Prepared By:

Melancthon Pit Licence Expansion

Natural Environment Level 1 Technical Report

Project No. 02-017-2018

July 2019

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Barrie, Ontario
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July 25, 2019

Duivenvoorden Haulage Ltd.
c/o WhiteWater Hydrogeology Ltd.
3425 9th Line
Innisfil, ON
L9S 3Z6

Attention: Tecia White, M.Sc. P.Geo.

RE: BIRKS NHC 02-017-2018
Natural Environment Level 1 Technical Report
Melancthon Pit License Expansion

Dear Ms. White,

Thank you for retaining Birks Natural Heritage Consultants, Inc. (Birks NHC) to undertake the Natural Environmental Assessment for the proposed Melancthon Pit License Expansion under the existing Class A license. The proposed expansion is located on Part Lot 14, Concession 4 OS E, in the Township of Melancthon, County of Dufferin. The proposed license expansion area is located on adjacent lands north of the existing Class A license pit.

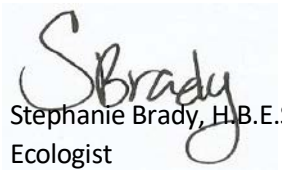
The purpose of this Natural Environment Level 1 Technical Report is to provide documentation of findings based on the appraisal of the field data, background information, and applicable policies and regulations. The data indicates potential for some features to be identified as significant natural heritage features. These features include woodland and wetland habitat, wildlife habitat for colonial species or species of special concern, and potential habitat for species listed as Threatened or Endangered under Ontario's *Endangered Species Act,* 2007. The information presented in this report is intended to be used to identify opportunities and constraints for the proposed pit expansion and assist in the creation of the site plan.

If you have any questions or concerns regarding this report, please do not hesitate to contact the undersigned.

Yours truly,

Birks Natural Heritage Consultants Inc.

Brad Baker, H. B. Sc.
Ecologist



Stephanie Brady, H.B.E.S.
Ecologist

cc: Tecia White, WhiteWater Hydrogeology Ltd.

https://birksnhc.sharepoint.com/sites/BirksNHC/Shared Documents/2018 Projects/02-017-2018 Melancthon Pit/Reporting/Birks02-017-2018 Natural Environment NEL 1 Report .docx

Table of Contents

List of Figures

List of Tables

List of Appendices

1 INTRODUCTION

Birks Natural Heritage Consultants, Inc. (Birks NHC) was retained by WhiteWater Hydrogeology Ltd. on behalf of Duivenvoorden Haulage Ltd. to undertake the Natural Environmental Assessments for the proposed Melancthon Pit License Expansion under the existing Class A license. This Natural Environment Level 1 (NEL 1) Technical Report is required for the proposed pit license expansion of the existing Class A license for the property identified as Part of Lot 14, Concession 4 OS E (the property) in the Township of Melancthon (the Township) and the County of Dufferin (the County). It is our understanding that the application is considered a Category 1 Class "A" Pit since extraction is proposed within 1.5 metres of the water table but it not proposed below the water table.

1.1 PURPOSE

The purpose of this NEL 1 Technical Report is to address the requirements set out by the province of Ontario for a NEL 1 Technical Report (Aggregate Resources of Ontario Provincial Standards, Section 2.2) that will accompany the application for a Category 1, Class "A" Pit Below Water Pit under the *Aggregate Resources Act* (ARA), 1990.

This report has been prepared to consider the natural heritage requirements of the following documents:

a) Provincial Policy Statement (MMAH 2014) and Associated Training Manuals;
b) Township of Melancthon Official Plan (2014);
c) County of Dufferin Official Plan (2017);
d) *Conservation Authorities Act*, 1990;
e) Ontario *Endangered Species Act,* 2007;
f) Federal *Species at Risk Act*, 2002;
g) Federal *Fisheries Act*, 1985;

The NEL 1 Technical Report is intended to identify and assess the potential natural heritage features and functions associated with the property. This information is used to identify opportunities and constraints with respect to the proposed license area expansion assisting in the creation of the site plan which considers identified natural heritage features and functions.

