



Alma Scoped Environmental Impact Study

Prepared for:

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Alma Scoped Environmental Impact Study

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Executive Summary

Natural Resource Solutions Inc. was retained by Mr. Kevin Vanleeuwen to complete a Scoped EIS to address potential impacts associated with the proposed residential subdivision development for the property located at Lot 1, Concession 1 West of Grand River, Township of Mapleton, Ontario, in the community of Alma. A comprehensive field program was completed on the property in 2021 and 2022, to document and assess the significance of existing natural features, including wetlands, watercourses, woodlands, Species at Risk habitat, and significant wildlife habitat. This report characterizes these important natural features and identifies potential impacts associated with the development as well as avoidance and mitigation measures. Significant impact to these natural features is not anticipated if the mitigation, protection and monitoring measures provided in this report are followed.

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Mr. Kevin Vanleeuwen to prepare a Scoped Environmental Impact Study (EIS) for a property located at Lot 1, Concession 1 West of Grand River, Township of Mapleton, Ontario, in the community of Alma. This Scoped EIS is required in support of a proposed residential subdivision development (Map 3) and the associated planning approvals.

The subject property is approximately 8.01 ha in area with frontage along Wellington Road 17, in the Township of Mapleton, Ontario (Map 1). The subject property is proposed to be developed into a residential subdivision, with 16 lots, an internal road network and a stormwater management block. Each lot is to be serviced with a private septic system and private well. A treed hedgerow is present along the southwestern property boundary, within an old railway right-of-way. An unnamed watercourse/drain, Watercourse A, and its floodplain, designated as Core Greenlands, is present along the northeastern property boundary. The subject property is comprised of an actively cultivated agricultural field. Surrounding lands include residential lots, within the Town of Alma, and agricultural lands.

The Watercourse A feature and its floodplain is regulated by the Grand River Conservation Authority (GRCA) and is a Core Greenlands feature as identified in Schedule A4 of the Wellington County Official Plan (2022). Due to development being proposed within the regulation limit of natural features, and EIS is required to demonstrate that no negative impacts to these features will occur as a result of the proposed development.

This study has been developed in accordance with the GRCA guidelines for EIS reports (GRCA 2005), and the Wellington County Official Plan (2022). This report summarizes background information on natural heritage features, as well as the results of original field surveys of flora and fauna in the study area. The detailed characterization of existing natural features was used to inform an analysis of the significance and sensitivity of the natural features within the study area with consideration for GRCA and the County of Wellington policies. NRSI worked closely with the proponent to minimize impacts to natural features.

For the purposes of this report, the “subject property” refers to the property located at Lot 1, Concession 1 West of Grand River, Township of Mapleton, Ontario. Lands within 120m of the subject property are referred to as the “study area” (Map 1). The “development footprint” is the lands occupied by the proposed residential subdivision - including 16 lots, an internal road network and stormwater management block - characterized as actively cultivated agricultural field.

NRSI submitted a Terms of Reference (TOR), dated January 7, 2022, to the GRCA and County of Wellington for review. Comments were received from the GRCA and County, indicating that the TOR was sufficient in its scope. The TOR and comments from the GRCA and County are included and provided in Appendix I.

1.1 Project Scoping

Background information pertaining to the biological resources on and in the vicinity of the subject property was collected in order to fully characterize the natural features within the subject property. The following resources were queried to gather this information:

- GRCA and Ministry of Natural Resources and Forestry (MNRF) file material;
- Natural Heritage Information Centre (NHIC) database (MNRF 2022a, 2022b);
- Government of Canada SARA Registry (Government of Canada, 2022);
- Ontario Breeding Bird Atlas (OBBA) (BSC et al. 2008);
- Ontario Butterfly Atlas (MacNaughton et al. 2022);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2020);
- Ontario Odonata Atlas Database (OOAD) (MNRF 2022c);
- Ontario Mammal Atlas (Dobbyn 1994);
- Species at Risk in Ontario (SARO) list (MECP 2022); and
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2022).

Initial wildlife species lists were compiled to provide information on plant and wildlife species reported from the vicinity of the study area (10km radius) using the resources listed above. The atlases provide data based on 10x10km survey squares; information on species from the squares that overlap the study area was compiled (squares 17NJ34

and 17NJ44 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.

Based on the results of the background review, NRSI carried out a screening exercise by comparing the list of Species at Risk (SAR) and Species of Conservation Concern (SCC) to the habitats thought to be present on-site. SAR are those listed on the Species at Risk in Ontario List (MNRF 2020c). 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 (Government of Ontario 2007), which includes protection to their habitat, and are referred to herein as “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 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.

The preliminary screening exercise involved cross-referencing the preferred habitat for reported SAR and SCC (MNRF 2020a, 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 finalized screening, with input from original surveys is provided in Appendix II.

1.2 Relevant Policies, Legislation, and Planning Studies

Natural heritage features within the study area were assessed for significance by evaluating them against relevant policies, legislation, and planning studies. Table 1

provides an overview of policies and the analysis of natural features. These findings informed the field program and constraints analysis. The specific implications of these policies were provided to the study team to help inform suitable draft plan of subdivision, guide the layout of development, and identify areas to be protected.

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation	Description	Project Relevance
Provincial Policy Statement (OMMAH 2020)	<ul style="list-style-type: none"> • Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS. • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. • The Natural Heritage Reference Manual (MNRF 2010) and the Significant Wildlife Habitat Technical Guide (SWHTG) (MNRF 2000, MNRF 2012) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS. 	<ul style="list-style-type: none"> • Natural features present within the study area which may have implications under the PPS: <ul style="list-style-type: none"> ○ Fish habitat ○ Wetlands ○ Woodlands ○ Candidate Significant Wildlife Habitat ○ Habitat for Endangered and Threatened species
<i>Endangered Species Act</i> (Government of Ontario 2007)	<ul style="list-style-type: none"> • 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 SAR and protects their habitats from damage and destruction. 	<ul style="list-style-type: none"> • Based on the background review and SAR screening, several SAR were identified as potentially occurring within the study area, however, field surveys did not document any SAR.
Migratory Birds Convention Act (CWS 2013)	<ul style="list-style-type: none"> • The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. • The schedule of on-site work must consider MBCA windows, with timing of breeding bird season typically occurring between 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). 	<ul style="list-style-type: none"> • The timing of construction activities, especially vegetation clearing and site grading must have consideration for the MBCA.
Fish and Wildlife Conservation Act	<ul style="list-style-type: none"> • The FWCA provides protection for certain bird species, not protected under the MBCA (i.e. raptors), as well as 	<ul style="list-style-type: none"> • The timing of construction activities, especially vegetation clearing and site grading must have

Policy/Legislation	Description	Project Relevance
(MNR 1997)	<p>fur-bearing mammals and their dens or habitual dwellings, besides from the Red Fox (<i>Vulpes vulpes</i>) and Striped Skunk (<i>Mephitis mephitis</i>).</p>	<p>consideration for bird nesting and den sites for fur-bearing mammals.</p>
Fisheries Act (Government of Canada 1985)	<ul style="list-style-type: none"> • Last amended in August 2019, the federal <i>Fisheries Act</i> provides for the protection of fish and fish habitat • The Act prohibits the 'harmful alteration, disruption, and destruction' (HADD) of fish and their habitats. • Department of Fisheries and Oceans (DFO) has developed an online self-assessment tool where proponents can determine whether their projects require DFO review based on the type of water body the work is occurring in and the nature of the proposed activity. 	<ul style="list-style-type: none"> • Watercourse A provides direct coolwater fish habitat and supports a small-bodied fish community. • Any proposed works that may cause a Harmful Alteration, Disruption or Destruction (HADD) or death of fish must be submitted to DFO for review. Re-alignment of Watercourse A will require a review by DFO.
Growth Plan for the Greater Golden Horseshoe (Government of Ontario 2019)	<ul style="list-style-type: none"> • The Growth Plan, in conjunction with other provincial land use plans, builds on the Provincial Policy Statement to establish a land use planning framework for the Greater Golden Horseshoe. • The Growth Plan identifies a Natural Heritage System (NHS) for the Greater Golden Horseshoe to be integrated into long-term regional planning approaches for the protection of these features and their ecological functions. • Updated NHS mapping for the Greater Golden Horseshoe was released in February 2018. 	<ul style="list-style-type: none"> • The Growth Plan defines Key Natural Heritage Features (KNHFs) to include, in part, SAR habitat, fish habitat, wetlands, Significant Woodlands, and SWH. • Section 4.2.2(3) of the plan identifies requirements of new development within the natural heritage system.
County of Wellington Official Plan (2022)	<ul style="list-style-type: none"> • Parts of lands within the subject property are identified on Schedule A4 (Mapleton) as Core Greenlands. Development is generally not permitted within Greenlands (S. 5.5.3 – Streams and Valleylands). 	<ul style="list-style-type: none"> • Schedule A4 – Mapleton identifies Core Greenlands along the northeastern edge of the subject property boundary.
County of Wellington By-Law No. 5115-09 (County of Wellington 2009)	<ul style="list-style-type: none"> • Aims to regulate tree protection within County limits. • Statutes provide guidelines for conservation and the sustainable use of woodlands. 	<ul style="list-style-type: none"> • Sustainable and good forestry practices must be employed throughout the subject property, where tree removal is proposed.
Grand River Conservation Authority Ontario Regulation 150/06	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • The proposed development footprint location is regulated by the GRCA, through the proximity to the unnamed Carroll Creek tributary (Watercourse A).

Policy/Legislation	Description	Project Relevance
(GRCA 2013)	<p>areas in and near rivers, streams, floodplains, wetlands, and slopes).</p> <ul style="list-style-type: none"> 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). 	<ul style="list-style-type: none"> In accordance with this policy, the proposed development must demonstrate no negative impacts to the regulated natural features or their ecological functions.

2.0 Field Methods

A comprehensive field program was developed and detailed in the TOR (Appendix I). A total of 11 field visits were carried out between April 2021 and November 2022 to complete a variety of field surveys which are described in detail within the TOR and summarized in Table 2. The locations of monitoring stations are shown on Map 2.

Table 2. Field Survey Summary

Survey Type	Protocol ¹	Date	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Ecological Land Classification and	Lee et. al (2008)	June 17, 2021	0600-0710	10	1-2	0	None	E. Gosnell
Vascular Flora Inventory	Systematic search by ELC polygon	June 17, 2021	0600-0710	10	1-2	0	None	E. Gosnell
Tree Inventory and Bat Habitat Assessment	MNRF (2017)	April 12, 2022	0930-1630	11	1	0	None	J. Lance, E. Milne
		April 26, 2022	0800-1500	7	3	75	None	M. Postma
		April 27, 2022	1030-1130	1	3	75	None	M. Postma
		September 20, 2002	1400-1800	25	4	30	None	M. Postma
		November 2, 2022	1400-17:30	18	3	0	None	M. Postma
Breeding Bird Surveys	OBBA (2020)	June 17, 2021	0600-0710	10	1-2	0	None	E. Gosnell
		June 30, 2021	0645-0800	21	2	100	None	K. Hoo
Herpetofauna Surveys	Systematic search within suitable habitat	June 1, 2021	2045-2210	11-13	0	5-10	None	J. Lance
		June 17, 2021	0600-0710	10	1-2	0	None	E. Gosnell
		June 30, 2021	0645-0800	21	2	100	None	K. Hoo
Aquatic Habitat Assessment	Non-standardized characterization	April 22, 2021	0915-1030	0	4	100	Snow	S. Burgin
		August 13, 2021	1000-1115	27	3	90	None	S. Burgin
		September 24, 2021	0915-1015	10	3-4	100	Drizzle	S. Burgin
Watercourse Thermal Monitoring	Continuous water temperature monitoring	Logger Install: April 22, 2021	0930	0	4	100	Snow	S. Burgin S. Smith
		Logger Retrieval: September 24, 2021	0930	10	4	100	Drizzle	S. Burgin
Fish Community Sampling	Stanfield 2017	August 13, 2021	1000-1115	27	3	90	None	S. Burgin

¹ See Terms of Reference in Appendix I for a detailed description of the methods employed during each survey.

3.0 Existing Conditions

3.1 Soils, Terrain and Drainage

Soils within the subject property are generally characterized as Huron loam (Hoffman et al. 1963). Geotechnical investigations completed within the subject property by CMT Engineering Inc. in 2020 documented silty topsoil at the surface of three borehole locations (in the north, southeast and southwest areas of the subject property), ranging in thickness from 360mm to 410mm. Clayey silt was documented underlying the topsoil in all three boreholes, ranging in depth from 5.89m to 7.82m, and was considered to be the predominant soil type within the subject property. Underlying the clayey silt was silt in two of the boreholes (located in the north and southwest) and sand in the third borehole (located in the southeast) (CMT 2020).

Although the subject property appears to be relatively flat, the overall elevation differs by approximately 9.0 m from west to east (CMT 2020). Overland site drainage generally flows from west to east, where it reaches Watercourse A along the northeastern edge of the subject property. Watercourse A flows generally southeast along the boundary of the subject property before entering into unnamed GRCA regulated wetlands located downstream and off-site. Watercourse A is a tributary of Carroll Creek which flows into the Grand River north of Inverhaugh, Ontario.

3.2 Vegetation

The subject property is comprised of both native and cultural vegetation communities, including agricultural land, manicured lawn, and mixed forest. These vegetation communities are described below and are delineated on Map 2. The dominant species in each community within the subject property are provided below.

3.2.1 Vegetation Communities

Agricultural Land (Ag)

The Agricultural Land community encompasses the majority of the subject property and consists of a planted hay crop. This community is dominated by Common Timothy (*Phleum pratense*), Orchard Grass (*Dactylis glomerata*), Reed Canary Grass (*Phalaris arundinacea*), Fescue (*Festuca sp.*), Bird's-foot Trefoil (*Lotus corniculatus*), White Clover (*Trifolium repens*), Alfalfa (*Medicago sativa*), Common Crown-vetch (*Securigera varia*),

Oxeye Daisy (*Leucanthemum vulgare*), Common Dandelion (*Taraxacum officinale*), Canada Goldenrod (*Solidago canadensis*), and Annual Fleabane (*Erigeron annuus*).

Deciduous Hedgerow (H)

The Deciduous Hedgerow community is located on the southwestern edge of the property and runs along a former rail line. This community is dominated by American Elm (*Ulmus americana*), White Ash (*Fraxinus americana*), Eastern Cottonwood (*Populus deltoides*), Sweet Cherry (*Prunus avium*), Hawthorn (*Crataegus sp.*) and Common Apple (*Malus pumila*). Common Crown-vetch, Canada Goldenrod, Common Burdock (*Arctium minus*), Field Bindweed (*Convolvulus arvensis*) and Bird's-foot Trefoil are commonly found within the ground-cover and understory.

Fresh-Moist White Cedar Hardwood Mixed Forest (FOM7)

The Fresh-Moist White Cedar Hardwood Mixed Forest community is located along the unnamed watercourse/drain (Watercourse A) that is present along the northeastern property boundary. This community is dominated by Eastern White Cedar (*Thuja occidentalis*), Manitoba Maple (*Acer negundo*) and Willow (*Salix sp.*).

Residential (RES)

The Residential community is located along the northern edge of the subject property and contains the existing disturbed and developed portion of the property. This community is characterized by manicured lawns and scattered planted trees.

Fresh-Moist Lowland Deciduous Forest (FOD7)

The Fresh-Moist Lowland Deciduous Forest community is located adjacent to the southeast corner of the subject property.

Mineral Cultural Meadow (CUM1)

The Mineral Cultural Meadow community is located adjacent to the southeast edge of the subject property, between the subject property and the GRCA-regulated wetland to the southeast.

3.2.2 Vascular Flora

Vegetation and tree inventories resulted in the identification of 45 plant species in ELC polygons which overlap with the subject property. A complete list of species observed is provided in Appendix III.

A thorough review of background information pertaining to federally, provincially or regionally rare plant species reported from the vicinity of subject property was completed for the SAR screening (Appendix II). This assisted in flagging specific species to be targeted during the vascular flora inventories. All vascular flora species observed were of common and secure species.

3.2.3 Tree Inventory

An inventory of all trees $\geq 10\text{cm}$ in Diameter at Breast Height (DBH) within the subject property with the potential to be impacted by the proposed works was completed by NRSI Certified Arborists/Registered Professional Foresters. The location of the trees inventoried was surveyed using an SXBlue II GNSS GPS unit, capable of sub-meter accuracy.

In total, 586 trees $\geq 10\text{cm}$ DBH were inventoried within the subject property. Table 3 below provides an overview of the trees located within the subject property, including their overall health. An analysis of trees located within the development footprint and their retention/removal is provided in Section 5.

