Pletch and Weber Properties, Belgrave, Ontario Environmental Impact Study II

Prepared for:
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Pletch and Weber Properties, Belgrave, Ontario
Environmental Impact Study II

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by the Municipality of Morris-Turnberry (hereafter referred to as 'the Municipality') to complete an Environmental Impact Study (EIS) for a proposed residential housing development located at 61 Corbett Drive (referred to as the 'Pletch property') and potential future residential development of the property at 84976 Huron County Road 4 (referred to as the 'Weber property'), within the settlement area of Belgrave in the Municipality of Morris-Turnberry, Ontario. The Pletch property is owned by the Municipality. The Weber property is in private ownership. Both properties fall partially within the settlement area boundary of Belgrave.

As part of ongoing work since 2019, NRSI prepared an EIS in November 2019 (NRSI 2019) that provided direction for managing environmental features within and adjacent to the subject property. Comments were received from North-South Environmental Inc. (North-South), on behalf of the County of Huron, dated April 21, 2020 (Appendix I). As such, this revised EIS supersedes the November 2019 submission and addresses all comments provided by North-South to-date, as detailed in the comment response table and supporting communication (Appendix I and II).

The subject land (the Pletch and Weber properties) has a total area of approximately 42ha and is located on the south and east sides of Belgrave. The subject land is characterized largely as undeveloped and consists of agricultural fields, wetland, and forested communities, and two tributaries to Belgrave Creek which bisect the Pletch property. An existing house is located within each of the Pletch and Weber properties. The existing home on the Pletch property is anticipated to be severed from the land proposed for development and to be retained within the boundaries of a new lot. The existing home on the Weber property is anticipated to be retained in its current location and may be severed from the land from development if the Weber property is developed for residential uses in the future.

Significant natural features are present, primarily within the Pletch property, and include woodland that is designated as 'Natural Environment – All other Features' in the County

of Huron Official Plan (2015), and wetland and watercourse features regulated by the Maitland Valley Conservation Authority (MVCA) (Maps 1a and 1b).

For the purposes of this report, the term 'subject land' refers to the property at 61 Corbett Drive (i.e. the 'Pletch property') and the entire property located at 84976 Huron County Road 4 ('Weber property'). The term 'development area' refers to lands located within the Pletch and Weber properties that fall within the settlement boundary. The term 'study area' includes the subject land and lands up to 120m from the subject land.

NRSI is part of a larger consultant team organized and scheduled by GSP Group Inc., who has commissioned a number of studies, including this EIS, to develop a community growth plan for Belgrave and more specifically future residential development options for the Pletch and Weber properties.

NRSI has developed this EIS in accordance with the *Huron County Official Plan* (County of Huron 2015), *Morris-Turnberry Official Plan* (Municipality of Morris-Turnberry 2017), and the *Policies and Procedures for Compliance with the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (MVCA 2016).

1.1 Proposed Undertaking

The Pletch property is proposed to be initially divided into 3 lots:

- Both of Lots 1 and 2 are partially within the settlement area boundary;
- Within the settlement area, Lot 1 is zoned for residential uses and may be further divided in the future to create residential lots at the east end of Jane Street by extending the street further east, and Lot 2 is zoned for agricultural uses and is proposed to be re-zoned for residential use in the area of the existing dwelling;
- Outside of the settlement area, Lots 1 and 2 will remain zoned for agricultural uses; and
- The Retained Lot is located entirely within the settlement area and is partially zoned for residential uses and partially for agricultural uses, and is proposed to be re-zoned for residential uses and further subdivided in the future into residential lots with an internal street created by plan of subdivision.

The north portion of the Weber property is located within the settlement area and may be developed for residential uses by plan of subdivision in the future. Future residential development on the area of the subject land within the settlement area will be serviced municipal water and private septic systems.

Outside of the settlement area, much of the Pletch property and a small part of the Weber property are zoned Natural Environment – Limited Protection Zone (NE2). Within the settlement area, parts of the properties are denoted in the Zoning By-law as Conservation Authority Notification Areas where an Environmental Impact Study and/or Conservation Authority permit is required prior to development. This EIS is intended to satisfy the requirement for an EIS and to provide information to refine and update the mapping of the limits of the NE2 Zone applicable to the subject land.

Plans prepared by GSP Group include a proposed Concept Plan (see Appendix III) illustrating the initial 3 lots proposed for the Pletch property, and two Development Concepts (see Appendix III) illustrate two options for the future subdivision lotting of the Pletch property.

1.2 Terms of Reference

A Terms of Reference (TOR) was prepared by NRSI and submitted to Huron County, MVCA and the Municipality of Morris-Turnberry on February 28, 2019. The TOR was peer reviewed by North-South Environmental (NSE) and comments were provided on May 15, 2019. The TOR and comments from NSE are provided in Appendix IV.

1.3 Project Scoping

In order to determine a study approach for the EIS, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are reported from, or have potential to occur within the study area. Background information on the natural environmental features within the study area was gathered from the following sources:

- Maitland Valley Conservation Authority (MVCA)
- Huron County Official Plan (2015)
- Ontario Ministry of Natural Resources and Forestry (OMNRF), Guelph District
- Natural Heritage Information Centre (NHIC) database (OMECP 2019)

- Aquatic Species at Risk Map (DFO 2019)
- Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al. 2008)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Butterfly Atlas (Jones et al. 2019)
- Ontario Odonata Atlas (OMNR 2005)

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (10km radius) using the various atlases and resources listed above. The atlases provide data based on 10x10km survey squares and information on species from the squares that overlap the study area was compiled (squares 17MJ64, 17MJ65, 17MJ74, and 17MJ75). These initial species lists were used to guide the scope and type of wildlife field surveys required as outlined in the following sections.

1.3.1 Species at Risk and Species of Conservation Concern Screening

Based on these initial species lists, a number of Species at Risk (SAR) and species of Conservation Concern (SCC) were identified as having records from within the vicinity of study area. SAR are those listed on the Species at Risk in Ontario List (OMECP 2019). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed by COSSARO as Endangered or Threatened are protected by the *Endangered Species Act* (*ESA*), 2007, which includes protection to their habitat, and are referred to herein as “regulated SAR”.

SCC include:

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

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

A preliminary screening exercise was conducted on these species to identify which species have suitable habitat within the study area. This involved cross-referencing the preferred habitat for reported SAR (OMECP 2019, 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 and is provided in Appendix V.

Final results of the SAR and SCC screening exercise, based on original field surveys and habitats present, are provided in Appendix V.

1.3.2 Significant Wildlife Habitat Screening

Based on background information review and desktop analysis a preliminary screening for potential Significant Wildlife Habitat (SWH) was completed within the study area (Appendix IV). This review compared site conditions with criteria set in the SWH Ecoregion 6E Criterion Schedule (OMNRF 2012) to determine the presence of any candidate SWH. Full results of the SWH screening exercise, based on original field surveys are provided in Appendix V.

2.0 Relevant Policies, Legislation, and Planning Studies

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

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation	Description	Project Relevance

Provincial Policy Statement (PPS) (OMMAH 2020).	• Issued under the authority of Section 3 of the Planning Act, the revised PPS 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 (OMNRF 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, OMNR 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• The following natural features were identified within the study area:
		  • Wetland
		  • Significant Woodland
		  • Significant Wildlife Habitat

Endangered Species Act (ESA) (Government of Ontario 2019)	• The original ESA, written in 1971, was revised in 2007. • The ESA prohibits killing, harming, harassing, or capturing SAR and protects their habitats from damage and destruction.	• Based on the background review, SAR/SCC screening, and field observations several SAR and SCC were documented within the subject property.
Migratory Birds Convention Act (Government of Canada 2019)	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment and was assented in 1994. • The schedule of on-site work must consider MBCA timing windows, with the breeding bird season typically occurring between April 1 and August 31, however, this is a guideline, since the MBCA applies to nesting bird species at any time. • "Incidental take" is considered illegal, with the exception of a	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for the MBCA.

Policy/Legislation	Description	Project Relevance
	permit obtained by the Canadian Wildlife Service (CWS).	
Fish and Wildlife Conservation Act, (Government of Canada 1997)	• The FWCA provides protection for certain bird species, not protected under the MBCA (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (*Vulpes vulpes*) and Striped Skunk (*Mephitis mephitis*).	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites of furbearing mammals.
Huron County Official Plan (OP) (County of Huron 2015)	• The Huron County OP requires evaluation of development impacts that occur within or adjacent to natural heritage features and areas as defined in the Huron County Official Plan Natural Environment Resource Map	• Presence of significant natural features within the subject property include woodland that is designated as 'Natural Environment – All other Features' by the Huron County OP.
Ontario Reg. 164/06 (Maitland Valley Conservation Authority (MVCA) 2016).	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this regulation, the MVCA has the responsibility to regulate activities in natural and hazardous areas (i.e. areas in and near rivers, streams, floodplains, wetlands, and slopes).	• MVCA regulated wetlands and tributaries are present within the subject property. • Development within 30m of a wetland is generally prohibited (Section 7.4.2.1.1). • Septic systems need to be located a minimum of 15m from the wetland boundary (Section 7.4.2.1.5.f).

3.0 Field Methods

A comprehensive, multi-season field program was developed and detailed in the TOR (Appendix IV). The field program was initiated in April 2019. A total of 9 field visits were carried out between April and October 2019 to complete a variety of field surveys which are described in detail within the TOR (Appendix IV) and summarized in Table 2. The locations of monitoring stations are shown on Map 2.

3.1 Field Surveys

Vegetation Community Mapping

Vegetation communities on-site and adjacent to the subject property (where access was granted) was characterized and mapped on May 16 and July 10, 2019 using the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Details on the vegetation communities were recorded including species composition, dominance, uncommon species and features.

Vascular Flora Inventories

A two-season vascular flora inventory was conducted within each identified ELC community on May 16 and July 10, 2019.

Wetland and Woodland Delineation

The wetland and woodland boundaries associated with the development area on the subject property were delineated on August 7, 2019. The wetland boundary was identified by an Ontario Wetland Evaluation System (OWES) certified biologist. The boundaries were surveyed the same day by NRSI staff using a SXBlue II GNSS GPS unit with sub-meter accuracy. Staff from the MVCA provided support on the delineation of the woodland and wetland boundaries but did not confirm them in the field (P. Huber-Kidby pers. comm. May 29, 2019).

Herpetofauna Surveys

Evening surveys for calling frogs and toads were completed April 24, May 22, and June 25, 2019 following the Marsh Monitoring Program protocol (BSC 2009). This involved 3-minute point counts at 5 stations adjacent to suitable breeding habitat (Map 2) to record species calling and their abundance. Call abundance codes for each amphibian species detected was determined, as outlined below:

- Code 1: Individuals can be counted and calls are not simultaneous. This code was assigned when individual males were able to be counted, and when the calls of individuals of the same species do not start at the same time. In addition, the number of individual frogs of each species calling are able to be recorded beside the code.
- Code 2: Calls are distinguishable, with some simultaneous calling. This code was assigned when there were a few males of the same species calling simultaneously. An estimate of the number of individual frogs of each species calling was recorded beside the code, based on their locations and/or by the differences in their voices.
- Code 3: Full chorus; calls continuous and overlapping. This code was assigned when a full chorus was encountered.

Herpetofauna area searches were conducted during all field visits within areas where suitable habitat or potential hibernacula were present within the subject property.

Breeding Bird Surveys

Breeding bird surveys were conducted June 14 and July 9, 2019, during the peak breeding season (i.e. late May – early July) in accordance with Ontario Breeding Bird Atlas (OBBA) methodology. 10-minute point counts were completed and area surveys were conducted within the subject property (Map 2). Standard breeding evidence was recorded during both early morning surveys and occurred before 1000hrs.

Mammal Surveys

Trees and snags within the development area were assessed for potential bat habitat and roosting potential. Evaluation methods for bat habitat were conducted following methods outlined in the Bat and Bat Habitat Surveys of Treed Habitats (OMNRF 2016) and Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats (OMNR 2011), which is also referred to by the MNRF for residential development applications. This assessment identified snags or trees ≥10cm DBH with suitable cavities and loose bark.

Incidental Observations

Area searches for herpetofauna, birds, butterflies, dragonflies and damselflies, and mammals were conducted during all site visits in conjunction with other surveys.

Aquatic Habitat Assessment

The existing aquatic habitat features were characterized for the watercourse within the subject property (Map 2) to assess for permanency and fish habitat suitability. The following characteristics were documented for each feature during the survey:

- Adjacent lands including valley and riparian conditions,
- Channel morphology,
- Substrate composition,
- Instream habitat and cover, including instream vegetation,
- Flow conditions,
- In situ water quality (water temperature, conductivity, pH),
- Indications of groundwater influence, and
- General notes on fish habitat usage and/or available habitat types (i.e. spawning, nursery, foraging etc.).

Table 2. Field Survey Summary

Survey Type	Protocol	Date (2019)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers[1]
Ecological Land Classification	Lee et. al (2008)	May 16	1000-1600	14	2	90	None	A. Dean J. Pickering
		July 10	0930-1530	27	1-2	10	None	A. Dean
Vascular Flora Inventory (Spring)	Systematic search by ELC polygon	May 16	1000-1600	14	2	90	None	A. Dean J. Pickering
Vascular Flora Inventory (Summer)	Systematic search by ELC polygon	July 10	0930-1530	27	1-2	10	None	A. Dean
Wetland Boundary and Dripline Delineation	Ontario Wetland Evaluation System (OWES) (2013)	August 7	1100-1400	28	0	10	None	K. Richter J. Lance
Aquatic Habitat Assessment	N/A	October 31	13:30-15:00	6	1	100	Light Rain	S. Burgin
Bat Habitat Assessment	OMNRF (2016), OMNRF (2017)	May 16	1000-1600	14	2	90	None	A. Dean J. Pickering
		June 14	0630-0930	8	3	30	None	D. Riley
Breeding Bird Surveys	OBBA (2001)	June 14	0630-0930	8	3	30	None	D. Riley
		July 9	0600-0900	12	0	0	None	K. Burrell
Anuran Surveys	BSC 2009	April 24	2030-2200	7	0	10	None	L. Knopf D. Frey
		May 22	2115-2230	12	1	0	None	L. Knopf A. Reinert
		June 25	2130-2245	18	2	50	None	K. Burrell
Reptile Area Searches	Systematic search within suitable habitats	May 16	1000-1600	14	2	90	None	A. Dean J. Pickering
		June 14	0630-0930	8	3	30	None	D. Riley

Survey Type	Protocol	Date (2019)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers[1]
		July 9	0600-0900	12	0	0	None	K. Burrell
		July 10	0930-1530	27	1-2	10	None	A. Dean

[1]Crew leads curricula vitae are provided in Appendix VI.

4.0 Existing Conditions

4.1 Soils, Terrain and Drainage

Background information indicates that the dominant soil type found within the study area is loam (Hoffman et al. 1952). Ecological Land Classification surveys conducted by NRSI also documented that the subject property consists primarily of silty clay loam and clay loam. NRSI biologists documented predominantly fine-textured mineral soils of clay loam and silty clay loam during ELC and soil sampling surveys (Appendix VII). Organic substrates were also documented in the wetland habitats in the southwest portion of the Pletch property (i.e. SWD6-3 and SWT3-2 vegetation communities) (Appendix VII).

The subject property contains two small tributaries which drain into the adjacent Belgrave Creek to the north of the subject property. Topography on the subject property contains low-lying wet areas of swamp and marsh in the east and southern portions of the Pletch property, and upland treed features and existing agricultural areas in the northern portion of the Weber property and western portion of the Pletch property.

Human-altered features are present in the wetland areas within the eastern portion of the Pletch property, where dug linear ponds were previously constructed. The surrounding lands are generally dominated by agricultural row crop and pasture lands.

4.2 Designated Natural Areas

There are no designated natural areas within the subject property.

4.3 Vegetation

4.3.1 Vegetation Communities

The subject property consists of a variety of plantation, deciduous swamp, meadow marsh, cultural meadow, and deciduous forest communities along with agricultural lands. A summary of ELC communities identified within the subject property is provided in Table 3 and shown on Map 2. Original ELC data sheets are provided in Appendix VII. A summary of the Floristic Quality Analysis (Oldham *et al.* 1995) completed for each vegetation community is provided at the end of Appendix VII.

Table 3. Vegetation Communities Identified within the Subject Property

ELC Description and Ecosite Type	Environmental Characteristics
Coniferous Plantation – CUP3	
Inclusion Communities: • Green Ash Mineral Deciduous Swamp (SWD2-2) • Reed Canary Grass Mineral Meadow Marsh (MAM2-2) • Mixed Plantation (CUP2) • Red Osier Dogwood Mineral Thicket Swamp (SWT2-5) • Mineral Cultural Meadow (CUM1)	This wooded community and its inclusions are located in the eastern portion of the Pletch property. Throughout this community White Pine (*Pinus strobus*), Norway Spruce (*Picea abies*), and White Cedar (*Thuja occidentalis*) form the majority of the canopy, with Hawthorn species (*Crataegus spp.*) and Alternate-leaved Dogwood (*Cornus alternifolia*) found in the subcanopy. European Buckthorn (*Rhamnus cathartica*), Glossy Buckthorn (*Frangula alnus*) and Choke Cherry (*Prunus virginiana*) are common throughout the understorey. Within the groundcover layer, Avens species (*Geum spp.*), Wild Strawberry (*Fragaria virginiana*), and Enchanter's Nightshade (*Circaea lutetiana ssp. canadensis*) were commonly observed. The SWD2-2 inclusion, located at the northern edge of this community, is a plantation, as Green Ash (*Fraxinus pennsylvanica*) was noted to be planted in rows. Much of this inclusion is dead and/or dying due to Emerald Ash Borer (*Agrilus planipennis*).
Narrow-leaved Sedge Mineral Meadow Marsh – MAM2-5	
Inclusion Communities: • Silky Dogwood Mineral Thicket Swamp (SWT2-8) • Shallow Aquatic (SA)	This meadow marsh community and its inclusions form the central natural vegetation community within the Pletch property. This community is dominated by a mix of constructed wetlands and dug features. Freeman's Maple (*Acer X freemanii*), White Elm (*Ulmus americana*) and Balsam Poplar (*Populus balsamifera ssp. balsamifera*) form the thin canopy, with Silky Dogwood (*Cornus amomum ssp. obliqua*), Pussy Willow (*Salix discolor*), and Glossy Buckthorn found in the subcanopy. Silky Dogwood, Red-osier Dogwood (*Cornus stolonifera*), and Pussy Willow are common throughout the understorey. Within the groudcover layer and standing water, various Sedge species (*Carex spp.*), Reed Canary Grass (*Phalaris arundinacea*), Blue-joint Grass (*Calamagrostis canadensis*), and Lance-leaved Aster (*Symphyotrichum lanceolatum)* were commonly observed.
Swamp Maple Organic Deciduous Swamp – SWD6-3	
Inclusion Communities: • Willow Organic Thicket Swamp (SWT3-2) • Fresh - Moist Poplar Deciduous Forest (FOD8-1)	This deciduous swamp community and its inclusions are located within the southern portion of the Pletch property, adjacent to the Weber property. This community is dominated by wet-tolerant species and aquatic vegetation. Freeman's Maple, Green Ash (*Fraxinus*

	pennsylvanica), and White Elm make up the canopy, with less mature Freeman's Maple, Green Ash and Glossy Buckthorn forming the subcanopy. Glossy Buckthorn, Red-osier Dogwood, and Canada Elderberry (*Sambucus canadensis*) are common within the understorey layer. Groundcover species observed include Spotted Jewelweed (*Impatiens capensis*), False Nettle (*Boehmeria cylindrica*), and Marsh Fern (*Thelypteris palustris var. pubescens*).
Dry – Fresh Sugar Maple Deciduous Forest – FOD5-1	
Inclusion Community: • White Pine Coniferous Plantation (CUP3-2)	This community is located within the Pletch property, southwest of the residence. The deciduous forest community and its inclusion contain a number of forest edges due to the presence of a trail network throughout this community. Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), and Black Cherry (*Prunus serotina*) dominate the canopy layer while Sugar Maple, Alternate-leaved Dogwood, and European Buckthorn form the subcanopy. Choke Cherry, European Buckthorn, and Glossy Buckthorn are common within the understorey. Within the ground cover layer, Trout Lily (*Erythronium americanum ssp. americanum*), Starry-False Solomon's Seal (*Maianthemum stellatum),* and Wild Leek (*Allium tricoccum*) were commonly observed.
Additional Land Uses and Communities	
Annual Row Crop (OAGM1) and Pasture	The subject property and adjacent lands include a variety of agricultural areas which contain row crops (corn in 2019) and pasture lands containing livestock. Row crops are found in the northeastern and central-western portion of the Pletch property and form the majority of the Weber property. Pasture is found within the southern portion of the Weber property.
Residential	Singled detached houses are located within both the Pletch and Weber properties. Both residential properties include manicured lawn and scattered trees planted throughout.
Cemetery	A small cemetery is located towards Brandon Road, encircled by the Pletch property. It is characterized by manicured lawn and a few scattered trees.

4.3.2 Feature Delineation

The woodland and wetland boundaries in the vicinity of the proposed lots were delineated in the field by NRSI biologists on August 7, 2019. The boundaries were surveyed the same day by NRSI, using a SXBlue II GNSS GPS unit with sub-meter accuracy. The woodland boundary was delineated at its dripline. The wetland boundary was identified primarily using the "50% wetland vegetation" rule as per OWES (2014). The MVCA provided their support in NRSI identifying the wetland boundary without staff from the MVCA reviewing the boundary in the field (P. Huber-Kidby pers. comm. May 29, 2019). The following provides a description and rationale for the wetland boundaries, as identified on Map 3.

MAM2-2 Reed-canary Grass Mineral Meadow Marsh

A small portion of this marsh boundary was identified, in proximity to a proposed lot, although outside the development area. This wetland is associated with the tributary and is dominated by Reed-canary Grass (*Phalaris arundinacea*), with Canada Anemone (*Anemone canadensis*), Spotted Jewelweed (*Impatiens capensis*), and Spotted Joe-pye-weed (*Eupatorium maculatum ssp. maculatum*). A small pond with Lesser Duckweed (*Lemna minor*) is found in this location.

MAM2-5 Narrow-leaved Sedge Mineral Meadow Marsh

The wetland vegetation along the boundary encompasses Perfoliate Thoroughwort (*Eupatorium perfoliatum*), Dark-green Bulrush (*Scirpus atrovirens*), Glossy Buckthorn, Lance-leaved and Purple-stemmed Asters (*Symphyotrichum puniceum var. puniceum*), Reed-canary Grass, and Spotted Jewelweed, as well as a variety of sedges (*Carex bebbii*, *C. granularis*, *C. lacustris*). Some Grey Dogwood (*Cornus foemina ssp. racemosa*) and Red-osier Dogwood along the periphery was included. Where upland species dominate among the Reed-canary Grass, these were excluded from the wetland. Upland species include Common Milkweed (*Asclepias syriaca*), Tall Goldenrod (*Solidago altissima var. altissima*), Wild Teasel (*Dipsacus fullonum ssp. sylvestris*), and Woodbine (*Parthenocissus vitacea*), among others.

SWD2-2 Green Ash Mineral Deciduous Swamp

This small wetland is very disturbed, originating as a plantation of Green Ash (planted in rows). The groundcover is a mix of Bitter Nightshade (Solanum dulcamara), Glossy Buckthorn, Prickly Cucumber (*Echinocystis lobata*), and Wood Avens (*Geum urbanum*), with other areas being unvegetated, indicative of standing water later into the growing season.

4.3.3 Vascular Flora

Detailed vegetation inventories resulted in the identification of 210 plant species in ELC polygons which overlap with the subject property. A complete list of species observed is provided in Appendix VIII.

During the scoping of the TOR, a thorough review of background information pertaining to federally, provincially or regionally rare plant species reported from the vicinity of subject property was completed (Appendix IV). This assisted in flagging specific species to be targeted during the vascular flora inventories. NRSI did not observe any SCC/SAR plant species within any vegetation communities surveyed throughout the subject property (Appendix V).

4.4 Wildlife

4.4.1 Birds

A total of 114 bird 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 been observed in the area (10 x 10km range), are known to nest in the area, and/or have exhibited some evidence of breeding in the area. A total of 63 of these species were documented within the study area during the field surveys, of which 50 species exhibited signs of breeding, such as males singing, females carrying food or nest materials, and the presence of fledged young. An additional 13 species were observed during other field investigations which did not exhibit signs of breeding evidence, such as species observed during migration periods. A complete list of bird observations is provided in Appendix VIII.

A total of 9 significant bird species are reported from the atlas square that overlaps with the subject property based on OBBA records and/or other background data (BSC et al. 2008, OMECP 2019). NRSI field surveys documented 4 significant bird species within

the study area: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), and Eastern Wood-Pewee (*Contopus virens*).

Barn Swallow is ranked as Threatened provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. Individual Barn Swallows were noted at breeding bird monitoring station BMB-002 on June 14 and July 9, involving 3 and 1 individuals, respectively. All individuals were noted to be foraging over the agricultural lands within the southern portion of the Weber property. Access to the Weber property barn was not granted during the course of fieldwork; however, observations indicate that nesting is likely occurring within the barn, given excellent foraging areas (i.e. pasture) immediately adjacent to the barn, and the barn providing an ideal nesting location for the species.

Bobolink is ranked as Threatened provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. A pair were observed within the agricultural field (pasture), located within the southern portion of the Weber property on June 14 indicating probable breeding. Subsequent site visits by NRSI biologists did not observe the species.

Eastern Meadowlark is ranked as Threatened provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. A single individual was observed within the agricultural field, located within the southern portion of the Weber property on May 16. Subsequent breeding bird surveys did not document the species again. As such, this observation is treated as a spring migrant and the species is not anticipated to be breeding within the subject property.

Eastern Wood-Pewee is ranked as Special Concern provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. Eastern Wood-Pewee was observed on both breeding bird visits (June 14 and July 9) and was documented by the presence of singing males at breeding bird monitoring stations BMB-001, -002, and -003. Probable nesting was documented by the presence of singing males observed at these stations spanning a period of more than 7 days.

Based on the habitat requirements of the species (i.e. deciduous and mixed woodland), the species is most likely breeding within the southern portion of the Pletch property.

4.4.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (ORAA), 11 species of herpetofauna are reported from the vicinity (approximately 10km) of the subject property (Ontario Nature 2019). NRSI field investigations confirmed the presence of 6 species within the study area. A complete list of herpetofauna reported from the study area, based on background information and observations by NRSI biologists is included in Appendix VIII.

A single Snapping Turtle (*Chelydra serpentina serpentine*) was observed on June 14 in suitable nesting habitat. Snapping Turtle is a SCC and is listed as Special Concern provincially and federally. As such, suitable habitat for this species is found within the subject property.

A single Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) was observed within the subject property. This species is ranked as abundant and secure throughout its Ontario range.

Anuran call surveys were conducted to identify the presence of breeding frog and toad species within the subject property. Anurans were observed at stations ANR-003, -004, and -005, within the large wetland complex in the southern portion of the Pletch property. Full choruses of Spring Peeper (*Pseudacris crucifer*) were heard earlier in the spring at these stations, with a full chorus of Northern Green Frog (*Lithobates clamitans melanota*) at Station ANR-003 in June. Lower numbers of American Toad (*Anaxyrus americanus*), Northern Leopard Frog (*Lithobates pipiens*), and Wood Frog (*Lithobates sylvaticus*) were observed from these areas. Table 4 presents the anuran call survey results, below.

Table 4. Anuran Call Survey Results

		Call Abundance*				
Station	Date	American Toad	Northern Green Frog	Northern Leopard Frog	Spring Peeper	Wood Frog
1	April 24	-	-	-	-	-
	May 22	-	-	-	-	-
	June 25	-	-	-	-	-
2	April 24	-	-	-	-	-
	May 22	-	-	-	-	-
	June 25	-	-	-	-	-
3	April 24	-	-	1(2)	3	-
	May 22	-	-	-	3	-
	June 25	-	3	-	-	-
4	April 24	-	-	1(1)	3	1(1)
	May 22	-	-	-	3	1(1)
	June 25	-	2(7)	-	-	-
5	April 24	2(4)	-	1(1)	3	2(4)
	May 22	1(1)	-	-	3	-
	June 25	1(1)	-	-	-	-

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

Temperature on survey dates: April 24 - 7°C; May 22 - 12°C; June 25 - 18°C.

4.4.3 Insects

4.4.3.1 Butterflies

According to the Ontario Butterfly Atlas (Jones et al. 2019), 18 butterfly species are known to occur within the 10 x 10km atlas square that overlaps with the study area, one of which, Monarch (*Danaus plexippus*), is identified as significant. NRSI biologists observed 6 species during surveys completed within the study area: Cabbage White (*Pieris rapae*), Giant Swallowtail (*Papilio cresphontes*), Monarch, Mourning Cloak (*Nymphalis antiopa*), Red Admiral (*Vanessa atalanta*), and Spring Azure (*Celastrina ladon*). With the exception of Monarch, all butterfly species observed by NRSI biologists are species ranked as common and secure throughout the province. A complete list of species observed is provided in Appendix VIII.

Common Milkweed and Swamp Milkweed (*Asclepias incarnata ssp. incarnata*) are found within the subject property, which is the host plant for Monarch butterfly, which was observed within the subject property in August.

4.4.3.2 Odonata

According to the Ontario Odonata Atlas (OMNR 2005), 8 Odonata species are reported from the atlas square that overlaps with the study area, none of which are identified as significant. NRSI biologists observed no odonate species during surveys completed within the subject property. A complete list of reported species is provided in Appendix VIII.

4.4.4 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 30 mammal species are reported from within 10km of the subject property. Five mammals were observed by NRSI biologists within the subject property. These include species commonly found within woodland environments: Eastern Cottontail (*Sylvilagus floridanus*), Gray Squirrel (*Sciurus carolinensis*), Red Squirrel (*Tamiasciurus hudsonicus*), Virginia Opossum (*Didelphis virginiana*), and White-tailed Deer (*Odocoileus virginianus*). Appendix VIII provides a complete list of mammal species reported from the study area.

4.4.4.1 Bat Habitat Assessment

A bat habitat assessment was conducted within the proposed development area. No suitable bat cavities were observed. Based on this habitat assessment, habitat for bats does not occur within the proposed development footprint. Based on the habitat present within the deciduous forest communities (e.g., FOD5-1, FOD5-2, and FOD8-1 communities) within the subject property it is anticipated that bats are present. Given that bat species in Ontario are insectivorous, wetlands are understood to provide important food sources for these species. Any SAR bats present within and adjacent to the subject property are likely to be highly dependent on the wetlands on-site.

Evaluation methods followed the MNRF Guelph District's guidance document, *Survey Protocol for Species at Risk Bats within Treed Habitats* (OMNRF 2017) and *Bat and Bat Habitat Surveys of Treed Habitats* (OMNRF 2016).

4.4.5 Incidental Wildlife

Surveys conducted by NRSI documented the presence of several Chimney Crayfish (*Fallicambarus fodiens*) within the southern portion of the Pletch property, notably within the Swamp Maple Organic Deciduous Swamp (SWD6-3) community. More information is provided in Section 5.3.

4.5 Aquatic Habitat Assessment

Three watercourse features were identified within the subject property. Two watercourse features were characterized during the October 31, 2019 assessment. The primary feature (Tributary 1) flows west as a permanent feature and enters the Pletch Property through the east boundary where it then turns 90° and flows north, bisecting the northern portion of the subject property, and exiting the property at Brandon Road. A small secondary intermittent channel (Tributary 2) was also observed approximately 520m upstream (south) from Brandon Road. At this location the channel bottom is elevated above the primary channel. When water levels within the primary channel are high enough a portion of the water flows southwest to the secondary channel, which then flows to the most northern constructed pond on the property. A third feature (Tributary 3) was also observed during spring surveys on May 16, 2019. This feature

exists as an intermittent feature and occurs approximately 350m upstream from Brandon Road to the west, where it connects to the primary channel from the west.

Tributary 1 exhibits a straightened, channelized form and evidence of bank erosion was noted throughout the upstream portion of the channel near the eastern boundary (Figure 1). Water flows to the property from an adjacent agricultural field through a perched concrete culvert and into a plunge pool before flowing to the channel (Figure 2).

Figure 1. Evidence of bank erosion (facing west – downstream).

Figure 2. Perched culvert outlet at upstream extent of subject property (facing east).

The erosion and channel incising observed throughout the subject property indicate that the system experiences pronounced changes in flows in response to spring freshet and precipitation events. Water levels were elevated and visibility was poor during the assessment, a result of a large rain event (25-40mm) over the previous 48 hours.

The wetted widths measured on October 31 ranged from 1.0 to 3.0m with bankfull widths of approximately 1.5 to 3.5m and bank heights ranging from 0.5 to 1.0m. Water depths were 0.3 to 0.8m. Bank and riparian areas were moderately vegetated in the areas of plantation and more heavily vegetated throughout the meadow habitat. Vegetation was dominated by terrestrial grasses and forbs, which provide some stability. Erosion was more evident in the areas associated with the plantation habitat where terrestrial grasses and forbs were more limited. Watercress (*Nasturtium officinale*) was observed in very low abundance within the channel (Figure 3), which is indicative of cool and cold-water aquatic habitat. The water temperature was measured at 10.1°C at 14:40, at which time the air temperature was 6.0°C. Conductivity was 596µs/cm, total dissolved solids was 298ppm, and pH was 7.6.