1.2 SITE DESCRIPTION

The property is largely dominated by agricultural lands (*i.e.,* active crops) and bounded by 4th line to the east. Remnant residential infrastructure, including a dilapidated barn, is present in the eastern portion of the property with mature laneway trees and an access driveway from 4th line. The naturalized areas are confined to the southwest corner of the property which include woodland, wetland, open meadow, and hedgerows.

Seasonal overland drainage is present within the property limits and evidence of ponding within the agricultural fields is evident through review of past aerial imagery, topography, and observed conditions.

Over the course of the field surveys the pond was observed forming with the spring runoff and quickly decreasing in size. The field conditions in the location of this temporal pond were dry in June such that agricultural use continues in the area.

1.3 Adjacent Land Use

The property is surrounded to the south and east by lands licensed for aggregate extraction with agricultural lands occurring over much of the remaining adjacent properties. Rural residences are located along 4th line and a naturalized woodland is present directly west of the property boundary.

1.4 Study Area

The study area for the NEL 1 Technical Report is defined in the Aggregate Resources of Ontario Provincial Standards, Sections 2.2.3 and 2.2.4 as the site and surrounding 120 metres. The study area is illustrated in Figure 1. For the purpose of classifying the significance of natural heritage features and functions, the study area is in Ecoregion 6E in Ontario.

2 ENVIRONMENTAL POLICY FRAMEWORK

The planning policies and regulations related to natural heritage which apply to the proposed expansion are summarized in the following sections. These sources provide information where natural heritage features or functions have been previously identified and guidance on what surveys will be required to ensure that all appropriate features and functions are considered in the NEL1 Technical Report.

2.1 Aggregate Resources Act, 1990

Under the ARA Provincial Standards, applicants are required to prepare a NEL 1 Technical Report. Where significant natural environment features occur on, or in proximity to (*i.e.,* within 120 metres or within the maximum limit of groundwater influence) the proposed operation, applicants are required to prepare a Natural Environment Level 2 (NEL 2) Technical Report, identifying the following:

- The features and function of the identified natural environment feature(s);
- The nature of the potential negative impacts of the extraction operation on those features;
- The proposed preventative, mitigative or remedial measures; and
- The nature and magnitude of any residual effects.

Significant natural heritage features are defined in the PPS (MMAH, 2014) with guidance from supporting technical resource manuals prepared by the Ministry of Natural Resources and Forestry (MNRF). Following receipt of proposed extraction area and operational details, a NEL 2 Technical Report will be produced for the submission as required under the ARA.

2.2 Provincial Policy Statement (2014)

Ontario's *Planning Act*, 1990 requires that planning decisions shall be consistent with the *Provincial Policy Statement*, 2014 (PPS). Section 2.1 of the PPS specifies policy related to protection of natural

heritage features and functions. According Sections 2.1.4 of the PPS, development and site alteration shall not be permitted in the following features:

a) Significant wetlands in Ecoregions 5E, 6E; and 7E; and
b) Significant coastal wetlands.

Additional features are protected by Section 2.1.5 of the PPS which states that, development and site alteration shall not be permitted in the following natural features unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions:

a) Significant woodlands in Ecoregions 6E; and 7E;
b) Significant valleylands in Ecoregions 6E; and 7E;
c) Significant wildlife habitat (SWH);
d) Significant areas of natural and scientific interest; and
e) Coastal wetlands in Ecoregions 5E, 6E; and 7E that are not subject to policy 2.1.4(b)

While many of these features are mapped and direction is available to allow for candidate features and functions to be identified it remains the responsibility of the Province and/or the Municipality to designate areas identified within Section 2.1.4 and 2.1.5 of the PPS as significant. The Natural Heritage Reference Manual (MNR, 2010) and Ecoregion 6E Significant Wildlife Habitat Criterion Schedule (MNRF, 2015a) were used within this report to identify candidate features and functions.

Sections 2.1.6 and 2.1.7 state that development and site alteration is not permitted in fish habitat or habitat of Endangered and Threatened species except in accordance with federal and provincial requirements.