Table 3. Summary of Inventoried Trees

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
American Basswood	<i>Tilia americana</i>			12				12
American Elm	<i>Ulmus americana</i>		21	60	4	1	13	99
Balsam Poplar	<i>Populus balsamifera</i>			1	1			2
Black Walnut	<i>Juglans nigra</i>		3	10				13
Bur Oak	<i>Quercus macrocarpa</i>			1				1
Eastern Cottonwood	<i>Populus deltoides</i>		18	33	1			52
Eastern White Cedar	<i>Thuja occidentalis</i>			38				38
Eastern White Pine	<i>Pinus strobus</i>			4				4
Green Ash	<i>Fraxinus pennsylvanica</i>		1	12	6	2	1	22
Large-toothed Aspen	<i>Populus grandidentata</i>			1	1			2
Manitoba Maple	<i>Acer negundo</i>		14	19	2	1		36
Silver Maple	<i>Acer saccharinum</i>			4				4
Slippery Elm	<i>Ulmus rubra</i>				4			4
Sugar Maple	<i>Acer saccharum</i>		3	18	1			22
Tulip Tree	<i>Liriodendron tulipifera</i>				1			1
White Ash	<i>Fraxinus americana</i>		1	45	15	2	3	66
White Spruce	<i>Picea glauca</i>		1	4				5
Total		0	62	262	36	6	17	383
Non-Native Species								
Blue Spruce	<i>Picea pungens</i>			8				8
Common Apple	<i>Malus pumila</i>		2	22	16			40
European Mountain-ash	<i>Sorbus aucuparia</i>		1	7	3			11
Golden Weeping Willow	<i>Salix x sepulcralis</i>		2					2

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Norway Maple	<i>Acer platanoides</i>			14		1		15
Sweet Cherry	<i>Prunus avium</i>		10	34	14		2	60
Total		0	15	85	33	1	2	136
**								
Hawthorn sp.	<i>Crataegus sp.</i>	1	11	27	4	3	1	47
Serviceberry sp.	<i>Amelanchier sp.</i>			1				1
Willow sp.	<i>Salix sp.</i>		1	14	2	2		19
Total		1	12	42	6	5	1	67
Overall Total		1	89	389	75	12	20	586

3.3 Wildlife

3.3.1 Birds

A total of 102 species are reported from the 10 x 10km OBBA squares that overlap with the study area (BSC et al. 2008). The data found in the OBBA includes those species that have exhibited some evidence of breeding in the area (10 x 10km range). A total of 26 of these species, plus one additional species, were documented within the study area during the field surveys, all of which exhibited signs of breeding, such as males singing, males on territory, and the presence of fledged young.

A total of seven significant bird species are known from the vicinity of the study area based on OBBA records or other background data (BSC et al. 2008, MNR 2022b). One of these species, Eastern Wood-pewee (*Contopus virens*), was detected by NRSI within the study area during breeding bird surveys in 2021.

One Eastern Wood-pewee, listed as Special Concern provincially and federally (MECP 2022, Government of Canada 2022b), was heard singing during the first breeding bird survey from within the FOD7 woodland adjacent to the southeast corner of the subject property. Given that this species was heard singing during only one breeding bird survey it is considered a “possible” breeder in the woodland (outside of the subject property).

Refer to Appendix III for a full list of bird species found in the study area and known from background data.

3.3.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (ORAA), 10 species of herpetofauna are reported from the vicinity (approximately 10km) of the study area (Ontario Nature 2020). NRSI field investigations confirmed the presence of three herpetofauna species within the study area: Northern Green Frog (*Lithobates clamitans*), Spring Peeper (*Pseudacris crucifer*), and Gray Treefrog (*Hyla versicolor*). All three frog species are common and secure in Ontario.

An anuran call survey was conducted on June 1, 2021, to identify the presence of breeding frog and toad species within the study area. Anurans were observed at one station, located at the off-property wetland to the southeast of the subject property, with seven Spring Peepers and two Gray Treefrogs detected.

A complete list of herpetofauna reported from the study area, based on background information and observations by NRSI biologists, is included in Appendix III.

3.3.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 46 mammal species are reported from within 10km of the study area. Four mammal species were observed by NRSI biologists within the study area. These include species commonly found within woodland and urban environments: Eastern Cottontail (*Sylvilagus floridanus*), Gray Squirrel (*Sciurus carolinensis*), Eastern Chipmunk (*Tamias striatus*), and Red Fox (*Vulpes vulpes*). Appendix III provides a complete list of mammal species reported from the study area.

3.3.3.1 Bat Habitat Assessment

A bat habitat assessment was conducted on trees within the subject property. No trees with suitable bat cavities were observed. Based on this habitat assessment, habitat for bats is not present within the subject property, however, it is anticipated that habitat for bat species may be present within the woodland adjacent to the southeast corner of the subject property.

Evaluation methods followed the MNRF Guelph District's guidance document, *Survey Protocol for Species at Risk Bats within Treed Habitats* (MNRF 2017).

3.3.4 Insects

According to the Ontario Butterfly Atlas (MacNaughton et al. 2022), 10 butterfly species are reported from within 10km of the study area, including one significant species, Monarch (*Danaus plexippus*), which is listed provincially as Special Concern (MECP 2022). This species' larval host plant, Milkweed (*Asclepias* sp.), was documented by NRSI in the agricultural vegetation community within the subject property, however Monarch was not observed during field surveys.

NRSI field investigations confirmed the presence of two butterfly species within the study area: European Skipper (*Thymelicus lineola*), and Cabbage White (*Pieris rapae*). Both species are non-native and common in Ontario.

Appendix III provides a complete list of butterfly species reported from the study area.

3.4 Aquatic Habitat

3.4.1 Aquatic Habitat Assessments

3.4.1.1 Watercourse A

The primary watercourse within the subject property is identified as Watercourse A, a tributary to Carroll Creek. This feature originates northwest of the subject property beyond the Queen Street and Peel Street West intersection (Map 1). It flows generally southeast, as an open ditch alongside the northeastern boundary of the subject property before entering into GRCA regulated wetlands located downstream and off-site.

Watercourse A is characterized by a relatively shallow channel (<0.05 - 0.3 m deep) with wetted widths ranging from approximately 0.5 - 2.5 m. Bankfull widths ranged from 1.8 - 4.1 m, with bank heights ranging from 0.5 - 1.05 m. The feature has been historically channelized and the watercourse continues to flow through a straightened channel adjacent to the subject property. There is evidence of bank erosion and channel incising, which indicates that the watercourse experiences seasonally high flows. This bank erosion and incising is particularly notable along the 90° bend where the watercourse turns and flows southeast, approximately 50m downstream from Queen Street. A general lack of suitable riparian and bank cover has resulted in relatively unstable banks, which further exacerbates the erosion.

In-stream cover is moderate to abundant, but variable across the surveyed length of Watercourse A, with some areas providing little to no cover and other areas providing nearly 100% cover. This cover is provided primarily by areas of gravel and cobble as well as overhanging bank vegetation (grasses and shrubs), with occasional in-stream vegetation and woody debris. Substrates within the watercourse were observed to be predominantly cobble and gravel with deposits of finer substrates (silt and sand) and detritus present within deeper sections and areas where bankside vegetation is thick,

slowing the water velocity and allowing deposition. Bank vegetation was observed to be relatively low adjacent to the residential properties, where it is mown grass. Towards the eastern extent of the study area, the riparian habitat becomes more naturalized within a narrow (<10m) buffer, with increasing amounts of overhanging shrubs, mature trees, graminoids and forbs. Overall shading to the watercourse is good (approximately 50 - 75%), provided by areas of overhanging bank vegetation, several large mature deciduous and coniferous trees, and shrubs. Temperature monitoring conducted along the watercourse suggests that the existing shading to Watercourse A may provide a slight cooling effect to water temperatures as no signs of groundwater input were observed within the assessed reach.

3.4.1.2 Ephemeral Drainage Channel

The ephemeral drainage channel (Map 1) originates along the southern boundary of the subject property and extends generally east and northeast to its confluence with Watercourse A (Map 1). The feature was observed to be dry during the August 13, 2021, field investigation, but provided some evidence of substrate sorting (exposed gravel present) and channelization/erosion. This ephemeral feature appears to have been historically used as a drainage channel for the adjacent agricultural field, and is only expected to convey seasonal overland flows during spring freshet and following heavy precipitation events. Terrestrial vegetation was observed rooted within the main channel of the feature, indicating it remains dry the majority of the year.

3.4.2 Thermal Regime Monitoring

The results of the 2021 water and air temperature monitoring showed a relatively consistent pattern of surface water temperatures across the two stations. However, variation with water temperatures lacked a strong correlation to precipitation events (Correlation coefficients < 0.08) (Figure 1). Due to these results, it is expected that the water temperatures are largely uninfluenced by surface run-off and are instead more reflective of thermal influences from daily air temperatures (Correlation coefficients >0.9).

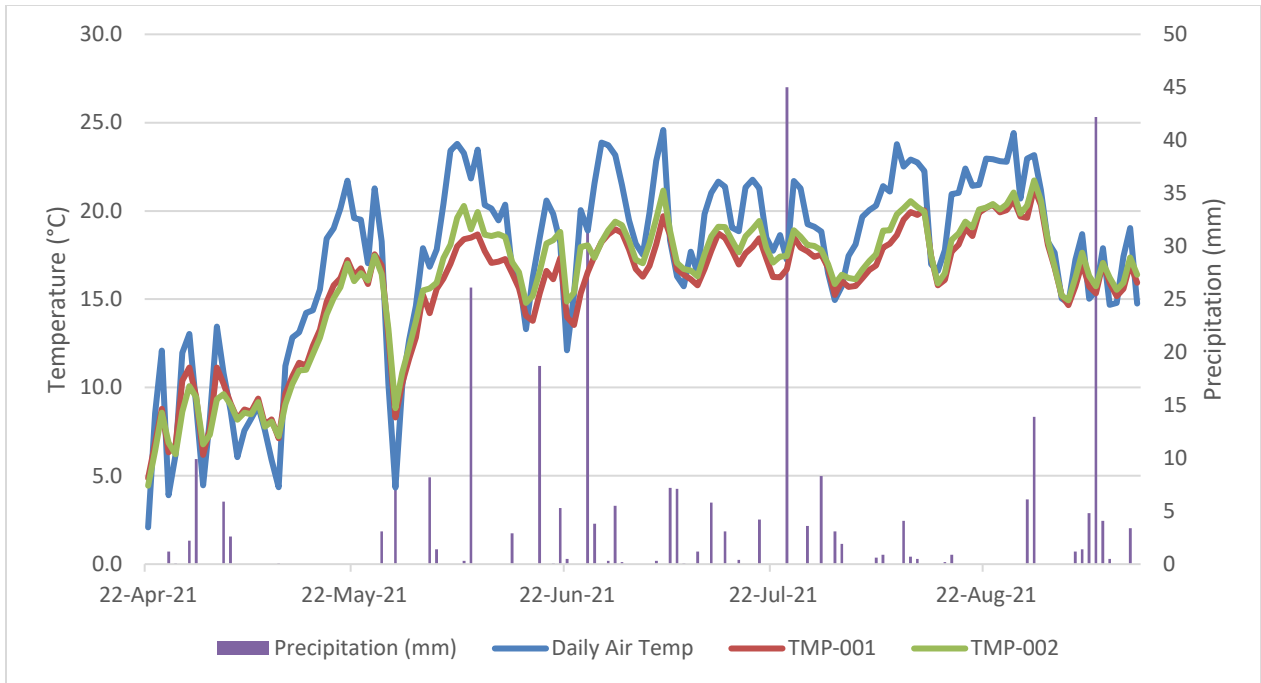


Figure 1. 2021 Surface Water Temperature Monitoring Watercourse A

Information provided by the GRCA indicates a coolwater thermal regime for Watercourse A, as historically classified by the MNR. This is generally supported by water temperature monitoring completed by NRSI in 2021. Baseline thermal regime determination suggests that Watercourse A falls within the “cool to cool-warmwater” thermal regime, based on comparisons of results to the analysis by Chu et al. (2009). Monitoring station TMP-001 (Figure 2), located furthest downstream (Map 2), was observed to be cooler on average than TMP-002 (Figure 3), which was located just south of Queen Street.

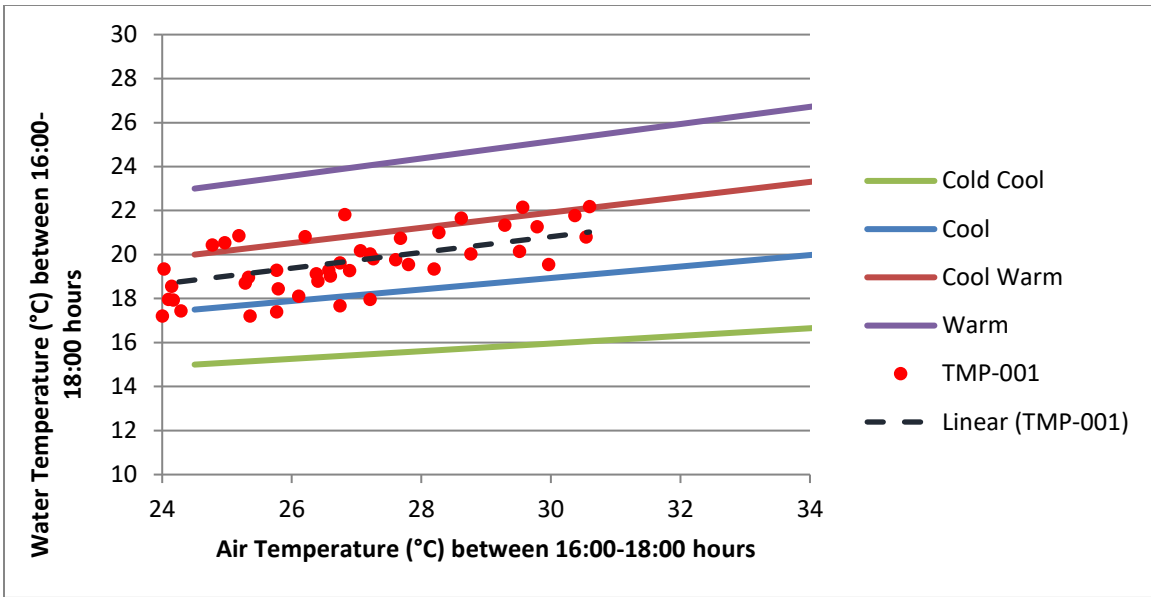


Figure 2. TMP-001 Thermal Regime Monitoring

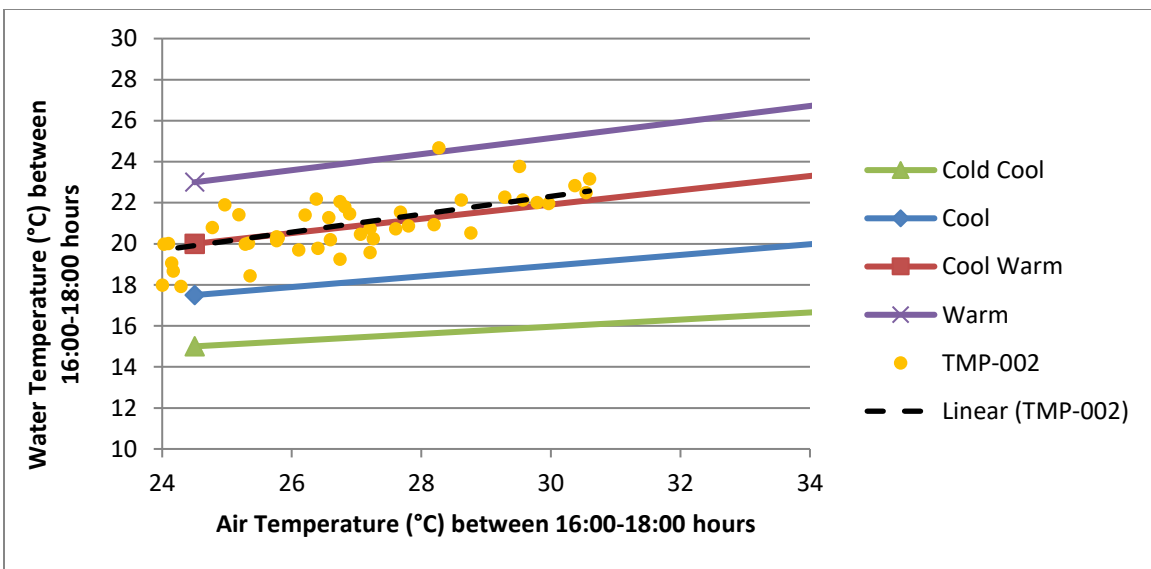


Figure 3. TMP-002 Thermal Regime Monitoring

No evidence of groundwater inputs, including Watercress (*Nasturtium officinale*), was observed during field investigations, which would suggest that there are no coldwater inputs between the two stations. Rather, it is possible that the cooling effect from upstream to downstream is a result of the treed corridor and improved shading afforded by the more natural vegetation located in the vicinity of TMP-001. The section of Watercourse A that flows adjacent to manicured lawn would experience thermal impacts

from the lack of shading, but does provide opportunities to improve the riparian buffer, which would help to further improve the thermal conditions of the watercourse.

