



211 Eliza Street, Arthur Environmental Impact Study

Prepared for:
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211 Eliza Street, Arthur Environmental Impact Study

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained in June 2020 by Sarah Properties Ltd. to complete an Environmental Impact Study (EIS) for a proposed residential development at 211 Eliza Street in Arthur, Ontario.

NRSI was originally retained to complete an EIS at this subject property in April 2018 by the previous landowners of the property. Field studies were completed in 2018 and 2019. The land was later sold and purchased by Sarah Properties Ltd. This EIS is a continuation of works originally started in association with the previous proponents and with planning services provided by MHBC Planning Ltd.

For the purposes of this report, the term “subject property” refers to the lands owned by the proponent including the area where the development is proposed to occur, legally described as 211 Eliza Street, Village of Arthur, County of Wellington. The subject property is approximately 16ha in area and is located at the south end of Eliza Street, north of Wellington Road 102 and east of Highway 6, on the southeast side of the Village of Arthur (Map 1). The subject property consists almost entirely of annual row crop agricultural land, with hedgerow trees around the perimeter and a cultural meadow on the west side of the property. A barn was present on the west side of the property until relatively recently, having been removed in September 2017 (Altena, personal communication 2018). A single laneway currently provides access to the property from Eliza Street, ending where the barn once stood.

The Conestogo River runs to the south and east of the subject property. Its associated slopes and floodplain, regulated by the Grand River Conservation Authority (GRCA), encroach into the subject property; these areas are designated as Core Greenlands in the County of Wellington’s Official Plan (OP). The river corridor and its associated slopes and floodplain thus create potential development constraints on the subject property. According to Ontario Regulation 150/06 Grand River Conservation Authority: Regulation of Development, Interference with Wetland and Alterations to Shorelines and Watercourses, development within GRCA-regulated lands is prohibited unless it can be demonstrated through an EIS that the existing natural features and functions will not be negatively impacted. Similarly, the County of Wellington requires an EIS for any development within or adjacent to the Greenlands system to demonstrate that the

development conforms to the applicable protective policies (e.g., Sections 5.4.3, 5.5.1, 5.5.3 of the OP) to the satisfaction of the County and other regulatory agencies.

Technical studies, relevant to other aspects of the development, such as planning and engineering, have been prepared by the project consulting team and have been used to supplement the natural feature characterization and assess potential impacts to the form and function of natural features. The consulting team is comprised of:

- GSP Group Inc. – planning
- RJ Burnside - functional servicing and hydrogeology studies, stormwater management, water balance, and
- CMT Engineering – geotechnical and slope stability investigation

This report contains the detailed findings of the EIS including the characterization of existing natural features based on the results of background review and original field surveys, the identification of any natural feature constraints in association with land use policy designations, and the assessment of potential impacts and mitigation measures associated with details of the proposed development. This impact study has been developed in accordance with the County of Wellington's OP (2019) and the GRCA EIS Guidelines (2005).

This report summarizes the work completed and includes background species information for the study area, the results of original field surveys including reptiles and amphibians, breeding birds, mammals, vegetation communities, and vascular flora and tree inventories. This report includes identification of the sensitivity and significance of natural features within the study area and any potential constraints associated with details of the proposed development. An analysis of impacts and recommendations are also provided.

1.1 Proposed Undertaking

The proposed development at 211 Eliza Street is a residential neighbourhood that will include a mixture of single-family detached lots, townhouses, and two apartment buildings. There will be two entrances to this proposed subdivision including a major access road connection from Eliza Street and a connection to the Eastridge Landing Subdivision to the north connecting to Schmidt Drive.

1.2 Project Scoping

Natural features are located just outside of the subject property boundary, therefore a larger study area was considered to inform this EIS. Henceforth, the term “study area” refers to the subject property and the surrounding lands to the east and west of the subject property, up to and including Conestogo River, and to the south up to Wellington Road 109. Additional information was collected and reviewed for these surrounding lands, and some field studies were conducted within this area where possible. This study area is considered sufficient to characterize the neighbouring natural features that may be influenced by on-site development within the subject property. Map 1 shows the natural features contained within the study area. The study area is located within Wellington County, within the Grand River Watershed, in Ecoregion 7E.

In order to determine a study approach for the 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. Background information on the natural environmental features within the study area was gathered from the following sources:

- Grand River Conservation Authority (GRCA)
- Natural Heritage Information Centre (NHIC) database (MNRF 2018a)
- Government of Canada SARA Registry (Government of Canada 2016)
- Ontario SAR List (MNRF 2018b)
- Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al. 2008)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2017)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Butterfly Atlas (Jones et al. 2013)
- Ontario Odonate Atlas (MNRF 2018c)

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 17NJ35 from the OBBA). These initial species lists were used to guide the scope and type of wildlife field surveys required as outlined in the following sections.

A Terms of Reference (TOR) was prepared by NRSI and distributed to Wellington County and the GRCA on January 17, 2019. The approved TOR and associated comments from reviewing agencies are provided in Appendix I.

1.2.1 Species at Risk and Species of Conservation Concern Screening

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 2018b). 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 the *Species at Risk Act* (SARA) under Schedule 1 they are protected by the federal Act, but not provincially by the ESA.

A preliminary screening exercise was conducted on these species to identify which species have suitable habitat within the study area. This involved cross-referencing the preferred habitat for reported SAR (MNRF 2018b, OMNR 2000) against habitats known to occur within the subject property or adjacent properties. This was completed to ensure that the potential presence of all SAR and SCC within the study area was adequately assessed in this EIS. The preliminary SAR/SCC screening tables can be found in the TOR (Appendix I). Final results of the SAR and SCC screening exercise, based on original field surveys and habitats present, are provided in Appendix II.

1.2.2 Significant Wildlife Habitat Screening

Based on background information review and desktop analysis, a preliminary screening for potential Significant Wildlife Habitat (SWH) was completed within the study area.

This review compared site conditions with criteria set in the SWH Ecoregion 7E Criterion Schedule (OMNRF 2015) to determine the presence of any candidate SWH. The preliminary SWH screening tables can be found in the TOR (Appendix I). Full results of the SWH screening exercise, based on original field surveys, are provided in Appendix III.

1.3 Relevant Policies, Legislation, and Planning Studies

Table 1 provides an overview of policies that were considered and which informed the field program and analysis. This section of the report was used to guide the assessment of specific implications of these policies to the proposed development.

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation	Description	Project Relevance
Provincial Policy Statement (OMMAH 2020).	- Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS (OMMAH 2014). - 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 (MNRF 2010) and the Significant Wildlife Habitat Technical Guide (MNRF 2000) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	- The following natural features afforded consideration within the PPS were identified within the study area, including: - Significant Woodland (not on subject property); - Significant Valleyland (not on subject property); - Candidate Significant Wildlife Habitat (not on subject property); and - Potential habitat for endangered and threatened species (not on subject property).
<i>Endangered Species Act</i> , 2007	- The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. - The ESA prohibits killing, harming, harassing or capturing Species at Risk (SAR) and protects their habitats from damage and destruction.	Based on the background review and SAR/SCC screening, no regulated SAR were identified as potentially occurring within the subject property.
Migratory Birds Convention Act (Canadian Wildlife Service 2013)	- The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. - The schedule of on-site work must consider MBCA windows, with timing of	The timing of construction activities, especially vegetation clearing and site grading must have

Policy/Legislation	Description	Project Relevance
	breeding bird season typically occurring between May 1 and July 31, however, this is a guideline, since the MBCA applies to nesting bird species. • “Incidental take” is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service (CWS).	consideration for the MBCA.
Canadian <i>Fisheries Act</i> , 1985	• Proposed amendments to the Fisheries Act were introduced in 2018 to restore lost protections and incorporate modern safeguards. On August 28, 2019, the new, "modernized" Fisheries Act came into force and includes new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. • The modernized Act provides protection for all fish and fish habitat and prohibits the harmful alteration, disruption or destruction of fish habitat • The Department of Fisheries and Oceans Canada's (DFO) Fish and Fish Habitat Protection Program ensures compliance with relevant provisions under both the Fisheries Act and the Species at Risk Act. The program reviews proposed works, undertaking and activities that may impact fish and fish habitat. • Works that are proposed in and around certain types of waterbodies may not require DFO review. Likewise, if proponents can follow all specified measures to protect fish and fish habitat outlined by DFO, review may not be necessary.	• The proposed approach to stormwater management must have consideration for fish and fish habitat within the Conestogo River.
Fish and Wildlife Conservation Act, 1997	• The FWCA provides protection for certain bird species, not protected under the MBCA (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (<i>Vulpes vulpes</i>) and Striped Skunk (<i>Mephitis mephitis</i>).	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites for furbearing mammals.
County of Wellington Official Plan (2019)	• Within Core Greenlands, development and site alteration shall not be permitted within Provincially Significant Wetlands, woodlands, steams and valleylands, or in significant habitat of threatened or endangered species,	• Core Greenlands and hazard lands are located adjacent to the subject property. An Environmental Impact Assessment is required.

Policy/Legislation	Description	Project Relevance
	except in accordance with provincial and federal requirements. • Certain uses shall be permitted if there are no negative impacts on significant features and functions and no significant negative impacts on other Greenland features or functions. Hazardous lands policies of Section 5.4.3 must be met. • If development is proposed in the Greenland system or on adjacent lands, the developer must identify the features potentially impacted by the development, prepare an environmental impact assessment and consider enhancement of the natural area where appropriate/reasonable, and address requirements of Environmental Impact Assessments in Section 4.6.3. • Development must not negatively impact groundwater recharge or discharge, impart groundwater or surface water quality, or negatively impact the municipal groundwater supply.	
GRCA Regulation 150/06 (2015)	• Regulation issued under <i>Conservation Authorities Act</i>, R.S.O. 1990. • Through this regulation, the GRCA has the responsibility to regulate activities in natural and hazardous areas (i.e. areas in and near rivers, streams, floodplains, wetlands, and slopes). • GRCA requires that an EIS be undertaken in accordance with their <i>EIS Guidelines and Submission Standards for Wetlands</i> where development is proposed within 120m of PSW or 30m of non-PSW (GRCA 2005). • Development, interference, or alteration within a Regulated Area may be permitted where it can be demonstrated that there are no adverse hydraulic or fluvial impacts on rivers, creeks, streams, or watercourses.	• GRCA regulates Conestoga River and the associated floodplain which is located directly adjacent to the subject property. • Permitting from the GRCA must be obtained for proposed works within their regulated areas.

2.0 Field Methods

A comprehensive, multi-season field program was developed and detailed in the TOR (Appendix I). The field work program was initiated in April 2018. A total of 10 field visits were carried out between April 2018 and April 2019 to complete a variety of field surveys which are described below and summarized in Table 2. An additional field visit was completed on September 14, 2020 to determine the crop and survey the edge of cultivation. The locations of monitoring stations are shown on Map 2. Surveys conducted were undertaken in accordance with provincial and local guidance documents, as described below.

During the field work program, all observations of mammals, herpetofauna, butterflies, dragonflies, and damselflies were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e. tracks, scats, dens, nests etc.)

Table 2. Field Survey Summary

Survey Type	Protocol	Date (2018 ¹)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Ecological Land Classification	Lee et. al (2008)	May 15	1715-2000	21	2	40	None	A. Dean K. MacLellan
		July 19	1000-1200	19	1-2	0	None	K. Ellis J. Turgeon
		November 8	0950-1130	3	3	95	Light snow	K. Ellis K. MacLellan
Vascular Flora Inventory (Spring)	Systematic search by ELC polygon	May 15	1715-2000	21	2	40	None	A. Dean K. MacLellan
Vascular Flora Inventory (Summer)	Systematic search by ELC polygon	July 19	1000-1200	19	1-2	0	None	K. Ellis J. Turgeon
Vascular Flora Inventory (Fall)	Systematic search by ELC polygon	November 8	0950-1130	3	3	95	Light snow	K. Ellis K. MacLellan
Tree Inventory	N/A	April 16, 2019	0845-1530	2	1	90	Light rain/snow	J. Lance K. MacLellan
		April 30, 2019	1000-1600	5	2	80	None	K. Ellis
Breeding Bird Surveys	OBBA (2001)	May 30	0650-0719	16	2	0	None	D. Riley S. Hofstetter
		June 11	0630-0700	11	2	0	None	D. Riley N. Schueder
Bat Habitat Assessments	OMNRF (2016 and 2017)	April 27	1800-1925	12	1	100	Rain	D. Frey C. Poulsen
		July 19	1000-1200	19	1	15	None	J. Turgeon
Bat Exit Surveys	MNRF (2014)	June 20	2000-2215	21	2	50	None	K. MacLellan J. Turgeon
		June 26	1940-2220	20	2	80	None	K. MacLellan N. Schueder
Anuran Surveys	BSC 2009	April 27	2050-2110	7	1	1	None	D. Frey C. Poulsen

Survey Type	Protocol	Date (2018 ¹)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Snake and Turtle Visual Encounter Surveys		May 15	2100-2130	13	1	10	None	K. MacLellan A. Dean
		June 20	2130-2245	21	2	50	None	K. MacLellan J. Turgeon
	Systematic search throughout subject property while conducting other surveys	May 15	1715-1900	20	2	45	None	K. MacLellan A. Dean
		May 30	0719-0750	17	2	0	None	D. Riley S. Hofstetter
		June 11	0702-0745	11	1	0	None	D. Riley N. Schueder

¹ 2018 unless otherwise stated.

2.1 Vegetation Surveys

2.1.1 Vegetation Community Delineation

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

2.1.2 Vascular Flora Inventory

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

2.1.3 Tree Inventory

A comprehensive tree inventory was undertaken documenting all trees that are ≥ 10 cm DBH within 5m of the subject property. The methods used for this inventory are detailed in the Tree Inventory and Preservation Plan (Appendix IV), along with a discussion of tree removal, compensation and protection.

2.2 Breeding Bird Surveys

Two breeding bird surveys were completed between sunrise and 10:00 hrs in suitable weather conditions. Surveys consisted of point counts and a walking transect within the subject property. All visual and auditory observations of birds at, and between monitoring stations, were recorded and evidence of breeding was collected as per the standard Ontario Breeding Bird Atlas (OBBA) methodology (BSC et al. 2001).

2.3 Herpetofauna Surveys

2.3.1 Anuran Call Surveys

Three evening anuran (frog and toad) call surveys were conducted following the Marsh Monitoring Program protocol (BSC 2009). The first survey was conducted at two monitoring stations (ANR-001 and ANR-002). On the second survey, an additional monitoring station (ANR-003) was added to provide additional coverage of potentially suitable habitat.

2.3.2 Snake and Turtle Visual Encounter Surveys

Three targeted surveys were conducted during appropriate weather conditions (cool and sunny, no precipitation) to observe snakes and turtles. The subject property was systematically searched for snakes and turtles while conducting other surveys.

2.4 Bat Surveys

2.4.1 Bat Habitat Assessment

Leaf-on and leaf-off bat habitat assessments were conducted to determine the presence of suitable habitat for SAR bat species. Evaluation methods followed the MNRF Guelph District's guidance document, *Survey Protocol for Species at Risk Bats within Treed Habitats* (OMNRF 2017).

2.4.2 Bat Exit Surveys

Two nights of bat exit surveys were conducted in June 2018 in order to determine presence of SAR bats at the trees determined to be potentially suitable. The exit surveys were performed according to the MNRF Guelph District's guidance document *Use of Buildings and Isolated Trees by Species at Risk Bats – Survey Methodology* (MNRF 2014). During the first exit survey visit, it was discovered that the large limb containing a cavity on 1 of the identified trees had naturally fallen. As a result, this tree no longer presented suitable habitat and was not surveyed. The 2 remaining trees, a White Ash (*Fraxinus americana*) and a Silver Maple (*Acer saccharinum*), were thus monitored on the two survey nights. The location of these 2 trees is shown on Map 2.

3.0 Existing Conditions

3.1 Soils, Terrain and Drainage

Background information indicates that the dominant soil type found within the study area is clay loam (Hoffman et al. 1963). Wellington County contains important agricultural soils that are imperfectly drained and sit on gently undulating upland areas where surface runoff is slow and internal drainage is moderate (Hoffman et al. 1963). CMT Engineering's geotechnical site investigation revealed that the site is underlain by a variety of soil types which include sandy silt, clayey sandy silt, clayey silt, and sand (CMT Engineering 2020). Soil sampling results during NRSI's ELC field investigations indicated a subsurface stratigraphy that is generally comprised of loam overlaying a silty clay loam. Heavy clay was encountered at a depth of 0.7m. A localized erosional area along the Conestogo River valley occurring at or near the subject property's east boundary, at the approximate location of the 'Oversteep' slope valley on Map 1, was observed by NRSI staff.

The subject property is located in close proximity to Conestogo River, which runs to the south and the west of the subject property. The confluence of Brandy Creek and the Conestogo River is located approximately 150m from the southern edge of the subject property. There is a drainage split across the site, with the east portion draining towards the river and the remainder draining south-west and discharging to the river further downstream.

Areas of the subject property were identified as recharge areas for groundwater (RJ Burnside 2020a). Groundwater flows from the eastern side of the subject property towards Conestogo River to the east. On the western side, groundwater flows west and southwest towards Conestogo River. RJ Burnside had monitoring wells placed for a period of 1 year and found that seasonally high groundwater levels ranged from 0.14-3.02m below the ground surface.

3.2 Vegetation

3.2.1 Vegetation Communities

The study area consists of a human-altered landscape mosaic, with fragmented natural areas, agricultural land, residential buildings, and roadways. The Conestogo River and its associated floodplain and riparian areas are associated with the natural features within the study area. At the time of field surveys, the subject property consisted almost

entirely of row crop agriculture (corn in 2018). It was cultivated/plowed as of September 2020. Deciduous forest, cultural woodland, coniferous plantation, meadow marsh, and cultural meadow exist within and adjacent to the subject property. A barn structure was formerly located at the Eliza Street entrance to the property. Hedgerows occur around much of the property's perimeter. A summary of ELC communities identified within the study area is provided in Table 3 and shown on Map 3.

Table 3. Vegetation Communities Identified within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
Forest		
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite	This treed community exists on the east side of the subject property and extends off-site. It occurs as a tableland feature at the top of the Conestogo River valley, and slopes steeply towards the river. <u>Canopy</u>: American Elm (<i>Ulmus Americana</i>), Green Ash (<i>Fraxinus pennsylvanica</i>) and Sugar Maple (<i>Acer saccharum</i>) <u>Sub-canopy</u>: White Ash (<i>Fraxinus americana</i>), Hawthorn (<i>Crataegus</i> spp.), White Elm and Green Ash <u>Understorey</u>: Choke Cherry (<i>Prunus virginiana</i> ssp. <i>virginiana</i>), Hawthorn spp. and White Ash <u>Groundcover</u>: White Avens (<i>Geum canadense</i>), Wild Strawberry (<i>Fragaria virginiana</i>), and Field Horsetail (<i>Equisetum arvense</i>)
FOD7-3	Fresh – Moist Willow Lowland Deciduous Forest Type	This treed community exists off-site to the southwest and is associated with low-lying habitat of the Conestogo River. <u>Canopy</u>: Crack Willow (<i>Salix fragilis</i>), American Elm, Green Ash <u>Sub-canopy</u>: Manitoba Maple (<i>Acer negundo</i>), Trembling Aspen (<i>Populus tremuloides</i>), Green Ash <u>Understorey</u>: Wild Black Currant (<i>Ribes americanum</i>), European Buckthorn (<i>Rhamnus cathartica</i>), Green Ash <u>Groundcover</u>: Moneywort (<i>Lysimachia nummularia</i>), Field Horsetail, Woolly Blue Violet (<i>Viola sororia</i>)
Cultural		
CUM1	Mineral Cultural Meadow Ecosite	This open community is located in several locations within and adjacent to the subject property. <u>Canopy</u>: n/a <u>Sub-canopy</u>: Hawthorn, Common Apple (<i>Malus pumila</i>), Scots Pine <u>Understorey</u>: Bell's Honeysuckle (<i>Lonicera x bella</i>), Multiflora Rose (<i>Rosa multiflora</i>), Wild Red Raspberry (<i>Rubus idaeus</i> ssp. <i>strigosus</i>)

		<u>Groundcover</u>: Smooth Brome (<i>Bromus inermis</i>), Orchard Grass (<i>Dactylis glomerata</i>), Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Canada Goldenrod (<i>Solidago canadensis</i>)
CUW1	Mineral Cultural Woodland Ecosite	This woodland community exists in several locations within the study area, occurring in the uplands adjacent to the Conestogo River. <u>Canopy</u>: Scots Pine, White Ash, American Elm <u>Sub-canopy</u>: Hawthorn, White Ash, Scots Pine <u>Understorey</u>: Choke Cherry (<i>Prunus virginiana</i>), Hawthorn, Multiflora Rose, Alternate-leaved Dogwood (<i>Cornus alternifolia</i>) <u>Groundcover</u>: Smooth Brome, Tall Goldenrod (<i>Solidago altissima</i>), Field Horsetail A distinct habitat inclusion exists within: Red Pine Coniferous Plantation (CUP3-1), and is dominated by Red Pine (<i>Pinus resinosa</i>), Scots Pine (<i>Pinus sylvestris</i>), Hawthorn spp., and Herb-robert (<i>Geranium robertianum</i>)
Wetland		
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type	This vegetation community occurs off-site and is associated with the Conestogo River riparian corridor. <u>Canopy</u>: n/a <u>Sub-canopy</u>: Manitoba Maple, Crack Willow <u>Understorey</u>: Red-osier Dogwood (<i>Cornus stolonifera</i>), Green Ash <u>Groundcover</u>: Reed Canary Grass (<i>Phalaris arundinacea</i>), Bitter Nightshade (<i>Solanum dulcamara</i>), Dark-green Bulrush (<i>Scirpus atrovirens</i>)
Other		
Hedgerow		Much of the subject property is bordered by hedgerows. These are dominated by White Cedar (<i>Thuja occidentalis</i>), White Spruce (<i>Picea glauca</i>), Scots Pine, Manitoba Maple, Norway Maple (<i>Acer platanoides</i>), Silver Maple (<i>Acer saccharinum</i>), Sugar Maple (<i>Acer saccharum</i> ssp. <i>saccharum</i>), and Hawthorn. Refer to the Tree Inventory and Preservation Plan for more information on the hedgerow trees within the subject property.

3.2.2 Vascular Flora

Detailed multi-season vegetation inventories conducted during the spring, summer, and fall resulted in the identification of 103 species in ELC polygons identified within the study area. A complete list of species observed by ELC community is provided in Appendix V.

There were no SAR or SCC vegetation species reported from the vicinity of the study area based on available background information. NRSI biologists did not observe any SAR/SCC vegetation species.

3.2.3 Tree Inventory

In total, 186 trees of 15 species were inventoried. Of the trees inventoried as assessed, 143 (76.8%) are native species and 42 (22.6%) are non-native species. The TIPP (Appendix IV) includes detailed results of the tree inventory and a discussion of tree removal, pruning, compensation, and protection.

3.3 Wildlife

3.3.1 Breeding Birds

A total of 93 bird species are reported from the 10 x 10km OBBA square that overlaps with the study area (BSC et al. 2008). 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. A total of 54 of these species was documented within the study area during the field surveys, of which 24 species exhibited signs of breeding, such as males singing, females carrying food or nest materials, and the presence of fledged young. A complete list of bird observations is provided in Appendix V.

In total, 7 significant bird species are known from the 10 x 10km atlas square that overlaps with the subject property based on OBBA records or other background data (BSC et al. 2008, MNRF 2018b). Based on results of the SAR and SCC screening (Appendix II), possible habitats within the study area were identified as suitable for the following bird species: Chimney Swift (*Chaetura pelagica*), Eastern Wood-pewee (*Contopus virens*), Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Wood Thrush (*Hylocichla mustelina*), Bobolink (*Dolichonyx oryzivorus*), and Eastern

Meadowlark (*Sturnella magna*). Bobolink and Eastern Meadowlark were observed exhibiting signs of breeding during breeding bird surveys, however, these observations were off-property. There is no suitable breeding habitat for Bobolink or Eastern Meadowlark on the subject property. Chimney Swift and Barn Swallow was observed flying over the subject property. No significant bird species with suitable habitat present exhibited signs of breeding on the subject property.

In total, 19 regionally significant bird species were observed within the study area and off the subject property, during field surveys. Willow Flycatcher (*Empidonax traillii*), Baltimore Oriole (*Icterus galbula*), and Savannah Sparrow (*Passerculus sandwichensis*) were the only species which exhibited breeding behavior, with singing males detected during breeding bird surveys.

3.3.2 Herpetofauna

According to the Ontario Amphibian and Reptile Atlas, 6 species of herpetofauna are reported from the vicinity (approximately 10km) of the study area. Of these 6 species, Snapping Turtle (*Chelydra serpentina serpentina*) is the only species considered of special concern. NRSI biologists observed 2 herpetofauna species within the study area: Northern Green Frog (*Lithobates clamitans melanota*) and Spring Peeper (*Pseudacris crucifer*). Table 4 provides a summary of the results of anuran call surveys conducted by NRSI in 2018.

Table 4. Anuran Call Survey Results

Station	Date	Spring Peeper Call Abundance
ANR-001	April 27	-
	May 15	-
	June 20	-
ANR-002	April 27	-
	May 15	1(1)
	June 20	-
ANR-003	-	-
	May 15	1(2)
	June 20	-

*Call abundance refers to the Marsh Monitoring Programs call codes (Bird Studies Canada 2009).

Call abundance: Call Code (number of individuals)

Station 003 was added on the second visit to provide additional coverage of potentially suitable habitat and was thus not surveyed on the first night.

Amphibian breeding habitat is absent from the subject property, as is turtle basking, foraging and nesting habitat. A complete list of herpetofauna reported from the study area is included in Appendix V.

3.3.3 Butterflies

According to the Ontario Butterfly Atlas (Jones et al. 2017), 5 butterfly species are known to occur within the 10 x 10km atlas square that overlaps with the study area, 1 of which is identified as regionally significant. NRSI biologists observed 4 species during surveys completed within the study area: Least Skipper (*Ancyloxypha numitor*), Spicebush Swallowtail (*Papilio troilus*), Cabbage White (*Pieris rapae*), and Monarch (*Danaus plexippus*), a species of Special Concern both provincially and federally. A complete list of species observed is provided in Appendix V.

Appendix II (SAR screening) provides summaries of significant butterfly species reported in the study area vicinity, their current status ranks, and preferred habitats. Based on field surveys conducted, only Monarch was confirmed within the study area by NRSI. Common Milkweed (*Asclepias syriaca*), the larval foodplant for Monarch, was found scattered throughout the meadow communities on and adjacent to the subject property. No other significant insect species were documented within the subject property.

3.3.4 Odonata

According to the Ontario Odonata Atlas (MNRF 2018c), no Odonata species are known to occur within the 10 x 10km atlas square that overlaps with the study area. This does not mean that there are no Odonata species in the area; it means no observations of Odonata species have been reported to the Ontario Odonata Atlas Database for that atlas square. NRSI biologists observed 3 species during surveys completed within the study area: Ebony Jewelwing (*Calopteryx maculata*), Twelve-spotted Skimmer (*Libellula pulchella*), and Blue Dasher (*Pachydipax longipennis*). These three odonate species are common throughout the province. A complete list of species observed is provided in Appendix V.

Based on results of the SAR and SCC screening (Appendix II), no Odonata species were identified as having suitable habitat within the study area.

3.3.5 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 40 mammal species are reported from within 10km of the study area. In total, of 8 of these species, or evidence of these species, were observed by NRSI biologists within the study area. These included species commonly found within urban, woodland, and agricultural environments: Eastern Cottontail (*Sylvilagus floridanus*), Groundhog (*Marmota monax*), Muskrat (*Ondatra zibethicus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Red Squirrel (*Tamiasciurus hudsonicus*), Northern Raccoon (*Procyon lotor*), Red Fox (*Vulpes vulpes*), and White-tailed Deer (*Odocoileus virginianus*). Appendix V provides a complete list of mammal species reported from the study area.

During the bat leaf-off assessment, 3 trees around the perimeter of the subject property contained cavities that were determined to provide potential bat habitat, including habitat for SAR bats. No leaf clusters were found during the leaf-on assessment that were considered to provide potential roosting habitat specifically for Tri-colored Bat (*Perimyotis subflavus*), which roost in clusters of live or dead foliage (OMRF 2017b). No bats were observed to exit from either of the two trees monitored for SAR bat presence.

4.0 Significance and Sensitivity of Natural Features

This section of the report provides an overview of the important natural heritage features in the study area and analysis of policies related to these features as per guidelines from Wellington County's Official Plan (2019) and GRCA (2015). The overview and analysis has been informed through available background information and the results of original field surveys habitats. The discussion has been broken up into the following two categories as they pertain to Wellington County's Greenlands System: Core Greenlands and Other Greenlands. The OP states that the Greenlands System must be maintained or enhanced; activities that diminish or degrade the essential functions of the Greenlands Systems are prohibited (County of Wellington 2019). Restoration and enhancement of the Greenlands System is encouraged when possible and reasonable (County of Wellington 2019). Development and site alteration is not permitted in the floodway of a river.

4.1 Core Greenlands

The Wellington County OP (2019) has mapped the natural features and floodplain surrounding Conestogo River as Core Greenlands (Map 1). Core Greenlands include wetlands, habitat of endangered or threatened species and fish habitat, and hazardous lands. The wetland community and GRCA hazard lands in this location make up the Core Greenlands on the surrounding lands.

4.1.1 Unevaluated Wetlands

Within the study area on lands adjacent to the subject property there is a wetland community (Reed-canary Grass Mineral Meadow Marsh Type) associated with Conestogo River and its floodplain (see Map 4). The Wellington County OP (2019) and GRCA (2015) require protection of unevaluated wetlands when development would seriously impair the future ecological function. All wetlands and their associated areas of interference are regulated by GRCA. The area of interference for wetlands greater than or equal to 2ha in size is defined as all lands within 120m of the wetland feature. Any development within a wetland or within the area of interference of a wetland requires a permit from the GRCA.

4.1.2 Habitat of Endangered and Threatened Species

Observations of regulated SAR within the study area are limited to Chimney Swift, Bank Swallow, Bobolink, and Eastern Meadowlark. As described in Section 3.3.1 suitable

breeding habitat for these species have not been identified on the subject property, as discussed in the SAR/SCC Screening Tables in Appendix II.

4.1.3 Hazardous Lands

The steep slopes and floodplain associated with Conestogo River, as mapped by GRCA, are considered Hazardous Lands (Map 4). The 100 year stable top of slope is shown on Map 4. Development should be directed away from unsafe areas that could pose a risk to public health, safety, or property caused by Natural Hazards (County of Wellington 2019). Development and site alteration is not permitted within the floodway of a river/stream (County of Wellington 2019).

4.2 Other Greenlands

Other Greenland features have not been mapped on or adjacent to the subject property by the OP (County of Wellington 2019). However, NRSI has identified the following features within the study area that are considered Greenlands features: woodlands, valleylands, and wildlife habitat (County of Wellington 2019).

4.2.1 Woodlands

The OP (County of Wellington 2019) defines woodlands that are 1ha or greater within an Urban System as significant. Significant woodlands are to be protected from development or site alterations which would negatively impact the feature or its ecological functions (County of Wellington 2019). Several woodland communities surround the subject property within and adjacent to the floodplain of Conestogo River, as shown on Map 4. An assessment of significance as per the OP is not provided in this report given that all woodland communities are to be retained and will have appropriate buffers, as discussed in Section 5 and shown on Map 5.