Section 2.1.8 extends protections of the PPS to adjacent lands, typically those within 120 metres of the potential impact. Section 2.1.8 states that development and site alteration shall not be permitted on adjacent lands to natural heritage features identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological function.

2.3 Endangered Species Act, 2007

Ontario's *Endangered Species Act*, 2007 (ESA) provides regulatory protection for Endangered and Threatened species, prohibiting harassment, harm and/or killing of individuals and destruction of their habitats. Habitat is characterized within the ESA as the area prescribed by a regulation as the habitat of the species, or, an area on which the species depends, directly or indirectly, to carry on its life processes including reproduction, rearing of young, hibernation, migration or feeding.

The Ontario Regulation (O. Reg.) 230/08 of the ESA identify Species at Risk in Ontario. These include species listed as Extirpated, Endangered, Threatened, and Special Concern. As noted above, only species listed as Endangered and Threatened receive species and habitat protection through the ESA. Species designated as Special Concern may receive protection under the Significant Wildlife Habitat provisions of the PPS.

2.4 Species at Risk Act, 2002

The federal *Species at Risk Act*, 2002 (SARA) provides regulatory protection to Extirpated, Endangered, and Threatened species through a prohibition on activities which could be considered detrimental (*i.e.* killing, harming or possession). Protection is extended to the "residence" and "critical habitat" of all species on federal lands. This habitat protection extends to cover all lands regardless of ownership where the habitat of a species listed in Schedule 1 is also protected by the *Migratory Breeding Birds Convention Act*, 1994 or the *Fisheries Act*, 1985 or through a special order issued by the Minister.

2.5 Growth Plan for the Greater Golden Horseshoe

The study area is within the Growth Plan for the Greater Golden Horseshoe, 2019 (the Growth Plan) planning area. The property, however, does not encompass areas identified as being within the Natural Heritage System of the Growth Plan. Policies specific to the Growth Plan are applicable to proposed aggregate operations, as follows:

Notwithstanding the policies in subsections 4.2.1, 4.2.2, 4.2.3 and 4.2.4, within the Natural Heritage System, mineral aggregate operations and wayside pits and quarries are subject to the following:

a) no new mineral aggregate operation and no new wayside pits and quarries, or any ancillary or accessory use thereto, will be permitted in the following key natural heritage features and key hydrologic features:
    i. significant wetlands;
    ii. habitat of endangered species and threatened species; and
    iii. significant woodlands unless the woodland is occupied by young plantation or early successional habitat, as defined by the Province, in which case, the application must demonstrate that policies 4.2.8.4 b) and c) and 4.2.8.5 c) have been addressed and that they will be met by the operation;
b) any application for a new mineral aggregate operation will be required to demonstrate:
    i. how the connectivity between key natural heritage features and key hydrologic features will be maintained before, during, and after the extraction of mineral aggregate resources;
    ii. how the operator could replace key natural heritage features and key hydrologic features that would be lost from the site with equivalent features on another part of the site or on adjacent lands;
    iii. how the water resource system will be protected or enhanced; and
    iv. how any key natural heritage features and key hydrologic features and their associated vegetation protection zones not identified in policy 4.2.2.3 a) will be addressed in accordance with policies 4.2.8.4 b) and c) and 4.2.8.5 c); and
c) an application requiring a new approval under the *Aggregate Resources Act* to expand an existing mineral aggregate operation may be permitted in the Natural Heritage System, including in key natural heritage features, key hydrologic features and any associated vegetation protection zones, only if the related decision is consistent with the PPS and satisfies the rehabilitation requirements of the policies in this subsection.

2.6 County of Dufferin

Within the County of Dufferin Official Plan (2017), the property is categorized as Countryside Area according to Schedule B (Community Structure and Land Use), Agricultural Area in Schedule C (Agricultural Area and Rural Land), and Sand and Gravel Resources Area in Schedule D (Mineral Aggregate Resource Areas). Naturalized portions of the property are identified as Woodlands according to Schedule E (Natural Heritage Features) and County Preliminary Natural Heritage System within Schedule E1 (Natural Heritage System).

