Ecological Feature or Function Effected	Potential Impact	Mitigation Measures	Net Impact
Non-native species planting Domestic pets Lighting Property encroachments			-No impact from property encroachments anticipated	-Limit use of salts or other additives for ice and snow control on the roadways. -Native species on landscape plans. -No invasive non-native species to be used anywhere	not be significant impacts to any of the natural features. **Low**

7.0 Environmental Management and Monitoring Plan

The primary objective of the Environmental Management and Monitoring Plan is to restore the function and structure of features which are removed and to enhance any areas on-site. It is proposed that this brownfield site be remediated, as well as the non-natural fill materials be excavated from the bank. There is opportunity to stabilize the bank and re-naturalize it with native species through new landscaping.

A monitoring plan is intended to protect the natural heritage features during and post-construction by ensuring tree protection and sediment fencing are installed properly and maintained. Monitoring will also ensure that naturalization plantings achieved a target rate of survival.

7.1 Monitoring

The following are recommendations for monitoring to be conducted on site prior to, during and following construction:

- Inspection of all Tree Protection Zone and Construction Delineation Area fencing prior to commencement of grading to ensure that fence placement reflects the extent of the identified natural feature buffers.
- Regular monitoring of tree protection fences, sediment fences and other ESC measures, particularly following large rain events, to be completed during construction.
- Inspection of planted tree and shrub stock and herbaceous vegetation to evaluate survival and success of establishment and identify need for replacement plantings for any dead material, to be completed post-construction, 2 years following the date of installation.
- Monitoring of plants within the Landscape Plan.

8.0 Summary

NRSI was retained by Farhi Holdings to complete a scoped EIS for the proposed development located at 435-451 Ridout Street. This report provides a summary of the natural features within the subject property, an analysis of the significance and sensitivity of these natural features, a description of the proposed preliminary development plan, and a preliminary assessment of potential impacts. Information on tree removal, protection and retention will be provided within the TPP once detailed site and grading plans are available. Further impact analysis and mitigation measures may be warranted once detailed designs are known and other studies have been completed (i.e. servicing plan, grading plan, stormwater management plan).

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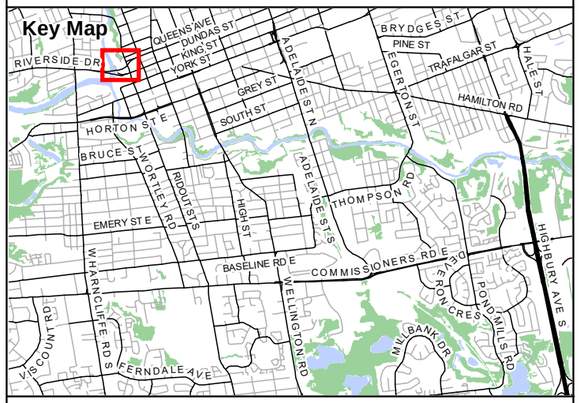
Maps

Map 1

435-451 Ridout Street

Subject Property



Legend

Subject Property

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2161 Date: July 11, 2019	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

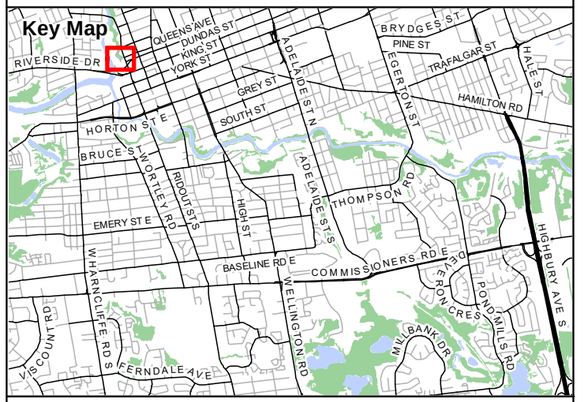
N

Path: X:\2161_RidoutSt_Development_EIS\NRSI_2161_Map1_SubjectProperty_2K_2019_07_11_LEH.mxd

Map 2

435-451 Ridout Street

Vegetation Communities



Legend

- Subject Property
- Regulatory Flood Line
- Ecological Land Classification (ELC)
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-1) Dry - Fresh Sugar Maple Deciduous Forest Type
- ELC Inclusion
- (CUW1) Mineral Cultural Woodland Ecosite

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Project: 2161
Date: July 11, 2019

NAD83 - UTM Zone 17
Size: 11x17"
1:1,100

0 20 40 60 Metres

N

Path: X:\2161_RidoutSt_Development_EIS\NRSI_2161_Map2_ELC_2K_2019_07_11_LEH.mxd

Ridout Scoped EIS

Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Comments
J	English Oak	*Quercus robur*	Non-Native	13.0	1	2.0	Improbable	Good	Columnar growth, healthy crown, behind fence.
K	Sycamore	*Platanus occidentalis*	Native	11.1	1	2.5	Improbable	Fair	Minor dieback, damage to roots.
L	English Oak	*Quercus robur*	Non-Native	14.0	1	2.0	Improbable	Good	Very minor dieback, columnar growth.
1482	English Oak	*Quercus robur*	Non-Native	16.2	1	2.5	Improbable	Fair	Codominant columnar growth, minor dieback.
1483	English Oak	*Quercus robur*	Non-Native	28.0	1	3.0	Improbable	Fair	Small dead branches, limited root zone.
1484	Small Leaf Linden	*Tilia cordata*	Non-Native	48.7	1	4.0	Improbable	Fair	Included bark, minor dieback.
1485	Austrian Pine	*Pinus nigra*	Non-Native	24.0	1	2.0	Possible	Poor	Small crown limited to above building height, potential diplodia, dieback.
1486	Austrian Pine	*Pinus nigra*	Non-Native	25.2	1	2.5	Possible	Fair	Small crown, minor dieback, minor mower damage.
1487	Austrian Pine	*Pinus nigra*	Non-Native	34.7	1	3.0	Possible	Fair	Small crown, minor dieback, minor mower damage.
1488	Common Hackberry	*Celtis occidentalis*	Native	23.0	1	4.0	Improbable	Fair	Growing on steep slope, minor dieback.
1489	Norway Spruce	*Picea abies*	Non-Native	39.6	1	4.0	Improbable	Fair	Minor dieback, top of slope.
1490	Norway Spruce	*Picea abies*	Non-Native	26.8	1	4.0	Improbable	Fair	Minor dieback, mid slope.
1491	Norway Spruce	*Picea abies*	Non-Native	37.8	1	4.0	Improbable	Fair	Minor dieback, mid slope.
1493	Hedge Maple	*Acer campestre*	Non-Native	26.9	1	5.5	Improbable	Fair	Codominant leaders, minor dieback, top of slope.
1492	Hedge Maple	*Acer campestre*	Non-Native	23.2	4	5.5	Improbable	Fair	Codominant leaders, asymmetrical crown to north.
1494	Hedge Maple	*Acer campestre*	Non-Native	21.2	4	5.0	Probable	Poor	Codominant leaders, dead stems, vertical crack, dieback.
1495	Hedge Maple	*Acer campestre*	Non-Native	16.4	1	4.5	Possible	Fair	Dead stem, remaining growth over parking lot, water sprouts at base.
1496	Norway Maple	*Acer platanoides*	Non-Native	39.0	1	4.0	Improbable	Good	Crown to edge of parking, healthy crown, minor erosion at base.
1497	Norway Maple	*Acer platanoides*	Non-Native	44.9	1	5.0	Improbable	Fair	Minor broken branches, healthy remaining crown.
1498	Norway Maple	*Acer platanoides*	Non-Native	41.5	1	7.0	Improbable	Fair	Crown outside of lots, erosion, minor dead branches.
1499	Austrian Pine	*Pinus nigra*	Non-Native	20.4	1	2.0	Possible	Poor	Minor pistol butt on upper side of retaining wall, potential diplodia, dieback.
1500	Hedge Maple	*Acer campestre*	Non-Native	23.3	1	2.5	Improbable	Good	Minor erosion, healthy crown.
1501	Norway Maple	*Acer platanoides*	Non-Native	24.2	1		Imminent	Very Poor	Broken hanging crown.
1502	Austrian Pine	*Pinus nigra*	Non-Native	26.0	1	5.0	Possible	Fair	Major dieback, leaning over parking lot, dead branches.
1503	Austrian Pine	*Pinus nigra*	Non-Native	20.8	1	3.0	Possible	Dead	Bore holes.
1504	Austrian Pine	*Pinus nigra*	Non-Native	24.3	1	3.0	Possible	Dead	Bore holes.
1505	Austrian Pine	*Pinus nigra*	Non-Native	16.9	1	2.0	Possible	Dead	Bore holes, losing bark.
1506	Norway Maple	*Acer platanoides*	Non-Native	38.7	2	5.0	Improbable	Fair	Codominant leaders, included bark; good reaction wood, erosion.
1507	Eastern Cottonwood	*Populus deltoides*	Native	54.8	1	6.0	Probable	Very Poor	Large dead branches, 75% dieback.
1508	Norway Maple	*Acer platanoides*	Non-Native	55.6	1	6.0	Improbable	Good	Crown stops at bottom lot, erosion.
1509	Eastern Cottonwood	*Populus deltoides*	Native	56.4	2	7.0	Possible	Fair	Codominant leaders, dieback, included bark, minor rot.
1510	Norway Maple	*Acer platanoides*	Non-Native	15.0	1	3.0	Improbable	Fair	Slightly suppressed, slightly unbalanced.
1511	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	21.5	1	3.0	Improbable	Fair	Broken branch, minor dieback.
1512	Colorado Spruce	*Picea pungens*	Non-Native	20.2	1	2.5	Possible	Fair	Asymmetrical crown to south, minor dieback.
1513	Norway Maple	*Acer platanoides*	Non-Native	21.8	1	4.0	Improbable	Good	Minor erosion, healthy crown.
1514	Eastern Cottonwood	*Populus deltoides*	Native	26.8	1	3.0	Improbable	Fair	Very high crown, minor dieback.
1515	Freeman's Maple	*Acer X freemanii*	Native	31.1	2	4.5	Improbable	Fair	Dieback, codominant leaders, minor dead branches.
1516	Norway Maple	*Acer platanoides*	Non-Native	47.5	1	5.0	Improbable	Good	Erosion, minor dieback.
1517	Norway Maple	*Acer platanoides*	Non-Native	17.1	1	3.0	Improbable	Fair	Erosion, slightly suppressed.
1518	Norway Maple	*Acer platanoides*	Non-Native	17.4	1	3.0	Probable	Very Poor	Completely defoliated at time of assessment, dead branches.
1519	Norway Maple	*Acer platanoides*	Non-Native	14.8	1	3.0	Improbable	Fair	Slightly suppressed, slightly overextended.
1520	Norway Maple	*Acer platanoides*	Non-Native	10.7	1	2.0	Improbable	Fair	Slightly suppressed, healthy crown.
1521	Sweet Cherry	*Prunus avium*	Non-Native	36.2	1	4.0	Improbable	Fair	Minor dieback, good torsion reaction wood, tall crown.
1522	Norway Maple	*Acer platanoides*	Non-Native	26.4	1	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope.
1522	Freeman's Maple	*Acer X freemanii*	Native	31.9	1	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope.
1523	Freeman's Maple	*Acer X freemanii*	Native	39.9	1	6.5	Improbable	Fair	Slightly unbalanced, bottom of slope.
1525	Freeman's Maple	*Acer X freemanii*	Native	25.8	1	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope, minor dieback.
1526	Norway Maple	*Acer platanoides*	Non-Native	25.7	1	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope, minor dieback.
1525	Norway Maple	*Acer platanoides*	Non-Native	25.7	1	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope, minor dieback.
1527	Manitoba Maple	*Acer negundo*	Native	29.6	1	7.0	Probable	Poor	Extreme lean northeast just over lot; water sprouts, dead branches.
1528	Norway Maple	*Acer platanoides*	Non-Native	27.3	1	4.5	Improbable	Fair	Minor dieback , erosion on lower side.
1529	Manitoba Maple	*Acer negundo*	Native	31.3	1	3.0	Probable	Very Poor	Broken top, large dead branches, leaning west. ,
1530	Manitoba Maple	*Acer negundo*	Native	38.5	1	3.0	Possible	Very Poor	Uprooted, growing horizontal.
1531	Manitoba Maple	*Acer negundo*	Native	30.6	1	4.0	Possible	Fair	Water sprouts, dieback, unbalanced .
1532	Norway Maple	*Acer platanoides*	Non-Native	13.7	1	3.0	Improbable	Fair	Slightly suppressed ,
1533	Common Hackberry	*Celtis occidentalis*	Native	70.3	1	7.0	Improbable	Excellent	Healthy crown, stable form.
1534	Common Hackberry	*Celtis occidentalis*	Native	80.8	1	6.0	Probable	Poor	Large dead branches, cavities, good reaction wood.
1535	Manitoba Maple	*Acer negundo*	Native	22.3	2	5.0	Probable	Very Poor	Deasd tree on top, broken branches , dieback .
1536	Manitoba Maple	*Acer negundo*	Native	30.4	1	6.0	Probable	Very Poor	Learge dead leaning top north.
1537	Norway Maple	*Acer platanoides*	Non-Native	21.7	1	4.5	Improbable	Fair	Erosion , slightly suppressed .
1538	Freeman's Maple	*Acer X freemanii*	Native	73.9	1	6.0	Improbable	Fair	Crown to edge of lot, codominant leaders , included bark.
1539	Norway Maple	*Acer platanoides*	Non-Native	27.5	2	3.0	Improbable	Fair	Codominant leaders, dead secondary stem.
1540	White Mulberry	*Morus alba*	Non-Native	12.5	1	1.5	Probable	Poor	Dieback, dead tree in crown.
1541	Manitoba Maple	*Acer negundo*	Native	60.0	1	3.0	Possible	Very Poor	Topped, suckering branches, major rot.
1542	Manitoba Maple	*Acer negundo*	Native	29.7	1	3.0	Probable	Very Poor	Uprooted, leaning horizontal west, broken branches.
1543	Black Walnut	*Juglans nigra*	Native	47.0	1	5.5	Improbable	Good	Asymmetrical crown to west, debris at base.
1544	Manitoba Maple	*Acer negundo*	Native	16.1	1	3.0	Probable	Very Poor	Major rotted base, major dieback.
1545	Manitoba Maple	*Acer negundo*	Native	38.4	1	4.0	Probable	Very Poor	Rotted base, water sprouts, dead crowns.
1546	Manitoba Maple	*Acer negundo*	Native	65.0	1	8.0	Probable	Poor	Rot at base, codominant leaders, broken branches, dieback.
1547	Common Hackberry	*Celtis occidentalis*	Native	24.0	1	3.0	Improbable	Fair	Slightly unbalanced.
1548	Common Hackberry	*Celtis occidentalis*	Native	13.6	1	3.0	Improbable	Fair	Slightly suppressed, erosion.
1549	Colorado Spruce	*Picea pungens*	Non-Native	32.3	1	3.0	Improbable	Good	Minor light pruning.
1550	Colorado Spruce	*Picea pungens*	Non-Native	17.8	1	3.5	Improbable	Fair	Dieback , dead lower branches.
1551	Colorado Spruce	*Picea pungens*	Non-Native	23.4	3	3.5	Improbable	Fair	Dieback , light pruning , codominant leaders.
1552	Colorado Spruce	*Picea pungens*	Non-Native	46.8	1	5.0	Improbable	Fair	Dead lower branches.
1553	Colorado Spruce	*Picea pungens*	Non-Native	57.3	1	4.0	Improbable	Fair	Dead lower branches.
1554	Colorado Spruce	*Picea pungens*	Non-Native	43.5	1	4.0	Improbable	Fair	Light pruning, codominant leaders.
1555	Colorado Spruce	*Picea pungens*	Non-Native	52.3	1	5.0	Improbable	Fair	Dead lower branches.
1556	Redbud	*Cercis canadensis*	Native	14.3	1	4.0	Improbable	Good	Leaning slightly over road, slightly unbalanced, prolific seed production,slightly unbalanced.
1557	Redbud	*Cercis canadensis*	Native	11.2	1	4.0	Improbable	Fair	Leaning toward road, slightly suppressed , slightly unbalanced.
1558	Redbud	*Cercis canadensis*	Native	10.1	1	5.0	Improbable	Fair	Leaning toward road , prolific seed production.
C	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-Native	54.0	1	7.0	Improbable	Good	Small dead branches , overhanging road, healthy structure.
D	Common Hackberry	*Celtis occidentalis*	Native	22.8	1	4.0	Improbable	Fair	Minor dieback.
1559	Redbud	*Cercis canadensis*	Native	16.7	1	5.0	Improbable	Fair	Prolific seed production, unbalanced, minor dieback.
1560	Redbud	*Cercis canadensis*	Native	10.9	1	4.0	Improbable	Fair	Minor dieback, seeds.
1561	Black Walnut	*Juglans nigra*	Native	69.8	1	7.0	Improbable	Good	Large healthy crown.
E	Manitoba Maple	*Acer negundo*	Native	28.6	1	4.5	Possible	Poor	Leaning west, water sprouts, dieback.
1562	Manitoba Maple	*Acer negundo*	Native	33.5	1	4.0	Probable	Very Poor	Rotten base, major dieback, dead top.
F	Common Hackberry	*Celtis occidentalis*	Native	18.2	1	3.5	Improbable	Fair	Asymmetrical crown, overextended branches.
G	Common Hackberry	*Celtis occidentalis*	Native	11.9	1	3.0	Improbable	Fair	Slightly suppressed.
H	White Mulberry	*Morus alba*	Non-Native	29.0	1	5.0	Probable	Poor	Major rot at base.
I	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	70.5	1	6.5	Improbable	Excellent	Large healthy crown.
1563	Manitoba Maple	*Acer negundo*	Native	14.0	1	3.0	Possible	Fair	Dieback slightly suppressed slightly unbalanced.
1564	Black Walnut	*Juglans nigra*	Native	78.7	1	6.5	Improbable	Fair	Minor dieback minor dead branches.
1565	Manitoba Maple	*Acer negundo*	Native	26.4	1	3.0	Possible	Poor	Damage at base, water sprouts , leaning west.
1566	American Basswood	*Tilia americana*	Native	39.4	1	5.0	Improbable	Fair	Minor dieback.
1567	Common Hackberry	*Celtis occidentalis*	Native	37.8	1	5.0	Improbable	Good	Minor dieback.
1568	Manitoba Maple	*Acer negundo*	Native	22.2	1	3.5	Possible	Very Poor	Rot at base, dead top.
1569	Canada Yew	*Taxus canadensis*	Native	10.2	1	3.0	Improbable	Good	Next to building, next to retaining wall, healthy crown.
1570	Canada Yew	*Taxus canadensis*	Native	10.0	1	2.0	Improbable	Good	Next to fece, healthy crown, codominant leaders.
1571	Manitoba Maple	*Acer negundo*	Native	22.2	1	3.0	Improbable	Fair	Damage atbase, dieback, water sprouts.
B	Red Maple	*Acer rubrum*	Native	19.9	1	3.5	Improbable	Good	Minor damage at base.
A	London Plane-Tree	*Platanus X acerifolia*	Non-Native	42.7	1	5.5	Improbable	Good	Minor dieback, minor water sprouts
N	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	97.3	1	6.0	Possible	Poor	Heavily pruned with only structurally safe branching remaining, galls, hollow base.
M	English Oak	*Quercus robur*	Non-Native	27.2	1	3.5	Improbable	Fair	Minor dieback of epicormic growth.