Figure 3. Watercress (*Nasturtium officinale*) within Tributary 1.

The channel substrates consist of silt, sand and clay with some small areas of gravel and cobble. Habitat and cover throughout the channel are provided mainly by undercut banks and dense overhanging terrestrial vegetation (Figure 4) within the relatively deep, incised channel.

Figure 4. Bank and riparian habitat along Tributary 1.

Tributary 3 exists within the ELC community MAM2-2 and appears to collect and divert flow from the residential lands to the west. An area of abundant watercress growth (Figures 5 and 6) was also observed along this feature, suggesting an area of groundwater input that flows to Tributary 1 through the mineral meadow marsh.

Figure 5. Tributary 3 facing upstream (west).

Figure 6. Tributary 3 facing downstream (east).

5.0 Significance and Sensitivity of Natural Features

This section of the report provides an overview of the important natural heritage features in the subject property. Based on information informed through available background information and the results of original field surveys of terrestrial and wetland habitats, significant natural features known from the study area include: Wetland, Significant Woodland, Significant Wildlife Habitat, Habitat for Endangered and Threatened Species, and Fish Habitat.

5.1 Wetland

The wetland within the subject property is unevaluated. The closest evaluated wetland is the Belgrave Creek Wetland, evaluated as non-provincially significant. This wetland is located almost 900m northeast of the unevaluated wetland, along Belgrave Creek. The closest provincially significant wetland is the Morris Creek Wetland Complex, located more than 5km to the east of the subject property. Given that both wetlands are greater than 750m from the wetland on the subject property, the unevaluated wetland within the Pletch property would not be complexed with either (according to OWES protocol). No threatened or endangered species were observed within the wetland, making it unlikely it would be provincially significant on its own, if formally evaluated.

Although likely not provincially significant, the wetland within the subject property is fairly extensive and provides habitat for numerous wildlife species. The presence of Monarch, Snapping Turtle, and Eastern Wood-Pewee, all SCC, score a value of 95 under the Special Features component of OWES (OMNRF 2014).

The boundary of the wetland in the vicinity of the proposed lots was delineated in the field by NRSI biologists and surveyed using a SXBlue II GNSS GPS unit with sub-meter accuracy.

5.2 Significant Woodland

The woodland within the subject property and contiguous lands within the study area are >4ha in size. Woodland significance was defined by the Huron Natural Heritage Study Technical Committee as forest patches that are ≥4ha (2013). As such, the woodland present within the subject property is considered significant. The boundary of the

woodland in proximity to the development area was delineated in the field by NRSI biologists and surveyed using a SXBlue II GNSS GPS unit with sub-meter accuracy.

5.3 Corridors and Linkages

Corridors and linkages are continuous, often linear, natural pathways between vegetation patches in a landscape that provide opportunities to connect natural features. They are important within the natural heritage system as they provide cover for movement of wildlife and dispersal of otherwise isolated populations.

The two tributaries of Belgrave Creek that flow through the subject land provide corridors which connect a number of nearby vegetated patches, woodlands and other watercourses in the broader landscape surrounding the study area. The linkage between these vegetation patches is weak in some areas as it is disconnected by roads, agricultural fields and development; however, the linear corridor of vegetation around Belgrave Creek provides a connection to the Maitland River and eventually the Lake Huron shoreline. These connections allow for the movement of both terrestrial and aquatic organisms through the greater natural heritage system of Huron County.

The vegetated corridor adjacent to the two tributaries is not within the area of the proposed development. The corridor and its linkages will be retained and further protected through the establishment of woodland, wetland and watercourse buffers.

5.4 Significant Wildlife Habitat

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

NRSI conducted a screening exercise that utilized general evaluation criteria set out in the SWH Technical Guide, Ecoregion 6E Criterion Schedule (OMNRF 2012), to identify the presence of candidate SWH within the subject property. Based on the background

information review, desktop analysis, and field studies, 2 SWH were confirmed for the subject property: Terrestrial Crayfish and Special Concern and Rare Wildlife Species (Eastern Wood-Pewee, Monarch, and Snapping Turtle). As well, 2 SWH were maintained as candidate for the subject property: Turtle Wintering Area and Turtle Nesting Area. All other candidate SWH types were ruled out as not occurring within the subject property. Refer to the final SWH screening exercise (Appendix V) for an analysis of each SWH type assessed within the subject property. Candidate and confirmed SWH types are discussed below.

5.4.1 Seasonal Concentration Areas

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

Turtle Wintering Area

Candidate Turtle Wintering Area SWH was documented through the observation of a single Snapping Turtle (June 14) within the central Narrow-leaved Sedge Mineral Meadow Marsh (MAM2-5) community (see Map 3). Based on the habitat present and the presence of the species, it is anticipated that Snapping Turtle overwinters within the shallow aquatic features of the MAM2-5 community.

5.4.2 Specialized Wildlife Habitat

Some species with specialized habitat for breeding require large areas of suitable habitat for their long-term survival. The largest and least fragmented habitats within a localized area will support the most significant populations of wildlife.

Turtle Nesting Area

Candidate Turtle Nesting Area SWH was documented through the observation of a single Snapping Turtle (June 14) within the central Narrow-leaved Sedge Mineral Meadow Marsh (MAM2-5) community. Based on the wetland present, including shallow aquatic features, and the presence of the species, it is anticipated that this SWH feature

may be present within the study area in the surrounding agricultural lands which contain suitable sandy soils.

5.4.3 Habitat for Species of Conservation Concern

Habitat for SCC include species that are listed as Special Concern or are rare, where populations are declining, or another featured species Confirmed habitat for Species of Conservation Concern may be considered Significant Wildlife Habitat (OMNR 2000). Based on the results of wildlife-specific field surveys, Eastern Wood-Pewee, Monarch, and Snapping Turtle were observed. An additional species, Terrestrial Crayfish, was observed.

Terrestrial Crayfish

SWH has been confirmed for Terrestrial Crayfish within the subject property (see Map 3). Several crayfish chimneys were observed within the Swamp Maple Organic Deciduous Swamp (SWD6-3) vegetation community within the southwestern portion of the Pletch property.

Special Concern and Rare Wildlife Species

Eastern Wood-Pewee SWH has been confirmed within the subject property. Vegetation communities that Eastern Wood-Pewee's were observed in include: Dry – Fresh Sugar Maple Deciduous Forest (FOD5-1), White Pine Coniferous Plantation (CUP3-2), and Willow Organic Thicket Swamp (SWT3-2), while the Fresh – Moist Poplar Deciduous Forest (FOD8-1), Swamp Maple Organic Deciduous Swamp (SWD6-3), and Dry – Fresh Sugar Maple – Beech Deciduous Forest (FOD5-2) also provide suitable habitat for the species that is contiguous with the vegetation communities where the species was observed.

SWH for Monarch is found within the subject property. Milkweed plants are spread throughout the natural vegetation communities of the subject property, with habitat for Monarch being found within the marsh wetlands and their periphery (cultural meadows).

Snapping Turtle SWH has been confirmed within the subject property. A single individual was observed within the central Narrow-leaved Sedge Mineral Meadow Marsh (MAM2-5) community.

5.5 Habitat of Endangered and Threatened Species

Observations of regulated SAR within the subject property are limited to Barn Swallow, Bobolink, and Eastern Meadowlark. As described in Section 4.4.1, Barn Swallow was observed foraging throughout the subject property and is anticipated to be nesting within the Weber property barn. Given that development is sufficiently distant from the presumed nesting location of Barn Swallows, within the Weber property barn, and that the existing pasture lands are outside of the developable lands, there are no proposed negative impacts on the species.

Eastern Meadowlark was observed incidentally (i.e. spring migrant), indicating that this species is not nesting within the area proposed for development. A pair of Bobolink's were observed within the southern portion of the Weber property, within pasture lands that is outside of the developable lands (see Map 2).

5.6 Fish Habitat

Tributary 1 is anticipated to provide direct fish habitat throughout the year, which includes cover and foraging habitat, but not suitable spawning habitat. Based on the presence of Watercress within Tributary 1 and Tributary 3, it is expected that Tributary 1 maintains cooler temperatures throughout the summer months, which may also provide thermal refuge for fish. Fish access appears to be uninhibited between Belgrave Creek and the subject property. Tributary 2 may also provide some fish habitat during times of the year when it is connected to Tributary 1.

The fish habitat within these tributaries must be protected from future development. The tributaries are located outside of the proposed development area, and will be provided further protection through watercourse, wetland and woodland buffers. Further information is provided in Section 6.2 and Section 6.4.1.

6.0 Impact Analysis

6.1 Approach to Impact Analysis

The impact analysis presented here is based on the Concept Plan, prepared by GSP Group Inc. (Appendix III).

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 completed, such as increased use of natural areas.
- Cumulative impacts associated with spatial and temporal implications of the proposed development.

6.2 Buffers

Buffers are a common and effective method to mitigate impacts from adjacent development on natural features and functions. The MVCA Regulations (O.Reg 164/06) prohibit development within 30m of a wetland (7.4.2.1.1). On existing lots of record only, single family buildings or structures may be permitted within 30m of a wetland if the interference on the hydrologic function of the wetland is acceptable to the MVCA (7.4.2.1.5) and all septic systems are located a minimum of 15m from the wetland edge (f). A 30m buffer from the wetland is recommended in accordance with MVCA policy. Any house and building development and associated grading should be outside the 30m wetland buffer. Septic systems may be closer to the wetland, but no closer than 15m to the wetland boundary. It is recommended that the 15m buffer from the wetland is a "no touch" buffer (i.e. no grading, no sheds, no ornamental landscaping). The 15m wetland buffer should be naturalized to protect the wetland from impacts.

A 10m buffer from the woodland dripline is recommended, according to best management practices. Any house and building development and associated grading (including septic system) should be outside the 10 m dripline buffer.

A 15m buffer from the bank full mark of the tributary is recommended, in accordance with O.Reg 164/06.

Proposed boundaries of the Retained Lot for future subdivision development will keep future residential lotting outside of the natural feature and associated buffers. The recommended buffers are shown on Maps 3 and 4. Additional mitigation measures are addressed below.

6.3 Direct Impacts

The approach to identifying and delineating the natural features was aimed at avoiding direct impacts from development on important natural features. Map 4 presents the proposed initial lot layout within the subject property. Direct impacts are discussed in more detail below.

6.3.1 Vegetation Removal

There will be minimal to no vegetation removal required for the development of most lots. Only lots in vicinity of the existing houses may require some tree removal. Individual tree removal should be minimized as much as possible (i.e. retain as many trees as possible). Any tree that is removed should be replaced by at least 2 caliper trees of a native species on the subject property or within the Town of Belgrave. Tree removal should occur between November 1 and March 31, to avoid impact to migratory birds or SAR bats (which would contravene the Migratory Birds Convention Act and/or the Endangered Species Act). Absolutely no vegetation should be removed from the woodlands or wetlands. Tree removal, if necessary, should occur using best management practices and arboricultural techniques, protecting any trees that are to remain standing. On Lot 1, the trees along the tributary should be protected and any building or grading should respect a 1m buffer from the dripline of the trees. In this location, the buffer and setback from the tributary will need to be factored in.

6.3.2 Wildlife and Their Habitats

According to the Canadian Wildlife Service (CWS), the peak breeding period for migratory birds that nest in treed habitat in southern Ontario is between April 1st and August 31st (CWS 2013). During this period, they recommend that no clearing of vegetation within simple and/or complex habitats occur. The *Migratory Birds Convention*

Act protects migratory birds, their eggs and nests from being harmed or destroyed at any time of the year. 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. If evidence of nesting of migratory birds are found, the nest site will be marked, with a buffer afforded to the nest, and activity in the area should cease until nesting is finished. It is therefore recommended that tree and vegetation removal and grading occur outside the peak breeding bird period, where possible. This includes the grading and building on currently farmed lands (i.e. agricultural fields), as certain species use these areas for nesting (including nests on the ground).

As a general means to limit the extent of impacts to wildlife habitat during construction, the limits of development will be clearly demarcated, including vegetation cutting and grading boundaries, so as to prevent encroachment into the surrounding natural features. Silt fencing should be correctly applied along the recommended natural heritage buffers to prohibit encroachment of machinery into natural areas, control surface water runoff and sedimentation, as well as hinder wildlife from entering construction sites.

Should any buildings be removed, such as the Weber barn, a nest search must be completed by a qualified biologist to assess the presence of active Barn Swallow nests. Should Barn Swallow nests be observed, the implications of the ESA must be followed.

Development is not proposed within the pasture where Bobolink were observed (see Section 5.4). Given that the location of observation is sufficiently distant to the proposed development (i.e. >120m), impacts to the species are therefore not anticipated (see Map 4).

Turtle nests were not observed, but turtle nesting surveys were also not completed, other than through incidental observations during other site investigations. It is possible that turtles are using the surrounding agricultural fields for nesting as they provide suitable sandy soils. Since some fields will be removed through the proposed

development, it is recommended that several turtle nesting areas be created within the buffers of the wetland to compensate for the removal of likely nesting habitat.

6.4 Indirect Impacts

6.4.1 Sediment and Erosion

Erosion and sediment control measures are recommended to be installed along the recommended buffer of any lots bordering natural heritage features (i.e. woodland or wetland) prior to any grading or digging within the area. An Erosion and Sediment Control Plan is recommended to be prepared for review and approval by MVCA and the County. The following recommendations with regards to erosion and sediment control are provided:

- All erosion control measures are to be inspected and monitored monthly or after each significant rainfall event (>13 mm), whichever is shorter, and repairs are to be completed as required.
- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any materials from leaving the site.
- Placement of sediment control fencing along buffer limits.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed.

The potential for invasive, non-native species to proliferate as a result of runoff entering natural areas, as well as encroachment by landowners are significant threats that could negatively impact the natural heritage system. Ensuring an effective Erosion and Sediment Control Plan, along with monitoring will help to ensure that the natural heritage system is not negatively impacted by invasive, non-native species proliferation. Ensuring buffers are adequately protected will ensure that encroachment by landowners does not occur in the natural heritage system.

Due to the presence of Watercress within the aquatic habitat feature (see Map 3) it is possible that groundwater input is occurring within the channel. The potential for coldwater upwelling may provide thermal refuge for fish. The proposed development will not occur within the aquatic feature, however, indirect impacts from sediment and

erosion may occur. It is recommended erosion and sediment control measures be followed as described above.

6.4.2 Water Quantity and Quality

A stormwater management plan for this development will be required and is to be prepared by an engineer familiar with maintaining wetland water balances. The stormwater management plan will need to ensure that the quality of post-development conditions are within the range to continue to support the wetlands and maintain their natural functions. As part of the stormwater management plan, a pre- to post-condition water balance will be required and will ensure that inputs to the wetlands in the post-development scenario are suitable for the wetland, in terms of water quality and quantity. A salt management plan is recommended to ensure road salts are not directed to the wetlands. Individual lot development must protect the overall existing drainage patterns within lots adjacent to natural communities (woodlands and wetlands) and should minimize impervious areas.

6.5 Induced Impacts

Induced impacts may arise following development of this area through a variety of human-induced impacts, including:

- physical disturbance of vegetation and habitat,
- noise disturbance on wildlife,
- increased light pollution adjacent to natural areas;
- dumping of yard waste or other debris into natural areas,
- entering natural features and the creation of footpaths,
- water quality impairment from pet waste or sediment
- proliferation of invasive, non-native species, and
- impacts of domestic pets on wildlife, especially the impact house cats have on the song bird population.

Stewardship brochures should be distributed to all landowners in the area, especially those with properties backing onto natural features. These brochures should contain information on how to support the continued health of the ecological resources on adjacent lands. Fencing should be considered in locations where lots back on to natural features, such as in proximity to the wetlands and woodlands. The boundary between

Lots 1 and 2 is proposed within the natural feature. Fencing should not be erected within the feature, but at the edge of the minimum buffer. Where this is not desirable, other forms of property demarcation should be considered, such as bollards. These should be erected at the buffer limit. Smaller property stakes can be used at the actual property limit.

Through the sale of the lots, property owners should be made aware of the restrictions at the backs of their properties when they buy a lot next to a natural feature. The buffers should be naturalized with native species and homeowners should not remove vegetation, mow vegetation, erect sheds or play structures in these areas, nor use buffers for storing yard waste or compost. Ideally, private lots would be entirely outside the natural areas and their buffers.

The stewardship brochures should recommend the following:

- Natural buffers are “no touch”,
- Plant a variety of native species,
- Do not plant non-native or invasive species,
- Do not use pesticides and limit use of fertilizers,
- Keep cats indoors,
- Keep dogs leashed or in fenced yards,
- Do not harm any wildlife (e.g. snakes), and
- Consider bird-friendly designs in windows.

A draft homeowner brochure has been included in Appendix IX.

The bulk of the natural features are to be retained on the lot with the Pletch house. Some stewardship of these natural areas should occur by the future property owner. The recommendations made to other property owners will apply to this owner as well. The natural areas are protected by municipal and Conservation Authority policies and should be protected in their natural states. At most, narrow footpaths could be established within the upland woodlands, where tree removal is avoided and other impacts, such as dumping and any building are prohibited. At minimum, enhancement of the natural area and associated buffers should contain periodic invasive species management and removal, prohibitions on invasive or aggressive garden species, and ensuring adherence to the buffers outlined in this EIS report. It is recommended that

details for a Restoration Management Plan should be developed at the Site Plan Application stage as to offset potential impacts.

6.6 Cumulative Impacts

The Belgrave community is a small town with limited opportunity for expansion. This is the only known development in the area. As such, there are no anticipated cumulative spatial or temporal impacts due to the proposed development.

7.0 Recommendations

The following summarizes key recommendations made in this report:

- A 30m buffer from the wetland is recommended in accordance with MVCA policy. Any house and building development and associated grading should be outside the 30m wetland buffer.
- Septic systems may be closer to the wetland, but no closer than 15m to the wetland boundary. It is recommended that the 15m buffer from the wetland is a "no touch" buffer (i.e. no grading, no sheds, no ornamental landscaping). The 15m wetland buffer should be naturalized to protect the wetland from impacts.
- Create turtle nesting mounds within the wetland buffers.
- A 10m buffer from the woodland dripline is recommended, according to best management practices. A minimum buffer of 1m from the dripline of the woodland should be protected and naturalized using native species. Any house and building development and associated grading (including septic system) should be outside the 1m dripline buffer.
- A 15m buffer from the bank full mark of the tributary is recommended, in accordance with O.Reg. 164/06.
- Any tree that is removed should be replaced by at least 2 caliper trees of a native species on the subject property or within the Town of Belgrave.
- Tree removal should occur between November 1 and March 31, to avoid impact to migratory birds or SAR bats (which would contravene the Migratory Birds Convention Act and/or the Endangered Species Act).
- Absolutely no vegetation should be removed from the woodlands or wetlands. Tree removal, if necessary, should occur using best management practices and arboricultural techniques, protecting any trees that are to remain standing.
- Should any buildings be removed, such as the Weber barn, a nest search must be completed by a qualified biologist to assess the presence of active Barn Swallow nests. Should Barn Swallow nests be observed, the implications of the ESA must be followed.
- All erosion control measures are to be inspected and monitored, and repairs are to be completed as required.

- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any materials from leaving the site.
- Placement of sediment control fencing along buffer limits.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed.
- Individual lot development must protect the overall existing drainage patterns within lots adjacent to natural communities (woodlands and wetlands) and should minimize impervious areas.
- Stewardship brochures should be distributed to all landowners in the area, especially those with properties backing onto natural features.
- Fencing should be considered in locations where lots back on to natural features, such as in proximity to the wetlands and woodlands. The boundary between Lots 1 and 2 is proposed within the natural feature. Fencing should not be erected within the feature, but at the edge of the minimum buffer.

8.0 Conclusions

NRSI was retained in February 2019 by the Municipality of Morris-Turnberry to complete an EIS for a proposed residential housing development located in Belgrave. The intent of this report is to characterize important natural features and identify potential impacts associated with the development.

The entire area proposed for development is comprised of agricultural habitats. Significant Woodland, unevaluated wetland, and Significant Wildlife Habitat is known from the subject property and are to be protected adjacent to the proposed development. Natural feature constraints were used to guide the concept plan. No direct impact to the woodland, wetlands, or Significant Wildlife Habitat is proposed. Recommendations have been made to protect the natural features and limit impact, such as planting native species to improve the overall site condition, as well as to increase education awareness of the environment through a stewardship brochure to future homeowners.

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 are not anticipated if the recommendations provided in this report are followed.

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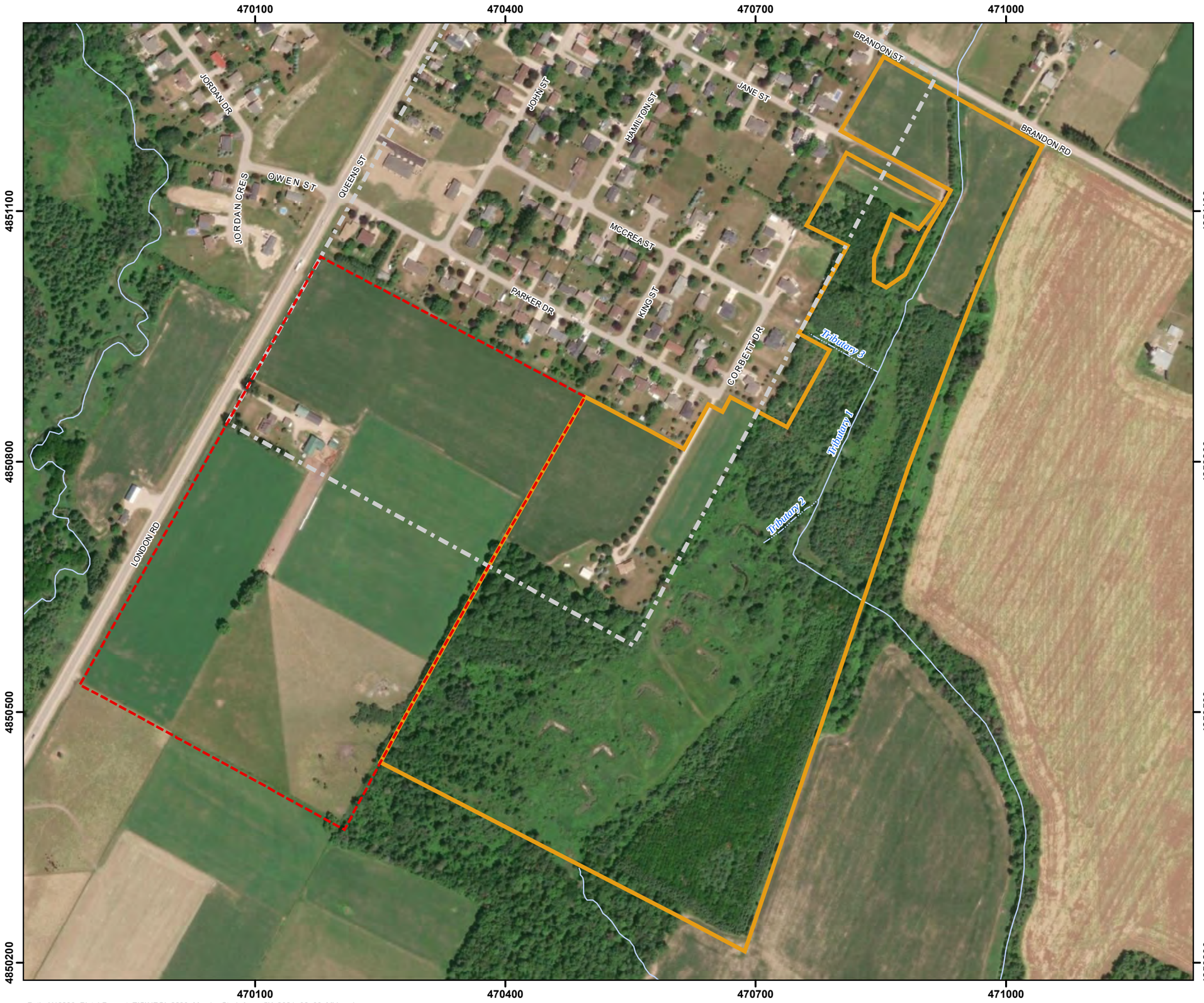
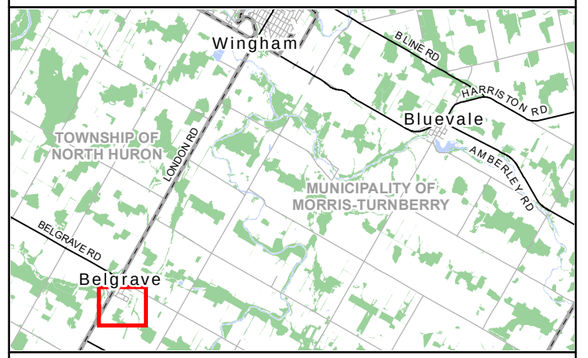
MAPS



Map 1A

Pletch and Weber Properties Environmental Impact Study

Study Area



Legend

- Pletch Property
- Weber Property
- Settlement Boundary
- Permanent Watercourse
- Intermittent Watercourse

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Aquatic, Terrestrial and Wetland Biologists

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Project: 2230
Date: February 9, 2021

NAD83 - UTM Zone 17
Size: 11x17"
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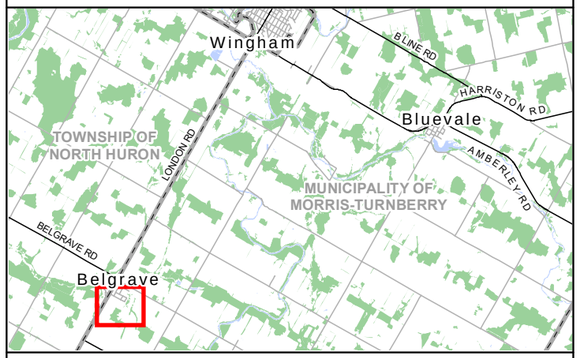
Map 1B

Pletch and Weber Properties Environmental Impact Study

Natural Features



Legend

- Huron County OP - Natural Environment
- Wetland (MVCA)
- Unevaluated Wetland
- Permanent Watercourse
- Intermittent Watercourse

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Date: June 30, 2020

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469800 470100 470400 470700 471000

4851100 4850800 4850500 4850200

BRANDON ST
JORDAN DR
QUEENS ST
JOHN ST
HAMILTON ST
JANE ST
BRANDON RD
OWEN ST
JORDAN CRES
MCCREA ST
PARKER DR
KING ST
CORBETT DR
LONDON RD

ANR-002
Agriculture (Row Crop)
CUM1
Agriculture (Row Crop)
SWD2-2
CUP3
Cemetery
MAM2-2
CUP3
BBS-006
Tributary 3
ANR-001
BBS-005
Tributary 1
SWT2-5
CUP2
Residential
Agriculture (Row Crop)
CUT1
Agriculture (Row Crop)
BBS-001
Tributary 2
CUP3
ANR-003
Residential
FOD5-1
ANR-004
SWT2-8
CUP3-2
BBS-004
BBS-002
CUP3-2
Pasture
ANR-005
MAM2-5
CUT1
FOD8-1
SWT3-2
SWD6-3
MAM2-5
BBS-003
CUP3
SWD6-3
FOD5-2

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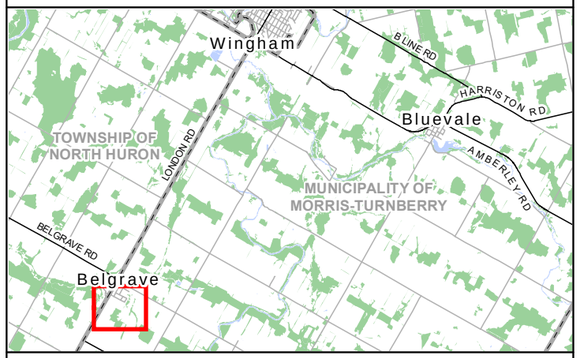
Map 2

Pletch and Weber Properties Environmental Impact Study

Vegetation Communities and Monitoring Stations



Legend

- Pletch Property
- Weber Property
- Permanent Watercourse
- Intermittent Watercourse
- Anuran Call Survey Location (ANR)
- Breeding Bird Monitoring Station (BBS)
- Ecological Land Classification (ELC)

(CUM1) Mineral Cultural Meadow Ecosite
(CUP2) Mixed Plantations
(CUP3) Coniferous Plantations
(CUP3-2) White Pine Coniferous Plantation Type
(CUT1) Mineral Cultural Thicket Ecosite
(FOD5-1) Dry - Fresh Sugar Maple Deciduous Forest Type
(FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
(FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
(MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type
(MAM2-5) Narrow-leaved Sedge Mineral Meadow Marsh
(SWD2-2) Green Ash Mineral Deciduous Swamp Type
(SWD6-3) Swamp Maple Organic Deciduous Swamp Type
(SWT2-5) Red-osier Dogwood Mineral Thicket Swamp Type
(SWT2-8) Silky Dogwood Mineral Thicket Swamp Type
(SWT3-2) Willow Organic Thicket Swamp Type

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Date: June 30, 2020

NAD83 - UTM Zone 17
Size: 11x17"
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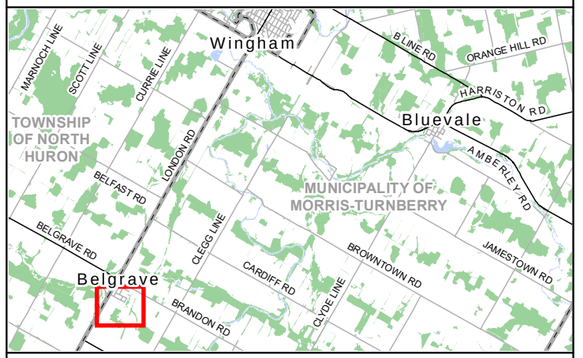
Map 3

Pletch and Weber Properties Environmental Impact Study

Significant Natural Features and Recommended Development Setbacks



Legend

- Pletch Property
- Weber Property
- Wetland Boundary (NRSI Surveyed August 7, 2019)
- Wetland Buffer (15m)
- Wetland Buffer (30m)
- Dripline (NRSI Surveyed August 7, 2019)
- Signficant Woodland Buffer (10m)
- Permanent Watercourse
- Intermittent Watercourse
- Bank Full Mark Buffer (15m)
- Potential Groundwater Input (Watercress)

Confirmed Significant Wildlife Habitat

- Terrestrial Crayfish
- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Special Concern and Rare Wildlife (Snapping Turtle)
- Special Concern and Rare Wildlife (Monarch)

Candidate Significant Wildlife Habitat

- Turtle Wintering Area

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Date: June 30, 2020

NAD83 - UTM Zone 17
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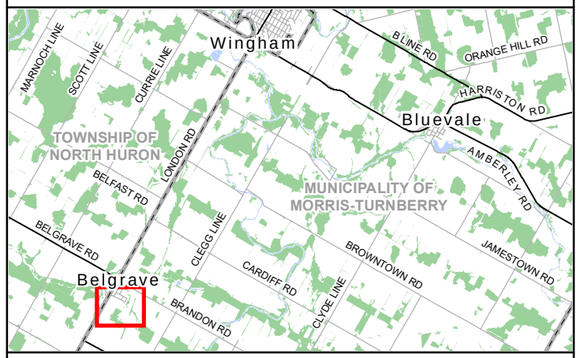
Map 4

Pletch and Weber Properties Environmental Impact Study

Concept Plan



Legend

- Pletch Property
- Weber Property
- Settlement Boundary
- Retained Lot
- Severed Lot
- Easement
- Wetland Boundary (NRSI Surveyed August 7, 2019)
- Wetland Buffer (15m)
- Wetland Buffer (30m)
- Dripline (NRSI Surveyed August 7, 2019)
- Signficant Woodland Buffer (10m)
- Permanent Watercourse
- Intermittent Watercourse
- Bank Full Mark Buffer (15m)
- Potential Groundwater Input (Watercress)

Confirmed Significant Wildlife Habitat

- Terrestrial Crayfish
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- Special Concern and Rare Wildlife (Snapping Turtle)
- Special Concern and Rare Wildlife (Monarch)

Candidate Significant Wildlife Habitat

- Turtle Wintering Area

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Project: 2230
Date: February 9, 2021

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APPENDIX I

North-South Peer Review (dated April 21, 2020) and NRSI Comment Response

21st April, 2020

Mr. Marcus Maddalena
County Biologist / Stewardship Coordinator
Huron County
Goderich, Ontario

Re: North-South Environmental Peer Review – EIS for 61 Corbett Drive (Pletch Property) and 84976 Huron County Road 4 (Weber Property), Belgrave, Ontario - TOR.

Dear Mr. Maddalena,

North-South Environmental (NSE) has been retained by Huron County to review the Environmental Impact Study (EIS) prepared by Natural Resource Solutions Inc. (NRSI) for 61 Corbett Dr and 84976 Huron County Road 4, in Huron County (herein referred to as the 'Subject Lands') from a Natural Heritage perspective. We previously reviewed the Terms of Reference (TOR) for this study. The subject lands include areas identified as 'Natural Environment' in the County Official Plan (2013), and hydrologic features including a Wetland and a Watercourse feature regulated by Maitland Valley Conservation Authority (MVCA).