2.7 Township of Melancthon

The proposed expansion area is designated Extractive Industrial, Agricultural, and Environment Conservation, as per Schedule A-1 (Land Use and Road Plans) of the Township of Melancthon Official Plan (2014). Schedule D (Natural Heritage 1 Wetlands) and Schedule E (Natural Heritage 2 Woodlands, Wildlife Habitat and ANSI) further identify the naturalized portions of the proposed expansion property as Locally Significant and Unevaluated Wetlands, and Significant Woodlands (Primarily 20+ hectares), and Watercourses.

2.8 Nottawasaga Valley Conservation Authority

Portions of the proposed expansion property are regulated by the Nottawasaga Valley Conservation Authority (NVCA) in accordance with O. Reg. 172/06 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Appendix A). Under this regulation, the NVCA requires that approvals be obtained for any proposed development within regulated areas.

3 STUDY APPROACH

The following activities were completed to fulfill the objectives of this study.

3.1 Data Sources

Background information related to the natural heritage features and functions of the study area was reviewed from the following:

- Aerial images (Google);
- Atlas of the Breeding Birds of Ontario [website - http://www.birdsontario.org/atlas/index.jsp] (Bird Studies Canada, 2006)];
- Atlas of the Mammals of Ontario - [Dobbyn J., (1994)];
- Azimuth field data collected in 2017 and 2018;
- Government of Canada's Species at Risk Public Registry;
- MNRF Natural Heritage Information Centre [website - https://www.ontario.ca/page/make-natural-heritage-area-map] (MNRF, 2018);
- MNRF's Species at Risk in Ontario list [website - http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/246809.html] (MNRF, 2018);

- Ontario Nature – Ontario Reptile and Amphibian Atlas [website - https://www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php] (Ontario Nature, 2018)
- Simcoe County Interactive Maps [website - https://maps.simcoe.ca/public/];

In addition to the reviewed data sources listed above, Birks NHC ecologists conducted a site visit on October 9, 2018 to confirm the data collected by Azimuth ecologists and to conduct a fall vegetation survey.

3.2 Field Surveys

Natural heritage features and functions within the study area were characterized through completion of field surveys. The following sections outline the methods used for each of the surveys, including specific provincial protocols utilized. During all surveys incidental wildlife, plant, and habitat observations were considered. Searches were also conducted to document the presence or absence of suitable habitat, based on habitat requirements of Threatened or Endangered species with habitat ranges overlapping the property. A summary of the surveys completed including the dates for the completion of the surveys are outlined in Table 1.

Table 1. Summary of Field Surveys Conducted

Dates	Start/End Time	Type of Survey	Biologists
June 10 & 29, 2018	5:50-9:15	Dawn breeding bird surveys	Brad Baker (Azimuth)
May 2, May 17, & June 19, 2018	20:50-22:15	Amphibian Calling surveys	Brad Baker, Alexa Pompilio (Azimuth)
March 26, 2018 April 7, 2018 April 23, 2018 May 2, 2018 May 10, 2018 May 17, 2018	9:00-15:30 20:50-22:15 10:00-16:00 20:50-22:15 12:30-14:45 20:50-22:15	Shorebird surveys	Brad Baker, Alexa Pompilio (Azimuth)
April 23, 2018	10:00-16:00	Headwater Drainage Feature Assessment	Brad Baker, Mike Gillespie (Azimuth)
November 2017 April 23, 2018 June 10, 2018 August 3, 2018 October 9, 2018	10:30-16:00 10:00-16:00 9:15-12:00 11:00-14:00 11:00-13:00	Ecological Land Classification and Vegetation surveys	Brad Baker, Melissa Fuller (Azimuth, Birks NHC)
March 26, 2018	9:00-15:30	Bat Snag Density survey (Step 2)	Brad Baker, Stephanie Brady (Azimuth)
June 12 - June 22, 2018	N/A (details found in Appendix B)	Bat Acoustic survey (Steps 3&4)	Brad Baker, Stephanie Brady (Azimuth, Birks NHC)