4.2.2 Valleylands

As per Section 5.5.3 of the OP, valleylands are protected from site alterations which would negatively impact the valleyland or its ecological functions (County of Wellington 2019). Mapping of valleylands is not provided in the OP. The PPS (2020) and the OP (County of Wellington 2019) defines valleylands as follows:

A natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year

Section 8.3 of the Natural Heritage Reference Manual (NHRM) (OMNR 2010) discusses the identification of valleys and the process for determining the physical boundaries. For well-defined valleys, the physical boundary is generally defined by the stable top of slope (OMNR 2010). The 100 year stable top of slope for the valleylands on and adjacent to the subject property is shown on Map 4. Natural communities, including woodlands, wetlands, and meadows, are found within and surrounding this valleyland and there is some evidence of erosion occurring adjacent to the subject property on the slopes of the river.

An assessment of significance as per the PPS is not provided in this report given that the natural features within and surrounding the valley and their functions will be maintained, as discussed further in Section 5.

4.2.3 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNRF considers significant in Ontario, as well as criteria to identify these habitats (OMNR 2000 and OMNRF 2012). The SWHTG groups SWH into 4 broad categories: seasonal concentration areas; rare vegetation communities and specialized wildlife habitat; habitats of Species of Conservation Concern; and animal movement corridors.

NRSI conducted a screening exercise that utilized general evaluation criteria set out in the SWHTG, Ecoregion 7E Criterion Schedule (OMNRF 2015), to identify the presence of candidate SWH within the subject property. Based on the background information review, desktop analysis, and field studies, there was no SWH identified within the subject property or adjacent lands (Appendix III).

Habitat for Monarch is found marginally within the subject property and adjacent study area. Milkweed plants are spread throughout the natural vegetation communities in the study area. NHIC's species conservation status ranks estimate the risk of a species going extinct or being extirpated. NHIC has assigned Monarch an S-RANK of "S2N, S4B" which indicates that the breeding population is apparently secure and the non-breeding population (i.e. migrating population) is imperiled. Because the breeding population is apparently secure, critical habitats for Monarch are currently only protected

under the SWH type Migratory Butterfly Stopover Areas which is not present within the subject property.

4.2.4 Regionally Significant Species Habitat

Only 3 regionally significant bird species were observed exhibiting signs of breeding on the subject property: Willow Flycatcher, Baltimore Oriole, and Savannah Sparrow. These species are all very common in Ontario and are ranked as S5B. Suitable breeding habitat for Willow Flycatcher is found within the woodland and meadow communities along the edge of the subject property. Suitable breeding habitat is found within the deciduous woodland and floodplain communities along the edge of the subject property for Baltimore Oriole. Suitable breeding habitat for Savannah Sparrow is not present within the study area, given that the species requires large tracts of grassland. Map 4 shows the suitable habitat for regionally significant bird species observed exhibiting signs of breeding on the subject property.

5.0 Impact Analysis

5.1 Proposed Undertaking

The development proposed on the subject property will include a mixture of single-family detached lots, townhouses, and two apartment buildings. There will be two entrances to this proposed subdivision including a major access road connection from Eliza Street and a connection to the Eastridge Landing Subdivision to the north connecting to Schmidt Drive. Map 5 shows the proposed development plans overlaid with significant natural features.

Servicing of the site will be achieved by watermains and storm and sanitary sewers. A connection and discharge point will be located at Eliza Street (RJ Burnside 2020b). A majority of the site will have stormwater conveyed southwest towards Eliza Street, the Conestogo River, and County Road 109, and north towards an existing residential development. A portion of the site drainage will discharge directly to Conestogo River (RJ Burnside 2020b). The ultimate downstream outlet for each drainage catchment is the Conestogo River (RJ Burnside 2020b). An infiltration trench will be utilized to achieve water balance requirements for the site and some quantity control (RJ Burnside 2020b). For further detail on drainage, the reader is referred to the Functional Servicing and Stormwater Management Report by RJ Burnside (2020b).

Proposed grading will match the existing boundary grades. The grading plan is shown on Map 5. Proposed development will remain outside of natural feature boundaries, and there is no proposed grading within natural feature buffers.

5.2 Approach to Impact Analysis

The impact analysis presented in this section is based on the development details submitted as part of the Site Plan Application, including the Draft Plan prepared by BSR&D (Appendix VI) and the functional servicing and stormwater management report prepared by RJ Burnside (2020b). The Tree Inventory and Preservation Report (Appendix IV) was used to assess impacts associated with tree removal. The proposed undertaking is outlined in Section 5.1 above and will result in site grading to the subject property line, vegetation removal and tree removal within the development footprint.

The following is a description of the types of impacts that are discussed:

- Direct impacts to 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 impacts associated with impacts after the development is constructed such as increased use of natural areas.

5.3 Direct Impacts

The approach to identifying and delineating the natural features was aimed at avoiding direct impacts from development on important natural features. Map 5 presents the proposed development layout over the existing natural features showing the direct impacts to natural features including tree removal. These impacts are discussed in more detail below.

5.3.1 Site Grading

Several existing grading constraints influenced and/or governed the grading plans as outlined in the Functional Servicing and Stormwater Report (RJ Burnside 2020b). This includes:

- Matching existing grades around the perimeter of the site, at the outside limit of the swale, to minimize grading and significant earthworks i.e. cut/fill quantities, and provision of adequate cover or proposed services
- Re-grading which will involve directing the runoff away from the proposed development and directing runoff to the outlets that ultimately discharge to Conestogo River.

The removal of one tree will be required to facilitate the proposed development, which is discussed in the following section. Grading will occur during the construction phase of the project and result in permanent cut/fills and vegetation clearing. Areas to be graded/disturbed must be clearly marked using flagging tape, fencing, spray paint, or other signage prior to beginning any activities. Strategies for controlling erosion and sedimentation is discussed further later in Section 5.4 of this report. For detailed grading plans the reader is referred to the Functional Service and Stormwater Report (RJ Burnside 2020b).

5.3.2 Vegetation Removal

A total of 186 trees were inventoried within the study area. As detailed in the TIPP (Appendix IV), the location of these trees was compared to the grading plan and recommended tree removal and retention was discussed.

Of the 186 trees inventoried, 1 is anticipated to be removed to facilitate the proposed development.

The location of the tree proposed for removal is shown in the TIPP (Appendix IV). Tree protection measures are also provided in Appendix IV to limit impacts to adjacent trees proposed for retention. The tree protection fencing (and associated sediment and erosion control fencing) is recommended to be installed at the grading limit line adjacent to existing natural features, as discussed in the TIPP (Appendix IV).

Vegetation should only be cleared where absolutely necessary. Areas to be cleared must be clearly marked using flagging tape, fencing, spray paint, or other signage prior to beginning any clearing activities. Trees will be felled into the area to be cleared to prevent damage to surrounding vegetation. Where possible, tree clearing should take place during winter months while the ground is frozen to reduce the potential for soil compaction and rutting and to avoid potential effects to nests of migratory birds. The removal of trees within the subject properties has the potential to disrupt nesting birds. The Migratory Birds Convention Act (MBCA) identifies a list of migratory bird species that are protected and prohibits the destruction of nests, individuals and activities that would cause an adult bird to abandon a nest (Government of Canada 1994). Tree removal is to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS 2012) which extends from approximately April 1 through August 31. An exception to this rule is for when removals are to occur in simple habitats, such as hedgerows. This is discussed further in Section 5.3.3. Every developer/consultant/contractor is legally obliged to carry out due diligence to protect migratory birds from harm during all construction projects.

In the absence of specific tree compensation guidelines from Wellington County, guidelines for compensation from the Township of Centre Wellington are recommended to be followed. Compensation for the removal of trees is typically required by the Township at a 2:1 ratio that consists of caliper trees, as discussed in the TIPP (Appendix

IV). Compensation plantings are recommended to be installed within the natural feature buffers and detailed landscaping plans should be prepared at the detailed design stage. Buffer plantings are discussed further in Section 5.4.2.

5.3.3 Wildlife and Their Habitats

The proposed development has been designed to avoid direct impacts to the significant natural features on the subject property and to respect recommended buffers, to the extent possible.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing should occur outside the bird nesting season of April 1-August 31 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests, where possible. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*. Nest searches, as a means of mitigation during the core breeding period, may be undertaken in “simple” habitats such as hedgerows, isolated trees, or constructed features (e.g. bridges, barns, etc.) where the potential to observe all active nests is relatively high. As discussed in the TIPP (Appendix IV), a qualified biologist may perform a nest search just prior to the removal activity (less than 48 hours prior) to ensure that nesting birds are not present. The reader is referred to Section 6.1.1 of the TIPP (Appendix IV) for full nest search requirements.

Some of the vegetation proposed to be removed includes hedgerows identified as regionally significant bird species habitat. As discussed in Section 4.2.4, these species are all very common in Ontario and will temporarily avoid the area during construction and likely relocate to appropriate habitat that is maintained or created surrounding the subject property post-development.

As a general means to limit the extent of impacts to wildlife habitat during construction, efforts should be made to clearly demarcate the limits of development, including vegetation cutting and grading boundaries, so as to prevent unnecessary encroachment into the surrounding natural features. These boundaries should be clearly marked using either bright-coloured snow fencing, or silt fencing erected for the purposes of on-site stormwater runoff and erosion control. The location of temporary tree protection fencing,

which will provide protection to areas being retained and tree root zones, is included in the appended Tree Inventory and Preservation Plan (Appendix IV).

No direct impacts to wildlife or their habitats are anticipated as a result of the proposed development.

5.4 Indirect Impacts

For the purposes of the analysis of potential indirect impacts, the following categories are discussed:

- Sediment and erosion
- Buffers
- Management to stormwater quality and quantity
- Indirect impacts to wildlife and their habitats

5.4.1 Sediment and Erosion

Erosion and sediment control was provided as part of the Functional Servicing and Stormwater Report prepared by RJ Burnside (2020b) and follows guidelines set by the Town of Arthur and Township of Wellington North. Prior to any grading or servicing works commencing onsite, erosion and sedimentation control measures shall be implemented. Consistent with recommendations made by RJ Burnside (2020b), the following measures with regards to erosion and sediment control are provided:

- All erosion control measures are to be inspected and monitored, and repairs are to be completed as required
- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any materials from leaving the site
- Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located entirely outside the retained natural features and their buffers, and preferably located away from buffers so as to limit potential to indirectly impact the adjacent natural features.
- To minimize the amount of earth from being tracked onto the roadways, a mud mat should be installed, prior to primary construction occurring.
- Placement of all sediment control fencing where required. This should include erection of heavy-duty silt fences prior to grading or construction adjacent to tree protection areas (in consultation with the environmental consultant(s)). In many cases fencing to protect trees and eliminate sedimentation will coincide.

- Silt fencing will be erected before grading begins to protect adjacent and downstream areas from migration of sediment in overland flow, and in some cases double row fencing may be appropriate next to sensitive natural features.
- All tree protection fencing must be installed prior to site alteration and construction activities, and inspected by a certified arborist or environmental inspector. Where tree protection fencing is not required along construction area limits, other forms of boundary demarcation should be used which may include silt fencing for erosion and sediment control purposes or brightly-coloured snow fencing.
- Placement of topsoil and seeding of all graded areas not subject to active construction within 30 days. A native seed mix, appropriate to the site conditions, should be applied in areas adjacent to existing natural features. It is also recommended that topsoil piles be located away from adjacent natural features and that silt fencing be installed around piles to prevent off-site migration of water-borne sediments.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed.

In the area of localized erosion near the subject property's east end it is recommended the slope stabilization measures, such as restoration plantings of native species, be carried out to reduce the potential for worsening erosion. The details of restoration plantings should be determined at the detailed design stage.

5.4.2 Buffers

Buffers are required for natural heritage features such as woodlands, wetlands, and watercourses to protect them from impacts during and after development. Wetland and woodland buffers are required to protect these features' form and function and protect the species that inhabit them. The outer limit of the buffers determines the outer boundary of the protected natural features and the constraints to guide development activities within the subject property. Development, including any form of construction or grading, will remain outside of the recommended buffer limits to the extent possible (Map 5).

Typical woodland buffers are prescribed based on protecting the trees and their root zones. Wetland and watercourse buffers are required to protect wetland form and function and protect the species that inhabit them.

Unevaluated wetlands, woodlands, and SWH are present within the subject property. Proposed buffers are shown on Map 5. A 30m wetland buffer and a 10m woodland buffer are recommended to protect these features. In addition to providing an adequate

safety buffer, a 6m buffer from the 100 year stable top of slope also provides adequate ecological protection for Conestogo River and valleylands.

There is minor encroachment into the above-mentioned buffers in the form of back of lots and an LID drainage swale. The maximum encroachment into the wetland buffer from back of lots is 12m and from the swale is 10m. The maximum encroachment into the woodland buffer from the back of lots is 4m and from the swale is 2.5m. There is no proposed development within the 100 year stable top of slope 6m buffer. Given that the swale is a LID measure that will be vegetated, there are no significant impacts anticipated from its encroachment into the woodland and wetland buffers and the buffers being provided will be adequate. The swale should be planted with native species. The back of lots will not have any associated grading within the woodland and wetland buffers; rear lot fencing is recommended to discourage encroachment further into the buffers.

There are no anticipated impacts to the ecological form or function of the natural features on or adjacent to the subject property as a result of the proposed development.

It is recommended that native species plantings occur in these buffers to enhance them and provide additional wildlife habitat. A planting plan will need to be established in detail at the detailed design stage and should include suitable shrub and tree species native to the area, along with herbaceous seed mix and removal strategies for invasive species, such as Common Buckthorn (*Rhamnus cathartica*), aiding in a transition to a healthy, dense, native buffer community. Species that provide erosion control are also recommended.

Vegetation should be inspected prior to planting to confirm appropriate species are being supplied and to ensure the initial health and condition of the material. The warranty for all proposed planted material throughout the subject property (shrubs, trees and herbaceous) should be discussed with the County to determine appropriate goals and monitoring requirements. All plants should be inspected by the environmental inspector or biologist prior to being planted within the site. Planted material shall also be inspected by an appropriate inspector at the end of the guarantee period. A monitoring report should be prepared for the County that summarizes the results of the tree

inspection and discusses any action that may be required for dead or dying trees. All tree staking is to be removed just prior to final inspection.

5.4.3 Management of Stormwater Quantity and Quality

The approach to stormwater management for the proposed development is summarized in the following section. The reader is referred to the Functional Servicing and Stormwater Management Report (RJ Burnside 2020b) and the Hydrogeological Assessment (RJ Burnside 2020a) for further details.

The reader is referred to Section 6.1 of the Hydrogeological Assessment (RJ Burnside 2020a) for a discussion of the requirements when encountering groundwater for construction below the water table.

The proposed development will be serviced by municipal water supply and wastewater services, therefore there will be no anticipated impacts to the water balance and local groundwater or surface water quantity and quality conditions as a result of on-site pumping or disposal of wastes (R.J. Burnside 2020b).

The conversion of pervious natural surfaces to impervious surfaces from development decreases infiltration potential and increases runoff with no mitigation measures in place. The following Low Impact Development (LID) mitigation measures are proposed on the subject property (RJ Burnside 2020a):

- Increased topsoil depths to 300 mm thickness in landscaped areas, to increase the soil's water retention capacity and increase infiltration
- Disconnection of roof leaders and discharge of rooftops to pervious areas, to increase infiltration and evapotranspiration potential
- A rear yard infiltration trench along the northern side of the subject property where groundwater levels were found to be the deepest, to increase infiltration
- Side and rear yard swales

R.J. Burnside (2020a) concluded that these LID mitigation measures will achieve 94% of the estimated pre-development infiltration, and therefore there will have no adverse impacts to stormwater quantity. The proposed development will increase infiltration within the subject property by 1,336m³ per year. Stormwater from single and townhouse roofs will be directly discharged onto pervious services and to a proposed infiltration trench that will achieve the water balance requirements for the site and provide quantity

control for some single lots (RJ Burnside 2020b). RJ Burnside (2020a) calculated an increase of potential surface runoff of 56,494m³ per year, with only a portion (2,353m³ per year) going to natural heritage features. Runoff will be directed towards Conestogo River, with an estimated maximum change in water elevation of 0.07m during a storm event (RJ Burnside 2020b). The increased water elevation will be negligible and quantity control measures are not required (R.J. Burnside 2020b). Given the size of Conestogo River, the increase of flow into the river from the proposed development will be negligible. Ripraps may be required in specific areas to mitigate erosion potential (R.J. Burnside 2020b). It is recommended that, at the detailed design stage, there is consideration for any localized impacts on the river at the point release sites due to increases in flow.

Water quality control will be achieved by two oil-grit separators at each outlet from the site which will provide 70% TSS removal (R.J. Burnside 2020a).

5.4.4 Indirect Impacts to Wildlife and their Habitats

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

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

Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located towards the frontage of the subject property (i.e. Eliza St.), where possible. The boundary of this area should be clearly marked.

Increased disturbance caused by excessive noise, dust, vibrations, artificial night-time lighting, and proximity of human presence during construction may cause certain wildlife species to abandon or avoid the area for travel, nesting, roosting or foraging. However, these impacts are anticipated to be minimal, localized, and temporary, and it is expected that displaced wildlife species will return to the vicinity of the subject property following construction.

Excessive noise caused by site preparation and construction activities may cause wildlife to temporarily avoid the area. These noise impacts can be mitigated by restricting the daily timing of construction activities to between 7:00 am and 7:00 pm. It is anticipated that construction will be limited to daytime hours.

Any lighting equipment associated with construction activities should be turned off following cessation of daily construction activities, or at least turned away from the adjacent natural features so as to prevent 'lightwash' of these areas.

During construction activities such as grading, tree clearing and grubbing, dust can potentially result in the following:

- Impacts to vegetation due to increased heat absorption and decreased transpiration,
- Immediate visual impacts.

Impacts due to dust should be mitigated for by moistening areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced.

No impacts to fish or fish habitat are anticipated based on the proposed development and associated storm water management strategy.

Significant impact to wildlife and their habitats is not anticipated if the above monitoring and development procedures are followed.

5.5 Induced Impacts

Induced impacts are described as those that are not directly related to the construction or operation of the facilities in question, but rather arise from the use of the natural areas as a result of the development. The simplest example is increased use of a natural area by residents, feral domestic wildlife, and unauthorized trail/pathway construction.

Once the development is completed, subsequent use of the natural areas by residents is difficult to control. Education with respect to the values and implications of the neighbouring natural areas is one tool that can be used. Fencing along rear lots on the eastern side of the subject property is recommended which would provide the following benefits:

- Prohibit encroachment into natural features
- Prohibit people from walking into the wetland and river and creating ad hoc trails
- Keep trash from blowing into the natural areas
- Prevent garden encroachment or dumping of yard waste into the natural areas

6.0 Recommendations

6.1 Construction and Design Related Mitigation

Construction monitoring is the responsibility of the proponent and is tied to the specific undertaking. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits. Often, an environmental inspector is required to carry out construction monitoring during grading, servicing and building construction. Specific monitoring requirements are to be determined at the detailed design stage.

The following summary of recommendations are provided to ensure that any potential impacts are minimized:

- The boundary of the significant natural features adjacent to the subject property should be clearly delineated in the field and inspected by an on-site Environmental Inspector prior to construction.
- Any limbs or roots of trees to be retained which are damaged during construction should be pruned using appropriate arboricultural techniques. Any hazard trees should be identified by a Certified Arborist or tree professional and removed as warranted.
- Sediment and erosion control measures and tree protection fencing must be installed prior to and maintained during construction.
- Sediment and erosion control fencing to be inspected on a regular basis by an Environmental Inspector or qualified biologist and tree protection fencing to be inspected by a Certified Arborist or qualified other to ensure no root or limb damage during installation.
- The limit of construction should be inspected by a qualified biologist on a regular basis to document any potential negative impacts to natural features (e.g., construction garbage, ineffective boundary markings, etc.).
- Areas of bare soil that are left idle until development, should be re-vegetated within 30 days to prevent erosion of soils and eliminate dust issues.
- Maintenance of machinery during construction should occur at a designated location away from the natural areas on-site.
- No storage of equipment, materials, or fill is to occur within natural features or their associated buffer.
- Trees to be planted as part of compensation should consist of native species and should be planted in accordance with the recommendations for restoration and enhancement, outlined in the Tree Inventory and Preservation Plan for the subject property (Appendix IV).
- Planting native species attractive to pollinators are recommended in gardens and buffer areas to increase habitat for these species.
- No vegetation removal should occur during the breeding bird season (April 1 to August 31), where possible. If removals must occur during this time period nest

surveys will be completed by a qualified biologist and a clearance letter will be prepared for Canadian Wildlife Service.

7.0 Conclusion

NRSI was retained in June 2020 by Sarah Properties Ltd. to complete an Environmental Impact Study (EIS) for a proposed residential development at 211 Eliza Street in Arthur, Ontario. The intent of this report is to characterize important natural features, recommend appropriate buffers, assess potential impacts associated with the development, and propose mitigation measures to eliminate or reduce potential impacts.

The subject property consists almost entirely of annual row crop agricultural land, with hedgerow trees around the perimeter and a cultural meadow on the west side of the property. Natural features are located just outside of the subject property boundary, which are considered Greenlands by Wellington County. Identified natural feature constraints were used to guide the layout of the proposed development and to mitigate the direct displacement of identified features where possible.

Direct impacts associated with this undertaking are associated with grading, and tree and vegetation removal. Recommendations have been made for tree preservation and compensation. A Tree Inventory and Preservation Plan has been prepared which provides recommendations for compensation.

Indirect impacts to water quality and quantity are addressed in the Functional Servicing and Stormwater Management Report prepared by RJ Burnside. This report also includes sediment and erosion controls to avoid indirect impacts to the natural features and will be finalized during the detailed design stage.

Recommendations have been provided to minimize impacts and ensure that mitigative measures are installed and functioning properly. These include recommendations to mitigate direct, indirect, and induced impacts that may arise during the proposed development.

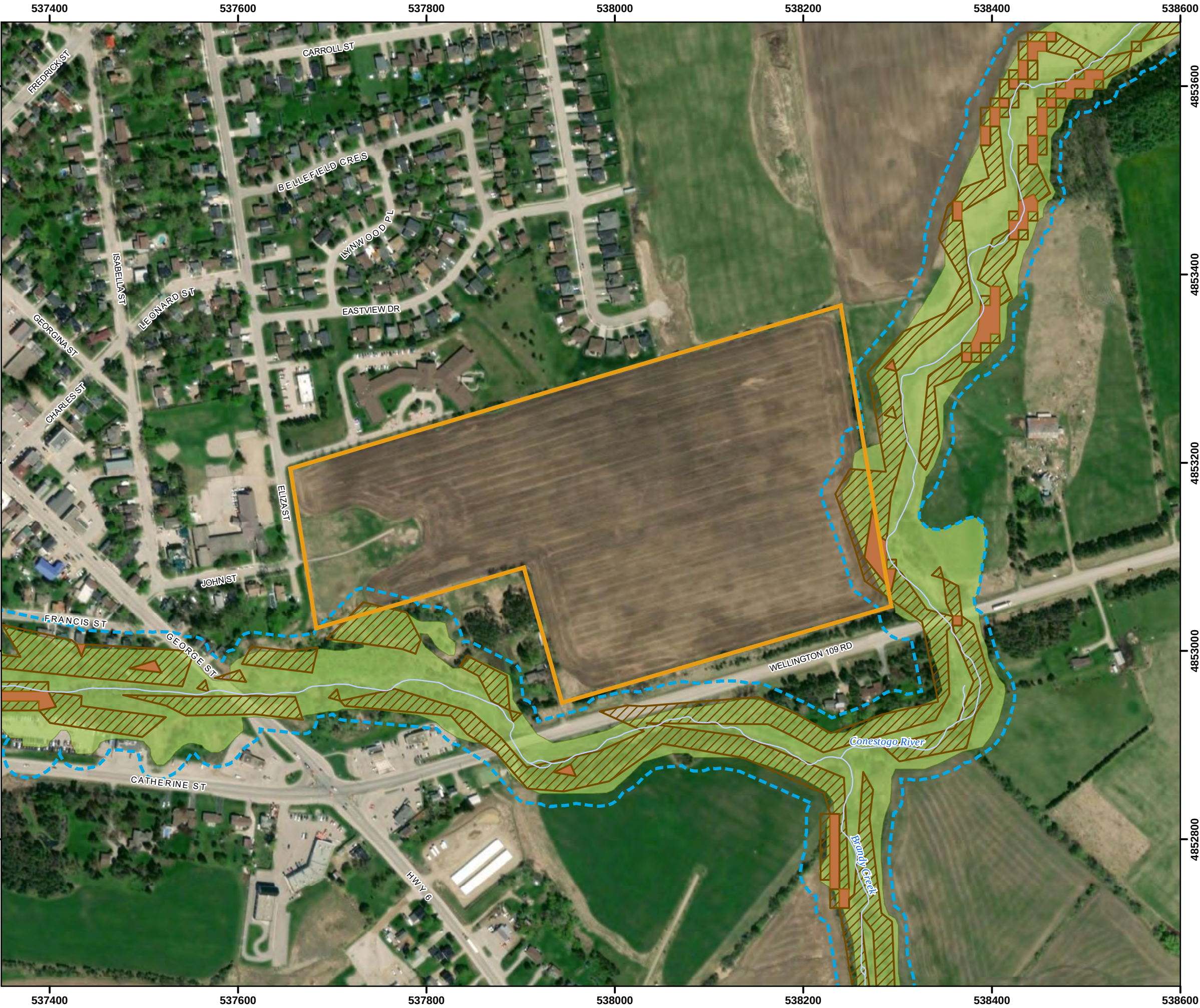
8.0 References

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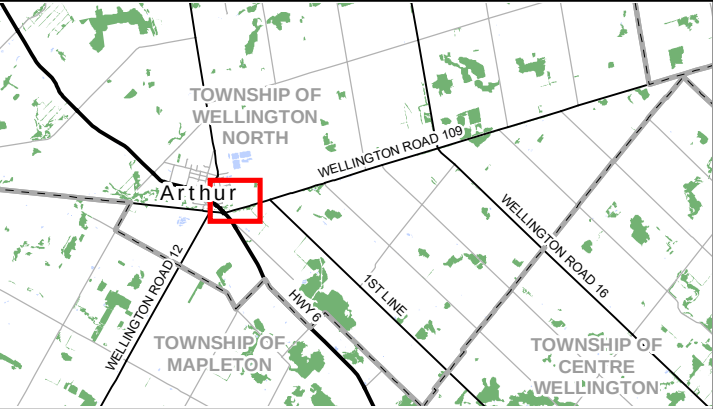
MAPS



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211 Eliza Street, Arthur EIS

Study Area and Natural Features

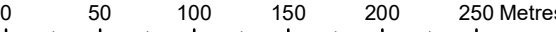


- Legend**
- Subject Property
 - Watercourse (GRCA)
 - Core Greenlands (County of Wellington)
 - Regulation Limit (GRCA)
 - Slope Valley (GRCA)**
 - Oversteep
 - Steep



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Project:2434 Date: October 26, 2020	NAD83 - UTM Zone 17 Size: 11x17" 1:4,017
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Map 2

211 Eliza Street, Arthur EIS

Monitoring Locations

Legend

Subject Property

Anuran Call Survey Location

Cavity Tree - Bat Exit Survey Location

Breeding Bird Point Count

Breeding Bird Transect

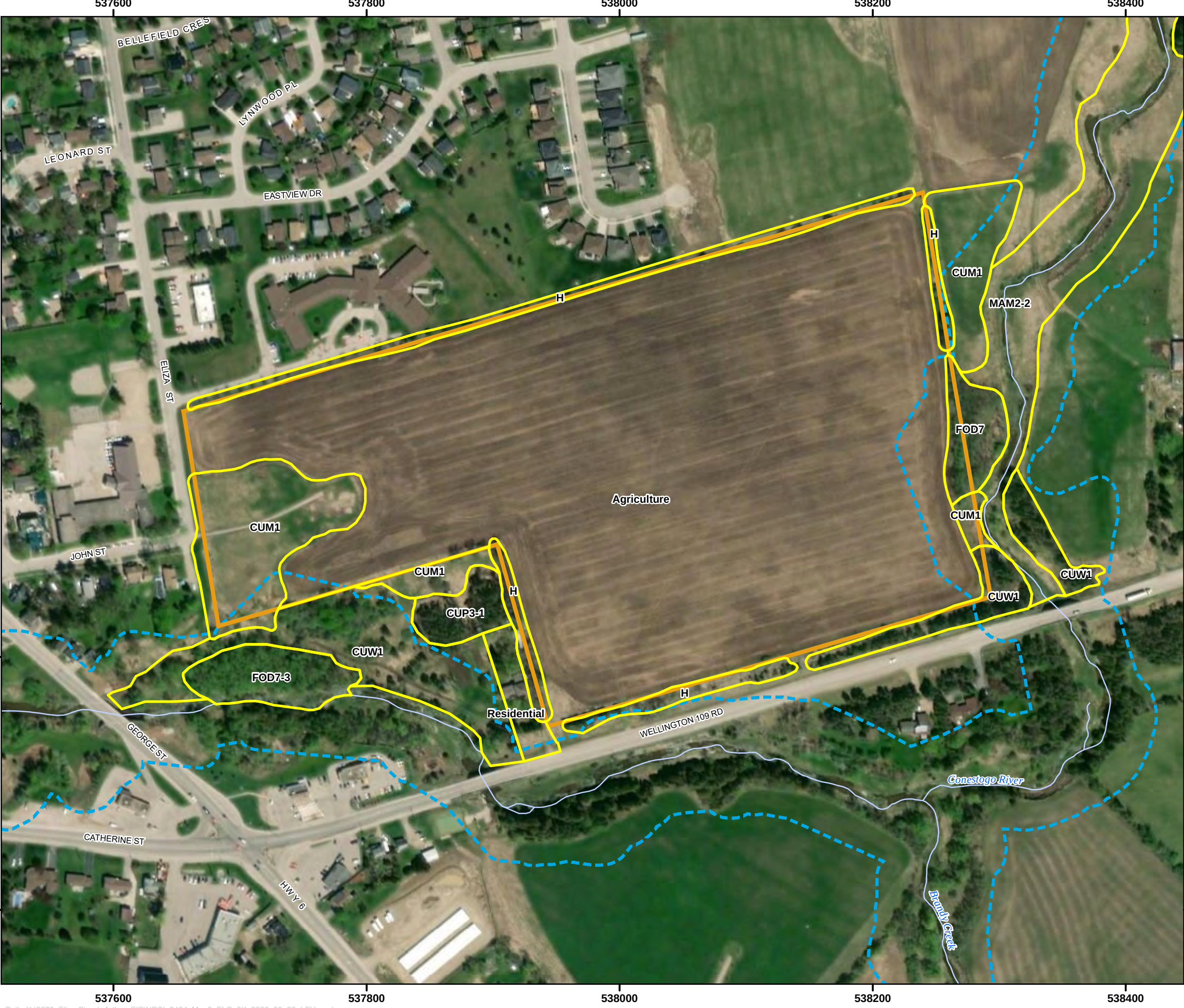
Watercourse (GRCA)