3.5 Fish Community

Electrofishing surveys were conducted on August 13, 2021, to characterize the fish community within Watercourse A. Results of the survey indicate that Watercourse A provides suitable direct habitat for a small-bodied fish community. A total of four fish species were captured within Watercourse A within the study area, none of which are considered species of Conservation Concern or Species at Risk. Table 4 provides a summary of fish captured within the watercourse, their temperature preference, general tolerance, and current status ranks.

Table 4. Watercourse A Fish Capture Results 2021

Fish Capture Results						
Common Name	Scientific Name	Thermal Regime ¹	Tolerance ¹	Status		EMS-001
				SARO ²	COSEWIC ³	
Central Stoneroller	<i>Campostoma anomalum</i>	Coolwater	Intermediate	NAR	NAR	15
Brook Stickleback	<i>Culaea inconstans</i>	Coolwater	Intermediate	NAR	NAR	14
Blacknose Dace	<i>Rhinichthys obtusus</i>	Coolwater	Intermediate	NAR	NAR	87
Creek Chub	<i>Semotilus atromaculatus</i>	Coolwater	Intermediate	NAR	NAR	70
Species Richness						4
Total Catch						186

¹Coker et al. 2001, ²MECP 2022, ³Government of Canada 2022b, NAR – Not At Risk

The fish community composition documented within Watercourse A includes intermediately tolerant coolwater species, consistent with the ‘cool to cool-warmwater’ thermal regime that was noted for the watercourse following water temperature monitoring. The dominant fish species observed within Watercourse A were Blacknose Dace (*Rhinichthys obtusus*) and Creek Chub (*Semotilus atromaculatus*). Both species are common and widespread throughout Ontario in cool, clear, swiftly flowing streams with gravel dominated substrates (Scott and Crossman 1973).

4.0 Significance and Sensitivity

An analysis of the significance of existing natural features was completed to identify those features and habitats that are sensitive to disturbance based on the rarity or sensitivity of the feature or the functions/processes that contribute toward their significance. This assessment also considered the policies, legislation, and regulations that apply to the study area natural features which must be considered in the evaluation of the proposed development.

The following is a discussion of the results of this analysis with regards to background information and findings of the field surveys.

4.1 Wetlands

An unevaluated wetland is located to the southeast of the subject property and is >50m from the subject property boundary. This wetland is regulated by the GRCA under O. Reg. 150/06, and a portion of the wetland is mapped within the Core Greenlands feature under the Wellington County Official Plan (2022). Development which may have negative impacts to the form and function of this feature is therefore prohibited.

Given that this wetland habitat is located well outside of the proposed development footprint (>50m), it is not expected that there will be any negative impacts to this feature.

4.2 Watercourses

Watercourse A is a permanent feature that flows generally southeast along the northeastern edge of the subject property boundary. This watercourse provides direct connection to Carroll Creek, approximately 1.0km downstream, and provides direct fish habitat that supports a small-bodied fish community comprised of coolwater species. Watercourse A was historically assigned a thermal code of cool by the MNR (GRCA 2022, Appendix I). This is generally consistent with water temperature monitoring conducted in 2021, which indicated a thermal regime of cool to cool-warm. Watercourse A and its floodplain is regulated by the GRCA under O. Reg. 150/06, and is a Core Greenlands feature under the Wellington County Official Plan (2022). Additionally, the fish and fish habitat present within Watercourse A is protected under the federal *Fisheries Act* and is regulated by DFO. The proposed Draft Plan of Subdivision proposes to re-align a section of Watercourse A, which would include works that may

cause a HADD and/or result in injury or death of fish, and as such, must be reviewed by DFO.

Watercourse A is expected to act as a receiver for stormwater from the proposed development near the southeast corner of the subject property. This has the potential to affect the thermal regime of the watercourse as well as its physical structure and water chemistry. Stormwater may be warmer than the receiving coolwater watercourse and periodic events of high velocity outflow to the creek may erode nearby banks. Bank erosion caused by the outflow channel would increase sedimentation to the creek above baseline conditions, which could negatively affect the fish community within Watercourse A and Carroll Creek, downstream. Stormwater must be managed appropriately on site, with mitigation measures applied, to reduce the water temperatures prior to release to the watercourse. Design should also consider its potential to cause erosion in the vicinity of, and downstream from, the outflow channel and address that accordingly.

4.3 Woodlands

The Wellington County Official Plan (2022) states that urban woodlands over 1 ha in size are considered to be significant (S. 5.5.4), while The Wellington County Natural Heritage System (NHS; 2018) includes all urban woodlands ≥ 1 ha and ≥ 30 m wide as Natural Heritage Components. The wooded area within the subject property runs along a former rail line on the southwestern edge of the property and is approximately 1 ha in size, however it is less than 30m wide and is not mapped as a Significant Woodland within the OP or as a Natural Heritage Component in the NHS. The small size and long/narrow shape of the wooded area create a significant amount of 'edge' habitat, it has low structural diversity, and limited habitat types, resulting in a low level of species diversity. It does not contain, and is not in close proximity to, any watercourses or wetlands. It is identified as Hedgerow on the mapping in this report. The trees within this feature are relatively young, and the composition is not unique or rare. No endangered or threatened species, species of conservation concern, or other significant species were documented within or near this feature during field surveys undertaken in 2021 and 2022.

Based on these characteristics of the wooded feature outlined above, this feature is not considered to be 'significant', as outlined by the County OP. However, sustainable and

good forestry practices must be employed throughout the subject property where tree removal is proposed, and tree removal is subject to the Wellington County *Forest Conservation By-law*.

4.4 Habitat of Endangered and Threatened Species

As noted above (Section 3.3.3.1), habitat for bat species, including bat SAR (Little Brown Myotis *Myotis lucifugus*, Northern Myotis *Myotis septentrionalis*, and Tricolored Bat *Perimyotis subflavus*) may be present within the FOD7 woodland adjacent to the southeast corner of the subject property. The bat habitat assessment of trees on-site did not find any trees with cavities suitable as habitat for bats. No bats were observed on-site during field surveys, although specific bat monitoring was not completed. Given that there is no habitat present on-site and the potential habitat of the adjacent woodland is located entirely outside of the proposed development, it is not expected that there will be any negative impacts to these species.

4.5 Significant Wildlife Habitat

4.5.1 Bat Maternity Colony Habitat (Candidate SWH)

Suitable bat maternity habitat may be present within the woodland adjacent to the southeast corner of the subject property. However, targeted surveys were not completed in this woodland given that this feature is located entirely outside of the proposed development and it not expected to be impacted.

4.5.2 Amphibian Breeding Habitat (Woodland) (Candidate SWH)

Amphibian Breeding Habitat (Woodland) may be present within the unevaluated wetland located to the southeast of the subject property. Two indicator species, Spring Peeper (seven individuals) and Gray Treefrog (two individuals), were detected in this wetland during the June 1, 2021, site visit. A full suite of targeted amphibian surveys was not completed in this wetland, however, given that this feature is located entirely outside of the proposed development and it not expected to be impacted.

4.5.3 Habitat for Species of Conservation Concern: Special Concern and Rare Wildlife *Eastern Wood-Pewee (not SWH)*

A singing male Eastern Wood-Pewee was detected in the woodland adjacent to the southeast corner of the subject property during the June 17, 2021, site visit. However,

Eastern Wood-Pewee was not documented within the study area during the June 30, 2021, breeding bird survey. These results suggest that the Eastern Wood-Pewee individual was likely a non-breeding late migrant or transient individual using the site as stop-over habitat. Furthermore, the lack of aural observation of this highly vocal species on June 30, or during any other site visit, suggests that an Eastern Wood-Pewee breeding territory was likely not present within the study area. Therefore, Eastern Wood-Pewee breeding habitat is considered absent in the study area. Additionally, given that this woodland is entirely outside of the subject property, it is not expected to be impacted by the proposed development.

5.0 Impact Analysis

The subject property is proposed to be developed into a residential subdivision, as shown on the Draft Plan of Subdivision prepared by Van Harten Surveying Inc. and shown on Map 3. The proposed development includes 16 lots, an internal road network and a stormwater management block. Each lot is to be serviced with a private septic system and private well.

5.1 Approach to Impact Analysis

The impact analysis presented here is based on the development details submitted as part of the Draft Plan of Subdivision (Map 3).

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.

5.2 Direct Impacts

The approach to identifying and delineating the natural features was aimed at avoiding direct impacts from development on important natural features. The Draft Plan of Subdivision, as shown on Map 3, presents the proposed lot layout within the subject property. Direct impacts are discussed in more detail below.

5.2.1 Vegetation Removal

Vegetation removal will be required for the development of the proposed residential subdivision. Individual tree removal should be minimized as much as possible (i.e., retain as many trees as possible). A retention analysis based on the Draft Plan of Subdivision indicated that 384 trees are proposed for removal, with 11 trees presumed to be retained but will be confirmed at the time of removal. Tree removal/retention is shown on Map 4. Tree removal should occur between September 1 and March 31, to avoid potential impact to nesting migratory birds (which would contravene the Migratory Birds Convention Act). Tree removal should occur using best management practices

and arboricultural techniques, protecting any trees that are to remain standing including and not limited to tree driplines and root protection zones.

Tree Protection and Mitigation Measures

A combination Erosion and Sediment Control (ESC) and Tree Protection Fencing (TPF) is recommended to be installed in order to protect on-site trees to be retained as well as off-property trees adjacent to the development. This ESC/TPF is to take the form of 2240mm iron T-bar stakes supporting 1200mm paige-wire fencing. A corresponding fencing diagram can be found on Map 4. The combination fencing should be installed prior to any construction activity, and be inspected by an Environmental Monitor, Certified Arborist/Registered Professional Forester (RFP) or approved other.

A Certified Arborist, RFP, or qualified other, is to be on-site during any excavation and vegetation removal activities where they are adjacent to trees identified to be retained to ensure that trees identified to be retained are not removed or damaged. It will be especially important that a Certified Arborist/RFP or qualified other be on-site during removals that are adjacent to Watercourse A. The Certified Arborist, RFP, or qualified other should be on-site to ensure that the TPF is installed and functioning as intended and that removals are in accordance with this report/map and the timing windows described above. The TPF should be inspected by a Certified Arborist, RFP, or qualified other occasionally throughout the construction period (i.e., once a month) or depending on frequency of works adjacent to the TPF.

The recommended ESC/TPF is to be maintained by the Client or its agents during the entire site alteration period to ensure that trees being retained (including their root systems) are protected. Minor damage (e.g., damage to limbs or roots) to trees to be retained must be pruned using proper arboricultural techniques. Root pruning, if necessary, should be performed by a Certified Arborist or RFP using an appropriate implement to make proper pruning cuts and encourage callous root growth. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, Township staff should be consulted to determine a plan of action, such as treatment or compensation. If replacement species are chosen, they are to be reviewed by a Landscape Architect in good standing with the Ontario Association of Landscape Architects (OALA), Certified Arborist/RFP, or qualified biologist.

Areas protected by the ESC/TPF shall remain undisturbed and shall not be used for temporary storage, placement or excavation of fill or top soil, or the storage of construction materials, equipment, waste or debris. Where fill must be temporarily located near tree protection barriers, plywood must be used to ensure no material enters the tree protection zones. Grading changes and construction of any kind are also prohibited within the tree protection zones. Recognizing the root system of a tree often extends well beyond its dripline (i.e., outside the protected area), construction contaminants such as fuels, oils, etc. should be kept clear of areas protected by the TPF. The tree protection zones will not be used for portable rooms/buildings, or the movement of vehicles, equipment, or pedestrians.

The TPF is to be removed upon completion of construction activities and when adjacent areas are stabilized with a suitable vegetative cover to the satisfaction of the Environmental Inspector or qualified biologist. Removal of TPF and revegetation will permit increased root development for the remaining trees. A Certified Arborist, RPF, or qualified other must inspect all retained trees and their rooting area, and recommend remediation work, if needed. A post-construction remediation plan may be required if damage to retained trees is noted. Following remediation activities, if needed, a final assessment should be done to ensure all protocols were met, ensuring final project approval.

Compensation

As Mapleton Township and the County of Wellington do not have specific requirements in regards to compensation planting, it is recommended that compensation for the proposed removal of 384 trees be determined based on direct consultation with the Township and County.

It is recommended that a detailed Landscape Plan should be prepared identifying compensation planting areas, as required, as well as for the restoration of the bank and riparian areas along Watercourse A, described below. During the development of landscaping plans, it is recommended that design options that mitigate for the loss of canopy cover from tree removals be considered. A naturalized planting approach in the stormwater management block and along Watercourse A should be considered in order to increase the prevalence of native species. Landscaping plantings incorporated into the overall development area should not include any species that are listed as

introduced or invasive (i.e., Norway Maple). The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation. Native and/or non-native species that are more tolerant to urban conditions (i.e., salt, compaction, drought) should be considered to increase overall survival.

Significant impact is not anticipated if the above development procedures are followed.

5.2.2 Wildlife and Their Habitats

According to CWS (2014), the peak breeding period for migratory birds that nest in treed habitats in southern Ontario is between April 1 and August 31. During this period, it is recommended that no clearing of vegetation within simple and/or complex habitats occurs. The *Migratory Birds Convention Act* protects migratory birds, their eggs and nests from being harmed or destroyed at any time of the year. However, 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 (CWS 2013). Nest searches, completed by a qualified biologist, should be completed within 24hrs prior tree clearing to ensure no impacts to nesting birds. The applicant should keep a clearance memo, prepared by the qualified biologist on file.

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 encroachment into the surrounding natural features. As mentioned above, ESC/TPF should be correctly installed along the development boundary (Map 4) to prohibit encroachment of machinery into natural areas, protect trees and vegetation, control surface water runoff and sedimentation, as well as hinder wildlife from entering construction sites.

5.2.3 Aquatic Habitat

The development proposes to re-align approximately 100m of Watercourse A where it abuts the northeastern side of the subject property. This would result in a direct impact to the aquatic habitat within that section of the watercourse, which includes shallow riffle and pool habitat that provides fish habitat to a small-bodied fish community. As it exists currently, this aquatic habitat is somewhat limiting as it is a historically channelized section of the watercourse, which currently experiences erosion and channel incising,

limited shading, with bank/riparian habitat consisting largely of manicured lawn that extends to the edge of the watercourse. The re-alignment proposes to incorporate natural channel design elements such as riffle-pool sequencing, a meandering form, and bank/riparian plantings that should improve upon existing fish habitat conditions. A Landscape Plan should be prepared to detail the location, species, size, numbers, seed mixes, etc. of trees, shrubs and herbaceous plants to be installed to restore and enhance the bank and riparian area. Emphasis should be placed on species which are hardy and suited to the conditions along the watercourse as well as to provide shade and structural stability to the channel.

Mitigation measures will also be incorporated into the details of the channel works that will aim to mitigate against potential HADD and injury/death of fish, which will include applicable measures to protect fish and fish habitat as listed by DFO (Government of Canada 2022a).

5.3 Indirect Impacts

5.3.1 Sediment, Erosion and Tree Protection

As described in section 5.2.1, Erosion and Sediment Control and Tree Protection Fencing (ESC/TPF) is recommended to be installed at the limit of the proposed development footprint as shown on Map 4. The following recommendations with regards to erosion and sediment control and tree protection are provided:

- A Certified Arborist or RPF, or qualified other, is to be on-site during any excavation and vegetation removal activities where they are adjacent to trees identified to be retained to ensure that trees identified to be retained are not removed or damaged.
- All ESC/TPF is to be inspected and monitored, and repairs are to be completed as required.
- All ESC/TPF is to be maintained by the Client or its agents during the entire site alteration period to ensure that trees being retained (including their root systems) are protected.
- All ESC/TPF should be inspected by a Certified Arborist, RFP, or qualified other occasionally throughout the construction period (i.e., once a month) or depending on frequency of works adjacent to the fencing.

- All materials and equipment used for the purpose of site preparation, construction and project completion should be operated and stored in a manner that prevents any materials from leaving the site.
- Following completion of construction and site stabilization, all ESC/TPF and accumulated sediment are to be removed and retained trees must be inspected by a Certified Arborist or RPF.

Significant impact is not anticipated if the above development procedures are followed.