Map 3

435-451 Ridout Street

Tree Inventory

Legend

- Subject Property
- Inventoried Tree (Crown to Scale)
- Candidate Bat Habitat
- Proposed Development
- Existing Conditions
- Regulatory Flood Line

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2151
Date: February 14, 2019

NAD83 - UTM Zone 17
Size: 24x36"
1:300

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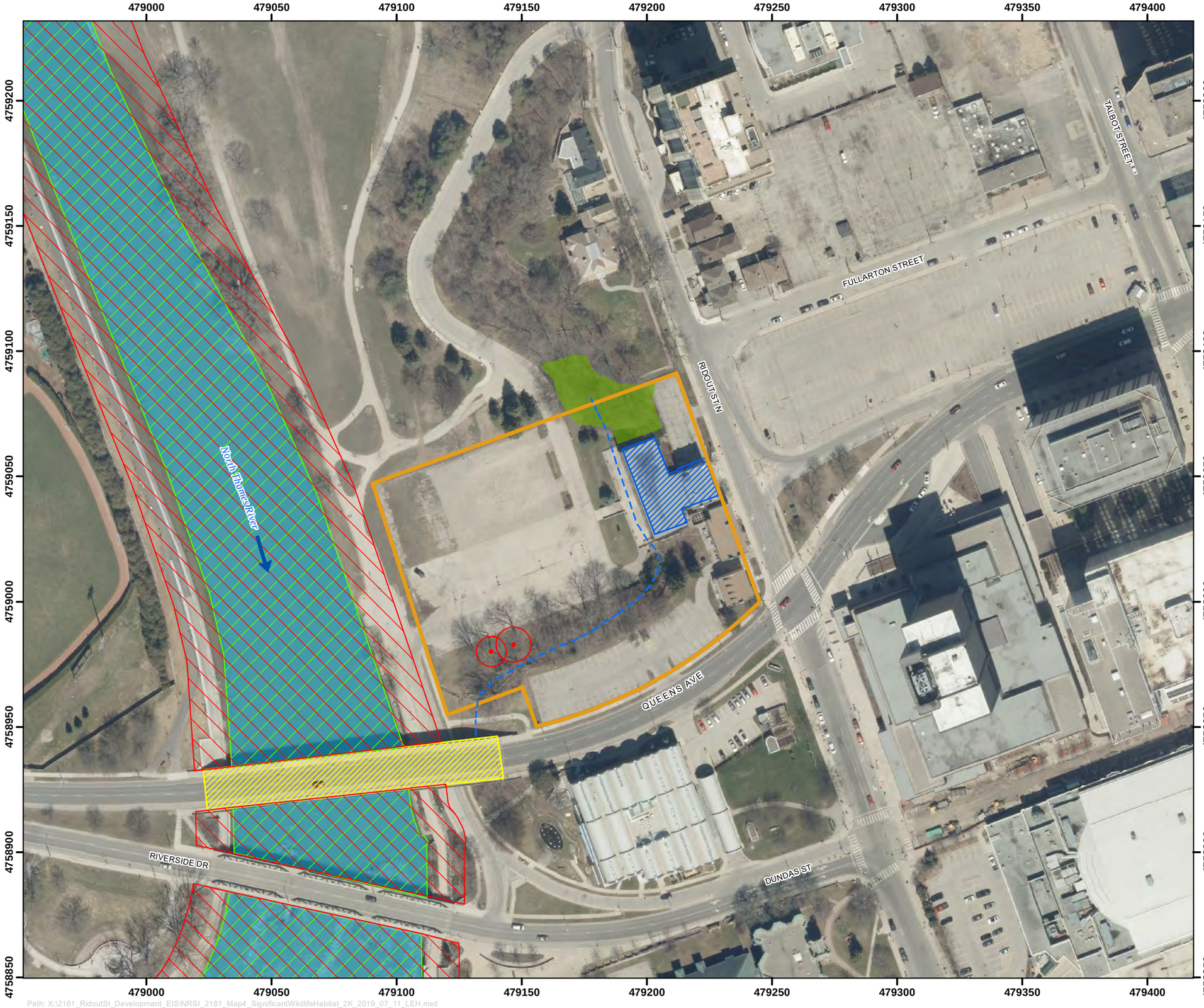
Meters



Map 4

435-451 Ridout Street

Significant Wildlife Habitat

Legend

- Subject Property
- Regulatory Flood Line
- Candidate Bat Habitat
- Fish Habitat
- Candidate Turtle Overwintering Habitat

Candidate Habitat of END or THR Species

- Barn Swallow

Candidate Special Concern and Rare Wildlife Species

- Eastern Wood-pewee
- Common Nighthawk

Confirmed Special Concern and Rare Wildlife Species

- Map Turtle

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2161
Date: July 11, 2019

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

0 20 40 60 80 100 Metres

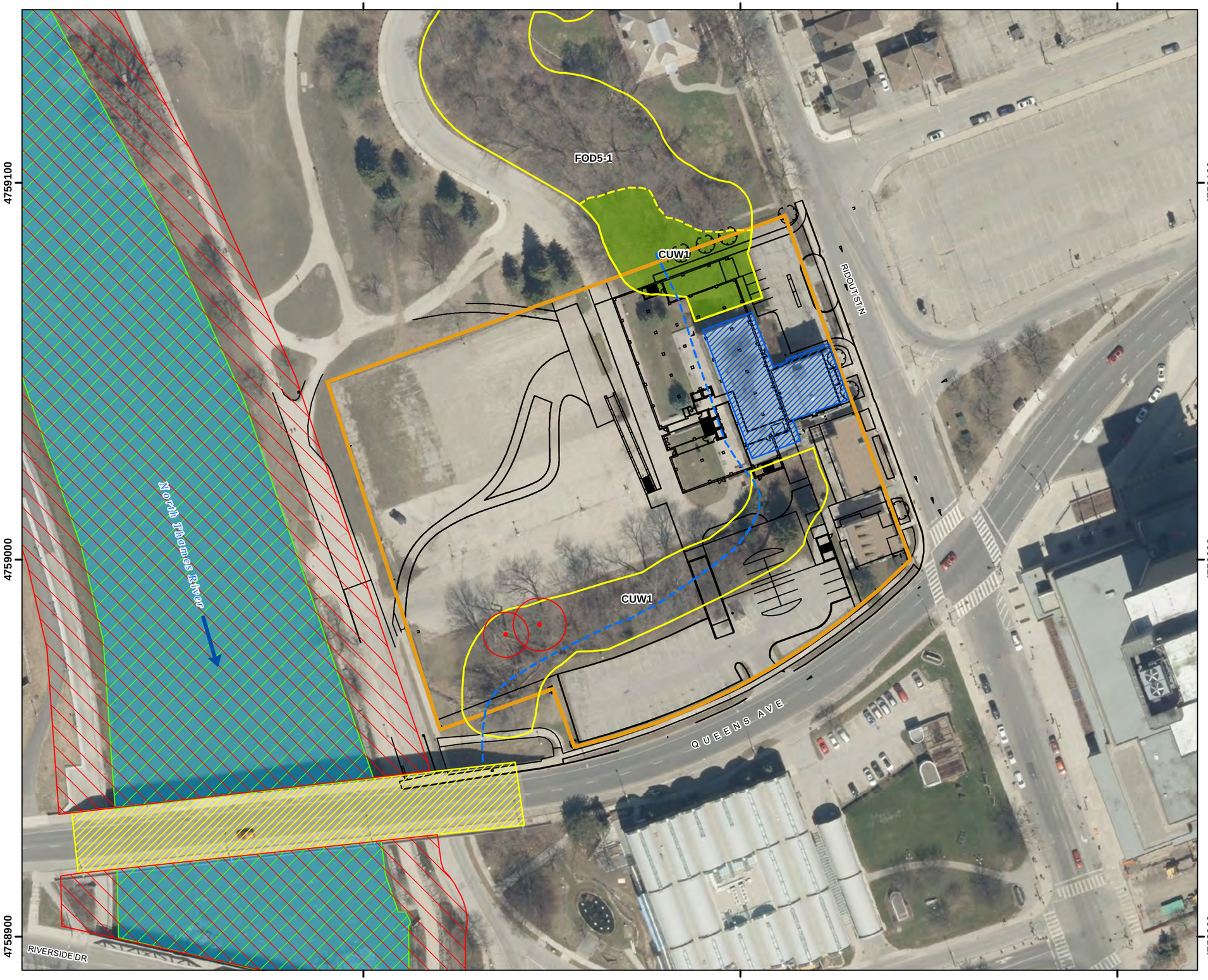
N

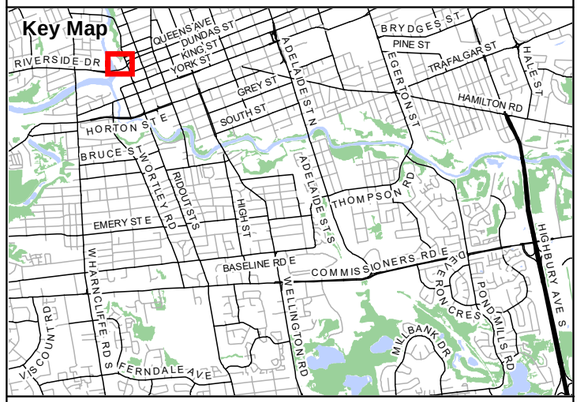
Path: X:\2161_RidoutSt_Development_EIS\NRSI_2161_Map4_SignificantWildlifeHabitat_2K_2019_07_11_LEH.mxd

Map 5

435-451 Ridout Street

Development Plan





Legend

- Subject Property
- Proposed Development
- Regulatory Flood Line
- Ecological Land Classification (ELC)

(CUW1) Mineral Cultural Woodland Ecosite

(FOD5-1) Dry - Fresh Sugar Maple Deciduous Forest Type

- ELC Inclusion

(CUW1) Mineral Cultural Woodland Ecosite

Significant Widlife Habitat

- Candidate Bat Habitat
- Fish Habitat
- Candidate Turtle Overwintering Habitat

Candidate Habitat of END or THR Species

- Barn Swallow

Candidate Special Concern and Rare Wildlife Species

- Eastern Wood-pewee
- Common Nighthawk

Confirmed Special Concern and Rare Wildlife Species

- Map Turtle

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2161
Date: July 11, 2019

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

0 20 40 60 Metres

N

Path: X:\2161_RidoutSt_Development_EIS\NRSI_2161_Map5_DevelopmentPlan_1K_2019_07_11_LEH.mxd

APPENDIX I Scoping Checklist & Correspondence

APPENDIX A

Environmental Impact Study
ISSUES SUMMARY CHECKLIST REPORT

Application Title: 451-453 Rideau

Date Submitted: Sept 24, 2018

Proponent: Fotenn

Qualifications

Primary Consultant: —

Key Contact Person: —

Other Consultants/field personnel:

Hydrogeology / Hydrology : Englobe

Geotechnical : _____

Biological - Flora NRSI

Biological – Fauna NRSI

Other: _____

Context for Background Information

Subwatershed : _____

Tributary Fact Sheet Number : _____

Planning/Policy Area: _____

Technical Advisory Review Team

- ☑ Ecologist Planner
- ☐ Planner for the File
- ☐ EEPAC
- ☑ Conservation Authority _____
- ☐ Ministry of Natural Resources
- ☐ Ministry of Energy and Environment
- ☐ Ministry of Municipal Affairs and Housing
- ☐ Ministry of Agriculture and Food

Other Review Groups (eg. Community Associations, Field Naturalists)

_____

1.0 DESCRIPTION OF THE ENVIRONMENT (Features)

Purpose: To have a clear understanding of the current status of the land, and the proposed "development" or land use change.

1.1 Mapping (Location and Context)

(current aerial photographs, preferably ortho-images, 1:2000 Ontario Base Map, NTS 1:50,000 maps)

- ☑ Land Use - Excerpts of the Official Plan for the City of London Ontario Schedules A, B, showing a 5-10km radius of subject site
- ☑ Terrain setting @ 1:10,000 – 1:15,000 scale showing landscape features, subwatershed divides
- ☑ Existing Environmental Resources @ 1:2,000 -1:5,000 showing Vegetation, Hydrology, contours, linkages
- ☑ Environmental Plan or Strategy from Subwatershed reports (tributary fact sheet), Community (Area) Plans, or other

1.2 Description of Site, Adjacent lands, Linkage with Natural Heritage System

List all supporting studies and reports available to provide background summary (e.g. *sub-watershed, hydrological, geo-technical, natural heritage etc.); check the first box if it is relevant to the subject area and surrounding landscape, and check the second box if it is determined that sufficient information is available.*

SWSR for Harris Park 2013
UTRCA London Dyke 2013

1.2.1 Terrain Setting

- ☑ ☑ Soils (surface & subsurface)
- ☑ ☑ Glacial geomorphology- landform type
- ☑ ☑ Sub-watershed
- ☑ ☑ Topographic features
- ☑ ☑ Ground water discharge
- ☑ ☑ Shallow ground water/baseflow
- ☑ ☑ Ground water recharge/aquifer
- ☑ ☑ Aggregate resources

1.2.2 Hydrology

- ☐ ☐ Hydrological catchment boundary
- ☐ ☐ Surface drainage pattern
- ☐ ☐ Watercourses (Permanent, Intermittent)
- ☐ ☐ Stream order (Headwater, 1st, 2nd, 3rd or higher)
- ☐ ☐ Agricultural drains
- ☐ ☐ Downstream receiving watercourse

Not for Nat Heritage

- Parking area flood
- Storage loss need compensation

1.2.3 **Natural Hazards**

- ☑ ☑ 100 year Erosion Line
- ☑ ☑ Floodline mapping
- ☑ ☑ ~~Fill line mapping~~ Max hazard line

1.2.4 **Vegetation**

- ☐ Vegetation Patch number
- ☑ ☑ System (Terrestrial , Wetland, Aquatic)
- ☐ ☐ Cover (Open, Shrub, Treed)
- ☑ ☑ Community Type(s)
- ☑ ☑ ELC Community Class (Bluff, Forest, Swamp, Tallgrass Prairie, Savannah & Woodland, Fen, Bog, Marsh, Open Water, Shallow Water)
- ☑ ☑ ELC Community Series
- ☐ ☐ Rare Vegetation Communities

1.2.5 **Flora**

- ☑ ☑ Flora (inventory dates, source)

3 season - but see what's present other 2 - existing data

- ☑ ☑ Rare flora (National, Provincial, Regional)

1.2.6 **Fauna**

- ☑ ☐ Fauna (inventory dates; source)
- ☐ ☐ Breeding Birds existing data from area + assume pres. of barn swallow
- ☐ ☐ Migratory Birds
- ☐ ☐ Amphibians
- ☑ ☑ Reptiles hide mentn
- ☑ ☑ Mammals incidental
- ☑ ☑ Butterflies incidental
- ☑ ☑ Odonata incidental
- ☑ ☑ Other assume bats are present
- ☐ ☐ Bird Species of Conservation Priority

} As habitat restoration as part of project

- ☑ ☑ Rare Fauna

1.2.7 **Wildlife habitat**

- [x] ☐ Species-At-Risk critical habitat mapping_____
- [ ] ☐ Winter habitat for deer, wild turkey
- [ ] ☐ Waterfowl Habitat (wetlands, poorly drained landscape – bottomlands, beaver ponds, seasonally flooded areas, staging areas, feeding areas)
- [ ] ☐ Colonial Birds Habitat
- [x] ☐ Hibernaculua
- [x] ☐ Habitat for Raptors _____
- [ ] ☐ Forests with springs or seeps
- [ ] ☐ Ephemeral ponds
- [x] ☐ Wildlife trees (snags, cavities, x-large trees > 65 cm dbh)
- [ ] ☐ Forest Interior Birds

_____
_____
_____

- [ ] ☐ Area-sensitive birds

_____
_____
_____

1.2.8 **Aquatic Habitat**

(*SWS Aquatic Resources Management Reports*)

existing info + check with ATRCA

- [ ] ☐ Fish communities

_____
_____

- [ ] ☐ Fish spawning areas
- [ ] ☐ Fish migration routes
- [ ] ☐ Thermal refuge for fish
- [ ] ☐ Thermal Regime (cold, cool, warm)
- [ ] ☐ Benthic inventory

_____
_____
_____

- [ ] ☐ Substrate _____
_____
- [ ] ☐ Riparian habitat (extent and type)

_____
_____
_____

1.2.9 **Linkages and Corridors**

(The diversity of natural features in an area, and the natural connections between them should be maintained, and improved where possible. Provincial Policy Statement 2.3.3).