3.2.1 Vegetation Community Mapping and Surveys

As a first step in identifying and assessing for potential natural heritage features on the property the vegetation communities were evaluated using Ecological Land Classification (ELC). The ecological community boundaries were determined through a review of aerial photography and then further refined during the site visits. Birks NHC staff conducted one site visit to confirm the vegetation communities as defined by Azimuth surveys in 2018. The ELC system for Southern Ontario (Lee *et al.,* 1998) was used with modifications. In early 2007, the MNRF refined their original vegetation type codes to more fully encompass the vast range of natural and cultural communities across Southern Ontario. Through this process new codes have been added while some have changed slightly. These updated ELC codes have also been used for reporting purposes in this study where they are more representative of the vegetation communities within the property. The resulting ELC Mapping is illustrated in Figure 2.

The significance of the woodland units present in the study area was assessed according to criteria defined by the Natural Heritage Reference Manual (MNR, 2010).

3.2.2 Wildlife Surveys

A wildlife assessment within the study area was completed through incidental observations by Birks NHC and Azimuth ecologists while on site. Any incidental observations of wildlife were noted, including other wildlife evidence such as dens, tracks, and scat. Notes and, where feasible, photos were taken for each incidental observation. These observations are helpful when making conclusions on the ecological function of the ecosystems identified within the study area.

Wildlife habitat functions were evaluated according to provincial criteria outlined in the Ecoregion 6E Criterion Schedules (MNRF, 2015a).

Dawn Breeding Bird Surveys

Dawn breeding bird surveys followed methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman *et al.,* 2007) as completed on June 10 and June 29, 2018. Specifically, breeding bird surveys consisted of ten-minute point counts that were used to establish estimates of bird abundance, species presence, and breeding activity in all habitat types present on the property at that time.

Migratory Waterfowl Stop-over

Visual surveys were carried out during the months of March, April, and May to determine if the large temporal pond provides habitat for migratory waterfowl. This included a total of 6 direct visual searches for waterfowl using the feature. Two ecologists observed the potential feature from vantage points on either side for a period of at least 1 hour and recorded any observations of waterfowl or shorebirds using the area.

Amphibians

Amphibian surveys were undertaken to review the potential of the SWDM2-1 wetland feature or other potential features to support breeding amphibians. Three surveys were completed on May 2, 17, and

June 19, 2018 following the Great Lakes Marsh Monitoring Program (Bird Studies Canada, 2008) protocol. Surveys followed the basic principles that include: allowing at least 15 days between each survey which begin one half hour after sunset and end by midnight on evenings with little wind and minimum night air temperatures (5°C, 10°C, and 17°C). Survey times were determined based upon spring weather conditions to target the prime breeding window for early and late breeders.

Calling evidence was recorded on a scale of L0-L3 and interpreted as follows:

- L0 – No calling;
- L1 – Individuals can be accurately counted; calls do not overlap;
- L2 – Some calls simultaneous, number of individuals can be estimated; and,
- L3 – Full chorus, calls overlap, individuals cannot be estimated.

Reptiles

Opportunistic surveys for reptiles were conducted during other formal surveys (*i.e.,* dawn breeding bird surveys) to document the presence of reptile species within the property. Although no formal surveys were completed due to the general lack of suitable habitat, the Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (OMNRF, 2015) was used as a guidance for optimum detectability times and methodology.

3.3 Fish Habitat Assessment

Drainage features associated with the property were considered for their potential to provide direct or indirect habitat for fish. An evaluation of potential fish habitat was conducted over the course of the season to determine permanency following the headwater drainage features (HDF) assessment Toronto Region Conservation Authority and the Credit Valley Conservation (TRCA and CVC, 2014) protocol. These guidelines use standardized survey methods and a tiered study design to determine the risk of functional impairment to an HDF through land development.