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Aquatic, Terrestrial and Wetland Biologists

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Project: 2434 Date: September 22, 2020	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000
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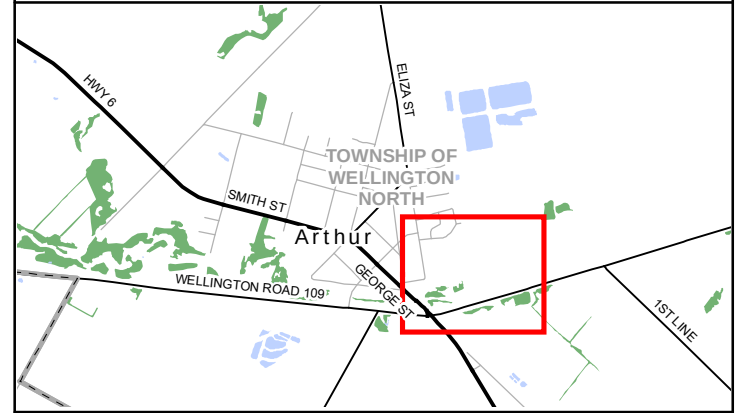
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211 Eliza Street, Arthur EIS

Vegetation Communities



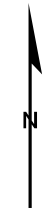
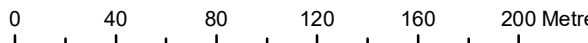
- Legend**
- Subject Property
 - Watercourse (GRCA)
 - Regulation Limit (GRCA)
 - Ecological Land Classification (ELC)
- (CUM1) Mineral Cultural Meadow Ecosite
(CUP3-1) Red Pine Coniferous Plantation Type
(CUW1) Mineral Cultural Woodland Ecosite
(FOD7) Fresh – Moist Lowland Deciduous Forest Ecosite
(FOD7-3) Fresh – Moist Willow Lowland Deciduous Forest Type
(H) Hedgerow
(MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type
Mineral Cultural Woodland Ecosite



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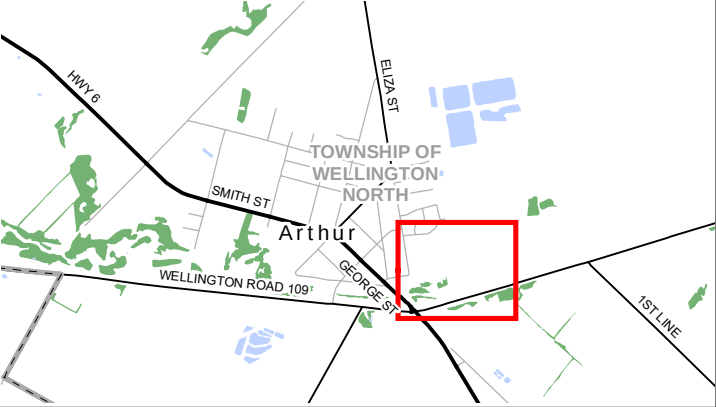
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211 Eliza Street, Arthur EIS
Natural Environment Constraints



Legend

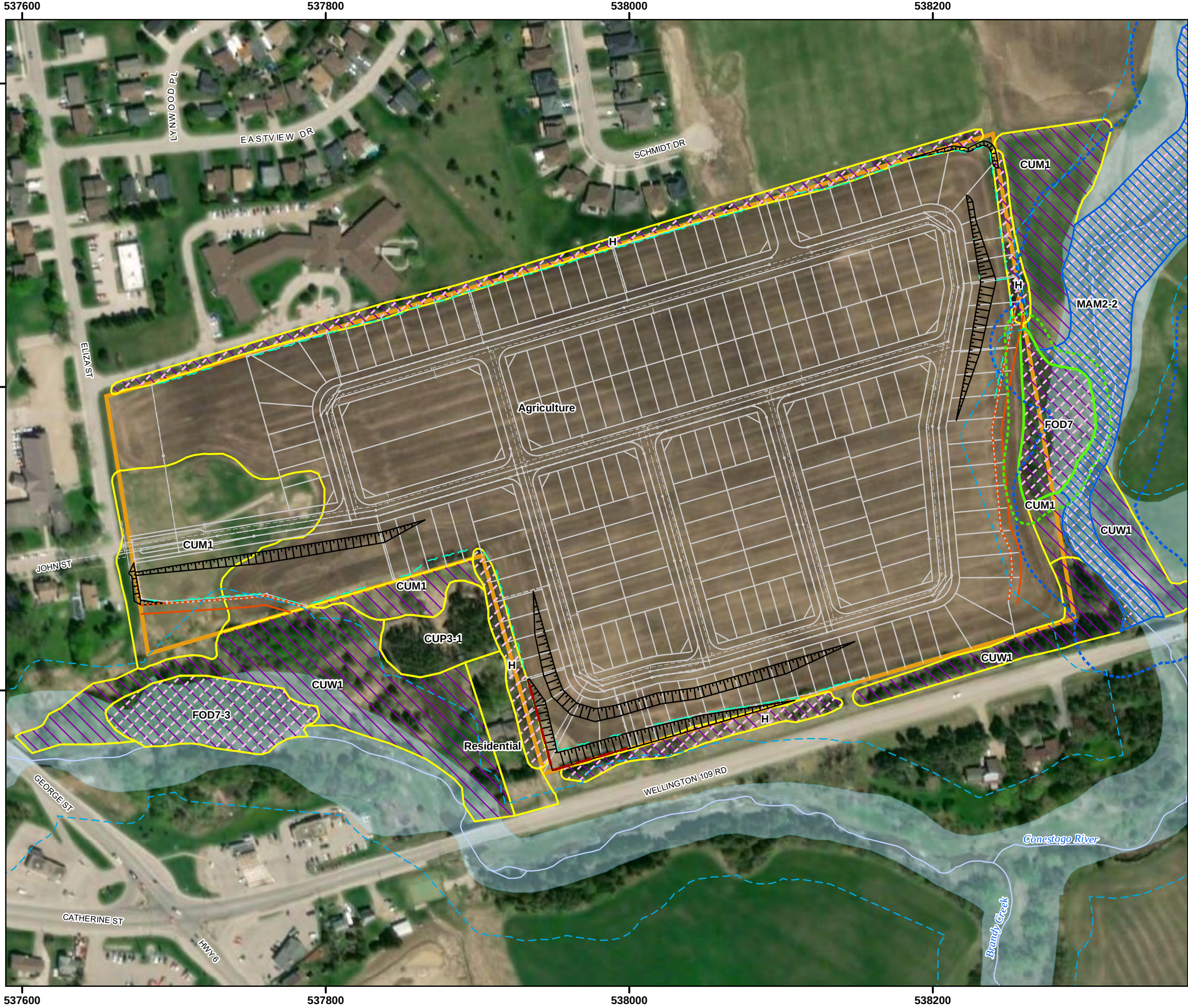
- | | |
|---|---|
| Subject Property | Ecological Land Classification (ELC) |
| Woodland Dripline | (CUM1) Mineral Cultural Meadow Ecosite |
| Woodland Dripline Buffer (10m) | (CUP3-1) Red Pine Coniferous Plantation Type |
| Wetland | (CUW1) Mineral Cultural Woodland Ecosite |
| Wetland Buffer (30m) | (FOD7) Fresh – Moist Lowland Deciduous Forest Ecosite |
| 100yr Stable Top of Slope | (FOD7-3) Fresh – Moist Willow Lowland Deciduous Forest Type |
| 100yr Stable Top of Slope Buffer (6m) | (H) Hedgerow |
| Watercourse (GRCA) | (MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type |
| Floodplain (GRCA) | Mineral Cultural Woodland Ecosite |
| Regulation Limit (GRCA) | |
| Regionally Significant Species Habitat | |
| Baltimore Oriole (<i>Icterus galbula</i>) | |
| Willow Flycatcher (<i>Empidonax traillii</i>) | |



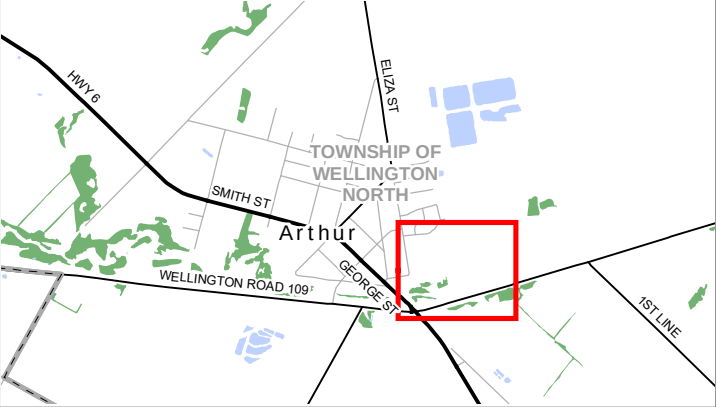
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Project:2076 Date: September 22, 2020	NAD83 - UTM Zone 17 Size: 11x17" 1:2,500
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211 Eliza Street, Arthur EIS Proposed Development



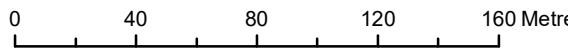
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- | | |
|---|---|
| Subject Property | Ecological Land Classification (ELC) |
| Woodland Dripline | (CUM1) Mineral Cultural Meadow Ecosite |
| Woodland Dripline Buffer (10m) | (CUP3-1) Red Pine Coniferous Plantation Type |
| Wetland | (CUW1) Mineral Cultural Woodland Ecosite |
| Wetland Buffer (30m) | (FOD7) Fresh – Moist Lowland Deciduous Forest Ecosite |
| Proposed Development | (FOD7-3) Fresh – Moist Willow Lowland Deciduous Forest Type |
| Proposed Grading | (H) Hedgerow |
| Proposed Swale | (MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type |
| Proposed Retaining Wall | Mineral Cultural Woodland Ecosite |
| Proposed Servicing | |
| 100yr Stable Top of Slope | |
| 100yr Stable Top of Slope Buffer (6m) | |
| Watercourse (GRCA) | |
| Floodplain (GRCA) | |
| Regulation Limit (GRCA) | |
| Regionally Significant Species Habitat | |
| Baltimore Oriole (<i>Icterus galbula</i>) | |
| Willow Flycatcher (<i>Empidonax traillii</i>) | |



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Project:2076 Date: January 8, 2021	NAD83 - UTM Zone 17 Size: 11x17" 1:2,500
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APPENDIX I
Terms of Reference and Agency Comments

January 16, 2019

Project No. 2076

Lambert and Janna Altena
c/o Dave Aston
540 Bingemans Centre Drive, Suite 200
Kitchener, ON N2B3X9

Dear Mr. Aston

RE: 211 Eliza Street, Arthur Environmental Impact Study – Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide the attached Terms of Reference (TOR) to prepare an Environmental Impact Study (EIS) for a proposed residential development at 211 Eliza Street, Arthur, Ontario.

Due to internal project constraints, the TOR has not yet been finalized, but we are submitting it as it was prepared in April 2018. In order to exercise due diligence and adhere to timing restrictions, the majority of our comprehensive, multi-season field program outlined in the TOR has now been completed. Table 1 below provides a summary of the field surveys that have been completed by NRSI since the initiation of this project. This summary is current as of January 16, 2019. The results of these field surveys, as well as any outstanding surveys addressed in the TOR, will be described in detail within the Environmental Impact Study.

Table 1. Field Survey Summary as of January 16, 2019.

Survey Type	Protocol	Date (2018)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Ecological Land Classification	Lee et. al (2008)	May 15	1715-2000	21	2	40	None	A. Dean K. MacLellan
		July 19	1000-1200	19	1-2	0	None	K. Ellis J. Turgeon
		November 8	0950-1130	3	3	95	Light snow	K. Ellis K. MacLellan
Vascular Flora Inventory (Spring)	Systematic search by ELC polygon	May 15	1715-2000	21	2	40	None	A. Dean K. MacLellan
Vascular Flora Inventory (Summer)	Systematic search by ELC polygon	July 19	1000-1200	19	1-2	0	None	K. Ellis J. Turgeon

Survey Type	Protocol	Date (2018)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Vascular Flora Inventory (Fall)	Systematic search by ELC polygon	November 8	0950-1130	3	3	95	Light snow	K. Ellis K. MacLellan
Breeding Bird Surveys	OBBA (2001)	May 30	0650-0719	16	2	0	None	D. Riley S. Hofstetter
		June 11	0630-0700	11	2	0	None	D. Riley N. Schueder
Bat Habitat Assessments	MNRF (2011, 2016 and 2017)	April 27	1800-1925	12	1	100	Rain	D. Frey C. Poulsen
		July 19	1000-1200	19	1	15	None	J. Turgeon
Bat Exit Surveys	MNRF (2014)	June 20	2000-2215	21	2	50	None	K. MacLellan J. Turgeon
		June 26	1940-2220	20	2	80	None	K. MacLellan N. Schueder
Anuran Surveys	BSC 2009	April 27	2050-2110	7	100	1	None	D. Frey C. Poulsen
		May 15	2100-2130	13	1	10	None	K. MacLellan A. Dean
		June 20	2130-2245	21	2	50	None	K. MacLellan J. Turgeon
General Snake and Turtle Searches	N/A	May 15	1715-1900	20	2	45	None	K. MacLellan A. Dean
		May 30	0719-0750	17	2	0	None	D. Riley S. Hofstetter
		June 11	0702-0745	11	1	0	None	D. Riley N. Schueder

Should you have any questions or comments regarding the Terms of Reference or field survey summary, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.



David Stephenson, M.Sc.,
Senior Biologist / Certified Arborist



Kayla MacLellan, B.Sc.,
Terrestrial and Wetland Biologist

January 16, 2019

Project 2076

Lambert and Janna Altena
c/o Mr. Dave Aston
MHBC Planners
540 Bingemans Centre Drive, Suite 200
Kitchener, ON N2B 3X9

Dear Mr. Aston,

**Re: 211 Eliza Street, Arthur
Environmental Impact Study – Terms of Reference**

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide the following Terms of Reference (TOR) to prepare an Environmental Impact Study (EIS) for a proposed residential development at 211 Eliza Street, Arthur, Ontario (herein called the subject property).

The subject property is approximately 16ha in area and is located at the south end of Eliza Street, north of Wellington Road 102 and east of Highway 6, on the southeast side of the Village of Arthur. The proposed development area is almost entirely agricultural cropland, with hedgerow trees along the border of the property. The southeast corner and a small section of the southwest side of the subject property overlap with the regulation limit associated with the Conestogo River, located to the south and east of the subject property. As such, lands regulated under the Grand River Conservation Authority (GRCA) Regulation 150/06 are present on the subject property. It has also been identified that these areas are closely associated with the County of Wellington's Greenlands system and the southeast corner of the subject property has been designated as Core Greenlands by the County. Due to the presence of Core Greenlands associated with the river corridor within and adjacent to the subject property, and the presence of GRCA-regulated lands, an EIS is required to demonstrate that the proposed development will not negatively impact the significant natural features and ecological functions in accordance with Wellington County's Official Plan (OP) policies and the GRCA's Ontario Regulation 150/06.

The following TOR outlines the steps proposed to complete the EIS for the proposed development within the subject property in accordance with *Grand River Conservation Authority Environmental Impact Study Guidelines and Submission Standards for Wetlands* (GRCA 2005), and Wellington County's Official Plan (County of Wellington, 2017).

Please do not hesitate to contact me if you have any questions or comments regarding the following TOR.

Sincerely,
Natural Resource Solutions Inc.



David Stephenson, M.Sc.,
Senior Biologist / Certified Arborist



Kayla MacLellan, B.Sc.,
Terrestrial and Wetland Biologist

CC: Dave Aston, MHBC Planning
Steven Roorda, R.J. Burnside

211 Eliza Street, Arthur, Ontario
Environmental Impact Study
Terms of Reference
April 08, 2018

Introduction

The subject property is legally described as 211 Eliza Street, Village of Arthur, County of Wellington. The subject property is approximately 16ha in area. The subject property is located at the south end of Eliza Street, north of Wellington Road 102 and east of Highway 6. It is located across Eliza Street from the Mennonite Fellowship building (Map 1).

The subject property consists almost entirely of agricultural land, with hedgerow trees around the perimeter and short grasses on the west side of the property. A barn was present on the west side of the property until recently, having been removed in September 2017 (Altena, personal communication 2018). Available aerial imagery is not recent enough to reflect this. Features that create the on-site natural environment constraints are located off-site. The Conestogo River runs to the south and east of the subject property. Its associated slopes and floodplain encroach into the subject property and these areas are designated as Core Greenlands in the County of Wellington's Official Plan (OP) and are also regulated by the GRCA. The river corridor and its associated slopes and floodplain thus create potential constraints on the subject property. According to Ontario Regulation 150/06 Grand River Conservation Authority: Regulation of Development, Interference with Wetland and Alterations to Shorelines and Watercourses, development within GRCA-regulated lands are prohibited unless it can be demonstrated through an EIS that the existing natural features and functions will not be negatively impacted. Similarly, the County of Wellington requires an EIS for any development within or adjacent to the Greenlands system to demonstrate that the development conforms to the applicable protective policies (e.g., Sections 5.4.3, 5.5.1, 5.5.3 of the OP) to the satisfaction of the County and other regulatory agencies. Within the Core Greenlands designation, development is not permitted in significant habitat of threatened or endangered species except in accordance with federal and provincial requirements. As such, the Greenlands-designated lands also create potential constraints on the subject property. Following preliminary NRSI characterization of the subject lands, potential natural feature constraints associated with potential Species at Risk (SAR), Species of Conservation Concern (SCC) habitat and Candidate Significant Wildlife Habitat (SWH) were also identified, subject to EIS-based field studies.

It is anticipated that the site development at 211 Eliza Street will be maintained outside of the floodplain and will be set back from the slope hazard. A preliminary concept plan was prepared for a pre-application meeting (Appendix I), which will be reviewed with potential modifications made based on the completion of associated studies. The designated Core Greenlands and GRCA-regulated areas should remain undeveloped.

The proposed development on the subject property will include a residential plan of subdivision with park space, and open space on the east side of the subject property where set-back from the river corridor and associated slopes is required.

Associated Studies

To ensure a fulsome analysis of potential environmental impacts and to meet both Wellington County and the GRCA's EIS requirements, associated reporting will be completed by the consulting team to provide detailed information on site topography, drainage, hydrology, soils and hydrogeological conditions. This will supplement the natural characterization reporting to be completed by NRSI and will inform the impact assessment for the EIS. Studies and reports to be completed to inform the EIS will include:

- Planning Justification Report,
- Functional Servicing Report
- Hydrogeology Report,
- Stormwater Management Report,
- Surveying and Topography, and
- Planning (MHBC)

Environmental Impact Study - Scoping

In order to determine a study approach for this EIS, existing natural heritage information was gathered and reviewed to identify key natural heritage features and species that are known or have the potential to occur in the vicinity of the subject property. The following is a description of information that has informed the study approach.

Study Area

A study area that extends beyond the proposed development area will be investigated. For the purpose of this TOR and subsequent EIS, neighbouring lands within 250m of the subject property will be referred to as the study area. This study area is considered sufficient to characterize the neighbouring natural features that may be influenced by on-site development within the subject area. The study area has primarily been considered in regards to desktop screening for potential SAR/SCC and SWH constraints, as it is anticipated that NRSI will not have property access to all of the study area in order to conduct EIS field surveys. Features within the study area have been considered in cases where the occurrence of adjacent significant habitat may require a buffer, development setback or other development constraints that extends onto the subject property.

Collection and Review of Background Information

The following background information sources assisted in guiding the study approach outlined in this TOR:

- Grand River Conservation Authority (GRCA Information Network) (GRCA 2018);
- Natural Heritage Information Centre (NHIC) database (OMNRF 2015a);
- County of Wellington Official Plan (County of Wellington 2017);
- OMNRF SAR list for Wellington County (OMNRF 2016b);
- GRCA Ontario Regulation 150/06 (GRCA 2013);
- Government of Canada SARA Registry (Government of Canada 2016);
- OMNRF Species at Risk in Ontario (OMNRF 2018a);
- Ontario Breeding Bird Atlas (BSC et al. 2008);
- Ontario Herpetofaunal Atlas (Ontario Nature 2017);
- Ontario Odonata Atlas (NHIC 2017);
- Mammal Atlas of Ontario (Dobbyn 1994); and
- Butterflies of Canada (Jones et al 2013)

This background information will be integrated with original data collected by NRSI during the 2018 field surveys to form the characterization component of the EIS.

Review of Potential Significant Species in the Area

A review of background information, including the sources mentioned above, was conducted to determine SAR and SCC that are reported to occur on or adjacent to the subject property and to further inform the scope for the field survey and impact analysis portions of the EIS. SAR are those listed on the Species at Risk in Ontario (SARO) List (OMNRF 2018a), and include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Regulated SAR refer to species listed as Endangered or Threatened, due to the protection afforded to their habitat under the *Endangered Species Act* (ESA).

SCC includes species that are:

- Designated provincially as Special Concern (OMNRF 2018a),
- Assigned a conservation status (S-Rank) of S1 to S3 or SH (i.e. critically imperiled, imperiled, vulnerable, or historical) (OMNRF 2018b),
- Designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2016), but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act (SARA) but not provincially by the ESA.

The screening exercise to determine the potential for SAR and SCC to occur within the subject lands is provided in Appendix II. Based on their associated habitat requirements, 5 species have the potential to occur on the subject property: Butternut (*Juglans cinerea*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*), and Monarch (*Danaus plexippus*). An additional 15 species have the potential to occur in the neighbouring lands: American Gromwell (*Lithospermum latifolium*), Hill's Pondweed (*Potamogeton hillii*), Chimney Swift (*Chaetura pelagica*), Eastern Wood-Pewee (*Contopus virens*), Bobolink (*Dolichonyx oryzivorus*), Barn Swallow (*Hirundo rustica*), Bank Swallow (*Riparia riparia*), Eastern Meadowlark (*Sturnella magna*), Snapping Turtle (*Chelydra serpentina serpentina*), Eastern Ribbonsnake (*Thamnophis sauritus septentrionalis*), Eastern Small-footed Myotis (*Myotis leibii*), Redside Dace (*Clinostomus elongates*), Wavy-rayed Lampmussel (*Lampsilis fasciola*), Black Redhorse (*Moxostoma duquesnei*), and Silver Shiner (*Notropis photogenis*). A total of 20 SAR and SCC thus have the potential to occur within the study area.

In addition to requirements under the *Endangered Species Act*, Section 5.4 of the County OP states that new development and site alteration shall not be permitted within significant habitat of Threatened or Endangered species except in accordance with provincial and federal requirements. Further, new development will not be permitted on lands adjacent to significant habitat for Threatened and Endangered species unless it can be demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Review of Potential Significant Wildlife Habitat (SWH)

The collection and review of background information informed the preliminary screening for potential SWH within the study area. This review compared site conditions with criteria set in the SWH Ecoregion 6E Criterion Schedule (OMNRF 2015b) to determine the presence of any candidate SWH. The results of the SWH screening informed

surveys required to confirm such habitat within or adjacent to the subject property and are appended to this TOR (Appendix III). Based on this screening, 1 habitat feature (Bat Maternity Colonies) has the potential to occur within the subject property; an additional 3 habitats have the potential to occur within the study area (Snake Hibernaculum, Colonially-nesting Bird Breeding Habitat in Banks and Cliffs, and Special Concern and Rare Wildlife Species).

As stated in Section 5.5.1 of the County OP, SWH is considered a form of Greenland designation within the County's Natural Heritage System. Development and site alteration is not permitted in SWH unless it can be demonstrated that the development will not negatively impact the habitat or its ecological functions.

Fish Habitat

The federal Department of Fisheries and Oceans (DFO) is responsible for administering the *Fisheries Act* and its protective policies for fish and fish habitat. Section 5.5.1 of the County OP also prohibits development and site alteration in fish habitat except in accordance with provincial and federal requirements. The Conestogo River and Brandy Creek, which meets the Conestogo River about 150m south of the subject property, provides direct fish habitat within the study area. However, because the concept site development plan will not involve any development activities within or immediately adjacent to the watercourse, no impacts to fish habitat are expected and no DFO review of the proposed development concept are considered necessary.

Field Surveys

The following field studies will be completed to build upon the background information collected and to inform the subsequent impact analysis. Note that certain field studies described below have been completed at the time of writing in order to meet appropriate seasonal survey periods.

Vegetation Community Mapping

Vegetation communities on the subject property will be characterized and mapped using the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Details on the vegetation communities will be recorded including species composition, dominance, uncommon species or features.

Vascular Flora Inventories

A three-season vascular flora inventory will be conducted within each ELC community in spring, summer, and fall 2018. Any rare species or vegetation communities identified and their location(s) will be recorded with a handheld GPS unit.

Tree Inventory

All trees $\geq 10\text{cm}$ diameter at breast height (DBH) on and within approximately 10 to 15m of the development area (where access allows) will be inventoried and assessed by a Certified Arborist. Trees on the subject property will be tagged with a pre-numbered aluminum forestry tag and off-site/private trees will be given a numeric identifier for mapping purposes. As the subject property is almost entirely agricultural land, the only trees expected to contribute to the inventory will be along the boundary of the subject property. The following will be recorded for each tree inventoried:

- Tree tag / identification number,
- Species,

- DBH (cm),
- Crown radius (metres),
- General condition/health (excellent, good, fair, poor, very poor, dead), including characteristics of any cavities from a bat maternity perspective;
- Potential for structural failure (improbable, possible, probable, imminent),
- Tree location (on-site, off-site, boundary trees), and
- General comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development)

Specific searches for Butternut (*Juglans cinerea*) will be undertaken throughout the subject property and adjacent lands (where access is granted), up to 50m, during the tree and vascular flora inventory.

A Tree Inventory and Preservation Plan (TIPP) outlining which trees (if any) are recommended to be retained, removed or transplanted will be prepared by a Certified Arborist and included in the EIS.

Herpetofauna Surveys

Evening surveys for calling anurans (frogs and toads) will be completed 3 times during the amphibian breeding season (late April, May, June) following the Marsh Monitoring Program protocol (BSC 2009). These surveys consist of 3 minute point counts during peak breeding periods to record species calling and their abundance. Surveys will be a minimum of 15 days apart. The first survey was completed on April 27, 2018.

Habitat adjacent to the subject property may provide habitat for 1 federally significant snake species (Eastern Ribbonsnake). Area searches will be conducted in conjunction with other scheduled field surveys to record the presence of snake species within the subject property beginning in May and ending in summer 2018. Habitat adjacent to the subject property may also provide habitat for one federally significant turtle species (Snapping Turtle). Area searches for turtles will also be conducted in conjunction with other scheduled field surveys, from approximately mid-May through June.

Breeding Bird Surveys

Two early morning breeding bird surveys will be completed between late May and early July 2017 in accordance with Ontario Breeding Bird Atlas (OBBA) protocol (OBBA 2001). Surveys will be completed between a half-hour before sunrise and 10:00am. Surveys will be scheduled to occur at least 10 days apart. Surveys will be completed through two point counts and a walking transect within the subject property. The point counts will be stationed at the subject property boundary, adjacent to the off-site natural features. Standard breeding evidence codes will be recorded based on OBBA. Any observations of significant species will be recorded in detail, including their specific observation location(s), observed behaviour and highest level of breeding evidence.

Mammal Surveys

Trees and snags within the subject property have been assessed during the leaf-off period for potential bat maternity colonies. This survey was completed on April 27, 2018. Evaluation methods for maternity colonies were conducted following methods outlined in the Bat and Bat Habitat Surveys of Treed Habitats (OMNRF 2016a) and Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats (OMNRF 2011), which is also referred to by the MNRF for residential development applications. The purpose of this assessment was to identify any snags or trees ≥10cm DBH with suitable cavities and/or loose bark (OMNRF 2014).

This leaf-off assessment found 3 potential bat maternity colony trees, although all of these trees are located on the very edge of the subject property boundary and may be outside of the proposed development footprint. An additional survey will be conducted during the leaf-on period to help inform the potential for Tri-colored Bat habitat. NRSI will consult with the MNRF on necessary next steps to meet the requirements of the *Endangered Species Act*.

In the event that trees which may provide maternity roosts are proposed for removal, bat exit surveys would be conducted following the *Use of Buildings by Little Brown Myotis and Northern Myotis* guidance (OMNRF 2013). Acoustic monitoring would be followed using methods outlined the guideline for *Species at Risk Bat Surveys for Buildings and Isolated Trees* (OMNRF 2014) and through MNRF consultation.

All mammal species will be recorded during field surveys.

Incidental Wildlife

Observations of all wildlife will be recorded during all field surveys including insect species such as butterflies, odonates (dragonflies and damselflies) and bumble bees. In addition to direct observations, any wildlife evidence such as dens, tracks, and scat will be documented.

Impact Assessment

The details of the development plan, including lot layout, stormwater management and grading details, will be reviewed and compared to the existing conditions within the subject property to inform the impact assessment. Any areas of conflict between significant natural features, buffers, etc. and the development plan will be assessed and discussed with the client and options for minimizing impacts will be recommended. The assessment of potential development impacts will be divided into:

- Direct impacts associated with natural feature removal or wildlife displacement caused by the actual proposed 'footprint' of the development.
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality as well as construction-related impacts.
- Induced impacts associated with post-construction stresses on the natural features caused by human habitation and use of the new lots.

A buffer analysis will be undertaken and discussed within the EIS to determine appropriate measures for ensuring that the natural features adjacent to the subject property are not disturbed or negatively impacted.