- ☐ ☐ Valleylands
- ☑ ☑ Significant Watercourses (Thames River, Stoney Creek, Medway Creek, Dingman Creek, Pottersburg Creek, Wabuno Creek, Mud Creek, Stanton Creek (Drain), Kelly Creek (Drain)
- ☐ ☐ Upland Corridors / migration routes
- ☐ ☐ Big Picture Cores and Corridors
- ☑ ☑ Linkages between aquatic and terrestrial areas (riparian habitat, runoff)
- ☐ ☐ Groundwater connections
- ☐ ☐ Patch clusters (mosaic of patches in the landscape)

_____
_____
_____
_____

1.3 Social Values

1.3.1 **Human Use Values**

- ☑ ☐ Recreational linkages for hiking, walking
- ☑ ☐ Nature appreciation, aesthetics
- ☐ ☐ Education, ,research
- ☑ ☐ Cultural / traditional heritage
- ☐ ☐ Social (parks and open space)
- ☐ ☐ Resource Products (e.g. timber, fish, furbearers, peat)
- ☐ ☐ Aggregate Resources

1.3.2 **Land Use-Cultural**

- ☑ ☑ Archaeological (pre 1500)
- ☐ ☐ Historical (post 1500-present)
- ☐ ☐ Adjacent historical and archeological
- ☐ ☐ Future

1.3.3 **Land Use-Active**

- ☑ ☑ Current
- ☐ ☐ Historical (past 50-100 years)
- ☐ ☐ Adjacent lands
- ☑ ☑ Future

1.3.4 **Other** _____
_____

2.0 EVALUATION OF SIGNIFICANCE

Components of the Natural Heritage System
The policies in Section 15.4 apply to recognized and potential components Of the natural heritage system as delineated on Schedule "B", or features that may be considered for inclusion on Schedule "B". They also address the protection of environmental quality and ecological function with respect to water quality, fish habitat, groundwater recharge, headwaters and aquifers.

1.1 Environmentally Significant Areas

- ☐ Identified Environmentally Significant Areas (*Recognized in Official Plan (Schedule "B" and/or Section 15.4.1.1*
  Name _____
- ☐ Potential Environmentally Significant Areas – Expansion of (*Recognized in Section 15.4.1.2 and Schedule "B")*
  Name _____
- ☐ Potential Environmentally Significant Areas (*Recognized in Section 15.4.1.5 and Schedule "B")*
  Name _____

1.2 Wetlands

- ☐ Provincially Significant Wetlands
- ☐ Locally Significant Wetlands
- ☐ Unevaluated Wetlands

1.3 Areas of Natural and Scientific Interest

- ☐ Provincial Life Science ANSI
- ☐ Regional Life Science ANSI
- ☐ Earth Science ANSI

1.4 Habitat of Species-At-Risk (SAR)

- ☐ Endangered
- ☐ Threatened
- ☐ Vulnerable

1.5 Woodlands

- ☐ Significant Woodlands
- ☐ Unevaluated Vegetation Patches

2.6 Corridors and Linkages

- ☐ River, Stream and Ravine Corridors
- ☐ Upland Corridors
- ☐ Naturalization and Anti-fragmentation Areas

3.0 IDENTIFICATION AND DESCRIPTION OF FUNCTIONS

Ecological Functions The natural processes, products or services that species and non-living environments provide or perform within or between ecosystems and landscapes. Check those functions that will be required to assess for the study (key and supporting functions).

3.1 Biological Functions

- ☑ habitat (provision of food, shelter for species)
- ☐ limiting habitat
- ☐ species life histories (reproduction and dispersal)
- ☐ habitat guilds
- ☐ indicator species
- ☐ keystone species
- ☑ introduced species
- ☐ predation / parasitism
- ☐ population dynamics
- ☐ vegetation structure, density and diversity
- ☐ food chain support
- ☐ productivity
- ☐ diversity
- ☐ carbon cycle
- ☐ energy cycling
- ☐ succession and disturbance processes (natural and man-made)
- ☐ relationships between species and communities

3.2 Hydrological and Wetland Functions

- ☐ ground water recharge and discharge (hydrogeology)
- ☑ water storage and release (fluvial geomorphology)
- ☑ maintaining water cycles (~~water balance~~)
- ☐ water quality improvement
- ☐ flood damage reduction
- ☐ shoreline stabilization / erosion control
- ☐ sediment trapping
- ☐ nutrient retention and removal / biochemical cycling
- ☐ aquatic habitat (fish, macroinvertebrates)

Flood Plain Storage
Coordinate with other Projects in area

3.3 Landscape Features and Functions

- ☐ size
- ☐ connections, corridors and linkages
- ☑ proximity to other areas / natural heritage features (e.g. woodlands, wetlands, valleylands, water, etc.)
- ☐ fragmentation

3.4 Functions, Benefits and Values of Importance to Humans

- ☑ contributing to healthy and productive landscapes
- ☐ improving air quality by supplying oxygen and absorbing carbon dioxide
- ☐ converting and storing atmospheric carbon
- ☐ providing natural resources for economic benefit
- ☑ providing green space for human activities
- ☑ aesthetic and quality-of-life benefit
- ☑ environmental targets and/or environmental management strategies

Subject: RE: Background Information Request - 435-451 Ridout St, London
From: "ESA-Aylmer (MNRF)" <ESA.Aylmer@ontario.ca>
Date: 1/31/2019 1:41 PM
To: Gina MacVeigh <gmacveigh@nrsi.on.ca>

Hello,

The Ministry of Natural Resources and Forestry (MNRF) understands that NRSI is conducting an information request for the proposed Farhi Holdings Corporation project located at 435-451 Ridout Street in the City of London identified in the information provided.

MNRF provides the following natural heritage information in response to your request.

Species at Risk (SAR)

The Species at Risk in Ontario (SARO) List (https://www.ontario.ca/laws/regulation/080230) is Ontario Regulation 230/08 issued under the Endangered Species Act, 2007 (ESA). The ESA came into force on June 30, 2008, and provides both species protection (under section 9) and habitat protection (under section 10) to species listed as endangered or threatened on the SARO List.

An initial Species at Risk (SAR) (Endangered and Threatened species) screening has been completed for the above-noted property.

There are no known occurrences of SAR on the subject property; However there are known occurrences of SAR in the general project area, including:

- Barn Swallow
- Chimney Swift
- Spiny Softshell
- Black Redhorse
- Silver Shiner
- Wavy-rayed Lampmussel

Please note that this is an initial screening for SAR and the absence of an element occurrence does not indicate the absence of species. The province has not been surveyed comprehensively for the presence or absence of SAR and MNRF data relies on observers to report sightings of SAR. Field assessments by a qualified professional may be necessary if there is a high likelihood for SAR species and/or habitat to occur within the project footprint and potentially be impacted.

It is important to note the following:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate new species for listing and/or re-evaluate species already on the SARO List.
- As a result, species designations may change and changes may occur in both species and habitat protection which could affect the level of protection they receive under the ESA 2007 and whether proposed projects may have adverse effects on SAR.
- Habitat protection provisions for a species may change if a species-specific habitat regulation comes into effect.

If an activity or project will result in adverse effects to endangered or threatened species and/or

their habitat, additional action would need to be taken in order to remain in compliance with the ESA. Additional action could be applying for an authorization under section 17(2)(c) of the ESA, or completing an online registry for an ESA regulation and following the rules in regulation if the project is eligible (http://www.ontario.ca/environment-and-energy/natural-resources-approvals).

Questions about the registry process should be directed to MNRF's Registry and Approval Services Centre at 1-855-613-4256 or at mnr.rasc@ontario.ca. Please be advised that applying for an authorization does not guarantee approval and the process can take several months.

Significant Wildlife Habitat (SWH)

Significant wildlife habitat (SWH) may be present on or adjacent to the above-noted subject lands (within 120 m). Please consult the Significant Wildlife Habitat Technical Guide (SWHTG, OMNR 2000), the Natural Heritage Reference Manual (NHRM) and the Ecoregion Criteria Schedules for criteria on identifying and determining significance of wildlife habitat. SWH is identified by planning authorities using the criteria and processes recommended in the SWHTG and Ecoregion Criteria Schedules.

Link to the SWHTG: https://www.ontario.ca/environment-and-energy/guide-significant-wildlife-habitat

Link to Ecoregion 7E criteria schedule: http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=21843&Attachment_ID=45645

MNRF completed a screening for S1-S3, SH and special concern species and the following have known occurrences in the general project area:

- Northern Map Turtle (SC, S3)
- Snapping Turtle (SC, S3)
- Peregrine falcon (SC, S3)
- Bald Eagle (SC, S3)

The habitat of provincially rare (S1-S3, SH) and Special Concern species is considered SWH under the category of 'Special Concern and Rare Wildlife Species' in the SWHTG Ecoregion Criteria Schedules. Therefore, consideration should be given to these species and whether their habitat occurs on or within 120 m of the subject lands.

Areas of Natural and Scientific Interest (ANSIs)

There are no Provincially or Regionally Significant Earth or Life Science ANSI's within or 120m adjacent to the proposed subject lands.

Significant Woodlands

We recommend you refer to applicable Official Plans for criteria to determine the significance of woodlands near the project locations. The NHRM also contains information and criteria for determining significant woodlands.

Significant Wetlands

There are no MNRF evaluated wetlands within the proposed project area. Site-specific

investigation within the study area may find existing wetlands within such ELC communities that have not yet been evaluated or designated. Consideration and delineation of wetland areas should be determined using criteria and methodology as outlined in the Ontario Wetland Evaluation System (OWES) and submitted to MNRF for review.

Significant Valleylands

MNRF does not possess significant valleylands mapping. The NHRM provides guidance and evaluation criteria for determining significant valleylands. Conservation authorities should be contacted to inquire about information pertaining to significant valleylands if they have not been identified in the applicable Official Plan.

Fish and Fish Habitat

There appear to be watercourses within and adjacent to the project area; however, no information on fish and fish habitat or mussel and mussel habitat is available.

There are occurrences of Black Redhorse and Silver Shiner within the Thames River.

MNRF recommends you contact the appropriate conservation authority and DFO for up-to-date fisheries, mussel, and drain information.

Natural Heritage Systems

Policy 2.1.2 of the PPS states that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems (NHS), should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

Applicable natural heritage studies (e.g. in an EIS) should identify and recognize natural heritage systems and the linkages between and among natural heritage features and areas associated with the proposed development and site alteration. Based on the local NHS/linkages identified, or those specifically identified in an Official Plan, an EIS should outline potential impacts to the NHS and consider ways of maintaining, restoring, and/or improving linkages between and among natural heritage features and areas.

Conservation Authorities and Official Plans may provide additional natural heritage information for this study.

Please be advised that it is your responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

If you have any questions or require additional information, please feel free to contact me.

Thanks,

Jason Webb
Management Biologist
Ministry of Natural Resources and Forestry
Aylmer District
(519) 773-4744

Jason.webb@ontario.ca

From: Gina MacVeigh [mailto:gmacveigh@nrsi.on.ca]
Sent: November-27-18 11:20 AM
To: ESA-Aylmer (MNRF) <ESA.Aylmer@ontario.ca>
Subject: Background Information Request - 435-451 Ridout St, London

Hello,

I would like to request background information for a subject property located at435 - 451 Ridout Street , in London, ON. NRSI has been retained by Farhi Holdings Corporation to complete a Scoped EIS for the property to allow for development to occur. Please find a formal background information request letter, including a map of the study area, attached to this email.

If any additional information is required at this time, please let me know.

Thank you very much.

--

Our main office in Waterloo has moved! Please note change of address below.

Gina MacVeigh F.W.T.
Aquatic Biologist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON N2L 3X2
(p) 519-725-2227 (f) 519-725-2575
(w)www.nrsi.on.ca (e) gmacveigh@nrsi.on.ca

Canada Top Small and

2018 Winner: Canada's Top Small & Medium Employers

Attachments:

NRSI_2161_Map2_DevelopmentPlan_1K_2018_09_27_KEF.PDF 591 KB

APPENDIX II Species at Risk Screening

Ridout Scoped EIS - SAR and SCC Screening

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Observed by NRSI in 2018	Habitat Preference[4,5]	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Carried Forward to EIS?	Rationale
Birds												
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	BSC et al. 2009	No	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	Yes	No	Yes	Breeding bird surveys, or detailed SAR bird surveys were specifically not required for this Scoped EIS due to the urban nature of the subject property. The chimneys of the buildings were looked at and deemed not suitable for Chimney Swift nesting.
Chordeiles minor	Common Nighthawk	S4B	SC	T	Schedule 1	BSC et al. 2009	No	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	Yes	Yes	Yes	Breeding bird surveys, or detailed SAR bird surveys were specifically not required for this Scoped EIS due to the urban nature of the subject property. Habitat is limited to roof tops. Mitigation will be discussed in the EIS.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		BSC et al. 2009	No	The eastern wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation.	Yes	Yes	Yes	Breeding bird surveys, or detailed SAR bird surveys were specifically not required for this Scoped EIS due to the urban nature of the subject property. Forest habitat is considered very disturbed, and any present individuals are likely to use the larger, less disturbed northern forested area off-property. Mitigation will be discussed in the EIS.
Falco peregrinus anatum/tundrius	Peregrine Falcon	S3B	SC	SC	Schedule 1	MNRF 2019b	No	Rock cliffs, crags, especially situated near water; tall buildings in urban centres; threatened by chemical contamination; reintroduction efforts have been attempted in numerous locations throughout Ontario	Yes	No	No	The Thames River have been assumed significant for several species and is proposed to be protected during all construction activities.
Riparia riparia	Bank Swallow	S4B	THR	T		BSC et al. 2009	No	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.	Yes	No	Yes	The larger study area contains a bridge that could contain suitable habitat. For the purpose of this EIS, the bridge and river corridor have been assumed significant for several species.
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR		MNRF 2019b	No	Require large continuous area of deciduous or mixed woods around large lakes, rivers; require area of 255 ha for nesting, shelter, feeding, roosting; prefer open woods with 30 to 50% canopy cover; nest in tall trees 50 to 200 m from shore; require tall, dead, partially dead trees within 400 m of nest for perching; sensitive to toxic chemicals	Yes	No	No	The Thames River have been assumed significant for several species and is proposed to be protected during all construction activities.
Hirundo rustica	Barn Swallow	S4B	THR	T		BSC et al. 2009	No	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	No	Yes	The larger study area contains a bridge that has confirmed nesting. For the purpose of this EIS, the bridge and river corridor have been assumed significant for several species.
Hylocichla mustelina	Wood Thrush	S4B	SC	T		BSC et al. 2009	No	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	No	No	Forest habitat is too marginal and the overall urbanized study area is not suitable for this species.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T		BSC et al. 2009	No	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	No	No	No	No open grassland habitat is present witin the study area.

Ridout Scoped EIS - SAR and SCC Screening

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Observed by NRSI in 2018	Habitat Preference[4,5]	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Carried Forward to EIS?	Rationale
Sturnella magna	Eastern Meadowlark	S4B	THR	T		BSC et al. 2009	No	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	No	No suitable open habitat is present within the study area.
Herpetofauna												
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2018	No	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water.	Yes	No	Yes	The Thames river corridor have been assumed significant for several species and is proposed to be protected during all construction activities.
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2018	No	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	Yes	No	Yes	The Thames river corridor have been assumed significant for several species and is proposed to be protected during all construction activities.
Emydoidea blandingii	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	THR	T	Schedule 1	Ontario Nature 2018	No	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	No	No suitable standing water is present within the study area.
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	Schedule 1	Ontario Nature 2018	No	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	No	No	No	No suitable natural areas or farmland are present within the study area.
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	Schedule 1	SAR Ontario	No	The Eastern Hog-nosed Snake specializes in hunting and eating toads, and usually only occurs where toads can be found. Eastern Hog-nosed Snakes prefer sandy, well-drained habitats such as beaches and dry forests where they can lay their eggs and hibernate. They use their up-turned snout to dig burrows below the frost line in the sand where eggs are deposited.	No	No	No	Habitat for toads is very limited, and the disturbed nature of the study area is not suitable for this species.
Regina septemvittata	Queensnake	S2	END	E	Schedule 1	SAR Ontario	No	The Queensnake is an aquatic species that is seldom found more than a few metres from the water. It prefers rivers, streams and lakes with clear water, rocky or gravel bottoms, lots of places to hide, and an abundance of crayfish. Queensnakes will often hibernate in groups with other snakes, amphibians and even crayfish. Suitable hibernation sites (called hibernacula) include abutments of old bridges and crevices in bedrock.	Yes	No	No	The Thames river corridor have been assumed significant for several species and is proposed to be protected during all construction activities.
Mammals												
Myotis leibii	Eastern Small-footed Myotis	S2S3	END			NRSI addition	No	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	No	No	No	No suitable caves, or mines, and no nearby woodland habitat that would provide suitable foraging habitat.
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	NRSI addition	No	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	Yes	Yes	Yes	Cavities in 2 trees were noted that may provide habitat for SAR bats. CUW feature not large enough to be considered SWH.
Myotis septentrionalis	Northern Myotis	S3?	END	E	Schedule 1	Dobbyn 1994	No	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	Yes	Yes	Yes	Cavities in 2 trees were noted that may provide habitat for SAR bats. CUW feature not large enough to be considered SWH.