Documents reviewed for this peer review were:

- NRSI 2019. Pletch and Weber Properties, Belgrave, Ontario Environmental Impact Study. Report prepared for the Municipality of Morris-Turnberry, Brussels, Ontario.
- North-South Environmental Inc. 2019. North-South Environmental Peer Review – 61 Corbett Drive (Pletch Property) and 84976 Huron County Road 4 (Weber Property), Belgrave, Ontario - TOR. Report prepared for Huron County, dated 3rd May, 2019.

This report provides initial general comments and follows them with specific comments on individual sections of the EIS, referring to the section numbers in the report.

General Comments

- In general, the methods described for field surveys correspond with industry protocols from the Ontario Ministry of Natural Resources and Forestry (MNRF) and Environment Canada that are followed by consultants in Ontario. The methods for field surveys provide a comprehensive overview of the flora and fauna of the site. We describe a few discrepancies with established methods in the review of individual exceptions below.
- We would agree for the most part with the analyses of the significance of the site, with one exception. The section on Significant Wildlife Habitat / Specialized Habitat for Wildlife does not include amphibian breeding habitat. However, the reported findings of the amphibian surveys indicate that the wetlands on the site constitute Significant Wildlife Habitat (SWH) for amphibian breeding. The rationale for this is provided in comments on Section 5.4 (Page 4).

- In general, the assessment and description of impacts requires additional consideration. Not enough detail on impacts has been provided to inform / confirm the proposed mitigation.
- Four lot boundaries include part of the edge of the natural heritage feature itself. This is certain to result in degradation of natural heritage in that area, and in fact would likely provide a conduit for impacts throughout the feature.
- Buffers:
    - The site plan includes buffer areas within lot boundaries, a practice that has been shown to be highly ineffective at protecting natural heritage in southern Ontario in the vicinity of urban development and would likely be similarly ineffective in Huron County.
    - Buffers should be located outside lots. We strongly disagree with the approach to buffers, particularly with regard to mitigation of impacts of encroachment from surrounding development.

Section 1.0 Introduction

As noted by Melissa Tonge (NSE 2019) in her comments on the TOR, the draft 2017 Morris-Turnberry EIS guidelines could have also been consulted (http://www.morristurnberry.ca/media/PDF/morris-turnberryofficialplan5yearreview.pdf).

Please review the guidelines to ensure all elements are addressed.

Section 1.3 Project Scoping

The bulleted list of sources in this section should include Department of Fisheries and Oceans Aquatic Species at Risk mapping (https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html).

Please include this mapping in the report.

Section 3.1 Field Surveys

Vegetation community mapping does not describe the methods used to obtain soil samples. Soil samples are a standard part of Ecological Land Classification (ELC) as described by Lee et al. (1998). In following sections describing vegetation communities, the description of soils in relation to ELC communities was inconsistent: some had descriptions of soils and some did not.

Please provide rationale for approach used for soil sampling (i.e., for sampling some, but not all sites).

Table 2. Field Survey Summary

Bat habitat assessment was conducted on May 16th. This date was likely reasonable for searching for tree cavities for Myotis bat species, which must be surveyed in leaf-off condition. However, one of the species identified in the preliminary list of SAR was Tri-coloured Bat, which roosts in leaf clusters (generally in Red Oak (*Quercus rubra*), and for which habitat should be surveyed in leaf-on condition.

Please provide comment on whether the site provides habitat for Tri-colored Bat.

Section 4.0 Existing Conditions

Section 4.3. Vegetation

Section 4.3.1. Vegetation Communities

Reporting on soil texture, depth of mottles and gley, depth of organic material and classification of soil moisture, are standard parts of vegetation community classification, especially for wetlands. The reporting of soils is inconsistent: it has been reported (incompletely) for some communities and not others.

The soil classification should be reported at a minimum for each wetland community.

Section 4.4 Wildlife

Section 4.4.1. Birds

It was noted that Barn Swallows observed on the property were "likely nesting in a local barn". The Barn Swallow Recovery Strategy notes habitat up to 200 m from a nest site is the primary foraging area for this species and is important for Barn Swallow recovery. This "likely" nesting site is on the subject property, approximately 200 m from the southern boundary of the proposed development, and potential impacts to Barn Swallows should be addressed. Nests of Barn Swallows are very recognizable so it is not clear why a search was not conducted within the barn.

The barn should be confirmed (or not) as Barn Swallow nesting habitat. If the barn is too hazardous to enter, the swallows' behaviour should be observed around the barn, to see if their behaviour is consistent with breeding.

Section 4.4.4.1. Bat Habitat Assessment

This section noted: "*Based on the habitat present within the deciduous forest communities (e.g., FOD5-1, FOD5-2, and FOD8-1 communities) within the subject property it is anticipated that bats are present*." Endangered bat species roost in tree cavities within both forest and swamp communities. Northern Myotis prefers to forage over flooded woodland pools, and Little Brown Myotis forages over many different types of ponds. Endangered bat species are likely highly dependent on wetlands within the site.

The importance of the wetlands to bat species should be described.

Section 5. Significance and Sensitivity of Natural Features

This section notes that "*significant natural features known from the study area include: Wetland, Significant Woodland, Significant Wildlife Habitat, and Habitat for Endangered and Threatened Species*." It should also have listed Fish Habitat.

Section 5.1. Wetland

The final sentence of the first paragraph reads: "*No threatened or endangered species were observed within the wetland, making it unlikely it would be provincially significant on its own, if formally evaluated*." This sentence ignores the potential for Endangered bats to roost within trees in wooded wetland communities, and to forage in wetland communities. Several provincial species of Special Concern were also noted within wetland habitat.

At a minimum, the Special Features point score for provincially significant species, including bats and species of Special Concern, should be calculated to determine whether it is sufficient to meet the criterion for provincial significance. The implications of any change in status should be discussed.

Section 5.4. Significant Wildlife Habitat

Breeding habitat for amphibians was dismissed as a type of SWH by the screening table (Appendix III, Table 2). However, breeding habitat for woodland amphibians should have been discussed here as the southern part of the wetland meets the criterion for Significant Wildlife Habitat (SWH) for Breeding Habitat for Amphibians (Woodlands). The number of amphibians observed at stations 3, 4 and 5 meet the criteria described in the Ecoregion Schedules for Ecoregion 6E for habitat for woodland breeding amphibians. The MNRF criteria regarding numbers and species is as follows: "*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) or 2 or more of the listed frog species with Call Level Codes of 3*." The call code for Spring Peepers at these three stations was 3; and 3 or 4 species were noted at each of these stations.

We have asked MNRF staff in the past for clarification of this criterion, and they have noted that a call code of 3 implies that more than 20 individuals are present, as it indicates that the frogs were too numerous to count. Therefore, the total number of amphibians within the wetland at each of these stations was at least 20. The criterion does not mean that two or more species must be documented each at a call code of 3. Based on this, the numeric criterion is met. Presence of 3-4 species at the ponds / stations meets the species criterion.

The report should be revised to reflect the confirmed presence of amphibian breeding (woodland) SWH. Please consider whether this affects the impact assessment or recommended mitigation measures.

Section 5.4.2. Specialized Wildlife Habitat

Turtle Nesting Area

This section is unclear: it says: "*Based on the wetland present, including shallow aquatic features, and the presence of the species, it is anticipated that this SWH feature [turtle nesting area] is present within the study area"*. Since turtles nest in upland habitats (usually sandy areas above the waterline) the turtles likely nest outside the wetland.

It is said later in the report that turtles likely nested in agricultural habitats, and this is more likely the case, though they may nest in many open upland areas of the site.

Potential nesting areas should be mapped, so that they can be used to inform mitigation in the appropriate section.

Seeps and Springs

The potential for seeps and springs is dismissed as a potential SWH in the screening table (Appendix III, Table 2), but organic soils likely indicate groundwater seepage in the Swamp Maple Organic Deciduous Swamp. In addition, Watercress (*Nasturtium officinale*) was documented within the stream, and was noted to be an indicator of cold water aquatic habitat. Watercress is an indicator of groundwater inputs.

Seepage areas should be mapped so they can be used to inform impacts and mitigation.

Section 5.6. Fish Habitat

This section states: "*Based on the presence of Watercress within the primary channel, it is expected that the watercourse maintains cooler temperatures throughout the summer months, which may also provide thermal refuge for fish*." As noted above, Watercress is an indicator of groundwater inputs to the stream. The areas of thermal refuge may be localized to groundwater upwelling areas in the stream bed.

Potential groundwater inputs (presence of watercress) should be shown so they can inform impacts and mitigation.

Section 6.0. Impact Analysis

Section 6.2. Buffers

The description of buffer widths is extremely unclear and inconsistent. The following sentence is an example:

"A 10m buffer from the woodland dripline is recommended, according to best management practices. It is recognized that the proposed lots overlap with some of these proposed buffers. A minimum buffer of 1m from the dripline of the woodland should be protected and naturalized using native species. Any house and building development and associated grading (including septic system) should be outside the 1m dripline buffer."

The buffers are, for the most part, within the lots. In the case of lots 18-20, the edge of the feature itself is within the lots. The inclusion of buffers and features within lots has been shown in our experience to be ineffective to protect natural features where intensive residential development occurs.

A buffer should function to protect the adjacent feature from development. If the buffer is not clearly marked, or is accessible to the adjacent landowner (and it would be entirely accessible as it is within the lot itself) it loses that function, as follows:

- It no longer has the same capacity to protect the feature from runoff bearing sediments and contaminants, which requires "rough" vegetation of sufficient width according to the slope, soil type etc. We frequently see sediment in runoff pooling in wetlands with buffers that are too narrow;
- It protects tree roots from damage from grading of adjacent features; tree roots can frequently extend beyond 1 m from the dripline so tree damage would be likely in a 1 m buffer.
- It allows the landowner to encroach on the feature, as is common in residential properties adjacent to natural features: for example we commonly see landowners remove vegetation, dump compost and building debris, erect structures such as sheds and gazebos, and dump swimming pool water in natural areas if the buffer is within their lots.

The 1m buffer would likely barely be respected. The 10 m buffer would probably be ignored entirely, as there is no rigorous recommendation that restricts even buildings, grading and septic systems within the 10 m buffer. It would be impossible to enforce this "buffer within a buffer" approach.

Similarly, the "buffer within a buffer" system for wetlands, where buffers are included in lots, with a 15 m buffer and a 30 m buffer both within the lot, will not be effective.

Buffers should be delineated between the feature boundary and the lot boundary.

Section 6.3.2. Wildlife and Their Habitats

The following sentence is incorrect, citing the wrong document:

"*According to the Canadian Wildlife Service (CWS), the peak breeding period for migratory birds that nest in treed habitat in southern Ontario is between May 1 and July 31 (CWS 2013).*"

According to the Government of Canada Nesting Periods for Migratory Birds (Environment Canada 2018), the nesting period for birds in zone C2 (the zone in which the site is located) is early April to late August (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#toc0).

If vegetation is removed within the nesting period, nest searches should be conducted; if evidence of nesting of migratory birds is found, the nest site should be marked, with a buffer added, and activity in the area should cease until nesting is finished.

Methods stated for protection of habitat in this section are too weak and unclear, as illustrated by the following sentence (Page 35): "*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.*"

"Efforts should be made" does not carry the weight of a firm recommendation.

Recommendations should be stated firmly, in clear language.

Section 6.4. Indirect Impacts

Section 6.4.1. Sediment and Erosion

The recommendations for sediment and erosion control do not correspond with current standards. An Erosion and Sediment Control Plan should be prepared for review and approval by the Conservation Authority and municipality. Recommendations for monitoring during construction should specify frequency of monitoring.

The potential for invasive, non-native species to proliferate as a result of runoff entering natural areas and encroachment by landowners should be addressed in this section.

6.4.2. Water Quantity and Quality

Recommendations in this section are too vague. Stormwater management plans should be prepared in conjunction with an engineer who is familiar with the requirements for maintaining wetlands and ensure that the quality of post-development flows to the wetland are within the range that will continue to support the wetland and maintain its functions. The pre- and post-development water balance should be analysed and water quantity should mimic pre-development flows. Water that contains salt should not be directed to the wetland as salt is not treated by storm water facilities.

Section 6.5. Induced Impacts

The list of induced impacts should include the potential proliferation of invasive, non-native species, as this is one of the most significant threats to natural areas from adjacent development.

Impacts of artificial light should be discussed.

The buffer widths proposed, and the inclusion of buffers (and in the case of lots 18-20, inclusion of the edge of the feature itself) within the lots will not protect the feature from induced impacts. Impacts from encroachment of adjacent landowners are consistently observed within natural features – for example dumping of debris, compost, clearing of vegetation and planting non-native species, erection of structures and dumping of swimming pool water. There are no mechanisms to enforce maintenance of vegetation within lots, so that the inclusion of the feature edge and buffers within lots will lead to negative impacts within the features.

The stewardship brochure will not be effective in limiting a significant number of the bulleted list of landowners' behaviours within their own properties. Moreover, these are typically only received by the initial purchaser; re-sale of homes will not typically include provision of this information effectively removing the efficacy of this as a mitigation measure. Stewardship brochures are a recommended measure to support other more stringent measures, not as a primary mitigation measure.

Buffers should be outside the lot boundaries.

Section 6.6. Cumulative Impacts

The potential for cumulative impacts would likely include degradation of the feature (degradation in vegetation quality, loss of ground flora diversity, reduction in breeding bird abundance and diversity) from the following cumulative impacts:

- encroachment from adjacent landowners,
- creation of user-generated trails within the feature and trampling of vegetation,
- impacts from off-leash dogs and cats,
- entry of sediment-bearing runoff to wetland and woodland communities; and
- changes in light regime adjacent to natural areas.

The cumulative consequence of these impacts would likely be consequent invasion of non-native invasive species and loss of biodiversity.

Please do not hesitate to call if you have questions or concerns about the comments.

Yours Truly,

Sarah Mainguy, B.Sc., M.Sc.

North-South Environmental Inc. Comments (Dated April 21, 2020) to the County of Huron
Pletch and Weber Property Revised Environmental Impact Study (February 2021)

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
1	Section 1.0 Introduction As noted by Melissa Tonge (NSE 2019) in her comments on the TOR, the draft 2017 Morris-Turnberry EIS guidelines could have also been consulted (http://www.morristurnberry.ca/media/PDF/morris-turnberryofficialplan5yearreview.pdf). Please review the guidelines to ensure all elements are addressed.	Reference to the Morris-Turnberry Official Plan has been included and consulted.	Section 1.0	Y
2	Section 1.3 Project Scoping The bulleted list of sources in this section should include Department of Fisheries and Oceans Aquatic Species at Risk mapping (https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html). Please include this mapping in the report.	Reference to the Department of Fisheries and Oceans (DFO) Aquatic Species at Risk mapping has been included within Section 1.3 and referenced appropriately. No species at risk or associated critical habitats are identified within the study area according to DFO. As such, mapping is not applicable.	Section 1.3	Y
3	Section 3.1 Field Surveys Vegetation community mapping does not describe the methods used to obtain soil samples. Soil samples are a standard part of Ecological Land Classification (ELC) as described by Lee et al. (1998). In following sections describing vegetation communities, the description of soils in relation to ELC communities was inconsistent: some had descriptions of soils and some did not. Please provide rationale for approach used for soil sampling (i.e., for sampling some, but not all sites).	Soil sampling was completed using a standard T-handle manual soil auger. The primary objective for this particular project was to identify wetland soils (or lack thereof), as measured by the moisture regime determined by the mottling depth for the effective texture, particularly for vegetation communities where a wetland versus lowland (i.e. non-wetland) ELC classification proved challenging. High-level soil sampling was also completed for all wetland	Section 4.1	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
		communities to determine organic versus mineral substrates in order to assign an accurate ELC classification. This was done by simply probing the uppermost soil layer to a depth of approximately 30-40cm to determine if organic wetland vegetation communities were present. Detailed soil sampling was not completed for those vegetation communities with easily discernible ELC classifications, such as CUP3, FOD5-1, MAM2-5, SWT3-2, as it was deemed by the field biologist to provide minimal value (if any) to the site characterization. The general soil types encountered on-site have been updated in the revised EIS (Section 4.1). Soil sampling results are provided in Appendix VI.		
4	Table 2. Field Survey Summary Bat habitat assessment was conducted on May 16th. This date was likely reasonable for searching for tree cavities for Myotis bat species, which must be surveyed in leaf-off condition. However, one of the species identified in the preliminary list of SAR was Tri-coloured Bat, which roosts in leaf clusters (generally in Red Oak (*Quercus rubra*), and for which habitat should be surveyed in leaf-on condition. Please provide comment on whether the site provides habitat for Tri-colored Bat.	Table 2 has been updated to confirm leaf-on surveys were conducted (June 14, 2019). However, the site does not provide optimum habitat for Tri-colored Bat, given the lack of Red Oak. NHIC data indicates there are no known locations of Tri-colored Bat within 8km of the site.	Table 2	Y
5	Section 4.3.1. Vegetation Communities	Refer to NRSI response to NSE Comment #3.	n/a	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	Reporting on soil texture, depth of mottles and gley, depth of organic material and classification of soil moisture, are standard parts of vegetation community classification, especially for wetlands. The reporting of soils is inconsistent: it has been reported (incompletely) for some communities and not others. The soil classification should be reported at a minimum for each wetland community.			
6	Section 4.4.1. Birds It was noted that Barn Swallows observed on the property were "likely nesting in a local barn". The Barn Swallow Recovery Strategy notes habitat up to 200 m from a nest site is the primary foraging area for this species and is important for Barn Swallow recovery. This "likely" nesting site is on the subject property, approximately 200 m from the southern boundary of the proposed development, and potential impacts to Barn Swallows should be addressed. Nests of Barn Swallows are very recognizable so it is not clear why a search was not conducted within the barn. The barn should be confirmed (or not) as Barn Swallow nesting habitat. If the barn is too hazardous to enter, the swallows' behaviour should be observed around the barn, to see if their behaviour is consistent with breeding.	Access was not granted to survey within the Weber property barn. However, field surveys did carefully note that the species is almost certainly nesting within the barn, given ideal foraging areas immediately adjacent to the barn, and nesting opportunities afforded by the barn. Impacts associated with the proposed development and Barn Swallows are documented in the EIS (Section 5.5 and 6.3.2).	Section 4.4.1, 5.5	Y
7	*Section 4.4.4.1. Bat Habitat Assessment* This section noted: "*Based on the habitat present within the deciduous forest communities (e.g., FOD5-1, FOD5-2, and FOD8-1 communities) within the subject property it is anticipated that bats are present*." Endangered bat species roost in tree cavities within both forest and swamp communities. Northern Myotis prefers to forage over flooded woodland pools, and Little Brown Myotis forages over many different types of ponds. Endangered bat species are likely highly dependent on wetlands within the site. The importance of the wetlands to bat species should be described.	The importance that the wetlands on-site may have for bat SAR is described in Section 4.4.4.1.	Section 4.4.4.1	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
8	Section 5. Significance and Sensitivity of Natural Features This section notes that "*significant natural features known from the study area include: Wetland, Significant Woodland, Significant Wildlife Habitat, and Habitat for Endangered and Threatened Species*." It should also have listed Fish Habitat.	Fish Habitat is now listed under the introductory paragraph for Significant and Sensitivity.	Section 5.0	Y
9	Section 5.1. Wetland The final sentence of the first paragraph reads: "*No threatened or endangered species were observed within the wetland, making it unlikely it would be provincially significant on its own, if formally evaluated*." This sentence ignores the potential for Endangered bats to roost within trees in wooded wetland communities, and to forage in wetland communities. Several provincial species of Special Concern were also noted within wetland habitat. At a minimum, the Special Features point score for provincially significant species, including bats and species of Special Concern, should be calculated to determine whether it is sufficient to meet the criterion for provincial significance. The implications of any change in status should be discussed.	**A. SAR Bats** Bat habitat assessments were conducted for the proposed development area only to identify suitable roosting habitat for bats, including to inform if any potential habitat for SAR bats exists. Bat presence surveys were not conducted within the scope of this study, per the approved Terms of Reference. Accordingly, potential presence of any bat SAR was unconfirmed within the scope of this study. The Southern Ontario OWES (2014) (Section 4.1.2) specifies that significant species known from the general area, such as those reported on the NHIC as Element Occurrences (EOs), should not be scored without supporting observational records to confirm species presence. Accordingly, while suitable foraging and roosting habitat for bats, including SAR bats, may be present within the study area, presence has not been confirmed within the scope of this study and	Section 5.1	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
		therefore cannot be scored per Section 4.1.2.1 and/or 4.1.2.2 of the OWES (2014). **B. Other SCC** Other provincially-significant species (i.e. SCC) observed within the wetland communities on-site include: Monarch, Snapping Turtle, Eastern Wood-Pewee. According to Section 4.1.2.3 of the OWES (2014), the presence of these 3 species, as confirmed within the scope of this study, scores a value of 95 in the Special Features component. Therefore, the presence of the 3 identified SCC alone is insufficient to score the wetlands as provincially significant, given that a score of 200 or greater in the Special Features component is required to qualify as PSW.		
10	Section 5.4. Significant Wildlife Habitat Breeding habitat for amphibians was dismissed as a type of SWH by the screening table (Appendix III, Table 2). However, breeding habitat for woodland amphibians should have been discussed here as the southern part of the wetland meets the criterion for Significant Wildlife Habitat (SWH) for Breeding Habitat for Amphibians (Woodlands). The number of amphibians observed at stations 3, 4 and 5 meet the criteria described in the Ecoregion Schedules for Ecoregion 6E for habitat for woodland breeding amphibians. The MNRF criteria regarding numbers and species is as follows: "*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*	Although three or more frog species were noted from stations ANR-003, ANR-004, and ANR-005, only two criterion species (Spring Peeper and Wood Frog) were observed within the subject property. Both Spring Peeper and Wood Frog were only recorded from stations ANR-004, and ANR-005. In NRSI's experience regarding the number of individuals included for Call Code 3, an estimate of individuals cannot be expressed as a number, given the large overlap in	Appendix II	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	masses) or 2 or more of the listed frog species with Call Level Codes of 3." The call code for Spring Peepers at these three stations was 3; and 3 or 4 species were noted at each of these stations. We have asked MNRF staff in the past for clarification of this criterion, and they have noted that a call code of 3 implies that more than 20 individuals are present, as it indicates that the frogs were too numerous to count. Therefore, the total number of amphibians within the wetland at each of these stations was at least 20. The criterion does not mean that two or more species must be documented each at a call code of 3. Based on this, the numeric criterion is met. Presence of 3-4 species at the ponds / stations meets the species criterion. The report should be revised to reflect the confirmed presence of amphibian breeding (woodland) SWH. Please consider whether this affects the impact assessment or recommended mitigation measures.	calls. This may be especially true for Spring Peeper which overlap frequently in their call behaviour and call structure. It is evident that Spring Peeper were recorded at a Call Level Code of 3 at both ANR-004 and ANR-005, and that Wood Frog totalled two individuals at ANR-004 and four individuals at ANR-005. It is NRSI's understanding that 20 individuals are not evident given the indistinction in determining individuals and that anuran survey results do not meet the criterion for Significant Wildlife Habitat for amphibian breeding habitat (woodland). Confirmation from MNRF staff (J. Crowley) is included, which confirms NRSI's interpretation of this SWH feature as not present.		
11	Section 5.4.2. Specialized Wildlife Habitat Turtle Nesting Area This section is unclear: it says: "*Based on the wetland present, including shallow aquatic features, and the presence of the species, it is anticipated that this SWH feature [turtle nesting area] is present within the study area".* Since turtles nest in upland habitats (usually sandy areas above the waterline) the turtles likely nest outside the wetland. It is said later in the report that turtles likely nested in agricultural habitats, and this is more likely the case,	Clarification has been provided in Section 5.4.2. Turtle Nesting Area SWH was not confirmed within the study area as targeted surveys were outside the scope of the approved Terms of Reference. Based on suitable sandy soils in the surrounding agricultural uplands turtle nesting is anticipated but not confirmed. As such, mapping of	Section 5.4.2, and Section 6.3.2	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	though they may nest in many open upland areas of the site. Potential nesting areas should be mapped, so that they can be used to inform mitigation in the appropriate section.	potential nesting areas cannot be completed. NRSI recommended in Section 6.3.2 that turtle nesting areas be created within the created buffers to offset removal of some agricultural lands due to the development and loss of potential nesting areas.		
12	Seeps and Springs The potential for seeps and springs is dismissed as a potential SWH in the screening table (Appendix III, Table 2), but organic soils likely indicate groundwater seepage in the Swamp Maple Organic Deciduous Swamp. In addition, Watercress (*Nasturtium officinale*) was documented within the stream, and was noted to be an indicator of cold water aquatic habitat. Watercress is an indicator of groundwater inputs. Seepage areas should be mapped so they can be used to inform impacts and mitigation.	Seeps and springs were not observed on-site within the scope of this study, despite the presence of vegetation communities with organic substrates and the observation of Watercress. Notwithstanding, groundwater inputs to the wetland communities are possible based on the vegetation observed, such as Watercress, however, no discernable areas of groundwater expression were observed on-site that would satisfy the SWH criteria.	n/a	Y
13	Section 5.6. Fish Habitat This section states: "*Based on the presence of Watercress within the primary channel, it is expected that the watercourse maintains cooler temperatures throughout the summer months, which may also provide thermal refuge for fish*." As noted above, Watercress is an indicator of groundwater inputs to the stream. The areas of thermal refuge may be localized to groundwater upwelling areas in the stream bed. Potential groundwater inputs (presence of watercress) should be shown so they can inform impacts and mitigation.	Due to the presence of Watercress, an area of potential groundwater input has been described in Section 5.6 and impacts detailed in Section 6.4.1. The area of potential groundwater input has been mapped on Map 3 and Map 4.	Section 5.6, 6.4.1, Map 3, and Map 4	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
14	Section 6.2. Buffers The description of buffer widths is extremely unclear and inconsistent. The following sentence is an example: *"A 10m buffer from the woodland dripline is recommended, according to best management practices. It is recognized that the proposed lots overlap with some of these proposed buffers. A minimum buffer of 1m from the dripline of the woodland should be protected and naturalized using native species. Any house and building development and associated grading (including septic system) should be outside the 1m dripline buffer."* The buffers are, for the most part, within the lots. In the case of lots 18-20, the edge of the feature itself is within the lots. The inclusion of buffers and features within lots has been shown in our experience to be ineffective to protect natural features where intensive residential development occurs. A buffer should function to protect the adjacent feature from development. If the buffer is not clearly marked, or is accessible to the adjacent landowner (and it would be entirely accessible as it is within the lot itself) it loses that function, as follows: • It no longer has the same capacity to protect the feature from runoff bearing sediments and contaminants, which requires "rough" vegetation of sufficient width according to the slope, soil type etc. We frequently see sediment in runoff pooling in wetlands with buffers that are too narrow; • It protects tree roots from damage from grading of adjacent features; tree roots can frequently extend beyond 1 m from the dripline so tree damage would be likely in a 1 m buffer. • It allows the landowner to encroach on the feature, as is common in residential properties adjacent to natural features: for example we commonly see landowners	The Township has revised the lot layout and rezoned the Pletch property to accommodate adequate buffers. Proposed boundaries of the Retained Lot for future subdivision development will keep future residential lotting outside of the natural features and their associated buffers. Updated recommendations with respect to buffers is provided.	Section 6.2 Map 4	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	remove vegetation, dump compost and building debris, erect structures such as sheds and gazebos, and dump swimming pool water in natural areas if the buffer is within their lots. The 1m buffer would likely barely be respected. The 10 m buffer would probably be ignored entirely, as there is no rigorous recommendation that restricts even buildings, grading and septic systems within the 10 m buffer. It would be impossible to enforce this "buffer within a buffer" approach. Similarly, the "buffer within a buffer" system for wetlands, where buffers are included in lots, with a 15 m buffer and a 30 m buffer both within the lot, will not be effective. Buffers should be delineated between the feature boundary and the lot boundary.			
15	Section 6.3.2. Wildlife and Their Habitats The following sentence is incorrect, citing the wrong document: "*According to the Canadian Wildlife Service (CWS), the peak breeding period for migratory birds that nest in treed habitat in southern Ontario is between May 1 and July 31 (CWS 2013).*" According to the Government of Canada Nesting Periods for Migratory Birds (Environment Canada 2018), the nesting period for birds in zone C2 (the zone in which the site is located) is early April to late August (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#toc0). If vegetation is removed within the nesting period, nest searches should be conducted; if evidence of nesting of migratory birds is found, the nest site should be marked,	The timing window has been corrected to April 1st to August 31st. Clarification surrounding nest survey requirements and actions to protect species is outlined.	Section 6.3.2	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	with a buffer added, and activity in the area should cease until nesting is finished. Methods stated for protection of habitat in this section are too weak and unclear, as illustrated by the following sentence (Page 35): "*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.*" "Efforts should be made" does not carry the weight of a firm recommendation. Recommendations should be stated firmly, in clear language.			
16	Section 6.4.1. Sediment and Erosion The recommendations for sediment and erosion control do not correspond with current standards. An Erosion and Sediment Control Plan should be prepared for review and approval by the Conservation Authority and municipality. Recommendations for monitoring during construction should specify frequency of monitoring. The potential for invasive, non-native species to proliferate as a result of runoff entering natural areas and encroachment by landowners should be addressed in this section.	Recommendations that an Erosion and Sediment Control Plan be prepared for approval and review by the MVCA and County have been included. Frequency of monitoring has been specified. Information regarding the potential for non-native, invasive species proliferation and buffer encroachment have been addressed.	Section 6.4.1	Y
17	6.4.2. Water Quantity and Quality Recommendations in this section are too vague. Stormwater management plans should be prepared in conjunction with an engineer who is familiar with the requirements for maintaining wetlands and ensure that the quality of post-development flows to the wetland are within the range that will continue to support the wetland and maintain its functions. The pre- and post-development water balance should be analysed and	Recommendations stating that a SWM plan be prepared by an engineer familiar with maintaining wetland form and function has been made. Further recommendations, including ensuring the quality of post-development conditions are within	Section 6.4.2	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	water quantity should mimic pre-development flows. Water that contains salt should not be directed to the wetland as salt is not treated by storm water facilities.	the range to support the wetland maintains functions has been stated. A water-balance comparing pre- to post-development has been described. A salt management plan has been recommended to ensure road salts are not directed to the wetlands.		
18	Section 6.5. Induced Impacts The list of induced impacts should include the potential proliferation of invasive, non-native species, as this is one of the most significant threats to natural areas from adjacent development. Impacts of artificial light should be discussed. The buffer widths proposed, and the inclusion of buffers (and in the case of lots 18-20, inclusion of the edge of the feature itself) within the lots will not protect the feature from induced impacts. Impacts from encroachment of adjacent landowners are consistently observed within natural features – for example dumping of debris, compost, clearing of vegetation and planting non-native species, erection of structures and dumping of swimming pool water. There are no mechanisms to enforce maintenance of vegetation within lots, so that the inclusion of the feature edge and buffers within lots will lead to negative impacts within the features. The stewardship brochure will not be effective in limiting a significant number of the bulleted list of landowners' behaviour within their own properties. Moreover, these are typically only received by the initial purchaser; re-sale of homes will not typically include provision of this information effectively removing the efficacy of this as a mitigation measure. Stewardship brochures are a	Updated text includes potential proliferation of invasive, non-native species and discusses artificial light impacts. Buffers from natural features are proposed to be situated outside of the lot layout for the future subdivision. Recommendations for a Restoration Management Plan is outlined during the Site Plan Application Stage.	Section 6.2 Section 6.5 Map 4	Y

Comment No.	North-South Comment	NRSI Response	Location in Revised EIS	Completed (Y/N)
	recommended measure to support other more stringent measures, not as a primary mitigation measure. Buffers should be outside the lot boundaries.			
19	Section 6.6. Cumulative Impacts The potential for cumulative impacts would likely include degradation of the feature (degradation in vegetation quality, loss of ground flora diversity, reduction in breeding bird abundance and diversity) from the following cumulative impacts: • encroachment from adjacent landowners, • creation of user-generated trails within the feature and trampling of vegetation, • impacts from off-leash dogs and cats, • entry of sediment-bearing runoff to wetland and woodland communities; and • changes in light regime adjacent to natural areas. The cumulative consequence of these impacts would likely be consequent invasion of non-native invasive species and loss of biodiversity.	Potential degradation of natural features due to landowner encroachment, unauthorized trails, trampling of vegetation, and domestic animals are outlined in Section 6.5. Impacts of sediment-bearing runoff and light pollution have also been added to induced impacts in Section 6.5. Further, NRSI has included recommendation for a restoration management plan and enhancement of the natural areas adjacent to the proposed development to offset potential impacts in Section 6.5.	Section 6.5	Y

APPENDIX II

MNRF Correspondence (J. Crowley pers. comm.)