Recommendations & Monitoring

Recommendations to avoid, or otherwise minimize or mitigate impacts to significant natural features and functions will be made in the EIS. A focus of this EIS will be the County-designated Core Greenlands and GRCA-regulated areas within and adjacent to the subject property. Opportunities for enhancement will be highlighted and recommended as they relate to the subject property. Monitoring recommendations will also be provided where necessary to ensure the effectiveness of recommended

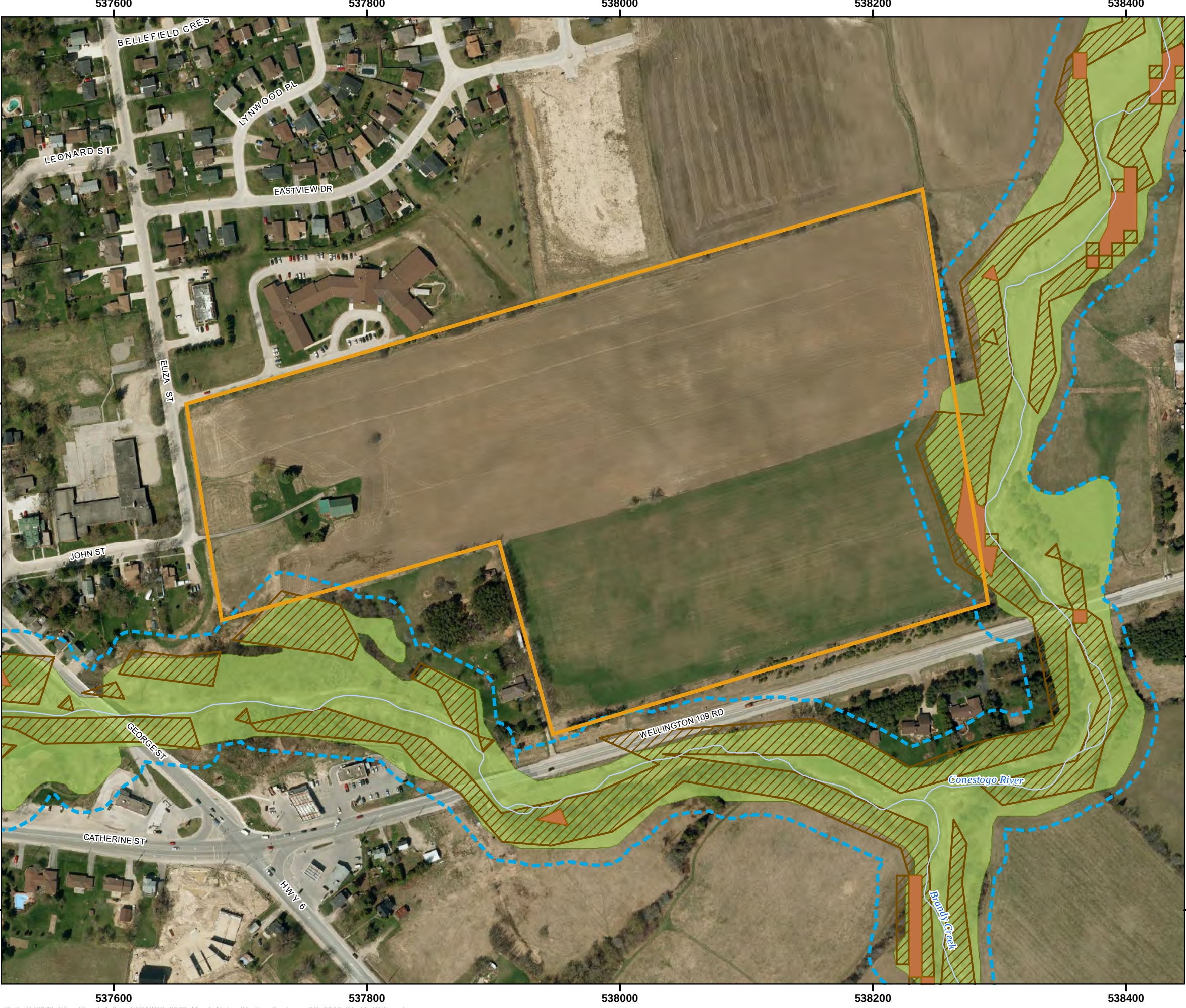
mitigation measures and to track compliance with construction-stage mitigation measures.

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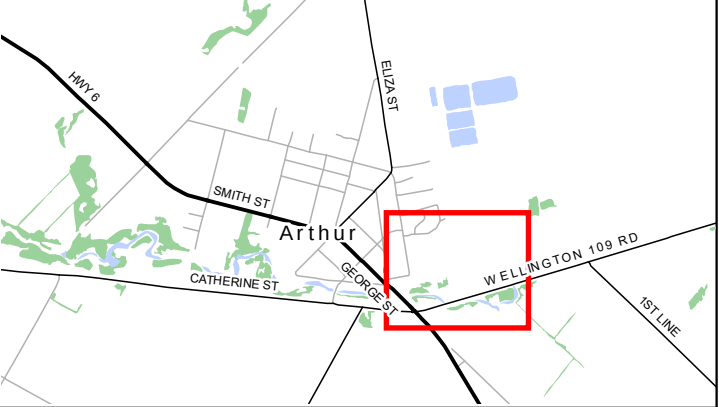
MAP



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211 Eliza Street, Arthur EIS

Natural Heritage Features

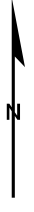
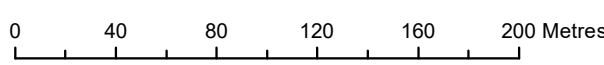


- Legend**
- Study Area
 - Watercourse (GRCA)
 - Core Greenlands (County of Wellington)
 - Regulation Limit (GRCA)
 - Slope Valley (GRCA)**
 - Oversteep
 - Steep



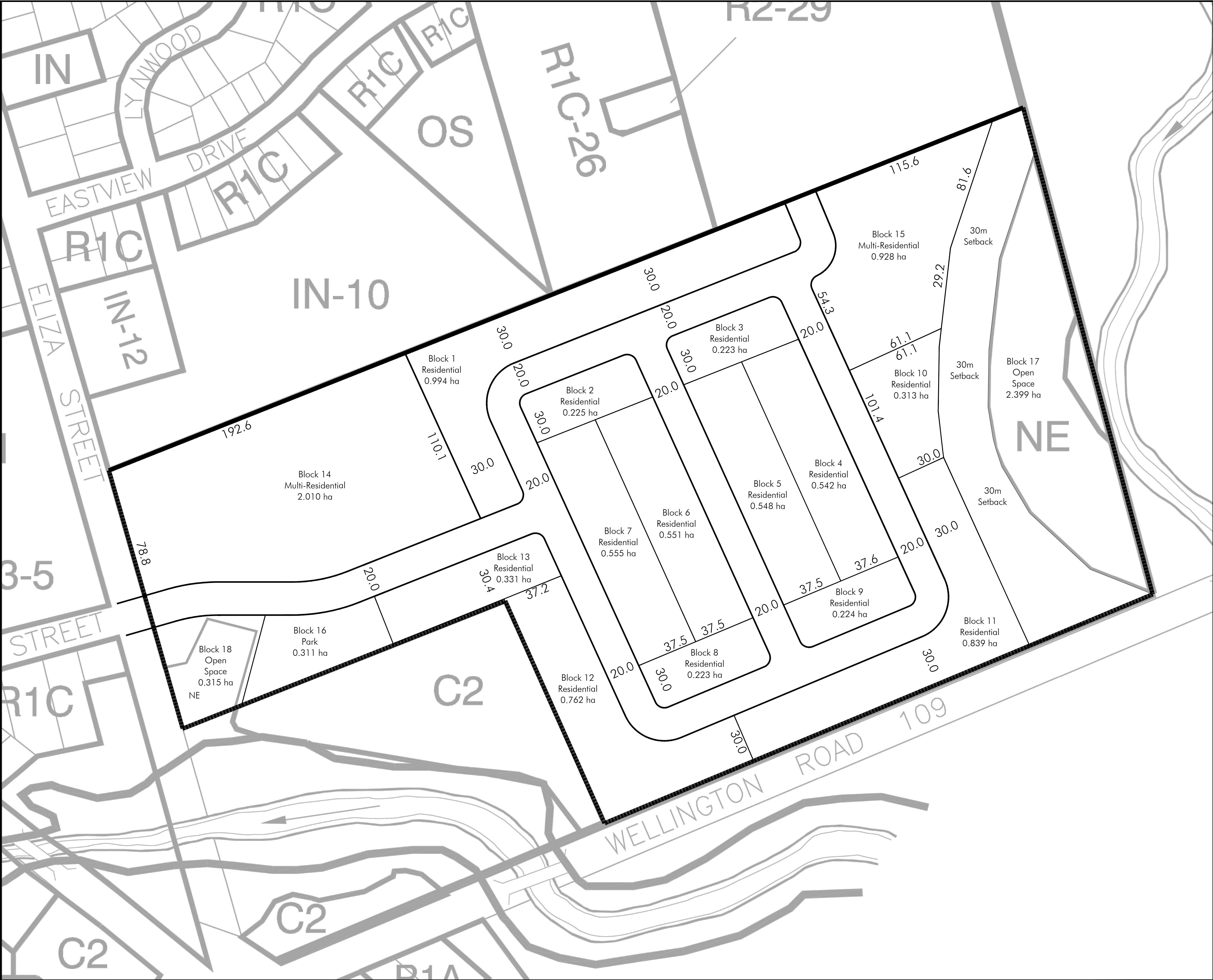
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© Copyright: Queen's Printer Ontario. Imagery: First Base Solutions (2010).

Project:2076 Date: January 15, 2019	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000
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APPENDIX I

Development Concept Site Plan



Legal Description

Pl Lt 1 Con 1 West Luther As In En6455
Except En6575 Township Of Wellington
North

Owner's Certificate

I HEREBY CERTIFY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING
LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

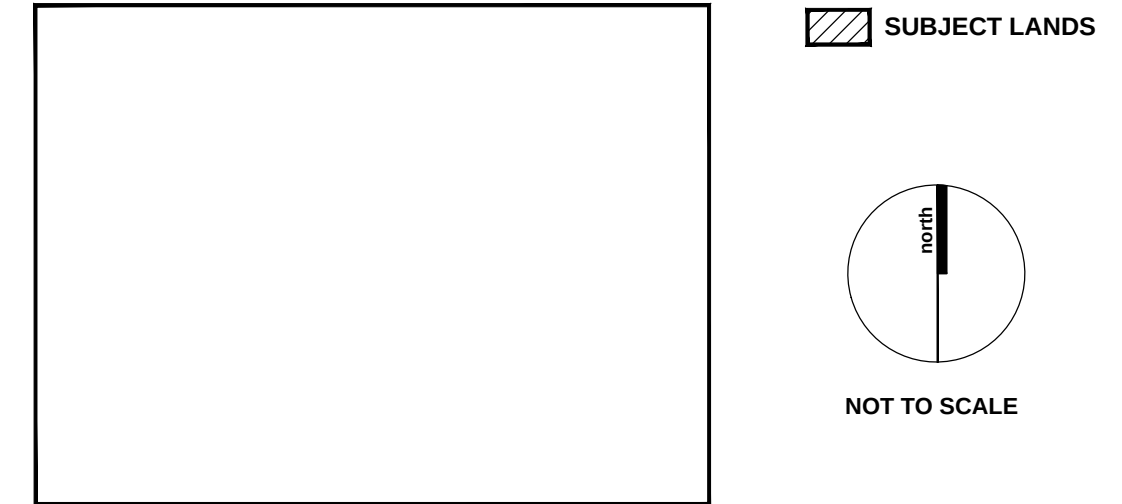
DATE: _____

Surveyor's Certificate

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND
THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

Key Plan



Additional Information Required Under Section 51(17) of the Planning Act
R.S.O. 1990, c.P.13 as Amended

A. As Shown	B. As Shown	C. As Shown
D. Residential	F. As Shown	H. Municipal Water Supply
E. As Shown	G. As Shown	I. Sandy Loam
J. As Shown	K. All Services As Required	L. As Shown

Area Schedule

DESCRIPTION	TOTALS		
	LOTS/ BLKS	AREA (ha.)	UNITS (min/max)
RESIDENTIAL	1-13	6.330	128
MULTI-RESIDENTIAL	14-15	2.938	102
PARK	16	0.626	
OPEN SPACE	17, 18	2.399	
ROADS		2.634	
TOTAL	18	14.928	230

- Max: 24.1 Units Per Hectare
- Min: 21.8 Units Per Hectare

1.	Jan 29, 2018	Issued for client review	NZ
Rev.	Date	Issued / Revision	By

Note:

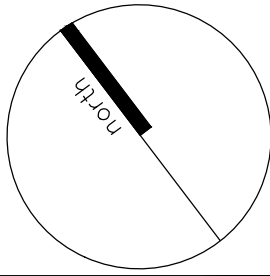


PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9 | P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

Stamp	Date	January 26, 2018
	Drawn By	NZ
	Plan Scale	1:1000
	File No.	17315A
	Checked By	EE
	Other	

Project	211 ELIZA ST. ARTHUR ONTARIO
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File Name	CONCEPT PLAN
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APPENDIX III
SWH Screening Table

211 Eliza Street, Arthur EIS - SAR/SCC Screening

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
Plants									
<i>Castanea dentata</i>	American Chestnut	S2	END	E	Schedule 1	Moist to well drained forests on sand, occasionally heavy soils.	MNRF 2018c	No	No
<i>Juglans cinerea</i>	Butternut	S3?	END	E	Schedule 1	Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands.	MNRF 2018c	Yes. Adjacent stream bank may provide suitable habitat.	Yes. Small areas of treed habitat and isolated landscape trees are present around perimeter of subject property .
<i>Lithospermum latifolium</i>	American Gromwell	S3	--	--	--	Shaded river banks and forested floodplains; borders of forests.	MNRF 2018c	Yes. Adjacent stream bank may provide suitable habitat.	No
<i>Panax quinquefolius</i>	American Ginseng	S3	END	E	Schedule 1	Rich, even swampy, hardwoods (beech, sugar maple, hemlock), especially on slopes or ravines (including forested dunes).	MNRF 2018c	No	No
<i>Potamogeton hillii</i>	Hill's Pondweed	S2	SC	SC	Schedule 1	Shallow water of small lakes, ponds, ditches, and streams.	MNRF 2018c	Yes	No
Birds									
<i>Ammodramus henslowii</i>	Henslow's Sparrow	SHB	END	E	Schedule 1	Large, fallow, grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha.	MNRF 2018c	No	No
<i>Asio flammeus</i>	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat.	MNRF 2018c	No	No
<i>Caprimulgus vociferus</i>	Eastern Whip-poor-will	S4B	THR	T	Schedule 1	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaf litter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100ha forests.	MNRF 2018c	No	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
<i>Cardellina canadensis</i>	Canada Warbler	S4B	SC	T	Schedule 1	Interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30ha.	MNRF 2018c	No	No
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	MNRF 2018c; BSC et al. 2006	Yes. Adjacent buildings may provide suitable habitat.	No. Property is not within an urban area.
<i>Childonias niger</i>	Black Tern	S3B	SC	NAR	--	Wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1m deep) water and areas of open water near nests; requires marshes >20 ha in size; feeds over adjacent grasslands.	MNRF 2018c	No	No
<i>Chordeiles minor</i>	Common Nighthawk	S4B	SC	T	Schedule 1	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	MNRF 2018c	No	No. Ploughed fields exist, however the fields are cropped annually and are unsuitable for nesting.
<i>Colinus virginianus</i>	Northern Bobwhite	S1	END	E	Schedule 1	Grassland, prairie or hay fields with woody cover in form of thickets, tangles of vines, shrubs; fence rows or woodland edges; cropland growing corn, soybeans or small grains and clover or grass; well-drained sandy or loamy soil; pond edges.	MNRF 2018c	No	No
<i>Contopus cooperi</i>	Olive-sided Flycatcher	S4B	SC	T	Schedule 1	Semi-open, conifer forest, prefers spruce; near pond, lake or river; treed wetlands for nesting; burns with dead trees for perching.	MNRF 2018c	No	No
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC	--	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	MNRF 2018c; BSC et al. 2006	Possible. Adjacent treed areas may provide suitable nesting habitat.	No
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	T	No Schedule	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50ha.	MNRF 2018c; BSC et al. 2006	Yes. Large grasslands are not present, but adjacent fields and meadows may provide suitable habitat.	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
<i>Empidonax virescens</i>	Acadian Flycatcher	S2S3B	END	E	Schedule 1	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30ha of forest.	MNRF 2018c	No	No
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S2B, S4N	SC	NAR	--	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 200m from shore; require tall, dead, partially dead trees within 400m of nest for perching.	MNRF 2018c	No	No
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T	--	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	MNRF 2018c; BSC et al. 2006	Yes. Man-made structures are present.	No. Man-made structures are not present.
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T	--	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.	MNRF 2018c; BSC et al. 2006	No	No
<i>Icteria virens</i>	Yellow-breasted Chat	S2B	END	E	Schedule 1	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	MNRF 2018c	No	No
<i>Ixobrychus exilis</i>	Least Bittern	S4B	THR	T	Schedule 1	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance.	MNRF 2018c	No	No
<i>Lanius ludovicianus</i>	Loggerhead Shrike	S2B	END	E	Schedule 1	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat.	MNRF 2018c	No	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	SC	T	Schedule 1	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	MNRF 2018c	No	No
<i>Parkesia motacilla</i>	Louisiana Waterthrush	S3B	SC	SC	Schedule 1	Prefers wooded ravines with running streams; also woodlands swamps; large tracts of mature deciduous or mixed forests; canopy cover is essential; has strong affinity to nest sites; nests on ground.	MNRF 2018c	No	No
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T	--	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.	MNRF 2018c; BSC et al. 2006	Possible. Adjacent riverbanks may provide suitable nesting habitat.	No. Banks and other suitable nesting substrates are not present.
<i>Setophaga cerulea</i>	Cerulean Warbler	S3B	THR	E	Schedule 1	Mature deciduous woodland of Great Lakes-St. Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha).	MNRF 2018c	No	No
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	T	No Schedule	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.	BSC et al. 2006; MNRF 2018b	Yes. Large grasslands are not present, but adjacent fields and meadows may provide suitable habitat.	No
<i>Tyto alba</i>	Barn Owl	S1	END	E	Schedule 1	Open areas such as fields, agricultural lands with scattered woodlots, buildings and/or orchards; grasslands, sedge meadows, marshes; snow-cover limits ability to catch prey; species has intolerance to severe cold; nests in hollow trees and live trees >46 cm dbh; also nests in barns, abandoned buildings.	MNRF 2018c	No	No. Barns are not present

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	S4B	SC	T	Schedule 1	Early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubby clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha of habitat.	MNRF 2018c	No	No
Herpetofauna									
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	S2	END	E	Schedule 1	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs.	MNRF 2018c	No	No
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28ha.	Ontario Nature 2018; MNRF 2018c	Possible. Adjacent watercourses may provide suitable habitat.	No
<i>Clemmys guttata</i>	Spotted Turtle	S3	END	E	Schedule 1	Unpolluted, shallow bodies of water such as streams, ponds, wet meadows, marshes or swamps with aquatic vegetation, logs or clumps of vegetation for basking. Nest is dug near water in fine-textured soil (e.g. sand) or moss. Vulnerable to factors affecting water quality, vegetation composition and structure. Average home range size 3.7ha.	MNRF 2018c	No	No
<i>Emydoidea blandingii</i>	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	THR	T	Schedule 1	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.	MNRF 2018c	No	No
<i>Sistrurus catenatus</i>	Massasauga Rattlesnake	S3	THR	T	Schedule 1	Upland, old field in summer; marsh, shrub swamp or bog; rivers and streams that provide sedge or low vegetative growth; in fall and winter; hibernate underground in mammal burrows, under rotting stumps, in rock crevices.	MNRF 2018c	No. Species is locally extirpated from Wellington County.	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
<i>Thamnophis butleri</i>	Butler's Gartersnake	S2	END	E	Schedule 1	Wet meadows, pastures, margins of marshes and streams, and open country.	MNRF 2018c	No. Species range within Wellington County restricted to the Luther Marsh area.	No
<i>Thamnophis sauritus septentrionalis</i>	Eastern Ribbonsnake	S3	SC	SC	Schedule 1	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups.	MNRF 2018c	Possible. Adjacent watercourses and open areas may provide suitable habitat.	No
Mammals									
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3B	END	--	--	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.	MNRF 2018c	Possible. Man-made structures adjacent to subject property may provide suitable habitat.	No
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	Schedule 1	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.	Dobbyn 1994; MNRF 2018c	Yes. Treed areas are present	Yes. Small areas of treed habitat and isolated landscape trees are present around perimeter of subject property .
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	Dobbyn 1994; MNRF 2018c	Yes. Treed areas are present	Yes. Small areas of treed habitat and isolated landscape trees are present around perimeter of subject property .
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	Schedule 1	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices.	MNRF 2018c	Yes. Treed areas are present	Yes. Small areas of treed habitat and isolated landscape trees are present around perimeter of subject property .
<i>Urocyon cinereoargenteus</i>	Grey Fox	S1	THR	T	Schedule 1	Hardwood forests with a mix of fields and woods; swamps; wooded, brushy or rocky habitats; woodland farmland edge; old fields with thickets. Dens in hollow log or tree. Individual has numerous winter dens throughout its range which is >40ha.	MNRF 2018c	No	No
Fish and Mussels									
<i>Clinostomus elongatus</i>	Redside Dace	S2	END	E	Schedule 3	Pools and slow-moving sections of relatively small (<10m width), clear, cool, streams with sand or gravel bottoms , riffle/pool habitat and overhanging vegetation; preferred water temperature range 14-23°C.	MNRF 2018c	Possible. Adjacent watercourses may provide suitable habitat.	No. Aquatic habitat is not present within subject property.

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9}	Background Source	Suitable Habitats within Study Area (within 250m)	Suitable Habitats within Subject Property
<i>Lampsilis fasciola</i>	Wavy-rayed Lampmussel	S1	THR	SC	Schedule 1	Clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable. It is typically found in gravel or sand substrates, often stabilized with cobble or boulders, in and around riffle areas up to 1m in depth. It is most abundant in small to medium-sized streams.	MNRF 2018c	Possible. Adjacent watercourses may provide suitable habitat.	No. Aquatic habitat is not present within subject property.
<i>Moxostoma duquesnei</i>	Black Redhorse	S2	THR	T	--	Pools and runs of creeks and small to medium rivers with sand, gravel and rocky substrates where siltation is minimal.	MNRF 2018c	Possible. Adjacent watercourses may provide suitable habitat.	No. Aquatic habitat is not present within subject property.
<i>Notropis photogenis</i>	Silver Shiner	S2S3	THR	T	Schedule 3	Cool to warm, clear waters of streams, over bottoms of cobble and boulders.	MNRF 2018c	Possible. Adjacent watercourses may provide suitable habitat.	No. Aquatic habitat is not present within subject property.
Insects									
<i>Bombus affinis</i>	Rusty-patched Bumble Bee	S1	END	E	--	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows. Currently, the only known population occurs in a managed oak savanna remnant in Lambton County, ON.	MNRF 2018c	No. Species restricted to habitats within and contiguous to the Pinery Provincial Park.	No. Species restricted to habitats within and contiguous to the Pinery Provincial Park.
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	E	Schedule 1	Open areas with Milkweed spp. (<i>Asclepias</i> spp.)	MacNaughton et al. 2018; MNRF 2018c	Yes	Yes. Meadow habitat is present on west of property.
<i>Pieris virginiensis</i>	West Virginia White	S3	--	SC	--	Rich, moist deciduous woods with host plant, Toothwort (<i>Cardamine</i> spp.)	MNRF 2018c	No	No

^{1,2}MNRF 2018a, ^{3,4}Government of Canada 2018, ⁵OMNR 2000, ⁶Reznicek et al. 2011, ⁷Layberry et al. 1998, ⁸Paulson 2011, ⁹Eakins 2018

LEGEND	
SRANK	SARA Schedule
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
S3 Vulnerable	
S4 Apparently Secure	
SH Possibly Extirpated (Historical)	
S#? Rank Uncertain	
B Breeding	
N Non-breeding	
COSSARO/COSEWIC	
NAR Not at Risk	
SC Special Concern	
END/E Endangered	
THR/T Threatened	

APPENDIX II
SAR/SCC Screening Table

Significant Wildlife Habitat Screening Tables

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

	Wildlife Species ¹	ELC Ecosite Codes ¹	Candidate SWH Habitat Criteria and Information Sources ¹	Confirmed SWH Defining Criteria ¹	Study Area Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
<u>Rationale:</u> Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	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 ^{cxviii} . <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat ^{cxviii} . • 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 ^{cxix} Index #7 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
<u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100 ^l or more of listed species for 7 days ^l , results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH ^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH ^{cxlviii} • Wetland area and shorelines associated with sites identified within the SWHTG ^{cxlviii} Appendix K ^{cxlix} are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST ^{cxix} Index #7 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH

	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					
<u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 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. <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area ^{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.	Suitable habitat not present within the study area. Not SWH
Wildlife Habitat: Raptor Wintering Area					
<u>Rational:</u> 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 <u>Special Concern:</u> 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	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha ^{cxlviii, cxlix} with a combination of forest and upland. ^{xxvi, 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, large trees and snags available for roosting <u>Information Sources</u> • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • 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 • 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.	Suitable habitat not present within the study area. Not SWH

	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					
<u>Rationale:</u> Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	- Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. - Active mine sites should not be considered as SWH - The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - Natural Heritage Information Center (NHIC) Bat Hibernaculum - Ministry of Northern Development and Mines for location of mine shafts. - Clubs that explore caves (eg. Sierra Club) - University Biology Departments with bat experts.	- All sites with confirmed hibernating bats are SWH. - The habitat area includes a 200m radius around the entrance of the hibernaculum^{cdviii, ccvii} for most. - Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"^{ccv} - SWHMIST^{cdix} Index #1 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH
Wildlife Habitat: Bat Maternity Colonies					
<u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings ^{xxii, 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} <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - University Biology Departments with bat experts.	- Maternity Colonies with confirmed use by: >10 Big Brown Bats >5 Adult Female Silver-haired Bats - The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. - Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects"^{ccv} - SWHMIS T^{cdix} Index #12 provides development effects and mitigation measures.	Small portions of treed habitat exist within the study area and subject property. Candidate SWH
Wildlife Habitat: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specified ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. <u>Information Sources</u> - OMNR for possible locations and contact for local experts - University of Waterloo, Biology Department	Long Point has been identified as a significant stopover habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration ^{ccv} - The confirmation criteria and habitat areas for this SWH are still being determined. - SWHDSS^{cdix} Index #38 provides development effects and mitigation measures	Criteria unavailable to assess significance of habitat within the study area.

	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					
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen ^{cix, cx, cxi, cxviii} . • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) ^{cvi} • Congregation of turtles is more common where wintering areas are limited and therefore significant ^{cix, cx, cxi, cxii} . • SWHMiST ^{cxix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Suitable habitat not present within the study area. Not SWH
Wildlife Habitat: Snake Hibernaculum					
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern:</u> Milksnake Eastern Ribbonsnake <u>Lizard:</u> <u>Special Concern</u> (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line ^{xdiv, i, ii, iii, 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. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u> ; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. <u>or</u> ; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH ⁱ • SWHMiST ^{cxix} Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST ^{cxix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Suitable habitat features may be present within the study area. No suitable habitat features are present within the subject property. Not SWH within Subject Property

	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)					
<u>Rationale:</u> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> - Reports and other information available from CAs - Ontario Breeding Bird Atlas^{CCV} - Bird Studies Canada; <i>NatureCounts</i> http://www.birdscanada.org/birdmon/ - Field Naturalist clubs	Studies confirming: - Presence of 1 or more nesting sites with 8^{CCVix} 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^{CCIX} Index #4 provides development effects and mitigation measures	Suitable habitat not present within the subject property; suitable habitat features may exist within areas of steep slopes associated with the watercourses adjacent to the subject property. Not SWH within Subject Property
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
<u>Rationale:</u> 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 15m from ground, near the top of the tree. <u>Information Sources</u> - Ontario Breeding Bird Atlas^{CCV}, colonial nest records. - Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). - NHIC Mixed Wader Nesting Colony - Aerial photographs can help identify large heronries - Reports and other information available from CAs - MNRF District Offices - Local naturalist clubs	Studies confirming: - Presence of 5^I or more active nests of Great Blue Heron or other listed species. - The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH^{CC, CCVII} - Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells - SWHMiST^{CCIX} Index #5 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH

	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)					
<u>Rationale:</u> Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	- Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. - Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> - Ontario Breeding Bird Atlas^{ccv}, rare/colonial species records. - Canadian Wildlife Service - Reports and other information available from CAs - Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area - MNRF District Offices - Field naturalist clubs	Studies confirming: - Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern¹. - Presence of 5 or more pairs for Brewer's Blackbird. - Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. - The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH^{cc, ccviii} - 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.	Suitable habitat not present within the study area. Not SWH
Wildlife Habitat: Migratory Butterfly Stopover Areas					
<u>Rationale:</u> Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern:</u> Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: <u>Field:</u> CUM CUS CUT <u>Forest:</u> FOC FOM FOD 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 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario ^{cdix} . - 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^{xxviii, 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}. <u>Information Sources</u> - OMNRF (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)^{xlii}. 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^{xi, 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 Red Admiral's is to be considered significant. - SWHMIST^{cxlix} Index #16 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. Not SWH

	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					
<u>Rationale:</u> Sites with a high diversity of species as well as high number 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 >10 ha ¹ in size and within 5km ^{iv, v, vi} of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake 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 are Candidate SWH ^{ccxviii} . <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMIST ^{cxlix} Index #9 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. Not SWH
Wildlife Habitat: Deer Yarding Areas					
<u>Rationale:</u> Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60% ^{ccxciv} . • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual" ^{ccxcv} • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH ^{vi, vii, viii, ix, x, i} . • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations ^{ccxcv} . • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMIST ^{cxlix} Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within the study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
<u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E 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 ^{exviii}	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	- Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. - Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands^{cxviii}. - If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. - 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. <u>Information Sources</u> - MNRF District Offices - LIO/NRVIS	Studies confirm: - Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF^{cxviii}. - 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 MNRⁱ. - 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}. - If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMIST^{cxix} Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within the study area. Not SWH

Significant Wildlife Habitat Assessment Tables

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

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					
<u>Rationale:</u> 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. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes^{boxviii} • SWHMiST^{cdix} Index #21 provides development effects and mitigation measures.	Vegetation type not present within the study area. Not SWH
Sand Barrens					
<u>Rationale:</u> 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%.	Any sand barren area, >0.5ha in size. <u>Information Sources</u> • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens^{boxviii} • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)ⁱ. • SWHMiST^{cdix} Index #20 provides development effects and mitigation measures.	Vegetation type not present within the study area. Not SWH

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 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	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 zoo geographically 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 ^{boxviii} .	An Alvar site > 0.5 ha in size ^{boxv} . <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists ^{boxvi} . • Ontario Nature – Conserving Great Lakes Alvars ^{boxviii} . • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species ^{boxv} , ^{boxviii} at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses ^{boxv} . • SWHMIST ^{boxviii} Index #17 provides development effects and mitigation measures.	Vegetation type not present within the study area. Not SWH
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest l. <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat ^{boxviii} • The stand will have experienced no recognizable forestry activities ^{boxviii} • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand ^{boxviii} • SWHDSS ^{boxviii} Index #23 provides development effects and mitigation measures.	Vegetation type not present within the study area. Not SWH

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					
<u>Rationale:</u> 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%.	- No minimum size to site - Site must be restored or a natural site. - Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - Natural Heritage Information Center (NHIC) has location information on their website - OMNRF Ecologists - Field naturalists clubs - Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in ^{boxv} Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used ^{cdviii} . - Area of the ELC Ecosite is the SWH. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). - SWHMiST^{cdix} Index #18 provides development effects and mitigation measures.	Vegetation type not present within the study area. Not SWH
Tallgrass Prairie					
<u>Rationale:</u> 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.	- No minimum size to site - Site must be restored or a natural site. - Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - OMNR Districts - Natural Heritage Information Center (NHIC) has location information available on their website - Field naturalists clubs - Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in ^{boxv} Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used ^{cdviii} . - Area of the ELC Ecosite is the SWH - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - SWHMiST^{cdix} Index #19 provides development effects and mitigation measures.	Vegetation type not present within the study area. Not SWH

Rare Vegetation Community ¹	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes ¹	Habitat Description ¹	Detailed Information and Sources ¹	Defining Criteria ¹	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG ^{cxlviii} . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M ^{cxlviii} The OMNR/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Center (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.	Other rare vegetation types not present within the study area. Not SWH