Ridout Scoped EIS - SAR and SCC Screening

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Observed by NRSI in 2018	Habitat Preference[4,5]	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Carried Forward to EIS?	Rationale
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	NRSI addition	No	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.	Yes	Yes	Yes	Cavities in 2 trees were noted that may provide habitat for SAR bats. CUW feature not large enough to be considered SWH.
Lepidoptera												
Asterocampa clyton	Tawny Emporer	S2S3				Macnaughton et al. 2018	Yes	Forests and hedgerows with abundant Common Hackberry (*Celtis occidentalis*).	Yes	Yes	Yes	Suitable habitat is not present within the subject property.
Asterocampa celtis	Hackberry Emporer	S2				Macnaughton et al. 2018	Yes	Forests and hedgerows with abundant Common Hackberry (*Celtis occidentalis*).	Yes	Yes	Yes	Suitable habitat is not present within the subject property.
Danaus plexippus	Monarch	S4	SC	SC		Macnaughton et al. 2018	No	Open areas with milkweed species (*Asclepias* spp.).	Yes	No	No	Monarch was observed within the subject property however suitable habitat is not present.
Erynnis brizo	Sleepy Duskywing	S1				Macnaughton et al. 2018	No	Forests and hedgerows with abundant Oak (*Quercus* spp.).	No	No	No	Suitable habitat is not present within the subject property.
Fish												
Notropis photogenis	Silver Shiner	S2S3	THR	T (May 2011)	Schedule 3	MNRF 2019b		Silver shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms. They live in schools and feed on crustaceans and adult flies that fall in the water or fly just above the surface. In June or July, they spawn by scattering their eggs over gravel riffles.	Yes	No	Yes	The Thames river corridor have been assumed significant for several species and is proposed to be protected during all construction activities.
Moxostoma duquesnei	Black Redhorse	S2	THR	T (May 2005)		MNRF 2019b		In Ontario, the Black Redhorse lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools. Adults feed on crustaceans and aquatic insects, while the young fish feed on plankton.	Yes	No	Yes	The Thames river corridor have been assumed significant for several species and is proposed to be protected during all construction activities.
Freshwater Mussels												
Lampsilis fasciola	Wavy-rayed Lampmussel	S1	THR	SC	Schedule 1	MNRF 2019b		The Wavy-rayed lampmussel is usually found in small to medium rivers with clear water. It lives in shallow riffle areas with clean gravel or sand bottoms. The Wavy-rayed lampmussel's fish hosts are the Largemouth bass and Smallmouth bass. The presence of fish hosts is one of the key features for an area to support a healthy mussel population.	Yes	No	Yes	The Thames river corridor have been assumed significant for several species and is proposed to be protected during all construction activities.

APPENDIX III Significant Wildlife Habitat Screening

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"[cccxi] • Any mixed species aggregations of 100[i] 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.	The lower, western portion of the subject property may seasonally flood, however this area is an actively used parking lot and is not suitable. **Not Present**
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"[cccxi] • 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 aquatic features are present within the subject property or neighboring lands. **Not Present**

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[i] 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[i] 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.	The Thames River is present to the west of the subject property, and off-property mowed lawn is present. Unvegetated shoreline is not present, and no candidate habitat is present within the subject property. **Not Present**
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[i]. • 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.	No forest habitat >20ha is present within the subject property of neighboring lands. **Not present**

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.	No suitable underground features are present within the study area. **Not present**
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.	A tree inventory was completed for the entire subject property, and any other trees that may be impacted. Trees were flagged as having potential bat habitat, and timing windows should follow. Area is not large enough to be considered SWH. **Not present**

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[i]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[i]. • 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[cxiix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Northern Map Turtle found in area. Thames River is a known turtle wintering area **Candidate SWH**
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[cxiix] Index #13 provides development effects and mitigation measures for snake hibernacula.	No suitable underground features were observed within the study area. **Not present**

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.	Steep slopes are present within the natural areas, but no exposed or sandy slopes are present. The Queen Street bridge is considered candidate habitat for several swallow species and should be assumed significant. **Not present**
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 wetland features are present within the study area. A stick nest search was completed during each field visit, including during leaf-off conditions on November 28, 2018. No stick nests were observed. **Not present**

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 or peninsulas are present within the study area. **Not present**
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.	No suitable natural areas are present within the study area. **Not present**

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.	No woodlots >5ha are present with the study area, and the subject property is not within 5km of a Great Lake. **Not present**
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.	No woodlots are large enough to be suitable. **Not present**

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.	Suitable vegetation is not present within the study area. **Not present**
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)[l]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	Suitable vegetation is not present within the study area. **Not present**

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.	Suitable vegetation is not present within the study area. **Not present**
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.	Suitable vegetation is not present within the study area. **Not present**

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.	Suitable vegetation is not present within the study area. **Not present**
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.	Suitable vegetation is not present within the study area. **Not present**
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.	Suitable vegetation is not present within the study area. **Not present**

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[l], or, • Presence of 10 or more nesting pairs for listed species including Mallards[l]. • 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.	No suitable ELC ecosites are present, and no wetland communities are present within the study area. **Not present**
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.	An active Osprey nest is known on the far west side of the subject property outside of any impacted lands. A stick nest search was completed during each field visit, including during leaf-off conditions on November 28, 2018. No stick nests were observed. **Not present**

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.	No wooded communities are present that are combined >30ha. A stick nest search was completed during each field visit, including during leaf-off conditions on November 28, 2018. No stick nests were observed. **Not present**
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[i] • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • 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.	No exposed mineral soil is present within the study area. No turtles, or evidence of turtles, were observed within the study area. **Not present**

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]. Information Sources • 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.	No seeps or springs are present within the study area. **Not present**
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.	Natural areas are present on slopes with developed lower slopes, so no woodland pooling can be present. **Not present**

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[j]. • 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.	No wetlands are present within the study area. **Not present**
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[i]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[i]. • 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"[ccxi] • SWHMIST[cxlix] Index #34 provides development effects and mitigation measures.	Wooded areas are not large enough and not mature enough to be suitable habitat. **Not present**

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	No marsh habitat is present within the study area. **Not present**
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 grassland habitat is present within the study area. **Not present**

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[cbiv] 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[cbxiii]. 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[j]. • 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.	No large natural areas, and no fields are present within the study area. **Not present**
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.	No wetland habitat is present within the study area. No chimneys were observed during field visits. **Not present**
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[bxviii]. 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.	Special Concern species have been identified through 1 and 10km grid atlas data, and candidate habitat is outlined in the SAR/SCC Screening in this report. **Candidate 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[l]. 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.	No suitable breeding habitat is known within the greater study area, and so no corridiors can be present. **Not Present**

Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 6E.

	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. Information Sources • 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	**Not Present**

APPENDIX IV Tree Inventory Data & Conditions of Assessment

Tree Health Assessment Criteria

Assessment Criteria*	Definition[1]
Excellent	Represents a tree in near perfect form, health, and vigor. 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, vigor 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 vigor and structure of the tree.
Poor	Represents a tree that exhibits a poor vigor, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown unbalance, 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

Tree Risk 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 a risk 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

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 proposed development on 435-451 Ridout Street, City of London, Ontario (the “Property”) 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. 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.

Ridout Scoped EIS
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	Comments
J	English Oak	*Quercus robur*	Non-Native	1	13	2.0	Improbable	Good	Columnar growth, healthy crown, behind fence.
K	Sycamore	*Platanus occidentalis*	Native	1	11	2.5	Improbable	Fair	Minor dieback, damage to roots.
L	English Oak	*Quercus robur*	Non-Native	1	14	2.0	Improbable	Good	Very minor dieback, columnar growth.
1482	English Oak	*Quercus robur*	Non-Native	1	16	2.5	Improbable	Fair	Codominant columnar growth, minor dieback.
1483	English Oak	*Quercus robur*	Non-Native	1	28	3.0	Improbable	Fair	Small dead branches, limited root zone.
1484	Small Leaf Linden	*Tilia cordata*	Non-Native	1	49	4.0	Improbable	Fair	Included bark, minor dieback.
1485	Austrian Pine	*Pinus nigra*	Non-Native	1	24	2.0	Possible	Poor	Small crown limited to above building height, potential diplodia, dieback.
1486	Austrian Pine	*Pinus nigra*	Non-Native	1	25	2.5	Possible	Fair	Small crown, minor dieback, minor mower damage.
1487	Austrian Pine	*Pinus nigra*	Non-Native	1	35	3.0	Possible	Fair	Small crown, minor dieback, minor mower damage.
1488	Common Hackberry	*Celtis occidentalis*	Native	1	23	4.0	Improbable	Fair	Growing on steep slope, minor dieback.
1489	Norway Spruce	*Picea abies*	Non-Native	1	40	4.0	Improbable	Fair	Minor dieback, top of slope.
1490	Norway Spruce	*Picea abies*	Non-Native	1	27	4.0	Improbable	Fair	Minor dieback, mid slope.
1491	Norway Spruce	*Picea abies*	Non-Native	1	38	4.0	Improbable	Fair	Minor dieback, mid slope.
1493	Hedge Maple	*Acer campestre*	Non-Native	1	27	5.5	Improbable	Fair	Codominant leaders, minor dieback, top of slope.
1492	Hedge Maple	*Acer campestre*	Non-Native	4	23	5.5	Improbable	Fair	Codominant leaders, asymmetrical crown to north.
1494	Hedge Maple	*Acer campestre*	Non-Native	4	21	5.0	Probable	Poor	Codominant leaders, dead stems, vertical crack, dieback.
1495	Hedge Maple	*Acer campestre*	Non-Native	1	16	4.5	Possible	Fair	Dead stem, remaining growth over parking lot, water sprouts at base.
1496	Norway Maple	*Acer platanoides*	Non-Native	1	39	4.0	Improbable	Good	Crown to edge of parking, healthy crown, minor erosion at base.
1497	Norway Maple	*Acer platanoides*	Non-Native	1	45	5.0	Improbable	Fair	Minor broken branches, healthy remaining crown.
1498	Norway Maple	*Acer platanoides*	Non-Native	1	42	7.0	Improbable	Fair	Crown outside of lots, erosion, minor dead branches.
1499	Austrian Pine	*Pinus nigra*	Non-Native	1	20	2.0	Possible	Poor	Minor pistol butt on upper side of retaining wall, potential diplodia, dieback.
1500	Hedge Maple	*Acer campestre*	Non-Native	1	23	2.5	Improbable	Good	Minor erosion, healthy crown.
1501	Norway Maple	*Acer platanoides*	Non-Native	1	24		Imminent	Very Poor	Broken hanging crown.
1502	Austrian Pine	*Pinus nigra*	Non-Native	1	26	5.0	Possible	Fair	Major dieback, leaning over parking lot, dead branches.
1503	Austrian Pine	*Pinus nigra*	Non-Native	1	21	3.0	Possible	Dead	Bore holes.
1504	Austrian Pine	*Pinus nigra*	Non-Native	1	24	3.0	Possible	Dead	Bore holes.
1505	Austrian Pine	*Pinus nigra*	Non-Native	1	17	2.0	Possible	Dead	Bore holes, losing bark.
1506	Norway Maple	*Acer platanoides*	Non-Native	2	39	5.0	Improbable	Fair	Codominant leaders, included bark, good reaction wood, erosion.
1507	Eastern Cottonwood	*Populus deltoides*	Native	1	55	6.0	Probable	Very Poor	Large dead branches, 75% dieback.
1508	Norway Maple	*Acer platanoides*	Non-Native	1	56	6.0	Improbable	Good	Crown stops at bottom lot, erosion.
1509	Eastern Cottonwood	*Populus deltoides*	Native	2	56	7.0	Possible	Fair	Codominant leaders, dieback, included bark, minor rot.
1510	Norway Maple	*Acer platanoides*	Non-Native	1	15	3.0	Improbable	Fair	Slightly suppressed, slightly unbalanced.
1511	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22	3.0	Improbable	Fair	Broken branch, minor dieback.
1512	Colorado Spruce	*Picea pungens*	Non-Native	1	20	2.5	Possible	Fair	Asymmetrical crown to south, minor dieback.
1513	Norway Maple	*Acer platanoides*	Non-Native	1	22	4.0	Improbable	Good	Minor erosion, healthy crown.
1514	Eastern Cottonwood	*Populus deltoides*	Native	1	27	3.0	Improbable	Fair	Very high crown, minor dieback.
1515	Freeman's Maple	*Acer X freemanii*	Native	2	31	4.5	Improbable	Fair	Dieback, codominant leaders, minor dead branches.
1516	Norway Maple	*Acer platanoides*	Non-Native	1	48	5.0	Improbable	Good	Erosion, minor dieback.
1517	Norway Maple	*Acer platanoides*	Non-Native	1	17	3.0	Improbable	Fair	Erosion, slightly suppressed.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Comments
1518	Norway Maple	*Acer platanoides*	Non-Native	1	17	3.0	Probable	Very Poor	Completely defoliated at time of assessment, dead branches.
1519	Norway Maple	*Acer platanoides*	Non-Native	1	15	3.0	Improbable	Fair	Slightly suppressed, slightly overextended.
1520	Norway Maple	*Acer platanoides*	Non-Native	1	11	2.0	Improbable	Fair	Slightly suppressed, healthy crown.
1521	Sweet Cherry	*Prunus avium*	Non-Native	1	36	4.0	Improbable	Fair	Minor dieback, good torsion reaction wood, tall crown.
1522	Norway Maple	*Acer platanoides*	Non-Native	1	26	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope.
1522	Freeman's Maple	*Acer X freemanii*	Native	1	32	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope.
1523	Freeman's Maple	*Acer X freemanii*	Native	1	40	6.5	Improbable	Fair	Slightly unbalanced, bottom of slope.
1525	Freeman's Maple	*Acer X freemanii*	Native	1	26	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope, minor dieback.
1526	Norway Maple	*Acer platanoides*	Non-Native	1	26	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope, minor dieback.
1525	Norway Maple	*Acer platanoides*	Non-Native	1	26	5.0	Improbable	Fair	Slightly unbalanced, bottom of slope, minor dieback.
1527	Manitoba Maple	*Acer negundo*	Native	1	30	7.0	Probable	Poor	Extreme lean northeast just over lot, water sprouts, dead branches.
1528	Norway Maple	*Acer platanoides*	Non-Native	1	27	4.5	Improbable	Fair	Minor dieback , erosion on lower side.
1529	Manitoba Maple	*Acer negundo*	Native	1	31	3.0	Probable	Very Poor	Broken top, large dead branches, leaning west. ,
1530	Manitoba Maple	*Acer negundo*	Native	1	39	3.0	Possible	Very Poor	Uprooted, growing horizontal.
1531	Manitoba Maple	*Acer negundo*	Native	1	31	4.0	Possible	Fair	Water sprouts, dieback, unbalanced .
1532	Norway Maple	*Acer platanoides*	Non-Native	1	14	3.0	Improbable	Fair	Slightly suppressed .
1533	Common Hackberry	*Celtis occidentalis*	Native	1	70	7.0	Improbable	Excellent	Healthy crown, stable form.
1534	Common Hackberry	*Celtis occidentalis*	Native	1	81	6.0	Probable	Poor	Large dead branches, cavities, good reaction wood.
1535	Manitoba Maple	*Acer negundo*	Native	2	22	5.0	Probable	Very Poor	Deasd tree on top, broken branches , dieback .
1536	Manitoba Maple	*Acer negundo*	Native	1	30	6.0	Probable	Very Poor	Learge dead leaning top north.
1537	Norway Maple	*Acer platanoides*	Non-Native	1	22	4.5	Improbable	Fair	Erosion , slightly suppressed .
1538	Freeman's Maple	*Acer X freemanii*	Native	1	74	6.0	Improbable	Fair	Crown to edge of lot, codominant leaders , included bark.
1539	Norway Maple	*Acer platanoides*	Non-Native	2	28	3.0	Improbable	Fair	Codominant leaders, dead secondary stem.
1540	White Mulberry	*Morus alba*	Non-Native	1	13	1.5	Probable	Poor	Dieback, dead tree in crown.
1541	Manitoba Maple	*Acer negundo*	Native	1	60	3.0	Possible	Very Poor	Topped, suckering branches, major rot.
1542	Manitoba Maple	*Acer negundo*	Native	1	30	3.0	Probable	Very Poor	Uprooted, leaning horizontal west, broken branches.
1542	Manitoba Maple	*Acer negundo*	Native	1	30	3.0	Probable	Very Poor	Uprooted, leaning horizontal west, broken branches.
1543	Black Walnut	*Juglans nigra*	Native	1	47	5.5	Improbable	Good	Asymmetrical crown to west, debris at base.
1544	Manitoba Maple	*Acer negundo*	Native	1	16	3.0	Probable	Very Poor	Major rotted base, major dieback .
1545	Manitoba Maple	*Acer negundo*	Native	1	38	4.0	Probable	Very Poor	Rotted base, water sprouts, dead crowns.
1546	Manitoba Maple	*Acer negundo*	Native	1	65	8.0	Probable	Poor	Rot at base, codominant leaders, broken branches, dieback.
1547	Common Hackberry	*Celtis occidentalis*	Native	1	24	3.0	Improbable	Fair	Slightly unbalanced.
1548	Common Hackberry	*Celtis occidentalis*	Native	1	14	3.0	Improbable	Fair	Slightly suppressed, erosion.
1549	Colorado Spruce	*Picea pungens*	Non-Native	1	32	3.0	Improbable	Good	Minor light pruning.
1550	Colorado Spruce	*Picea pungens*	Non-Native	1	18	3.5	Improbable	Fair	Dieback , dead lower branches.
1551	Colorado Spruce	*Picea pungens*	Non-Native	3	23	3.5	Improbable	Fair	Dieback , light pruning , codominant leaders.
1552	Colorado Spruce	*Picea pungens*	Non-Native	1	47	5.0	Improbable	Fair	Dead lower branches.
1553	Colorado Spruce	*Picea pungens*	Non-Native	1	57	4.0	Improbable	Fair	Dead lower branches.
1554	Colorado Spruce	*Picea pungens*	Non-Native	1	44	4.0	Improbable	Fair	Light pruning, codominant leaders.
1555	Colorado Spruce	*Picea pungens*	Non-Native	1	52	5.0	Improbable	Fair	Dead lower branches.
1556	Redbud	*Cercis canadensis*	Native	1	14	4.0	Improbable	Good	Leaning slightly over road, slightly unbalanced, prolific seed production,slightly unbalanced.
1557	Redbud	*Cercis canadensis*	Native	1	11	4.0	Improbable	Fair	Leaning toward road, slightly suppressed , slightly unbalanced.
1558	Redbud	*Cercis canadensis*	Native	1	10	5.0	Improbable	Fair	Leaning toward road , prolific seed production.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Comments
C	Thornless Honey Locust	*editsia triacanthos var. inerr*	Non-Native	1	54	7.0	Improbable	Good	Small dead branches , overhanging road, healthy structure.
D	Common Hackberry	*Celtis occidentalis*	Native	1	23	4.0	Improbable	Fair	Minor dieback.
1559	Redbud	*Cercis canadensis*	Native	1	17	5.0	Improbable	Fair	Prolific seed production, unbalanced, minor dieback.
1560	Redbud	*Cercis canadensis*	Native	1	11	4.0	Improbable	Fair	Minor dieback, seeds.
1561	Black Walnut	*Juglans nigra*	Native	1	70	7.0	Improbable	Good	Large healthy crown.
E	Manitoba Maple	*Acer negundo*	Native	1	29	4.5	Possible	Poor	Leaning west, water sprouts, dieback.
1562	Manitoba Maple	*Acer negundo*	Native	1	34	4.0	Probable	Very Poor	Rotten base, major dieback, dead top.
F	Common Hackberry	*Celtis occidentalis*	Native	1	18	3.5	Improbable	Fair	Asymmetrical crown, overextended branches.
G	Common Hackberry	*Celtis occidentalis*	Native	1	12	3.0	Improbable	Fair	Slightly suppressed.
H	White Mulberry	*Morus alba*	Non-Native	1	29	5.0	Probable	Poor	Major rot at base.
I	Sugar Maple	*er saccharum ssp. sacchar*	Native	1	71	6.5	Improbable	Excellent	Large healthy crown.
1563	Manitoba Maple	*Acer negundo*	Native	1	14	3.0	Possible	Fair	Dieback slightly suppressed slightly unbalanced.
1564	Black Walnut	*Juglans nigra*	Native	1	79	6.5	Improbable	Fair	Minor dieback minor dead branches.
1565	Manitoba Maple	*Acer negundo*	Native	1	26	3.0	Possible	Poor	Damage at base, water sprouts , leaning west.
1566	American Basswood	*Tilia americana*	Native	1	39	5.0	Improbable	Fair	Minor dieback.
1567	Common Hackberry	*Celtis occidentalis*	Native	1	38	5.0	Improbable	Good	Minor dieback.
1568	Manitoba Maple	*Acer negundo*	Native	1	22	3.5	Possible	Very Poor	Rot at base, dead top.
1569	Canada Yew	*Taxus canadensis*	Native	1	10	3.0	Improbable	Good	Next to building, next to retaining wall, healthy crown.
1570	Canada Yew	*Taxus canadensis*	Native	1	10	2.0	Improbable	Good	Next to fece, healthy crown, codominant leaders.
1571	Manitoba Maple	*Acer negundo*	Native	1	22	3.0	Improbable	Fair	Damage atbase, dieback, water sprouts.
B	Red Maple	*Acer rubrum*	Native	1	20	3.5	Improbable	Good	Minor damage at base.
A	London Plane-Tree	*Platanus X acerifolia*	Non-Native	1	43	5.5	Improbable	Good	Minor dieback, minor water sprouts
N	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	97	6.0	Possible	Poor	Heavily pruned with only structurally safe branching remaining, galls, hollow base.
M	English Oak	*Quercus robur*	Non-Native	1	27	3.5	Improbable	Fair	Minor dieback of epicormic growth.