-------- Forwarded Message --------
Subject:RE: SWH - Amphibian Breeding (Wetland or Woodland) - Input on criteria?
Date: Wed, 9 Oct 2019 14:29:55 +0000
From: Crowley, Joe (MECP) <Joe.Crowley@ontario.ca>
To: Jennifer McCarter <jmccarter@nrsi.on.ca>
CC: Heather Fotherby <hfotherby@nrsi.on.ca>

Hey Jen,

I agree with you; that would be my interpretation of that criterion as well. Frankly, I don't really think it could be interpreted any differently. Maybe the district is referring to another criteria somewhere else that only requires one species with call code 3? I suggest responding to them with a similar e-mail – quote the criteria and provide your interpretation – and ask them if there is something you are missing….

Cheers,
Joe

Joe Crowley
Species at Risk Specialist (Herpetology)
Species at Risk Branch
Ontario Ministry of the Environment, Conservation and Parks
300 Water Street, 5th Floor, North Tower
Peterborough, ON K9J 8M5
Phone: (705) 755-5646
Fax: (705) 755-2901
Joe.Crowley@ontario.ca

Please Note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Jennifer McCarter <jmccarter@nrsi.on.ca>
Sent: October-01-19 2:09 PM
To: Crowley, Joe (MECP) <Joe.Crowley@ontario.ca>
Cc: Heather Fotherby <hfotherby@nrsi.on.ca>
Subject: Re: SWH - Amphibian Breeding (Wetland or Woodland) - Input on criteria?

Hi!

It was good to see you too. I know - CHS absolutely flew by and there wasn't enough time to chat with everyone. It was a great conference though! :)

That'd be great if you could look into it for us when you have a chance!

I've attached the two Ecoregion Criteria schedules, for your reference (easier than you finding them?). Here's the text for SWH - amphibian breeding for ecoregions 6E and 7E (copy and pasted from the attached documents) (criteria are the same for both):

Ecoregion 6E:

Woodland: "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Ⓔ."

Wetland: "Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses)
lxxi or 2 or more of the listed frog/toad species with Call Level Codes of 3Ⓔ. or; Wetland with confirmed breeding Bullfrogs are significantⒺ."

Ecoregion 7E:

Woodland: "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Ⓔ."

Wetland: "Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses)
lxxi or 2 or more of the listed frog/toad species with Call Level Codes of 3Ⓔ. or; Wetland with confirmed breeding Bullfrogs are significantⒺ."

We have been interpreting **"2 or more of the listed frog species with Call Level Codes of 3"** to mean that at least two different listed species should both exhibit a call code of 3 (not one species at call code 3, as per Aylmer district's interpretation).

We just want to ensure that as a company we are interpreting and applying the criteria correctly.

Thanks again!

Jen

Jennifer McCarter M.Sc.
Terrestrial and Wetland Biologist
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@nrsinews

On 10/1/2019 1:39 PM, Crowley, Joe (MECP) wrote:

Hey Jenn,

Yeah, I would be happy to look into it. I probably won't get to this for a little while though, as I have a huge backlog from being away for a week in Montreal. Can you send me the relevant SWH criteria for the relevant ecoregion that you're working in? That would really speed things up. The schedules are pretty prescriptive – is it not obvious from the schedule, or are you basically asking if MNRF is misreading and/or deviating from the criteria in the schedule?

It was great to see you two in Montreal – sorry I didn't have more time to hang out! Friday night and Sat were kind of a write off with having to do the trivia last-minute, unfortunately.

Cheers,
Joe

_____
Joe Crowley
Species at Risk Specialist (Herpetology)
Species at Risk Branch
Ontario Ministry of the Environment, Conservation and Parks
300 Water Street, 5th Floor, North Tower
Peterborough, ON K9J 8M5
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Fax: (705) 755-2901
Joe.Crowley@ontario.ca

Please Note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Jennifer McCarter <jmccarter@nrsi.on.ca>
Sent: October-01-19 11:41 AM
To: Crowley, Joe (MECP) <Joe.Crowley@ontario.ca>
Cc: Heather Fotherby <hfotherby@nrsi.on.ca>
Subject: SWH - Amphibian Breeding (Wetland or Woodland) - Input on criteria?

Hey Joe,

Hope you're having a good week so far.

We're hoping you can provide some insight into the criteria for SWH - Amphibian Breeding.

NRSI's understanding to date had been that the criteria requires TWO species to have high abundance (i.e. TWO species with call code 3 OR 20+ individuals).

We just received guidance from MNRF Aylmer district for a specific project, however, indicating that habitats would qualify as SWH if there were more than two species observed calling, even if only one was documented calling at a call code 3.

Obviously, we would like to ensure we are determining SWH properly according to the criteria and intent of the policy - so we'd like your input on how to determine SWH - Amphibian Breeding to ensure we're being consistent.

I realize that you're MECP now - so if there's someone else at MNRF that might be able to help or provide input, please feel free to forward my email.

Thanks!!

Jen

Jennifer McCarter M.Sc.
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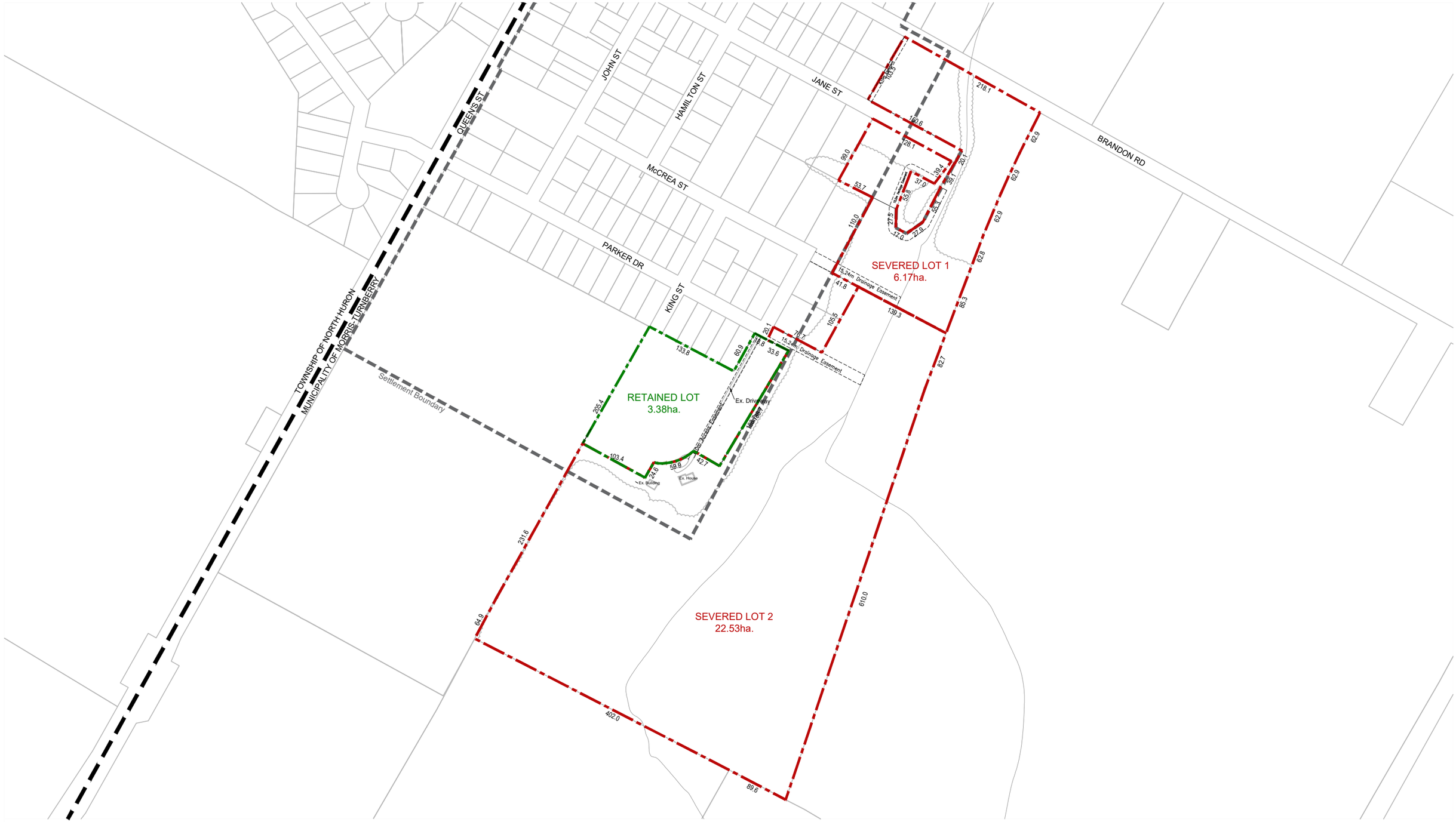
APPENDIX III
Concept Plan



SEVERANCE SKETCH

61 CORBETT DRIVE, BELGRAVE
MUNICIPALITY OF MORRIS-TURNBERRY

Retained Area: 3.38ha.

Severed Area: 28.70ha.

Existing Watercourse

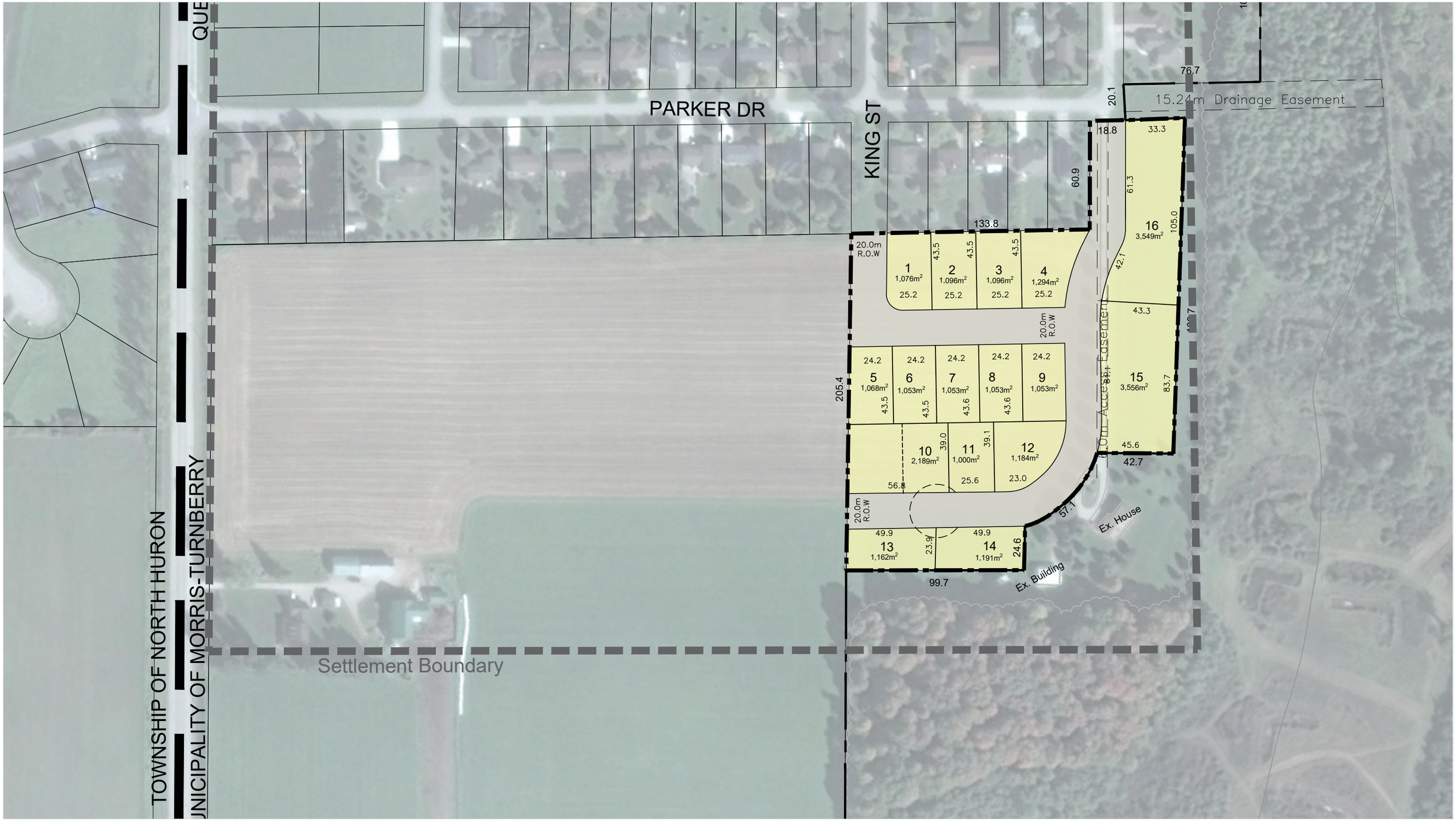
Existing Vegetation

0 25 50 100 200
Meters

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:5000 | January 27, 2021 | Project No.: 19032 | Drawn By: MN

GSP group



DEVELOPMENT CONCEPT 1

PLETCH PROPERTY, MORRIS TURNBERRY

NUMBER OF LOTS: 16

0 10 20 30 50 10
Meters

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:2000 | December 7, 2020 | Project No.: 19032 | Drawn By: MN

GSP group

QUEEN

PARKER DR

KING ST

Settlement Boundary

1 1,049m² 43.5
2 1,000m² 43.5
3 1,000m² 43.5
4 1,000m² 45.7
5 3,540m² 53.3 69.1 60.9
6 3,539m² 51.0 46.2 53.1
7 3,547m² 72.4 79.4 46.0
8 1,000m² 23.0
9 1,000m² 23.0 43.6
10 1,000m² 23.0 43.6
11 1,000m² 23.0 43.5
12 1,000m² 23.1 43.5
13 1,994m² 51.7 38.7
14 1,000m² 25.8 39.0 39.1
15 1,410m² 29.3
16 1,191m² 99.7 24.6
17 1,162m²

133.8 20.5 6.1 30.0 51.0 205.4 40.0 194.7 76.7 20.1 105.5

DEVELOPMENT CONCEPT 2

PLETCH PROPERTY, MORRIS TURNBERRY

NUMBER OF LOTS: 17

0 10 20 30 50 10
Meters

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

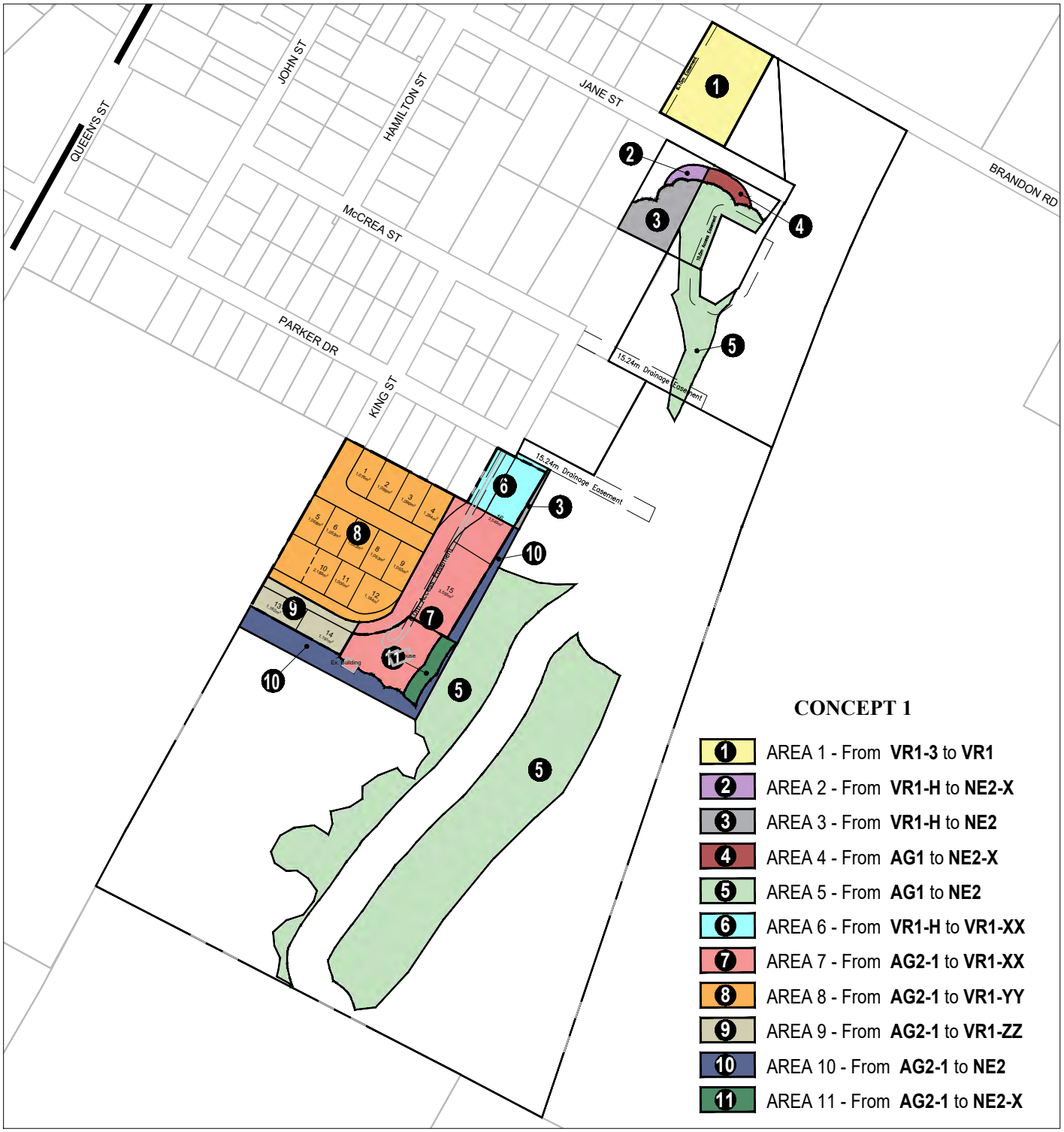
Scale 1:2000 | December 7, 2020 | Project No.: 19032 | Drawn By: MN

GSP group

SCHEDULE 2

CORPORATION OF THE MUNICIPALITY OF MORRIS-TURNBERRY

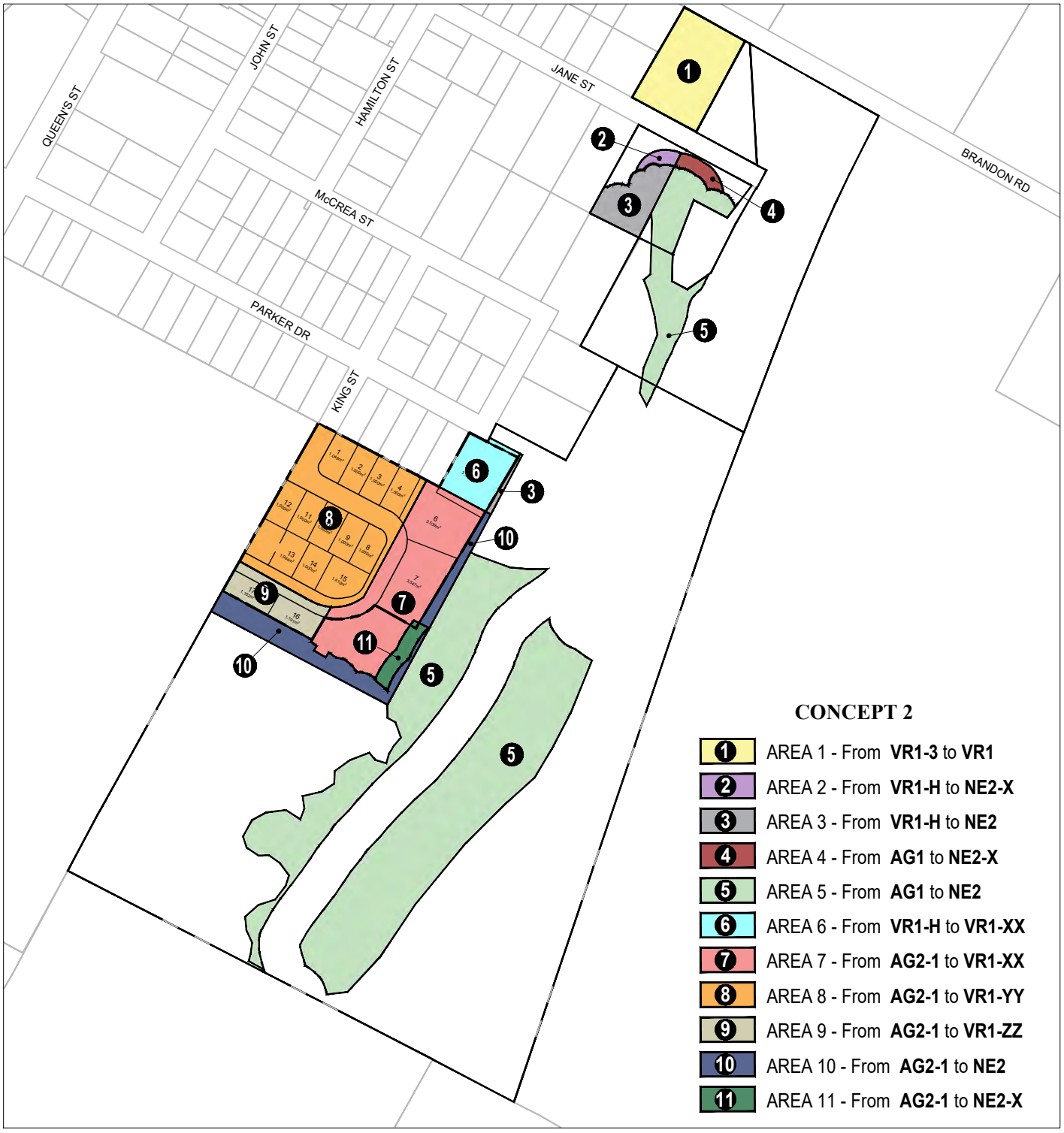
BY-LAW NO._____



SCHEDULE 2

CORPORATION OF THE MUNICIPALITY OF MORRIS-TURNBERRY

BY-LAW NO._____



APPENDIX IV

Terms of Reference and Agency Comments

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

February 28, 2019 Project No. 2230

Patrick Huber-Kidby
Environmental Planner
Maitland Valley Conservation Authority
1093 Marietta Street, Box 127
Wroxeter, ON, N0G 2X0

Nancy Michie
Administrator Clerk – Treasurer
Municipality of Morris-Turnberry
41342 Morris Road, Box 310
Brussels, ON, N0G 1H0

Jenn Burns
Planner
Huron County
57 Napier Street,
Goderich, ON, N7A 1W2

Dear Mr. Huber-Kidby, Ms. Michie, and Ms. Burns,

Re: 61 Corbett Drive (Pletch Property) and 84976 Huron County Road 4 (Weber Property), Belgrave, Ontario
Environmental Impact Study – Terms of Reference

Natural Resource Solutions Inc. (NRSI) has been retained by the Municipality of Morris-Turnberry to prepare an Environmental Impact Study (EIS) for a proposed residential housing development located at 61 Corbett Drive and 84976 Huron County Road 4, within the Town of Belgrave, Ontario, referred to as the 'Pletch property' and 'Weber property', respectively. The properties are comprised of agricultural fields, wetland, and forested communities, and two tributaries to Belgrave Creek bisecting the Pletch property. The Pletch property is owned by the Municipality, whereas the Municipality is considering acquiring the Weber property. In order to characterize the entire area and not miss any timing windows from a natural heritage perspective, the Municipality would like the Weber property included within the study area, pending approval to access the property.

NRSI is part of a larger consultant team, led by GSP Group to inform a development concept. The development concept will be fairly high level and will not include detailed plans required to undertake a fulsome impact analysis, such as a grading plan or erosion and sediment control plan, etc. These will be provided at the Draft Plan stage. As such, the impact analysis to be undertaken as part of this EIS will be undertaken at a higher level and will include recommendations to be considered once detailed plans are known.

Significant natural features present on or adjacent to the subject properties include woodland that is designated as 'Natural Environment – All other Features' in the County of Huron Official Plan (2013), and wetland and watercourse features regulated by the Maitland Valley

Conservation Authority (MVCA). An EIS is required due to the presence of these natural heritage features and MVCA-regulated features on the property.

The attached Terms of Reference (TOR) outlines the steps required to complete the scoped EIS for the proposed development in accordance with County of Huron and MVCA guidelines.

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

Sincerely,
Natural Resource Solutions Inc.

Katharina Richter, B.E.S.
Senior Biologist

Kenneth Burrell, M.E.S.
Terrestrial and Wetland Biologist

cc: Craig Metzger, Senior Planner, County of Huron
Steve Wever, GSP Group Inc.

61 Corbett Drive and 84976 Huron County Road 4, Belgrave
Environmental Impact Study Terms of Reference
February 28, 2019

Introduction

NRSI has been retained to complete an EIS for a property located at 61 Corbett Drive and 84976 Huron County Road 4, in Belgrave, Ontario (Map 1). The proposed development will feature a series of internal road extensions from existing roads within the town of Belgrave, along with a series of lots for single-detached homes (Appendix I). The presence of MVCA-regulated features (wetland and watercourse) and woodland within the subject property have triggered the need for an EIS.

EIS completion will be divided into 3 main components:

(1) background information collection and project scoping,

(2) field work completion and natural feature characterization, and

(3) EIS report preparation.

1. Background Information Collection and Project Scoping

Background Data Collection

Background information pertaining to the biological resources on and in the vicinity of the subject property will be collected. This information will include file material from the MVCA and Ministry of Natural Resources and Forestry (MNRF), as well as the County of Huron Official Plan (2013), Ontario Breeding Bird Atlas (BSC et al. 2006), Ontario Butterfly Atlas (MacNaughton et al. 2018), Ontario Reptile and Amphibian Atlas (Ontario Nature 2018), Ontario Mammal Atlas (Dobbyn 1994), and online databases, such as the Natural Heritage Information Centre, Species at Risk listings at the federal (Committee on the Status of Endangered Wildlife in Canada (COSEWIC)) and provincial (Species at Risk in Ontario) levels, and species of regional significance.

Species at Risk / Species of Conservation Concern Screening

A screening has been completed to determine the potential for Species at Risk (SAR) and Species of Conservation Concern (SCC) and their habitat to be present on the site. The habitats on the site, as derived from air photo interpretation, have been compared to the habitat requirements of SAR/SCC reported from the local area. See Appendix II for the preliminary SAR/SCC screening. Based on the results of the preliminary screening, 15 SAR and SCC were identified as having potentially suitable habitat on or adjacent to the subject property. These species will be addressed in the EIS. The results of this screening are provided in Appendix II of this TOR.

Significant Wildlife Habitat Screening

Potential Significant Wildlife Habitat (SWH) types were also screened based on NRSI's knowledge of the natural features on and adjacent to the subject property and using discrete significance criteria established by the MNRF (MNRF 2015b). The results of the SWH screening have informed surveys required to confirm such habitat within or adjacent to the subject property.

Based on the preliminary screening, 14 Candidate SWH types were identified as potentially occurring within or adjacent to the subject property, pending further assessment during site investigations. Appendix III provides a summary of the SWH screening exercise including rationale as to why the SWH types are considered “candidate” or “not present”.

2. Field Surveys and Characterization

The following field surveys will be completed to characterize the existing natural features and wildlife habitats according to standardized survey protocols:

- Mapping of vegetation communities using the Ecological Land Classification (ELC) methods for southern Ontario (Lee et al. 1998).
- Three-season (spring, early and late summer) vascular flora inventory (May, June, and July).
- Wetland boundary review in the vicinity of the proposed lots, including site visit with the MVCA to confirm and survey the boundary.
- Woodland dripline review to delineate and survey the boundary of the woodland in the vicinity of the proposed lots.
- Breeding bird surveys according to the Ontario Breeding Bird Atlas methodology (2 surveys, early and late June).
- Anuran call surveys during the amphibian breeding season (3 visits, 1 in each late April, May, and June, according to the Marsh Monitoring Program survey methodology).
- Reptile area searches of the subject property will also be carried out as part of each site visit in order to determine the presence/absence of habitat for snake and turtle species, particularly in proximity to any features identified as potentially suitable hibernacula.
- 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).
- Incidental observations of all wildlife and their signs (dens, scat, tracks) will be made at every site visit. This will include observations of herpetofauna, butterflies, dragonflies, and damselflies.

Following completion of the field surveys, the natural features including any habitat for SAR/SCC and SWH will be characterized and any constraints identified according to their significance or sensitivity. Where applicable, recommendations will be provided within the EIS with regards to appropriate buffers from features to be retained.

3. Impact Assessment and Wetland Development Assessment

<u>Impact Assessment</u>
The details of the proposed undertaking will be reviewed and compared to the existing conditions on the subject property. Any areas of conflict between significant natural features, buffers, etc., and the development will be discussed with the client and options for minimizing impacts will be recommended.

Impacts as a result of the proposed development will be determined based on the direct, indirect, induced, and cumulative effects of the proposal:

- **Direct impacts** associated with disruption or displacement caused by the actual proposed 'footprint' of the undertakings, such as tree removal, direct impacts to wildlife and/or their habitats, or removal of invasive species or hazard trees.

- **Indirect impacts** associated with changes in site conditions, such as indirect impacts to wildlife and modifications to drainage and water quantity/quality. This will include a description of the overland and groundwater flow.
- **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.
- **Cumulative impacts** associated with surrounding activities and their cumulative impact on natural features or species habitats over time and space.

Mitigation and Enhancement

Recommendations with respect to mitigation of residual impacts will be made and opportunities for ecological enhancement and restoration within the subject property will be highlighted as appropriate, based on the development concept. Details will be based on the results of the site characterization and may include specific areas of restoration or enhancement, native species buffer plantings, invasive species management, etc.

Monitoring

If required, recommendations for the development of a during and post-construction monitoring program will be developed appropriately based on the development concept. Details will be based on the results of the site characterization. This will include recommendations for monitoring the effectiveness of recommended mitigation measures, restoration/enhancement plantings and other stewardship initiatives, if applicable.

Report

The findings of the natural feature characterization and the impact assessment with associated mitigation, enhancement, and monitoring recommendations (if applicable) will be summarized in an EIS report. The report will include the approved TOR, records of agency correspondence, the findings of the EIS, and a description of the proposed undertaking, including how the development conforms to relevant policies.

References

Bird Studies Canada, Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2006. Ontario Breeding Bird Atlas Database, 31 January 2008. http://www.birdsontario.org/atlas/aboutdata.jsp?lang=en (Accessed February 2019).

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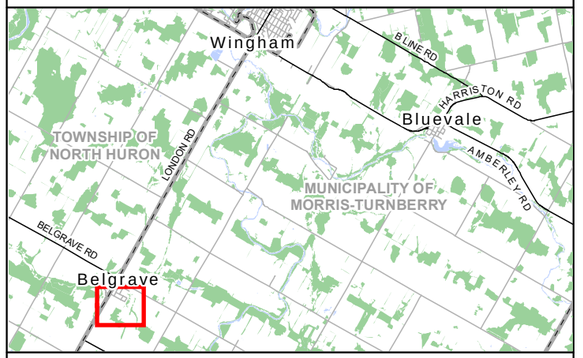
Ontario Ministry of Natural Resources and Forestry (MNRF). 2018d. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry.

MAPS

Map 1

Pletch and Weber Properties Environmental Impact Study

Subject Properties



Legend

- Pletch Property
- Weber Property
- Huron County OP - Natural Environment
- Wetland (MVCA)
- Permanent Watercourse
- Unevaluated Wetland

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© Copyright: Queen's Printer Ontario. Imagery: ESRI (2015).