Significant Wildlife Habitat Assessment Tables

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

	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				
<u>Rationale:</u> 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 (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur ^{cxlix} . • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{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.	Suitable habitat not present within the study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
<u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern:</u> Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	- Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. - Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. - Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> - Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. - MNR values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. - Nature Counts, Ontario Nest Records Scheme data. - OMNRF Districts - Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. - 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^{cv}, ^{ccvii}. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat^{cv}. - 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	Suitable habitat not present within the study area. Not SWH
Wildlife Habitat: Woodland Raptor Nesting Habitat					
<u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat ^{hooxviii, lxxviii, xc, xci, xciii, xciv, xcv, xcvi, cxodiii} . 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 Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. - In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> - OMNRF - 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 28ha area of habitat is the SWH^{ccvii}. - 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 mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. - SWHMiST^{cxlix} Index #27 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle <u>Special Concern:</u> 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. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH¹ • 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 dependent 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^{cxlix}. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST^{cxlix} Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Suitable habitat not present within the study area. Not SWH
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, cxlii, cxiv} <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat^{cxlviii} • SWHMiST^{cxlix} Index #30 provides development effects and mitigation measures	Seeps and springs not present within the subject property; not expected to present within study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m² (about 25m diameter)^{ccvii} within or adjacent (within 120m) to a woodland (no minimum size)^{cdxxxii, lxiii, bxv, lxvi, lxvii, lxviii, lxx, lxxi}. 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^{cdxviii} <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)^{lxxi} or 2 or more of the listed frog 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 woodland area plus a 230m radius of woodland area^{lxiii, lxv, lxvi, lxvii, lxviii, lxx, lxxi} if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST^{cdlix} Index #14 provides development effects and mitigation measures.	Suitable habitat not present within the study area Not SWH
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
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 American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog 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 >500m² (about 25m diameter)^{ccvii} supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats^{cdxxxiv}. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)^{lxxi, lxxiii}, or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys^{cviii} will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST^{cdlix} Index #15 provides development effects and mitigation measures.	Isolated wetland features not present within the study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Woodland Area-Sensitive Bird Breeding Habitat					
<u>Rationale:</u> 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 Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	- Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.^{cv, cxoxd, cxoodi, cxoodii, cxoodiv, cxoxv, cxoxvi, cxoxvii, cxoxviii, cxoxix, cxd, cxli, cxlii, cxliii, cxliv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix} - Interior forest habitats are at least 200m from forest edge habitat. Information Sources - Local bird 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 greatest value to interior species - Reports and other information available from CAs.	- Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. - Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. - Conduct field investigations in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} - SWHMIST^{cxlix} Index #34 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH

Significant Wildlife Habitat Assessment Tables

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

	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 Sandhill Crane 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^{CCOV}. - For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> - Contact OMNRF, wetland evaluations are a good source of information. - Field naturalist clubs - Natural Heritage Information Center (NHIC) Records - Reports and other information available from CAs. - Ontario Breeding Bird Atlas^{CCOV}	Studies confirm: - Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species¹. - Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH¹. - 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"^{CCOXI}. - SWHMiST^{CCIX} Index #35 provides development effects and mitigation measures	Suitable habitat not present within the study area. Not SWH
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) >30 ha ^{cbx, cbx1, cbx2, cbx3, cbx4, cbx5, cbx6, cbx7, cbx8, cbx9}. 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)¹. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. <u>Information Sources</u> - Agricultural land classification maps, Ministry of Agriculture. - Ask local birders - Ontario Breeding Bird Atlas^{CCOV} - Reports and other information available from CAs.	Field Studies confirm: - Presence of nesting or breeding of 2 or more of the listed species. - A field with 1 or more breeding Short-eared Owl is to be considered SWH. - The area of SWH is the contiguous ELC ecosite field areas. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{CCOXI}. - SWHMiST^{CCIX} Index #32 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH

	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 cxcix.	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 for some bird species.	Large field areas succeeding to shrub and thicket habitats >10ha ^{cxiv} 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) ¹ . Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species ^{cxviii} . Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas ^{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 ¹ . • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMiST ^{cxlix} Index #33 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH
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: (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish: (<i>Cambarus Diogenes</i>)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. 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 ^{ccii} • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult ^{ccii} • SWHMiST ^{cxlix} Index #36 provides development effects and mitigation measures.	Suitable habitat not present within the study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
<u>Rationale:</u> 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.	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 ^{boviii} . <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas ^{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 needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST ^{cdix} Index #37 provides development effects and mitigation measures.	Special Concern and Rare Wildlife Species possible within the study area and subject property. Candidate SWH

Significant Wildlife Habitat Assessment Tables

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

	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 Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat ^{cxixiv, cxoxv, cxoxvi, cxoxvii, cxoxviii, cxoix, cxox, cxoxi} Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule ¹ . <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center 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 waterway ^{cxlix} or be up to 200m wide ^{cxlix} of woodland habitat and with gaps <20m ^{cxlix} . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat ^{cxlix} . • SWHMiST ^{cxlix} Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat (Wetland) is not present within the study area. Therefore, amphibian movement corridors are not applicable. Not SWH
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule ¹ . • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion ^{cxooii, cxooiii, cxlix, cxciiv} . • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide ^{cxlix} with gaps <20m ^{cxlix} and if following riparian area with at least 15m of vegetation on both sides of waterway ^{cxlix} . Shorter corridors are more significant than longer corridors ^{cxlix} . • SWHMiST ^{cxlix} Index #39 provides development effects and mitigation measures.	Deer Wintering Habitat is not present within the study area. Therefore, deer movement corridors are not applicable. Not SWH

Subject: Re: 211 Eliza St, Arthur Terms of Reference (proj2076)
From: Kayla MacLellan <kmaclellan@nrsl.on.ca>
Date: 7/16/2019, 4:34 PM
To: Linda Redmond <lindar@wellington.ca>

Hi Linda,

Thank you for the feedback and quick response.

Have a nice day,

Kayla

Kayla MacLellan B.Sc.
Terrestrial and Wetland Biologist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON N2L 3X2
(p) 519-725-2227 Ext. 232 (f) 519-725-2575
(w) www.nrsl.on.ca (e) kmaclellan@nrsl.on.ca
 [@nrslnews](https://twitter.com/nrslnews)

On 7/16/2019 4:32 PM, Linda Redmond wrote:

Hello Kayla,
The Terms of Reference for the above proposal appear to be thorough and complete. I have no concerns or changes to them.

Regards,
Linda

Linda Redmond
Manager of Planning & Environment
County of Wellington Planning Dept.
74 Woolwich Street
Guelph ON N1H 3T9
T 519.837.2600 x 2380
E lindar@wellington.ca
W www.wellington.ca

-----Original Message-----

From: wellingtoncounty@esolutionsgroup.ca <wellingtoncounty@esolutionsgroup.ca> On Behalf Of Kayla MacLellan
Sent: July 16, 2019 3:42 PM
To: Linda Redmond <lindar@wellington.ca>
Subject: 211 Eliza St, Arthur Terms of Reference (proj2076)

Hello Linda,

I am a biologist at Natural Resource Solutions Inc. and we have been retained to complete an EIS for a proposed residential subdivision development in Arthur. I emailed a Terms of

Reference back in January 2019 looking to receive feedback but have not received a reply. I just wanted to check in to see if you received it, perhaps I got your email address wrong. I can forward you the original email if you did not receive it, but I have also attached the Terms of Reference document with an associated cover letter here.

I hope this reaches you. Thank you for your time, and I look forward to hearing your feedback. Please let me know if you have any questions.

Sincerely,
Kayla MacLellan

Origin: <https://www.wellington.ca/en/resident-services/pl-aboutus.aspx>

This email was sent to you by Kayla MacLellan<kmaclellan@nrsi.on.ca> through
<https://www.wellington.ca/>.

Subject: RE: 211 Eliza Street, Arthur - Terms of Reference (proj2076)

From: Laura Warner <lwarner@grandriver.ca>

Date: 2/11/2019, 2:42 PM

To: Kayla MacLellan <kmaclellan@nr.si.on.ca>

CC: David Stephenson <dstephenson@nr.si.on.ca>, "Steven Roorda (steven.roorda@rjburnside.com)" <steven.roorda@rjburnside.com>, "aldos@wellington.ca" <aldos@wellington.ca>, Rachel Martin MHBC <rmartin@mhbcplan.com>, "daston@mhbcplan.com" <daston@mhbcplan.com>, "lindar@wellington.ca" <lindar@wellington.ca>

Good afternoon Kayla,

The GRCA has reviewed the EIS Terms of Reference for the property at 211 Eliza Street in Arthur and have no concerns.

Kind regards,
Laura



GRCA logo

Laura Warner | Resource Planner
Grand River Conservation Authority
400 Clyde Road, Cambridge ON N1R 5W6
P: (519) 621-2763 x 2231 | F: (519) 621-4844
lwarner@grandriver.ca | www.grandriver.ca

From: Kayla MacLellan [mailto:kmaclellan@nr.si.on.ca]

Sent: Thursday, January 17, 2019 12:32 PM

To: lindar@wellington.ca; Laura Warner

Cc: David Stephenson; Steven Roorda (steven.roorda@rjburnside.com); aldos@wellington.ca; Rachel Martin MHBC; daston@mhbcplan.com

Subject: 211 Eliza Street, Arthur - Terms of Reference (proj2076)

Good afternoon,

Natural Resource Solutions Inc. has been retained to complete an Environmental Impact Study for a proposed residential subdivision development in Arthur, Ontario.

I am submitting a Terms of Reference for your review and comment. This particular Terms of Reference was prepared a number of months ago but due to some project constraints we have not had the opportunity to submit it for your review until now. I have attached a cover letter to further explain.

Thank you for your time, and I look forward to receiving your feedback. Please do not hesitate to contact me if you have any questions.

Sincerely,

Kayla MacLellan

--

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

file:///S:/Projects/

Kayla MacLellan B.Sc.

Terrestrial and Wetland Biologist

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APPENDIX II
Revised SAR/SCC Screening Tables

Appendix II: 211 Eliza Street, Arthur EIS - SAR/SCC Screening

Scientific Name	Common Name	SRANK ¹	COSSARO ¹	COSEWIC ²	SARA Schedule ³	Habitat Preference ^{3,4,5}	Background Source	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	NRSI Observed
Plants										
<i>Castanea dentata</i>	American Chestnut	S2	END	E	Schedule 1	Moist to well drained forests on sand, occasionally heavy soils.	MNRF 2018	No. No sandy soils are present.	No. No sandy soils are present.	No
<i>Juglans cinerea</i>	Butternut	S3?	END	E	Schedule 1	Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands.	MNRF 2018	Yes. The Conestogo River and hardwood stands are adjacent to the subject property and may provide suitable bank habitat. Species was not observed during vegetation inventories within the subject property.	Yes. Hardwood stands are present. Species was not observed during vegetation inventories.	No
<i>Lithospermum latifolium</i>	American Gromwell	S3	--	--	--	Shaded river banks and forested floodplains; borders of forests.	MNRF 2018	Yes. Suitable habitat is present in stream banks of the Conestogo River and forested floodplain adjacent to the subject property. Species was not observed during vegetation inventories within the subject property.	No. Stream banks are not present.	No
<i>Panax quinquefolius</i>	American Ginseng	S3	END	E	Schedule 1	Rich, even swampy, hardwoods (beech, sugar maple, hemlock), especially on slopes or ravines (including forested dunes).	MNRF 2018	No. No suitable swamps are present.	No. No suitable swamps are present.	No
<i>Potamogeton illii</i>	Hill's Pondweed	S2	SC	SC	Schedule 1	Shallow water of small lakes, ponds, ditches, and streams.	MNRF 2018	Yes. Suitable habitat is present in the Conestogo River adjacent to the subject property. Species was not observed during vegetation inventories within the subject property.	No. No open water is present.	No
Birds										
<i>Ammodramus henslowii</i>	Henslow's Sparrow	SHB	END	E	Schedule 1	Large, fallow, grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha.	MNRF 2018	No. No grassland of suitable size is present.	No. No grassland of suitable size is present.	No
<i>Asio flammeus</i>	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat.	MNRF 2018	No. The majority of the surrounding area consists of active agricultural row crop.	No. No open grassy areas of suitable size are present. The subject property consists of active agricultural row crop in 2018.	No
<i>Caprimulgus vociferus</i>	Eastern Whip-poor-will	S4B	THR	T	Schedule 1	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaf litter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100ha forests.	MNRF 2018	No. No forests of suitable size are present.	No. No forests of suitable size are present.	No
<i>Cardellina canadensis</i>	Canada Warbler	S4B	SC	T	Schedule 1	Interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30ha.	MNRF 2018	No. No forests of suitable size are present.	No. No forests of suitable size are present.	No
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	MNRF 2018; Cadman et al. 2007	Yes. Suitable habitat is present in buildings adjacent to the subject property. Species was observed in 2018 but not during breeding bird surveys.	No. No buildings are present.	Yes (Flying Over)
<i>Childonias niger</i>	Black Tern	S3B	SC	NAR	--	Wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1m deep) water and areas of open water near nests; requires marshes >20 ha in size; feeds over adjacent grasslands.	MNRF 2018	No. No wetlands of suitable size are present.	No. No wetlands or open water are present.	No
<i>Chordeiles minor</i>	Common Nighthawk	S4B	SC	T	Schedule 1	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	MNRF 2018	No. No suitable open ground is present as the majority of the study area consists of active agricultural row crop.	No. No suitable open ground is present as the subject property consists of active agricultural row crop.	No
<i>Contopus cooperi</i>	Olive-sided Flycatcher	S4B	SC	T	Schedule 1	Semi-open, conifer forest, prefers spruce; near pond, lake or river; treed wetlands for nesting; burns with dead trees for perching.	MNRF 2018	No. No suitable coniferous forests near open water are present.	No. No coniferous forest is present.	No
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC	--	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	MNRF 2018; Cadman et al. 2007	Yes. Suitable habitat is present within treed areas adjacent to the subject property. Species was not observed during breeding bird surveys within the subject property in 2018.	Yes. Forest edges are present. Species was not observed during breeding bird surveys in 2018.	No
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	T	No Schedule	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50ha.	MNRF 2018; Cadman et al. 2007	Yes. Suitable habitat is present in meadows and fields adjacent to the subject property. Species was observed during breeding bird surveys in 2018.	No. The subject property consists of active agricultural row crop. No grassland is present.	Yes (Study Area Only)
<i>Empidonax virens</i>	Acadian Flycatcher	S2S3B	END	E	Schedule 1	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30ha of forest.	MNRF 2018	No. No habitat of suitable size is present.	No. No habitat of suitable size is present.	No
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S2B, S4N	SC	NAR	--	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 200m from shore; require tall, dead, partially dead trees within 400m of nest for perching.	MNRF 2018	No. No suitable habitat near open water is present.	No. No suitable habitat near open water is present.	No
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T	--	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	MNRF 2018; Cadman et al. 2007	Yes. Buildings are present. Species was observed in 2018 but not during breeding bird surveys.	No. No buildings are present.	Yes (Flying Over)
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T	--	Carollian 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.	MNRF 2018; Cadman et al. 2007	Yes. Deciduous forest is present. Species was not observed during breeding bird surveys in 2018.	Yes. Forest edges are present. Species was not observed during breeding bird surveys in 2018.	No
<i>Icteria virens</i>	Yellow-breasted Chat	S2B	END	E	Schedule 1	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	MNRF 2018	No. No thick communities are present.	No. No thick communities are present.	No
<i>Ixobrychus exilis</i>	Least Bittern	S4B	THR	T	Schedule 1	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance.	MNRF 2018	No. No dense cattails within marsh community adjacent to the subject property.	No. No wetlands are present.	No
<i>Lanius ludovicianus</i>	Loggerhead Shrike	S2B	END	E	Schedule 1	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat.	MNRF 2018	No. Habitat of suitable size is not present.	No. Habitat of suitable size is not present.	No
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	SC	T	Schedule 1	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	MNRF 2018	No. Habitat of suitable size is not present.	No. Habitat of suitable size is not present.	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ²	SARA Schedule ³	Habitat Preference ^{3,4,5}	Background Source	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	NRSI Observed
<i>Parkesia motacilla</i>	Louisiana Waterthrush	S3B	SC	SC	Schedule 1	Prefers wooded ravines with running streams; also woodlands swamps; large tracts of mature deciduous or mixed forests; canopy cover is essential; has strong affinity to nest sites; nests on ground.	MNRF 2018	No. No swamps, wooded ravines or large forest tracts are present.	No. No swamps, wooded ravines or large forest tracts are present.	No
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T	--	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.	MNRF 2018; Cadman et al. 2007	Yes. Suitable banks are present. Species was not observed during breeding bird surveys within the subject property in 2018.	No. No suitable banks are present.	No
<i>Setophaga cerulea</i>	Cerulean Warbler	S3B	THR	E	Schedule 1	Mature deciduous woodland of Great Lakes-St.Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha).	MNRF 2018	No. No forests of suitable size are present.	No. No forests of suitable size are present.	No
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	T	No Schedule	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.	Cadman et al. 2007; MNRF 2020b	Yes. Suitable habitat is present in grassy meadows and farmland. Species was observed during breeding bird surveys in 2018.	No. The subject property consists mostly of active agricultural row crop. No grassland of suitable size is present.	Yes (Study Area Only)
<i>Tyto alba</i>	Barn Owl	S1	END	E	Schedule 1	Open areas such as fields, agricultural lands with scattered woodlots, buildings and/or orchards; grasslands, sedge meadows, marshes; snow-cover limits ability to catch prey; species has intolerance to severe cold; nests in hollow trees and live trees >46 cm dbh; also nests in barns, abandoned buildings.	MNRF 2018	No. Species has not previously been documented within the vicinity (eBird 2020).	No. Species has not previously been documented within the vicinity (eBird 2020).	No
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	S4B	SC	T	Schedule 1	Early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubby clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha of habitat.	MNRF 2018	No. Habitat of suitable size is not present.	No. Habitat of suitable size is not present.	No
Herpetofauna										
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	S2	END	E	Schedule 1	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs.	MNRF 2018	No. No potential breeding pools are present.	No. No potential breeding pools are present.	No
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernates together in groups in mud under water; home range size ~28ha.	Ontario Nature 2019; MNRF 2018	Yes. Suitable habitat is present along the Conestogo River riparian corridor adjacent to the subject property. Species not observed during targeted reptile area searches within the subject property.	No. No wetlands or open water are present.	No
<i>Clemmys guttata</i>	Spotted Turtle	S3	END	E	Schedule 1	Unpolluted, shallow bodies of water such as streams, ponds, wet meadows, marshes or swamps with aquatic vegetation, logs or clumps of vegetation for basking. Nest is dug near water in fine-textured soil (e.g. sand) or moss. Vulnerable to factors affecting water quality, vegetation composition and structure. Average home range size 3.7ha.	MNRF 2018	No. No suitable waterbodies present.	No. No waterbodies present.	No
<i>Emydoidea blandingii</i>	Blanding's Turtle (Great Lakes/St. Lawrence population)	S3	THR	T	Schedule 1	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.	MNRF 2018	No. No suitable waterbodies present.	No. No waterbodies present.	No
<i>Sistrurus catenatus</i>	Massasauga Rattlesnake	S3	THR	T	Schedule 1	Upland, old field in summer; marsh, shrub swamp or bog; rivers and streams that provide sedge or low vegetative growth; in fall and winter; hibernates underground in mammal burrows, under rotting stumps, in rock crevices.	MNRF 2018	No. Species is locally extirpated from Wellington County.	No. Species is locally extirpated from Wellington County.	No
<i>Thamnophis butleri</i>	Butler's Gartersnake	S2	END	E	Schedule 1	Wet meadows, pastures, margins of marshes and streams, and open country.	MNRF 2018	No. Species range within Wellington County restricted to the Luther Marsh area.	No. Species range within Wellington County restricted to the Luther Marsh area.	No
<i>Thamnophis sauritus septentrionalis</i>	Eastern Ribbonsnake	S3	SC	SC	Schedule 1	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups.	MNRF 2018	Yes. Suitable habitat is present along the Conestogo River riparian corridor adjacent to the subject property. Species not observed during targeted reptile area searches within the subject property.	No. No open water is present.	No
Mammals										
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3B	END	--	--	Hibernates in cool caves and abandoned mines; roosts in rocky habitats including talus slopes and open rock barrens. May also roost in man-made structures, however, very rarely; foraging habitat poorly understood in Ontario. Within the United States of America, it feeds primarily in forests, but also over waterbodies, within riparian forests, and occasionally open fields.	MNRF 2018	No. No rocky habitats are present.	Yes (Foraging Only). Suitable foraging habitat is present in open fields.	No
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	Schedule 1	Hibernates in cool, humid caves and abandoned mines; uses caves, quarries, tunnels, hollow trees or tree cavities, or buildings for roosting and maternity colonies; forages over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Dobbyn 1994; MNRF 2018	Yes. Suitable roosting habitat may be present in trees. No targeted bat habitat assessment was conducted outside of the subject property. Suitable foraging habitat is present.	Yes (Foraging Only). Potential roost trees within the subject property were surveyed. No bats were observed roosting.	No
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1	Hibernates in cool, humid caves and abandoned mines; uses hollow trees or tree cavities, loose bark, or buildings for roosting and maternity colonies; forages within treed habitats over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Dobbyn 1994; MNRF 2018	Yes. Suitable roosting habitat may be present in trees or buildings. No targeted bat habitat assessment was conducted outside of the subject property. Suitable foraging habitat is present.	Yes (Foraging Only). Potential roost trees within the subject property were surveyed. No bats were observed roosting.	No
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	Schedule 1	Hibernates in cool, humid caves and abandoned mines; maternity colony and roosting habitat poorly understood in Ontario. Elsewhere within its range, this species has been documented to use dead/dying leaf clusters, arboreal lichens and epiphytes, or buildings for roosting and maternity colonies; forages over still water, rivers, wetlands, in forest gaps, edges, or along trails.	MNRF 2018	Yes. Suitable roosting habitat may be present. No targeted bat habitat assessment was conducted outside of the subject property. Suitable foraging habitat is present.	Yes (Foraging Only). No leaf clusters or other roosting or maternity habitat was observed.	No
<i>Urocyon cinereoargenteus</i>	Grey Fox	S1	THR	T	Schedule 1	Hardwood forests with a mix of fields and woods; swamps; wooded, brushy or rocky habitats; woodland farmland edge; old fields with thickets. Dens in hollow log or tree. Individual has numerous winter dens throughout its range which is >40ha.	MNRF 2018	No. No suitable woodlands are present.	No. No suitable woodlands are present.	No
Fishes and Mussels										
<i>Clinostomus elongatus</i>	Redside Dace	S2	END	E	Schedule 3	Pools and slow-moving sections of relatively small (<10m width), clear, cool, streams with sand or gravel bottoms, riffle/pool habitat and overhanging vegetation; preferred water temperature range 14-23°C.	MNRF 2018	Possible. Conestogo River may provide suitable habitat adjacent to the subject property. No aquatic surveys were completed.	No. Aquatic habitat is not present.	No
<i>Lampsilis fasciola</i>	Wavy-rayed Lampmussel	S1	THR	SC	Schedule 1	Clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable. It is typically found in gravel or sand substrates, often stabilized with cobble or boulders, in and around riffle areas up to 1m in depth. It is most abundant in small to medium-sized streams.	MNRF 2018	Possible. Conestogo River may provide suitable habitat adjacent to the subject property. No aquatic surveys were completed.	No. Aquatic habitat is not present.	No
<i>Moxostoma duquesnei</i>	Black Redhorse	S2	THR	T	--	Pools and runs of creeks and small to medium rivers with sand, gravel and rocky substrates where siltation is minimal.	MNRF 2018	Possible. Conestogo River may provide suitable habitat adjacent to the subject property. No aquatic surveys were completed.	No. Aquatic habitat is not present.	No

Scientific Name	Common Name	SRANK ¹	COSSARO ¹	COSEWIC ²	SARA Schedule ³	Habitat Preference ^{3,4,5}	Background Source	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	NRSI Observed
<i>Notropis photogenis</i>	Silver Shiner	S2S3	THR	T	Schedule 3	Cool to warm, clear waters of streams, over bottoms of cobble and boulders.	MNRF 2018	Possible. Conestogo River may provide suitable habitat adjacent to the subject property. No aquatic surveys were completed.	No. Aquatic habitat is not present.	No
Insects										
<i>Bombus affinis</i>	Rusty-patched Bumble Bee	S1	END	E	—	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows. Currently, the only known population occurs in a managed oak savanna remnant in Lambton County, ON.	MNRF 2018	No. Species restricted to habitats within and contiguous to the Pinery Provincial Park.	No. Species restricted to habitats within and contiguous to the Pinery Provincial Park.	No
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	E	Schedule 1	Open areas with Milkweed spp. (<i>Asclepias</i> spp.)	MacNaughton et al. 2020; MNRF 2018	Yes. Suitable habitat is present.	Yes. Suitable habitat is present. Species was observed within subject property.	Yes
<i>Pieris virginensis</i>	West Virginia White	S3	—	SC	—	Rich, moist deciduous woods with host plant, Toothwort (<i>Cardamine</i> spp.)	MNRF 2018	No. No suitable woods are present.	No. No suitable woods or the host species are present.	No

^{1,2}MNRF 2018a, ^{3,4}Government of Canada 2018, ⁵OMNR 2000, ⁶Reznicek et al. 2011, ⁷Layberry et al. 1998, ⁸Paulson 2011, ⁹Eakins 2018

LEGEND	
SRANK	SARA Schedule
S1 Critically Imperiled	Schedule 1 Officially Protected under SARA
S2 Imperiled	
S3 Vulnerable	Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1
S4 Apparently Secure	
SH Possibly Extirpated (Historical)	
S#? Rank Uncertain	
B Breeding	
N Non-breeding	
COSSARO/COSEWIC	
NAR Not at Risk	
SC Special Concern	
END/E Endangered	
THR/T Threatened	

APPENDIX III
Revised SWH Screening Tables

Appendix III: Significant Wildlife Habitat Screening Tables

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

	Wildlife Species ¹	ELC Ecosite Codes ¹	Candidate SWH Habitat Criteria and Information Sources ¹	Confirmed SWH Defining Criteria ¹	Study Area Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	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} . <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (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" ^{ncxci} • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat ^{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.	CUM communities are present within the subject property. However, aerial imagery does not indicate the presence of sheet water within the subject property of study area during spring. Not SWH
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 American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100 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" ^{ncxci} • 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.	None of the listed ELC communities are present within the subject property or study area. Not SWH

	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					
<u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 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. <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area ^{cxviii} • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMiST ^{cdix} Index #8 provides development effects and mitigation measures.	None of the listed ELC communities are present within the subject property. A MAM2 community is present within the subject property but is not suitable or large enough to support large congregations. Not SWH
Wildlife Habitat: Raptor Wintering Area					
<u>Rational:</u> 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 <u>Special Concern:</u> 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	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha ^{cxviii, 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 ^{cdix} Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting <u>Information Sources</u> • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years) ^{cdix} for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMiST ^{cdix} Index #10 and #11 provides development effects and mitigation measures.	Forest communities (FOD) are present within the study area but are small in size and fragmented. Upland habitat of suitable size is not present as the majority of the subject property consists of active agricultural row crop. Not SWH

	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					
<u>Rationale</u> Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	- Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. - Active mine sites should not be considered as SWH - The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - Natural Heritage Information Center (NHIC) Bat Hibernaculum - Ministry of Northern Development and Mines for location of mine shafts. - Clubs that explore caves (eg. Sierra Club) - University Biology Departments with bat experts.	- All sites with confirmed hibernating bats are SWH. - The habitat area includes a 200m radius around the entrance of the hibernaculum^{ccviii, ccvii} for most. - Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"^{ccv} - SWHMiST^{cdix} Index #1 provides development effects and mitigation measures.	None of the listed ELC communities are present within the study area or subject property. Not SWH
Wildlife Habitat: Bat Maternity Colonies					
<u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings ^{xxii, xxv, xxvi, xxvii, xxvi} (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} <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - University Biology Departments with bat experts.	- Maternity Colonies with confirmed use by: >10 Big Brown Bats >5 Adult Female Silver-haired Bats - The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecosystem containing the maternity colonies. - Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects"^{ccv} - SWHMiS T^{cdix} Index #12 provides development effects and mitigation measures.	No potential bat roost trees were identified within the subject property in the listed communities during bat habitat assessment surveys. Not SWH
Wildlife Habitat: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specified ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. <u>Information Sources</u> - OMNR for possible locations and contact for local experts - University of Waterloo, Biology Department	Long Point has been identified as a significant stopover habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration ^{ccv} - The confirmation criteria and habitat areas for this SWH are still being determined. - SWHDSS^{cdix} Index #38 provides development effects and mitigation measures	Criteria unavailable to assess significance of habitat within the study area.