APPENDIX V ELC Data Sheets

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Page __ of __

Site:	2161 Rideau Scoped EIS
Polygon:	1
UTM:	
Date:	Oct 11, 2018
Time:	09:55-12:00
Surveyor(s):	JBB, GKM
Weather:	17°C, cc 70%, w 3E, no precip

Community Classification

Vegetation Type:	
Inclusion:	
Complex:	

Polygon Description

System	Substrate	Topo Feature		Community	
/ Terrestrial	Organic	Lacustrine	Talus	Lake	Barren
Wetland	/ Mineral Soil	Riverine	Crevice/Cave	Pond	Meadow
Aquatic	Parent Min.	Bottomland	Alvar	River	Prairie
	Acidic Bedrock	Terrace	Rockland	Stream	Thicket
History	Basic Bedrock	Valley Slope	Beach/Bar	Marsh	Savannah
/ Natural	Carb. Bedrock	Tableland	Sand Dune	Swamp	Woodland
Cultural		/ Roll. Upland	Bluff	Fen	/ Forest
	Site	Cliff		Bog	Plantation

Cover	Site	Plant Form		
Open	Open Water	Plankton	Forb	Coniferous
Shrub	Shallow Water	Submerged	Lichen	Mixed
/ Treed	/ Surficial Dep.	Floating-Lvd.	Bryophyte	
	Bedrock	Graminoid	/ Deciduous	

Stand Description

	Layer	HT	Cover	Species
*	Super-canopy			
1	Canopy			ACENEGU > CELTOCC1 > PICEABIE
2	Sub-canopy			ACENEGU > MORU ALB > CELOCCI
3	Understorey			RHACATH > VITRIPA > PARQUIN
4	Groundcover			POAPRAT > ALLIPETE > SOLALTI

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	O	< 10	O	10 - 24	O	25 - 50	O	> 50
Snags	O	< 10	O	10 - 24	O	25 - 50	R	> 50
Deadfall/Logs	O	< 10	O	10 - 24	R	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer		Young	X	Mid-age		Mature		Old Growth

Modified ELC Community Description

Page __ of __

Soils	1	2	3
Position:			
Aspect:			
%			
Type:			
Class:			

Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Effective Texture				
Surface Stoniness				
Surface Rockiness				
Depth to:				
	Mottles			
	Gley			
	Bedrock			
	Water table			
	Carbonates			
Depth of Organics				
Pore Size Disc #1				
Pore Size Disc #2				
Pore Size Disc #3				
Moisture Regime				

Polygon:

Tree Tally

Species	Tally 1	Tally 2	Tally 3
Total:			
Basal Area			
Snags			

Notes: grey squirrel, mallard, B-C chickadee, Am. crow, house sparrow,

Polygon Photo Number(s):

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site: 2161 Ridout
Polygon: 1
UTM:
Date: Oct 11, 2018 | Time: 09:55-12:00
Surveyor(s): JBB, GKM
Weather: 17°C, cc70%, w3E, no precip

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer
Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample	Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
Acer negundo						Poa pratensis					
Picea pungens						heath aster					
Acer x freemanii						ribgrass					
Acer platanoides						garlic mustard					
Pinus nigra						Solidago altiss.					
Populus delt.						bitter nightshade					
Celtis occid.						common burdock					
Morus alba						Daucus carota					
Prunus avium						lamb's quarters					
~~Am~~ Field maple						Field sow thistle					
Picea abies						Canada thistle					
						Yellow rocket					
						Cichorium intybus					
						Solidago canad.					
						Symph. ericoides					
						Bromus inermis					
						Avens sp.					
						~~[illegible]~~					
Japanese barberry						Orchard grass					
Juniperus communis						Phleum pratense					
Rhus hirta						Motherwort					
Thimbleberry						Impatiens cape.					
Rosa multiflora						Phytolacca americana					
Euonymus alata						pale touch-me-not					
Glossy buckthorn						Taraxacum officin					
Fragrant sumac						Wild geranium					
Virginia creeper						Japanese knotweed					
Rhamnus cath						hoary vervain					
Lonicera tart.						Bidens sp.					
Vitis riparia						groundivy					

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Modified ELC Community Description

PLANT SPECIES LIST

Site:
Polygon:
UTM:
Date: | Time:
Surveyor(s):
Weather:

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer
Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample	Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Page __ of __

Site: 2161 Rideout Scoped EIS	
Polygon: 2	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Community Classification

Vegetation Type:	
Inclusion:	
Complex:	

Polygon Description

System	Substrate	Topo Feature		Community	
/ Terrestrial	Organic	Lacustrine	Talus	Lake	Barren
Wetland	/ Mineral Soil	Riverine	Crevice/Cave	Pond	Meadow
Aquatic	Parent Min.	Bottomland	Alvar	River	Prairie
	Acidic Bedrock	Terrace	Rockland	Stream	Thicket
History	Basic Bedrock	Valley Slope	Beach/Bar	Marsh	Savannah
/ Natural	Carb. Bedrock	Tableland	Sand Dune	Swamp	Woodland
Cultural		/ Roll. Upland	Bluff	Fen	/ Forest
	Site	Cliff		Bog	Plantation

Cover	Site	Plant Form		
Open	Open Water	Plankton	Forb	Coniferous
Shrub	Shallow Water	Submerged	Lichen	Mixed
/ Treed	/ Surficial Dep.	Floating-Lvd.	Bryophyte	
	Bedrock	Graminoid	/ Deciduous	

Stand Description

	Layer	HT	Cover	Species
*	Super-canopy			
1	Canopy			blackwalnut > hackberry > sugarmaple
2	Sub-canopy			Redbud > hackberry > blackwalnut
3	Understorey			Redbud > LONITAR > RHAMCAT
4	Groundcover			kent. bluegrass, tall goldenrod, lily-of-the-valley

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0: none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	O	< 10	O	10 - 24	O	25 - 50	R	> 50
Snags	O	< 10	O	10 - 24	O	25 - 50	N	> 50
Deadfall/Logs	O	< 10	O	10 - 24	O	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer		Young	X	Mid-age		Mature		Old Growth

Modified ELC Community Description

Page __ of __

Soils	1	2	3
Position:			
Aspect:			
%			
Type:			
Class:			

Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Effective Texture				
Surface Stoniness				
Surface Rockiness				
Depth to:				
	Mottles			
	Gley			
	Bedrock			
	Water table			
	Carbonates			
Depth of Organics				
Pore Size Disc #1				
Pore Size Disc #2				
Pore Size Disc #3				
Moisture Regime				

Polygon:

Tree Tally

Species	Tally 1	Tally 2	Tally 3
Total:			
Basal Area			
Snags			

Notes:

Polygon Photo Number(s):

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site: 2161 Ridout * see previous sheets*

Polygon: 2

UTM:

Date: | Time:

Surveyor(s):

Weather:

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample	Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
Redbud						Calico aster					
Thornless Honey Locust						heart-leaved aster					
Black walnut						yellow wood sorrel					
Fraxinus americana						tall goldenrod					
Celtis occidentalis						Kentucky bluegrass					
Acer negundo						garlic mustard					
Tilia americana						lily of the valley					
Canada Yew						zigzag goldenrod					
Sugar Maple						Avens sp.					
						Celendine					
						Jacobaea vulgaris					
Lonicera tartarica											
Common lilac											
Rhamnus cathartica											
Virginia creeper											

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Modified ELC Community Description

PLANT SPECIES LIST

Page ____of____

Site:

Polygon:

UTM:

Date: | Time:

Surveyor(s):

Weather:

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample	Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample

Wildlife Habitat Field Data Collection

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Name: Ridout Scoped EIS **Project #:** 2161 **Area and/or Polygon ID:**

Date: Oct 11, 2018 / Nov 28, 2018 **Start Time:** 9:55 / 10:55 **End Time:** 12:00 / 11:30 **Observers:** GKM, JBB

Weather Conditions: 17°C, cc 70%, w3E no precip / -1°C, cc 80%, w3E, no precip

Indicate whether or not the following habitat features are present within the polygon. If Yes to any, fill in Page 2. Incidental Wildlife Observations on Page 2.

Habitat Features	Present Yes	Present No	Information to Record on Page 2
Water			**Applicable to All**: Draw extent of all water if not indicated through ELC. Dimensions (length, width, and depth). Vegetation species, woody debris/basking logs within water. Presence of fish. Longevity of site (if known, or estimate). Sources of disturbance, current use, origin (natural or anthropogenic). Evidence of wildlife use including waterfowl, turtles, amphibians. **All Swamps**: Always search for Heron Nest Bowls. Record if active (April-June only) - Evidence includes egg shells, guano, dead young. Map colony/nests if found.
Spring Flooded Field		✓	
Vernal Pool		✓	
Pond		✓	
Shallow Marsh (MAS) or Open Water		✓	
Swamp		✓	
Fields			**Applicable to All:** Height of vegetation. Evidence of small mammals. Size of site. Frequency and source of disturbance. Location and abundance of raptor perches (scattered trees, snags, fenceposts). Abundance of nectar-producing plants (e.g. goldenrods and asters). Adjacency to forest and forest size
Non-rotational Hay or Weakly Grazed Pasture		✓	
Meadow		✓	
Thicket, Woodland, Hydro Corridor		✓	
Substrate and Topography			
Sand or Fine/Loose Gravel		✓	Evidence of use (turtles in or near the area, turtle tracks, raided nests). Proximity to Shallow Marsh (MAS) or Open Water
Banks, Steep Slopes, Sand Piles		✓	Count swallow nest holes and indicate location. Estimate number of breeding pairs. Sources of disturbance. Draw extent if not indicated through ELC.
Cliffs		✓	Height of cliff. Rock type. Presence of ledges or crevices and their size. Draw extent of cliffs if not indicated through ELC.
Karst		✓	Depth of crevices
Cave		✓	Depth of cave, bedrock type
Natural Rock Piles / Talus Slopes		✓	Age. Rock/soil type. Draw extent of talus slopes if not indicated by ELC. Adjacency to large water body with productive fish population (otters).
Exposed Unvegetated Lake/River/Wetland Edge		✓	Source of disturbances. Presence of shorebird food sources (snails, worms, clams, insects). Percent vegetation cover. Distance to a Great Lake.
Seeps or Springs		✓	Ecosite. Number or area of extent. Presence of indicator plants. Iron staining. Water temperature. Degree and length of slope. Soil types.
Islands or Peninsulas in Open Water		✓	Natural or artificial. Record any gulls or terns observed. Draw extent of island or peninsula if not indicated through ELC.
Anthropogenic Features			**Applicable to All:** Age. Rock size. Evidence of Use. Depth into the ground. Vegetation present. Amount of sun exposure (or direction the slope faces). Substrate composition (or bedrock type). Proximity to water and estimated subterranean influence or potential for winter water fluctuation. **Abandoned Wells Only:** Presence and type of capping. **Abandoned Road or Rail Bed Only:** Extent in the landscape. Connectivity to other natural features. Overhead vegetation cover.
Abandoned Mine Shaft		✓	
Old Rock or Debris Pile, Old Stone Fence		✓	
Abandoned Road or Rail Bed		✓	
Abandoned Well		✓	
Old Foundation		✓	
Burrows or Dens			**Applicable to Mammal Burrows or Dens:** Diameter of entrance. Ecosite of location. Soil Type. Proximity to water and type of water. Availability of aquatic vegetation or fish. Evidence of use, or tracks or digging marks. Adjacency to large water body with productive fish population. Evidence of otter (observed, tracks, scat, predated fish, turtles, eggs, frogs). Ecosite of location. Soil type. Source of site moisture (meadow marsh, creek/river edge, swamp etc).
Small - Rodent or Snake		✓	
Medium	✓		
Large		✓	
Log Jams, Old Beaver Lodges		✓	
Crayfish Chimney (7E only)		✓	
Evidence			
Extensive Browse and/or Ungulate Scat		✓	Vegetation species browsed. Ecosite. Other evidence of ungulate use. Presence of seeps/springs. Barriers to movement to and from the area.
Nest Bowl or Stick Nest (herons or raptors)		✓	Quantity. Ecosite of location. Evidence of use. Species if known or bird group. Size. Height in tree. Tree species.
Outstanding Trees			
Large DBH, Outstanding Tall Snag		✓	Tree species. Evidence of perch usage or nesting. DBH, height. Exposure above canopy. Distance from surrounding forest (m) or within.
Large DBH Cavity Tree (Live or Dead)	✓		Tree species. DBH. Number of cavities. Size and type of cavities. Evidence of use by bats (abundant guano) or other mammals or wood ducks.
Rare Communities or Species			
Old-Growth Forest (Mature Forest)		✓	Average age of trees. Range of DBH or prism sweep. Sources of disturbance (includes presence of exotics). Any cut stumps in the mature/old growth component.
Tallgrass Prairie or Savannah		✓	Soil type. Percent cover of trees, shrubs, forbs, and grasses. Sources of disturbance (includes presence of exotics).
Bog		✓	Soil type and depths.
Red Spruce or White Oak Forest		✓	Soil type and drainage regime. DBH range or prism sweep. Approximate Canopy Cover. Source of disturbance or evidence of forestry.
Coastal Marshes (Great Lakes/Shallow Atlantic)		✓	Substrate type (bedrock or soil type). Water level. Evidence of water fluctuation. Presence of Beaver Pond. Amount of exposed shoreline.
Dunes / Beaches / Bars / Ridges		✓	Soil or substrate type. Sand class. Sources of disturbance (includes presence of exotics). Percent cover of trees, shrubs, forbs, and grasses.
Sand Barren		✓	Sand class. Sources of disturbance (includes presence of exotics). Percent area of exposed rock, vegetation, and sand. Sources of erosion or fire.
Alvar		✓	Bedrock type. Soil type and depth. Percent area of exposed rock and vegetation. Sources of disturbance (includes presence of exotics).
Rare Species (**NOT** Species At Risk)		✓	Number of individuals and locations. Ecosite or Vegetation Type.
Rare Vegetation Community		✓	Sources of disturbance (includes presence of exotics).