Project: 2230
Date: February 28, 2019

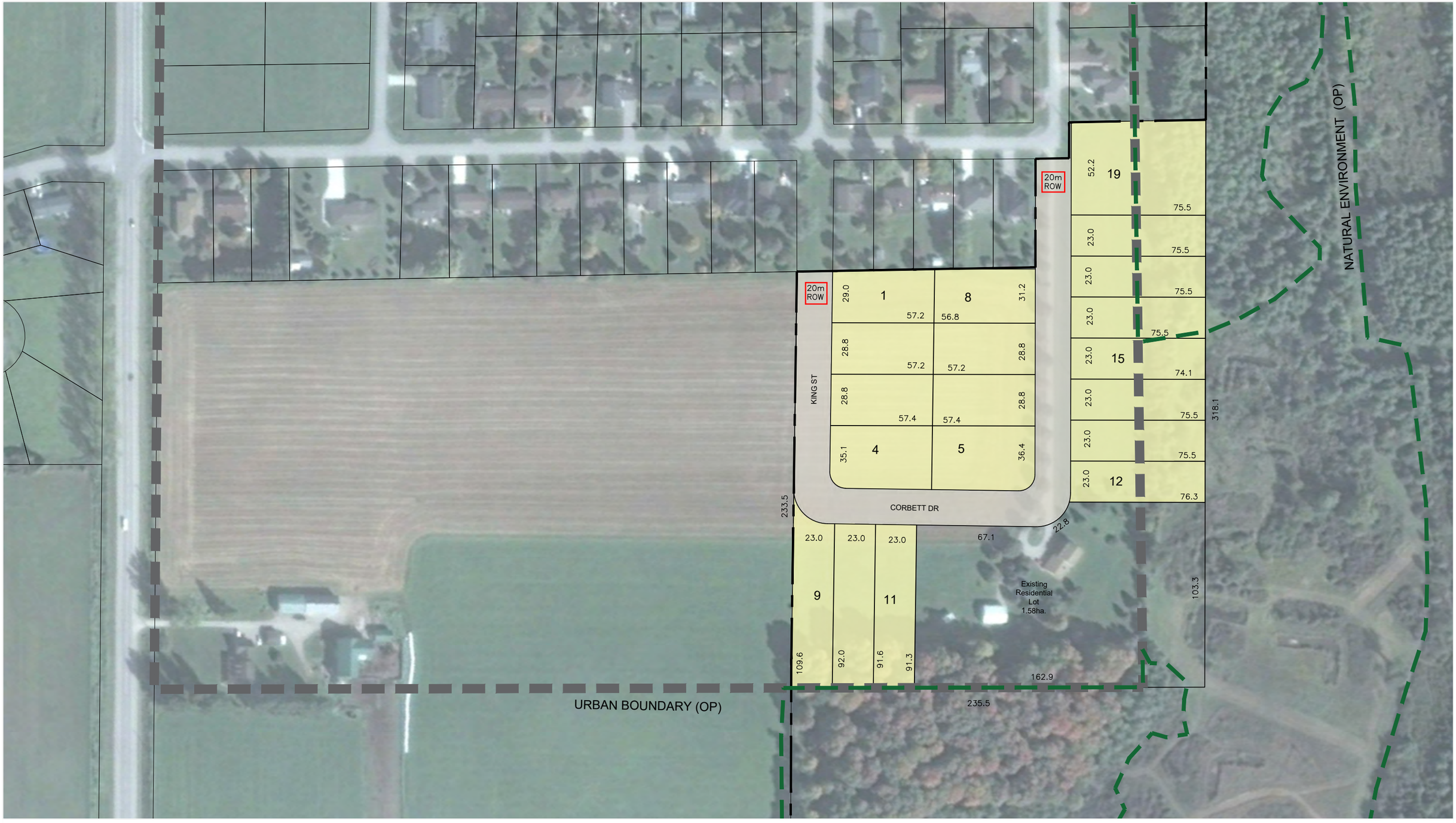
NAD83 - UTM Zone 17
Size: 11x17"
1:4,500

N

0 100 200 300 Metres

Path: X:\2230_PletchPropertyEIS\NRSI_2230_Map1_SubjectProperty_5K_2019_02_28_LEH.mxd

APPENDIX I
Proposed Lot Layouts



DEVELOPMENT CONCEPT 1

PLETCH PROPERTY, MORRIS TURNBERRY

NUMBER OF LOTS: 19

0 10 20 30 50 10

Meters

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:2000 | February 21, 2019 | Project No.: 19032 | Drawn By: MN

GSP group

DEVELOPMENT CONCEPT 2

PLETCH PROPERTY, MORRIS TURNBERRY

NUMBER OF LOTS: 52

0 10 20 30 50 10

Meters

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:2000 | February 21, 2019 | Project No.: 19032 | Drawn By: MN

GSP group

DEVELOPMENT CONCEPT 2

PLETCH PROPERTY, MORRIS TURNBERRY

NUMBER OF LOTS: 58

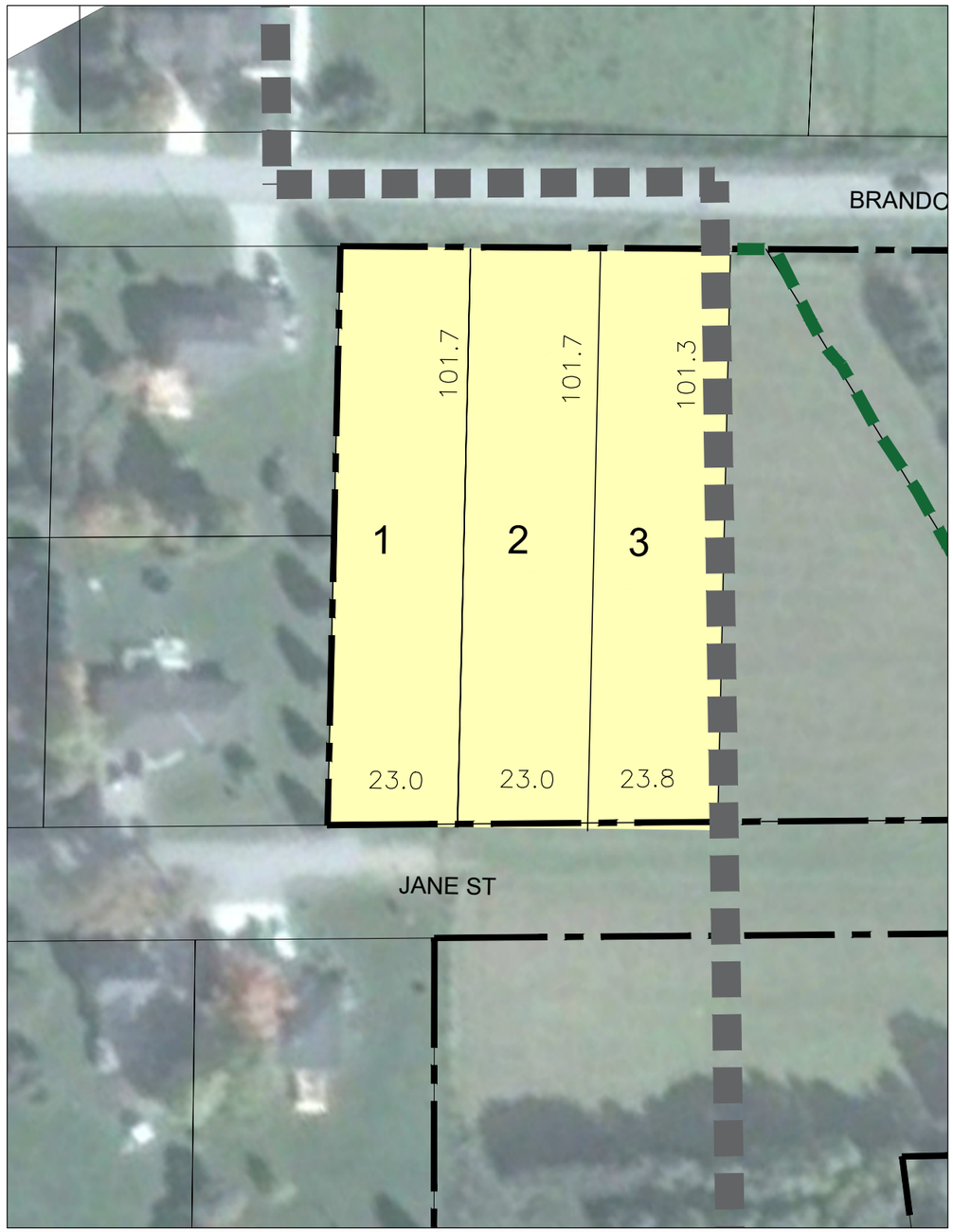
0 10 20 30 50 10
Meters

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

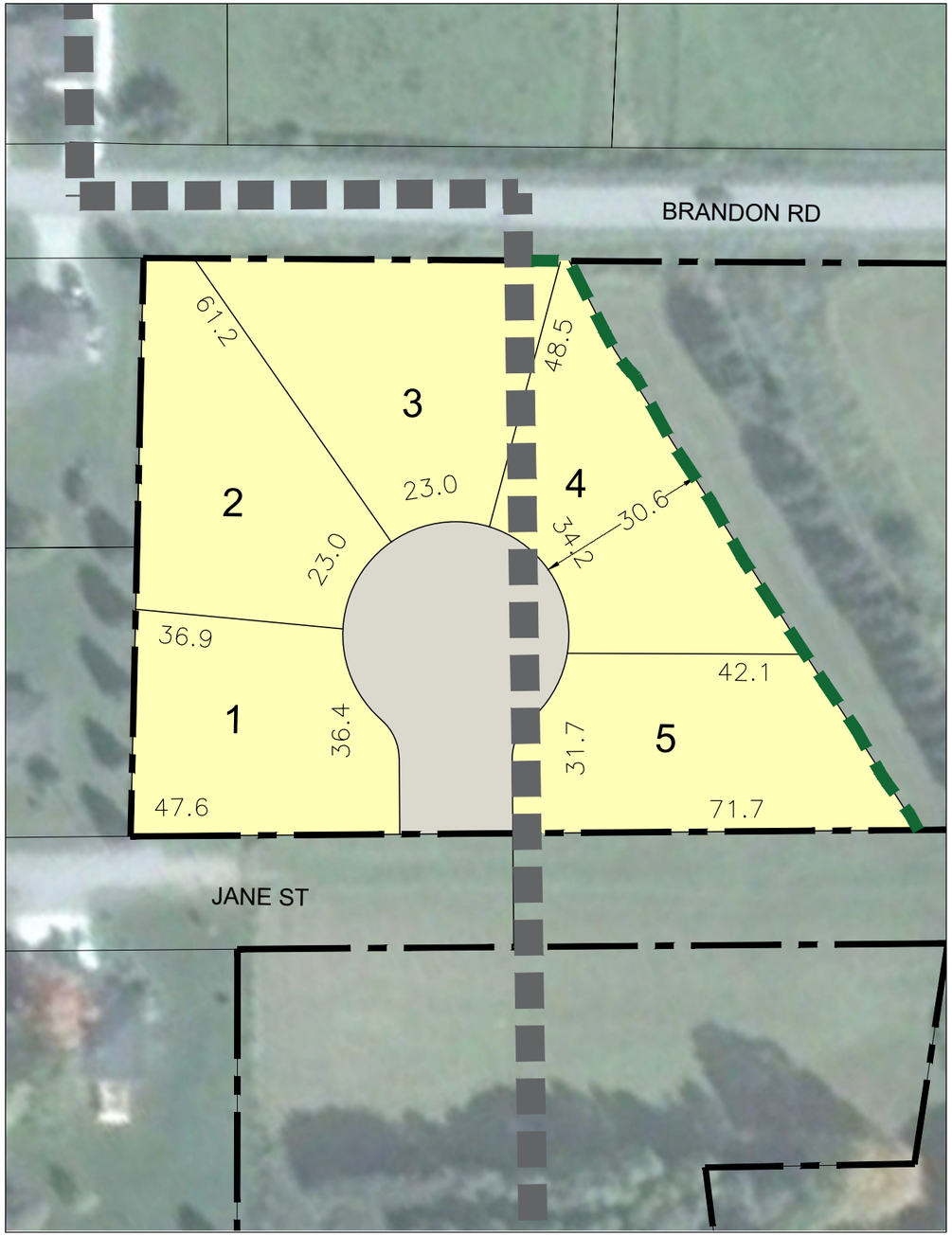
Scale 1:2000 | February 21, 2019 | Project No.: 19032 | Drawn By: MN

GSP group

CONCEPT 4



CONCEPT 5



DEVELOPMENT CONCEPT 4 & 5

PLETCH PROPERTY, MORRIS TURNBERRY

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:1000 | February 21, 2019 | Project No.: 19032 | Drawn By: MN

GSP group

APPENDIX II

SAR/SCC Screening

2230 - Pletch & Weber Properties EIS
Species at Risk / Species of Conservation Concern Screening

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitats within Subject Property
Birds								
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	An interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30ha.	BSC et al. 2008	Yes. Suitable breeding habitat is present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	THR	Schedule 1	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	BSC et al. 2008	Yes. Suitable breeding habitat may be present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	--	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	BSC et al. 2008	Yes. Suitable breeding habitat is present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50ha.	BSC et al. 2008	No. Agricultural lands do not provide suitable habitat (i.e. row crops). Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Hirundo rustica	Barn Swallow	S4B	THR	THR	--	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	BSC et al. 2008	Yes. Suitable breeding habitat is present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Hylocichla mustelina	Wood Thrush	S4B	SC	THR	--	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12m.	MNRF 2018b; BSC et al. 2008	Yes. Suitable breeding habitat is present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitats within Subject Property
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1	Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks.	BSC et al. 2008	Yes. Suitable breeding habitat is present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Riparia riparia	Bank Swallow	S4B	THR	T	--	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	BSC et al. 2008	No. Suitable habitat is not present.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10ha in size.	MNRF 2018b; BSC et al. 2008	No. Agricultural lands do not provide suitable habitat (i.e. row crops). Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence.
Herpetofauna								
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha.	Ontario Nature 2019; MNRF 2018b	Yes. Suitable nesting habitat may be present. Turtle nesting surveys will be conducted throughout the subject property to confirm presence/absence.
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Population)*	S3	NAR	T	Schedule 1	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.	Ontario Nature 2019	Yes. Anuran call surveys to be completed in the spring to determine presence/absence.
Chrysemys picta marginata	Midland Painted Turtle	S5		SC		Quiet, warm, shallow water with abundant aquatic vegetation such as ponds, large pools, streams, ditches, swamps, marshy meadows; eggs are laid in sandy places, usually in a bank or hillside, or in fields; bask in groups; not territorial.	Ontario Nature 2019	Yes. Suitable nesting habitat may be present. Turtle nesting surveys will be conducted throughout the subject property to confirm presence/absence.
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	Schedule 1	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	Ontario Nature 2019	Yes. Reptile surveys will be conducted throughout the subject property to confirm presence/absence.

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitats within Subject Property
Mammals								
Myotis leibii	Eastern Small-footed Myotis	S2S3B	END	--	--	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	N/A	Yes. Suitable habitat may be present within the subject property. Habitat assessments will be conducted to determine suitability throughout the subject property.
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	MNRF 2018b; Dobbyn 1994	Yes. Bat cavity assessments will be conducted throughout the subject property to confirm presence/absence.
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	N/A	Yes. Bat cavity assessments will be conducted throughout the subject property to confirm presence/absence.
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices.	N/A	Yes. Bat cavity assessments will be conducted throughout the subject property to confirm presence/absence.
Insects								
Danaus plexippus	Monarch	S2N, S4B	SC	E	Schedule 1	Open areas with milkweed species (*Asclepias* spp.).	MNRF 2018b; MacNaughton et al. 2019	Yes. Insect surveys will be conducted throughout the subject property.

[1,2]MNRF 2018a, [3,4]Government of Canada 2018, [5]OMNR 2000, [6]Reznicek et al. 2011, [7]Layberry et al. 1998, [8]Paulson 2011

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S#? Rank Uncertain
B Breeding
N Non-breeding
COSSARO/COSEWIC
NAR Not at Risk
SC Special Concern
END/E Endangered
THR/T Threatened
SARA Schedule
Schedule 1 Officially Protected under SARA

APPENDIX III

Significant Wildlife Habitat Screening Assessment

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

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: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 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.	Minimal areas of candidate habitat may be present within the subject property, but not large enough to support significant stopover habitat. **Not SWH**
Wildlife Habitat: Raptor Wintering Area					
Rational: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha[cxlviii, cxlix] with a combination of forest and upland.[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting Information Sources • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	Subject property is adjacent to settlement area, with which candidate species are not tolerant of. **Not SWH**

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: Bat Hibernacula					
Rationale Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum[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.	Suitable habitat not present within the subject property. **Not SWH**
Wildlife Habitat: Bat Maternity Colonies					
Rationale: Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii] • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii] • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii] • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx] Information Sources • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by: • >10 Big Brown Bats • >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.	Suitable treed habitat is present within the subject property. Bat cavitiy assessments will be conducted throughout subject property to determine suitability. **Candidate SWH**

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: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specified ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. Information Sources • OMNR for possible locations and contact for local experts • University of Waterloo, Biology Department	Long Point has been identified as a significant stopover habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv] • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHDSS[cxlix] Index #38 provides development effects and mitigation measures	Criteria unavailable to assess significance of habitat within the subject property.
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May)[cvii] • Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Suitable overwintering habitat (i.e. permanent water) may be present within the subject property. Turtle nesting surveys will be conducted to determine presence/absence of feature from the site. **Candidate SWH**

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: Snake Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, liii, 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. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[i] • 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.	The subject property contains potentially suitable habitat features that may support snake hibernacula. Reptile searches will be conducted throughout the subject property confirm presence/absence. **Candidate SWH**

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)					
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv] • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • Field surveys to observe and count swallow nests are to be completed during the breeding season Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #4 provides development effects and mitigation measures	Suitable nesting habitat not present within the subject property. **Not SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5[i] or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH [cc, ccvii] • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMiST[cxlix] Index #5 provides development effects and mitigation measures.	Suitable habitat not present within the subject property. **Not SWH**

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)					
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i]. • 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.	Suitable habitat not present within the subject property. **Not SWH**
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: Field: CUM CUS CUT Forest: FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south[xxxii, xxxiii, xxxiv, xxxv, xxxvi.] • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat cxlviii, cxlix. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes[xxxvii, xxxviii, xxxix, xl, xli.] Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[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.	Study area not located within 5 km of Lake Ontario. **Not SWH**

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: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant[cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #9 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. **Not SWH**
Wildlife Habitat: Deer Yarding Areas					
Rationale: Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"[cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH[lvi, lvii, lviii, lix, lx, i]. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations[cxcv]. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within or adjacent to the subject property. **Not SWH**

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					
Rationale: Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions[exlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within or adjacent to the subject property. **Not SWH**

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm absence. **Not SWH**
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • 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.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm absence. **Not SWH**

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					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • 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	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm absence. **Not SWH**
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Vegetation type likely not present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm presence/absence. **Candidate SWH**

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					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• 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. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm absence. **Not SWH**
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• 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. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm absence. **Not SWH**

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					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii] The OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Other rare vegetation types possibly present within the subject property. Vascular floral and Ecological Land Classification surveys to be completed throughout the subject property confirm presence/absence. **Candidate SWH**

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					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, 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.	Minimal areas of candidate habitat are potentially present within the subject property. Breeding bird surveys will be conducted to determine presence/absence of this feature. **Candidate SWH**
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Suitable treed habitat is present within the subject property, however, subject property is adjacent to settlement, which species are not tolerant of. **Not SWH**

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					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as 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. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Minimal amount of suitable treed habitat is present within the subject property. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence. **Candidate SWH**
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Suitable habitat may be present within the subject property. Turtle nesting surveys will be conducted to determine presence/absence. **Candidate SWH**

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					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	Seeps or springs may be present within the subject property. Field surveys will be conducted to determine presence/absence of this feature. **Candidate SWH**
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[cbxxxii, bxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Candidate amphibian breeding habitat may exist within the subject property. Anuran call surveys will be conducted to confirm presence/absence. **Candidate SWH**

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)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 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.	Suitable amphibian breeding habitat not present within the developable lands. Anuran call surveys will be conducted to confirm presence/absence. **Not SWH**
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Marginally suitable habitat may be present within the subject property. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence. **Candidate SWH**

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[j]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[j]. • 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	Minimal areas of candidate habitat may be present within the subject property. Breeding bird surveys will be conducted to determine presence/absence of this feature. **Candidate SWH**
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[j]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	Suitable habitat and of sufficient size is not present within the subject property. **Not SWH**

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					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha[cbxiv] in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[l]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [cbxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[l]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Suitable habitat and of sufficient size is not present within the subject property. **Not SWH**
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.[ccii]	Chimney or Digger Crayfish: (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[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.	Candidate habitat may be present within the subject property. Wildlife surveys will be conducted throughout the subject property to confirm presence/absence. **Candidate SWH**

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					
Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Special Concern and Provincially Rare plant and animal species are possible within the subject property. Wildlife surveys will be conducted throughout the subject property to confirm presence/absence. **Candidate SWH**

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					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. Information Sources • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat is not present within the subject property. Therefore, amphibian movement corridors are not applicable. **Not SWH**
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[i]. • 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 [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix] . Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	Deer Wintering Habitat is not reported from the study area. Therefore, deer movement corridors are not applicable. **Not SWH**

Subject: RE: Pletch and Weber Properties, EIS Terms of Reference (proj2230)
From: Marcus Maddalena <mmaddalena@huroncounty.ca>
Date: 3/7/2019, 9:16 AM
To: Jennifer Burns <jburns@huroncounty.ca>, "kburrell@nrsi.on.ca" <kburrell@nrsi.on.ca>

Hi Ken,

I am just confirming that we have received the TOR. I will review the document and seek some feedback from our peer reviewer.

I apologize for the delay in this response, as I am new to the position of County Biologist and have spent the first few days this week getting my feet under me so to speak.

Best,
Marcus

Marcus Maddalena, MES
County Biologist / Stewardship Coordinator
County of Huron
Phone: (519) 524-8394 x 3286

From: Jennifer Burns
Sent: Monday, March 4, 2019 1:44 PM
To: Marcus Maddalena
Subject: FW: Pletch and Weber Properties, EIS Terms of Reference (proj2230)

Hi Marcus-
This is the TOR for the proposed EIS on the Pletch (61 Corbett Dr, Belgrave) & Weber Farms.
Thanks-
Jenn

From: Ken Burrell [mailto:kburrell@nrsi.on.ca]
Sent: February 28, 2019 1:14 PM
To: phuber-kidby@mvca.on.ca; Nancy Michie; Jennifer Burns
Cc: Craig Metzger; swever@gspgroup.ca; Katharina Richter
Subject: Pletch and Weber Properties, EIS Terms of Reference (proj2230)

Hi Patrick, Nancy, and Jenn,

I trust you're all well. Please find attached the Terms of Reference, in support of the Environmental Impact Study for the proposed development on the Pletch and Weber Properties, in Belgrave. We are hoping to receive your comments regarding the ToR at your earliest convenience.

If you have any questions or comments, please do not hesitate to contact me.

Kind regards,

Ken

--

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

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Ken Burrell M.E.S.
Terrestrial and Wetland Biologist
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Subject: FW: TOR Review - Pletch and Weber Properties
From: Jennifer Burns <jburns@huroncounty.ca>
Date: 5/16/2019, 11:27 AM
To: Steve Wever <swever@gspgroup.ca>, "krichter@nrsi.on.ca" <krichter@nrsi.on.ca>
CC: Marcus Maddalena <mmaddalena@huroncounty.ca>, Nancy Michie <nmichie@morristurnberry.ca>, "Trevor Hallam (thallam@morristurnberry.ca)" <thallam@morristurnberry.ca>

Hi Steve/Katharina-
Please find attached the peer review for the TOR submitted for the Pletch and Weber properties in Morris-Turnberry. Marcus' comments are below.
Please let either of us know if you have any further questions or concerns at this time.
Kind Regards-
Jenn

Jennifer Burns, MSc. | Planner
Huron County Planning & Development Department
57 Napier Street, Goderich, ON, N7A 1W2
T. 519.524.8394 x 3 | F. 519.524.5677 | Email: jburns@huroncounty.ca

---

From: Marcus Maddalena
Sent: May 15, 2019 2:37 PM
To: Jennifer Burns
Subject: FW: TOR Review - Pletch and Weber Properties

Hi Jenn,

You will find the review of the TOR attached. NSE's comments are quite thorough, and I believe they capture any concerns I have about the proposed TOR.

Best,
Marcus Maddalena
Marcus Maddalena
County Biologist / Stewardship Coordinator, County of Huron
57 Napier Street, 2nd Floor
Goderich, Ontario, N7A 1W2
Phone: (519) 524-8394 x 3286
mmaddalena@huroncounty.ca

From: Kristen Harrison [mailto:kharrison@nsenvironmental.com]
Sent: Friday, May 3, 2019 4:41 PM
To: Marcus Maddalena
Cc: Melissa Tonge
Subject: TOR Review - Pletch and Weber Properties

Good afternoon Marcus,

Melissa prepared a peer review of the proposed TOR for the Pletch and Weber Properties EIS and completed a review of the letter.

Please find attached our comments and recommendations.

Regards,

Kristen

Kristen Harrison, B.E.S., M.Sc.
Senior Ecologist | Project Manager
kharrison@nsenvironmental.com

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May 3rd, 2019

Mr. Marcus Maddalena
County Biologist / Stewardship Coordinator
Huron County
Goderich, Ontario

Re: North-South Environmental Peer Review – 61 Corbett Drive (Pletch Property) and 84976 Huron County Road 4 (Weber Property), Belgrave, Ontario - TOR.

Dear Mr. Maddalena,

North-South Environmental (NSE) has been retained by Huron County to review the NRSI Terms of Reference (TOR) for 61 Corbett Dr and 84976 Huron County Road 4, in Huron County (herein referred to as the 'Subject Lands') from a Natural Heritage perspective. As acknowledged in the proposed TOR, the subject lands include areas identified as 'Natural Environment' in the County Official Plan (2013), and hydrologic features including a Wetland and a Watercourse feature regulated by Maitland Valley Conservation Authority (MVCA).

We note that the proposed EIS process does not follow the Morris-Turnberry EIS guideline (Appendix 1 of the Morris-Turnberry Official Plan). However, upon review of the proposed TOR we generally agree with the approach proposed and offer the following comments and recommendations:

- As part of the background review, we recommend that all (if any exist) relevant field-based information collected through studies (within 5 years) for the subject lands and on adjacent lands also be reviewed and integrated in the EIS where available and relevant;
- Consultation via site walk(s), correspondence and interaction with both County and Agency (MVCA) representatives is anticipated. As noted in the TOR, pre-screening consultation (e.g., MNRF or MECP correspondence) and any mitigation requirements provided by agency representatives should be appended to the EIS Report.
- There is no mention of agency confirmation of the forest dripline in this field task. Please include reference to the approval agency participating in confirming this feature limit.
- In addition to the three-season vascular flora inventory, a Floristic Quality Analysis (Oldham et al. 1995) of each vegetation community including species richness, mean Coefficient of Conservatism of native species, number of conservative species, proportion of non-natives, number of invasives, sum of Weediness Coefficient and mean Wetland Coefficient for native species should be included in accordance with EIS Requirements (MVCA 2010).
- The wetland feature identified on the subject property and illustrated in Map 1 should be delineated following the Ontario Wetland Evaluation System (OWES) protocol. Discussion for the feature to be considered as potential PSW should be added to the report assessment.

- The watercourse feature in Map 1 has not been considered for field surveys and characterization. It is recommended that the watercourse be characterized (Habitat Assessment and Stream Inventory) in following with EIS Requirements (MVCA 2010), and that existing flows (quantity and quality), meander belts and setbacks for bank erosion be included, as appropriate. In addition, fish habitat types (i.e., cold, cool or warm water) and associated buffers, should be included in the characterization and the effects assessments. If the stream assessment has been intentionally left out of the TOR, rationale as to why the watercourse feature is not being assessed should be included.
- It is not clear what assessment, if any, is being undertaken for corridors and linkages and how they will be evaluated. A description of corridors and linkages between and among natural features and areas, surface water features and ground water features (existing or potential) both on the site and in the surrounding areas should be provided (MVCA 2010).
- **Impact Assessment**: We understand that the level of detail will be in large part 'conceptual' with the intent to determine development potential for the properties. To that end, we request the following:
    - The proposed development area / envelope or conceptual site plan should be provided as an overlay to the natural features on the site (following the proposed work plan) to illustrate areas of potential impact or conflict, including confirmed feature limits following agency field-review.
    - Impacts, where possible, should be quantified (e.g. XX ha will be removed).
    - Any woodland / aquatic features required to be protected should be clearly identified and adequate protection measures (buffers/vegetation protection zones) illustrated on a map / figure.
- As requested in EIS Requirements (MVCA 2010), construction scheduling, including any phasing should be discussed
- As indicated in the proposed TOR, individuals involved in each of the field inventories and EIS analysis will be included. We would also recommend that professional qualifications and all data sheets supporting the level of effort for all flora and fauna inventories, including dates and times for each field survey also be provided.
- **SWH Screening Table**:
    - Table 5: Amphibian Movement Corridors are identified as 'Not SWH' with the rationale that there is no amphibian breeding habitat. We note that the field work includes anuran calling surveys, which would indicate the potential presence of breeding habitat. We suggest that this candidacy be reviewed.

Thank you for considering NSE's comments on this Terms of Reference. Please don't hesitate to contact us if you have any questions or require clarification on any items herein.

Sincerest Regards,

Melissa Tonge, B.Sc., M.Sc.
North-South Environmental Inc.

References:

Huron County Official Plan. 2015. Natural Environment Policies and Schedule.

Maitland Valley Conservation Authority (MVCA), January 2010. Requirements of an Environmental Impact Study (EIS). pp 21.

Morris-Turnberry Official Plan. 2006. January 2018 Consolidation. Section 4 Policies, Schedules and Appendix 1.

Oldham, M. J., W.D. Bakowsky, and D. A. Sutherland. 1995. Floristic quality assessment system for southern Ontario. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario.

APPENDIX V

Species at Risk / Species of Conservation Concern and Significant Wildlife Habitat Screenings

2230 - Pletch & Weber Properties EIS
Species at Risk / Species of Conservation Concern Screening

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Observed	Suitable Habitats within Subject Property.
Birds									
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	An interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30ha.	BSC et al. 2008	No	No. Suitable habitat is not present within the study area. Breeding bird surveys did not detect the species.
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	THR	Schedule 1	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	BSC et al. 2008	No	No. Suitable habitat is not present within the study area. Breeding bird surveys did not detect the species.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	--	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	BSC et al. 2008	Yes	Yes. Suitable habitat is present within the subject property. Breeding bird surveys detected the species on both breeding bird visits (June 14 and July 9) indicating probable breeding evidence within the forested portions of the Pletch Property.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50ha.	BSC et al. 2008	Yes	Yes. Suitable habitat is present within the southern extent of the Weber property, outside of the developable area, within existing pasture. A pair was observed on June 14, indicating probable breeding evidence. The species was not detected on subsequent field surveys.
Hirundo rustica	Barn Swallow	S4B	THR	THR	--	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	BSC et al. 2008	Yes	Yes. Suitable foraging habitat is found within the subject property. Individuals were observed foraging over the southern portion of the Weber Property. Breeding bird surveys did not document nesting within the study area.
Hylocichla mustelina	Wood Thrush	S4B	SC	THR	--	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12m.	MNRF 2018b; BSC et al. 2008	No	No. Suitable habitat is not present within the study area. Breeding bird surveys did not detect the species.
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1	Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks.	BSC et al. 2008	No	No. Suitable habitat is not present within the study area. Breeding bird surveys did not detect the species.
Riparia riparia	Bank Swallow	S4B	THR	T	--	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	BSC et al. 2008	No	No. Suitable habitat is not present within the study area. Breeding bird surveys did not detect the species.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10ha in size.	MNRF 2018b; BSC et al. 2008	Yes	Yes. Suitable habitat is present within the southern portion of the Weber property, outside of the developable area. A single individual was observed on May 16, however, the species was not detected on subsequent visists. As such, the observation in May is treated as a spring migrant.

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Observed	Suitable Habitats within Subject Property.
Herpetofauna									
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha.	Ontario Nature 2019; MNRF 2018b	Yes	Yes. Suitable wintering habitat is present within the eastern portion of the Pletch property. Suitable nesting habitat is likely present within the agricultural lands within and adjacent to the MAM2-5 community. Herpetofauna area search surveys detected the species within the subject property on June 14.
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Population)*	S3	NAR	T	Schedule 1	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.	Ontario Nature 2019	No	Yes. Suitable habitat is present within the subject property, however, anuran call surveys did not detect the species.
Chrysemys picta marginata	Midland Painted Turtle	S5		SC		Quiet, warm, shallow water with abundant aquatic vegetation such as ponds, large pools, streams, ditches, swamps, marshy meadows; eggs are laid in sandy places, usually in a bank or hillside, or in fields; bask in groups; not territorial.	Ontario Nature 2019	No	Yes. Suitable habitat is present within the subject property, however, no individuals were observed during field visits conducted by NRSI biologists.
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	Schedule 1	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	Ontario Nature 2019	No	Yes. Suitable habitat is not present within the study area, however, herpetofauna area searches did not detect the species.
Mammals									
Myotis leibii	Eastern Small-footed Myotis	S2S3B	END	--	--	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	N/A	No	No. Marginal suitable habitat is present within the existing houses. Should existing houses be removed within the subject property a bat exit survey should be undertaken.
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	MNRF 2018b; Dobbyn 1994	No	No. Marginal suitable habitat is present within the subject property. Bat habitat assessments identified very few potential bat cavities and no evidence of roosting was observed. The proposed development is not anticipated to remove any trees. Should existing houses be removed within the subject property, a bat exit survey should be undertaken.
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	N/A	No	No. Marginal suitable habitat is present within the subject property. Bat habitat assessments identified very few potential bat cavities and no evidence of roosting was observed. The proposed development is not anticipated to remove any trees. Should existing houses be removed within the subject property, a bat exit survey should be undertaken.
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices.	N/A	No	No. Marginal suitable habitat is present within the subject property. Bat habitat assessments identified very few potential bat cavities and no evidence of roosting was observed. The proposed development is not anticipated to remove any trees. Should existing houses be removed within the subject property, a bat exit survey should be undertaken.

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Observed	Suitable Habitats within Subject Property.
Insects									
Danaus plexippus	Monarch	S2N, S4B	SC	E	Schedule 1	Open areas with milkweed species (*Asclepias* spp.).	MNRF 2018b; MacNaughton et al. 2019	Yes	Yes. Host plants (Milkweed sp. Asclepias spp.) for Monarch were observed during field surveys completed by NRSI biologists, including vascular flora surveys in spring and summer 2019. During incidental field surveys in August, several individual Monarch's were observed throughout the subject property.