	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					
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen ^{cix, cx, cxj, cxviii} . • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) ^{cvi} . • Congregation of turtles is more common where wintering areas are limited and therefore significant ^{cix, cx, cxj, cxii} . • SWHMiST ^{cdix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.	None of the listed ELC communities are present within the subject property. A MA community and a watercourse are present within the study area but are not suitable habitat. Not SWH
Wildlife Habitat: Snake Hibernaculum					
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern:</u> Milksnake Eastern Ribbonsnake <u>Lizard:</u> <u>Special Concern</u> (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line ^{xiv, i, ii, iii, 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. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u> : individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. <u>or</u> : individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • <u>Note:</u> If there are Special Concern Species present, then site is SWH • <u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH ⁱ . • SWHMiST ^{cdix} Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST ^{cdix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Suitable habitat features may be present within the study area. No suitable habitat features are present within the subject property. Not SWH

	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)					
<u>Rationale:</u> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> - Reports and other information available from CAs - Ontario Breeding Bird Atlas^{ccv} - Bird Studies Canada; <i>NatureCounts</i> http://www.birdscanada.org/birdmon/ - Field Naturalist clubs	Studies confirming: - Presence of 1 or more nesting sites with 8^{cdix} 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"^{cccxi} - SWHMiST^{cdix} Index #4 provides development effects and mitigation measures	No suitable banks are present within the subject property. However, suitable banks are present within the study area along the Conestogo River. None of the listed species were observed within the subject property during breeding bird surveys in 2018. Not SWH
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
<u>Rationale:</u> 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 15m from ground, near the top of the tree. <u>Information Sources</u> - Ontario Breeding Bird Atlas^{ccv}, colonial nest records. - Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). - NHIC Mixed Wader Nesting Colony - Aerial photographs can help identify large heronries - Reports and other information available from CAs - MNRF District Offices - Local naturalist clubs	Studies confirming: - Presence of 5^l or more active nests of Great Blue Heron or other listed species. - The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH^{cc, ccvii} - Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells - SWHMiST^{cdix} Index #5 provides development effects and mitigation measures.	None of the listed ELC communities are present within the subject property or study area. Not SWH

	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 populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 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 Center (NHIC) Colonial Waterbird Nesting Area - MNRF District Offices - Field naturalist clubs	Studies confirming: - Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern¹. - Presence of 5 or more pairs for Brewer's Blackbird. - Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. - The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <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^{cdix} Index #6 provides development effects and mitigation measures.	No rocky islands or waterbodies are present within the subject property. Suitable habitat for Brewer's Blackbird may be present within the study area. However, none of the listed species were observed within the subject property during breeding bird surveys in 2018. Not SWH
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers 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 CUS CUT Forest: FOC FOM FOD 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 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario ^{cdix} . - 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^{xxvii, xxviii, xxix, xxx, xxxi}. - 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^{xxvii, xxviii, xxxix, xl, xli}. Information Sources - OMNRF (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)^{xlii}. 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^{xxvii}, 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 Red Admiral's is to be considered significant. - SWHMiST^{cdix} Index #16 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. Not SWH

	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					
<u>Rationale:</u> Sites with a high diversity of species as well as high number 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 >10 ha ¹ in size and within 5km ^{iv, v, vi, vii, viii, ix, x, xi, xii, xiv, xv} of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake 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 are Candidate SWH ^{cxlviii} . <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMiST ^{cxlix} Index #9 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. Not SWH
Wildlife Habitat: Deer Yarding Areas					
<u>Rationale:</u> Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60% ^{ccxiv} . • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual" ^{ccxv} • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH ^{lvi, lvii, lviii, lxx, lxi} . • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations ^{ccv} . • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST ^{cxlix} Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within the study area. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
<u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E 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 ^{exlviii}	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands^{cxlviii}. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • 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. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF^{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 MNR^l. • 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}. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST^{cxlix} Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within the study area. Not SWH

Appendix III: Significant Wildlife Habitat Assessment Tables

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

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. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes ^{lxviii} • SWHMiST ^{cxlix} Index #21 provides development effects and mitigation measures.	None of the listed ELC communities are present within the study area or subject property. Not SWH
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%.	Any sand barren area, >0.5ha in size. <u>Information Sources</u> • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens ^{lxviii} • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics) ⁱ . • SWHMiST ^{cxlix} Index #20 provides development effects and mitigation measures.	None of the listed ELC communities are present within the study area or subject property. Not SWH

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 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	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 6E	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 zoo geographically 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 ^{lxviii} .	An Alvar site > 0.5 ha in size ^{lxv} . <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists ^{lxvi} • Ontario Nature – Conserving Great Lakes Alvars ^{lxvii} • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species ^{lxv} , ^{cxlix} at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses ^{lxv} . • SWHMiST ^{cxlix} Index #17 provides development effects and mitigation measures.	None of the listed ELC communities are present within the study area or subject property. Not SWH
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest í. <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat ^{cxlviii} • The stand will have experienced no recognizable forestry activities ^{cxlviii} • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand ^{lxviii} • SWHDSS ^{cxlix} Index #23 provides development effects and mitigation measures.	No old growth forest is present within the study area or subject property. Not SWH

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					
<u>Rationale:</u> 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%.	- No minimum size to site - Site must be restored or a natural site. - Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - Natural Heritage Information Center (NHIC) has location information on their website - OMNRF Ecologists - Field naturalists clubs - Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in ^{boxv} Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used ^{cxlviii} . - Area of the ELC Ecosite is the SWH. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). - SWHMiST^{cxlix} Index #18 provides development effects and mitigation measures.	None of the listed ELC communities are present within the study area or subject property. Not SWH
Tallgrass Prairie					
<u>Rationale:</u> 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.	- No minimum size to site - Site must be restored or a natural site. - Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - OMNR Districts - Natural Heritage Information Center (NHIC) has location information available on their website - Field naturalists clubs - Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in ^{boxv} Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used ^{cxlviii} . - Area of the ELC Ecosite is the SWH - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - SWHMiST^{cxlix} Index #19 provides development effects and mitigation measures.	None of the listed ELC communities are present within the study area or subject property. Not SWH

Rare Vegetation Community ¹	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes ¹	Habitat Description ¹	Detailed Information and Sources ¹	Defining Criteria ¹	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG ^{cxlviii} . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M ^{cxlviii} The OMNR/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Center (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.	Other rare vegetation communities are not present within the study area or subject property. Not SWH

Appendix III: Significant Wildlife Habitat Assessment Tables

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

	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 (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur ^{cxlix} . • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{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 areas adjacent to wetlands are present within the subject property. However, suitable habitat may be present within the study area. Not SWH

Wildlife Species ¹		Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
<u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern:</u> Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	- Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. - Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. - Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> - Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. - MNR values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. - Nature Counts, Ontario Nest Records Scheme data. - OMNRF Districts - Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. - 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^{cv}, ^{ccvii}. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat^{cv}. - 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	No large, suitable bodies of water are present within the study area or subject property. Not SWH
Wildlife Habitat: Woodland Raptor Nesting Habitat					
<u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat^{boocviii}, ^{boocix}, ^{xc}, ^{xc}, ^{xciii}, ^{xciv}, ^{xcv}, ^{xcvi}, ^{cxoxxiii}. 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 Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. - In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> - OMNRF - 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 28ha area of habitat is the SWH^{ccvii}. - 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 mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. - SWHMiST^{cxlix} Index #27 provides development effects and mitigation measures.	A CUP community is present within the study area but is not of suitable size. Not SWH

Wildlife Species ¹		Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) ^{cxviii} 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. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWHⁱ • 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 dependent on slope, riparian vegetation and adjacent land use is the SWH^{cxviii}. • Travel routes from wetland to nesting area are to be considered within the SWH^{cxlix}. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST^{cxlix} Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Exposed soil adjacent to the listed ELC communities are not present within the subject property. However, suitable habitat may be present within the study area. Not SWH
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system ^{cxvii, cxlix} . • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species^{cxix, cxx, cxxi, cxxii, cxiii, cxiv} <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat^{cxlviii} • SWHMiST^{cxlix} Index #30 provides development effects and mitigation measures	Seeps and springs not present within the subject property and are not expected to be present within study area. Not SWH

Wildlife Species ¹		Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m² (about 25m diameter)^{ccvii} within or adjacent (within 120m) to a woodland (no minimum size)^{clxxxii, lxiii, lxx, 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} <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)^{lxxi} or 2 or more of the listed frog 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 woodland area plus a 230m radius of woodland area^{lxiii, lxx, 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.	No breeding pools within the listed ELC communities are present within the subject property. Suitable habitat may be present within the study area. Not SWH
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
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 American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog 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 >500m² (about 25m diameter)^{ccvii} supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats^{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. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)^{lxxi, lxxiii}, or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys^{cviii} will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST^{cxlix} Index #15 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Anuran call surveys indicate that wetlands adjacent to the subject property do not qualify as Amphibian Breeding Habitat (Wetland) SWH. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
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 Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	- Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. cv, cxxxi, cxxxi, cxxxi, cxxxi, cxxxi, cxxvi, cxxvii, cxxviii, cxxix, cxi, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cxlv, clv, cxvii, cxviii, cxlix - Interior forest habitats are at least 200m from forest edge habitat. Information Sources - Local bird 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 greatest value to interior species - Reports and other information available from CAs.	- Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. - Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. - Conduct field investigations in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ccxi - SWHMiST cxlix Index #34 provides development effects and mitigation measures.	Forest of suitable size is not present within the study area or subject property. Not SWH

Appendix III: Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	ELC Ecosite Codes ¹	Candidate SWH Habitat Criteria and Information Sources ¹	Confirmed SWH Defining Criteria ¹	Study Area Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
<u>Rationale:</u> 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 Sandhill Crane Green Heron Trumpeter Swan <u>Special Concern:</u> Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 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^{cxixiv} • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • 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 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed speciesⁱ. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWHⁱ. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi}. • SWHMiST^{cxlix} Index #35 provides development effects and mitigation measures	None of the listed communities are present within the subject property. A MAM2 community is present within the study area. None of the listed species were observed during breeding bird surveys in 2018. Not SWH
Wildlife Habitat: Open Country Bird Breeding Habitat					
<u>Rationale:</u> This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow <u>Special Concern:</u> Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha^{clx, clxi, clxii, clxiii, clxiv, 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. <u>Information Sources</u> • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas^{ccv}	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds 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.	Grasslands of suitable size are not present within the study area or subject property. Savannah Sparrow was observed exhibiting possible breeding evidence within the subject property during breeding bird surveys in 2018. Not SWH

	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 cxcix.	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 for some bird species.	Large field areas succeeding to shrub and thicket habitats >10ha ^{cxiv} 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 ^{cxviii} . Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas ^{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. • 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.	None of the listed ELC communities are present within the subject property. CUW communities are present within the study area but are not adjacent to fields of suitable size that are not active agricultural row crop. Not SWH
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: (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish: (<i>Cambarus Diogenes</i>)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. 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 ^{ccj} • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult ^{ccj} • SWHMiST ^{cxlix} Index #36 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Suitable habitat is present within the study area's MAM2 community but was not surveyed for chimneys. Not SWH

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
<u>Rationale:</u> 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.	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^{boxviii}. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas^{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 needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST^{cxlix} Index #37 provides development effects and mitigation	See SAR/SCC screening table for details. Not SWH

Appendix III: Significant Wildlife Habitat Assessment Tables

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

	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 Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat ^{cbxxiv, cbxxv, cbxxvi, cbxxvii, cbxxviii, cbxxix, cbxxx, cbxxxI} Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule ¹ . <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center 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 waterway ^{cxlix} or be up to 200m wide ^{cxlix} of woodland habitat and with gaps <20m ^{cxlix} . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat ^{cxlix} . • SWHMiST ^{cxlix} Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat (Wetland) is not present within the subject property. Therefore, amphibian movement corridors are not applicable. Not SWH
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule ¹ . • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion ^{cbxxii, cbxxiii, cxlix, cxciiv} . • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide ^{cxlix} with gaps <20m ^{cxlix} and if following riparian area with at least 15m of vegetation on both sides of waterway ^{cxlix} . Shorter corridors are more significant than longer corridors ^{cxlix} . • SWHMiST ^{cxlix} Index #39 provides development effects and mitigation measures.	Deer Wintering Habitat is not present within the subject property. Therefore, deer movement corridors are not applicable. Not SWH

APPENDIX IV
Tree Inventory and Preservation Plan



211 Eliza Street, Arthur

Tree Inventory and Preservation Plan

Prepared for:

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Project No. 2434 | January 2021



NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

211 Eliza Street, Arthur
Tree Inventory and Preservation Plan

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Sarah Properties Ltd. to complete a Tree Inventory and Preservation Plan (TIPP) in conjunction with an Environmental Impact Study (EIS) for a proposed residential development at 211 Eliza Street (the “subject property”) in the Village of Arthur, Wellington County.

The subject property is approximately 16ha in size and is dominated by actively cultivated agricultural fields, bordered by hedgerows and individual trees. The subject property is located at the edge of the village, with residential properties to the north and west, Highway 109 to the south, and the Conestogo River to the east (Map 1). Surrounding lands are largely agricultural. A barn was removed from the subject property in recent years. For more information regarding the site context and adjacent natural features, please refer to the EIS (NRSI 2020).

The County of Wellington has not enacted a by-law for the protection of trees outside of woodlands on private property but this TIPP is anticipated to be required for review by the County as part of a Draft Plan of Subdivision application. This report provides the findings of the tree inventory, analysis of development plans against the overall health and the structural integrity of trees, protection measures for trees to be retained, and recommended mitigation and compensation measures.

The tree data and locations have been compared to the proposed Draft Plan prepared by Black, Shoemaker, Robinson & Donaldson Ltd. (November 6, 2020) and grading plan prepared by RJ Burnside & Associates Ltd. (January 7, 2021). These plans show the proposed block layout and road network, proposed grading, as well as setbacks associated with top of slope, and the area regulated by the Grand River Conservation Authority (GRCA). The existing overall health and/or potential for structural failure was compared to the layout to determine whether existing trees may be impacted by the proposed undertaking.

Avoidance, mitigation, and protection measures for trees were examined to determine which trees would be impacted and which could be retained. In the case of trees requiring removal, compensation for removal is discussed.

This report summarizes the following:

- Findings of the tree inventory;
- Assessment of overall health and potential for structural failure of inventoried trees;
- Tree retention analysis based on details of the proposed development;
- Protection measures for trees to be retained; and,
- Recommended mitigation and compensation measures.

2.0 Tree Inventory and Methods

A comprehensive inventory of trees $\geq 10\text{cm}$ in Diameter at Breast Height (DBH) on and within approximately 5m of the subject property was completed by NRSI Certified Arborists on April 16 and 30, 2019. Inventories were conducted before leaf-out for most tree species, therefore, NRSI was able to assess the overall health and potential for structural failure of inventoried trees, but not the foliar characteristics of deciduous individuals. Individual trees that were $\geq 10\text{cm}$ in DBH were assessed by a Certified Arborist, and their locations were surveyed using a SXBlue II GNSS GPS unit, as shown on Map 2. In cases of multi-stemmed trees, DBH is presented as the sum of the three largest stems.

On-property trees were tagged with a pre-numbered aluminum forestry tag, while trees rooted outside the subject property and those on the property boundary were not tagged because they are not wholly owned by the Client. All trees on and within approximately 5m of the subject property are accounted for in this TIPP, but not all trees that should have been tagged were, and estimations of ownership have been made using the tree locations relative to the surveyed property lines in Map 2.

A complete list of the trees that were assessed and their overall health and potential for structural failure is included in Appendix I. The following information was recorded for each tree:

- Species;
- DBH measurement (cm);
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent); 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 were assessed based on the criteria outlined in Appendix II. 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 III.

2.1 Bat Habitat Assessment Methods

Three bat species known from the area are listed as Endangered provincially and are afforded general habitat protection under the Endangered Species Act (2007). Bat Species at Risk (SAR) include Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*).

These species are known to roost in tree cavities, hollows, or under loose bark, as well as within buildings (OMNR 2000). Bat habitat assessments were conducted in both leaf-off and leaf-on seasons as part of the EIS field surveys; refer to the EIS report for more information (NRSI 2021).

3.0 Summary of Tree Inventory Findings

In total, 186 trees were inventoried, comprising 15 species. Of the trees inventoried and assessed, 143 (76.8%) are native species, dominated by White Ash (*Fraxinus americana*), and 42 (22.6%) are non-native, dominated by Common Apple (*Malus domestica*) and Scots Pine (*Pinus sylvestris*). One tree was in such a decayed condition that distinguishing characteristics were absent and could not be identified to species level. No significant species was recorded.

The highest density of trees inventoried was off-property in a fencerow composed mostly of White Ash on the residential property southwest of the subject property, bordering a pine plantation. Approximately one-third of the inventoried trees (32.7%) are deemed to be outside the subject property, and 42.5% appear to be on the boundary of the subject property with adjacent lands. Some of the trees at the east of the property compose the edge of wooded features at the top of a steep slope that leads down to the Conestogo River. A hedgerow feature and a cultural woodland line the property at the south, along Highway 109; some of these trees were inventoried before it was determined that these trees are far enough outside the subject property and not anticipated to be impacted by the proposed development.

A complete list of the trees that were assessed and their overall health and potential for structural failure is included in Appendix I, and tree locations within the subject property are shown on Map 2. The majority of the inventoried trees were in fair condition with an improbable or possible potential for structural failure. Appendix IV presents tables summarizing the overall health of trees inventoried within the study area, along with their potential for structural failure.

3.1 Bat Habitat Findings

Between the tree inventory and other targeted surveys, two trees were identified as having potentially suitable features for bat maternity colony habitat. One of these trees with suitable features was captured during the tree inventory, therefore only that tree is distinguished on Maps 2 & 3. For more information, please refer to the EIS (NRSI 2021).

4.0 Tree Removal and Retention Analysis

Tree removal and retention was based on the Draft Plan and grading plan. This was determined by comparing the location of the trees to the block layout and proposed grading of the development proposal (Map 2).

Five trees identified as having a probable potential for structural failure are recommended for retention at this time because they are located near many other trees to be retained and activities associated with their removal may damage other trees. Four such trees are beyond the stable top-of-slope at the east of the property and are not near proposed development; one (#1407) is an off-property tree in the fencerow at the southwest and should be noted as a potential hazard.

Of the 186 trees inventoried, 1 is anticipated to be removed to facilitate the proposed development. This tree is a Hawthorn *sp.* in fair health with an improbable potential for structural failure, and has a DBH of 24.0cm. This tree is jointly owned with neighbouring landowners ("boundary tree") and is not tagged. It should be properly identified and marked for removal in the field by a Certified Arborist, based upon a TIPP approved by municipal authorities. As per Section 10 of the Forestry Act (R.S.O. 1990, c. F.26), this tree cannot be harmed or destroyed without first securing permission from adjacent landowner(s).

All other inventoried trees are anticipated to be retained. The proposed grading and swale locations have been configured in such a way to allow for all other boundary or off-site trees to be retained. The swale on Map 2 is shown as the centre line with a maximum 3:1 slope and a minimum depth of 0.15m; no grading is to occur within the dripline of trees adjacent to the swale. The dense White Ash fencerow on the property southwest of the subject property has been retained by shifting east the proposed drainage swale along that boundary. Some of these trees exhibited signs of Emerald Ash Borer (*Agrilus planipennis*) infestation at the time of the tree inventory, and it is likely that this pest will continue to impact Ash trees in the area. South of the White Ash fencerow, a number of large Silver Maple trees (#1446-1451) will be retained and direct impacts avoided by installing a retaining wall at the extent of their driplines.

5.0 Tree Compensation Plan

The County of Wellington has not set out compensation requirements for trees removed as part of an approved Draft Plan of Subdivision. In the absence of specific criteria, it is suggested that elements of the Township of Centre Wellington's Public Forest Policy (2018) be used as a guideline. In accordance with this policy, it is recommended that each native and non-native tree that was assessed in good or fair health be replaced with two caliper trees. This approach would result in 2 replacement trees, as outlined in Table 1. Centre Wellington's tree planting specifications allow for the caliper size to be 50-70mm for urban areas and 35-50mm for rural areas (Centre Wellington 2018). Detailed landscaping plans for the subject property at the Detailed Design Stage will set out the location, species and size selection.

It is recommended that trees be selected from a range of genera in order to minimize the susceptibility of the landscape to specific diseases or pests. While it is recognized that some non-native tree species make good street trees because of their tolerance of salt, air pollution, and suboptimal soil conditions, trees in any buffer plantings and most street trees should be native to the County of Wellington. Suggested species for different applications are offered in Centre Wellington's Public Forest Policy (2018).

Table 1. Summary of Trees to be Removed and Recommended Compensation Plan

Tree Inventory	Total
Total number of trees inventoried	186
Total number of trees to be removed	1
Tree Compensation	
Trees in poor to very poor condition or dead (exempt from compensation)	0
Trees in good to fair condition to be removed	1
Number of compensation plantings at 2:1 replacement	2

6.0 Tree Protection Measures and Recommended Mitigation

6.1 Prior to Construction

Temporary tree protection fencing (TPF) will be situated where trees are adjacent to the limit of disturbance/grading. A combined erosion and sediment control fence (i.e. silt fence, ESC) and TPF is recommended where trees are situated adjacent to the limit of disturbance. The Township of Centre Wellington's TPF specification is recommended and shown on Map 3. The TPF is to consist of a wooden frame with angled supports that do not disturb the root zone, and upright barriers of orange plastic safety fencing or plywood. Where trees and their driplines are well beyond the property boundary or the setbacks associated with the slope and riparian wetland east of the subject property, ESC fencing alone may be sufficient to protect retained trees beyond the limits of disturbance. Suggested locations of TPF and ESC are shown on Map 3.

The temporary TPF will be installed and maintained by the Developer and/or their agents. Prior to any construction activities (rough grading, vegetation and tree removal), the TPF will be installed at a minimum distance of the Tree Protection Zone (TPZ) outlined in the Public Forest Policy (Centre Wellington 2018) and shown on Map 3. It should be noted that there are some instances where the TPZ of a retained tree is encroached upon by the proposed works: trees #1495, #1493, #1490, #1489, #1486, #1485 and #1402. The TPZ of these trees is somewhat inflated by the summed DBH of multiple stems. These trees are recommended for retention because they will likely withstand this encroachment. Tree #1485, a Mountain-Ash species (*Sorbus* sp.) will have some grading encroachment, which will be configured close to the trunk; however given this individual tree's vigour and the typical tolerance of this species to disruption, it is expected that it will likely withstand this encroachment and there will be no substantial negative impacts to this tree.

Signage indicating the purpose of protection fencing will be attached to the fencing in every discrete location of TPF, and every 50m if a length of TPF exceeds 50m. Signage should communicate prohibited activities within the tree protection zone and provide contact details for the County and developer.

This TIPP is to be reviewed and approved by the County of Wellington. Upon approval of the TIPP and prior to any on-site works (i.e. rough grading, tree removal), a qualified Certified Arborist or Environmental Monitor is to submit written verification to the County that all of the recommended tree protection measures have been installed in accordance with the TIPP.

6.1.1 Migratory Birds Convention Act

The removal of trees within the subject properties has the potential to disrupt nesting birds. The Migratory Birds Convention Act (MBCA) identifies a list of migratory bird species that are protected and prohibits the destruction of nests, individuals and activities that would cause an adult bird to abandon a nest (Government of Canada 1994). Tree removal is to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS 2012) which extends from approximately April 1 through August 31. Every developer/consultant/contractor is legally obliged to carry out due diligence to protect migratory birds from harm during all construction projects.

Historically, the implementation policies of the MBCA provided for biologists to conduct nest searches when vegetation removals were to occur during the nesting period. These provisions were revoked in 2014. One exception is for when the removals are to occur in simple habitats which are characterized in the MBCA (i.e. bridge structures, isolated trees, vacant lot). The trees anticipated to be removed are mostly isolated fencerow and ornamental trees and may qualify as 'simple habitat'.

Should tree removal be required to occur within the peak breeding window, pending discussion and approval by the CWS, nest surveys may be conducted by a qualified biologist just prior to the removal activity (less than 48 hours prior to) to ensure that nesting birds are not present. Should a nest be identified within a tree(s) to be removed, there shall be no removal or construction activity until sign-off is obtained from the qualified biologist that the nest is no longer active. Trees identified as having no nesting activity can be removed; however, tree removal is to occur within 48 hours of the nest search. If tree removal does not occur within this time frame, additional nest searches are to be conducted.

In the event a nest survey is conducted, a clearance letter is to be prepared by the qualified biologist that undertook the surveys and submitted to the County and Village for their files in the event a record of due diligence is requested by CWS.

6.2 During Construction

The temporary TPF is to be maintained by the Developer and/or their agents during the entire construction period and until the site is stabilized to the satisfaction of the Environmental Monitor, or qualified other, to ensure that trees being retained and their root systems are protected. Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any of the trees

intended to be retained be seriously damaged or die as a result of construction activities, the owner will remove and replace the tree at their own expense, in consultation with the County and Village. Replacement species are to be reviewed by a member of the Ontario Association of Landscape Architects (OALA) or Certified Arborist. Watering and pruning of newly planted trees will be carried out by the owner/contractor as required during the warranty period (approximately 2 years).

6.3 Post-Construction

As trees being retained are situated along the boundaries of the subject property it is recommended that the temporary TPF be removed upon completion of construction activities and adjacent areas are stabilized with a vegetative cover (i.e. sod in urban area or a native seed mix along naturalized hedgerows) to the satisfaction of the Environmental Monitor or qualified biologist

7.0 Mitigation

7.1 Restoration and Landscaping

Species used for replacement plantings, with the possible exception of street trees, should be native to Wellington County. Species that are listed as provincially or federally significant may be used with an understanding of applicable policies. The use of hardy species will ensure successful early establishment and increase the likelihood of survival. Given the proximity of the subject property to the Conestogo River that could transport tree and vegetation seeds long distances, it is recommended that selected species be non-invasive and native to Wellington County. For street tree plantings, the use of non-native species that are sometimes more tolerant of urban conditions (e.g. salt and drought, disturbed soils) may be suitable as long as they do not include invasive species such as Norway Maple (*Acer platanoides*) or Black Locust (*Robinia pseudoacacia*).

At the detailed design stage, it is recommended that the following criteria be considered during the development of proposed planting plans:

- Yard plantings will be limited to native, non-invasive tree species indigenous to Wellington County that complement the surrounding natural features;
- Tree species to be situated in close proximity to roads should be tolerant of salt, drought and compaction;
- Avoid Ash species due to the risk of the Emerald Ash Borer;
- All plant material is to conform to the latest edition of the *Canadian Nursery Trades Association Specifications and Standards*;
- Plantings installed as per specifications outlined in planting plans to be prepared by a member of OALA or Certified Arborist;
- Spacing of plant material should account for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.;
- Special attention to location and height of trees in proximity to utilities and required sight lines; and,
- Ensure that there is sufficient soil volume for all plantings.

8.0 References

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Appendix I
Tree Inventory Data