5.3.2 Water Quantity and Quality

The residential development must protect the overall existing drainage patterns and water balance to natural heritage features (watercourses and wetlands) and should minimize impervious areas. The proposed lots are large in size, ranging from 0.3ha to 0.5ha in area. Proposed dwelling footprint and proposed septic area is shown on each lot on the Draft Plan of Subdivision. The large lots compared to the impervious footprint of the dwelling will result in ample grassed area to receive runoff from the roofs and driveways and will promote infiltration. Runoff from driveways and the streets will be directed to the stormwater management facility for retention and treatment prior to being outlet to Watercourse A. Details of the stormwater management facility and strategy are provided by GM BluePlan Engineering.

Stormwater management design must consider the sensitivity of Watercourse A as a receiver. It is recommended that the pond and outflow design consider ways to mitigate thermal impacts to the creek as well as its potential to cause erosion.

Use of salt during the winter should be minimized, or alternatives to road salt should be used to avoid water contamination.

As described in section 5.2.1, it is recommended that a detailed Landscape Plan be prepared for the bank and riparian areas along Watercourse A, that includes the planting and establishment of native trees, shrubs, and forbs. The establishment of a native plantings would improve shading to the watercourse, which should help to further reduce thermal impacts and provide additional cooling to the channel to help maintain a coolwater thermal regime. These plantings would also improve bank stability, provide improved management of surface runoff, and provide additional cover habitat to the channel. Compensation tree plantings throughout the development will promote water

retention, evapotranspiration and infiltration, aiding in the mitigation of stormwater impacts.

Significant impact is not anticipated if the above development procedures are followed.

5.4 Induced Impacts

Induced impacts may arise following development through a variety of human-induced impacts. The identified natural features are protected by municipal and Conservation Authority policies and should be protected in their natural states. The following recommendations should be followed to avoid induced impacts:

- No removal of vegetation and habitat from the natural vegetation communities
- Minimize noise disturbance on wildlife during construction
- No dumping of yard waste or other debris into natural areas
- Keep house cats indoors and dogs leashed to avoid impact to wildlife
- No planting of non-native, invasive species (such as Norway Maple, *Acer platanoides*)
- Landscaping around homes should be as natural as possible (minimal lawn area, use of native species in gardens).

6.0 Recommendations

The following summarizes key recommendations made in this report:

- Install a combination of ESC and TPF (as shown on Map 4) prior to any construction activity, to be maintained by the Client during the entire site alteration period.
- Tree removal should occur between September 1 and March 31, to avoid impact to migratory birds (which would contravene the Migratory Birds Convention Act). Tree removal should occur using best management practices and arboricultural techniques, protecting any trees that are to remain standing.
- A Certified Arborist/RPF, or qualified other, is to be on-site during any excavation and vegetation removal activities where they are adjacent to trees identified to be retained to ensure that trees identified to be retained are not removed or damaged.

- All ESC/TPF should be inspected by a Certified Arborist, RFP, or qualified other occasionally throughout the construction period (i.e., once a month) or depending on frequency of works adjacent to the fencing.
- Submit the proposed re-alignment of Watercourse A to DFO for approval and implement applicable measures to protect fish and fish habitat (Government of Canada 2022a) during the re-alignment of Watercourse A.
- Develop a detailed Landscape Plan for the bank and riparian areas along Watercourse A and the overall development area in order to restore and enhance aquatic habitat conditions within the watercourse and to offset the proposed tree removal, 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.
- The stormwater management pond and outflow design must consider ways to mitigate thermal impacts to the Watercourse A as well as its potential to cause erosion.
- Following completion of construction and site stabilization, all ESC/TPF and accumulated sediment are to be removed, and retained trees must be inspected by a Certified Arborist or RPF.

7.0 Conclusions

NRSI was retained by Mr. Kevin Vanleeuwen to complete a Scoped EIS to address potential impacts associated with the proposed residential subdivision development for the property located at Lot 1, Concession 1 West of Grand River, Township of Mapleton, Ontario, in the community of Alma. The intent of this report is to characterize important natural features, and identify potential impacts associated with the development as well as avoidance and mitigation measures.

This report provides recommendations 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 and after the proposed development. Significant impact to natural features is not anticipated if the above mitigation, protection and monitoring measures provided in this report are followed.

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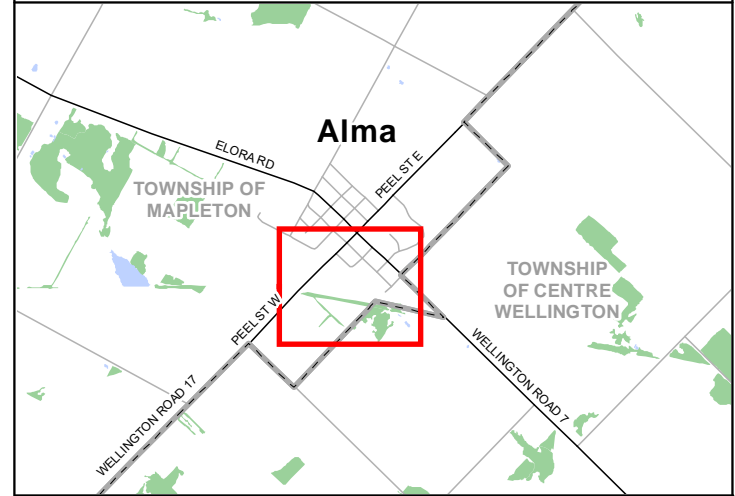
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MAPS



Alma Scoped EIS Map 1

Study Area and Natural Features



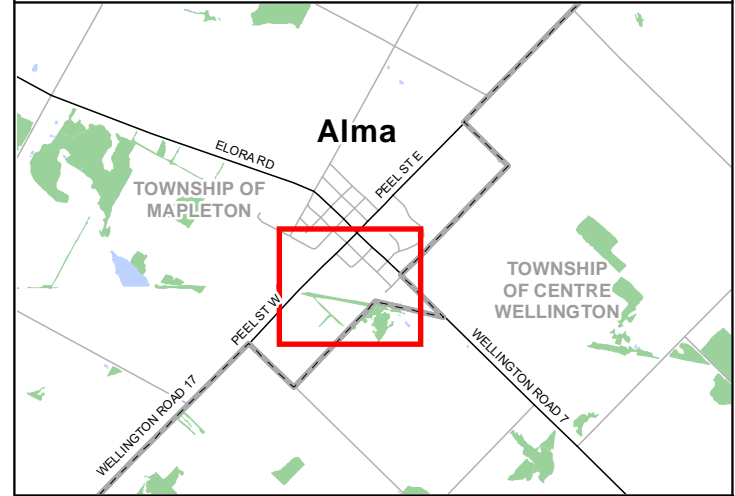
- Legend**
- Study Area (120m)
 - Subject Property
 - Core Greenlands (County of Wellington)
 - Primary Road
 - Secondary Road
 - Floodline
 - Permanent Watercourse
 - Intermittent/Ephemeral Watercourse
 - Water Body
 - Regulatory Floodplain
 - Wetland (GRCA)
 - Unevaluated Wetland



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Project: 2582 Date: January 11, 2023	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000

Alma Scoped EIS Monitoring Locations and Vegetation Communities



- Legend**
- Study Area (120m)
 - Subject Property
 - Temperature Monitoring (Water)
 - ▲ Temperature Monitoring (Air)
 - Primary Road
 - Secondary Road
 - Permanent Watercourse
 - Intermittent/Ephemeral Watercourse
 - Water Body
 - Wetland (GRCA)
 - Unevaluated Wetland
 - Ecological Land Classification (ELC)
- (Ag) Agricultural
 (CUM) Cultural Meadow
 (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
 (FOM7) Fresh - Moist White Cedar - Hardwood Mixed Forest Ecosite
 (H) Deciduous Hedgerow
 (Res) Residential

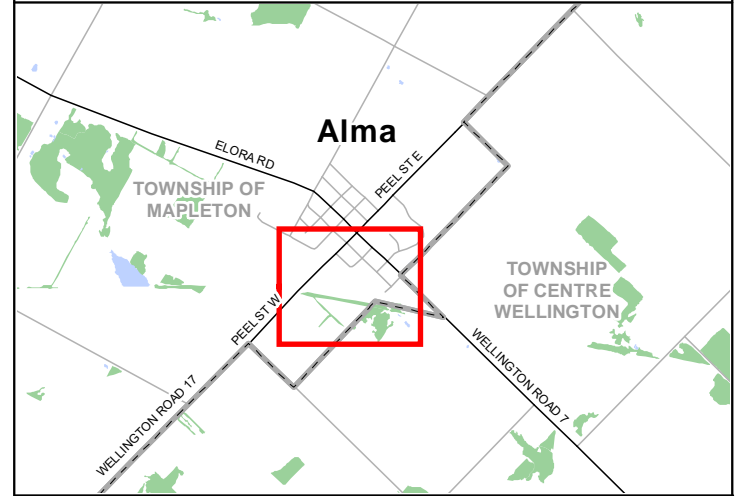


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Project: 2582 Date: January 11, 2023	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000



Alma Scoped EIS Draft Plan of Subdivision



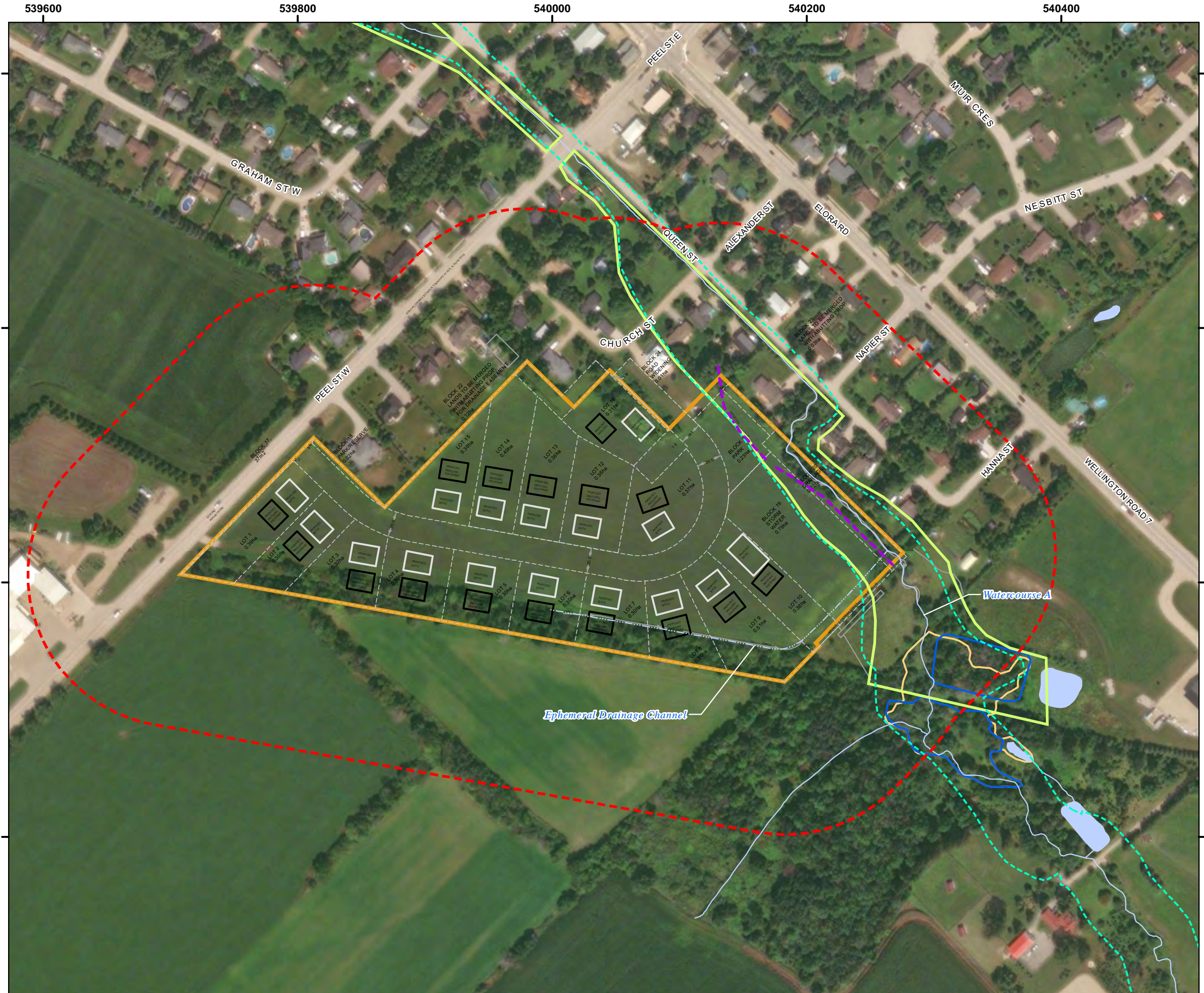
- Legend**
- Study Area (120m)
 - Subject Property
 - Core Greenlands (County of Wellington)
 - Proposed Draft Plan
 - Proposed Building
 - Proposed Lots
 - Proposed Septic
 - Floodline
 - Permanent Watercourse
 - Intermittent/Ephemeral Watercourse
 - Water Body
 - Regulatory Floodplain
 - Wetland (GRCA)
 - Unevaluated Wetland



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Project: 2582 Date: May 5, 2023	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000
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0 50 100 150 200 Metres



APPENDIX I
Terms of Reference and Agency Review



NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

January 7, 2022

Project No. 2582

Nathan Garland, Resource Planner
Grand River Conservation Authority
400 Clyde Road, PO Box 729
Cambridge, ON N1R 5W6

Curtis Marshall, Manager of Development Planning
County of Wellington
74 Woolwich Street,
Guelph, ON N1H 3T9

Dear Mr. Garland and Mr. Marshall,

**Re: Lot 1, Concession 1 West of Grand River, Pilkington, Township of
Mapleton, Ontario. Alma Environmental Impact Study, Terms of Reference**

Natural Resource Solutions Inc. (NRSI) has been retained by Mr. Kevin Vanleeuwen to prepare an Environmental Impact Study (EIS) in support of a proposed residential subdivision located at Lot 1, Concession 1 West of Grand River, Township of Mapleton, Ontario, in the community of Alma (see Map 1).

The subject property is an actively cultivated agricultural field, with a treed corridor located along the rail line at the southwestern property boundary, and an unnamed watercourse/drain along the southeastern edge of the subject property boundary. The watercourse/drain feature is regulated by the Grand River Conservation Authority (GRCA) and is a Core Greenlands feature as identified in Schedule A4 of the Wellington County Official Plan (2016).

Due to development being proposed within the regulation limit of natural features, an EIS is required. The attached Terms of Reference (TOR) outlines our approach to complete the EIS in accordance with guidelines of the GRCA and the County.

I trust the information within the TOR provides an adequate description of our proposed studies necessary to complete the EIS. Please provide any input you may have on the actions and methods described below at your earliest convenience.

Sincerely,
Natural Resource Solutions Inc.

M. Elaine Gosnell, B.Sc.,
Senior Wetland and Terrestrial Biologist

Cc: Mr. Kevin Vanleeuwen, Applicant
Mr. Jeff Buisman, Van Harten Surveying Inc.

**Lot 1, Concession 1 West of Grand River, Pilkington, Township of Mapleton,
Ontario
Alma Environmental Impact Study, Terms of Reference
January 7, 2022**

Introduction

The subject property is approximately 6.59 ha in area with frontage along Wellington Road 17, in the Township of Mapleton, Ontario as shown on Map 1. The subject property is proposed to be developed into a rural residential subdivision, with 16 lots, an internal road network and stormwater management block. Each lot is to be serviced with a private septic system. A preliminary Draft Plan of Subdivision has been prepared by Van Harten Surveying Inc. and is appended to this TOR. A treed hedgerow is present along the southwestern property boundary, within an old railway right-of-way. An unnamed watercourse/drain and its floodplain, designated as Core Greenlands, is present along the southeastern property boundary. An unevaluated wetland is located off-site, and is >50m from the subject property boundary. The subject property is comprised of an actively cultivated agricultural field. Surrounding lands include residential lots, within the Town of Alma, and agricultural lands.

An Environmental Impact Study (EIS) is required to ensure that no negative impacts will occur to the form and function of the watercourse and Core Greenlands.

Characterization

Collection and Review of Background Information

Background information has been collected for the study area that includes the subject property as well as the adjacent lands within 120m of the subject property boundary. This area is considered sufficient to characterize the neighbouring natural features that may be influenced by the proposed severance and development.

The following background information sources have been reviewed in the preparation of the TOR for the EIS:

- Grand River Conservation Authority (GRCA);
- Natural Heritage Information Centre (NHIC) database (MNRF 2020a);
- Government of Canada SARA Registry (Government of Canada, 2019);
- Ontario Breeding Bird Atlas (OBBA) (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2020);
- Ontario Odonata Atlas Database (OOAD) (MNRF 2020b);
- Atlas of the Mammals of Ontario (Dobbyn, 1994); and
- Ontario Butterfly Atlas (MacNaughton et al., 2020)

Screening for Species at Risk

A screening for potential Species at Risk (SAR) and Species of Conservation (SCC) that may be present on-site has been undertaken using the background information collected. SAR known from the vicinity of the subject property in the background information were screened based on comparing their habitat preferences to the habitat conditions on the subject property.