[1,2]MNRF 2018a, [3,4]Government of Canada 2018, [5]OMNR 2000, [6]Reznicek et al. 2011, [7]Layberry et al. 1998, [8]Paulson 2011

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S#? Rank Uncertain
B Breeding
N Non-breeding
COSSARO/COSEWIC
NAR Not at Risk
SC Special Concern
END/E Endangered
THR/T Threatened
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 Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii]. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100 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.	Minimal area of suitable habitat is present, however, adjacent land-uses preclude this habitat feature from being present. **Not SWH**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[l] or more of listed species for 7 days[l], results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	Minimal area of candidate habitat is present within the subject property, however, it is not large enough to support significant stopover and staging habitat. **Not SWH**

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: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 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.	Minimal area of candidate habitat is present within the subject property, however, it is not large enough to support significant stopover and staging habitat. **Not SWH**
Wildlife Habitat: Raptor Wintering Area					
Rational: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha[cxlviii, cxlix] with a combination of forest and upland.[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting Information Sources • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	Subject property is adjacent to settlement area, with which candidate species are not tolerant of. **Not SWH**

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: Bat Hibernacula					
Rationale Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum[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.	Suitable habitat not present within the subject property. **Not SWH**
Wildlife Habitat: Bat Maternity Colonies					

Rationale:
Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.
	Big Brown Bat
	Silver-haired Bat
		Maternity colonies considered SWH are found in forested Ecosites.
		
		All ELC Ecosites in ELC Community Series:
		FOD
		FOM
		SWD
		SWM
			Maternity colonies can be found in tree cavities, vegetation and often in buildings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH).
			• Maternity roosts are not found in caves and mines in Ontario[xxii]
			• Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]
			• Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]
			• Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]
			
			Information Sources
			• OMNRF for possible locations and contact for local experts
			• University Biology Departments with bat experts.
				• Maternity Colonies with confirmed use by:
				  • >10 Big Brown Bats
				  • >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.
					Bat cavity assessments conducted throughout the development area did not document suitable nesting features within the subject property. Development is not proposed within forested communities. Forested communities will be protected by a 10m buffer from site grading and building envelopes.
					
					Not SWH

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: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specified ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. Information Sources • OMNR for possible locations and contact for local experts • University of Waterloo, Biology Department	Long Point has been identified as a significant stopover habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv] • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHDSS[cxlix] Index #38 provides development effects and mitigation measures	Criteria unavailable to assess significance of habitat within the subject property.
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May)[cvii] • Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Suitable overwintering habitat (i.e. permanent water) is present within the subject property. Turtle nesting surveys documented a single Snapping Turtle. Based on suitable habitat and the presence of the species it is anticiapted that this feature is present within the subject property. **Candidate SWH**

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: Snake Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, liii, 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. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[i] • 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.	Suitable habitat features were not observed within the subject property. Reptile searches observed a single Eastern Garter Snake within the subject property. **Not SWH**

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)					
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv] • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • Field surveys to observe and count swallow nests are to be completed during the breeding season Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #4 provides development effects and mitigation measures	Suitable nesting habitat not present within the subject property. **Not SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5[i] or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH [cc, ccvii] • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMiST[cxlix] Index #5 provides development effects and mitigation measures.	Marginally suitable habitat is present within the subject property. Breeding bird surveys documented two (2) Green Heron's and a flyover Great Blue Heron, however, no nests were documented throughout the subject property. **Not SWH**

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)					
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i]. • 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.	Suitable habitat not present within the subject property. **Not SWH**
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: Field: CUM CUS CUT Forest: FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south[xxxii, xxxiii, xxxiv, xxxv, xxxvi.] • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat cxlviii, cxlix. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes[xxxvii, xxxviii, xxxix, xl, xli.] Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[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.	Study area not located within 5 km of Lake Ontario. **Not SWH**

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: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant[cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #9 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. **Not SWH**
Wildlife Habitat: Deer Yarding Areas					
Rationale: Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"[cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH[lvi, lvii, lviii, lix, lx, i]. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations[cxcv]. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within or adjacent to the subject property. **Not SWH**

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					
Rationale: Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions[exlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within or adjacent to the subject property. **Not SWH**

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • 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.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**

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					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • 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	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**

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					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• 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. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• 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. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	Vegetation type not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**

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					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii] The OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Rare vegetation types not present within the subject property. Vascular floral and Ecological Land Classification surveys did not document this vegetation community within the subject property. **Not SWH**

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					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, 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.	Minimal areas of candidate habitat are present within the subject property. Breeding bird surveys did not document criterion species. **Not SWH**
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Suitable treed habitat is present within the subject property, however, subject property is adjacent to settlement, which species are not tolerant of. Breeding bird surveys documented a flyover Osprey, however, suitable nest trees were not observed throughout the subject property. **Not SWH**

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					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as 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. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Minimal amount of suitable treed habitat is present within the subject property. Breeding bird surveys did not document criterion species throughout the subject property. **Not SWH**
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area 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.	Based on the observation of a Snapping Turtle within the subject property on June 14, it is highly likely that turtles are using the area for nesting. No turtle nesting surveys were completed and no turtle nests were observed during other field work. However, it is likely turtles are nesting within the agricultural fields within and adjacent to the subject property. **Candidate SWH**

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					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	Seeps or springs were not documented during field surveys throughout the subject property. **Not SWH**
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[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] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Anuran call surveys did not document criterion species at levels of significance. **Not SWH**

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)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 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.	Suitable amphibian breeding habitat is not present within the subject property (i.e. suitable habitat is <120m of woodland). **Not SWH**
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Breeding bird surveys documented the presence of Red-breasted Nuthatch and Scarlet Tanager within the subject property indicating possible breeding evidence. Single Yellow-bellied Sapsuckers, Veery, and Blackburnian Warbler were observed within the subject property in May (and not on follow-up breeding bird surveys) and were determined to be spring migrants. **Not SWH**

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[j]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[j]. • 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	Breeding bird surveys documented the presence of Green Heron as the only criterion species. **Not SWH**
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[j]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	Breeding bird surveys documented Savannah Sparrow as the only criterion species within the subject property. **Not SWH**

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					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha[cxiv] in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[i]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [cbxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[i]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • 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.	Breeding bird surveys documented Willow Flycatcher as possibly breeding within the subject property. Field Sparrow was observed in May, however, the species was not detected on subsequent breeding bird visits, indicating spring migrants. **Not SWH**
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.[ccii]	Chimney or Digger Crayfish: (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[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.	Several Chimney Crayfish burrows were observed within the SWM6-3 community confirming the presence of this feature. **Confirmed SWH**

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					
Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Field studies documented Eastern Wood-Pewee, Monarch, and Snapping Turtle within the subject property, confirming the presence of this feature. **Confirmed SWH**

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					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. Information Sources • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat is not present within the subject property. Therefore, amphibian movement corridors are not applicable. **Not SWH**
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[i]. • 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 [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix] . Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	Deer Wintering Habitat is not reported from the study area. Therefore, deer movement corridors are not applicable. **Not SWH**

APPENDIX VI
Staff Curricula Vitae

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

STEVE BURGIN, F.W.T., B.Sc., P.Biol.
AQUATIC BIOLOGIST

EDUCATION

- Fish and Wildlife Technologist (2008), Sir Sandford Fleming College, Lindsay, Ontario
- B.Sc. (Honours) Biology (2010), Trent University, Peterborough, Ontario

CERTIFICATIONS AND MEMBERSHIPS

Certifications:

- Swift Water Rescue Operations, 2018
- Professional Biologist (P.Biol), Alberta Society of Professional Biologists, 2018
- Class 1 Electrofishing Certification, 2015
- Society for Freshwater Science, Taxonomic Certification for Identification of Aquatic Insects to Family Level, 2014
- Trout Unlimited Canada Aquatic Renewal Program Workshops 1, 2, 3 (2013), 4, and 5 (2014)
- DFO Mussel Identification Workshop, 2012
- Royal Ontario Museum Species at Risk Workshop, 2012
- Royal Ontario Museum Fish Identification Workshop, 2011
- Environmental Monitoring for Construction Projects, Vancouver Island University, 2011
- MOE Technical Workshop – Draft Water Assessment and Water Body Reports Guidance, 2011
- Ontario Recreational Canoe Association (ORCA) Level 1, 2005

Memberships:

- American Fisheries Society, Southern Ontario Chapter
- Trout Unlimited Canada, Speed Valley Chapter

AREAS OF PROFESSIONAL EXPERIENCE

Steve is an Aquatic Biologist with over eleven years of diverse expertise in aquatic and fisheries ecology, including over eight years of experience directly related to environmental consulting with Natural Resource Solutions Inc. He specializes in aquatic habitat surveys and mapping, fish community assessments, aquatic species at risk, permitting and authorizations, and environmental reporting. He works regularly on multidisciplinary project teams where he provides guidance on environmental constraints and opportunities, and recommendations for mitigation relating to the aquatic environment. Steve regularly contributes to reports including environmental assessments and environmental impact studies (EIS) and routinely reviews scientific literature and supporting background information in support of projects.

Steve provides expertise in the following areas:

- permitting and authorization processes for the *Endangered Species Act, Species at Risk Act* and the *Fisheries Act*, including for Redside Dace (*Clinostomus elongatus*) and Lake Sturgeon (*Acipenser fulvescens*)
- fisheries habitat inventories including spawning surveys and detailed aquatic habitat mapping
- fish sampling using active and passive capture methods and fish identification

- monitoring of streams and rivers using invertebrate bio-assessment protocols
- environmental assessments and environmental impact studies
- Development and implementation of multi-year aquatic monitoring programs through pre-, during-, and post-construction for a variety of developments including residential and commercial, linear and hydroelectric

Permitting and Authorizations
Steve is experienced in federal and provincial legislation and has worked on many projects involving the *Fisheries Act* and the *Species at Risk Act*, specifically relating to Redside Dace (*Clinostomus elongatus*) and Lake Sturgeon (*Acipenser fulvescens*). He regularly conducts background screening activities for aquatic Species at Risk and has experience with the preparation and submission of *Fisheries Act* Request for Reviews and the *Species at Risk Act* Information Gathering Form and Avoidance Alternatives Form.

Steve's specific expertise includes:

- screening for aquatic Species at Risk fish and freshwater mussels under the *Fisheries Act* and *Species at Risk Act*
- authorization and permitting under the federal *Fisheries Act* and provincial *Species at Risk Act*
- conducting surveys for SAR fish and freshwater mussels

Aquatic Habitat Assessments
As an Aquatic Biologist, Steve has carried out many aquatic habitat assessments in order to determine the existing conditions as well as the impacts of development on natural and human-altered aquatic features. He is trained in the Ontario Stream Assessment Protocol (OSAP) and proficient in other assessment methods. He has worked on different habitat types (i.e. lakes, reservoirs, large rivers, and streams with warm and coldwater fish assemblages) and has a comprehensive understanding of the physical features and processes that affect aquatic species.

Steve's specific expertise includes:

- visual aquatic habitat characterization and habitat mapping
- OSAP methodologies for channel structure, substrate and bank conditions
- water quality measurements
- habitat compensation and mitigation measures for authorizations under the federal *Fisheries Act*
- aquatic habitat assessments for land use planning projects such as environmental impact studies and subwatershed studies
- lake and stream habitat assessments in southern and northern Ontario for hydro and wind development projects

Fish Community Studies
Steve has been involved in a number of fish community studies in streams, rivers, ponds, and lakes. He has used a variety of active and passive methods of fish capture in the context of biological monitoring studies, population and biomass estimates, and fish community assessments, including aquatic Species at Risk. He has also been involved in several mark-recapture programs and spawning assessments specifically relating to Brook Trout and Lake Trout.

Steve's specific expertise includes:

- backpack and punt electrofishing in streams and other wadeable habitats
- boat electrofishing in non-wadeable habitats
- passive fish sampling gear (gill nets, trap nets, fyke nets etc.)
- removal sampling for population and biomass estimates
- fish salvage operations for construction and restoration projects in northern and southern Ontario
- spawning surveys and dispersion studies of Brook Trout and Lake Trout in northern Ontario lakes, utilizing a variety of passive sampling methods and fish tagging

Benthic Invertebrate Biomonitoring
Steve has carried out numerous sampling exercises for aquatic macroinvertebrate biomonitoring programs. He has conducted assessments using a variety of methods and protocols including surber samplers, drift nets, kick screens, Eckman grab samples, and kick and sweep collections with D-nets.

Steve's specific expertise includes:

- transect kick and sweep as per OBBN/OSAP protocol for streams
- calculation and analysis/interpretation of benthic indices and metrics
- broad understanding of life history and pollution tolerances for species
- species identification to Family (certified Family-level taxonomist)

Environmental Reporting
Steve has reported existing aquatic habitat, mussel, and fish community characteristics for a variety of environmental impact studies, environmental assessments, baseline studies, and pre- and post-construction monitoring of aquatic conditions, including the preparation of annual technical reports as part of multi-year monitoring programs. Steve has experience in gathering the required background and field information necessary to characterize existing conditions and conduct impact assessments.

Steve's specific expertise includes:

- review of agency files, planning and engineering reports, and fisheries management plans
- field studies of aquatic habitats and fish and benthic communities
- discernment of significance and sensitivity of aquatic habitats and biota
- summarizing environmental constraints and opportunities
- recommending mitigation measures
- preparation of environmental impact study reports, environmental assessment reports, and annual technical reports for multi-year monitoring programs

EMPLOYMENT HISTORY

Aquatic Biologist
Natural Resource Solutions Inc., Waterloo, Ontario 2010 to Present

Electrofishing Technician
Credit Valley Conservation Authority, Mississauga, Ontario 2010

Fisheries Technician (Summer Contract)
Algonquin Fisheries Assessment Unit, Whitney, Ontario 2008/2009

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

KEN BURRELL, M.E.S.
TERRESTRIAL AND WETLANDS BIOLOGIST

EDUCATION

- Masters of Environment and Resource Studies (2013) University of Waterloo, Waterloo, Ontario
- Bachelors of Environment and Resource Studies (2011) University of Waterloo, Waterloo, Ontario

CERTIFICATIONS AND MEMBERSHIPS

- Certifications:
  - Provincial Ecological Land Classification (ELC) Training, Ministry of Natural Resources and Forestry (MNRF; 2011),
  - Data Sensitivity Training (2013), Natural Heritage Information Centre (NHIC), MNRF, and
  - Scientific permit to capture and band migratory birds (2005).
- Memberships:
  - Director (2014 – present) and Member, Ontario Field Ornithologists,
  - Voting Member, Ontario Bird Records Committee (2011 – present),
  - Member, Bird Studies Canada and Society of Canadian Ornithologists, and
  - Member, Field Botanists of Ontario.

AREAS OF PROFESSIONAL EXPERIENCE

Ken specializes in natural resource inventories and evaluations, research and impact studies. He routinely completes natural area inventories, and has conducted breeding and migratory bird, ELC, mammal, and amphibian surveys. He has worked on numerous projects which have focused on the identification of important natural features and the evaluation of the significance and sensitivity of these features. Ken provides expertise in the following areas:

- analysis of interrelations between biological and physical components of ecosystems.
- analysis of environmental impacts on terrestrial resources.

Species At Risk

Over the past eight years Ken has developed a specialization in dealing with project-specific issues pertaining to Species at Risk. Ken regularly participates in consultation processes with MNRF, municipalities, and proponents in the application of the Endangered Species Act. He is familiar with current Species at Risk guidance documents such as the Ontario Recovery Strategy Series and Survey Protocols. Ken has authored several Draft COSEWIC Status Report and Residence Descriptions for the Harris's Sparrow and Rapids Clubtail, as well as the Henslow's Sparrow survey protocol for the MNRF. Ken also volunteers substantial amounts of his time with recovery teams province-wide. Ken's specific expertise includes:

- Familiarity with provincial and federal legislation, policies, procedures, directives and guidelines pertaining to Species at Risk (e.g. Endangered Species Act, Provincial Policy Statement, Fish and Wildlife Conservation Act, Species at Risk Act etc.).
- Screening studies to determine potential presence of SAR and Species of Conservation Concern.
- Providing technical advice to assist in protection of habitats, mitigation of impacts, need for further studies and analysis.
- Assessing potential adverse impacts to Species at Risk and their habitats and recommending detailed mitigation strategies based on current Management Plans and Recovery Strategies.
- Familiarity with permitting and habitat compensation processes required under the Endangered Species Act including negotiating and developing Overall Benefit Plans and habitat compensation/enhancement plans.

Biological Monitoring
Ken has extensive experience conducting monitoring of wetland and woodland vegetation, breeding birds, amphibians and mammals. Ken regularly develops pre- and post-construction monitoring programs on a site specific basis, following standard monitoring protocols. Ken's specific expertise includes:

- identification of significant and sensitive natural resources and wildlife species.
- inventories of terrestrial biological resources.
- surveys of plants, birds, mammals, reptiles, amphibians and butterflies.
- 15 years of bird identification experience.

Impact Assessment
Ken has completed numerous Environmental Impact Studies which involved the collection and review of background information, field studies, analysis of impacts and the recommendation of mitigation measures. In all cases, there is an emphasis on avoiding impacts to natural features. Ken's specific expertise includes:

- Identification and delineation of development constraints posed by natural features and their local and provincial designations.
- Determination of appropriate buffers.
- Analysis of impacts on wetlands, woodlands and wildlife habitats from various types of development including roads, residential and industrial development, stormwater management facilities, sewage/water treatment facilities, pipelines, and golf courses.
- Familiarity with the Environmental Assessment process and implementation at the federal, provincial and municipal levels.

EMPLOYMENT HISTORY

Biologist
Natural Resource Solutions Inc.,Waterloo, Ontario. 2010 to present

Environmental Scientist
Stantec Ltd., Guelph, Ontario 2006 to 2009

Field Ornithologist
University of Waterloo, Waterloo, Ontario 2006

PUBLICATIONS

COSEWIC. Draft COSEWIC Assessment and Status Report on the Rapids Clubtail *Phanogomphus quadricolor* in Canada. In prep.

Burrell, K. and M. Burrell. Best Places to Bird in Ontario. Greystone Books Ltd. In press.

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Holden, B.R. and K.G.D. Burrell. 2014. A birding perspective and analysis of Hurricane Sandy in Ontario, Autumn 2012. *Ontario Birds,* 32(1): pp 12-22.

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ANDREW M. DEAN, B.E.S.
TERRESTRIAL AND WETLAND BIOLOGIST

EDUCATION

- Honours Bachelor of Environmental Studies, Environment and Resource Studies (2009), University of Waterloo, Waterloo, Ontario.

CERTIFICATIONS AND MEMBERSHIPS

- Certifications:
  - Prescribed Burn Worker Certification (RX-100), 2017
  - Ontario Reptile and Amphibian Survey Course, 2015
  - MNRF Certified Butternut Health Assessor, 2014
  - MNRF Ontario Wetland Evaluation Training Course, 2012
  - Ecological Land Classification for Southern Ontario, 2011
  - Certified Seed Collector, Forest Gene Conservation Association, 2010
  - Diploma of Excellence in Ecological Restoration and Rehabilitation, University of Waterloo, 2009

- Memberships:
  - Region of Waterloo Ecological and Environmental Advisory Committee
  - Field Botanists of Ontario
  - North American Native Plant Society
  - Ontario Nature

AREAS OF PROFESSIONAL EXPERIENCE

Andrew specializes in environmental monitoring and natural area inventories and evaluations, specializing in vegetation community mapping, and vascular plant identification. He has worked in a variety of habitats identifying and mapping significant and sensitive natural resources and has experience in applying the Ecological Land Classification system for Southern Ontario, and the Ontario Wetland Evaluation System.

Andrew's specific expertise includes:

- conducting inventories of terrestrial and wetland biological resources
- conducting identification of significant vegetation communities
- application of Ecological Land Classification vegetation community mapping
- application of Ontario Wetland Evaluation System (OWES)

Terrestrial and Wetland Ecosystem Studies
Andrew routinely conducts vegetation inventories and vegetation community mapping for a variety of habitat types. His expertise lies in botany, and he can readily identify bats, reptiles, amphibians and mammals as well. Andrew has been involved in Species at Risk monitoring, namely for American ginseng (*Panax quinquefolius*). He is knowledgeable in a variety of standardized survey methodologies including transect and quadrat sampling as well as airphoto interpretation. Andrew has extensive experience conducting soil sampling and analysis as a

component of Ecological Land Classification assessments, and the identification of wetland habitats.
Andrew's specific expertise includes:

- field and laboratory identification of vascular plants
- inventories and mapping of terrestrial and wetland vegetation communities and fauna
- field soil sampling analysis

Wildlife Studies
Andrew has experience conducting wildlife population surveys and assessments of terrestrial, wetland and riparian wildlife habitats. He has worked on various studies investigating a variety of wildlife habitats, and has been involved in collecting field data for projects monitoring populations of birds and mammals.

Andrew's specific expertise includes:

- wildlife population surveys, including winter tracking
- acoustic surveys of bats
- visual and auditory identification of amphibians and raptors

Renewable Energy Studies
Andrew has experience conducting pre-construction vegetation and wildlife monitoring related to proposed wind power and solar generating facilities in Ontario, as well as post-construction monitoring of vegetation and fauna at operational wind power projects in Ontario.

Andrew's specific expertise includes:

- participation in a wide array of biological field surveys including but not limited to: acoustic bat monitoring, bird behaviour monitoring, vegetation, herpetofauna and mammal inventories, and post-construction mortality surveys
- extensive experience in analyzing data, and interpreting and reporting monitoring results

EMPLOYMENT HISTORY

Terrestrial and Wetland Biologist
Natural Resource Solutions Inc., Waterloo, Ontario 2011 to present

Junior Environmental Scientist
Groundwater Environmental Management Services Inc., Richmond Hill, Ontario 2010 to 2011

Field Technician
Ontario Aggregate Resources Corporation, Management of Abandoned Aggregate Properties Program, Burlington, Ontario 2010

PUBLICATIONS AND PRESENTATIONS

Presentations
Dean, A.M., Miller, N.M., and Ryckman, A.G. 2013. "Predicting High Risk Turbines: A Landscape Approach to Assessing Potential Bat Mortality". Poster Presentation, Canadian Wind Energy Association (CanWEA) Annual Conference. Toronto, Ontario.

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

LILLIAN KNOPF, M.Sc.
TERRESTRIAL AND WETLAND BIOLOGIST

EDUCATION

- Master of Science, Biology; University of Waterloo, Waterloo, Ontario
- *Thesis Title: "Short-term changes in phosphorus delivery to lakes: Implications for phytoplankton"*
- Bachelor of Science in Environmental Sciences (2011), Co-op, Major in Environmental Biology; University of Guelph, Guelph, Ontario

MEMBERSHIPS

- Memberships:
    - Ontario Field Ornithologists
    - Field Botanists of Ontario
    - Ontario Nature

AREAS OF PROFESSIONAL EXPERIENCE

Lillian is a Terrestrial and Wetland Biologist with experience working on a variety of environmental projects. Lillian is experienced in project management, developing site-specific monitoring programs, leading field crews, analyzing data, and assessing potential impacts to wildlife. Lillian routinely conducts literature reviews and collects and reviews existing background material.

Lillian provides expertise in the following areas:

- inventories of terrestrial and wetland biological resources
- identification of significant and sensitive natural areas and wildlife species
- analysis of environmental impacts on terrestrial and wetland resources
- impact mitigation in sensitive habitats
- evaluation and application of natural resource policies and guidelines

Renewable Energy Projects
Lillian has managed several renewable energy projects, and has experience coordinating and conducting biological monitoring programs during the pre-construction and post-construction phases of wind and solar project developments. These studies include pre- and post-construction studies focusing on habitat assessments, migratory and breeding birds, bats, amphibians, and reptiles.

Lillian's specific expertise includes:

- coordinating field studies and data collection, and completing final reports in accordance with agency guidelines
- analysis of biological data, including the interpretation and reporting of monitoring results.

Wildlife and Wildlife Habitat Studies
Lillian has worked on a variety of studies investigating a wide range of wildlife habitats and wildlife populations. She has coordinated a range of field investigations, including surveys of birds, bats, reptiles, amphibians, and vegetation inventories, as well as specific surveys for Species at Risk. Lillian also has experience conducting surveys and inventories to identify the presence of wildlife within study sites, including amphibians, plants, reptiles, and mammals.

Lillian's specific expertise includes:

- identification of significant or preferred habitat for sensitive or significant species
- field identification of reptiles, mammals, and amphibians
- background review, agency consultation, and work program preparation
- research and reporting on vegetation and wildlife

EMPLOYMENT HISTORY

Terrestrial and Wetland Biologist
Natural Resource Solutions Inc., Waterloo, Ontario 2012; 2015 to present

Graduate Research Student and Teaching Assistant
University of Waterloo, Waterloo, Ontario 2012 to 2014

Aquatic Biologist
C. Portt and Associates, Guelph, Ontario 2011

Assistant Resource Technician
Ontario Ministry of Natural Resources, Guelph, Ontario 2011

Algal Laboratory Technician (Co-op)
Ontario Ministry of the Environment, Etobicoke, Ontario 2010

PUBLICATIONS AND PRESENTATIONS

Publications

Burrell, K.G.D. and **L.A. Knopf**. 2016. "The status of the Eastern Phoebe (*Sayornis phoebe*) in Cuba". Journal of Caribbean Ornithology 29: 18-20.

MacDougall, M.J., A.M. Paterson, J.G. Winter, F.C. Jones, **L.A. Knopf**, and R.H. Hall. 2016. "Response of periphytic diatom communities to multiple stressors influencing lakes in the Muskoka River Watershed, Ontario, Canada". Freshwater Science 36(1): 77-89.

Presentations

Miller, N., **L. Knopf**, and D. Stephenson. 2017. Water Budget Mitigation and Enhancement Measures Between SWM Outflow and Ecological Receivers. TRIECA Conference. Brampton, Ontario. March 23, 2017.

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

KATHARINA S. RICHTER, B.E.S.
SENIOR BIOLOGIST

EDUCATION

- Bachelor of Environmental Studies, Environment & Resource Studies (2002), University of Waterloo, Waterloo, Ontario

CERTIFICATION AND MEMBERSHIPS

- Certification:
  - MNRF Ontario Reptile and Amphibian Field Survey Training Course, 2013
  - MNRF Ontario Wetland Evaluation Training Course, 2012
  - MNRF Ecological Land Classification, 2003
- Memberships:
  - Ontario Nature
  - Waterloo Region Nature

AREAS OF PROFESSIONAL EXPERIENCE

Katharina is a Terrestrial and Wetland Biologist with more than 15 years of experience working on many environmental projects. She has managed a diverse number of projects including Natural Heritage Systems studies, Environmental Impact Studies, the natural heritage component of Environmental Assessments, Subwatershed Studies and Secondary Plans, trail development, creek rehabilitation, wetland evaluations, as well as vegetation and wildlife monitoring. Katharina has an excellent understanding of ecology, ecological restoration, hydrology, and wild lands management. She provides expertise in Species at Risk management and permitting through the Ministry of Natural Resources and Forestry.

Katharina provides expertise in the following areas:

- inventories of wetland and terrestrial biological resources
- identification of significant and sensitive natural resources
- evaluations of natural resource policies and guidelines and their application to management
- analysis of environmental impacts and mitigation on natural heritage resources
- management plans for significant species and habitats
- development of implementation guidelines and monitoring programs
- rehabilitation of disrupted habitats, including wetlands and watercourses

Natural Heritage System Planning
Katharina has been involved in many Natural Heritage System studies. She has worked with municipal staff, the MNRF, and Conservation Authorities to develop Natural Heritage Systems that are consistent with provincial policy. These studies have included a detailed assessment of the significance of natural habitats, such as woodlands and wildlife habitat.

Katharina's specific expertise includes:

- identification of rare and sensitive species and habitats
- comparison of Natural Heritage System criteria used in various jurisdictions
- development and review of implementation strategies
- analysis of potential corridors and restoration areas
- peer review

Wetland Studies
Katharina has participated in many wetland studies in southern and northern Ontario. She has completed many Environmental Impact Studies dealing with wetlands, which involved the collection and review of background information, field studies including boundary stakings, analysis of impacts and mitigation measures. Analyses of impacts from various types of developments have included golf courses, roads and bridges, residential housing, and sewage/water treatment facilities.

Katharina's specific expertise includes:
- wetland evaluations following the OWES protocol
- inventories and mapping of wetland flora, fauna and soils
- wetland management, preservation, restoration and creation
- analysis of wetland buffers/setbacks
- wetland compensation

Terrestrial Vegetation and Wildlife Studies
Katharina routinely conducts inventories of vascular plants, birds, reptiles, amphibians, mammals, and insects. She has also carried out studies involving the assessment of habitat potential for specific species.

Katharina's specific expertise includes:
- wildlife and vegetation habitat mapping, evaluations, and research
- assessment and evaluation of Significant Wildlife Habitat
- surveys of plants, birds, mammals, reptiles, amphibians, and butterflies, including Species at Risk
- integration of terrestrial and aquatic ecology with other disciplines
- evaluation of environmental impacts
- development of management plans

Woodlots and Trees
Katharina has participated in numerous tree surveys including the evaluation of health and the risk of failure. She has carried out monitoring of forest vegetation with assessment of tree health and analysis of change over time. She has conducted woodlot evaluations and analysis of potential impacts for a wide range of developments, including the assessment of woodlots as habitat for Species at Risk and as Significant Wildlife Habitat.

Katharina's specific expertise includes:
- woodlot and tree inventories, dripline staking, mapping and evaluations
- tree saving and preservation plans
- analysis of the significance of woodlots
- tree planting, compensation, and re-vegetation plans

EMPLOYMENT HISTORY

Terrestrial and Wetland Biologist
Natural Resource Solutions Inc., Waterloo, Ontario 2003 to present

Environmental Coordinator
City of Waterloo, Waterloo, Ontario 2001 to 2002

Environmental Technician
City of Waterloo, Waterloo, Ontario 1999 to 2001

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

DANIEL RILEY, B.L.A.
TERRESTRIAL AND WETLAND BIOLOGIST

EDUCATION

- Bachelor of Landscape Architecture, School of Environmental Design and Rural Development, Honours with Distinction (2014), University of Guelph, Guelph, Ontario
- Conducted a fourth year research thesis on the use of design techniques to mitigate the road mortality of turtle species in Ontario

CERTIFICATIONS AND MEMBERSHIPS

- Certifications:
  - Certificate of Bilingual Studies (French Immersion) (TDSB, 2009)
- Memberships:
  - Member, Ontario Field Ornithologists

AREAS OF PROFESSIONAL EXPERIENCE

Dan specializes in natural resource inventories and evaluations, research and impact studies. He routinely completes natural area inventories, and has conducted studies on breeding and migrating birds, reptiles, amphibians, odonates and butterfly species.

Dan provides expertise in the following areas:
- inventories of wetland and terrestrial biological resources
- identification of significant and sensitive natural resources and wildlife species
- analysis of interrelations between biological and physical components of ecosystems
- analysis of environmental impacts on wetland and terrestrial resources

Terrestrial Vegetation and Wildlife Studies
Dan has worked on various studies investigating a wide range of wildlife habitats and wildlife population assessments, including seasonal and long-term monitoring of impacts of developments on species. Dan has conducted a wide range of monitoring surveys and inventories including species specific surveys for species of conservation concern such as Canada warbler, short-eared owl, butler's garter snake and eastern fox snake.

Dan's specific expertise includes:
- identification of significant and sensitive wildlife species and habitats
- surveys of birds, reptiles, amphibians, dragonflies and butterflies
- over 20 years of bird identification experience
- over 15 years of reptile and amphibian identification experience
- short-term and long-term monitoring techniques for flora and fauna

Renewable Energy Projects
Dan has experience conducting both pre- and post-construction studies on raptors, migrating songbirds and migrating butterflies at wind farms and solar farms throughout Ontario and in Alberta. Dan has been extensively involved in the collection of pre-construction wildlife population and occurrence data for proposed wind and solar

farms in Ontario. He also has a comprehensive background in post-construction monitoring of bird and wildlife populations, mortality searches, searching efficiency studies and scavenger removal trials.