211 Eliza Street, Arthur Tree Inventory and Preservation Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
1329	Manitoba Maple	<i>Acer negundo</i>	Native	1	11.1	2.0	Possible	Fair	On-property	Retain			Leaning away from subject property; lichen-covered; minor epicormic growth.
1330	Manitoba Maple	<i>Acer negundo</i>	Native	1	17.7	2.5	Possible	Fair	On-property	Retain			Heavily leaning away from subject property; codominant leaders; lichen-covered; minor epicormic growth.
1331	White Ash	<i>Fraxinus americana</i>	Native	1	14.1	2.0	Possible	Poor	Off-property	Retain			Insectivore action; asymmetrical crown; dieback.
1332	White Ash	<i>Fraxinus americana</i>	Native	1	19.9	2.5	Possible	Fair	Boundary	Retain			Codominant leaders, slightly suppressed; stunted twig growth.
1333	White Ash	<i>Fraxinus americana</i>	Native	1	21.6	3.0	Possible	Poor	Boundary	Retain			EAB exit holes; crooked stem; epicormic growth.
1334	White Ash	<i>Fraxinus americana</i>	Native	1	12.3	1.5	Possible	Poor	Boundary	Retain			Major stem wound, centre rot; leaning away from subject property.
1335	White Ash	<i>Fraxinus americana</i>	Native	1	17.6	2.0	Improbable	Fair	Boundary	Retain			Crooked stem; slightly suppressed; few small dead branches.
1336	White Ash	<i>Fraxinus americana</i>	Native	1	20.6	2.5	Possible	Fair	Boundary	Retain			Very crooked stem; bark rubbing.
1337	White Ash	<i>Fraxinus americana</i>	Native	1	71.0	6.0	Probable	Poor	Boundary	Retain			Codominant leaders, 1 dead; 40% live crown lost; dead branches, some broken.
1338	White Ash	<i>Fraxinus americana</i>	Native	1	22.0	3.0	Possible	Fair	On-property	Retain			Bark seam; basal rot; 1 dead branch.
1339	White Ash	<i>Fraxinus americana</i>	Native	1	11.0	1.0	Improbable	Fair	On-property	Retain			Asymmetrical crown due to neighboring tree.
1340	White Ash	<i>Fraxinus americana</i>	Native	1	53.1	1.0	Probable	Dead	On-property	Retain			Loose bark; insect galleries; conk at base; dead crown.
1341	Common Apple	<i>Malus domestica</i>	Non-Native	3	51.8	3.0	Improbable	Fair	On-property	Retain			Codominant stems with included bark; dense, squat crown; water sprouts.
1342	White Elm	<i>Ulmus americana</i>	Native	1	14.8	2.0	Improbable	Fair	On-property	Retain			Suppressed, asymmetrical crown due to large neighboring tree.
1343	White Elm	<i>Ulmus americana</i>	Native	1	37.8	7.0	Improbable	Fair	On-property	Retain			Codominant leaders; minor epicormic growth; 1 broken branch.
1344	White Ash	<i>Fraxinus americana</i>	Native	1	32.1	4.0	Improbable	Fair	On-property	Retain			Couple broken branches; minor outer bark sloughing.
1345	Mountain-Ash species	<i>Sorbus sp.</i>	Non-Native	1	15.3	4.0	Possible	Fair	On-property	Retain			Growing at top of valley but leans toward subject property; dead lower branches.
1346	White Elm	<i>Ulmus americana</i>	Native	1	19.8	3.0	Possible	Fair	On-property	Retain			Pistol butt growing from upper valley wall; epicormic growth; bark cracks.
1347	White Elm	<i>Ulmus americana</i>	Native	1	51.1	7.0	Possible	Fair	On-property	Retain			Codominant leaders; included bark; epicormic growth; budding out well.
1348	Black Cherry	<i>Prunus serotina</i>	Native	1	28.2	3.0	Possible	Fair	On-property	Retain			Significant stem wound; dead lower branches; couple tight branch unions.
1349	White Elm	<i>Ulmus americana</i>	Native	1	30.1	2.5	Probable	Dead	On-property	Retain			Dead crown; shedding bark.
1350	White Elm	<i>Ulmus americana</i>	Native	1	39.9	6.0	Probable	Very Poor	On-property	Retain			75% live crown lost; shedding bark epicormic growth.
1351	Hawthorn species	<i>Crataegus sp.</i>	Native	8	53.8	6.0	Possible	Fair	On-property	Retain			Many stems; spreading crown; dead branches, some broken.
1352	Hawthorn species	<i>Crataegus sp.</i>	Native	1	17.8	4.0	Improbable	Fair	On-property	Retain			Asymmetrical crown to west; phototrophic growth; secondary stem dead, rot where it broke off; stem lean.
1353	Hawthorn species	<i>Crataegus sp.</i>	Native	2	33.2	3.0	Possible	Poor	On-property	Retain			Asymmetrical crown to east; stem lean; branch rub; canker; cavity with rot and fungus.
1354	Prunus species	<i>Prunus sp.</i>	Native	2	18.9	2.0	Possible	Fair	On-property	Retain			Asymmetrical crown to east; stem lean; branch rub; erosion downslope; included bark.
1355	White Elm	<i>Ulmus americana</i>	Native	1	37.2	2.0	Possible	Dead	On-property	Retain			Sloughing bark.
1356	Hawthorn species	<i>Crataegus sp.</i>	Native	1	22.7	5.0	Possible	Fair	On-property	Retain			Hanger; phototrophic growth; asymmetrical crown to west; branch rub; history of branch failure.
1357	Hawthorn species	<i>Crataegus sp.</i>	Native	1	19.7	3.0	Improbable	Fair	On-property	Retain			Asymmetrical crown to east; canker; phototrophic growth; branch rub.
1358	White Ash	<i>Fraxinus americana</i>	Native	1	11.3	2.0	Possible	Fair	On-property	Retain			Basal rot; included bark; hanger.
1359	White Ash	<i>Fraxinus americana</i>	Native	1	12.1	1.0	Possible	Fair	On-property	Retain			Canker; epicormic growth; phototrophic growth; small dead branches.
1360	White Ash	<i>Fraxinus americana</i>	Native	1	12.1	1.0	Improbable	Fair	On-property	Retain			Small dead branches; branch rub; phototrophic growth.
1361	White Ash	<i>Fraxinus americana</i>	Native	1	17.5	1.5	Improbable	Fair	On-property	Retain			Branch rub; small dead branches.
1362	Hawthorn species	<i>Crataegus sp.</i>	Native	1	15.8	2.5	Possible	Fair	On-property	Retain			Phototrophic growth; stem lean; branch rub; asymmetrical crown to east.
1363	White Ash	<i>Fraxinus americana</i>	Native	1	24.7	4.0	Improbable	Fair	On-property	Retain			Asymmetrical crown to west; suckering; branch rub.
1364	White Ash	<i>Fraxinus americana</i>	Native	4	114.8	5.0	Improbable	Fair	On-property	Retain			Branch rub; epicormic growth; suckering; included bark; small dead branches.
1365	White Ash	<i>Fraxinus americana</i>	Native	1	29.6	3.0	Improbable	Dead	On-property	Retain			EAB; sloughing bark.
1366	White Ash	<i>Fraxinus americana</i>	Native	2	65.2	2.0	Possible	Dead	On-property	Retain			EAB; sloughing bark.
1367	Freeman's Maple	<i>Acer X freemanii</i>	Native	1	16.0	2.0	Improbable	Fair	On-property	Retain			Included bark; branch rub; canker; asymmetrical crown to west.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
1368	White Ash	<i>Fraxinus americana</i>	Native	4	43.8	3.0	Improbable	Fair	On-property	Retain			Suckering; asymmetrical crown to west; branch rub.
1369	White Ash	<i>Fraxinus americana</i>	Native	2	36.6	3.0	Improbable	Fair	On-property	Retain			Included bark; branch rub; bark damage.
1370	White Ash	<i>Fraxinus americana</i>	Native	1	28.4	4.0	Improbable	Good	Boundary	Retain			Asymmetrical crown to west; branch rub; phototrophic growth.
1371	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	33.3	6.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to west; included bark; light pruning; basal rot.
1372	Common Apple	<i>Malus domestica</i>	Non-Native	2	27.9	2.0	Improbable	Fair	On-property	Retain			Suppressed; included bark; branch rub.
1373	Common Apple	<i>Malus domestica</i>	Non-Native	1	12.0	2.0	Improbable	Poor	Boundary	Retain			Asymmetrical crown to east; branch rub; dead branches; suppressed.
1374	Mountain-Ash species	<i>Sorbus sp.</i>	Non-Native	4	69.0	3.0	Possible	Fair	Boundary	Retain			Canker; branch rub; rot.
1375	White Ash	<i>Fraxinus americana</i>	Native	1	21.6	4.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to west; small dead branches.
1376	White Ash	<i>Fraxinus americana</i>	Native	1	21.6	4.5	Improbable	Fair	Off-property	Retain			Asymmetrical crown to west; small dead branches.
1377	White Ash	<i>Fraxinus americana</i>	Native	1	12.6	2.0	Improbable	Fair	Off-property	Retain			Asymmetrical crown to west; small dead branches.
1378	White Ash	<i>Fraxinus americana</i>	Native	1	36.0	4.0	Improbable	Fair	Boundary	Retain			Large basal wound, some rot; branch rub; hanger.
1379	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	47.7	3.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to east; bark staining; included bark; branch rub; hangers.
1380	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	35.0	3.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to east; included bark; branch rub.
1381	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	32.2	5.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to west; included bark; branch rub.
1382	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	46.5	4.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; small dead branches.
1383	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	47.6	6.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; small dead branches; asymmetrical crown to west; hangers.
1384	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	18.7	6.0	Possible	Poor	Boundary	Retain			Included bark; branch rub; small dead branches; asymmetrical crown to east; hangers.
1385	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	21.0	4.0	Improbable	Poor	Boundary	Retain			Included bark; branch rub; small dead branches; asymmetrical crown to west; suppressed.
1386	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	2	59.7	3.5	Improbable	Fair	Boundary	Retain			Included bark; branch rub; small dead branches.
1387	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	39.7	4.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; small dead branches; staining.
1388	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	49.0	6.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; small dead branches; staining.
1389	Manitoba Maple	<i>Acer negundo</i>	Native	1	10.5	1.5	Possible	Fair	On-property	Retain			Few dead branches; lichen-covered; growing on slope; minor epicormic growth.
1390	Common Apple	<i>Malus domestica</i>	Non-Native	3	64.5	4.0	Possible	Fair	Off-property	Retain			3 codominant stems twisting around each other; dead branches; poor structure.
1391	Common Apple	<i>Malus domestica</i>	Non-Native	3	73.5	3.5	Improbable	Fair	Boundary	Retain			Codominant stems; dead branches; exposed roots.
1392	Hawthorn species	<i>Crataegus sp.</i>	Native	4	11.1	2.0	Possible	Fair	Off-property	Retain			Small stems; arching toward field; water sprouts; few dead branches.
1393	Norway Maple	<i>Acer platanoides</i>	Non-Native	3	37.1	2.5	Possible	Fair	Off-property	Retain			3 codominant stems with included bark; poor structure but healthy crown.
1394	Hawthorn species	<i>Crataegus sp.</i>	Native	2	44.3	3.5	Improbable	Fair	Off-property	Retain			Large specimen; history of lower branch pruning; dead branches; heavily armed; open crown.
1395	Hawthorn species	<i>Crataegus sp.</i>	Native	1	21.0	2.5	Improbable	Fair	Off-property	Retain			Twisting branches; phototrophic growth; few dead branches.
1396	Hawthorn species	<i>Crataegus sp.</i>	Native	3	10.6	2.0	Improbable	Good	Boundary	Retain			Slight lean toward field; healthy crown.
1397	Hawthorn species	<i>Crataegus sp.</i>	Native	2	10.5	2.0	Improbable	Fair	Off-property	Retain			Upright; branch rubbing with neighboring branch; minor epicormic growth.
1398	Hawthorn species	<i>Crataegus sp.</i>	Native	2	14.0	3.0	Possible	Fair	Boundary	Retain			Arching lean toward field; water sprouts.
1399	Hawthorn species	<i>Crataegus sp.</i>	Native	1	14.0	2.0	Improbable	Fair	Off-property	Retain			Water sprouts; basal shoots; sloughing lower bark; codominant leaders.
1400	Hawthorn species	<i>Crataegus sp.</i>	Native	2	11.4	1.5	Improbable	Fair	Off-property	Retain			Codominant stems; compact crown; water sprouts.
1401	Hawthorn species	<i>Crataegus sp.</i>	Native	2	48.6	3.5	Improbable	Good	Off-property	Retain			Large specimen; crossing branches; dead/pruned lower branches; broad, healthy crown.
1402	Silver Maple	<i>Acer saccharinum</i>	Native	5	133.4	5.0	Possible	Fair	On-property	Retain			10% live crown lost; lower stems wounds open, with woundwood; conks on main stem, secondary stems fairly healthy.
1403	Silver Maple	<i>Acer saccharinum</i>	Native	2	113.3	4.5	Improbable	Good	Off-property	Retain			Epicormic growth but healthy crown.
1404	White Ash	<i>Fraxinus americana</i>	Native	6	58.9	3.5	Possible	Fair	Boundary	Retain			Upright codominant stems, 1 dead; basal wound on 1 stem.
1405	White Ash	<i>Fraxinus americana</i>	Native	2	45.5	3.5	Possible	Fair	On-property	Retain			Closed bark seam; 1 dead branch; insectivore action.
1406	Hawthorn species	<i>Crataegus sp.</i>	Native	4	40.2	2.5	Possible	Fair	Boundary	Retain			Centre rot in primary stem; crossing branches; slightly suppressed.
1407	White Ash	<i>Fraxinus americana</i>	Native	4	29.8	2.5	Probable	Poor	Boundary	Retain			2 stems dead; fence wire beginning to girdle; suppressed.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
1408	Silver Maple	<i>Acer saccharinum</i>	Native	1	52.8	6.0	Improbable	Good	Off-property	Retain			1 vigorous lateral scaffold branch; few broken branches; overall healthy crown.
1409	White Ash	<i>Fraxinus americana</i>	Native	1	28.9	4.0	Improbable	Good	Boundary	Retain			1 girdling root; asymmetrical crown due to neighboring tree.
1410	White Ash	<i>Fraxinus americana</i>	Native	1	29.5	4.0	Possible	Fair	Boundary	Retain			Asymmetrical crown due to neighboring tree; fence wire through stem; 10% dieback.
1411	White Ash	<i>Fraxinus americana</i>	Native	1	23.8	4.0	Possible	Fair	Boundary	Retain			Suppressed leader superseded by overextended lateral; asymmetrical crown.
1412	White Ash	<i>Fraxinus americana</i>	Native	2	46.0	4.0	Possible	Fair	Boundary	Retain			Weak leader, phototrophic growth; long wound along secondary stem; minor epicormic growth.
1413	White Ash	<i>Fraxinus americana</i>	Native	1	41.0	4.0	Improbable	Good	Off-property	Retain			Few dead branches.
1414	White Ash	<i>Fraxinus americana</i>	Native	1	42.5	4.5	Possible	Poor	Boundary	Retain			Strange, stunted twigs; missing bark; epicormic growth; few dead branches.
1415	White Ash	<i>Fraxinus americana</i>	Native	1	32.8	3.0	Possible	Fair	Boundary	Retain			Few dead branches; minor bark sloughing.
1416	White Ash	<i>Fraxinus americana</i>	Native	1	13.7	2.0	Possible	Fair	Boundary	Retain			Suppressed crown; epicormic growth.
1417	White Ash	<i>Fraxinus americana</i>	Native	1	25.6	3.5	Improbable	Fair	Boundary	Retain			Bark seams; dead lower branches; minor insectivore action.
1418	White Ash	<i>Fraxinus americana</i>	Native	1	28.0	3.5	Possible	Fair	Off-property	Retain			Few dead branches; minor insectivore action.
1419	White Ash	<i>Fraxinus americana</i>	Native	1	19.5	3.0	Possible	Fair	Boundary	Retain			Crooked stem leaning away from subject property; insectivore action; dead lower branches.
1420	White Ash	<i>Fraxinus americana</i>	Native	1	24.8	3.5	Possible	Poor	Boundary	Retain			Dead leader; 50% live crown lost; fence wire beginning to girdle; pistol butt.
1421	White Ash	<i>Fraxinus americana</i>	Native	3	11.1	2.5	Possible	Poor	On-property	Retain			Suppressed crown, phototrophic growth; epicormic growth, stunted branchlets.
1422	White Ash	<i>Fraxinus americana</i>	Native	1	26.1	4.0	Improbable	Fair	Off-property	Retain			Light pruning; closed branch stubs.
1423	White Ash	<i>Fraxinus americana</i>	Native	1	27.8	3.5	Possible	Fair	Boundary	Retain			Codominant leaders; minor insectivore action.
1424	White Ash	<i>Fraxinus americana</i>	Native	1	28.0	3.0	Possible	Poor	Boundary	Retain			Dead leader; broken branches; epicormic growth.
1425	White Ash	<i>Fraxinus americana</i>	Native	1	13.6	2.0	Possible	Fair	Boundary	Retain			Asymmetrical crown away from subject property; insectivore action; bark rubbing.
1426	White Ash	<i>Fraxinus americana</i>	Native	1	10.7	1.5	Possible	Fair	Boundary	Retain			Spindly, suppressed crown.
1427	White Ash	<i>Fraxinus americana</i>	Native	2	37.0	4.0	Improbable	Fair	Off-property	Retain			Crown of primary stem mostly healthy, though asymmetrical; minor insectivore action.
1428	White Ash	<i>Fraxinus americana</i>	Native	1	20.9	3.0	Possible	Fair	Boundary	Retain			Codominant leaders; insectivore action; 10% dieback.
1429	White Ash	<i>Fraxinus americana</i>	Native	2	43.8	4.0	Possible	Fair	Boundary	Retain			Asymmetrical crown due to neighboring tree; crossing stems; dead lower branches.
1430	White Ash	<i>Fraxinus americana</i>	Native	1	31.3	4.0	Possible	Fair	Off-property	Retain			Asymmetrical crown due to neighboring tree; crossing stems; dead lower branches.
1431	White Ash	<i>Fraxinus americana</i>	Native	2	21.0	2.0	Improbable	Fair	Off-property	Retain			Codominant stems; dieback.
1432	White Ash	<i>Fraxinus americana</i>	Native	1	12.8	2.0	Possible	Fair	Off-property	Retain			Minor lean and unbalanced crown away from subject property.
1433	White Ash	<i>Fraxinus americana</i>	Native	1	33.2	4.0	Possible	Fair	Boundary	Retain			Broken scaffold branch; minor bark sloughing.
1434	White Ash	<i>Fraxinus americana</i>	Native	1	14.8	2.0	Possible	Fair	Off-property	Retain			Suppressed crown; epicormic growth; bark wounds.
1435	White Ash	<i>Fraxinus americana</i>	Native	2	52.0	6.0	Possible	Poor	Boundary	Retain			Few dead branches; signs of EAB; epicormic growth; overextended scaffold branch.
1436	White Ash	<i>Fraxinus americana</i>	Native	1	17.5	3.0	Improbable	Fair	Boundary	Retain			Upper stem arches away from subject property.
1437	White Ash	<i>Fraxinus americana</i>	Native	1	26.0	3.0	Improbable	Fair	Off-property	Retain			Dead lower branches; bark rubbing; minor insectivore action.
1438	White Ash	<i>Fraxinus americana</i>	Native	1	11.1	2.0	Possible	Fair	Off-property	Retain			Round crown with dead lower branches.
1439	White Ash	<i>Fraxinus americana</i>	Native	1	40.8	5.5	Possible	Fair	Off-property	Retain			Signs of EAB; history of branch failure.
1440	White Ash	<i>Fraxinus americana</i>	Native	1	21.5	3.0	Possible	Fair	Off-property	Retain			Minor insectivore action; asymmetrical crown with codominant leaders.
1441	White Ash	<i>Fraxinus americana</i>	Native	1	47.3	5.0	Possible	Fair	Off-property	Retain			Large codominant leaders; 10% live crown lost; history of branch failure.
1442	White Ash	<i>Fraxinus americana</i>	Native	1	53.7	5.0	Possible	Fair	Boundary	Retain			3 codominant leaders from 1.5m; fence wire through stem; centre rot where stems fused; history of some branch failures.
1443	European Mountain-Ash	<i>Sorbus aucuparia</i>	Non-Native	5	47.4	4.0	Possible	Poor	Boundary	Retain			Codominant stems, 2 twisting; basal wound; dieback; leaning into subject property.
1444	Silver Maple	<i>Acer saccharinum</i>	Native	1	67.3	6.0	Improbable	Fair	Boundary	Retain			Strong compartmentalization; dense crown; some branch failures; epicormic growth.
1445	Silver Maple	<i>Acer saccharinum</i>	Native	1	59.0	5.0	Possible	Fair	Boundary	Retain			History of branch failure; bark seam.
1446	Silver Maple	<i>Acer saccharinum</i>	Native	1	101.3	7.0	Possible	Fair	Boundary	Retain			Centre rot with fruiting bodies at base; history of branch failure; budding out well, very little dieback.
1447	Silver Maple	<i>Acer saccharinum</i>	Native	1	76.4	7.0	Possible	Fair	Boundary	Retain			Codominant leaders with included bark; history of branch failure; unbalanced crown.
1448	Silver Maple	<i>Acer saccharinum</i>	Native	1	89.7	7.0	Possible	Fair	Boundary	Retain			Spreading crown with history of branch failure; water sprouts; budding out well.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
1449	Silver Maple	<i>Acer saccharinum</i>	Native	1	64.3	6.0	Possible	Fair	Boundary	Retain			History of smaller branch failures; lacking some vigour.
1450	Silver Maple	<i>Acer saccharinum</i>	Native	1	76.1	7.0	Possible	Fair	Off-property	Retain			History of branch failure.
1451	Silver Maple	<i>Acer saccharinum</i>	Native	1	86.2	7.0	Possible	Fair	Off-property	Retain			History of branch failure; leaders arise from point at 1.5m.
1452	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	42.3	4.5	Improbable	Good	Off-property	Retain			1 broken branch; growing near power lines.
1453	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	28.1	3.0	Improbable	Fair	Off-property	Retain			Light pruning; unbalanced crown; growing near power lines.
1454	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	23.1	2.5	Improbable	Good	Off-property	Retain			Light pruning; growing near power lines.
1455	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	38.6	4.0	Improbable	Good	Off-property	Retain			Unbalanced crown; light pruning; growing near power lines.
1456	White Elm	<i>Ulmus americana</i>	Native	1	33.5	3.0	Improbable	Good	Off-property	Retain			Tight unions amongst leaders; minor epicormic growth; budding out well.
1457	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	29.8	3.5	Improbable	Fair	Off-property	Retain			Couple dead branches; unbalanced crown; growing near power lines.
1458	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	45.6	4.0	Possible	Fair	Off-property	Retain			2 major branch failures; twisting branches; growing near power lines.
1459	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	23.7	2.0	Improbable	Fair	Off-property	Retain			Crooked stem; branch stub nearly closed; light pruning; growing near power lines.
1460	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	28.3	3.5	Improbable	Fair	Off-property	Retain			Unbalanced crown; crooked stem; growing near power lines.
1461	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	27.8	3.0	Improbable	Fair	Off-property	Retain			Crooked stem; couple poor branch attachments; growing near power lines.
1462	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	26.2	3.5	Possible	Fair	Off-property	Retain			Topped, crooked stem in response; growing near power lines.
1463	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	18.7	2.5	Possible	Poor	Off-property	Retain			Topped, crooked stem in response; little live crown; growing near power lines.
1464	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	20.8	3.0	Possible	Poor	Off-property	Retain			Crown thinning; crooked stem; growing near power lines.
1465	Scots Pine	<i>Pinus sylvestris</i>	Non-Native	1	33.6	3.5	Improbable	Good	Off-property	Retain			Crooked codominant leaders; growing near power lines.
1466	White Ash	<i>Fraxinus americana</i>	Native	3	54.7	2.5	Possible	Fair	On-property	Retain			Codominant stems; twisting branches; fence wire through stem, swollen tissue.
1467	White Ash	<i>Fraxinus americana</i>	Native	2	72.4	4.5	Possible	Poor	Boundary	Retain			Codominant stems; fence wire through stem; 1 stem is mostly dead with advanced decay; few dead branches.
1468	White Ash	<i>Fraxinus americana</i>	Native	1	35.2	4.5	Possible	Fair	On-property	Retain			Crooked stem; fence wire through stem; bark crack.
1469	White Ash	<i>Fraxinus americana</i>	Native	1	14.2	1.5	Improbable	Fair	On-property	Retain			Crooked stem; suppressed crown.
1470	White Ash	<i>Fraxinus americana</i>	Native	2	51.8	4.5	Possible	Poor	On-property	Retain			Codominant stems, 1 dead.
1471	White Ash	<i>Fraxinus americana</i>	Native	2	23.9	1.5	Possible	Fair	Boundary	Retain			Basal rot where former stem failed; bark seam.
1472	White Ash	<i>Fraxinus americana</i>	Native	2	30.9	4.5	Possible	Fair	Boundary	Retain			Lower stem wounds; fence wire through stem; outer bark sloughing.
1473	White Ash	<i>Fraxinus americana</i>	Native	1	35.8	4.5	Possible	Poor	Boundary	Retain			Large longitudinal wound showing centre rot; fence wire through stem; outer bark sloughing; unbalanced crown.
1474	White Ash	<i>Fraxinus americana</i>	Native	1	37.4	3.5	Possible	Fair	On-property	Retain			Poor branch attachments; dense crown; outer bark sloughing.
1475	Hawthorn species	<i>Crataegus sp.</i>	Native	1	28.8	5.0	Improbable	Fair	Boundary	Retain			Additional stems dead; branch rub; asymmetrical crown to west; hangers.
1476	Hawthorn species	<i>Crataegus sp.</i>	Native	2	48.0	4.0	Improbable	Good	Boundary	Retain			Included bark; branch rub; broken branches.
1477	Mountain-Ash species	<i>Sorbus sp.</i>	Non-Native	1	14.8	1.0	Improbable	Fair	Boundary	Retain			Branch rub; suppressed; asymmetrical crown to east.
1478	Common Apple	<i>Malus domestica</i>	Non-Native	1	19.7	1.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to east; suppressed; branch rub.
1479	Common Apple	<i>Malus domestica</i>	Non-Native	4	73.0	4.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown to west; branch rub; included bark.
1480	Common Apple	<i>Malus domestica</i>	Non-Native	2	37.0	2.5	Improbable	Poor	Off-property	Retain			Asymmetrical crown to east; branch rub; included bark; history of branch failure.
1481	Hawthorn species	<i>Crataegus sp.</i>	Native	3	57.0	1.0	Improbable	Fair	Boundary	Retain			Branch rub; included bark; prune cuts; dead branches.
1482	Common Apple	<i>Malus domestica</i>	Non-Native	1	30.5	4.0	Improbable	Fair	Boundary	Retain			Codominant leaders; included bark; epicormic growth; branch rub.
1483	Unknown	<i>Unknown</i>	Unknown	1	40.0	0.5	Improbable	Dead	Boundary	Retain			No bark or crown; cavities.
1484	Common Apple	<i>Malus domestica</i>	Non-Native	1	30.9	2.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; canker.
1485	Mountain-Ash species	<i>Sorbus sp.</i>	Non-Native	2	11.4	1.0	Improbable	Fair	Boundary	Retain			Canker; abuts fence.
1486	Common Apple	<i>Malus domestica</i>	Non-Native	4	83.0	2.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; canker; abuts fence.
1487	Common Apple	<i>Malus domestica</i>	Non-Native	3	50.0	2.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; canker; abuts fence.
1488	Common Apple	<i>Malus domestica</i>	Non-Native	2	19.2	1.0	Improbable	Fair	Boundary	Retain			Included bark; branch rub; canker; abuts fence.
1489	Common Apple	<i>Malus domestica</i>	Non-Native	3	45.5	2.0	Improbable	Fair	On-property	Retain			Included bark; branch rub; canker.
1490	Common Apple	<i>Malus domestica</i>	Non-Native	4	67.0	2.0	Improbable	Fair	On-property	Retain			Included bark; branch rub; canker; abuts fence; asymmetrical crown to south.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
1491	Hawthorn species	<i>Crataegus sp.</i>	Native	3	24.0	2.0	Improbable	Fair	Boundary	Remove	Development	Yes	Included bark; branch rub; abuts fence; basal rot.
1492	Common Apple	<i>Malus domestica</i>	Non-Native	2	48.0	2.0	Improbable	Fair	Off-property	Retain			Included bark; canker; abuts fence; branch rub; stem growing around wire.
1493	Common Apple	<i>Malus domestica</i>	Non-Native	7	79.0	2.0	Improbable	Poor	Boundary	Retain			Branch rub; dead stems; abuts fence; canker; asymmetrical crown to south.
1494	Mountain-Ash species	<i>Sorbus sp.</i>	Non-Native	4	46.4	2.0	Possible	Fair	Boundary	Retain			Canker, rot on one stem; branch rub; included bark; epicormic growth.
1495	Mountain-Ash species	<i>Sorbus sp.</i>	Non-Native	6	45.0	2.0	Improbable	Fair	Boundary	Retain			Canker; branch rub; included bark; some rot.
1496	Norway Maple	<i>Acer platanoides</i>	Non-Native	3	35.6	3.0	Improbable	Good	Off-property	Retain			Included bark; branch rub.
1497	White Spruce	<i>Picea glauca</i>	Native	1	12.0	3.0	Improbable	Good	Boundary	Retain			Light pruning.
1498	White Spruce	<i>Picea glauca</i>	Native	1	14.0	3.0	Improbable	Good	Boundary	Retain			Light pruning.
1499	Norway Maple	<i>Acer platanoides</i>	Non-Native	2	50.8	4.0	Improbable	Fair	Off-property	Retain			Included bark; canker; branch rub; basal wound compartmentalized.
1500	Common Apple	<i>Malus domestica</i>	Non-Native	1	28.0	2.0	Improbable	Fair	Boundary	Retain			Included bark; canker; branch rub; small dead branches.
1501	Norway Maple	<i>Acer platanoides</i>	Non-Native	3	54.2	2.0	Improbable	Fair	Off-property	Retain			Branch rub; included bark.
1502	White Ash	<i>Fraxinus americana</i>	Native	1	23.1	2.0	Improbable	Good	Off-property	Retain			No visible defects.
1503	White Ash	<i>Fraxinus americana</i>	Native	3	58.2	2.0	Possible	Fair	Off-property	Retain			EAB; woodpecker damage; suckers; bark peeling.
1504	White Ash	<i>Fraxinus americana</i>	Native	4	45.9	2.0	Possible	Fair	Off-property	Retain			EAB; woodpecker damage; branch rub.
1505	White Ash	<i>Fraxinus americana</i>	Native	3	41.7	2.0	Improbable	Fair	Off-property	Retain			Canker; included bark; branch rub; broken branches.
1506	White Ash	<i>Fraxinus americana</i>	Native	3	38.1	2.0	Improbable	Good	Off-property	Retain			Included bark.
1507	White Ash	<i>Fraxinus americana</i>	Native	1	31.2	2.0	Improbable	Fair	Off-property	Retain			EAB; woodpecker damage, basal wound, and large wound along stem, both compartmentalized.
1508	White Ash	<i>Fraxinus americana</i>	Native	1	31.2	2.0	Improbable	Poor	Off-property	Retain			EAB; woodpecker damage, basal wound with rot.
1509	White Ash	<i>Fraxinus americana</i>	Native	1	36.3	3.0	Improbable	Fair	Off-property	Retain			EAB; woodpecker damage, basal wound compartmentalized.
1510	White Ash	<i>Fraxinus americana</i>	Native	1	28.4	3.0	Possible	Fair	Off-property	Retain			EAB; woodpecker damage, basal wounds; hanger; prune for improbable.
1511	White Ash	<i>Fraxinus americana</i>	Native	1	38.4	3.0	Possible	Poor	Off-property	Retain			EAB; woodpecker damage, basal wound compartmentalized; epicormic growth where codominant leader broke off, compartmentalized; hanger.
1512	White Ash	<i>Fraxinus americana</i>	Native	1	41.7	4.0	Possible	Fair	Off-property	Retain			Compartmentalized wounds; hanger; EAB.
1513	White Ash	<i>Fraxinus americana</i>	Native	1	29.3	2.0	Improbable	Very Poor	Off-property	Retain			Rot; loss of bark; canker.
1514	Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	Native	1	19.0	2.0	Improbable	Poor	Off-property	Retain			Wounds failed to compartmentalize; rot; bark peeling; codominant leaders.

Appendix II

Tree Health and Potential for Structural Failure Assessment Criteria

Tree Health Assessment Criteria

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

¹ (Dunster 2009)

Potential for Structural Failure Assessment Criteria

Assessment Criteria*	Definition ¹
Improbable	The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
Possible	Failure could occur, but it is unlikely during normal weather conditions within the specified time frame.
Probable	Failure may be expected under normal weather conditions within the specified time frame.
Imminent	Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for an assessor to encounter, and it may require immediate action to protect people from harm.
*A specified time frame of 2 years will be used when assessing potential for structural failure.	

¹ (Dunster et al. 2013)

Appendix III
Conditions of Tree Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations by Natural Resource Solutions Inc. (NRSI) as they existed at the time of the site inspection(s) of the Client's Property at 211 Eliza Street in the Village of Arthur, as described in this report (the "Property") and the trees situated thereon, 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 at the date of site inspection(s), and the analysis and recommendations made in relation to the proposed undertaking. It is recommended that the inventoried trees discussed in this assessment should be re-assessed periodically, where required (e.g. after 2 years).

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 including, without limitation, acting 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 providing payment of the Assessor's regular hourly billing fees.

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

Assumptions

The Client is hereby notified that where any of the information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, NRSI will in no way be responsible for the veracity or accuracy of any such information. Further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property 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.

Restriction of Assessment

The assessment carried out was restricted to the areas as described in this report. NRSI is not legally liable for any other trees 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. 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.

No guarantees are offered, or implied, that trees recommended for retention, 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 extreme 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 with 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 for the Client. The data collected reflect NRSI's best assessment of the inventoried trees situated on the Property with the information available at the time of observation. Data analysis and the assessment of potential impacts to inventoried trees is specific to the proposed undertaking as described in this report. 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 of this assessment for purposes unrelated to the proposed undertaking.

General

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

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

Appendix IV
Tree Data and Summary Tables

Summary of Inventoried Trees

Common Name	Scientific Name	Good	Fair	Poor	Very Poor	Dead	Total
Native Species							
Black Cherry	<i>Prunus serotina</i>		1				1
Freeman's Maple	<i>Acer X freemanii</i>		1				1
Hawthorn species	<i>Crataegus</i> sp.	3	16	1			20
Manitoba Maple	<i>Acer negundo</i>		3				3
Prunus species	<i>Prunus</i> sp.		1				1
Silver Maple	<i>Acer saccharinum</i>	2	9				11
Sugar Maple	<i>Acer saccharum</i> ssp. <i>saccharum</i>		9	3			12
White Ash	<i>Fraxinus americana</i>	5	60	15	1	3	84
White Elm	<i>Ulmus americana</i>	1	4		1	2	8
White Spruce	<i>Picea glauca</i>	2					2
Subtotal		13	104	19	2	5	143
Non-Native Species							
Common Apple	<i>Malus domestica</i>		15	3			18
European Mountain-Ash	<i>Sorbus aucuparia</i>			1			1
Mountain-Ash species	<i>Sorbus</i> sp.		6				6
Norway Maple	<i>Acer platanoides</i>	1	3				4
Scots Pine	<i>Pinus sylvestris</i>	4	7	2			13
Subtotal		5	31	6			42
Unknown species						1	1
Overall Total		18	135	25	2	6	186

Overall Health of Trees Inventoried

Potential for Structural Failure Rating	Overall Condition						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable		18	70	6	1	2	97
Possible			65	17		2	84
Probable				2	1	2	5
Imminent							0
Total	0	18	135	25	2	6	186

Maps



Path: X:\2076_Eliza Street_Arthur_EIS\NRSI_2434_Map1_StudyArea_3K_2020_09_04_LEH.mxd

Map 1

211 Eliza Street, Arthur EIS

Study Area

Legend

Subject Property

Watercourse (GRCA)

Regulation Limit (GRCA)

Wooded Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Project:2434 Date: September 4, 2020	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000
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04080120160200 Metres



Map 2

211 Eliza Street, Arthur

Tree Inventory and Preservation Plan

Key-Map

Legend

- Subject Property
- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Habitat Tree
- Minimum Tree Protection Zone (Centre Wellington 2018)
- Proposed Grading
- Proposed Development
- Proposed Retaining Wall
- Existing Conditions
- Proposed Servicing
- 100yr Stable Top of Slope
- Wetland 30m Buffer
- Woodland Drpline 10m Buffer
- Watercourse (GRCA)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MHFPO Copyright: Queen's Printer Ontario.

Project: 2434
Date: January 1, 2021
NAD83 - UTM Zone 17
Scale: 1:500

0 10 20 30 40 50 60
Meters

- #### Migratory Birds Convention Act
- The destruction of migratory birds and their nests is prohibited under the federal Migratory Birds Convention Act, 1994.
 - Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults.
 - Vegetation clearing is recommended to occur outside the bird nesting season (April 1 – August 31) so as to limit disturbances to nesting activities of birds within the proposed work zone.
 - Specific to non-woodland areas, if vegetation clearing cannot be avoided during the bird nesting season, a qualified biologist will be retained to carry out a nest search ahead of clearing activities within the work zone.
 - Nest areas will be identified in the field. There shall be no construction activity in identified nesting areas until sign-off is obtained from the biologist.
 - Areas identified as having no bird nesting activity can be cleared. However, clearing must occur within 48 hours of the last sighting of vegetation clearing is not performed within 48 hours, additional nest searches must be conducted.
- #### Species at Risk (SAR) Bat Habitat
- The destruction of SAR bats and their habitat is prohibited under the Endangered Species Act (ESA), 2007.
 - Vegetation clearing has the potential to directly impact bat roosting habitat.
 - Tree removal should occur outside of the active roosting season (April 1 to October 31) to avoid destruction of potential bat habitat, and therefore contravention of the ESA.