Characteristics of Identified Wildlife Habitat

Date: Nov 28/Oct 11, 2018

Project Name: Ridout Scoped EIS | Project #: 2161 | Area and/or Polygon ID: Entire Site

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Aquatic, Terrestrial and Wetland Biologists

Indicate the location of the habitat feature on the Field Map.

Identified Habitat Feature	# Observed:	UTM(s)	Photo Numbers	Habitat Details (refer to Page 1)	Associated Wildlife Observed and Evidence
Burrows/Dens- Medium	1	Sloped, community south		inappropriate habitat for Am. Badger. No activity or signs of activity Present snow on November visit revealed no signs of activity.	None
Large DBH cavity tree	2	inventoried		potential bat habitat observed on 2 common Hackberries, #1533, 1534.	

TY	Species	EV	#	Notes	TY	Species	EV	#	Notes

Faunal Type Codes (TY)
B=Bird
M=Mammal
H=Herpetofauna
L=Lepidoptera
F=Fish
D=Dragonfly or Damselfly

Evidence Codes (EV)

Breeding Birds
H- Suitable Habitat
S- Singing Male
P- Pair
T- Territory
D- Courtship Display
V- Visiting Nest
A- Anxienty Behavior
N- Nest Building (not wren or woodpecker)
NB- Nest Building (not wren or woodpecker)
DD- Distraction Display
NU- Used nest
FY- Fledged Young
FS- Food/Fecal Sac
CF- Adult carrying food
NE- Nest with eggs
NY- Nest with young
AE-Adult entering/leaving nest

Other Wildlife
OB- Observed
DP- Distinctive Parts
TK- Tracks
VO- Vocalization
HO- House/Den
FE- Feeding Evidence
CA- Carcass/Bones
FY- Eggs or young
SC- Scat
SI- Other Signs (Specify)

APPENDIX VI Vascular Flora Species Observed within the Subject Property

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Data[5]	NRSI Observed
Gymnosperms	**Conifers**						
Cupressaceae	**Cypress Family**						
Juniperus communis	Common Juniper	S5					X
Pinaceae	**Pine Family**						
Picea abies	Norway Spruce	SE3					X
Picea pungens	Colorado Spruce	SE1					X
Pinus nigra	Austrian Pine	SE2					X
Taxaceae	**Yew Family**						
Taxus canadensis	American Yew	S5					X
Dicotyledons	**Dicots**						
Aceraceae	**Maple Family**						
Acer campestre	Hedge Maple	SE1					X
Acer negundo	Manitoba Maple	S5					X
Acer platanoides	Norway Maple	SE5					X
Acer saccharum ssp. saccharum	Sugar Maple	S5					X
Acer X freemanii	Freeman's Maple						X
Anacardiaceae	**Sumac or Cashew Family**						
Rhus aromatica	Fragrant Sumac	S5					X
Rhus hirta	Staghorn Sumac	S5					X
Apiaceae	**Carrot or Parsley Family**						
Daucus carota	Wild Carrot	SE5					X
Araliaceae	**Ginseng Family**						
Hedera helix	English Ivy	SNA					X
Asteraceae	**Composite or Aster Family**						
Arctium minus ssp. minus	Common Burdock	SE5					X
Cichorium intybus	Chicory	SE5					X

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Data[5]	NRSI Observed
Cirsium arvense	Canada Thistle	SE5					X
Senecio jacobaea	Tansy Grounsel	SE1					X
Solidago altissima var. altissima	Tall Goldenrod	S5					X
Solidago canadensis	Canada Goldenrod	S5					X
Solidago flexicaulis	Zig-zag Goldenrod	S5					X
Sonchus arvensis ssp. arvensis	Field Sow-thistle	SE5					X
Symphyotrichum ericoides var. ericoides	White Heath Aster	S5					X
Symphyotrichum lateriflorum var. lateriflorum	Calico Aster	S5					X
Taraxacum officinale	Common Dandelion	SE5					X
Balsaminaceae	**Touch-me-not Family**						
Impatiens capensis	Spotted Touch-me-not	S5					X
Impatiens pallida	Pale Touch-me-not	S5					X
Berberidaceae	**Barberry Family**						
Berberis thunbergii	Japanese Barberry	SE5					X
Brassicaceae	**Mustard Family**						
Alliaria petiolata	Garlic Mustard	SE5					X
Barbarea vulgaris	Yellow Rocket	SE5					X
Caprifoliaceae	**Honeysuckle Family**						
Lonicera tatarica	Tartarian Honeysuckle	SE5					X
Celastraceae	**Staff-tree Family**						
Euonymus alata	Winged Spindle Tree	SE2					X
Chenopodiaceae	**Goosefoot Family**						
Chenopodium album var. album	Lamb's-quarters	SE5					X
Fabaceae	**Pea Family**						
Cercis canadensis	Canadian Redbud	SX					X
Gleditsia triacanthos var. inermis	Honey Locust						X
Geraniaceae	**Geranium Family**						

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Data[5]	NRSI Observed
Geranium maculatum	Spotted Crane's-bill	S5					X
Juglandaceae	**Walnut Family**						
Juglans nigra	Black Walnut	S4					X
Lamiaceae	**Mint Family**						
Leonurus cardiaca ssp. cardiaca	Common Motherwort	SE5					X
Moraceae	**Mulberry Family**						
Morus alba	White Mulberry	SE5					X
Oleaceae	**Olive Family**						
Fraxinus americana	White Ash	S5					X
Syringa vulgaris	Common Lilac	SE5					X
Oxalidaceae	**Wood Sorrel Family**						
Oxalis stricta	Upright Yellow Wood-sorrel	S5					X
Papaveraceae	**Poppy Family**						
Chelidonium majus	Celandine	SE5					X
Phytolaccaceae	**Pokeweed Family**						
Phytolacca americana	Pokeweed	S4					X
Plantaginaceae	**Plantain Family**						
Plantago lanceolata	Ribgrass	SE5					X
Polygonaceae	**Smartweed Family**						
Polygonum cuspidatum	Japanese Knotweed	SE4					X
Rhamnaceae	**Buckthorn Family**						
Rhamnus cathartica	European Buckthorn	SE5					X
Frangula alnus	Glossy Buckthorn	SE5					X
Rosaceae	**Rose Family**						

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Data[5]	NRSI Observed
Prunus avium	Cherry Plum	SE4					X
Rosa multiflora	Multiflora Rose	SE4					X
Rubus occidentalis	Black Raspberry	S5					X
Salicaceae	**Willow Family**						
Populus deltoides ssp. deltoides	Eastern Cottonwood	S5					X
Solanaceae	**Nightshade Family**						
Solanum dulcamara	Bitter Nightshade	SE5					X
Tiliaceae	**Linden Family**						
Tilia americana	American Basswood	S5					X
Ulmaceae	**Elm Family**						
Celtis occidentalis	Common Hackberry	S4					X
Verbenaceae	**Vervain Family**						
Verbena stricta	Hoary Vervain	S4					X
Vitaceae	**Grape Family**						
Parthenocissus vitacea	Woodbine	S5					X
Vitis riparia	Riverbank Grape	S5					X
Monocotyledons	**Monocots**						
Liliaceae	**Lily Family**						
Convallaria majalis	Lily-of-the-valley	SE5					X

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Data[5]	NRSI Observed
Poaceae	**Grass Family**						
Bromus inermis ssp. inermis	Awnless Brome	SE5					X
Dactylis glomerata	Orchard Grass	SE5					X
Phleum pratense	Timothy	SE5					X
Poa pratensis ssp. pratensis	Kentucky Bluegrass	S5					X
					Total	**0**	**63**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]MNRF 2018a

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
S5 Secure	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
SNA Unranked	
S#? Rank Uncertain	
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

APPENDIX VII Bird Species Reported from the Study Area

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA (17MH75)[5]	MNRF Background [6]	Harris Park SLSR[7]	NRSI Observed
Anatidae	**Ducks, Geese & Swans**								
Branta canadensis	Canada Goose	S5				CO		X	
Aix sponsa	Wood Duck	S5				CO			
Anas platyrhynchos	Mallard	S5				CO		X	X
Lophodytes cucullatus	Hooded Merganser	S5B, S5N				CO			
Phasianidae	**Partridges, Grouse & Turkeys**								
Bonasa umbellus	Ruffed Grouse	S4				PO			
Meleagris gallopavo	Wild Turkey	S5				CO			
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA				CO		X	
Zenaida macroura	Mourning Dove	S5				CO		X	
Cuculiformes	**Cuckoos & Anis**								
Coccyzus americanus	Yellow-billed Cuckoo	S4B				PO			
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B				PO			
Caprimulgidae	**Goatsuckers**								
Chordeiles minor	Common Nighthawk	S4B	SC	SC	Schedule 1	PR			
Apodidae	**Swifts**								
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	CO		X	
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B				PR			
Rallidae	**Rails, Gallinules & Coots**								
Rallus limicola	Virginia Rail	S5B				PR			
Porzana carolina	Sora	S4B				PR			
Charadriidae	**Plovers**								
Charadrius vociferus	Killdeer	S5B, S5N				CO		X	
Scolopacidae	**Waders**								
Scolopax minor	American Woodcock	S4B				PO			
Actitis macularia	Spotted Sandpiper	S5				PR			
Ardeidae	**Herons & Bitterns**								
Ardea herodias	Great Blue Heron	S4B				PO		X	
Butorides virescens	Green Heron	S4B				CO			
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B				CO			
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR			X	X	

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA (17MH75)[5]	MNRF Background [6]	Harris Park SLSR[7]	NRSI Observed
Accipiter striatus	Sharp-shinned Hawk	S5	NAR			CO			
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR		CO			
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR		CO			
Strigidae	**Typical Owls**								
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR		CO			
Bubo virgianus	Great Horned Owl	S4				CO			
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S4B				PR			
Picidae	**Woodpeckers**								
Melanerpes carolinus	Red-bellied Woodpecker	S4				CO		X	
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B				PR			
Picoides pubescens	Downy Woodpecker	S5				CO		X	
Picoides villosus	Hairy Woodpecker	S5				CO			
Colaptes auratus	Northern Flicker	S4B				CO		X	
Falconidae	**Caracaras & Falcons**								
Falco sparverius	American Kestrel	S4				PR			
Falco peregrinus anatum/tundrius	Peregrine Falcon	S3B	SC	SC	Schedule 1		X		
Tyrannidae	**Tyrant Flycatchers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		PO			
Empidonax traillii	Willow Flycatcher	S5B				PO			
Empidonax minimus	Least Flycatcher	S4B				PO			
Sayornis phoebe	Eastern Phoebe	S5B				CO			
Myiarchus crinitus	Great Crested Flycatcher	S4B				CO		X	
Tyrannus tyrannus	Eastern Kingbird	S4B				CO			
Vireonidae	**Vireos**								
Vireo gilvis	Warbling Vireo	S5B				CO		X	
Vireo olivaceus	Red-eyed Vireo	S5B				CO		X	
Corvidae	**Crows & Jays**								
Cyanocitta cristata	Blue Jay	S5				CO		X	
Corvus brachyrhynchos	American Crow	S5B				CO			X
Alaudidae	**Larks**								
Eremophila alpestris	Horned Lark	S5B				PR			
Hirundinidae	**Swallows**								
Progne subis	Purple Martin	S4B				PO			
Tachycineta bicolor	Tree Swallow	S4B				CO			
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B				CO			
Riparia riparia	Bank Swallow	S4B	THR	T		CO			
Petrochelidon pyrrhonota	Cliff Swallow	S4B				CO			
Hirundo rustica	Barn Swallow	S4B	THR	T		CO		X	

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA (17MH75)[5]	MNRF Background [6]	Harris Park SLSR[7]	NRSI Observed
Paridae	**Chickadees & Titmice**								
Poecile atricapillus	Black-capped Chickadee	S5				CO		X	X
Sittidae	**Nuthatches**								
Sitta canadensis	Red-breasted Nuthatch	S5				CO			
Sitta carolinensis	White-breasted Nuthatch	S5				CO			
Troglodytidae	**Wrens**								
Troglodytes aedon	House Wren	S5B				CO		X	
Thryothorus ludovicianus	Carolina Wren	S4				CO		X	
Polioptilidae	**Gnatcatchers**								
Polioptila caerulea	Blue-gray Gnatcatcher	S4B				CO			
Mussciciapidae	**Old world Flycatchers**								
Turdidae	**Thrushes**								
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR		CO			
Catharus fuscescens	Veery	S4B				PO			
Hylocichla mustelina	Wood Thrush	S4B	SC	T		PR			
Turdus migratorius	American Robin	S5B				CO		X	
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S4B				CO		X	
Toxostoma rufum	Brown Thrasher	S4B				CO		X	
Sturnidae	**Starlings**								
Sturnus vulgaris	European Starling	SNA				CO		X	
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5B				CO		X	
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA				CO		X	X
Fringillidae	**Finches & Allies**								
Carpodacus mexicanus	House Finch	SNA				CO		X	
Spinus tristis	American Goldfinch	S5B				CO		X	
Parulidae	**Wood Warblers**								
Vermivora cyanoptera	Blue-winged Warbler	S4B				PR			
Oreothlypis ruficapilla	Nashville Warbler	S5B						X	
Geothylpis trichas	Common Yellowthroat	S5B				CO			
Setophaga ruticilla	American Redstart	S5B				PO			
Setophaga petechia	Yellow Warbler	S5B				CO		X	
Setophaga pensylvanica	Chestnut-sided Warbler	S5B				PO			
Setophaga pinus	Pine Warbler	S5B				PR			
Emberizidae	**New World Sparrows & Allies**								
Pipilo erythrophthalmus	Eastern Towhee	S4B				PR			

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA (17MH75)[5]	MNRF Background [6]	Harris Park SLSR[7]	NRSI Observed
Spizella passerina	Chipping Sparrow	S5B				CO		X	
Spizella pusilla	Field Sparrow	S4B				PR			
Pooecetes gramineus	Vesper Sparrow	S4B				PR			
Passerculus sandwichensis	Savannah Sparrow	S4B				CO			
Melospiza melodia	Song Sparrow	S5B				CO		X	
Melospiza georgiana	Swamp Sparrow	S5B				PO			
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Piranga olivacea	Scarlet Tanager	S4B				PO			
Cardinalis cardinalis	Northern Cardinal	S5				CO		X	
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B				CO		X	
Passerina cyanea	Indigo Bunting	S4B				CO			
Icteridae	**Blackbirds**								
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	PR			
Agelaius phoeniceus	Red-winged Blackbird	S4				CO		X	
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	CO			
Quiscalus quiscula	Common Grackle	S5B				CO		X	
Molothrus ater	Brown-headed Cowbird	S4B				CO		X	
Icterus spurius	Orchard Oriole	S4B				CO			
Icterus galbula	Baltimore Oriole	S4B				CO		X	
					Total	**91**	**2**	**37**	**4**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]BSC et al. 2009; [6]MNRF 2019b; [7]NRSI 2013

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
S5 Secure	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
SNA Unranked	
S#? Rank Uncertain	
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

APPENDIX VIII Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Reptile and Amphibian Atlas[5] 17MH75	NHIC Data[6]	Harris Park SLSR[7]
Turtles								
Apalone spinifera spinifera	Spiny Softshell	S3	THR	E	Schedule 1		X	
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	X		
Chrysemys picta marginata	Midland Painted Turtle	S5		SC		X		
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	X	X	X
Trachemys scripta elegans	Red-eared Slider	SNA				X		
Snakes								
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	Schedule 1	X		
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	Schedule 1	X		
Opheodrys vernalis	Smooth Greensnake	S4				X		
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR		X		
Regina septemvittata	Queensnake	S2	END	E	Schedule 1	X		
Storeria dekayi dekayi	Northern Brownsnake	S5	NAR	NAR		X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5				X		
Salamanders								
Ambystoma sp.	Jefferson/Blue-spotted Salamander Cor	S2				X		
Ambystoma maculatum	Spotted Salamander	S4				X		
Hemidactylium scutatum	Four-toed Salamander	S4	NAR	NAR		X		
Notophthalmus viridescens viridesc	Red-spotted Newt	S5				X		
Plethodon cinereus	Eastern Red-backed Salamander	S5				X		
Toads and Frogs								
Anaxyrus americanus	American Toad	S5				X		
Hyla versicolor	Tetraploid Gray Treefrog	S5				X		
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Population)*	S3	NAR	T	Schedule 1	X		
Pseudacris crucifer	Spring Peeper	S5				X		
Lithobates catesbeiana	American Bullfrog	S4				X		
Lithobates clamitans melanota	Northern Green Frog	S5				X		
Lithobates palustris	Pickerel Frog	S4	NAR	NAR		X		
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR		X		
Lithobates sylvaticus	Wood Frog	S5				X		
					Total	**25**	**2**	**1**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]Ontario Nature 2018; [6]MNRF 2018a; [7]NRSI 2013