The initial screening found several SAR to have the potential to occur within the subject property and the immediate vicinity:

- Little Brown Myotis (*Myotis lucifugus*) – provincially and federally Endangered
- Northern Myotis (*Myotis septentrionalis*) – provincially and federally Endangered
- Tricolored Bat (*Perimyotis subfalvus*) – provincially and federally Endangered

Screening for Significant Wildlife Habitat

A screening for potential Significant Wildlife Habitat (SWH) that may be present on-site has been undertaken using the background information collected. An initial screening found several SWH types to have the potential to occur within the subject property and the immediate vicinity:

- Bat Maternity Colonies
- Terrestrial Crayfish
- Special Concern and Rare Wildlife Species

Field Surveys

Field surveys have been undertaken in spring and summer of 2021, building on the background information collected. The following is a description of the surveys that have been conducted by NRSI:

Vegetation Community Mapping

Vegetation communities on-site were characterized in the summer of 2021 using the Ecological Land Classification (ELC) for Southern Ontario methodology (Lee et al. 1998). Details of the vegetation communities were recorded including species composition, dominance, uncommon species or features.

Vascular Flora Inventories

A one-season summer vascular flora inventory was conducted within each ELC community in 2021. Any rare species or vegetation communities identified and their location(s) were recorded with a handheld GPS unit.

Bird Surveys

Two breeding bird surveys were conducted during the peak breeding season (late May – early July) in accordance with Ontario Breeding Bird Atlas (OBBA) methodology and appropriate protocol for SAR birds (OBBA 2020).

Area searches were conducted within all habitat types and standard breeding evidence was recorded during both early morning surveys.

Herpetofauna

Area searches for herpetofauna were carried out as part of each site visit in order to determine the presence/absence of snake and turtle species, particularly in proximity the unnamed watercourse/drain.

Bat Habitat Assessment

A bat habitat assessment according to MNRF guidelines (MNRF 2017) to assess the presence of suitable roosting habitat (e.g., “cavity trees”) that may be used by SAR bats – April and May (combined with other field surveys) has been completed throughout the site.

Aquatic Habitat Assessment and Fish Community Sampling

An aquatic habitat assessment of the unnamed watercourse/drain was completed in summer 2021, including monitoring of the watercourse temperature to determine thermal regime. General habitat characterization was completed, documenting adjacent land uses and riparian habitat, channel morphology, substrate composition, flow conditions, and instream habitat and cover. Water temperature loggers (HOBO Pro v2) were installed along the watercourse in two locations to assess thermal regime from spring to fall 2021.

Fish community sampling was completed in summer to characterize fish habitat on the subject lands. Fish sampling was carried out with a backpack electrofishing unit using the Ontario Stream Assessment Protocol single pass survey method (Stanfield 2017).

Incidental Wildlife

In addition to the targeted surveys noted above, all wildlife species were recorded during all field surveys. This included direct observations, as well as signs such as dens, tracks, scats, etc. Area searches for reptiles and insects were carried out where habitat was suitable in conjunction with other field surveys.

Characterization of Natural Features

The original field data collected during the 2021 field season will be integrated with appropriate background information to form the characterization component of the EIS. This will include updated screening tables, species lists, and maps which will identify and characterize all significant natural features and occurrences.

Significance and Sensitivity Analysis

Significant and sensitive biological features on the subject property will be identified according to relevant natural heritage policies, federal and provincial species listings, and wildlife habitats. The presence of any SAR or SCC and their habitat, and any Candidate or Confirmed SWH will be identified and discussed.

Features and species that are significant will be shown on a map as constraints to the development and will be provided to the client for consideration in planning the layout of the proposed subdivision. NRSI and the client will work together to identify a lot configuration that protects and avoid impacts to natural features.

Impact Analysis

The details of the proposed subdivision development, and construction/disturbance limits will be reviewed and compared to the existing natural features and identified habitats in the study area. Anticipated impacts due to the proposed layout will be discussed where there are any areas of conflict between significant features or ecological functions and the development. The analysis of impacts will be divided into:

- **Direct impacts** associated with disruption or displacement caused by the actual proposed 'footprint' of the proposed development, direct impacts to vegetation, wildlife and/or their habitats.
- **Indirect impacts** associated with changes in site conditions such as alterations to drainage patterns, surface water and groundwater. This will also include potential disturbances arising from construction such as sediment and erosion, noise, dust and lighting.

- **Induced impacts** associated with impacts after the development is constructed such as subsequent demand on the resources created by habitation/use of the area and vicinity.

NRSI will complete an impact assessment based on details of the proposed subdivision as provided by Van Harten Surveying Inc.

Recommendations & Monitoring

Recommendations will be made to avoid, minimize or mitigate any potential impacts on the identified significant natural features. Where feasible, opportunities for enhancement and site-specific restoration of natural features will be provided to further mitigate potential impacts and to improve overall ecological integrity. The EIS will discuss recommendations for buffer enhancements and restoration where appropriate.

Reporting

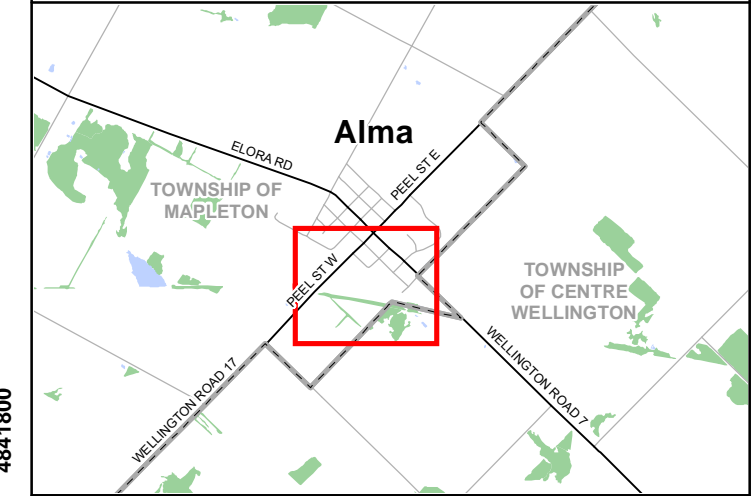
The findings of the EIS will be documented in a report and submitted to the GRCA and County of Wellington for review. The EIS report will be prepared in digital format including appropriate mapping (study area, existing conditions, monitoring locations, proposed development plans), and appendices (TOR, screening documents, species lists, pertinent agency correspondence, analysis tables, etc.).

References

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https://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- Ontario Ministry of Natural Resources and Forestry (MNRF). (2020b). *Ontario Odonata Atlas Database (OOAD)*. Ontario Ministry of Natural Resources and Forestry (MNRF).
- Ontario Nature. (2020). *Ontario Reptile and Amphibian Atlas: A citizen science project to map the distribution of Ontario's reptiles and amphibians*.
<http://www.butterfly.ontarioinsects.org/herp/index.html>
- Stanfield, L. (editor). 2017. Ontario Stream Assessment Protocol. Version 10.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario.

MAPS

Alma Scoped EIS Study Area



- Legend**
- Subject Property
 - Core Greenlands (County of Wellington)
 - Primary Road
 - Secondary Road
 - Permanent Watercourse
 - Intermittent/Ephemeral Watercourse
 - Water Body
 - Wetland (GRCA)
 - Unevaluated Wetland



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: ESRI (2018).

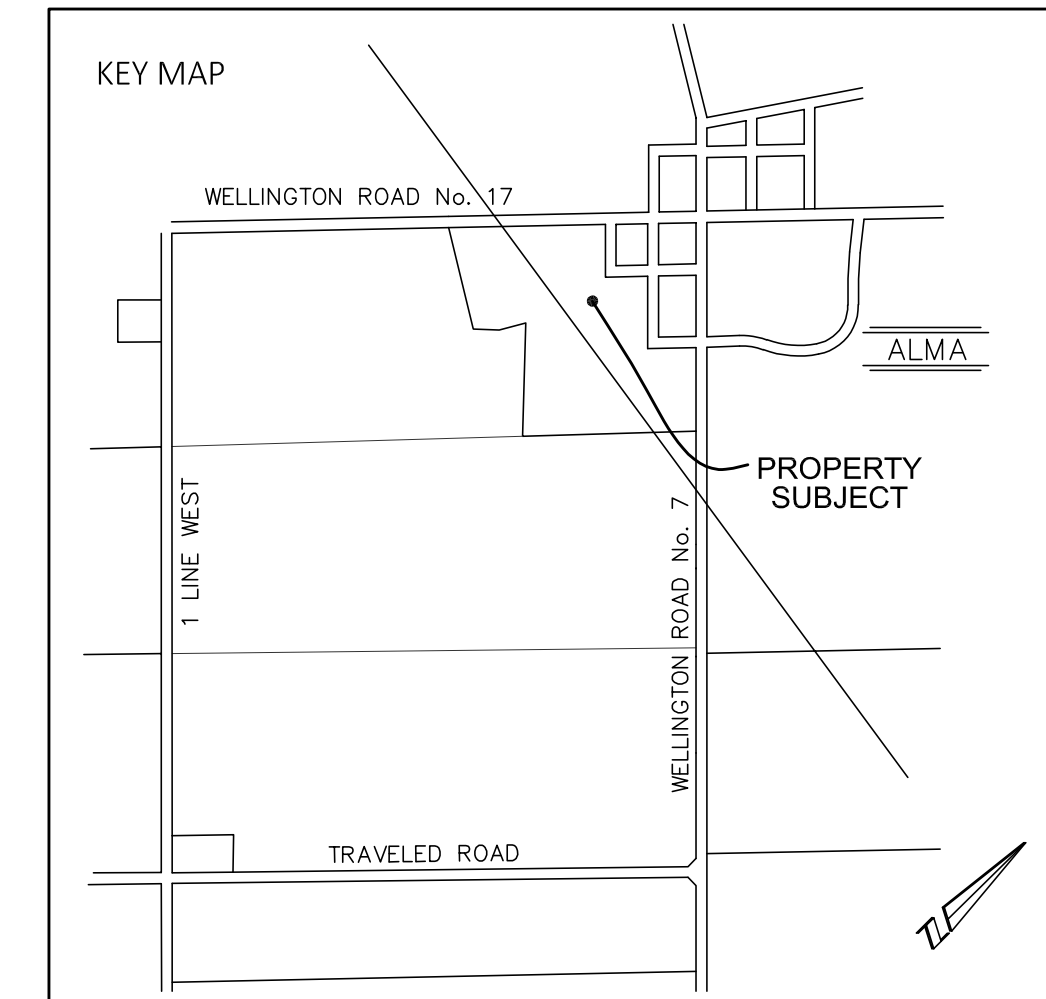
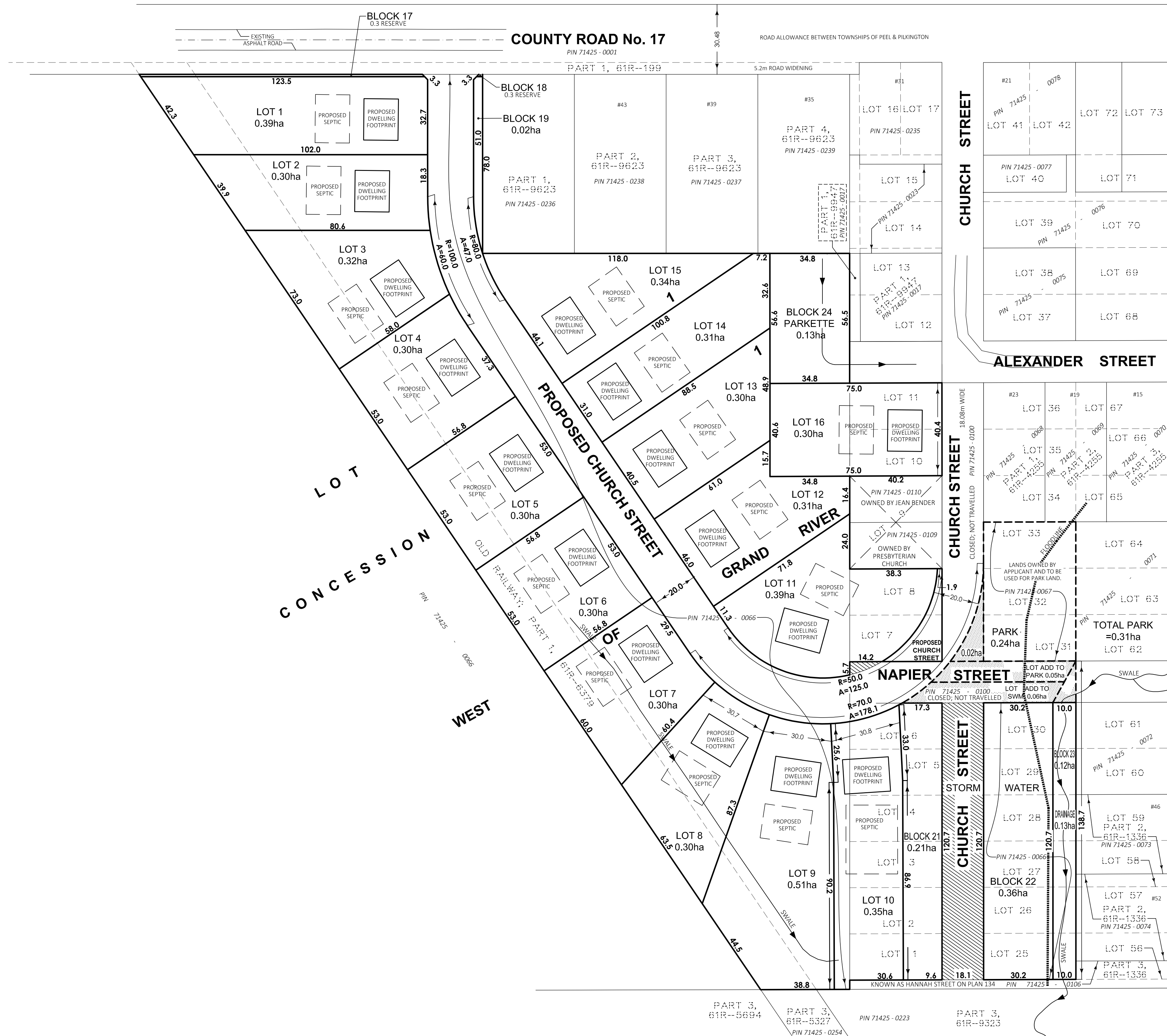
Project: 2582 Date: May 13, 2021	NAD83 - UTM Zone 17 Size: 11x17" 1:3,000
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0 50 100 150 200 Metres



DRAFT PLAN OF SUBDIVISION OF
LOTS 1-8,10,11,25-30
REGISTERED PLAN 134
 AND
LOT 1, CONCESSION 1
WEST OF GRAND RIVER
 GEOGRAPHIC MUNICIPALITY OF PILKINGTON
 TOWNSHIP OF MAPLETON
 COUNTY OF WELLINGTON

SCALE 1 : 1000
 VAN HARTEN SURVEYING INC.



LAND USE SCHEDULE

DESCRIPTION	LOTS	AREA (hectares)
LOTS	1-16	-
BLOCKS		-
RESERVES	17,18	-
PARK/BOULEVARD	19	-
STORMWATER MANAGEMENT	21,22	-
DRAINAGE	23	-
		0.0

ADDITIONAL INFORMATION
 (UNDER SECTION 51(17) OF THE PLANNING ACT)
 INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j and I ARE AS SHOWN ON THE DRAFT PLAN OF SUBDIVISION

h) municipal water supply
 i) sand and gravel
 k) municipal sanitary

OWNER'S CERTIFICATE
 I AUTHORIZE _____ TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION.