3.4 Species at Risk Assessment

The Species at Risk assessment included an analysis of the habitat requirements of Species at Risk reported to occur in the area to identify those having potential to occur within the study area. Birks NHC staff reviewed the data collected by Azimuth ecologists in 2017 and 2018 related to potential habitat for provincially designated species, specifically Species at Risk listed under O. Reg. 230/08 of the ESA or Schedule 1 of the SARA as Threatened or Endangered.

Habitat requirements and appropriate designations for all species that could potentially occur in the area are outlined in Table 2 below. Where it is determined that the species have potential habitat within the study area, survey results were reviewed to determine the function of the potential habitat.

Table 2. Species at Risk Assessment

Common Name	Scientific Name	Designation		Habitat Affinities Present Within Study Area
		ESA	SARA	
Mammals				
[1]Little Brown Myotis	*Myotis lucifugus*	END	END	Yes – suitable forest communities present.
[1]Northern Myotis	*Myotis septentrionalis*	END	END	Yes – suitable forest communities present.
[1]Tri-colored Bat	*Perimyotis subflavus*	END	END	Yes – suitable forest communities present.
[1]Eastern Small-footed Myotis	*Myotis leibii*	END	END	Marginal - suitable habitat potentially present within adjacent lands (*i.e.,* active pit). It is unlikely that appropriate habitat would be present within sand and gravel pits.
Birds				
[1]Barn Swallow	*Hirundo rustica*	THR	THR	Yes – Suitable structures present within the property. One abandoned nest identified within old barn.
[1]Bank Swallow	*Riparia riparia*	THR	THR	Yes - Suitable habitat present within adjacent lands (*i.e.,* active pit). Species not documented during field surveys in 2018.
[1]Eastern Meadowlark	*Sturnella manga*	THR	THR	Marginal – Observed once on May 10 outside of 2018 breeding season.
[1,2]Bobolink	*Dolichonyx oryzivorus*	THR	THR	Marginal – Observed once on May 10 outside of 2018 breeding season.
[1]Eastern Whip-poor-will	*Caprimulgus vociferus*	THR	THR	No – Woodland communities are small and do not contain appropriate characteristics (*i.e.,* clear understory). Species not documented in 2018.
Reptiles				
[1]Blanding's Turtle	*Enydoidea blandingii*	THR	END	Marginal – Wetland community did not retain standing over throughout the year. Species not observed in 2018.
Vegetation				
[1]Butternut	*Juglans cinerea*	END	END	Yes - Naturalized portions of the property could support individuals of this species. No Butternut trees were identified during surveys in 2018.

Source: (1) MNRF SARO List, Birks NHC expertise; (2) NHIC (2018)
Designation Status
Provincial Status – Species at Risk in Ontario list as outlined in O. Reg. 230/08 of the *Endangered Species Act,* 2007
Federal Status – The *Species at Risk Act*, 2002 establishes Schedule 1 as the official list of Species at Risk.

Of the species identified in the table above, the following are relevant to the study area and proposed development:

- Endangered Bats Species (Little Brown Myotis, Northern Myotis, Tri-colored Bat, and Eastern Small-footed Myotis); and
- Threatened Bird Species (Barn Swallow, Eastern Meadowlark, and Bobolink).

Bird Surveys outlined in Section 3.2.2 were intended to determine presence/absence of Species at Risk Birds and the following assessments were undertaken to provide additional information related to Endangered bat species.

3.4.1 Endangered Bat Species

The 'Technical Note for Species at Risk Bats', published by the Regional Operations Division of the MNRF in 2015 ('Technical Note') (MNRF, 2015b), provides direction in the assessment of habitat for Species at Risk bats and was the basis for the bat surveys on the property. As outlined in the Technical Note important habitat for these species includes hibernacula, maternity roosts, day roosts, and foraging habitat. Azimuth ecologists conducted both habitat and acoustic surveys in 2018 following the Technical Note. Steps 1 (Identification of ELC polygons), step 2 (snag density) and steps 3 & 4 (acoustic) were completed for the study area within areas of suitable habitat. The habitat characteristics in the study area were not representative of typical habitat for Eastern Small-footed Myotis so the site assessment was undertaken with a focus on Little Brown Myotis, Northern Myotis, and Tri-colored Bat. These species are listed as Endangered by both the SARA and the ESA. Results of each survey are presented in Appendix B.