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
S5 Secure	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
SNA Unranked	
S#? Rank Uncertain	
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

APPENDIX IX Mammal Species Reported from the Study Area

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Mammal Atlas[5]	NHIC Data[6]	Harris Park SLSR[7]	NRSI Observed
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			
Lagomorpha	**Rabbits and Hares**								
Lepus europaeus	European Hare	SNA				X			
Sylvilagus floridanus	Eastern Cottontail	S5				X			
Rodentia	**Rodents**								
Castor canadensis	Beaver	S5				X			
Marmota monax	Woodchuck	S5				X			X
Microtus pennsylvanicus	Meadow Vole	S5				X			
Mus musculus	House Mouse	SNA				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			
Tamias striatus	Eastern Chipmunk	S5				X		X	X
Carnivora	**Carnivores**								
Canis latrans	Coyote	S5				X			
Mephitis mephitis	Striped Skunk	S5				X			
Mustela erminea	Ermine	S5				X			
Mustela vison	American Mink	S4				X			
Procyon lotor	Northern Raccoon	S5				X		X	X
Vulpes vulpes	Red Fox	S5				X			
Artiodactyla	**Deer and Bison**								
Odocoileus virginianus	White-tailed Deer	S5				X			
					Total	**24**	**0**	**2**	**4**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]Dobbyn 1994; [6]MNRF 2018a; [7]NRSI 2013

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be
S3 Vulnerable	reassessed for consideration for inclusion to
S4 Apparently Secure	Schedule 1
S5 Secure	Schedule 3 Special concern; may be
SNA Unranked	reassessed for consideration for inclusion to
S#? Rank Uncertain	Schedule 1
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

APPENDIX X Lepidoptera Species Reported from the Study Area

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	TEA Atlas[5] (17MH75)	NHIC Data[6]	NRSI Observed
Anatrytone logan	Delaware Skipper	S4				X		
Ancyloxypha numitor	Least Skipper	S5				X		
Epargyreus clarus	Silver-spotted Skipper	S4				X		
Erynnis baptisiae	Wild Indigo Duskywing	S4				X		
Erynnis brizo	Sleepy Duskywing	S1				X		
Erynnis icelus	Dreamy Duskywing	S5				X		
Erynnis juvenalis	Juvenal's Duskywing	S5				X		
Euphyes vestris	Dun Skipper	S5				X		
Poanes hobomok	Hobomok Skipper	S5				X		
Polites mystic	Long Dash Skipper	S5				X		
Polites peckius	Peck's Skipper	S5				X		
Polites themistocles	Tawny-edged Skipper	S5				X		
Thymelicus lineola	European Skipper	SNA				X		
Wallengrenia egeremet	Northern Broken Dash	S5				X		
Papilio cresphontes	Giant Swallowtail	S4				X		
Papilio glaucus	Eastern Tiger Swallowtail	S5				X		
Papilio polyxenes	Black Swallowtail	S5				X		
Papilio troilus	Spicebush Swallowtail	S4				X		
Colias eurytheme	Orange Sulphur	S5				X		
Colias philodice	Clouded Sulphur	S5				X		
Pieris oleracea	Mustard White	S4				X		
Pieris rapae	Cabbage White	SNA				X		
Callophrys augustinus	Brown Elfin	S5				X		
Cupido comyntas	Eastern Tailed Blue	S5				X		
Lycaena epixanthe	Bog Copper	S4S5				X		
Lycaena phlaeas	American Copper	S5				X		
Satyrium acadica	Acadian Hairstreak	S4				X		
Satyrium calanus	Banded Hairstreak	S4				X		
Aglais milberti	Milbert's Tortoiseshell	S5				X		
Asterocampa celtis	Hackberry Emperor	S2				X		
Asterocampa clyton	Tawny Emperor	S2S3				X		
Boloria bellona	Meadow Fritillary	S5				X		
Boloria selene	Silver-bordered Fritillary	S5				X		
Cercyonis pegala	Common Wood-Nymph	S5				X		
Chlosyne nycteis	Silvery Checkerspot	S5				X		
Coenonympha tullia	Common Ringlet	S5				X		

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	TEA Atlas[5] (17MH75)	NHIC Data[6]	NRSI Observed
Danaus plexippus	Monarch	S2N, S4B	SC	END	Schedule 1	X		
Euphydryas phaeton	Baltimore Checkerspot	S4				X		
Junonia coenia	Common Buckeye	SNA				X		
Lethe anthedon	Northern Pearly-Eye	S5				X		
Lethe appalachia	Appalachian Brown	S4				X		
Lethe eurydice	Eyed Brown / Northern Eyed Brown	S5				X		
Libytheana carinenta	American Snout	SNA				X		
Limenitis archippus	Viceroy	S5				X		
Limenitis arthemis astyanax	Red-spotted Purple	S5				X		
Megisto cymela	Little Wood-Satyr	S5				X		
Nymphalis antiopa	Mourning Cloak	S5				X		
Phyciodes cocyta	Northern Crescent	S5				X		
Phyciodes tharos	Pearl Crescent	S4				X		
Polygonia comma	Eastern Comma	S5				X		
Polygonia comma	Eastern Comma/Hop Merchant	S5				X		
Polygonia interrogationis	Question Mark	S5				X		
Polygonia progne	Grey Comma	S5				X		
Speyeria cybele	Great Spangled Fritillary	S5				X		
Vanessa atalanta	Red Admiral	S5				X		
Vanessa cardui	Painted Lady	S5				X		
Vanessa virginiensis	American Lady	S5				X		
					Total	**57**	**0**	**0**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]MacNaughton et al. 2018; [6]MNRF 2018a

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
S5 Secure	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
SNA Unranked	
S#? Rank Uncertain	
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

APPENDIX XI Odonata Species Reported from the Study Area

Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Odonate Atlas[5]	NHIC Data[6]	NRSI Observed
Calopterygidae	**Broadwinged Damselflies**							
Calopteryx maculata	Ebony Jewelwing	S5				X		
Hetaerina americana	American Rubyspot	S4				X		
Lestidae	**Spreadwings**							
Lestes dryas	Emerald Spreadwing	S5				X		
Coenagrionidae	**Narrow-winged Damselflies**							
Argia apicalis	Blue-fronted Dancer	S4				X		
Argia moesta	Powdered Dancer	S5				X		
Argia tibialis	Blue-tipped Dancer	S3				X		
Enallagma antennatum	Rainbow Bluet	S4				X		
Enallagma civile	Familiar Bluet	S5				X		
Enallagma exsulans	Stream Bluet	S5				X		
Ischnura posita	Fragile Forktail	S4				X		
Ischnura verticalis	Eastern Forktail	S5				X		
Aeshnidae	**Darners**							
Aeshna umbrosa	Shadow Darner	S5				X		
Anax junius	Common Green Darner	S5				X		
Boyeria vinosa	Fawn Darner	S5				X		
Macromia illinoiensis	Illinois (Swift) River Cruiser	S4				X		
Libellulidae	**Skimmers**							
Erythemis simplicicollis	Eastern Pondhawk	S5				X		
Libellula luctuosa	Widow Skimmer	S5				X		
Libellula pulchella	Twelve-spotted Skimmer	S5				X		
Plathemis lydia	Common Whitetail	S5				X		
					Total	**19**	**0**	**0**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]MNRF 2018b; [6]MNRF 2018a

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
S5 Secure	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
SNA Unranked	
S#? Rank Uncertain	
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

APPENDIX XII Aquatic Species from the Study Area

Fish Species Reported from the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Data[5]	UTRCA[6]
Petromyzontidae	**Lampreys**						
Ichthyomyzon fossor	Northern Brook Lamprey (GL-USL Pop.)	S3	SC	SC (April 2007)	Schedule 1		X
Cyprinidae	**Carps and Minnows**						
Campostoma anomalum	Central Stoneroller	S4		NAR (April 1998)			X
Clinostomus elongatus	Redside Dace	S2	END	E (April 2007)	Schedule 1		X
Cyprinella spiloptera	Spotfin Shiner	S4					X
Cyprinus carpio	Common Carp	SNA					X
Luxilus chrysocephalus	Striped Shiner	S4	NAR	NAR (April 1993)			X
Luxilus cornutus	Common Shiner	S5					X
Nocomis micropogon	River Chub	S4	NAR	NAR (April 1988)			X
Notropis photogenis	Silver Shiner	S2S3	THR	T (May 2011)	Schedule 3	X	
Notropis rubellus	Rosyface Shiner	S4	NAR	NAR (April 1994)			X
Notropis volucellus	Mimic Shiner	S5					X
Pimephales notatus	Bluntnose Minnow	S5	NAR	NAR (April 1998)			X
Rhinichthys cataractae	Longnose Dace	S5					X
Catostomidae	**Suckers**						
Catostomus commersonii	White Sucker	S5					X
Hypentelium nigricans	Northern Hog Sucker	S4					X
Moxostoma duquesnei	Black Redhorse	S2	THR	T (May 2005)		X	
Moxostoma erythrurum	Golden Redhorse	S4	NAR	NAR (April 1989)			X
Ictaluridae	**North American Catfishes**						
Noturus flavus	Stonecat	S4					X
Centrarchidae	**Sunfishes and Basses**						
Ambloplites rupestris	Rock Bass	S5					X
Lepomis gibbosus	Pumpkinseed	S5					X
Micropterus dolomieu	Smallmouth Bass	S5					X
Percidae	**Perches and Darters**						
Etheostoma blennioides	Greenside Darter	S4	NAR	NAR (Nov 2006)	Schedule 3		X
Etheostoma caeruleum	Rainbow Darter	S4					X
Etheostoma flabellare	Fantail Darter	S4					X
Etheostoma nigrum	Johnny Darter	S5					X
Percina caprodes	Logperch	S5					X
Percina maculata	Blackside Darter	S4					X
					Total	**2**	**25**

[1]MNRF 2019; [2]MNRF 2018c; [3,4]Government of Canada 2018; [5]MNRF 2018a; [6]UTRCA 2013

Legend	
SRANK	**SARA Schedule**
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
S5 Secure	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
SNA Unranked	
S#? Rank Uncertain	
COSSARO	**COSEWIC**
NAR Not at Risk	NAR Not at Risk
SC Special Concern	SC Special Concern
THR Threatened	T Threatened
END Endangered	E Endangered

UTRCA Fish Sampling Records

Location		Species at Risk (SAR) Status			Provincial Status	Site Number	Sample Date
Species (Common Name)	**Scientific Name**	**COSEWIC**	**SARA**	**ESA 2007**	**SRank**	**Abundance**	**Distribution**
North Thames River							
Gibbons Park, Near Footbridge			UTM x: 478414	UTM y: 4760639		TF15	10/14/2005
Blackside Darter	*Percina maculata*				S4	Abundant	widespread
Central Stoneroller	*Campostoma anomalum*				S4	Abundant	widespread
Common Carp	*Cyprinus carpio*				SNA	Abundant	widespread
Fantail Darter	*Etheostoma flabellare*				S4	Abundant	widespread
Greenside Darter	*Etheostoma blennioides*				S4	Abundant	widespread
Johnny Darter	*Etheostoma nigrum*				S5	Abundant	widespread
Northern Hog Sucker	*Hypentelium nigricans*				S4	Abundant	widespread
Pumpkinseed	*Lepomis gibbosus*				S5	Abundant	widespread
Redhorse sp.							
Rock Bass	*Ambloplites rupestris*				S5	Abundant	widespread
Smallmouth Bass	*Micropterus dolomieu*				S5	Abundant	widespread
Spotfin Shiner	*Cyprinella spiloptera*				S4	Abundant	widespread
Stonecat	*Noturus flavus*				S4	Abundant	widespread
Striped Shiner	*Luxilus chrysocephalus*				S4	Abundant	widespread
White Sucker	*Catostomus commersoni*				S5	Abundant	widespread
Gibbons Park, Near Footbridge			UTM x: 478414	UTM y: 4760639		TF15	10/20/2007
Blackside Darter	*Percina maculata*				S4	Abundant	widespread
Bluntnose Minnow	*Pimephales notatus*				S5	Abundant	widespread
Central Stoneroller	*Campostoma anomalum*				S4	Abundant	widespread
Common Carp	*Cyprinus carpio*				SNA	Abundant	widespread
Fantail Darter	*Etheostoma flabellare*				S4	Abundant	widespread
Golden Redhorse	*Moxostoma erythrurum*				S4	Abundant	widespread
Greenside Darter	*Etheostoma blennioides*				S4	Abundant	widespread
Johnny Darter	*Etheostoma nigrum*				S5	Abundant	widespread
Logperch	*Percina caprodes*				S5	Common	widespread
Mimic Shiner	*Notropis volucellus*				S5	Abundant	widespread
Northern Hog Sucker	*Hypentelium nigricans*				S4	Abundant	widespread
Rock Bass	*Ambloplites rupestris*				S5	Abundant	widespread
Rosyface Shiner	*Notropis rubellus*				S4	Abundant	widespread
Smallmouth Bass	*Micropterus dolomieu*				S5	Abundant	widespread
Spotfin Shiner	*Cyprinella spiloptera*				S4	Abundant	widespread
Striped Shiner	*Luxilus chrysocephalus*				S4	Abundant	widespread
White Sucker	*Catostomus commersoni*				S5	Abundant	widespread
North Thames River							
d/s Blackfriars Bridge			UTM x: 478970	UTM y: 4759434		TF12	10/15/2007
Central Stoneroller	*Campostoma anomalum*				S4	Abundant	widespread
Greenside Darter	*Etheostoma blennioides*				S4	Abundant	widespread
Logperch	*Percina caprodes*				S5	Common	widespread
Longnose Dace	*Rhinichthys cataractae*				S5	Common	widespread

Location		Species at Risk (SAR) Status			Provincial Status	Site Number	Sample Date
Species (Common Name)	**Scientific Name**	**COSEWIC**	**SARA**	**ESA 2007**	**SRank**	**Abundance**	**Distribution**
Mimic Shiner	*Notropis volucellus*				S5	Abundant	widespread
Northern Hog Sucker	*Hypentelium nigricans*				S4	Abundant	widespread
Rainbow Darter	*Etheostoma caeruleum*				S4	Uncommon	localized
River Chub	*Nocomis micropogon*				S4	Common	widespread
Rock Bass	*Ambloplites rupestris*				S5	Abundant	widespread
Smallmouth Bass	*Micropterus dolomieu*				S5	Abundant	widespread
Spotfin Shiner	*Cyprinella spiloptera*				S4	Abundant	widespread
Striped Shiner	*Luxilus chrysocephalus*				S4	Abundant	widespread
White Sucker	*Catostomus commersoni*				S5	Abundant	widespread
d/s Blackfriars Bridge			UTM x: 478970	UTM y: 4759434		TF12	5/15/2012
Greenside Darter	*Etheostoma blennioides*				S4	Abundant	widespread
Mimic Shiner	*Notropis volucellus*				S5	Abundant	widespread

Location		Species at Risk (SAR) Status			Provincial Status		Site Number	Sample Date
Species (Common Name)	**Scientific Name**	**COSEWIC**	**SARA**	**ESA 2007**	**SRank**	**Abundance**	**Distribution**	

COSEWIC Status: The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses species for their consideration for legal protection and recovery (or management) under the Species at Risk Act (SARA).

Extinct: A wildlife species that no longer exists.
Extirpated: A wildlife species no longer existing in the wild in Canada, but exists elsewhere.
Endangered: A wildlife species facing imminent extirpation or extinction.
Threatened: A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk: A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient: A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Reference: www.cosewic.gc.ca (current to November 2011)

SARA Status: The federal at risk designation for species under the Species at Risk Act (SARA)
Reference: www.sararegistry.gc.ca (current to December 2011)

ESA 2007 / SARO Status: Species at Risk in Ontario (SARO) are designated by the Ontario Ministry of Natural Resources (OMNR) in accordance with the provincial Endangered Species Act (ESA) through the Committee on the Status of Species at Risk in Ontario (COSSARO).

Extirpated: A native species that no longer exists in the wild in Ontario but still occurs elsewhere.
Endangered: A native species facing imminent extinction or extirpation in Ontario.
Threatened: A native species that is at risk of becoming endangered in Ontario.
Special Concern: A native species that is sensitive to human activities or natural events which may cause it to become endangered or threatened.

Reference: www.ontario.ca/speciesatrisk (current to January 2012)

Provincial Rank (SRANK): Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are assigned to consider only those factors within the political boundaries of Ontario.

SX Presumed Extirpated: Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH Possibly Extirpated (Historical): Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1 Critically Imperiled: Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2 Imperiled: Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 Vulnerable: Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure: Common, widespread, and abundant in the nation or state/province.
SNR Unranked: Nation or state/province conservation status not yet assessed.
SU Unrankable: Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA Not Applicable: A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# Range Rank: A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Reference: http://nhic.mnr.gov.on.ca/MNR/nhic/nhic.cfm (current to March 2012)

Abundance: Refers to the relative abundance or common occurrence of the species found within the waters of the Thames River watershed based on sampling results. Consideration was given to accurately reflect the species presence within the watershed due to the sampling capture method, effort, and biases, difficulty in capturing certain species and anecdotal reporting.
Abundant: Greater than 50 sample records in the database
Common: Between 15 and 50 sample records in the database
Historical: . species that have been previously recorded in the Thames
Rare: Less than 5 sample records in database
Uncommon: Between 5 and 15 sample records in database

Distribution: Indicates whether species are sampled throughout the watershed or restricted to specific locales.