DATE: _____

SURVEYOR'S CERTIFICATE
 I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

DATE: _____ **JEFFREY BUISMAN**
 ONTARIO LAND SURVEYOR

PINS 71425-0066, 71425-0067, 71425-0103, 71425-0105, 71425-0106, 71425-0242
 OWNER: EXACT CONSTRUCTION LTD.
 ADDRESS: _____

- DENOTES LANDS TO BE PURCHASED FROM TOWNSHIP OF MAPLETON AND ADDED TO DEVELOPMENT
 - LANDS OWNED BY TOWNSHIP TO BE USED FOR PARKLAND, STORMWATER AND DRAINAGE.
- PROPOSED STORMWATER MANAGEMENT:**
- BLOCK 21 0.21
 - BLOCK 22 0.36
 - CHURCH STREET SOUTH OF NAPIER 0.22
 - SOUTH 1/2 OF NAPIER 0.85ha

V.1 JANUARY 13/21
 V.2 JANUARY 22/21
 V.3 MARCH 29/21
 V.4 APRIL 8/21

Van Harten
 SURVEYING INC.
 LAND SURVEYORS and ENGINEERS

Kitchener/Waterloo Ph: 519-742-8371	Guelph Ph: 519-821-2763	Orangeville Ph: 519-940-4110
--	----------------------------	---------------------------------

www.vanharten.com info@vanharten.com

DRAWN BY: ARN CHECKED BY: JEB PROJECT No. 29069-20

Apr 8, 2021 9:44:02 AM
 G:\PILKINGTON\CON 1 WGR\EXACT ALMA SUBDIVISION\ACAD\EXACT DRAFT PLAN SUB (4).dwg

Subject: RE: Alma Subdivision EIS - Terms of Reference (proj2582)

From: Laura Warner <lwarner@grandriver.ca>

Date: 1/12/2022, 3:46 PM

To: Elaine Gosnell <egosnell@nrsi.on.ca>

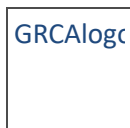
CC: "Jeff.Buisman@vanharten.com" <Jeff.Buisman@vanharten.com>, "khoo@nrsi.on.ca" <khoo@nrsi.on.ca>, "exact.construction@hotmail.com" <exact.construction@hotmail.com>, "curtism@wellington.ca" <curtism@wellington.ca>

Hi Elaine,

We have completed our review of the EIS terms of reference for the proposed Alma subdivision and can offer the following comments:

- The Draft Plan of Subdivision V.4 illustrates a drainage swale over top of the proposed septic beds of Lots 6-8. This should be addressed within the EIS. Any required drainage swale should be located away from residential septic systems.
- The watercourse on the site is an un-named tributary of Carroll Creek and the MNRF has assigned it a Thermal Code of Cool with a direct connection to Carroll Creek. The larger system supports a diverse fish community and the proposed development should mitigate thermal impacts as part of its water quality and quantity design.
- The EIS should also identify what other technical studies that are being undertaken to support the proposed development. The EIS should identify and interpret the supporting studies and the environmental impacts and responses to recommended mitigation measures.

Kind regards,
Laura



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: Elaine Gosnell <egosnell@nrsi.on.ca>

Sent: Friday, January 7, 2022 3:45 PM

To: Nathan Garland <ngarland@grandriver.ca>; curtism@wellington.ca

Cc: Jeff Buisman <Jeff.Buisman@vanharten.com>; Kathryn Hoo <khoo@nrsi.on.ca>; exact.construction@hotmail.com

Subject: Alma Subdivision EIS - Terms of Reference (proj2582)

Hello Nathan and Curtis,

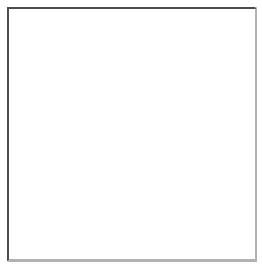
NRSI has been retained by Kevin Vanleeuwen of Exact Construction to prepare an EIS for the proposed development of a parcel of land in Alma, Ontario. We have prepared a Terms of Reference for the EIS, which is attached for your review. We did complete our field surveys last year in the spring and summer and are moving forward into the EIS analysis and reporting.

Please let me know if you have any questions or comments on the TOR.

Thank you,

Elaine

--



Elaine Gosnell B.Sc. P.Biol.
Senior Terrestrial and Wetland Biologist

Natural Resource Solutions Inc.

415 Phillip Street, Unit C

Waterloo, ON N2L 3X2

(p) 519-725-2227 Ext. 413 (f) 519-725-2575

(m) 519-580-1746

(w) www.nrsi.on.ca (e) egosnell@nrsi.on.ca

[@nrsinews](#) [Natural Resource Solutions Inc.](#)

Over 20 years of environmental consulting excellence

Subject: RE: Alma Subdivision EIS - Terms of Reference (proj2582)
From: Matthieu Daoust <mattd@wellington.ca>
Date: 1/11/2022, 2:06 PM
To: "egosnell@nrsi.on.ca" <egosnell@nrsi.on.ca>

Hi Elaine,

Thanks for sending over the proposal. The only comments we would have from a County level would be in regards to potential woodlands review. Particularly, the wooded area along the old rail bed to determine if it is "significant" or "locally significant" and provide any recommendations as may be appropriate. Reference should be made to Section 5.5 and 5.6 of the County Plan.

Regards

Matt Daoust, MCIP RPP

Planner
Planning and Development Department
County of Wellington
74 Woolwich Street
Guelph ON N1H 3T9
T (519) 837-2600 x2065
E mattd@wellington.ca

From: Elaine Gosnell <egosnell@nrsi.on.ca>
Sent: January 7, 2022 3:45 PM
To: Nathan Garland <ngarland@grandriver.ca>; Curtis Marshall <curtism@wellington.ca>
Cc: Jeff Buisman <Jeff.Buisman@vanharten.com>; Kathryn Hoo <khoo@nrsi.on.ca>; exact.construction@hotmail.com
Subject: Alma Subdivision EIS - Terms of Reference (proj2582)

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you know the contents to be safe.

Hello Nathan and Curtis,

NRSI has been retained by Kevin Vanleeuwen of Exact Construction to prepare an EIS for the proposed development of a parcel of land in Alma, Ontario. We have prepared a Terms of Reference for the EIS, which is attached for your review. We did complete our field surveys last year in the spring and summer and are moving forward into the EIS analysis and reporting.

Please let me know if you have any questions or comments on the TOR.

Thank you,

Elaine

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file:///S:/Projects/2

Elaine Gosnell B.Sc. P.Biol.
Senior Terrestrial and Wetland Biologist

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APPENDIX II
Species at Risk, Species of Conservation Concern, and Significant Wildlife Habitat
Screening Results

Scientific Name	Common Name	S-RANK ¹	SARO ²	COSEWIC ³	SARA ³	SARA Schedule ³	Background Source	Habitat Preference ⁴	Suitable Habitats within Subject Property
Birds									
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T	T	Schedule 1	BSC et al. 2008	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No. Steep cliffs or banks are not present within the subject property. Breeding bird surveys did not detect the species.
<i>Hirundo rustica</i>	Barn Swallow	S4B	SC	SC	T	Schedule 1	BSC et al. 2008	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	No. Building structures are not present within the subject property. Breeding bird surveys did not detect the species.
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	SC	T	Schedule 1	BSC et al. 2008	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	No. Suitable grasslands are not present within the subejct property. Breeding bird surveys did not detect the species.
<i>Sturnella magna</i>	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1	BSC et al. 2008	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	No. Suitable grasslands are not present within the subejct property. Breeding bird surveys did not detect the species.
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	BSC et al. 2008	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks	Wooded areas of sufficient size are not present within the subject property. The species was detected in the study area during breeding bird surveys, in the woodland adjacent to the southern corner of the subject property.
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	BSC et al. 2008	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland >10 ha	No. Suitable grasslands are not present within the subejct property. Breeding bird surveys did not detect the species.
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T	T	Schedule 1	BSC et al. 2008	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	No. Wooded areas of sufficient size are not present within the subject property. Breeding bird surveys did not detect the species.
Herpetofauna									
<i>Chelydra serpentina</i>	Snapping Turtle	S4	SC	SC	SC	Schedule 1	Ontario Nature 2020	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	No. Suitable nesting habitat is not present within the subject property. Herpetofauna surveys did not document the species.

Scientific Name	Common Name	S-RANK ¹	SARO ²	COSEWIC ³	SARA ³	SARA Schedule ³	Background Source	Habitat Preference ⁴	Suitable Habitats within Subject Property
Mammals									
<i>Taxidea taxus jacksoni</i>	American Badger (Southwestern Ontario population)	S1	END	E	E	Schedule 1	Dobbyn 1994	In Ontario, badgers are found in a variety of habitats, such as tall grass prairie, sand barrens and farmland. These habitats provide badgers with small prey, including groundhogs, rabbits and small rodents.	No. Suitable habitat is not present within the study area.
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END				Dobbyn 1994	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.	No. Suitable habitat is not present within the study area.
<i>Myotis lucifungus</i>	Little Brown Myotis	S3	END	E	E	Schedule 1	Dobbyn 1994	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.	Field surveys did not document suitable habitat within the subject property. Suitable habitat may be present within the study area, within the woodland adjacent to the southeast corner of the subject property.
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	E	Schedule 1	Dobbyn 1994	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.	Field surveys did not document suitable habitat within the subject property. Suitable habitat may be present within the study area, within the woodland adjacent to the southeast corner of the subject property.
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	E	Schedule 1	Dobbyn 1994	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.	Field surveys did not document suitable habitat within the subject property. Suitable habitat may be present within the study area, within the woodland adjacent to the southeast corner of the subject property.
<i>Microtus pinetorum</i>	Woodland Vole	S3?	SC	SC	SC	Schedule 1	Dobbyn 1994	In Ontario, the Woodland Vole lives in mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.	No. Suitable habitat is not present within the study area.
Butterflies									
<i>Danaus plexippus</i>	Monarch	S2N,S4B	SC	E	SC	Schedule 1	Macnaughton et al. 2022	Open areas with milkweed species (<i>Asclepias spp.</i>).	Open areas with milkweed species are present within the subject property, however, Monarch was not detected during field surveys.
Plants									
<i>Panax quinquefolius</i>	American Ginseng	S2	END	E	E	Schedule 1	Dougan & Associates 2009	Typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple (<i>Acer saccharum</i>), White Ash (<i>Fraxinus americana</i>) and American Basswood (<i>Tilia americana</i>). It usually grows in deep, nutrient rich soil over limestone or marble bedrock.	No. Suitable rich, moist mature forest is not present within the subject property. Vascular floral surveys did not document the species within the subject property.
<i>Castanea dentata</i>	American Chestnut	S1S2	END	E	E	Schedule 1	Dougan & Associates 2009	Moist to well drained forests on sand, occasionally heavy soils.	No. Suitable forest is not present within the subject property. Vascular floral surveys and tree inventory did not document the species within the subject property.

Scientific Name	Common Name	S-RANK ¹	SARO ²	COSEWIC ³	SARA ³	SARA Schedule ³	Background Source	Habitat Preference ⁴	Suitable Habitats within Subject Property
<i>Juglans cinerea</i>	Butternut	S2?	END	E	E	Schedule 1	Dougan & Associates 2009	Usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. Also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	Suitable sunny openings and forest edges within the subject property may provide suitable habitat. Vascular floral surveys and tree inventory did not document the species within the subject property.
<i>Potamogeton hillii</i>	Hill's Pondweed	S2S3	SC	SC	SC	Schedule 1	Dougan & Associates 2009	Highly alkaline waters of ditches, beaver ponds and slow-moving cold waters.	Watercourse A present within the subject property may provide suitable habitat. Vascular floral surveys did not document the species within the subject property.
<i>Aureolaria flava</i>	Smooth Yellow False Foxglove	S2?		T	NS	No Schedule	Dougan & Associates 2009	Found in dry, open to semi-open, upland oak forests, woodlands and savanna habitats in southwestern Ontario. Occurs on a variety of well-drained soils in various situations including sand dunes, sand plains, clay ridges, and slopes, stony loams on moraines, and shallow soils over carbonate bedrock on the rim of the Niagara Escarpment.	No. Suitable open and upland oak forest is not present within the subject property. Vascular floral surveys did not document the species within the subject property.

¹MNRF 2022a, ²MECP 2022, ³Government of Canada 2022, ⁴MNRF 2000

Legend
SRank
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
S#? Rank Uncertain
COSSARO / COSEWIC
END / E Endangered
THR / T Threatened
SC Special Concern
NAR Not at Risk
SARA Schedule
Schedule 1 Officially Protected under SARA

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
<p><u>Rationale:</u> Habitat important to migrating waterfowl.</p>	<p>American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall</p>	<p>CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.</p>	<p>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^{exlviii}.</p> <p><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</p>	<p>Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{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^{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.</p>	<p>Suitable habitat is not present within the study area. Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
<p><u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.</p>	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	<ul style="list-style-type: none"> • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Environment Canada • 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 	<p>Studies carried out and verified presence of:</p> <ul style="list-style-type: none"> • Aggregations of 100¹ or more of listed species for 7 days¹, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH^{cxlviii} • Wetland area and shorelines associated with sites identified within the SWHTG^{cxlviii} Appendix K^{cxlix} are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST^{cxlix} Index #7 provides development effects and mitigation measures. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>
Wildlife Habitat: Shorebird Migratory Stopover Area					
<p><u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.</p>	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	<p>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.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • 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 	<p>Studies confirming:</p> <ul style="list-style-type: none"> • 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. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>
Wildlife Habitat: Raptor Wintering Area					

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
<p><u>Rationale:</u> Sites used by multiple species, a high number of individuals and used annually are most significant</p>	<p>Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl</p> <p><u>Special Concern:</u> Short-eared Owl Bald Eagle</p>	<p>Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC</p> <p>Upland: CUM, CUT, CUS, CUW</p>	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.</p> <p>Raptor wintering sites need to be > 20 ha^{cxlviii, cxlix} with a combination of forest and upland.^{xvi, xvii, xviii, xix, xx, xxi}</p> <p>Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands^{cxlix}</p> <p>Field area of the habitat is to be wind swept with limited snow depth or accumulation.</p> <p>Eagle sites have open water, large trees and snags available for roosting</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • 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. 	<p>Studies confirm the use of these habitats by:</p> <ul style="list-style-type: none"> • 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. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>
Wildlife Habitat: Bat Hibernacula					
<p><u>Rationale</u> Bat hibernacula are rare habitats in Ontario landscapes.</p>	<p>Big Brown Bat Tri-coloured Bat</p>	<p>Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)</p>	<ul style="list-style-type: none"> • 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum^{cxlviii, 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^{cxlix} Index #1 provides development effects and mitigation measures. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Bat Maternity Colonies					
<p><u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.</p>	<p>Big Brown Bat Silver-haired Bat</p>	<p>Maternity colonies considered SWH are found in forested Ecosites.</p> <p>All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM</p>	<p>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).</p> <ul style="list-style-type: none"> • 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} <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts. 	<ul style="list-style-type: none"> • Maternity Colonies with confirmed use by: <ul style="list-style-type: none"> • >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^{cxlix} Index #12 provides development effects and mitigation measures. 	<p>Suitable habitat was not found within the subject property during bat habitat assessments.</p> <p>Suitable habitat may be present within the woodland adjacent to the southeast corner of the subject property.</p> <p>Candidate SWH</p>
Wildlife Habitat: Bat Migratory Stopover Area					
	<p>Hoary Bat Eastern Red Bat Silver-haired Bat</p>	<p>No specified ELC types.</p>	<p>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.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • OMNRF for possible locations and contact for local experts • University of Waterloo, Biology Department 	<p>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^{ccxv}</p> <ul style="list-style-type: none"> • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHDSS^{cxlix} Index #38 provides development effects and mitigation measures 	<p>Not SWH.</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Turtle Wintering Area					
<p><u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant</p>	<p>Midland Painted Turtle</p> <p><u>Special Concern:</u> Northern Map Turtle Snapping Turtle</p>	<p>Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO</p> <p>Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.</p>	<p>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.</p> <ul style="list-style-type: none"> Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen^{cx, cx, cx, cxviii} Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> 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)^{cvii} Congregation of turtles is more common where wintering areas are limited and therefore significant^{cx, cx, cx, cxii} SWHMiST^{cxlix} Index #28 provides development effects and mitigation measures for turtle wintering habitat. 	<p>Suitable habitat not present within the study area.</p> <p>Not SWH</p>
Wildlife Habitat: Snake Hibernaculum					
<p><u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant</p>	<p><u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake</p> <p><u>Special Concern:</u> Milksnake Eastern Ribbonsnake</p> <p><u>Lizard:</u> <u>Special Concern</u> (Southern Shield population): Five-lined Skink</p>	<p>For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator.</p> <p>For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3</p>	<ul style="list-style-type: none"> 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^{xliv, 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 	<p>Studies confirming:</p> <ul style="list-style-type: none"> 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 SWHⁱ SWHMiST^{cxlix} Index #13 provides development effects and mitigation measures for snake hibernacula. Presence of any active hibernaculum for skink is significant. SWHMiST^{cxlix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat. 	<p>Suitable habitat not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹		Candidate SWH		Confirmed SWH	Subject Propety
	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)						
<p><u>Rationale:</u> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.</p>	<p>Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)</p>	<p>Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns</p> <p>Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1</p>	<ul style="list-style-type: none"> 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 	<p>Studies confirming:</p> <ul style="list-style-type: none"> Presence of 1 or more nesting sites with 8^{cxlvix} or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. A colony identified as SWH will include a 50m radius habitat area from the peripheral nests^{ccvii} Field surveys to observe and count swallow nests are to be completed during the breeding season Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} SWHMiST^{cxlix} Index #4 provides development effects and mitigation measures 	<p>Suitable habitat not present within the study area.</p> <p>Not SWH</p>	
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)						
<p><u>Rationale:</u> Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.</p>	<p>Great Blue Heron Black-crowned Night-heron Great Egret Green Heron</p>	<p>SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1</p>	<ul style="list-style-type: none"> 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 MNR District Offices Local naturalist clubs 	<p>Studies confirming:</p> <ul style="list-style-type: none"> Presence of 5ⁱ 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^{cxlix} Index #5 provides development effects and mitigation measures. 	<p>Suitable habitat not present within the study area.</p> <p>Not SWH</p>	