Dan's specific expertise includes:

- methodological approaches for conducting a wide range of pre-construction wind farm studies, including: migration surveys (dawn and dusk), daytime soaring surveys, point counts (diurnal and nocturnal), and driving transect surveys.
- identification of mortalities
- conducting mortality searches

EMPLOYMENT HISTORY

Terrestrial and Wetland Biologist
Natural Resource Solutions Inc., Waterloo, Ontario 2017 to present

Wildlife Biologist
Canadian Wildlife Service, Environment Canada, Burlington, Ontario
2017

Field Biologist
Bird Studies Canada, Toronto, Ontario 2016

Biologist
WSP Canada, Aurora, Ontario 2015

Environmental Technologist
AMEC: Environment and Infrastructure, Windsor, Ontario 2011

VOLUNTEER EXPERIENCE

- **FIELD TRIP LEADER**, Ontario Field Ornithologists (2016 to present)
- **ORNITHOLOGICAL COLLECTIONS ASSISTANT**, Department of Ornithology, Royal Ontario Museum (2015-2016)
- **PARTICIPANT**, Great Canadian Birdathon, Celebrity Birder (2017), Toronto summer bird count (2016), Guelph Christmas bird count (2017 to present), Sandbanks Christmas bird count (2015), Toronto Christmas bird count (1999 to 2010)
- **WILDLIFE GUIDE**, Rancho Naturalista, Tuis, Costa Rica (2008 and 2010)

PRESENTATIONS

Riley, D. J. 2017. Historical bird sightings, eBird and you. Oral presentation. Ontario Natural Regional Meeting: Great Lakes West. Owen Sound, Ontario. April 29, 2017

Riley, D. J. 2017. Avian urbanites: Chimney Swifts in Toronto. Oral presentation. High Park Nature Centre. Toronto, Ontario. August 03, 2016

APPENDIX VII

Ecological Land Classification Data Forms

6 incl. Narrow-leaved Sedge Mineral Meadow Marsh MAM2-5

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

→ 4. incl. Red Osier Dogwood Mineral Thicket Swamp SWT2-5
5. incl. Mineral Cultural Meadow CUM1

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

Community Classification

	Vegetation Type:	Coniferous Plantation		CUP3
1.	X Inclusion:	Green Ash Mineral Deciduous Swamp		SWD2-2
2.	X ~~Complex~~: incl	Reed Canary Grass Mineral Meadow Marsh		MAM2-2
3.	incl	Mixed Plantation		CUP2

Polygon Description

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

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

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	2	4	wh. pine >> Norway spruce > wh. cedar
2	Sub-canopy	3	2	hawthorn sp. > wh. cedar > alt. leaf dogwood
3	Understorey	4	3	Euro. buckthorn > glossy buckthorn > choke cherry
4	Groundcover	5-7	3	avens sp. > wild strawberry > enchanters nightshade

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

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

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

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

Community Age	Pioneer	Young	X	Mid-age	Mature	Old Growth
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NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	Pletch EIS (*2230)		
Polygon:	A - CUP3		
UTM:			
Date:	May 16/19	Time:	1000 - 1600h
Surveyor(s):	AMD, JKP, A. Dean, J. Pickering		
Weather:	14°C, wind 2/SW 70% cc		

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

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

Species	Layer 1	2	3	4	Sample
Norway spruce					
green ash					
bitter nightshade					
choke cherry					
Euro buckthorn					
Viburnum opulus					
wh pine					
glossy buckthorn					
alt. leaf dogwood					
sugar maple					
Sorbus aucuparia					
Viburnum opulus					
dwarf raspberry					
wh. cedar					
E. cottonwood					
freeman's maple					
hawthorn sp					
Red dogwood					
silky dogwood					
grey dogwood					
spirea alba					
common apple					
slender willow					

Species	Layer 1	2	3	4	Sample
avens sp.					
field horsetail					
iris sp					
reed canary					
garlic mustard					
wild cucumber					
periwinkle					
Cirsium canadense					
tall buttercup					
trout lily					
wild strawberry					
Mentha aquatica					x ✓
fringed loose.					
watercress					
scouring rush					
can. anemone					
Carex stricta					
tall buttercup					
bloodroot					
turtlehead					
red maple					
red raspberry					
wh. elm					

Wildlife and Other Notes

- photos 4379 - 4390
- SWD2-2 inclusion is a green ash plantation
-
- some areas of walnut plantation mixed in CUP3

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

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

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

Species	Layer				Sample
	1	2	3	4	

Species	Layer				Sample
	1	2	3	4	

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Page 2 of 6

PLANT SPECIES LIST

Site:	(#2230)
Polygon:	A - CUP3
UTM:	/
Date:	May 16/19 **Time:** 1000-1600
Surveyor(s):	AMD, JKP
Weather:	14°C, Wind-2, 90% CC, No precip.

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

Species	Layer				Sample
	1	2	3	4	
bl. walnut					
bl. raspberry					

Species	Layer				Sample
	1	2	3	4	
Anemone virg					

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

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

Community Classification

Vegetation Type:		Narrow-leaved Sedge Mineral Meadow Marsh	MAM2-5
x	Inclusion:	Silky Dogwood Mineral Thicket Swamp	SWT2-8
x	Complex:	Willow Mineral Thicket Swamp	SWT2-2
x complex		Shallow Aquatic	SA

complexes not mapped

Polygon Description

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

but constructed/ restored

Cover			Plant Form			
X	Open		Plankton		Forb	Coniferous
	Shrub	X	Submerged		Lichen	Mixed
	Treed		Floating-Lvd		Bryophyte	
			X Graminoid		Deciduous	

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	2	1	freeman's maple > wh. elm > balsam poplar
2	Sub-canopy	3	2	Silky dogwood > pussy willow > glossy buckthorn
3	Understorey	1½	2	silky dogwood > R.O. dogwood > pussy willow
4	Groundcover	½	4	Carex spp. > red canary grass > Canada bluejoint > lance leaf aster

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

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

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

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

Community Age	Pioneer	X Young	Mid-age	Mature	Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	(#2230)
Polygon:	B - MAM2-5
UTM:	/
Date: May 16/19	Time: 1000 - 1600
Surveyor(s): AMD JKP	
Weather: 14°C, Wind-2, 90% CC, No precip.	

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

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

Species	Layer 1	2	3	4	Sample
silky dogwood					
R.O dogwood					
Spiraea alba					
wh. cedar					
slender willow					
pussy willow					
Betula pendula					
white elm					
freeman's maple					
Sambucus canaden.					
nannyberry					
glossy buckthorn					
red maple					
Rosa palustris					
balsam poplar					
Betula pendula					creek

Species	Layer 1	2	3	4	Sample
red canary					
Swamp milkweed					
Mentha aquatica					x ✓
Iris sp.					
tall goldenrod					
Phragmites					
marsh marigold					
Myriophyllum sibiricum					
marsh cinquefoil					
bog buckbean					
broad cattail					
sp. jewelweed					
Carex stricta					
Viola sororia					x ✓
Swamp buttercup					
sensitive fern					
Viola cucullata					x ✓

Wildlife and Other Notes

- photos 4391 - 4397
- large constructed wetland complex, Ducks Unlimited
- standing water throughout - up to 30cm (more in SA features)
- SA: dug linear features, + chara sp. and mermaid weed
- SWT2-2: mixed willows and dogwoods (silky gray, red-osier)

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

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

Community Classification

	Vegetation Type:	Swamp Maple Organic Deciduous Swamp	SWM6-3
1. X	Inclusion:	Willow Organic Thicket Swamp	SWT3-2
2. X	~~Complex~~: incl	F-M Poplar Deciduous Forest	FOD8-1

Polygon Description

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

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

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	2	4	freeman's maple > green ash > white elm
2	Sub-canopy	3	4	freeman's maple > green ash > glossy buckthorn
3	Understorey	4-5	4	glossy buckthorn > RO dogwood > Canada elderberry
4	Groundcover	6-7	4	spice-elder > false nettle > marsh fern

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

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

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

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

Community Age		Pioneer		Young	X	Mid-age		Mature	Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	(#2230)		
Polygon:	C-SWM6-3		
UTM:	—		
Date:	May 16/19	Time:	1000-1600
Surveyor(s):	AMD, JKP		
Weather:	14°C, 2-wind, 90% CC, no precip.		

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

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

Species	Layer 1	2	3	4	Sample
green ash					
Eur. buckthorn					
glossy buckthorn					
nannyberry					
spiraea alba					
tamarack					
silky dogwood					
wh. elm					
Rubus pubescens					
virgins bower					
RO dogwood					
Sambucus canad.					
Ribes amer					
freemans maple					
Spicebush					
prickly gooseberry					
Rosa palustris					
bitter nightshade					
alt leaf dogwood					

Species	Layer 1	2	3	4	Sample
Sensitive fern					
starry false sol seal					
sp. joe pye					
Viola sororia					x ✓
red trillium					
Mentha arvensis					
sp. jewelweed					
turtlehead					
Iris sp					
Carex bromoides					
trout lily					
Viola labradorica					

Wildlife and Other Notes

- photos 4398 - 4400
- crayfish chimneys - multiple in community
- very wet - ~30-40cm water depth @ max

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

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

Community Classification

Vegetation Type:	D-F Sugar Maple Deciduous Forest	FODS-1
X Inclusion:	White Pine Coniferous Plantation	CUP3-2
Complex:		

Polygon Description

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

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

Stand Description

	Layer	HT	Cover	Species
*	Super-canopy			
1	Canopy	2	4	Sugar maple >> Am beech > bl. cherry
2	Sub-canopy	3	4	Sugar maple > alt.leaf dogwood > Euro. buckthorn
3	Understorey	4-5	4	choke cherry > Euro. buckthorn > glossy buckthorn
4	Groundcover	6-7	4	trout lily > starry false solomons seal > wild leek

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

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

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

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

Community Age	Pioneer	Young	X Mid-age	Mature	Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	(#2230)
Polygon:	D - FODS-1
UTM:	
Date:	May 16/19 Time: 1000-1600
Surveyor(s):	AMD, JKP
Weather:	14°C, wind-2, 90% CC, no precip.

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

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

Species	Layer 1	2	3	4	Sample
wh. pine					
Euro.buckthorn					
choke cherry					
sugar maple					
Viburnum opulus					
nannyberry					
wt elm					
bl. cherry					
alt.leaf dogwood					
Sorbus aucuparia					
glossy buckthorn					
red elderberry					
Ribes rubrum					
Rosa multiflora					
nannyberry					
Am.beech					
prickly gooseberry					

Species	Layer 1	2	3	4	Sample
trout lily					
Viola labrador.					
bloodroot					
Viola Sororia					x ✓
Allium					X
Viola labrador.					
wild leek					
Viola pubescens					
Viola sororia					velvet
sensitive fern					
jack pulpit					
wh. trillium					
Starry false sol. sea					
red trillium					
Caulophyllum gigant.					
daffodil					
goutweed					
false sol. seal					

Wildlife and Other Notes

- photos 4401 - 4404
- yard/garden waste during along edges
- trail network

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Site:	(#2230)
Polygon:	/
UTM:	/
Date:	May 16/19
Time:	1000-1600
Surveyor(s):	AMD JKP
Weather:	14°C, Wind-2, 90% CC, no precip.

Community Classification

Vegetation Type:	
Inclusion:	
Complex:	

Polygon Description

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

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

Stand Description

	Layer	HT	Cover	Species
*	Super-canopy			
1	Canopy			
2	Sub-canopy			
3	Understorey			
4	Groundcover			

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

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

Size Class Analysis	< 10	10 - 24	25 - 50	> 50
Snags	< 10	10 - 24	25 - 50	> 50
Dead/Fall/Logs	< 10	10 - 24	25 - 50	> 50

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

Community Age	Pioneer	Young	Mid-age	Mature	Old Growth

Modified ELC Community Description

Soils	1	2	3
Position:	5	4	5
Aspect:	30	15	n/a
%	0.5	1	0
Type:	S	C	S
Class:	A	b	A

Strata:	Texture	SiCL	CL	Om
	Depth	0-54	0-29	0-63
Strata:	Texture		SiCL	
	Depth		50-47	
Strata:	Texture			
	Depth			
Strata:	Texture			
	Depth			
Effective Texture		SiCL	CL	Om
Surface Stoniness				
Surface Rockiness				
Depth to:				
	Mottles	20	33	
	Gley	–	–	
	Bedrock	–	–	
	Water table	3	–	
	Carbonates	–	–	
Depth of Organics		–	–	
Pore Size Disc #1				
Pore Size Disc #2				
Pore Size Disc #3				
Moisture Regime		6	5	7

Polygon: Subject property

Tree Tally

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

NOTES:

↳ north end of Property

- Soil sample 1: SWD2-2 in CUP3 (row planted green ash)
- soil sample 2: CUP2 (cedar/dogwood/elm/red maple), row planted
  - ↳ complex microtopography due to plantation activity and related soil works
- soil sample 3: SWD6-3 (same soil profile as adjacent SWT3-2)

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Modified ELC Community Description

PLANT SPECIES LIST

Site:

Polygon:

UTM:

Date: | Time:

Surveyor(s):

Weather:

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

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

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site: (#2230)

Polygon: CUP3 (w/ inclusions)

UTM: —

Date: July 10/19 | Time: 0930-1530

Surveyor(s): A. Dean

Weather: 27°C, Wind 1-2, 10% CC, No precip.

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

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample	Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
whirillow						Hillberile					
Crataegus punct						heal all					
peach leaf willow						orchard grass					
Salix Ericepl						wild basil					
Salix discolor						wild carrot					
						yellow avens					
						common milkweed					
crownvetch						Nasturtium offic					
Carex retrorsa						redtop grass					
day lily						Elymus repens					
Erigeron phil						Rumex obtus					
calico aster						tall buttercup					
Lemna minor						sp. jewelweed					
periwinkle						Poa palustris					
Scouring rush						reed canary					
Persicaria amphib						spotted joe pye					
Euthamia gram						NE aster					
bird foot trefoil						bitter nightshade					
timothy						indian hemp					
Festuca arund.						turtlehead					
Elymus virginicus						Iris versicolor					
Juncus dudleyi						lance leaf aster					
path rush						Canada anemone					
fringed loosestrife						dark green bulrush					
ox eye daisy						Carex flava					
Carex pellita						Carex vulp					
Canada bluejoint						water speedwell					
Poa pratensis						nipplewort					
lance leaf aster						Carex stricta					
P.S aster						wild cucumber					

- photos 5010-5019
- E. gartersnake

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

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

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

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
Rosa palustris					

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
Carex bebbii					✓x
tall buttercup					
purple fringed orchid					
timothy					
heal all					
sp. jewelweed					
Scirpus pendulus					
Evl. primrose					
Erigeron annuus					
Carex flava					
Carex pellita					
Poa pratensis					
Juncus dudleyii					
chara vulgaris					
Juncus articulatus					✓x

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

(SWT2; mixed willows/dogwoods)
(SA: mermaidweed - chara)
(narrow leaved sedge MAM, mineral soils)

Site:	Fletch Els (# 2230)
Polygon:	B (w inclusions) MAM2-5
UTM:	
Date: July 10/19	Time: 0930 - 1530
Surveyor(s):	~~A.~~ A. Dean
Weather:	27°C wind 1-2/ W, 10% CC

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

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
white willow					
Salix discolor					
Salix petiolaris					
Betula pendula					
glossy buckthorn					
Viburnum trilobum					
peach leaf willow					
wild cucumber					
marsh skullcap					
soft rush					
cow vetch					
michigan lily					
sp. joe pye					
tall GR					
Canada anemone					
Bidens sp.					
~~[illegible]~~ Potamogeton foliosus					✓x
water speedwell					
Glyceria septent.					
Canada goldenrod					
T.S. aster					
Cicuta bulb.					
moneywort					
Equisetum fluv.					
Lycopus amer.					
Ludwigia palustris					
lance leaf aster					
Glyceria striata					
Aster sp.					✓x
virgins bower					

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
indian hemp					
reed canary					
Carex vulp.					
Carex granularis					
Festuca pratensis					
Persicaria amphibia					
Poa palustris					
dark green bulrush					
path rush					
Carex lacustris					
Carex aquatilis					
Curly dock					
Iris versicolor					
Swamp milkweed					
marsh cinquefoil					
Proserpinaca pal.					
Silverweed					
Utricularia gibba					✓
Canada bluejoint					
Carex stricta					
Lycopus uni.					
~~[illegible]~~					
Carex ~~[illegible]~~ prairea					✓x
Eleocharis eryth.					
Agrostis stolon.					
Eleocharis palustris					✓x
Galium labradoricum					✓x
boneset					
Am. wild mint					
Campanula apar.					

- photos 4997 - 5002

- red admiral, mourning cloak

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

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

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

Species	Layer 1	2	3	4	Sample
spicebush					
gray dogwood					
Salix exigua					
E. cottonwood					
Shining willow					

Species	Layer 1	2	3	4	Sample
maddog skullcap					
bitter nightshade					
Cicuta bulb					
soft bulrush					
Carex comosa					

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Page 3 of 4

PLANT SPECIES LIST

Site:	(#2230)
Polygon:	C (w inclusion) SWM6-3
UTM:	
Date: July 10/19	Time: 0930 - 1530
Surveyor(s):	AMO A. Dean
Weather:	27°C, wind 1-2, 10% CC, No precip.

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

Species	Layer 1	2	3	4	Sample
Silky dogwood					
Spiraea alba					
Rosa palustris					
peach leaf willow					
glossy buckthorn					
Can. elderberry					
RO dogwood					
nannyberry					
Salix petiolephala					
White willow					
Galium palustre					
purple fringed orchid					
Glyceria striata					
Carex brunescens					
Carex stipata					
Carex radiata					
Dryopt. cristata					
Carex leptalea					
Solidago rugosa					
marsh skullcap					
Carex lacustris					
P.S. aster					
Aster sp.					✓ same
False nettle					
wl. avens					
Eleocharis palustris					✓ same
Eleocharis erythr					
dark green bulrush					
Lycopus uni					
Iris versicolor					

Species	Layer 1	2	3	4	Sample
Campanula spar.					
red canary					
lance leaf aster					
Carex lasio					
Carex stricta					
bonesct					
Swamp milkweed					
Virgins bower					
canada goldenrod					
Canada anemone					
P.S aster					
Canada bluejoint					
sp. jewelweed					
mantla arvensis					
marsh fern					
Cicuta bulb					
Persicaria amphib.					
michigan lily					
Veronica scutellata					
calico aster					
Carex granularis					
late goldenrod					
Carex gracillima					
Carex lacustris					
stellaria graminea					
Galium labrador.					✓ same
Agrostis stolon.					
Mimulus ringens					
Carex flava					
Carex bebbii					✓ same, Oval

- photos 5003, 5007-5009
- crayfish chimneys in adjacent pasture (MAM2-5)

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

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

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

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

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site: (#2230)	
Polygon: D (F inclusion) FOD5-1	
UTM:	
Date: July 10/19	Time: 0930 - 1530
Surveyor(s): A. Dean	
Weather: 27°C, wind 1-2, 10% CC, No precip.	

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

Species	Layer 1	2	3	4	Sample	Species	Layer 1	2	3	4	Sample
glossy buckthorn						heal all					
Euro. buckthorn						Can. anemone					
bur oak						ox eye daisy					
Sorbus aucuparia						enchant. nightshade					
Rubus allegheny						calico aster					
guelder rose						Arenaria serp.					
bl. walnut						Carex gracillima					
wt spruce						Carex blanda					
						wood agrimony					
						Carex communis					
						Viola labrador					
						Triosteum aurant.					
						Carex lepto.					
						Carex arctata					
						wood strawberry					
						red baneberry					
						Glyceria striata					
						Ranunculus recurv.					
						Carex hitchcock					
						Oxalis stricta					
						Rugell's plantain					
						Carex albursina					
						yellow avens					
						tall buttercup					
						helleborine					
						wild basil					
						Carex hirtifolia					
						zigzag GR					
						Sonchus asper					

- E. wood pewee
- photos 5004-5006

APPENDIX VIII

Species Lists Reported from the Study Area

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Observed[5]	Huron County	NRSI Observed			
											CUP3 (with SWD2-2, MAM2-2, CUP2, SWT2-5, and CUM1 inclusions)	MAM2-5 (with SWT2-8, and SA inclusions)	SWM6-3 (with SWT3-2 and FOD8-1 inclusions)	FOD5-1 (with CUP3-2 inclusion)
Pteridophytes	**Ferns & Allies**													
Dryopteridaceae	**Wood Fern Family**													
Dryopteris cristata	Crested Wood Fern	7	-5		S5					X			X	
Onoclea sensibilis	Sensitive Fern	4	-3		S5					X		X	X	X
Equisetaceae	**Horsetail Family**													
Equisetum arvense	Field Horsetail	0	0		S5					X	X			
Equisetum fluviatile	Water Horsetail	7	-5		S5					X		X		
Equisetum hyemale ssp. affine	Scouring-rush	2	-2		S5					X	X			
Thelypteridaceae	**Beech Fern Family**													
Thelypteris palustris var. pubescens	Marsh Fern	5	-4		S5					X			X	
Gymnosperms	**Conifers**													
Cupressaceae	**Cypress Family**													
Thuja occidentalis	White Cedar	4	-3		S5					X	X	X		
Pinaceae	**Pine Family**													
Larix laricina	Tamarack	7	-3		S5					X			X	
Picea abies	Norway Spruce		5	-1	SE3						X			
Picea glauca	White Spruce	6	3		S5					X				X
Pinus strobus	Eastern White Pine	4	3		S5					X	X			X
Dicotyledons	**Dicots**													
Aceraceae	**Maple Family**													
Acer rubrum	Red Maple	4	0		S5					X	X	X		
Acer saccharum ssp. saccharum	Sugar Maple	4	3		S5					X	X			X
Acer X freemanii	Freeman's Maple										X	X	X	
Apiaceae	**Carrot or Parsley Family**													
Aegopodium podagraria	Goutweed		0	-3	SE5									X
Cicuta bulbifera	Bulb-bearing Water-hemlock	5	-5		S5					X		X	X	
Daucus carota	Wild Carrot		5	-2	SE5					I	X			
Apocynaceae	**Dogbane Family**													
Apocynum cannabinum var. cannabinum	Indian Hemp		1		S5					X	X	X		
Vinca minor	Periwinkle		5	-2	SE5					I	X			
Asclepiadaceae	**Milkweed Family**													
Asclepias incarnata ssp. incarnata	Swamp Milkweed	6	-5		S5					X		X	X	
Asclepias syriaca	Common Milkweed	0	5		S5					X	X			
Asteraceae	**Composite or Aster Family**													
Erigeron annuus	Daisy Fleabane	0	1		S5							X		
Erigeron philadelphicus ssp. philadelphicus	Philadelphia Fleabane	1	-3		S5					X	X			
Eupatorium perfoliatum	Perfoliate Thoroughwort	2	-4		S5					X		X	X	
Eupatorium maculatum ssp. maculatum	Spotted Joe-pye-weed	3	-5		S5					X	X	X	X	
Euthamia graminifolia	Flat-topped Bushy Goldenrod	2	-2		S5					X	X			
Lapsana communis	Nipplewort		5	-2	SE5					I	X			
Leucanthemum vulgare	Ox-eye Daisy		5	-1	SE5						X			X
Solidago altissima var. altissima	Tall Goldenrod	1	3		S5					X		X		
Solidago canadensis	Canada Goldenrod	1	3		S5					X		X	X	
Solidago flexicaulis	Zig-zag Goldenrod	6	3		S5					X				X

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Observed[5]	Huron County	NRSI Observed			
											CUP3 (with SWD2-2, MAM2-2, CUP2, SWT2-5, and CUM1 inclusions)	MAM2-5 (with SWT2-8, and SA inclusions)	SWM6-3 (with SWT3-2 and FOD8-1 inclusions)	FOD5-1 (with CUP3-2 inclusion)
Solidago gigantea	Giant Goldenrod	4	-3		S5					X			X	
Solidago rugosa ssp. rugosa	Rough Goldenrod	4	-1		S5					X			X	
Sonchus asper ssp. asper	Spiny-leaved Sow-thistle		0	-1	SE5					I				X
Symphyotrichum lanceolatum	Panicled Aster	3	-3		S5						X	X	X	
Symphyotrichum lateriflorum var. lateriflorum	Calico Aster	3	-2		S5					X	X		X	X
Symphyotrichum species	Aster species											X	X	
Symphyotrichum novae-angliae	New England Aster	2	-3		S5					X	X			
Symphyotrichum puniceum var. puniceum	Purple-stemmed Aster				S5					X	X	X	X	
Balsaminaceae	**Touch-me-not Family**													
Impatiens capensis	Spotted Touch-me-not	4	-3		S5					X	X	X	X	
Berberidaceae	**Barberry Family**													
Caulophyllum giganteum	Blue Cohosh				S5									X
Betulaceae	**Birch Family**													
Betula pendula	European Weeping Birch		-4	-3	SE4							X		
Brassicaceae	**Mustard Family**													
Alliaria petiolata	Garlic Mustard		0	-3	SE5					I	X			
Nasturtium officinale	Water-cress		-5	-1	SE?					I	X			
Campanulaceae	**Bellflower Family**													
Campanula aparinoides	Marsh Bellflower	7	-5		S5					X		X	X	
Caprifoliaceae	**Honeysuckle Family**													
Sambucus canadensis	Common Elderberry	5	-2		S5					X		X	X	
Symphoricarpos albus	Snowberry	7	4		S5									X
Triosteum aurantiacum	Wild Coffee	7	5		S5					X				X
Viburnum lentago	Nannyberry	4	-1		S5					X		X	X	X
Viburnum opulus	Guelder Rose		0	-1	SE4						X			X
Viburnum trilobum	High Bush Cranberry	5	-3		S5					X		X		
Caryophyllaceae	**Pink Family**													
Arenaria serpyllifolia	Thyme-leaved Sandwort		0	-2	SE5					I				X
Stellaria graminea	Grass-leaved Stitchwort		5	-2	SE5					I			X	
Cornaceae	**Dogwood Family**													
Cornus alternifolia	Alternate-leaved Dogwood	6	5		S5					X	X		X	X
Cornus amomum ssp. obliqua	Silky Dogwood	5	-4		S5					X	X	X	X	
Cornus foemina ssp. racemosa	Red Panicled Dogwood	2	-2		S5					X	X		X	
Cornus stolonifera	Red-osier Dogwood	2	-3		S5					X	X	X	X	
Cucurbitaceae	**Gourd Family**													
Echinocystis lobata	Prickly Cucumber	3	-2		S5					X	X	X		
Dipsacaceae	**Teasel Family**													
Dipsacus fullonum ssp. sylvestris	Wild Teasel		5	-1	SE5					I	X			
Fabaceae	**Pea Family**													
Coronilla varia	Variable Crown-vetch		5	-2	SE5						X			
Lotus corniculatus	Bird's-foot Trefoil		1	-2	SE5					I	X			
Vicia cracca	Tufted Vetch		5	-1	SE5					I		X		

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	NHIC Observed[5]	Huron County	NRSI Observed			
											CUP3 (with SWD2-2, MAM2-2, CUP2, SWT2-5, and CUM1 inclusions)	MAM2-5 (with SWT2-8, and SA inclusions)	SWM6-3 (with SWT3-2 and FOD8-1 inclusions)	FOD5-1 (with CUP3-2 inclusion)
Fagaceae	**Beech Family**													
Fagus grandifolia	American Beech	6	3		S5					X				X
Quercus macrocarpa	Bur Oak	5	1		S5					X				X
Grossulariaceae	**Currant Family**													
Ribes americanum	Wild Black Currant	4	-3		S5					X			X	
Ribes cynosbati	Prickly Gooseberry	4	5		S5					X			X	X
Ribes rubrum	Red Currant		5	-2	SE5									X
Haloragaceae	**Water-milfoil Family**													
Myriophyllum sibiricum	Pale Water-milfoil		-5		S5							X		
Proserpinaca palustris	Field Mermaid-weed	7	-5		S4							X		
Juglandaceae	**Walnut Family**													
Juglans nigra	Black Walnut	5	3		S4					X	X			X
Lamiaceae	**Mint Family**													
Clinopodium vulgare	Wild Basil	4	5		S5					X	X			X
Lycopus americanus	Cut-leaved Water-horehound	4	-5		S5					X		X		
Lycopus uniflorus	Northern Water-horehound	5	-5		S5					X		X	X	
Mentha arvensis ssp. borealis	American Wild Mint	3	-3		S5					X		X	X	
Prunella vulgaris ssp. lanceolata	Heal-all	5	5		S5						X	X		X
Scutellaria galericulata	Hooded Skullcap	6	-5		S5					X	X		X	
Scutellaria lateriflora	Mad-dog Skullcap	5	-5		S5					X			X	
Lauraceae	**Laurel Family**													
Lindera benzoin	Spicebush	6	-2		S5					X			X	
Lentibulariaceae	**Bladderwort Family**													
Utricularia gibba	Humped Bladderwort	9	-5		S4							X		
Menyanthaceae	**Buckbean Family**													
Menyanthes trifoliata	Three-leaved Buckbean	9	-5		S5					X		x		
Oleaceae	**Olive Family**													
Fraxinus pennsylvanica	Green Ash	3	-3		S5					X	X		X	
Onagraceae	**Evening-primrose Family**													
Circaea lutetiana ssp. canadensis	Yellowish Enchanter's Nightshade	3	3		S5					X	X			X
Ludwigia palustris	Marsh Purslane	5	-5		S5					X		X		
Oenothera biennis	Common Evening-primrose	0	3		S5					X		X		
Oxalidaceae	**Wood Sorrel Family**													
Oxalis stricta	Upright Yellow Wood-sorrel	0	3		S5					X				X
Papaveraceae	**Poppy Family**													
Sanguinaria canadensis	Bloodroot	5	4		S5					X	X			X
Plantaginaceae	**Plantain Family**													
Plantago rugelii	Rugel's Plantain	1	0		S5					X				X

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											CUP3 (with SWD2-2, MAM2-2, CUP2, SWT2-5, and CUM1 inclusions)	MAM2-5 (with SWT2-8, and SA inclusions)	SWM6-3 (with SWT3-2 and FOD8-1 inclusions)	FOD5-1 (with CUP3-2 inclusion)
Polygonaceae	**Smartweed Family**													
Persicaria amphibia	Water Smartweed	5	-5		S5					X	X	X	X	
Rumex crispus	Curly-leaf Dock		-1	-2	SE5					I		X		
Rumex obtusifolius ssp. obtusifolius	Bitter Dock		-3	-1	SE5					I	X			
Primulaceae	**Primrose Family**													
Lysimachia ciliata	Fringed Loosestrife	4	-3		S5					X	X			
Lysimachia nummularia	Moneywort		-4	-3	SE5					I		X		
Ranunculaceae	**Buttercup Family**													
Actaea rubra	Red Baneberry	5	5		S5					X				X
Anemone canadensis	Canada Anemone	3	-3		S5					X	X	X	X	X
Anemone virginiana var. virginiana	Thimbleweed	4	5		S5					X	X			
Caltha palustris	Marsh-marigold	5	-5		S5					X		X		
Clematis virginiana	Virgin's-bower	3	0		S5					X		X	X	
Ranunculus acris	Tall Buttercup		-2	-2	SE5					I	X	X		X
Ranunculus hispidus var. caricetorum	Swamp Buttercup	5	-5		S5					X		X		
Ranunculus recurvatus var. recurvatus	Hooked Buttercup	4	-3		S5					X				X
Rhamnaceae	**Buckthorn Family**													
Rhamnus cathartica	European Buckthorn		3	-3	SE5					I	X		X	X
Frangula alnus	Glossy Buckthorn		-1	-3	SE5					I	X	X	X	X
Rosaceae	**Rose Family**													
Agrimonia gryposepala	Tall Hairy Agrimony	2	2		S5					X				X
Comarum palustre	Marsh Cinquefoil	7	-5		S5					X		X		
Crataegus species	Hawthorn species										X			
Crataegus punctata	Large-fruited Thorn	4	5		S5					X	X			
Fragaria vesca ssp. americana	Woodland Strawberry	4	4		S5					X				X
Fragaria virginiana	Wild Strawberry				S5						X			
Geum aleppicum	Yellow Avens	2	-1		S5					X	X			X
Geum canadense	White Avens	3	0		S5					X			X	
Geum urbanum	Wood Avens		5	-1	SE2						X			
Malus domestica	Apple										X			
Argentia anserina ssp. anserina	Silverweed	5	-4		S5					X		X		
Prunus serotina	Black Cherry	3	3		S5					X				X
Prunus virginiana ssp. virginiana	Choke Cherry	2	1		S5					X	X			X
Rosa multiflora	Multiflora Rose		3	-3	SE4					I				X
Rosa palustris	Marsh Rose	7	-5		S5					X		X	X	
Rubus allegheniensis	Alleghany Blackberry	2	2		S5					X				X
Rubus idaeus ssp. melanolasius	Wild Red Raspberry	0	-2		S5					X	X			
Rubus occidentalis	Black Raspberry	2	5		S5					X	X			
Rubus pubescens	Dwarf Raspberry	4	-4		S5					X	X		X	
Sorbus aucuparia	European Mountain-ash		5	-2	SE4					I	X			X
Spiraea alba	Narrow-leaved Meadow-sweet	3	-4		S5					X	X	X	X	
Rubiaceae	**Madder Family**													
Galium labradoricum	Labrador Marsh Bedstraw	9	-5		S5							X	X	
Galium palustre	Marsh Bedstraw	5	-5		S5					X			X	
Salicaceae	**Willow Family**													
Populus balsamifera ssp. balsamifera	Balsam Poplar	4	-3		S5					X		X		
Populus deltoides ssp. deltoides	Eastern Cottonwood	4	-1		S5					X	X		X	