<u>Step 1 - Identification of ELC polygons where Maternity Roost Habitat may occur</u>

Survey methodology provided by the MNRF for the identification of potential maternity roost habitat for bats suggests that the following ELC polygons may provide maternity roost habitat:

- Deciduous Forests (FOD)
- Mixedwood Forests (FOM)
- Coniferous Forests (FOC)
- Deciduous Swamps (SWD)
- Mixedwood Swamps (SWM)
- Coniferous Swamps (SWC)

All ELC polygons falling within the ranges identified above were evaluated using Snag Density Surveys. These included:

- FODM5-1 - Fresh Sugar Maple Deciduous Forest
- FOMM7-1 - Moist White Cedar-Sugar Maple Mixed Forest

<u>Step 2 - Snag Density Survey</u>

Snag density surveys are currently considered to be of importance in the identification of potential maternity roost habitat for Little Brown Myotis and Northern Myotis. These snag density surveys

represent Step 2 of the survey methodology provided by the MNRF. For the snag density surveys, 16 plots were randomly distributed across a property by means of placing points on a handheld GPS with a spacing of approximately 100 metres between each point. Snag density surveys are required to take place while the forest is still in a leaf-off condition. Leaf-off condition in this situation refers to the point in the spring where buds may be emerging, but leaves associated with the deciduous canopy have not emerged fully. At each location, all trees with a Diameter at Breast Height (DBH) of ≥ 25cm were identified and assessed within a survey plot with a radius of 12.6 meters. Information related to the species of tree, presence of snags and location of snags was recorded for each tree within the plots.

Step 3&4 – Acoustic Data Collection

Acoustic field data collection was conducted for portions of the property through the deployment of six Wildlife Acoustic Song Meter SM3Bat Bioacoustic Recorders (Figure 3) with a weather resistant SMM-U1 ultrasonic microphone for a period of ten days to record ultrasonic calls that would be produced by a bat using the area. The recorders were deployed from June 12 to June 22, 2018.

Wildlife Acoustics Kaleidoscope Pro 3 Analysis Software was used to process the sound files. The Kaleidoscope program converted call data into individual files and was used to filter out false trigger noise such as rain and wind. Each file (or pass) which was confirmed as a bat call was classified with an identification using the Kaleidoscope software's bat classifiers. Call classification was confirmed and evaluated by Birks NHC ecologists.

Each bat pass for each species and/or species group was broken down within 30-minute intervals starting at sunset (21:03) and ending at sunrise (5:50) (Appendix B).

4 NATURAL HERITAGE FEATURES AND FUNCTIONS

The following sections present an examination of our findings as they related to natural heritage features and functions in the study area.

4.1 VEGETATION COMMUNITIES AND PLANTS

4.1.1 Vegetation Communities

A total of 7 vegetation communities were identified within the property limits. Vegetation communities identified within the study area and their respective locations are illustrated on Figure 2. As previously discussed, the majority of the property is maintained as active agriculture fields with a naturalized area present in the south-west corner. The naturalized area of the property contains both upland forest and wetland conditions, where upland forest is largely deciduous. The vegetation communities that occur on the property include:

1. FODM5-1: Dry-Fresh Sugar Maple Deciduous Forest
2. FOMM7-1: Fresh-Moist White Cedar-Sugar Maple Mixed Forest
3. MAMM1-3: Reed-Canary Grass Mineral Meadow Marsh

4. MEMM3: Mixed Meadow
5. OAGM1: Annual Row Crops
6. SWDM2-1: Black Ash Mineral Deciduous Swamp
7. WOCM1: Dry-Fresh Coniferous Woodland

4.1.2 Vascular Plants

Plants were considered over the course of a growing season. Vegetation surveys were undertaken by Birks NHC staff in August and October 2018 site visits and Azimuth ecologists in November 2017 then April and June 2018. No Species at Risk or provincially rare plant species were documented within the study area. A formal list has not been compiled for inclusion in this report but will be appended to the NEL 2 technical report and can be provided upon request.