APPENDIX V

Species Reported within the Vicinity of the Study Area

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington/D ufferin County ³	NHIC Data ⁴	NRSI Observed							
											CUM1	CUW1	FOD7-3	FOD7	CUP3-1	MAM2-2	Hedgerow	Entire Site
Pteridophytes	Ferns & Allies																	
Equisetaceae	Horsetail Family																	
<i>Equisetum arvense</i>	Field Horsetail	0	0		S5				X			X		X				1
<i>Equisetum hyemale</i> ssp. <i>affine</i>	Scouring-rush	2	-2		S5				X			X						1
Gymnosperms	Conifers																	
Cupressaceae	Cypress Family																	
<i>Thuja occidentalis</i>	White Cedar	4	-3		S5				X			X					X	1
Pinaceae	Pine Family																	
<i>Picea glauca</i>	White Spruce	6	3		S5				X								X	1
<i>Pinus resinosa</i>	Red Pine	8	3		S5				X						X			1
<i>Pinus sylvestris</i>	Scots Pine		5	-3	SE5				X			X		X	X		X	1
Dicotyledons	Dicots																	
Aceraceae	Maple Family																	
<i>Acer negundo</i>	Manitoba Maple	0	-2		S5				X		X	X	X	X		X	X	1
<i>Acer platanoides</i>	Norway Maple		5	-3	SE5				X			X					X	1
<i>Acer saccharinum</i>	Silver Maple	5	-3		S5				X		X	X					X	1
<i>Acer saccharum</i> ssp. <i>saccharum</i>	Sugar Maple	4	3		S5				X			X	X	X			X	1
Apiaceae	Carrot or Parsley Family																	
<i>Daucus carota</i>	Wild Carrot		5	-2	SE5				X			X					X	1
Asclepiadaceae	Milkweed Family																	
<i>Asclepias syriaca</i>	Common Milkweed	0	5		S5				X		X	X	X				X	1
Asteraceae	Composite or Aster Family																	
<i>Ambrosia artemisiifolia</i>	Common Ragweed	0	3		S5				X		X							1
<i>Arctium minus</i> ssp. <i>minus</i>	Common Burdock		5	-2	SE5				X		X	X	X	X			X	1
<i>Artemisia vulgaris</i>	Common Mugwort		5	-1	SE5				X			X						1
<i>Cichorium intybus</i>	Chicory		5	-1	SE5				X		X							1
<i>Cirsium arvense</i>	Canada Thistle		3	-1	SE5				X		X						X	1
<i>Cirsium vulgare</i>	Bull Thistle		4	-1	SE5				X		X							1
<i>Euthamia graminifolia</i>	Flat-topped Bushy Goldenrod	2	-2		S5				X		X	X					X	1
<i>Inula helenium</i>	Elecampane		5	-2	SE5				X		X							1
<i>Lapsana communis</i>	Nipplewort		5	-2	SE5				X				X					1
<i>Leucanthemum vulgare</i>	Ox-eye Daisy		5	-1	SE5				X		X						X	1
<i>Solidago altissima</i> var. <i>altissima</i>	Tall Goldenrod	1	3		S5				X			X		X				1
<i>Solidago canadensis</i>	Canada Goldenrod	1	3		S5				X		X	X	X				X	1
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Field Sow-thistle				SE5				X		X							1
<i>Symphotrichum lateriflorum</i> var. <i>lateriflorum</i>	Calico Aster	3	-2		S5				X			X						1
<i>Symphotrichum novae-angliae</i>	New England Aster	2	-3		S5				X		X							1
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster				S5							X						1
<i>Tanacetum vulgare</i>	Common Tansy		5	-1	SE5				X		X	X					X	1
<i>Tussilago farfara</i>	Coltsfoot		3	-2	SE5				X			X						1
Balsaminaceae	Touch-me-not Family																	
<i>Impatiens capensis</i>	Spotted Touch-me-not	4	-3		S5				X				X					1

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington/D ufferin County ³	NHIC Data ⁴	NRSI Observed							
											CUM1	CUW1	FOD7-3	FOD7	CUP3-1	MAM2-2	Hedgerow	Entire Site
Brassicaceae	Mustard Family																	
<i>Alliaria petiolata</i>	Garlic Mustard		0	-3	SE5									X				1
<i>Hesperis matronalis</i>	Dame's Rocket		5	-3	SE5				X				X					1
Campanulaceae	Bellflower Family																	
<i>Triodanis perfoliata</i>	Venus' Looking-glass	6	0		S4						X	X						1
Caprifoliaceae	Honeysuckle Family																	
<i>Lonicera tatarica</i>	Tartarian Honeysuckle		3	-3	SE5				X		X	X		X		X		1
<i>Lonicera X bella</i>	Bell's Honeysuckle		5	-3	SE2													1
<i>Sambucus racemosa ssp. pubens</i>	Red-berried Elderberry	5	2		S5				X			X						1
<i>Viburnum opulus</i>	Guelder Rose		0	-1	SE4							X		X				1
Chenopodiaceae	Goosefoot Family																	
<i>Chenopodium album var. album</i>	Lamb's-quarters		1	-1	SE5				X		X							1
Cornaceae	Dogwood Family																	
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	6	5		S5				X			X		X		X		1
<i>Cornus stolonifera</i>	Red-osier Dogwood	2	-3		S5				X		X	X						1
Cucurbitaceae	Gourd Family																	
<i>Echinocystis lobata</i>	Prickly Cucumber	3	-2		S5				X				X	X		X		1
Dipsacaceae	Teasel Family																	
<i>Dipsacus fullonum ssp. sylvestris</i>	Wild Teasel		5	-1	SE5				X		X	X				X	X	1
Euphorbiaceae	Spurge Family																	
<i>Euphorbia esula</i>	Leafy Spurge		5	-2	SE5				X		X					X		1
Fabaceae	Pea Family																	
<i>Lotus corniculatus</i>	Bird's-foot Trefoil		1	-2	SE5				X		X					X		1
<i>Robinia pseudo-acacia</i>	Black Locust		4	-3	SE5				X				X					1
<i>Trifolium pratense</i>	Red Clover		2	-2	SE5				X							X		1
<i>Vicia cracca</i>	Tufted Vetch		5	-1	SE5				X		X	X						1
Geraniaceae	Geranium Family																	
<i>Geranium robertianum</i>	Herb Robert		5	-2	SE5				X			X	X					1
Grossulariaceae	Currant Family																	
<i>Ribes americanum</i>	Wild Black Currant	4	-3		S5				X			X						1
<i>Ribes rubrum</i>	Red Currant		5	-2	SE5				X				X					1
<i>Ribes triste</i>	Wild Red Currant	6	-5		S5				X			X				X		1
Guttiferae	St. John's-wort Family																	
<i>Hypericum perforatum</i>	Common St. John's-wort		5	-3	SE5				X		X	X		X				1
Hydrophyllaceae	Water-leaf Family																	
<i>Hydrophyllum virginianum</i>	Virginia Water-leaf	6	-2		S5				X					X				1
Lamiaceae	Mint Family																	
<i>Glechoma hederacea</i>	Creeping Charlie		5	-2	SE5				X				X					1
<i>Galeopsis tetrahit</i>	Common Hemp-nettle		5	-1	SE5				X		X							1
<i>Mentha arvensis ssp. borealis</i>	American Wild Mint	3	-3		S5				X			X						1
<i>Nepeta cataria</i>	Catnip		1	-2	SE5				X		X							1
Malvaceae	Mallow Family																	
<i>Malva neglecta</i>	Cheeses		5	-1	SE5						X							1

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington/D ufferin County ³	NHIC Data ⁴	NRSI Observed							
											CUM1	CUW1	FOD7-3	FOD7	CUP3-1	MAM2-2	Hedgerow	Entire Site
Oleaceae	Olive Family																	
<i>Fraxinus americana</i>	White Ash	4	3		S5				X		X	X	X	X			X	1
<i>Fraxinus pennsylvanica</i>	Green Ash	3	-3		S5				X			X		X				1
<i>Ligustrum vulgare</i>	Common Privet		1	-2	SE5				X		X							1
Onagraceae	Evening-primrose Family																	
<i>Epilobium species</i>	Willow-herb speices										X							1
<i>Oenothera biennis</i>	Common Evening-primrose	0	3		S5				X		X	X						1
Plantaginaceae	Plantain Family																	
<i>Plantago lanceolata</i>	Ribgrass		0	-1	SE5				X		X							1
Primulaceae	Primrose Family																	
<i>Lysimachia nummularia</i>	Moneywort		-4	-3	SE5				X			X	X					1
Ranunculaceae	Buttercup Family																	
<i>Anemone canadensis</i>	Canada Anemone	3	-3		S5				X			X						1
<i>Ranunculus acris</i>	Tall Buttercup		-2	-2	SE5				X		X			X				1
Rhamnaceae	Buckthorn Family																	
<i>Rhamnus cathartica</i>	European Buckthorn		3	-3	SE5				X			X						1
Rosaceae	Rose Family																	
<i>Agrimonia gryposepala</i>	Tall Hairy Agrimony	2	2		S5				X		X		X					1
<i>Crataegus spp.</i>	Hawthorn species											X	X	X			X	1
<i>Crataegus monogyna</i>	English Hawthorn		5	-1	SE5				X					X				1
<i>Crataegus punctata</i>	Large-fruited Thorn	4	5		S5				X					X				1
<i>Fragaria virginiana</i>	Wild Strawberry				S5				X			X	X	X			X	1
<i>Geum aleppicum</i>	Yellow Avens	2	-1		S5				X			X	X					1
<i>Geum spp.</i>	Avens species													X				1
<i>Malus domestica</i>	Apple										X	X	X	X			X	1
<i>Potentilla recta</i>	Rough-fruited Cinquefoil		5	-2	SE5							X						1
<i>Prunus americana</i>	American Plum	6	5		S4							X		X				1
<i>Prunus serotina</i>	Black Cherry	3	3		S5							X						1
<i>Prunus virginiana ssp. virginiana</i>	Choke Cherry	2	1		S5				X			X		X			X	1
<i>Rosa canina</i>	Canker Rose		5	-1	SE2							X						1
<i>Rosa multiflora</i>	Multiflora Rose		3	-3	SE4							X	X	X			X	1
<i>Rubus idaeus ssp. melanolasius</i>	Wild Red Raspberry	0	-2		S5				X			X	X				X	1
<i>Sorbus aucuparia</i>	European Mountain-ash		5	-2	SE4				X			X		X			X	1
Rubiaceae	Madder Family																	
<i>Galium mollugo</i>	White Bedstraw		5	-2	SE5				X			X						1
<i>Galium palustre</i>	Marsh Bedstraw	5	-5		S5				X		X							1
Salicaceae	Willow Family																	
<i>Populus balsamifera ssp. balsamifera</i>	Balsam Poplar	4	-3		S5				X			X		X				1
<i>Populus tremuloides</i>	Trembling Aspen	2	0		S5				X			X						1
<i>Salix fragilis</i>	Crack Willow		-1	-3	SE5				X			X						1
Scrophulariaceae	Figwort Family																	
<i>Verbascum thapsus</i>	Common Mullein		5	-2	SE5				X		X							1
<i>Veronica officinalis</i>	Common Speedwell		5	-2	SE5				X				X					1
Solanaceae	Nightshade Family																	
<i>Solanum dulcamara</i>	Bitter Nightshade		0	-2	SE5				X			X	X	X				1
Ulmaceae	Elm Family																	
<i>Ulmus americana</i>	White Elm	3	-2		S5				X			X		X				1

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington/Dufferin County ³	NHIC Data ⁴	NRSI Observed							
											CUM1	CUW1	FOD7-3	FOD7	CUP3-1	MAM2-2	Hedgerow	Entire Site
Violaceae	Violet Family																	
<i>Viola sororia</i>	Woolly Blue Violet	4	1		S5				X			X						1
Vitaceae	Grape Family																	
<i>Parthenocissus vitacea</i>	Woodbine	3	3		S5				X		X							1
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	6	1		S4?												X	1
Monocotyledons	Monocots																	
Cyperaceae	Sedge Family																	
<i>Scirpus atrovirens</i>	Dark-green Bulrush	3	-5		S5				X		X							1
Liliaceae	Lily Family																	
<i>Asparagus officinalis</i>	Garden Asparagus		3	-1	SE5				X		X							1
Orchidaceae	Orchid Family																	
<i>Epipactis helleborine</i>	Common Helleborine		5	-2	SE5				X				X					1
Poaceae	Grass Family																	
<i>Bromus inermis</i> ssp. <i>inermis</i>	Awnless Brome		5	-3	SE5				X		X	X		X			X	1
<i>Dactylis glomerata</i>	Orchard Grass		3	-1	SE5				X		X	X					X	1
<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-4		S5				X		X	X	X			X	X	1
<i>Phleum pratense</i>	Timothy		3	-1	SE5				X		X							1
Total									88	0	44	60	26	30	2	4	35	103

¹MNRF 2020a; ²Government of Canada 2019; ³Riley 1989; ⁴MNRF 2020b

LEGEND	
SRANK	COSSARO
S1 Critically Imperiled	END Endangered
S2 Imperiled	THR Threatened
S3 Vulnerable	SC Special Concern
S4 Apparently Secure	NAR Not at Risk
S5 Secure	DD Data Deficient
SU Unrankable	EXP Extirpated
SNA Unranked	COSEWIC
SX Presumed Extirpated	E Endangered
SH Possibly Extirpated (Historical)	T Threatened
S#? Rank Uncertain	SC Special Concern
Wellington County	NAR Not at Risk
X Native, Present and all Introduced Species	DD Data Deficient
	XT Extirpated
R Native, Present, and Provincially or Otherwise Rare	SARA Schedule
	Schedule 1 Officially Protected under SARA

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status	OBBA ³	NHIC Data ⁴	NRSI Observed			
							17NJ35		BMB-001	BMB-002	Transect A	Incidental
Anatidae	Ducks, Geese & Swans											
<i>Branta canadensis</i>	Canada Goose	S5					CO				X	X
<i>Aix sponsa</i>	Wood Duck	S5					CO					X
<i>Anas rubripes</i>	American Black Duck	S4				√	CO					
<i>Anas platyrhynchos</i>	Mallard	S5					CO					X
<i>Anas discors</i>	Blue-winged Teal	S4				√	CO					
<i>Oxyura jamaicensis</i>	Ruddy Duck	S4B, S4N				√	PR					
Phasianidae	Partridges, Grouse & Turkeys											
<i>Bonasa umbellus</i>	Ruffed Grouse	S4					PR					
<i>Meleagris gallopavo</i>	Wild Turkey	S5					CO					X
Podicipediformes	Grebes											
<i>Podilymbus podiceps</i>	Pied-billed Grebe	S4B, S4N				√	PO					
Columbidae	Pigeons & Doves											
<i>Columba livia</i>	Rock Pigeon	SNA					CO		X	PO	X	X
<i>Zenaidura macroura</i>	Mourning Dove	S5					CO				X	X
Cuculiformes	Cuckoos & Anis											
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S5B				√*	PO					
Apodidae	Swifts											
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	√	CO					X
Trochilidae	Hummingbirds											
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B					PR					
Charadriidae	Plovers											
<i>Charadrius vociferus</i>	Killdeer	S5B, S5N					CO		PO	PO		X
Scolopacidae	Waders											
<i>Bartramia longicauda</i>	Upland Sandpiper	S4B				√	CO					
<i>Gallinago delicata</i>	Wilson's Snipe	S5B					PO					
<i>Scolopax minor</i>	American Woodcock	S4B					PO					
<i>Actitis macularia</i>	Spotted Sandpiper	S5					CO					
<i>Phalaropus tricolor</i>	Wilson's Phalarope	S3B				√	PR					
Ardeidae	Hérons & Bitterns											
<i>Ardea herodias</i>	Great Blue Heron	S4B				**	PO				X	
<i>Butorides virescens</i>	Green Heron	S4B				**	PR					
Cathartidae	Vultures											
<i>Cathartes aura</i>	Turkey Vulture	S5B				√	PR					X
Accipitridae	Hawks, Kites, Eagles & Allies											
<i>Circus cyaneus</i>	Northern Harrier	S4B	NAR	NAR		√*	CO					
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR			√*	CO					
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR			CO					X

Scientific Name	Common Name	SRANK ¹	COSSARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status	17NJ35	NHIC Data ⁴	BMB-001	BMB-002	Transect A	Incidental
Strigidae	Typical Owls											
<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR			PO					
<i>Bubo virginianus</i>	Great Horned Owl	S4					PR					
Alcedinidae	Kingfishers											
<i>Megasceryle alcyon</i>	Belted Kingfisher	S4B				√	CO					X
Picidae	Woodpeckers											
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S4				√	PO					
<i>Picoides pubescens</i>	Downy Woodpecker	S5					CO					X
<i>Picoides villosus</i>	Hairy Woodpecker	S5				√*	CO					X
<i>Colaptes auratus</i>	Northern Flicker	S4B				√*	CO					X
<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5				√*	PO					
Falconidae	Caracaras & Falcons											
<i>Falco sparverius</i>	American Kestrel	S4				√*	CO					
Tyrannidae	Tyrant Flycatchers											
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC		√	CO					
<i>Empidonax alnorum</i>	Alder Fly catcher	S5B					CO					
<i>Empidonax traillii</i>	Willow Fly catcher	S5B				√	PO		PO			X
<i>Empidonax minimus</i>	Least Fly catcher	S4B				√	CO					
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B					CO					X
<i>Myiarchus crinitus</i>	Great Crested Fly catcher	S4B					CO		PO			X
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B				√*	CO					X
Vireonidae	Vireos											
<i>Vireo gilvus</i>	Warbling Vireo	S5B					PR		PO	PR		
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B					PR					
Corvidae	Crows & Jays											
<i>Cyanocitta cristata</i>	Blue Jay	S5					CO		PR			X
<i>Corvus brachyrhynchos</i>	American Crow	S5B					CO		PR		PO	X
Auduidae	Larks											
<i>Eremophila alpestris</i>	Horned Lark	S5B					PR				PO	
Hirundinidae	Swallows											
<i>Progne subis</i>	Purple Martin	S4B				√	PO					
<i>Tachycineta bicolor</i>	Tree Swallow	S4B					CO					X
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B					CO					
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T		√*5	PR					
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4B				**6	CO					
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T			CO					X
Paridae	Chickadees & Titmice											
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5					CO					X
Sittidae	Nuthatches											
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5				√*						X
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5					CO					
Certhiidae	Creepers											
<i>Certhia americana</i>	Brown Creeper	S5B				√*						X

Scientific Name	Common Name	SRANK ¹	COSSARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status	17NJ35	NHIC Data ⁴	BMB-001	BMB-002	Transect A	Incidental
Troglodytidae	Wrens											
<i>Troglodytes aedon</i>	House Wren	S5B					CO		PR	PR		X
Regulidae	Kinglets											
<i>Regulus satrapa</i>	Golden-crowned Kinglet	S5B				√						X
Turdidae	Thrushes											
<i>Catharus fuscescens</i>	Veery	S4B				√*	PR					
<i>Hylocichla ustelina</i>	Wood Thrush	S4B	SC	T		√*	PR					
<i>Turdus migratorius</i>	American Robin	S5B					CO		PR	PR		X
Mimidae	Mockingbirds, Thrashers & Allies											
<i>Dumetella carolinensis</i>	Gray Catbird	S4B					CO			PO		X
<i>Toxostoma rufum</i>	Brown Thrasher	S4B				√	CO					X
Sturnidae	Starlings											
<i>Sturnus vulgaris</i>	European Starling	SNA					CO		PO	PO		
Bombycillidae	Waxwings											
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B					CO		PO	PO		X
Passeridae	Old World Sparrows											
<i>Passer domesticus</i>	House Sparrow	SNA					CO					X
Fringillidae	Finches & Allies											
<i>Carpodacus mexicanus</i>	House Finch	SNA					PR					
<i>Spinus tristis</i>	American Goldfinch	S5B					CO		PR	PO		X
Parulidae	Wood Warblers											
<i>Seiurus aurocapillus</i>	Ovenbird	S4B				√*	CO					X
<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B					PR					
<i>Mniotilta varia</i>	Black-and-white Warbler	S5B				√*	PO					
<i>Geothlypis philadelphia</i>	Mourning Warbler	S4B					CO					
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B					PR					
<i>Setophaga ruticilla</i>	American Redstart	S5B				√*	CO					
<i>Setophaga petechia</i>	Yellow Warbler	S5B					CO			PO	PR	X
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B					PO					
<i>Setophaga pinus</i>	Pine Warbler	S5B				√*	PO					
<i>Setophaga coronata</i>	Yellow-rumped Warbler	S5B					CO					
Emberizidae	New World Sparrows & Allies											
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B				√*	PR					
<i>Spizella passerina</i>	Chipping Sparrow	S5B					CO				PO	X
<i>Spizella pusilla</i>	Field Sparrow	S4B				√*	PO					X
<i>Pooecetes gramineus</i>	Vesper Sparrow	S4B				√*	PR					
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B				√*	CO		PO		PO	X
<i>Melospiza melodia</i>	Song Sparrow	S5B					CO		PR	PR	PR	X
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B					PR					
<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5B					PO					
<i>Junco hyemalis</i>	Dark-eyed Junco	S5B				√						X
Cardinalidae	Cardinals, Grosbeaks & Allies											
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5					PR		PO	PO	PO	X
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S4B				√*	PO					X
<i>Passerina cyanea</i>	Indigo Bunting	S4B					PR					X

							17NJ35					
Scientific Name	Common Name	SRANK ¹	COSSARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status		NHIC Data ⁴	BMB-001	BMB-002	Transect A	Incidental
Icteridae	Blackbirds											
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	√*	CO			PO	PO	X
Agelaius phoeniceus	Red-winged Blackbird	S4					CO		PR	PR		X
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	√*	CO	X		PR		X
Quiscalus quiscula	Common Grackle	S5B					CO			PR	PO	X
Molothrus ater	Brown-headed Cowbird	S4B					CO		PO			X
Icterus galbula	Baltimore Oriole	S4B				√*	CO			PO		X
¹MNRF 2020a; ²Government of Canada 2019; ³Cadman et al. 2007; ⁴MNRF 2020b					Total	132	93	1	15	19	13	49

⁵Only significant in nesting colonies >100; ⁶Only significant in nesting colonies >8

LEGEND		
SRANK	COSSARO	Breeding Evidence
S1 Critically Imperiled	END Endangered	OB Observed
S2 Imperiled	THR Threatened	PO Possible
S3 Vulnerable	SC Special Concern	PR Probable
S4 Apparently Secure	NAR Not at Risk	CO Confirmed
S5 Secure	DD Data Deficient	
SU Unrankable	EXP Extirpated	
SNA Unranked	COSEWIC	
SX Presumed Extirpated	E Endangered	
SH Possibly Extirpated (Historical)	T Threatened	
S#? Rank Uncertain	SC Special Concern	
Wellington County	NAR Not at Risk	
√ Significant and rare	DD Data Deficient	
√* Significant but not rare	XT Extirpated	
** Only habitats that support/recently supported active nests considered significant	SARA Schedule	
	Schedule 1 Officially Protected under SARA	

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status ³	Ontario Reptile and Amphibian Atlas ⁴ (17NJ35)	NHIC Data ⁵	NRSI Observed
Turtles									
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	R	X		
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S5				X	X		
Salamanders									
<i>Necturus maculosus</i>	Mudpuppy	S4	NAR	NAR		R	X		
Toads and Frogs									
<i>Anaxyrus americanus</i>	American Toad	S5				X	X		
<i>Pseudacris crucifer</i>	Spring Peeper	S5				X			X
<i>Lithobates clamitans melanota</i>	Northern Green Frog	S5				X	X		X
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR		X	X		
Total						7	6	0	2

¹MNRF 2020a; ²Government of Canada 2019; ³Dougan 2009; ⁴Ontario Nature 2020; ⁵MNRF 2020b

LEGEND	
SRANK	COSSARO
S1 Critically Imperiled	END Endangered
S2 Imperiled	THR Threatened
S3 Vulnerable	SC Special Concern
S4 Apparently Secure	NAR Not at Risk
S5 Secure	DD Data Deficient
SU Unrankable	EXP Extirpated
SNA Unranked	COSEWIC
SX Presumed Extirpated	E Endangered
SH Possibly Extirpated (Historical)	T Threatened
S#? Rank Uncertain	SC Special Concern
Wellington County	NAR Not at Risk
X Significant	DD Data Deficient
R Rare	XT Extirpated
	SARA Schedule
	Schedule 1 Officially Protected under SARA

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status ³	Ontario Butterfly Atlas ⁴ (17NJ35)	NHIC Data ⁵	NRSI Observed
Hesperiidae	Skippers								
<i>Ancyloxypha numitor</i>	Least Skipper	S5							X
<i>Atalopedes campestris</i>	Sachem	SNA					X		
Papilionidae	Swallowtails								
<i>Papilio troilus</i>	Spicebush Swallowtail	S4							X
Pieridae	Whites and Sulphurs								
<i>Colias philodice</i>	Clouded Sulphur	S5					X		
<i>Pieris rapae</i>	Cabbage White	SNA					X		X
Nymphalidae	Brush-footed Butterflies								
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	END	Schedule 1	X*	X		X
<i>Limenitis arthemis arthemis</i>	White Admiral/Banded Purple	S5					X		

¹MNRF 2020a; ²Government of Canada 2019; ³Dougan 2009; ⁴MacNaughton et al. 2020; ⁵MNRF 2020b

LEGEND	
SRANK	COSSARO
S1 Critically Imperiled	END Endangered
S2 Imperiled	THR Threatened
S3 Vulnerable	SC Special Concern
S4 Apparently Secure	NAR Not at Risk
S5 Secure	DD Data Deficient
SU Unrankable	EXP Extirpated
SNA Unranked	COSEWIC
SX Presumed Extirpated	E Endangered
SH Possibly Extirpated (Historical)	T Threatened
S#? Rank Uncertain	SC Special Concern
Wellington County	NAR Not at Risk
X Rare	DD Data Deficient
X* Significant only within City of Guelph	XT Extirpated
	SARA Schedule
	Schedule 1 Officially Protected under SARA

Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status ³	Odonate Atlas ⁴	NHIC ⁵	NRSI Observed
Calopterygidae	Broadwinged Damselflies								
<i>Calopteryx maculata</i>	Ebony Jewelwing	S5							X
Libellulidae	Skimmers								
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	S5							X
<i>Pachydiplax longipennis</i>	Blue Dasher	S5							X
					Total	0	0	0	3

¹MNRF 2020a; ²Government of Canada 2019; ³Dougan 2009; ⁴OOAD 2018; ⁵MNRF 2020b

LEGEND	
SRANK	COSSARO
S1 Critically Imperiled	END Endangered
S2 Imperiled	THR Threatened
S3 Vulnerable	SC Special Concern
S4 Apparently Secure	NAR Not at Risk
S5 Secure	DD Data Deficient
SU Unrankable	EXP Extirpated
SNA Unranked	COSEWIC
SX Presumed Extirpated	E Endangered
SH Possibly Extirpated (Historical)	THR Threatened
S#? Rank Uncertain	SC Special Concern
Wellington County	NAR Not at Risk
X Significant	DD Data Deficient
SARA Schedule	XT Extirpated
Schedule 1 Officially Protected under SARA	

Mammal Species Reported From the Study Area

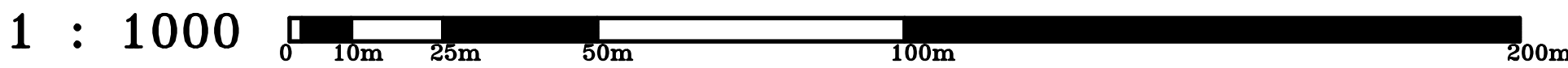
Scientific Name	Common Name	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status ³	Ontario Mammal Atlas ⁴	NHIC Data ⁵	NRSI Observed
Didelphimorphia	Opossums								
<i>Didelphis virginiana</i>	Virginia Opossum	S4				X	X		
Insectivora	Shrews and Moles								
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5				X	X		
<i>Condylura cristata</i>	Star-nosed Mole	S5				X	X		
<i>Sorex cinereus</i>	Masked Shrew	S5				X	X		
<i>Sorex fumeus</i>	Smoky Shrew	S5				X	X		
<i>Sorex palustris</i>	Water Shrew	S5				R	X		
Chiroptera	Bats								
<i>Eptesicus fuscus</i>	Big Brown Bat	S4				X	X		
<i>Lasiurus borealis</i>	Eastern Red Bat	S4				X	X		
<i>Lasiurus cinereus</i>	Hoary Bat	S4				X	X		
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	Schedule 1	X	X		
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1	R	X		
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	Schedule 1	R	X		
Lagomorpha	Rabbits and Hares								
<i>Lepus americanus</i>	Snowshoe Hare	S5				R	X		
<i>Lepus europaeus</i>	European Hare	SNA				X	X		
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5				X	X		X
Rodentia	Rodents								
<i>Castor canadensis</i>	Beaver	S5				X	X		
<i>Erethizon dorsatum</i>	Porcupine	S5				X	X		
<i>Clethrionomys gapperi</i>	Southern Red-backed Vole	S5				R	X		
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	S5				R	X		
<i>Marmota monax</i>	Woodchuck	S5				X	X		X
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5				X	X		
<i>Mus musculus</i>	House Mouse	SNA				X	X		
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5				R	X		
<i>Ondatra zibethicus</i>	Muskrat	S5				X	X		X
<i>Peromyscus leucopus</i>	White-footed Mouse	S5				X	X		
<i>Peromyscus maniculatus</i>	Deer Mouse	S5				X	X		
<i>Rattus norvegicus</i>	Norway Rat	SNA				X	X		
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5				X	X		X
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5				X	X		X
<i>Tamias striatus</i>	Eastern Chipmunk	S5				X	X		
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5				X	X		

Scientific Name	Common Name	SRANK ¹	SARO ¹	COSEWIC ²	SARA Schedule ²	Wellington County Status ³	Ontario Mammal Atlas ⁴	NHIC Data ⁵	NRSI Observed
Carnivora	Carnivores								
<i>Canis latrans</i>	Coyote	S5				X	X		
<i>Mephitis mephitis</i>	Striped Skunk	S5				X	X		
<i>Mustela erminea</i>	Ermine	S5				X	X		
<i>Mustela frenata</i>	Long-tailed Weasel	S4				R	X		
<i>Mustela vison</i>	American Mink	S4				X	X		
<i>Procyon lotor</i>	Northern Raccoon	S5				X	X		X
<i>Ursus americanus</i>	American Black Bear	S5	NAR	NAR		R	X		
<i>Vulpes vulpes</i>	Red Fox	S5				X	X		X
Artiodactyla	Deer and Bison								
<i>Odocoileus virginianus</i>	White-tailed Deer	S5				X	X		X
					Total	40	40	0	8

¹MNRF 2020a; ²Government of Canada 2019; ³Dougan 2009; ⁴Dobbyn 1994; ⁵MNRF 2020b

LEGEND	
SRANK	COSSARO
S1 Critically Imperiled	END Endangered
S2 Imperiled	THR Threatened
S3 Vulnerable	SC Special Concern
S4 Apparently Secure	NAR Not at Risk
S5 Secure	DD Data Deficient
SU Unrankable	EXP Extirpated
SNA Unranked	COSEWIC
SX Presumed Extirpated	E Endangered
SH Possibly Extirpated (Historical)	THR Threatened
S#? Rank Uncertain	SC Special Concern
Wellington County	NAR Not at Risk
X Present	DD Data Deficient
R Rare	XT Extirpated
	SARA Schedule
	Schedule 1 Officially Protected under SARA

APPENDIX VI
Draft Plan (BSR&D)



SHEET No.	
SCALE: 1 : 1000	COMP. REF. /ARTHUR/SITE15