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					
<p><u>Rationale:</u> Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.</p>	<p>Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird</p>	<p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)</p> <p>MAM1 – 6 MAS1 – 3 CUM CUT CUS</p>	<ul style="list-style-type: none"> 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 MNR District Offices Field naturalist clubs 	<p>Studies confirming:</p> <ul style="list-style-type: none"> 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^{cxlix} Index #6 provides development effects and mitigation measures. 	<p>Suitable habitat not present within the study area.</p> <p>Not SWH</p>
Wildlife Habitat: Migratory Butterfly Stopover Areas					
<p><u>Rationale:</u> Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.</p>	<p>Painted Lady Red Admiral</p> <p><u>Special Concern:</u> Monarch</p>	<p>Combination of ELC Community Series: Need to have present one Community Series from each landclass:</p> <p><u>Field:</u> CUM CUS CUT</p> <p><u>Forest:</u> FOC FOM FOD CUP</p> <p>Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.</p>	<p>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^{cxlix}.</p> <ul style="list-style-type: none"> The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south^{xxxii, xxxiii, xxxiv, xxxv, xxxvi}. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat cxlviii, cxlix. Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes^{xxxvii, xxxviii, xxxix, xl, xli}. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF (NHIC) Agriculture Canada in Ottawa may have list of butterfly experts. Field Naturalist Clubs Toronto Entomologists Association Conservation Authorities 	<p>Studies confirm:</p> <ul style="list-style-type: none"> The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)^{xliii}. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day^{xxxvii}, significant variation can occur between years and multiple years of sampling should occur^{xl, xlii}. Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. SWHMiST^{cxlix} Index #16 provides development effects and mitigation measures. 	<p>Study area not located within 5 km of Lake Ontario.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Landbird Migratory Stopover Areas					
<p><u>Rationale:</u> Sites with a high diversity of species as well as high number are most significant</p>	<p>All migratory songbirds.</p> <p>Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html</p> <p>All migrant raptors species:</p> <p>Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)</p>	<p>All Ecosites associated with these ELC Community Series:</p> <p>FOC FOM FOD SWC SWM SWD</p>	<p>Woodlots need to be >10 ha¹ in size and within 5km^{iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv} of Lake Ontario.</p> <ul style="list-style-type: none"> 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}. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Bird Studies Canada Ontario Nature Local birders and naturalist club Ontario Important Bird Areas (IBA) Program 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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. 	<p>Study area not located within 5 km of Lake Ontario.</p> <p>Not SWH</p>
Wildlife Habitat: Deer Yarding Areas					
<p><u>Rationale:</u> Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.</p>	<p>White-tailed Deer</p>	<p>Note: OMNRF to determine this habitat.</p> <p>ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC.</p> <p>Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT</p>	<ul style="list-style-type: none"> 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%^{cxciiv}. 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. 	<p>No Studies Required:</p> <ul style="list-style-type: none"> 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^{lvii, lviii, lix, lx, l}. 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. 	<p>Deer overwintering yard not identified by MNRF within or adjacent to the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
<p><u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions^{cxlviii}</p>	White-tailed Deer	<p>All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p> <p>Conifer plantations much smaller than 50ha may also be used.</p>	<ul style="list-style-type: none"> 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 Ecoregion 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> MNRF District Offices LIO/NRVIS 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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 MNRF¹. 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. 	<p>Suitable habitat not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community ¹	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes ¹	Habitat Description ¹	Detailed Information and Sources ¹	Defining Criteria ¹	Assessment Details
Cliff and Talus Slopes					
<p><u>Rationale:</u> Cliffs and Talus Slopes are extremely rare habitats in Ontario.</p>	<p>Any ELC Ecosite within Community Series:</p> <p>TAO CLO TAS CLS TAT CLT</p>	<p>A Cliff is vertical to near vertical bedrock >3m in height.</p> <p>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.</p>	<p>Most cliff and talus slopes occur along the Niagara Escarpment.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes^{bcxviii} • SWHMiST^{cxlix} Index #21 provides development effects and mitigation measures. 	<p>Vegetation type not present within the study area.</p> <p>Not SWH</p>
Sand Barrens					
<p><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.</p>	<p>ELC Ecosites:</p> <p>SBO1 SBS1 SBT1</p> <p>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.</p>	<p>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%.</p>	<p>Any sand barren area, >0.5ha in size.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities 	<ul style="list-style-type: none"> • Confirm any ELC Vegetation Type for Sand Barrens^{bcxviii} • 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. 	<p>Vegetation type not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community ¹	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes ¹	Habitat Description ¹	Detailed Information and Sources ¹	Defining Criteria ¹	Assessment Details
Alvar					
<p>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.</p>	<p>ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2</p> <p>Five Alvar</p> <p>Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema branchiatum</p> <p>These indicator species are very specific to Alvars within Ecoregion 6E</p>	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. 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^{lxxviii}.</p>	<p>An Alvar site > 0.5 ha in size^{lxxv}.</p> <p>Information Sources</p> <ul style="list-style-type: none"> Alvars of Ontario (2000), Federation of Ontario Naturalists^{lxxvi}. Ontario Nature – Conserving Great Lakes Alvars^{ccviii}. Natural Heritage Information Center (NHIC) has location information on their website Field Naturalist clubs Conservation Authorities 	<p>Field studies identify four of the five Alvar indicator species^{lxxv}, ^{cxlix} at a Candidate Alvar site is Significant.</p> <ul style="list-style-type: none"> 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^{lxxv}. SWHMiST^{cxlix} Index #17 provides development effects and mitigation measures. 	<p>Vegetation type not present within the study area.</p> <p>Not SWH</p>
Old Growth Forest					
<p>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.</p>	<p>Forest Community Series: FOD FOC FOM SWD SWC SWM</p>	<p>Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.</p>	<p>Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest I.</p> <p>Information Sources</p> <ul style="list-style-type: none"> 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 	<p>Field Studies will determine:</p> <ul style="list-style-type: none"> 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^{lxxviii} SWHDSS^{cxlix} Index #23 provides development effects and mitigation measures. 	<p>Vegetation type not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community ¹	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes ¹	Habitat Description ¹	Detailed Information and Sources ¹	Defining Criteria ¹	Assessment Details
Savannah					
<p><u>Rationale:</u> Savannahs are extremely rare habitats in Ontario.</p>	<p>TPS1 TPS2 TPW1 TPW2 CUS2</p>	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p>	<p>• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities 	<p>Field studies confirm one or more of the Savannah indicator species listed in^{lxv} Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used^{cxlviii}.</p> <ul style="list-style-type: none"> • 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. 	<p>Vegetation type not present within the study area.</p> <p>Not SWH</p>
Tallgrass Prairie					
<p><u>Rationale:</u> Tallgrass Prairies are extremely rare habitats in Ontario.</p>	<p>TPO1 TPO2</p>	<p>A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.</p>	<p>• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities 	<p>Field studies confirm one or more of the Prairie indicator species listed in^{lxv} Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used^{cxlviii}.</p> <ul style="list-style-type: none"> • 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. 	<p>Vegetation type not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community ¹	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes ¹	Habitat Description ¹	Detailed Information and Sources ¹	Defining Criteria ¹	Assessment Details
Other Rare Vegetation Communities					
<p><u>Rationale:</u> Plant communities that often contain rare species which depend on the habitat for survival.</p>	<p>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.</p>	<p>Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.</p>	<p>ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M^{cxlviii}</p> <p>The OMNR/NHIC will have up to date listing for rare vegetation communities.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities 	<p>Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG^{cxlviii}.</p> <ul style="list-style-type: none"> • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST^{cxlix} Index #37 provides development effects and mitigation measures. 	<p>Other rare vegetation types not anticipated to be present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
<p><u>Rationale:</u> Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.</p>	<p>American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard</p>	<p>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</p> <p>Note: includes adjacency to Provincially Significant Wetlands</p>	<p>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}.</p> <ul style="list-style-type: none"> • 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • 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 	<p>Studies confirmed:</p> <ul style="list-style-type: none"> • 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. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		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					
<p><u>Rationale:</u> Nest sites are fairly uncommon in Ecoregion 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.</p>	<p>Osprey</p> <p><u>Special Concern:</u> Bald Eagle</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands</p>	<ul style="list-style-type: none"> Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 	<p>Studies confirm the use of these nests by:</p> <ul style="list-style-type: none"> 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^{cvii}, ^{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^{cvii}. 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 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
<p><u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.</p>	<p>Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk</p>	<p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC, SWM, SWD and CUP3.</p>	<p>All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat^{lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii}.</p> <p>Interior habitat determined with a 200m buffer^{cxlviii}.</p> <ul style="list-style-type: none"> 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>
Wildlife Habitat: Turtle Nesting Area					
<p><u>Rationale:</u> These habitats are rare and when identified will often be the only breeding site for local populations of turtles</p>	<p>Midland Painted Turtle</p> <p><u>Special Concern:</u> Northern Map Turtle Snapping Turtle</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100m)^{cxlviii} or within the following ELC Ecosites:</p> <p>MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1</p>	<ul style="list-style-type: none"> 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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^{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. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Seeps and Springs					
<p><u>Rationale:</u> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.</p>	<p>Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.</p>	<p>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.</p>	<p>Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system^{cxvii, cxlix}.</p> <ul style="list-style-type: none"> 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} <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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. 	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> 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 	<p>Suitable habitat is not present within the subject property.</p> <p>Not SWH</p>
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
<p><u>Rationale:</u> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.</p>	<p>Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog</p>	<p>All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p> <p>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.</p>	<ul style="list-style-type: none"> 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)^{cbxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx} Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat^{cxlviii} <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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, 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. 	<p>Suitable habitat is not present within the subject property.</p> <p>Suitable habitat may be present within the study area, within the wetland to the southeast of the subject property.</p> <p>Candidate SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
<p><u>Rationale:</u> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations</p>	<p>Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickereel Frog Green Frog Mink Frog Bullfrog</p>	<p>ELC Community Classes SW, MA, FE, BO, OA and SA.</p> <p>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.</p>	<ul style="list-style-type: none"> Wetlands >500m² (about 25m diameter)^{ccvii} supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats^{clxxxiv}. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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. 	<p>Suitable wetland habitat is not present within the study area.</p> <p>Not SWH</p>
Woodland Area-Sensitive Bird Breeding Habitat					
<p><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.</p>	<p>Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren</p> <p>Special Concern: Cerulean Warbler Canada Warbler</p>	<p>All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p>	<ul style="list-style-type: none"> Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.^{cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxi, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cli, clii, cliii, cliv, clv, clvii, clviii, clix} Interior forest habitats are at least 200m from forest edge habitat. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<p>Suitable habitat is not present within the study area.</p> <p>Not SWH</p>

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	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
<p><u>Rationale:</u> Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.</p>	<p>American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan</p> <p><u>Special Concern:</u> Black Tern Yellow Rail</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1</p> <p>For Green Heron: All SW, MA and CUM1 sites.</p>	<ul style="list-style-type: none"> Nesting occurs in wetlands All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present^{cxix}. 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> 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} 	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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"^{ccxi}. SWHMiST^{cxlix} Index #35 provides development effects and mitigation measures 	<p>Suitable habitat is not present within the subject property.</p> <p>Not SWH</p>
Wildlife Habitat: Open Country Bird Breeding Habitat					
<p><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.</p>	<p>Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow</p> <p><u>Special Concern:</u> Short-eared Owl</p>	<p>CUM1 CUM2</p>	<p>Large grassland areas (includes natural and cultural fields and meadows) >30 ha^{cbx, cbxi, cbxii, cbxiii, cbxiv, cbxv, cbxvi, cbxvii, cbxviii, cbxix}. 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.</p> <p>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.</p> <p>The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Agricultural land classification maps, Ministry of Agriculture. Ask local birders Ontario Breeding Bird Atlas^{ccv} Reports and other information available from CAs. 	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> 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. 	<p>Suitable habitat is not present within the subject property.</p> <p>Not SWH</p>

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	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
<p><u>Rationale:</u> 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.</p>	<p><u>Indicator spp.:</u> Brown Thrasher Clay-coloured Sparrow</p> <p><u>Common spp.:</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher</p> <p><u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler</p>	<p>CUT1 CUT2 CUS1 CUS2 CUW1 CUW2</p> <p>Patches of shrub ecosites can be complexed into a larger habitat for some bird species.</p>	<p>Large field areas succeeding to shrub and thicket habitats >10ha^{cxix} in size.</p> <ul style="list-style-type: none"> 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. <p>Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species^{cxixiii}.</p> <p>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Agricultural land classification maps Ministry of Agriculture Local bird clubs Ontario Breeding Bird Atlas^{ccv} Reports and other information available from CAs 	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common speciesⁱ. 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. 	<p>Suitable habitat is not present within the subject property.</p> <p>Not SWH</p>
Wildlife Habitat: Terrestrial Crayfish					
<p><u>Rationale:</u> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.^{ccii}</p>	<p>Chimney or Digger Crayfish: (<i>Fallicambarus fodiens</i>)</p> <p>Devil Crawfish or Meadow Crayfish: (<i>Cambarus Diogenes</i>)</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM</p>	<p>Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish.</p> <ul style="list-style-type: none"> 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. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998 	<p>Studies Confirm:</p> <ul style="list-style-type: none"> Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites^{cci} Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the 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^{cci} SWHMiST^{cxlix} Index #36 provides development effects and mitigation measures. 	<p>Suitable habitat is not present within the subject property.</p> <p>Not SWH</p>

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	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
<p><u>Rationale:</u> These species are quite rare or have experienced significant population declines in Ontario.</p>	<p>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.</p>	<p>All plant and animal element occurrences (EO) within a 1 or 10km grid.</p> <p>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.</p>	<p>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^{lxviii}.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • 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^{cxv} • Expert advice should be sought as many of the rare spp. have little information available about their requirements. 	<p>Studies Confirm:</p> <ul style="list-style-type: none"> • 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 measures. 	<p>Field surveys did not document any SC and/or Rare Wildlife Species within the subject property.</p> <p>Eastern Wood-pewee (<i>Contopus virens</i>) was detected in the woodlot adjacent to the southern corner of the subject property during 1 of 2 breeding bird surveys ("possible" breeding), however, this species was not detected during any other site visit, and sufficient habitat for this species is not present within the subject property.</p> <p>Not SWH</p>

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
<p>Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.</p>	<p>Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog</p>	<p>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.</p>	<p>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 Schedule¹. <u>Information Sources</u> • MNR District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs</p>	<p>• 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.</p>	<p>Amphibian Breeding Habitat (Wetland) not present within the subject property. Therefore, amphibian movement corridors are not applicable. Not SWH</p>
Wildlife Habitat: Deer Movement Corridors					
<p>Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.</p>	<p>White-tailed Deer</p>	<p>Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.</p>	<p>Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule¹. • 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^{cbxxxii, cbxxxiii, cxlix, cxciiv}. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> • MNR District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs</p>	<p>• 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.</p>	<p>Deer Winter Congregation Area is not anticipated to be present within the study area; therefore, deer movement corridors are not applicable. Not SWH</p>

¹MNR 2015

APPENDIX III
Species Lists Reported from the Study Area

Plant Species Reported from the Study Area - Alma Scoped EIS (Project #2582)