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Salix alba var. alba	White Willow			-2	SE4					I	X	X	X	
Salix amygdaloides	Peach-leaved Willow	6	-3		S5					X	X	X	X	
Salix discolor	Pussy Willow	3	-3		S5					X	X	X		
Salix eriocephala	Heart-leaved Willow	4	-3		S5					X	X		X	
Salix exigua	Sandbar Willow	3	-5		S5					X			X	
Salix lucida	Shining Willow	5	-4		S5					X			X	
Salix petiolaris	Slender Willow	3	-4		S5					X	X	X		
Scrophulariaceae	**Figwort Family**													
Chelone glabra	Turtlehead	7	-5		S5					X	X		X	
Mimulus ringens	Square-stemmed Monkey-flower	6	-5		S5					X			X	
Veronica anagallis-aquatica	Water Speedwell		-5	-1	SE5					I	X	X		
Veronica scutellata	Marsh Speedwell	7	-5		S5								X	
Solanaceae	**Nightshade Family**													
Solanum dulcamara	Bitter Nightshade		0	-2	SE5					I	X		X	
Solanum nigrum	Black Nightshade		0	-1	SE1						X			
Ulmaceae	**Elm Family**													
Ulmus americana	White Elm	3	-2		S5					X	X	X	X	X
Urticaceae	**Nettle Family**													
Boehmeria cylindrica	False Nettle	4	-5		S5					X			X	
Violaceae	**Violet Family**													
Viola cucullata	Marsh Blue Violet	5	-5		S5					X		X		
Viola labradorica	Alpine Violet				S4S5								X	X
Viola pubescens	Downy Yellow Violet	5	4		S5					X				X
Viola sororia	Woolly Blue Violet	4	1		S5					X		X	X	X
Vitaceae	**Grape Family**													
Parthenocissus vitacea	Woodbine	3	3		S5					X	X			
Monocotyledons	**Monocots**													
Araceae	**Arum Family**													
Arisaema triphyllum	Jack-in-the-pulpit	5	-2		S5					X				X
Cyperaceae	**Sedge Family**													
Carex albursina	White Bear Sedge	7	5		S5					X				X
Carex aquatilis	Aquatic Sedge	7	-5		S5					X		X		
Carex arctata	Drooping Wood Sedge	5	5		S5					X				X
Carex bebbii	Bebb's Sedge	3	-5		S5					X		X	X	
Carex blanda	Woodland Sedge	3	0		S5					X				X
Carex bromoides	Bromelike Sedge	7	-4		S5							X		
Carex brunnescens ssp. brunnescens	Brownish Sedge	7	-3		S5					X			X	
Carex communis	Fibrous Rooted Sedge	6	5		S5					X				X
Carex comosa	Bristly Sedge	5	-5		S5					X			X	
Carex flava	Yellow Sedge	5	-5		S5					X	X	X	X	
Carex gracillima	Graceful Sedge	4	3		S5					X			X	X
Carex granularis	Meadow Sedge	3	-4		S5					X		X	X	
Carex hirtifolia	Pubescent Sedge	5	5		S5					X				X
Carex hitchcockiana	Hitchcock's Sedge	6	5		S5					X				X
Carex lacustris	Lake-bank Sedge	5	-5		S5					X		X	X	

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Carex lasiocarpa	Slender Sedge	8	-5		S5								X	
Carex leptalea ssp. leptalea	Bristle-stalked Sedge	8	-5		S5					X			X	
Carex leptonervia	Finely-nerved Sedge	5	0		S5					X				X
Carex pellita	Woolly Sedge	4	-5		S5					X	X	X		
Carex prairea	Prairie Sedge	7	-4		S5							X		
Carex radiata	Radiate Sedge	4	5		S5					X			X	
Carex retrorsa	Retrorse Sedge	5	-5		S5					X	X			
Carex stipata	Awl-fruited Sedge	3	-5		S5					X			X	
Carex stricta	Tussock Sedge	4	-5		S5					X	X	X	X	
Carex vulpinoidea	Fox Sedge	3	-5		S5					X	X	X		
Eleocharis erythropoda	Red-footed Spike-rush	4	-5		S5					X		X	X	
Eleocharis smallii	Small's Spike-rush	6	-5		S5					X		X	X	
Scirpus atrovirens	Dark-green Bulrush	3	-5		S5					X	X	X	X	
Scirpus pendulus	Lined Bulrush	3	-5		S5					X		X		
Iridaceae	**Iris Family**													
Iris versicolor	Multi-coloured Blue-flag	5	-5		S5					X	X	X	X	
Juncaceae	**Rush Family**													
Juncus articulatus	Jointed Rush	5	-5		S5					X		X		
Juncus dudleyi	Dudley's Rush	1	0		S5					X	X	X		
Juncus effusus var. solutus	Soft Rush	4	-5		S5					X		X		
Juncus tenuis	Path Rush	0	0		S5					X	X	X		
Lemnaceae	**Duckweed Family**													
Lemna minor	Lesser Duckweed	2	-5		S5					X	X			
Liliaceae	**Lily Family**													
Allium tricoccum	Wild Leek	7	2		S5					X				X
Erythronium americanum ssp. americanum	Yellow Dog's-tooth Violet	5	5		S5					X	X		X	X
Hemerocallis fulva	Orange Day-lily		5	-3	SE5					I	X			
Lilium michiganense	Michigan Lily	7	-1		S5					X		X	X	
Maianthemum racemosum ssp. racemosum	False Solomon's Seal	4	3		S5					X				X
Maianthemum stellatum	Star-flowered Solomon's Seal	6	1		S5					X			X	X
Narcissus pseudonarcissus	Daffodil				SE2									X
Trillium erectum	Purple Trillium	6	1		S5					X			X	X
Trillium grandiflorum	White Trillium	5	5		S5					X				X
Orchidaceae	**Orchid Family**													
Epipactis helleborine	Common Helleborine		5	-2	SE5					I	X			X
Platanthera psycodes	Smaller Purple-fringed Orchis	8	-3		S5					X		X	X	
Poaceae	**Grass Family**													
Agrostis stolonifera	Redtop		-3		S5					X		X	X	
Calamagrostis canadensis	Blue-joint Grass	4	-5		S5					X	X	X	X	
Dactylis glomerata	Orchard Grass		3	-1	SE5					I	X			
Elymus repens	Quack Grass		3	-3	SE5					I	X			
Elymus virginicus var. virginicus	Virginia Wild Rye	5	-2		S5					X	X			
Festuca arundinacea	Tall Fescue		2	-1	SE5					I	X			
Festuca pratensis	Meadow Fescue		4	-1	SE5					I		X		
Glyceria septentrionalis	Floating Manna Grass	8	-5		S4							X		
Glyceria striata	Fowl Meadow Grass	3	-5		S5					X		X	X	X
Phalaris arundinacea	Reed Canary Grass	0	-4		S5					X	X	X	X	

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Phleum pratense	Timothy		3	-1	SE5					I	X	X		
Phragmites australis	Common Reed	0	-4		S5							X		
Poa palustris	Fowl Meadow Grass	5	-4		S5					X	X	X		
Poa pratensis ssp. pratensis	Kentucky Bluegrass	0	1		S5					X	X	X		
Potamogetonaceae	**Pondweed Family**													
Potamogeton foliosus	Leafy Pondweed	4	-5		S5					X		X		
Typhaceae	**Cattail Family**													
Typha latifolia	Broad-leaved Cattail	3	-5		S5					X		X		
[1,2]MNRF 2018; [3,4]Government of Canada 2018; [5]MNRF 2018								**Total**			**95**	**93**	**83**	**63**

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
S#? Rank Uncertain
COSSARO
END Endangered
THR Threatened
SC Special Concern
NAR Not at Risk
DD Data Deficient
COSEWIC
E Endangered
T Threatened
Huron County
X Present and Native
I Present and Introduced
? Questionable Records Only

Floristic Quality Assessments

Coniferous Plantation (CUP3)

FLORISTIC SUMMARY & ASSESSMENT	CUP3		
Species Diversity*			
Total Species:	**95**		
Native Species:	**64**	67.37%	
Exotic Species	**27**	28.42%	
Total Taxa in Region (List Region, Source)	862		
% Regional Taxa Recorded	11.02%		
Regionally Significant Species	0		
S1-S3 Species	0		
S4 Species	1		
S5 Species	63		
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average)		**6.90**	
CC 0 to 3	lowest sensitivity	31	48.44%
CC 4 to 6	moderate sensitivity	29	45.31%
CC 7 to 8	high sensitivity	1	1.56%
CC 9 to 10	highest sensitivity	0	0.00%
Floral Quality Index (FQI)		**55.20**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.20**	
weediness = -1	low potential invasiveness	12	44.44%
weediness = -2	moderate potential invasiveness	10	37.04%
weediness = -3	high potential invasiveness	5	18.52%
Presence of Wetland Species			
average wetness value		**1.10**	
upland		19	20.00%
facultative upland		11	11.58%
facultative		15	15.79%
facultative wetland		28	29.47%
obligate wetland		15	15.79%

Narrow-leaved Sedge Mineral Meadow Marsh (MAM2-5)

FLORISTIC SUMMARY & ASSESSMENT	MAM2-5		
Species Diversity*			
Total Species:	**93**		
Native Species:	**80**	86.02%	
Exotic Species	**12**	12.90%	
Total Taxa in Region (List Region, Source)	862		
% Regional Taxa Recorded	10.79%		
Regionally Significant Species	0		
S1-S3 Species	0		
S4 Species	3		
S5 Species	77		
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average)		**6.97**	
CC 0 to 3	lowest sensitivity	28	35.00%
CC 4 to 6	moderate sensitivity	34	42.50%
CC 7 to 8	high sensitivity	11	13.75%
CC 9 to 10	highest sensitivity	3	3.75%
Floral Quality Index (FQI)		**62.34**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.19**	
weediness = -1	low potential invasiveness	6	50.00%
weediness = -2	moderate potential invasiveness	3	25.00%
weediness = -3	high potential invasiveness	3	25.00%
Presence of Wetland Species			
average wetness value		**0.39**	
upland		3	3.23%
facultative upland		5	5.38%
facultative		13	13.98%
facultative wetland		30	32.26%
obligate wetland		39	41.94%

Swamp Maple Organic Deciduous Swamp (SWM6-3)

FLORISTIC SUMMARY & ASSESSMENT	SWM6-3		
Species Diversity*			
Total Species:	**88**		
Native Species:	**77**	87.50%	
Exotic Species	**8**	9.09%	
Total Taxa in Region (List Region, Source)	862		
% Regional Taxa Recorded	10.21%		
Regionally Significant Species	0		
S1-S3 Species	0		
S4 Species	0		
S5 Species	77		
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average)		**6.92**	
CC 0 to 3	lowest sensitivity	22	28.57%
CC 4 to 6	moderate sensitivity	40	51.95%
CC 7 to 8	high sensitivity	11	14.29%
CC 9 to 10	highest sensitivity	1	1.30%
Floral Quality Index (FQI)		**60.72**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.20**	
weediness = -1	low potential invasiveness	3	37.50%
weediness = -2	moderate potential invasiveness	3	37.50%
weediness = -3	high potential invasiveness	2	25.00%
Presence of Wetland Species			
average wetness value		**1.11**	
upland		7	7.95%
facultative upland		4	4.55%
facultative		12	13.64%
facultative wetland		28	31.82%
obligate wetland		31	35.23%

FLORISTIC SUMMARY & ASSESSMENT	FOD5-1		
Species Diversity*			
Total Species:	**68**		
Native Species:	**51**	75.00%	
Exotic Species	**16**	23.53%	
Total Taxa in Region (List Region, Source)	862		
% Regional Taxa Recorded	7.89%		
Regionally Significant Species	0		
S1-S3 Species	0		
S4 Species	1		
S5 Species	50		
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average)		**6.92**	
CC 0 to 3	lowest sensitivity	14	27.45%
CC 4 to 6	moderate sensitivity	31	60.78%
CC 7 to 8	high sensitivity	4	7.84%
CC 9 to 10	highest sensitivity	0	0.00%
Floral Quality Index (FQI)		**49.42**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.21**	
weediness = -1	low potential invasiveness	6	37.50%
weediness = -2	moderate potential invasiveness	5	31.25%
weediness = -3	high potential invasiveness	4	25.00%
Presence of Wetland Species			
average wetness value		**1.10**	
upland		19	27.94%
facultative upland		21	30.88%
facultative		16	23.53%
facultative wetland		7	10.29%
obligate wetland		1	1.47%

#2230 - Pletch Property EIS
Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17MJ64, 17MJ65, 17MJ74, 17MJ75	NHIC Data[6]	NRSI Observed
Anatidae	**Ducks, Geese & Swans**							
Branta canadensis	Canada Goose	S5				CO		PO
Cygnus olor	Mute Swan	SNA				PR		
Aix sponsa	Wood Duck	S5				PO		
Anas rubripes	American Black Duck	S4				CO		
Anas platyrhynchos	Mallard	S5				CO		
Anas discors	Blue-winged Teal	S4				PR		
Lophodytes cucullatus	Hooded Merganser	S5B, S5N				PO		
Phasianidae	**Partridges, Grouse & Turkeys**							
Phasianus colchicus	Ring-necked Pheasant	SNA				PO		
Bonasa umbellus	Ruffed Grouse	S4				PO		PO
Meleagris gallopavo	Wild Turkey	S5				PO		
Columbidae	**Pigeons & Doves**							
Columba livia	Rock Pigeon	SNA				PR		PO
Zenaida macroura	Mourning Dove	S5				PR		PO
Cuculiformes	**Cuckoos & Anis**							
Coccyzus americanus	Yellow-billed Cuckoo	S4B				PR		
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B				PO		
Apodidae	**Swifts**							
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	PO		
Trochilidae	**Hummingbirds**							
Archilochus colubris	Ruby-throated Hummingbird	S5B				PO		PO
Rallidae	**Railes, Gallinules & Coots**							
Rallus limicola	Virginia Rail	S5B				PO		
Porzana carolina	Sora	S4B				PO		
Gallinula galeata	Common Gallinule	S4B				CO		
Charadriidae	**Plovers**							
Charadrius vociferus	Killdeer	S5B, S5N				CO		PO
Scolopacidae	**Waders**							
Gallinago delicata	Wilson's Snipe	S5B				PO		
Scolopax minor	American Woodcock	S4B				PO		
Actitis macularia	Spotted Sandpiper	S5				PR		

#2230 - Pletch Property EIS
Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17MJ64, 17MJ65, 17MJ74, 17MJ75	NHIC Data[6]	NRSI Observed
Ardeidae	**Herons & Bitterns**							
Ardea herodias	Great Blue Heron	S4B				PO		X
Butorides virescens	Green Heron	S4B				PR		PO
Cathartidae	**Vultures**							
Cathartes aura	Turkey Vulture	S5B				PO		X
Accipitridae	**Hawks, Kites, Eagles & Allies**							
Pandion haliaetus	Osprey	S5B						X
Circus cyaneus	Northern Harrier	S4B	NAR	NAR		PO		
Accipiter striatus	Sharp-shinned Hawk	S5	NAR			PR		
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR		PR		
Accipiter gentilis	Northern Goshawk	S4	NAR	NAR		CO		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR		PO		
Strigidae	**Typical Owls**							
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR		PO		
Bubo virgianus	Great Horned Owl	S4				PO		
Alcedinidae	**Kingfishers**							
Megaceryle alcyon	Belted Kingfisher	S4B				CO		
Picidae	**Woodpeckers**							
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	END	Schedule 1	CO		
Melanerpes carolinus	Red-bellied Woodpecker	S4				PO		
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B				CO		X
Picoides pubescens	Downy Woodpecker	S5				PO		PO
Picoides villosus	Hairy Woodpecker	S5				CO		PO
Colaptes auratus	Northern Flicker	S4B				PO		PO
Dryocopus pileatus	Pileated Woodpecker	S5				PO		
Falconidae	**Caracaras & Falcons**							
Falco sparverius	American Kestrel	S4				PR		
Tyrannidae	**Tyrant Flycatchers**							
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		PR		PR
Empidonax alnorum	Alder Flycatcher	S5B				PO		
Empidonax traillii	Willow Flycatcher	S5B				PO		PO
Empidonax minimus	Least Flycatcher	S4B				PO		X
Sayornis phoebe	Eastern Phoebe	S5B				CO		
Myiarchus crinitus	Great Crested Flycatcher	S4B				PR		PO
Tyrannus tyrannus	Eastern Kingbird	S4B				CO		PO

#2230 - Pletch Property EIS
Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17MJ64, 17MJ65, 17MJ74, 17MJ75	NHIC Data[6]	NRSI Observed
Vireonidae	**Vireos**							
Vireo flavifrons	Yellow-throated Vireo	S4B				PO		
Vireo gilvis	Warbling Vireo	S5B				PR		PO
Vireo olivaceus	Red-eyed Vireo	S5B				PR		PO
Corvidae	**Crows & Jays**							
Cyanocitta cristata	Blue Jay	S5				PO		PO
Corvus brachyrhynchos	American Crow	S5B				PO		PO
Corvus corax	Common Raven	S5						PR
Alaudidae	**Larks**							
Eremophila alpestris	Horned Lark	S5B				PO		
Hirundinidae	**Swallows**							
Tachycineta bicolor	Tree Swallow	S4B				CO		PO
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B				PR		
Riparia riparia	Bank Swallow	S4B	THR	T		CO		
Petrochelidon pyrrhonota	Cliff Swallow	S4B				CO		
Hirundo rustica	Barn Swallow	S4B	THR	T		CO		PO
Paridae	**Chickadees & Titmice**							
Poecile atricapillus	Black-capped Chickadee	S5				PR		PR
Sittidae	**Nuthatches**							
Sitta canadensis	Red-breasted Nuthatch	S5				PR		PO
Sitta carolinensis	White-breasted Nuthatch	S5				PR		PO
Certhiidae	**Creepers**							
Certhia americana	Brown Creeper	S5B				PO		
Troglodytidae	**Wrens**							
Troglodytes aedon	House Wren	S5B				CO		PO
Troglodytes hiemalis	Winter Wren	S5B				PO		
Polioptilidae	**Gnatcatchers**							
Polioptila caerulea	Blue-gray Gnatcatcher	S4B				PR		
Regulidae	**Kinglets**							
Regulus calendula	Ruby-crowned Kinglet	S4B						X
Turdidae	**Thrushes**							
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR		CO		
Catharus fuscescens	Veery	S4B				PR		X
Hylocichla mustelina	Wood Thrush	S4B	SC	T		PO	X	
Turdus migratorius	American Robin	S5B				CO		PR

#2230 - Pletch Property EIS
Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17MJ64, 17MJ65, 17MJ74, 17MJ75	NHIC Data[6]	NRSI Observed
Mimidae	**Mockingbirds, Thrashers & Allies**							
Dumetella carolinensis	Gray Catbird	S4B				CO		PR
Toxostoma rufum	Brown Thrasher	S4B				PO		
Sturnidae	**Starlings**							
Sturnus vulgaris	European Starling	SNA				CO		PO
Bombycillidae	**Waxwings**							
Bombycilla cedrorum	Cedar Waxwing	S5B				PO		PO
Passeridae	**Old World Sparrows**							
Passer domesticus	House Sparrow	SNA				CO		PR
Fringillidae	**Finches & Allies**							
Carpodacus mexicanus	House Finch	SNA				PO		
Carpodacus purpureus	Purple Finch	S4B						PO
Spinus tristis	American Goldfinch	S5B				CO		PR
Parulidae	**Wood Warblers**							
Seiurus aurocapillus	Ovenbird	S4B				PO		
Parkesia noveboracensis	Northern Waterthrush	S5B				PO		
Mniotilta varia	Black-and-white Warbler	S5B				PR		
Oreothlypis celata	Orange-crowned Warbler	S4B						X
Oreothlypis ruficapilla	Nashville Warbler	S5B				PO		PO
Geothylpis philadelphia	Mourning Warbler	S4B				PO		PO
Geothylpis trichas	Common Yellowthroat	S5B				PR		PO
Setophaga ruticilla	American Redstart	S5B				PR		PO
Setophaga magnolia	Magnolia Warbler	S5B				PO		
Setophaga fusca	Blackburnian Warbler	S5B				PO		X
Setophaga petechia	Yellow Warbler	S5B				PR		PO
Setophaga pensylvanica	Chestnut-sided Warbler	S5B				PO		
Setophaga caerulescens	Black-throated Blue Warbler	S5B				PO		
Setophaga pinus	Pine Warbler	S5B				PR		
Setophaga coronata	Yellow-rumped Warbler	S5B				PR		
Setophaga virens	Black-throated Green Warbler	S5B				PR		
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	PO		

#2230 - Pletch Property EIS
Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17MJ64, 17MJ65, 17MJ74, 17MJ75	NHIC Data[6]	NRSI Observed
Emberizidae	**New World Sparrows & Allies**							
Pipilo erythrophthalmus	Eastern Towhee	S4B				PO		
Spizella passerina	Chipping Sparrow	S5B				PR		PO
Spizella pallida	Clay-colored Sparrow	S4B				PR		
Spizella pusilla	Field Sparrow	S4B				PO		X
Pooecetes gramineus	Vesper Sparrow	S4B				PR		
Passerculus sandwichensis	Savannah Sparrow	S4B				CO		PO
Melospiza melodia	Song Sparrow	S5B				CO		PO
Melospiza lincolnii	Lincoln's Sparrow	S5B						X
Melospiza georgiana	Swamp Sparrow	S5B				PR		PR
Zonotrichia albicollis	White-throated Sparrow	S5B				PO		X
Cardinalidae	**Cardinals, Grosbeaks & Allies**							
Piranga olivacea	Scarlet Tanager	S4B				PO		PO
Cardinalis cardinalis	Northern Cardinal	S5				PO		PO
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B				PR		CO
Passerina cyanea	Indigo Bunting	S4B				PR		
Icteridae	**Blackbirds**							
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	PR		PR
Agelaius phoeniceus	Red-winged Blackbird	S4				CO		PR
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	PO	X	X
Quiscalus quiscula	Common Grackle	S5B				CO		PO
Molothrus ater	Brown-headed Cowbird	S4B				PR		PO
Icterus spurius	Orchard Oriole	S4B				PR		PO
Icterus galbula	Baltimore Oriole	S4B				PO		PO
					Total	114	2	63

[1,2]MNRF 2019; [3,4]Government of Canada 2019; [5]BSC et al. 2008; [6]MNRF 2019

LEGEND	
S1 Critically Imperiled	**SARA Schedule**
S2 Imperiled	Schedule 1 Officially Protected under SARA
S3 Vulnerable	**Breeding Evidence Codes**
S4 Apparently Secure	X Observed (not observed to be breeding)
S5 Secure	PO Possible
COSSARO	PR Probable
END Endangered	CO Confirmed
THR Threatened	
SC Special Concern	
NAR Not at Risk	
COSEWIC	
E Endangered	
T Threatened	
SC Special Concern	
NAR Not at Risk	

2230 - Pletch Property EIS

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Reptile and Amphibian Atlas[5]	NHIC Data[6]	NRSI Observed
Turtles								
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	X	X	X
Chrysemys picta marginata	Midland Painted Turtle	S5		SC		X		
Snakes								
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	Schedule 1	X		
Storeria dekayi dekayi	Northern Brownsnake	S5	NAR	NAR		X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5				X		X
Salamanders								
Plethodon cinereus	Eastern Red-backed Salamander	S5				X		
Toads and Frogs								
Anaxyrus americanus	American Toad	S5				X		X
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Population)*	S3	NAR	T	Schedule 1	X		
Pseudacris crucifer	Spring Peeper	S5						X
Lithobates clamitans melanota	Northern Green Frog	S5				X		X
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR		X		X
Lithobates sylvaticus	Wood Frog	S5				X		
					Total	**11**	**1**	**6**

[1,2]MNRF 2018; [3,4]Government of Canada 2018; [5]Ontario Nature 2018; [6]MNRF 2018

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

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	TEA Atlas[5] (17MJ75; 17MJ65; 17MJ74; 17MJ64)	NHIC Data[6]	NRSI Observed
Hesperiidae	**Skippers**							
Polites mystic	Long Dash Skipper	S5				X		
Pieridae	**Whites and Sulphurs**							
Colias eurytheme	Orange Sulphur	S5				X		
Colias philodice	Clouded Sulphur	S5				X		
Pieris oleracea	Mustard White	S4				X		
Pieris rapae	Cabbage White	SNA				X		X
Pontia protodice	Checkered White	SNA				X		
Papilionidae	**Swallowtails**							
Papilio cresphontes	Giant Swallowtail	S4						X
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**							
Celastrina ladon	Spring Azure	SU						X
Satyrium acadica	Acadian Hairstreak	S4				X		
Nymphalidae	**Brush-footed Butterflies**							
Aglais milberti	Milbert's Tortoiseshell	S5				X		
Coenonympha tullia	Common Ringlet	S5				X		
Danaus plexippus	Monarch	S2N, S4B	SC	END	Schedule 1	X		X
Limenitis archippus	Viceroy	S5				X		
Limenitis arthemis astyanax	Red-spotted Purple	S5				X		
Nymphalis antiopa	Mourning Cloak	S5				X		X
Polygonia comma	Eastern Comma	S5				X		
Polygonia comma	Eastern Comma/Hop Merchant	S5				X		
Speyeria cybele	Great Spangled Fritillary	S5				X		
Vanessa atalanta	Red Admiral	S5				X		X
Vanessa cardui	Painted Lady	S5				X		
					TOTAL	18	0	6

[1,2]MNRF 2019; [3,4]Government of Canada 2019; [5]Jones et al. 2019; [6]MNRF 2019

LEGEND
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
COSSARO
SC Special Concern
THR Threatened
END Endangered
COSEWIC
SC Special Concern
T Threatened
SARA Schedule
Schedule 1 Officially Protected under SARA

Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Odonate Atlas[5]	NRSI Observed
Calopterygidae	**Broadwinged Damselflies**						
Hetaerina americana	American Rubyspot	S4				X	
Coenagrionidae	**Narrow-winged Damselflies**						
Amphiagrion saucium	Eastern Red Damsel	S4				X	
Argia moesta	Powdered Dancer	S5				X	
Enallagma antennatum	Rainbow Bluet	S4				X	
Enallagma exsulans	Stream Bluet	S5				X	
Ischnura verticalis	Eastern Forktail	S5				X	
Libellulidae	**Skimmers**						
Libellula luctuosa	Widow Skimmer	S5				X	
Libellula pulchella	Twelve-spotted Skimmer	S5				X	
					Total	**8**	**0**

[1,2]MNRF 2018; [3,4]Government of Canada 2018; [5]MNRF 2005

LEGEND
NAR Not at Risk
SC Special Concern
THR Threatened
END Endangered
EXP Extirpated
DD Data Deficient
COSEWIC
NAR Not at Risk
SC Special Concern
T Threatened
E Endangered
XT Extirpated
DD Data Deficient
SARA Schedule
Schedule 1 Officially Protected under SARA

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Mammal Atlas[5]	NHIC Data[6]	NRSI Observed
Didelphimorphia	**Opossums**							
Didelphis virginiana	Virginia Opossum	S4				X		X
Insectivora	**Shrews and Moles**							
Blarina brevicauda	Northern Short-tailed Shrew	S5				X		
Condylura cristata	Star-nosed Mole	S5				X		
Sorex palustris	Water Shrew	S5				X		
Chiroptera	**Bats**							
Eptesicus fuscus	Big Brown Bat	S4				X		
Lasionycteris noctivagans	Silver-haired Bat	S4				X		
Lasiurus borealis	Eastern Red Bat	S4				X		
Lasiurus cinereus	Hoary Bat	S4				X		
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	X		
Lagomorpha	**Rabbits and Hares**							
Lepus americanus	Snowshoe Hare	S5				X		
Lepus europaeus	European Hare	SNA				X		
Sylvilagus floridanus	Eastern Cottontail	S5				X		X
Rodentia	**Rodents**							
Castor canadensis	Beaver	S5				X		
Marmota monax	Woodchuck	S5				X		
Microtus pennsylvanicus	Meadow Vole	S5				X		
Ondatra zibethicus	Muskrat	S5				X		
Peromyscus leucopus	White-footed Mouse	S5				X		
Peromyscus maniculatus	Deer Mouse	S5				X		
Rattus norvegicus	Norway Rat	SNA				X		
Sciurus carolinensis	Eastern Gray Squirrel	S5				X		X
Tamiasciurus hudsonicus	Red Squirrel	S5				X		X
Tamias striatus	Eastern Chipmunk	S5				X		
Carnivora	**Carnivores**							
Canis latrans	Coyote	S5				X		
Mephitis mephitis	Striped Skunk	S5				X		

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Mammal Atlas[5]	NHIC Data[6]	NRSI Observed
Mustela erminea	Ermine	S5				X		
Mustela frenata	Long-tailed Weasel	S4				X		
Mustela vison	American Mink	S4				X		
Procyon lotor	Northern Raccoon	S5				X		
Vulpes vulpes	Red Fox	S5				X		
Artiodactyla	**Deer and Bison**							
Odocoileus virginianus	White-tailed Deer	S5				X		X
					Total	30	0	5

[1,2]MNRF 2018; [3,4]Government of Canada 2018; [5]Dobbyn 1994; [6]MNRF 2018

Legend
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
S#? Rank Uncertain
COSSARO
NAR Not at Risk
SC Special Concern
THR Threatened
END Endangered
COSEWIC
NAR Not at Risk
SC Special Concern
T Threatened
E Endangered
SARA Schedule
Schedule 1 Officially Protected under SARA

APPENDIX IX

Educational Brochure

Welcome to Your New Home in Belgrave

Homeowners Environmental Stewardship Guide

This homeowner's manual has been prepared as a guide to ensure the protection of natural areas and flora and fauna within the local area surrounding your community in Belgrave. This community is located next to several natural features, including woodlands, wetlands, and watercourses. This community has been designed to preserve these adjacent natural features and the wildlife habitat that they provide, through the establishment of vegetated, protective buffers between the community and the natural feature edges.

Living next to these natural areas provides a wonderful educational opportunity for an individual and community to better understand and appreciate the natural heritage features available. With this opportunity comes a responsibility to learn how to manage daily affairs and activities so that these areas are protected and enhanced. Read on to learn more about these areas and take advantage of the opportunity to develop a lifestyle in harmony with this wonderful environment.

Protecting our Natural Heritage

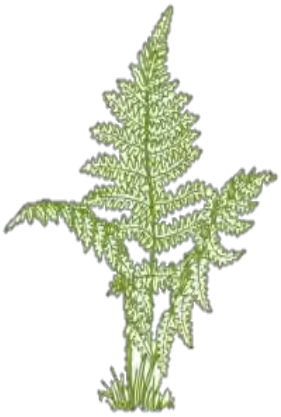
Wetland and Watercourse Protection

Wetlands are located nearby and provide important habitat for a wide variety of plant and wildlife species. Wetlands and watercourses are regulated by the Maitland Valley Conservation Authority and necessary buffers to protect these features have been established. You can help maintain the ecological health and integrity of the community by following some of the recommendations below.

Woodland Protection

Treed areas and woodlands provide a variety of important services, such as improving air quality, providing shade, reducing local energy use, sequestering carbon and providing habitat for a variety of wildlife species. Various protection measures have been provided to protect and enhance these features, including vegetation plantings and necessary buffers from development.

As a landowner, it is important that you take steps to ensure the protection of these features which may back onto your property. You can do this by following the recommendations provided at the bottom of this brochure.



Wildlife Habitat

Various bird species and animal species have been found in areas near your home. As a homeowner, you have the opportunity to assist wildlife by providing additional habitat in your own backyard.

Please consider planting native wildlife species that includes a mixture of native tree and shrub species. Shrubs could include various dogwoods, nannyberry or fruit producing species, such as Choke Cherry (*Prunus virginiana*) and Purple-flowering Raspberry (*Rubus odoratus*) that provide food for birds and other wildlife.

There are also a wide variety of native wildflower species that will thrive in your garden and provide excellent habitat for native pollinators, such as bees and butterflies. Consider species such as Black-eyed Susan (*Rudbeckia hirta*), New England Aster (*Symphyotrichum novae-angliae*), Common Milkweed (*Asclepias syriaca*) and Yellow Evening Primrose (*Oenothera biennis*) that are sure to add colour and vibrancy to your garden. Native plant nurseries are present within Huron County and should carry a wide range of suitable species.

Another way that you can help wildlife, in particular the many bird species that call the nearby woodlands home, is by the use of bird friendly design techniques. This includes the placement of visual markers/decals on large windows, particularly ones that back onto natural areas and not placing an abundance of indoor plants near large windows.

What Can I Do?

Do's

- Maintain vehicles to reduce leaks and drips. Clean up after accidental spills.
- Pick up after pets. Pet waste can pollute natural areas, particularly watercourses.
- Reduce the use of de-icing salt and chemicals which can contaminate groundwater and streams.
- Walk on designated pathways only.
- Have respect for local wildlife populations. Woodlands and wetlands are home to a wide variety of wildlife species. Many of these species' populations are declining due to human impacts. None of these creatures are dangerous and all should be left alone.
- Keep dogs on a leash to limit disturbance to ground nesting birds.
- Keep domestic cats indoors to limit predation on songbirds and nests.
- Leave all bird nests alone. Often mothers will leave when there is a threat and return once the threat is gone.
- Plant native species of shrubs, trees and wildflowers to provide additional habitat, particularly if your property backs onto natural habitats.

Don'ts

- Do not walk, or allow pets inside natural areas to prevent the disturbance of wildlife, trampling of plants and introduction/spreading of non-native plant species.
- Do not introduce invasive plant or animal species into the natural areas, including the dumping of any yard or household waste, which may contain seeds of invasive species.
- If planting trees, shrubs or flowers near the buffer areas (backing onto woodlands or wetlands), please ensure these are species native to Huron County
- Do not plant anything in the surrounding natural areas unless you are participating in an event authorized by the Maitland Valley Conservation Authority or other public agency.
- Do not interfere or disrupt local wildlife populations. Be mindful of species that could be using the surrounding habitats by not interfering or disrupting their movements.

Contact Information

If you have any questions or concerns please contact:

Maitland Valley Conservation Authority
1093 Marietta Street,
Wroxeter, ON
N0G 2X0

Phone: 519-335-3557