Prepared - Monday, July 08, 2013

UTRCA / DFO / EC Mussel Sampling Records

North Thames River

SiteCode - TF000 **LOCATION: Gibbons Park, Grosvenor St parking lot**

UTM X 478699 UTM Y: 4760521

DATE 9/10/2004

Common Name	Latin Name	Condition	Number	COSEWIC Status	SARO Status
Elktoe	*Alasmidonta marginata*	Relict Shell	2		
Fluted Shell	*Lasmigona costata*	Live	2		
Giant Floater	*Pyganodon grandis*	Relict Shell	0		
Mucket	*Actinonaias ligamentina*	Live	1		
Wavy-rayed Lampmussel	*Lampsilis fasciola*	Relict Shell	1	Special Concern	Threatened
Zebra Mussel	*Dreissena polymorpha*	Live			

COSEWIC Status: The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses species for their consideration for legal protection and recovery (or management) under the Species at Risk Act (SARA).

Extinct: A wildlife species that no longer exists.
Extirpated: A wildlife species no longer existing in the wild in Canada, but exists elsewhere.
Endangered: A wildlife species facing imminent extirpation or extinction.
Threatened: A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

References: http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1
https://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm?stype=speciesindex=1cosid=common=scientific=population=taxid=3locid=0desid=0schid=0desid2=0
http://www.cosewic.gc.ca/eng/sct0/rpt/rpt_csar_e.pdf
http://www.cosewic.gc.ca/eng/sct5/index_e.cfm
(current to September 2009)

SARO Status: Species at Risk in Ontario (SARO) are designated by the Ontario Ministry of Natural Resources (OMNR) in accordance with the provincial Endangered Species Act (ESA) through the Committee on the Status of Species at Risk in Ontario (COSSARO).

Extirpated: A species that no longer exists in the wild in Ontario but still occurs elsewhere.
Endangered: A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.
Threatened: A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

Reference: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/STEL01_131230.html
http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html and
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080230_e.htm
http://www.mnr.gov.on.ca/276841.pdf (current to September 2009)

UTRCA Benthic Sampling Data

Taxonomic Name	Common Name	Life Stage	# in Subsample	Biotic Index

North Thames River

Downstream of Black Friars Bridge, accessed from Cummings Ave.

Site code: TF14 UTM X: 478959 UTM Y: 4759451

Sampled - 10/20/2004

REP: 1

Acariformes	Water Mite	A	10	4
Caenidae	Crawling Mayfly	N	8	7
Ceratopogonidae	Biting Midge	L	1	6
Chironomidae	Midge	P	9	6
Chironomidae	Midge	L	84	6
Elmidae	Riffle Beetle	A	2	4
Elmidae	Riffle Beetle	L	4	4
Empididae	Dance Fly	L	3	6
Ephemerellidae	Mayfly	N	6	1
Erpobdellidae	Leech	A	3	10
Heptageniidae	Stream Mayfly	N	41	4
Hydropsychidae	Net-spinning Caddisfly	L	35	4
Nematoda	Thread Worm	A	1	-1
Oligochaeta	Aquatic Worm	A	27	8
Philopotamidae	Finger-net Caddisfly	L	4	3
Polycentropodidae	Caddisfly	L	1	6
Psephenidae	Water Penny Beetle	L	1	4
Psychomyiidae	Tube-making Caddisfly	L	2	2
Sialidae	Alderfly	N	1	4
Sphaeriidae	Fingernail Clam	A	4	8
Taeniopterygidae	Stonefly	N	1	2
Tipulidae	Crane Fly	L	4	3
Tricorythidae	Crawling Mayfly	N	23	4
Turbellaria	Flatworm	A	5	4

Stream Health **Fair** **Family Biotic Index** **5.26**

Sampled - 10/25/2004

REP: 1

Acariformes	Water Mite	A	4	4
Asellidae	Sow Bug	A	1	8
Baetidae	Small Mayfly	N	1	4
Caenidae	Crawling Mayfly	N	19	7
Calopterygidae	Broad-winged Damselfly	N	1	5
Ceratopogonidae	Biting Midge	L	1	6
Chironomidae	Midge	P	2	6
Chironomidae	Midge	L	110	6
Elmidae	Riffle Beetle	L	6	4
Elmidae	Riffle Beetle	A	1	4
Empididae	Dance Fly	L	7	6
Ephemerellidae	Mayfly	N	5	1
Heptageniidae	Stream Mayfly	N	23	4
Hydropsychidae	Net-spinning Caddisfly	L	24	4
Nematoda	Thread Worm	A	1	-1
Oligochaeta	Aquatic Worm	A	21	8
Philopotamidae	Finger-net Caddisfly	L	1	3
Psephenidae	Water Penny Beetle	L	2	4
Psychomyiidae	Tube-making Caddisfly	L	2	2
Sphaeriidae	Fingernail Clam	A	6	8
Taeniopterygidae	Stonefly	N	1	2
Tipulidae	Crane Fly	L	1	3
Tricorythidae	Crawling Mayfly	N	19	4

Taxonomic Name	Common Name	Life Stage	# in Subsample	Biotic Index
Turbellaria	Flatworm	A	5	4
	Stream Health **Fair**		**Family Biotic Index**	**5.49**
Sampled - 6/2/2005				
	REP: 1			
Acariformes	Water Mite	A	1	4
Baetidae	Small Mayfly	L	12	4
Caenidae	Crawling Mayfly	N	1	7
Ceratopogonidae	Biting Midge	L	1	6
Chironomidae	Midge	P	20	6
Chironomidae	Midge	L	122	6
Cyclopoida	Fish Lice	A	3	8
Empididae	Dance Fly	L	1	6
Ephemerellidae	Mayfly	N	2	1
Heptageniidae	Stream Mayfly	N	1	4
Hydropsychidae	Net-spinning Caddisfly	L	4	4
Nematoda	Thread Worm	A	1	-1
Oligochaeta	Aquatic Worm	A	83	8
Philopotamidae	Finger-net Caddisfly	L	1	3
Simuliidae	Black Fly	L	1	6
	Stream Health **Poor**		**Family Biotic Index**	**6.59**
Sampled - 6/12/2006				
	REP: 1			
Acariformes	Water Mite	A	1	4
Baetidae	Small Mayfly	N	2	4
Chironomidae	Midge	P	5	6
Chironomidae	Midge	L	177	6
Cyclopoida	Fish Lice	A	1	8
Elmidae	Riffle Beetle	L	1	4
Erpobdellidae	Leech	A	1	10
Hydropsychidae	Net-spinning Caddisfly	L	4	4
Oligochaeta	Aquatic Worm	A	7	8
Simuliidae	Black Fly	L	3	6
Sphaeriidae	Fingernail Clam	A	1	8
	Stream Health **Fairly Poor**		**Family Biotic Index**	**6.04**
Sampled - 6/7/2007				
	REP: 1			
Acariformes	Water Mite	A	3	4
Baetidae	Small Mayfly	N	8	4
Chironomidae	Midge	P	8	6
Chironomidae	Midge	L	112	6
Corixidae	Water Boatmen	A	1	5
Cyclopoida	Fish Lice	A	67	8
Daphniidae	Water Flea	A	3	8
Elmidae	Riffle Beetle	A	3	4
Elmidae	Riffle Beetle	L	1	4
Empididae	Dance Fly	L	2	6
Empididae	Dance Fly	P	1	6
Ephemerellidae	Mayfly	N	1	1
Heptageniidae	Stream Mayfly	N	3	4
Hydropsychidae	Net-spinning Caddisfly	L	15	4
Leptoceridae	Long-horned Caddisfly	L	1	4
Oligochaeta	Aquatic Worm	A	33	8
Ostracoda	Seed Shrimp	A	1	8
Simuliidae	Black Fly	L	1	6

Taxonomic Name	Common Name	Life Stage	# in Subsample	Biotic Index
	Stream Health	**Fairly Poor**	**Family Biotic Index**	**6.16**
Sampled - 5/13/2008				
	REP: 1			
Acariformes	Water Mite	A	5	4
Baetidae	Small Mayfly	N	40	4
Caenidae	Crawling Mayfly	N	1	7
Chironomidae	Midge	P	20	6
Chironomidae	Midge	L	112	6
Cyclopoida	Fish Lice	A	21	8
Daphniidae	Water Flea	A	56	8
Elmidae	Riffle Beetle	A	1	4
Elmidae	Riffle Beetle	L	3	4
Ephemerellidae	Mayfly	N	3	1
Erpobdellidae	Leech	A	1	10
Heptageniidae	Stream Mayfly	N	3	4
Hydropsychidae	Net-spinning Caddisfly	L	3	4
Oligochaeta	Aquatic Worm	A	32	8
Perlidae	Stonefly	N	3	1
Philopotamidae	Finger-net Caddisfly	L	1	3
Psephenidae	Water Penny Beetle	L	1	4
Simuliidae	Black Fly	L	13	6
	Stream Health	**Fairly Poor**	**Family Biotic Index**	**6.05**
Sampled - 6/3/2009				
	REP: 1			
Asellidae	Sow Bug	A	2	8
Baetidae	Small Mayfly	N	20	4
Chironomidae	Midge	P	1	6
Chironomidae	Midge	L	141	6
Collembola	Springtail	A	1	5
Corixidae	Water Boatmen	A	2	5
Cyclopoida	Fish Lice	A	6	8
Daphniidae	Water Flea	A	30	8
Elmidae	Riffle Beetle	L	22	4
Elmidae	Riffle Beetle	A	6	4
Ephemerellidae	Mayfly	N	1	1
Erpobdellidae	Leech	A	2	10
Heptageniidae	Stream Mayfly	N	4	4
Hydropsychidae	Net-spinning Caddisfly	L	24	4
Nematoda	Thread Worm	A	5	-1
Oligochaeta	Aquatic Worm	A	70	8
Ostracoda	Seed Shrimp	A	1	8
Simuliidae	Black Fly	L	3	6
Talitridae	Sideswimmer	A	1	8
Tricorythidae	Crawling Mayfly	N	2	4
Turbellaria	Flatworm	A	1	4
	Stream Health	**Fairly Poor**	**Family Biotic Index**	**6.24**
Sampled - 5/27/2010				
	REP: 1			
Acariformes	Water Mite	A	8	4
Baetidae	Small Mayfly	N	12	4
Caenidae	Crawling Mayfly	N	1	7
Ceratopogonidae	Biting Midge	L	1	6
Chironomidae	Midge	P	43	6
Chironomidae	Midge	L	199	6
Cyclopoida	Fish Lice	A	2	8

Taxonomic Name	Common Name	Life Stage	# in Subsample	Biotic Index
Elmidae	Riffle Beetle	A	1	4
Elmidae	Riffle Beetle	L	1	4
Ephemerellidae	Mayfly	N	1	1
Heptageniidae	Stream Mayfly	N	1	4
Hydropsychidae	Net-spinning Caddisfly	L	7	4
Nematoda	Thread Worm	A	1	-1
Oligochaeta	Aquatic Worm	A	76	8
Ostracoda	Seed Shrimp	A	1	8
Simuliidae	Black Fly	L	1	6
Sphaeriidae	Fingernail Clam	A	1	8
	Stream Health	**Fairly Poor**	**Family Biotic Index**	**6.38**

Sampled - 6/6/2011

REP: 1

Acariformes	Water Mite	A	1	4
Baetidae	Small Mayfly	N	4	4
Chironomidae	Midge	P	31	6
Chironomidae	Midge	L	245	6
Elmidae	Riffle Beetle	A	1	4
Elmidae	Riffle Beetle	L	4	4
Ephemerellidae	Mayfly	N	1	1
Erpobdellidae	Leech	A	2	10
Heptageniidae	Stream Mayfly	N	3	4
Hydropsychidae	Net-spinning Caddisfly	L	19	4
Hydrozoa	Hydra	A	1	5
Nematoda	Thread Worm	A	1	-1
Oligochaeta	Aquatic Worm	A	20	8
Simuliidae	Black Fly	L	1	6
Sphaeriidae	Fingernail Clam	A	2	8
	Stream Health	**Fairly Poor**	**Family Biotic Index**	**6.02**

Sampled - 5/15/2012

REP: 1

Acariformes	Water Mite	A	9	4
Baetidae	Small Mayfly	N	6	4
Caenidae	Crawling Mayfly	N	1	7
Capniidae	Stonefly	N	1	1
Chironomidae	Midge	L	177	6
Chironomidae	Midge	P	30	6
Elmidae	Riffle Beetle	A	2	4
Elmidae	Riffle Beetle	L	7	4
Ephemerellidae	Mayfly	N	5	1
Glossiphoniidae	Leech	A	1	8
Glossosomatidae	Caddisfly	L	3	0
Helicopsychidae	Snail-case Caddisfly	L	1	3
Heptageniidae	Stream Mayfly	N	8	4
Hydropsychidae	Net-spinning Caddisfly	L	5	4
Hydroptilidae	Micro-caddisfly	L	1	4
Nematoda	Thread Worm	A	8	-1
Oligochaeta	Aquatic Worm	A	41	8
Philopotamidae	Finger-net Caddisfly	L	3	3
Psephenidae	Water Penny Beetle	L	1	4
Psychomyiidae	Tube-making Caddisfly	L	1	2
Sphaeriidae	Fingernail Clam	A	1	8
Tipulidae	Crane Fly	L	1	3
Trichoptera	Caddisfly	P	3	-1
	Stream Health	**Fairly Poor**	**Family Biotic Index**	**5.97**

Taxonomic Name	Common Name	Life Stage	# in Subsample	Biotic Index
North Thames River	**Gibbons Park, Upstream of Footbridge**			
	Site code: TF15	UTM X: 478414	UTM Y: 4760639	
Sampled - 10/14/2005				
	REP: 1			
Acariformes	Water Mite	A	6	4
Ancylidae	Limpet	A	3	6
Chironomidae	Midge	P	6	6
Chironomidae	Midge	L	77	6
Elmidae	Riffle Beetle	A	1	4
Elmidae	Riffle Beetle	L	6	4
Helicopsychidae	Snail-case Caddisfly	L	1	3
Heptageniidae	Stream Mayfly	N	29	4
Hydropsychidae	Net-spinning Caddisfly	L	44	4
Limnephilidae	Northern Caddisfly	L	1	4
Nematoda	Thread Worm	A	2	-1
Oligochaeta	Aquatic Worm	A	4	8
Philopotamidae	Finger-net Caddisfly	L	2	3
Psephenidae	Water Penny Beetle	L	1	4
Psychomyiidae	Tube-making Caddisfly	L	4	2
Rhyacophilidae	Primative Caddisfly	L	1	0
Sphaeriidae	Fingernail Clam	A	16	8
Taeniopterygidae	Stonefly	N	3	2
Tipulidae	Crane Fly	L	2	3
Tricorythidae	Crawling Mayfly	N	12	4
Turbellaria	Flatworm	A	3	4
	Stream Health	**Fair**	**Family Biotic Index**	**5.09**

Benthic Samples were obtained using a Rapid Bioassessment Protocol developed by the United States Environmental Protection Agency and modified by Dr. Robert Bailey of the University of Western Ontario Zoology Department. A representative section of stream is selected, incorporating a riffle if present, and sampled by moving upstream along a diagonal transect, dislodging and capturing invertebrates with a .5 mm mesh "D"- frame net. Samples are preserved in the field and analyzed in the lab to randomly select a 100 bug subsample which is identified to the Family taxonomic level.

The biotic index is a value assigned to benthic invertebrate taxa indicating their pollution sensitivity and tolerance on a scale from 0 to 10. Lower numbers indicate pollution sensitivity and high numbers tolerance. A value of -1 indicates that no biotic index value has been assigned to these taxa.

The Family Biotic Index is the weighted average of the biotic index and number of bugs in each taxa in the sample. The water quality ranges for the FBI values are as follows: < 4.25 = Excellent; 4.25 - 5.00 = Good; 5.00 - 5.75 = Fair; 5.75 - 6.50 = Fairly Poor; 6.50 - 7.25 = Poor; and > 7.25 = Very Poor.

Report prepared - Monday, July 08, 2013

UTRCA Benthic Water Quality Sampling Summary

STREAM NAME	LOCATION	DATE	FBI	QUALITY
North Thames River	Downstream of Black Friars Bridge, accessed from Cummings Ave.			
Site code TF14	UTM X Coordinate: 478959 UTM Y Coordinate: 4759451			
		10/20/2004	5.26	Fair
		10/25/2004	5.49	Fair
		6/2/2005	6.59	Poor
		6/12/2006	6.04	Fairly Poor
		6/7/2007	6.16	Fairly Poor
		5/13/2008	6.05	Fairly Poor
		6/3/2009	6.24	Fairly Poor
		5/27/2010	6.38	Fairly Poor
		6/6/2011	6.02	Fairly Poor
		5/15/2012	5.97	Fairly Poor
North Thames River	Gibbons Park, Upstream of Footbridge			
Site code TF15	UTM X Coordinate: 478414 UTM Y Coordinate: 4760639			
		10/14/2005	5.09	Fair

Biotic indices are values assigned to benthic invertebrate taxa indicating their pollution sensitivity and tolerance on a scale from 0 t
Lower numbers indicate pollution sensitivity and high numbers tolerance. The Family Biotic Index (FBI) is the weighted average of
biotic index and number of bugs in each taxa in the sample. The water quality ranges for the FBI values are as follows: < 4.25 =
Excellent; 4.25 - 5.00 = Good; 5.00 - 5.75 = Fair; 5.75 - 6.50 = Fairly Poor; 6.50 - 7.25 = Poor; and > 7.25 = Very Poor.

Monday, July 08, 2013