Scientific Name	Common Name	CC	CW	Weed	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Wellington County*	NHIC Data*	NRSI Observed
		Oldham et al. 1995	Oldham et al. 1995	Oldham et al. 1995	MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Dougan & Associates 2009	MNRF 2022b	NRSI Results From 2021
Gymnosperms	Conifers											
Cupressaceae	Cypress Family											
<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3		S5							X
Pinaceae	Pine Family											
<i>Picea glauca</i>	White Spruce	6	3		S5							X
<i>Picea pungens</i>	Blue Spruce	0	3	NA	SE1							X
<i>Pinus strobus</i>	Eastern White Pine	4	3		S5							X
Dicotyledons	Dicots											
Aceraceae	Maple Family											
<i>Acer negundo</i>	Manitoba Maple	0	0		S5							X
<i>Acer platanoides</i>	Norway Maple	0	5	-3	SE5							X
<i>Acer saccharinum</i>	Silver Maple	5	-3		S5							X
<i>Acer saccharum</i>	Sugar Maple	4	3		S5							X
Apiaceae	Carrot or Parsley Family											
<i>Daucus carota</i>	Wild Carrot	0	5	-2	SE5							X
Asclepiadaceae	Milkweed Family											
<i>Asclepias syriaca</i>	Common Milkweed	0	5		S5							X
Asteraceae	Composite or Aster Family											
<i>Arctium minus</i>	Common Burdock	0	3	-2	SE5							X
<i>Erigeron annuus</i>	Annual Fleabane	0	3		S5							X
<i>Leucanthemum vulgare</i>	Oxeye Daisy	0	5	-1	SE5							X
<i>Solidago canadensis</i>	Canada Goldenrod	1	3		S5							X
<i>Taraxacum officinale</i>	Common Dandelion	0	3	-2	SE5							X
Brassicaceae	Mustard Family											
<i>Sinapis arvensis</i>	Corn Mustard	0	5	-1	SE5							X
Caprifoliaceae	Honeysuckle Family											
<i>Lonicera tatarica</i>	Tatarian Honeysuckle	0	3	-3	SE5							X
Caryophyllaceae	Pink Family											
<i>Silene vulgaris</i>	Bladder Campion	0	5	-1	SE5							X
Convolvulaceae	Morning-glory Family											
<i>Convolvulus arvensis</i>	Field Bindweed	0	5	-1	SE5							X
Fabaceae	Pea Family											
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	0	3	-2	SE5							X
<i>Medicago lupulina</i>	Black Medic	0	3	-1	SE5							X
<i>Medicago sativa</i>	Alfalfa	0	5		SE5							X
<i>Securigera varia</i>	Common Crown-vetch	0	5	-2	SE5							X
<i>Trifolium repens</i>	White Clover	0	3	-1	SE5							X
<i>Quercus macrocarpa</i>	Bur Oak	5	3		S5							X
Juglandaceae	Walnut Family											
<i>Juglans nigra</i>	Black Walnut	5	3		S4?							X
Lamiaceae	Mint Family											
<i>Clinopodium vulgare</i>	Field Basil	4	5		S5							X
Magnoliaceae	Magnolia Family											
<i>Liriodendron tulipifera</i>	Tulip Tree	8	3		S4							X
Oleaceae	Olive Family											
<i>Fraxinus americana</i>	White Ash	4	3		S4							X
<i>Fraxinus pennsylvanica</i>	Green Ash	3	-3		S4							X

Bird Species Reported from the Study Area - Alma Scoped EIS (Project #2582)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	BSC et al. 2008	MNRF 2022b	NRSI Results from 2021
Anatidae	Ducks, Geese & Swans								
<i>Aix sponsa</i>	Wood Duck	S5B,S3N					PO		
<i>Anas crecca</i>	Green-winged Teal	S4B,S4N,S5M					CO		
<i>Anas platyrhynchos</i>	Mallard	S5					CO		
<i>Anas rubripes</i>	American Black Duck	S4					PO		
<i>Branta canadensis</i>	Canada Goose	S5					CO		
<i>Lophodytes cucullatus</i>	Hooded Merganser	S5					PO		
<i>Spatula discors</i>	Blue-winged Teal	S3B,S4M					PO		
Phasianidae	Partridges, Grouse & Turkeys								
<i>Bonasa umbellus</i>	Ruffed Grouse	S5					PR		
<i>Meleagris gallopavo</i>	Wild Turkey	S5					PO		
<i>Phasianus colchicus</i>	Ring-necked Pheasant	SNA					PO		
Podicipediformes	Grebes								
<i>Podilymbus podiceps</i>	Pied-billed Grebe	S4B,S2N					CO		
Columbidae	Pigeons & Doves								
<i>Columba livia</i>	Rock Pigeon	SNA					CO		
<i>Zenaidura macroura</i>	Mourning Dove	S5					CO		PO
Cuculiformes	Cuckoos & Anis								
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S4S5B					PO		
Trochilidae	Hummingbirds								
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B					CO		
Rallidae	Rails, Gallinules & Coots								
<i>Gallinula galeata</i>	Common Gallinule	S3B					PO		
<i>Porzana carolina</i>	Sora	S5B					PO		
<i>Rallus limicola</i>	Virginia Rail	S4S5B					PR		
Charadriidae	Plovers & Lapwings								
<i>Charadrius vociferus</i>	Killdeer	S4B					CO		PO
Scolopacidae	Sandpipers & Allies								
<i>Actitis macularia</i>	Spotted Sandpiper	S5B					PR		
<i>Gallinago delicata</i>	Wilson's Snipe	S5B					PO		
<i>Scolopax minor</i>	American Woodcock	S4B					PR		
Ardeidae	Hérons & Bitterns								
<i>Ardea herodias</i>	Great Blue Heron	S4					PO		
<i>Botaurus lentiginosus</i>	American Bittern	S5B					PO		
<i>Butorides virescens</i>	Green Heron	S4B					PO		
Accipitridae	Hawks, Kites, Eagles & Allies								
<i>Accipiter cooperii</i>	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	PO		
<i>Accipiter gentilis</i>	Northern Goshawk	S4	NAR	NAR	NS	No schedule	PR		
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	PO		
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	PR		
<i>Circus hudsonius</i>	Northern Harrier	S5B,S4N	NAR	NAR	NS	No schedule	PO		

Strigidae	Typical Owls								
<i>Asio otus</i>	Long-eared Owl	S4					CO		
<i>Bubo virginianus</i>	Great Horned Owl	S4					PO		
<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	PO		
Alcedinidae	Kingfishers								
<i>Megaceryle alcyon</i>	Belted Kingfisher	S5B,S4N					CO		
Picidae	Woodpeckers								
<i>Colaptes auratus</i>	Northern Flicker	S5					CO		PO
<i>Dryobates pubescens</i>	Downy Woodpecker	S5					CO		PO
<i>Dryobates villosus</i>	Hairy Woodpecker	S5					PO		
<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5					PR		
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5B,S3N					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	SC	Schedule 1	PR		PO
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B					PO		
<i>Empidonax minimus</i>	Least Flycatcher	S5B					PR		
<i>Empidonax traillii</i>	Willow Flycatcher	S4B					PO		
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S5B					PR		PR
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B					CO		
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B					PO		
Vireonidae	Vireos								
<i>Vireo gilvus</i>	Warbling Vireo	S5B					PO		PR
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B					CO		
Corvidae	Crows & Jays								
<i>Corvus brachyrhynchos</i>	American Crow	S5					CO		PR
<i>Cyanocitta cristata</i>	Blue Jay	S5					PO		PO
Alaudidae	Larks								
<i>Eremophila alpestris</i>	Horned Lark	S4					PO		
Hirundinidae	Swallows								
<i>Hirundo rustica</i>	Barn Swallow	S4B	SC	SC	T	Schedule 1	CO		
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4S5B					CO		
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T	T	Schedule 1	CO		
<i>Tachycineta bicolor</i>	Tree Swallow	S4S5B					CO		
Paridae	Chickadees & Titmice								
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5					CO		PR
Sittidae	Nuthatches								
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5					PR		
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5					PR		
Certhiidae	Creepers								
<i>Certhia americana</i>	Brown Creeper	S5					CO		
Troglodytidae	Wrens								
<i>Cistothorus palustris</i>	Marsh Wren	S4B,S3N					PO		
<i>Thryothorus ludovicianus</i>	Carolina Wren	S4							PO
<i>Troglodytes aedon</i>	House Wren	S5B					PO		PO
Turdidae	Thrushes								
<i>Catharus fuscescens</i>	Veery	S5B					PO		
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T	T	Schedule 1	PR		
<i>Sialia sialis</i>	Eastern Bluebird	S5B,S4N	NAR	NAR	NS	No schedule	CO		
<i>Turdus migratorius</i>	American Robin	S5					CO		CO

Mimidae	Mockingbirds, Thrashers & Allies								
<i>Dumetella carolinensis</i>	Gray Catbird	S5B,S3N					CO		PR
<i>Mimus polyglottos</i>	Northern Mockingbird	S4					PR		
<i>Toxostoma rufum</i>	Brown Thrasher	S4B					PR		
Sturnidae	Starlings								
<i>Sturnus vulgaris</i>	European Starling	SNA					CO		CO
Bombycillidae	Waxwings								
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5					PR		PR
Passeridae	Old World Sparrows								
<i>Passer domesticus</i>	House Sparrow	SNA					CO		
Fringillidae	Finches & Allies								
<i>Haemorhous mexicanus</i>	House Finch	SNA					CO		
<i>Haemorhous purpureus</i>	Purple Finch	S5					PO		
<i>Spinus tristis</i>	American Goldfinch	S5					CO		PR
Emberizidae	New World Sparrows & Allies								
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	PR		
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B,S4N					PO		
<i>Melospiza melodia</i>	Song Sparrow	S5					CO		CO
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S5B,S3N					PO		PR
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B,S3N					PO		
<i>Spizella pallida</i>	Clay-colored Sparrow	S5B,S3N					CO		
<i>Spizella passerina</i>	Chipping Sparrow	S4B,S3N					PR		CO
<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5					PO		
Icteridae	Troupials & Allies								
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S5					CO		CO
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	SC	T	Schedule 1	CO		
<i>Icterus galbula</i>	Baltimore Oriole	S4B					CO		PR
<i>Molothrus ater</i>	Brown-headed Cowbird	S5					CO		CO
<i>Quiscalus quiscula</i>	Common Grackle	S5					CO		PR
<i>Sturnella magna</i>	Eastern Meadowlark	S4B,S3N	THR	T	T	Schedule 1	PR		
Parulidae	Wood Warblers								
<i>Geothlypis philadelphia</i>	Mourning Warbler	S5B					PR		
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B,S3N					CO		
<i>Leiostyris alpestris</i>	Nashville Warbler	S5B					PR		
<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B					PO		
<i>Seiurus aurocapilla</i>	Ovenbird	S5B					PR		
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B					PR		
<i>Setophaga petechia</i>	Yellow Warbler	S5B					CO		PR
<i>Setophaga ruticilla</i>	American Redstart	S5B					CO		PO
<i>Setophaga virens</i>	Black-throated Green Warbler	S5B					PO		
Cardinalidae	Cardinals, Grosbeaks & Allies								
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5					PR		PO
<i>Passerina cyanea</i>	Indigo Bunting	S5B					PR		
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S5B					PR		
<i>Piranga olivacea</i>	Scarlet Tanager	S5B					PR		
Total							102	0	27

*OBBA Atlas Squares: 17NJ34, 17NJ44

**NHIC Atlas Square: 17NJ4041

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Reptile and Amphibian Species Reported from the Study Area - Alma Scoped EIS (Project #2582)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NHIC Data**	NRSI Observed
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Ontario Nature 2020	MNRF 2022b	NRSI Results from 2021
Turtles									
<i>Chelydra serpentina</i>	Snapping Turtle	S4	SC	SC	SC	Schedule 1	X		
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S4		SC	SC	No schedule	X		
Snakes									
<i>Diadophis punctatus</i>	Northern Ring-necked Snake	S4					X		
<i>Storeria occipitomaculata</i>	Red-bellied Snake	S5					X		
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5					X		
Frogs and Toads									
<i>Anaxyrus americanus</i>	American Toad	S5					X		
<i>Dryophytes versicolor</i>	Gray Treefrog	S5							X
<i>Pseudacris crucifer</i>	Spring Peeper	S5					X		X
<i>Lithobates clamitans</i>	Green Frog	S5					X		X
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X		
<i>Lithobates sylvaticus</i>	Wood Frog	S5					X		
Total							10	0	3

*ORAA Atlas Squares: 17NJ34, 17NJ44

**NHIC Atlas Square: 17NJ4041

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Mammal Species Reported from the Study Area - Alma Scoped EIS (Project #2582)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Dobbyn 1994	MNRF 2022b	NRSI Results from 2021
Didelphimorphia	Opossums								
<i>Didelphis virginiana</i>	Virginia Opossum	S4					X		
Eulipotyphla	Shrews, Moles, Hedgehogs, and Allies								
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5					X		
<i>Condylura cristata</i>	Star-nosed Mole	S5					X		
<i>Parascalops breweri</i>	Hairy-tailed Mole	S4					X		
<i>Sorex cinereus</i>	Masked Shrew	S5					X		
<i>Sorex fumeus</i>	Smoky Shrew	S5					X		
<i>Sorex palustris</i>	Water Shrew	S5					X		
Chiroptera	Bats								
<i>Eptesicus fuscus</i>	Big Brown Bat	S4					X		
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4					X		
<i>Lasiurus borealis</i>	Eastern Red Bat	S4					X		
<i>Lasiurus cinereus</i>	Hoary Bat	S4					X		
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END				X		
<i>Myotis lucifugus</i>	Little Brown Myotis	S3	END	E	E	Schedule 1	X		
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	E	Schedule 1	X		
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	E	Schedule 1	X		
Lagomorpha	Rabbits and Hares								
<i>Lepus americanus</i>	Snowshoe Hare	S5					X		
<i>Lepus europaeus</i>	European Hare	SNA					X		
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5					X		X
Rodentia	Rodents								
<i>Castor canadensis</i>	Beaver	S5					X		
<i>Erethizon dorsatum</i>	Porcupine	S5					X		
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	S5					X		
<i>Marmota monax</i>	Woodchuck	S5					X		
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5					X		
<i>Microtus pinetorum</i>	Woodland Vole	S3?	SC	SC	SC	Schedule 1	X		
<i>Mus musculus</i>	House Mouse	SNA					X		
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5					X		
<i>Ondatra zibethicus</i>	Muskrat	S5					X		
<i>Peromyscus leucopus</i>	White-footed Mouse	S5					X		
<i>Peromyscus maniculatus</i>	Deer Mouse	S5					X		
<i>Rattus norvegicus</i>	Norway Rat	SNA					X		
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5					X		X
<i>Synaptomys cooperi</i>	Southern Bog Lemming	S4					X		
<i>Tamias striatus</i>	Eastern Chipmunk	S5					X		X
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5					X		
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5					X		
Canidae	Canines								
<i>Canis latrans</i>	Coyote	S5					X		
<i>Vulpes vulpes</i>	Red Fox	S5					X		X

Felidae	Felines								
<i>Lynx rufus</i>	Bobcat	S4						X	
Mephitidae	Skunks and Stink Badgers								
<i>Mephitis mephitis</i>	Striped Skunk	S5						X	
Mustelidae	Weasels and Allies								
<i>Mustela erminea</i>	Ermine	S4						X	
<i>Mustela frenata</i>	Long-tailed Weasel	SU						X	
<i>Neovison vison</i>	American Mink	S4						X	
<i>Taxidea taxus jacksoni</i>	American Badger (Southwestern Ontario)	S1	END	E	E	Schedule 1		X	
Procyonidae	Raccoons and Allies								
<i>Procyon lotor</i>	Northern Raccoon	S5						X	
Ursidae	Bears								
<i>Ursus americanus</i>	American Black Bear	S5	NAR	NAR	NS	No schedule		X	
Artiodactyla	Deer and Bison								
<i>Odocoileus virginianus</i>	White-tailed Deer	S5						X	
Total								46	0
									4

*Mammal Atlas Square Numbers: 17NJ34, 17NJ44

**NHIC Atlas Squares: 17NJ4041

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Butterfly Species Reported from the Study Area - Alma Scoped EIS (Project #2582)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TEA Atlas*	NHIC Data**	NRSI Observed
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Macnaughton et al. 2022	MNRF 2022b	NRSI Results from 2021
Hesperiidae	Skippers								
<i>Carterocephalus palaemon</i>	Arctic Skipper	S5					X		
<i>Thymelicus lineola</i>	European Skipper	SNA							X
Papilionidae	Swallowtails								
<i>Papilio polyxenes</i>	Black Swallowtail	S5					X		
Pieridae	Whites and Sulphurs								
<i>Pieris rapae</i>	Cabbage White	SNA							X
Lycaenidae	Harvesters, Coppers, Hairstreaks, Blues								
<i>Celastrina lucia</i>	Northern Spring Azure	S5					X		
<i>Satyrium acadica</i>	Acadian Hairstreak	S4					X		
Nymphalidae	Brush-footed Butterflies								
<i>Coenonympha tullia</i>	Common Ringlet	S5					X		
<i>Danaus plexippus</i>	Monarch	S2N,S4B	SC	E	SC	Schedule 1	X		
<i>Lethe eurydice</i>	Eyed Brown	S5					X		
<i>Limenitis archippus</i>	Viceroy	S5					X		
<i>Megisto cymela</i>	Little Wood-Satyr	S5					X		
<i>Nymphalis antiopa</i>	Mourning Cloak	S5					X		
Total							10	0	2

*TEA Atlas Squares: 17NJ34, 17NJ44

**NHIC Atlas Square:

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