4.2 Provincially Significant Wetland

There are no mapped Provincially Significant Wetlands identified within 1 km of the study area.

4.2.1 Other Wetlands

A small marsh and adjacent thicket/deciduous swamp communities, approximately 1.3 ha, are present in the southwest corner of the property. This wetland community is not part of a contiguous wetland complex and does not extend beyond the property limits. The wetland boundary was established in the field through the application of the ELC system by Azimuth ecologists and verified by Birks NHC staff.

A second wetland area was mapped by the NVCA in the north portion of the property in the center of an agricultural field. This area exists as a temporal pond which fills with surface drainage in the spring when the snow melts and the water quickly infiltrates into the ground. No wetland vegetation was present in the area during the 2017 or 2018 surveys and it is not considered wetland for the purpose of this assessment.

4.3 Woodland

The forested portion of the property is part of a larger contiguous woodland unit which extends beyond the property limits to the north and west. The contiguous woodland measures approximately 27 ha in size (Appendix C). The significance of the contiguous woodland was assessed according to criteria defined by the Natural Heritage Reference Manual (MNR, 2010). Woodland assessment requires that the forest cover in the larger planning area be considered to assist in determining the significance of the woodland in question. For the purpose of the assessment, the Pine River Subwatershed forest cover value was used. There is approximately 41.8% forest cover within the Pine River Subwatershed (NVCA 2013) which means that a Significant Woodland should be at least 50ha in size. Notwithstanding, size criteria is not the only value that significance is based on. As outlined in the full assessment, included in Appendix C, the woodland could be considered as a candidate based on the following criteria for significance:

- Considered potentially significant on the basis of proximity to other woodland or other habitats
  - Includes wetland habitat and an area of seasonal surface drainage
- Considered potentially significant on the basis of water protection
  - The study area is mapped as being within a Significant Recharge Area by both the County and the Township

4.4 Wildlife and Habitat Function

4.4.1 Mammals

Observations of mammals on the property were primarily limited to common species which would be expected in an agricultural setting. Evidence of White-tailed Deer (*i.e.,* tracks, browse) was observed throughout the study area. Other mammal observations included Eastern Chipmunk, Eastern Coyote Eastern Red Squirrel, Porcupine, Raccoon, and Skunk. Bat acoustic surveys identified Hoary Bat, Silver-haired Bat, Big Brown Bat, and Little Brown Myotis.

Significant and Sensitive Species

With the exception of the Little Brown Myotis, all mammal species observed during the surveys are provincially ranked S5 and G5, or very common provincially and globally. Endangered bat species are discussed in further detail in Section 4.7.1 of this report.

4.4.2 Birds

The breeding bird and migratory waterfowl surveys conducted in 2018 documented forty-six species in the study area with evidence of breeding documented for thirty-seven of those species. The remaining were species with wide ranges that were observed flying over for which there is no breeding habitat (*e.g.*, Ring-billed Gull), or that were not in appropriate habitat (*e.g*., Mallard). A formal list has not been compiled for inclusion in this report but will be appended to the NEL 2 technical report and can be provided upon request.

The majority of the species recorded are urban tolerant and typical of cultural and agricultural landscapes (*e.g*., American Goldfinch, American Robin). These species are tolerant to disturbances within the landscape and able to adapt to changing environments.

The matrix of open field and wooded areas, which is very common throughout the County, allows for a varied species list including woodland species such as Red-eyed Vireo, Eastern Wood-pewee and Wood Thrush, and grassland species such as Vesper Sparrow and Savannah Sparrow. Field Sparrow, despite its name, typically prefer edges and thickets, together with Indigo Bunting, Gray Catbird, and Song Sparrow. Species which tend to be found in wetland conditions were also observed such as Common Yellowthroat and American Redstart.

Significant and Sensitive Species

Three bird species which have been designated as Threatened species under the ESA were observed in the study area including Barn Swallow, Eastern Meadowlark, and Bobolink. Barn Swallow individuals nest in artificial structures such as barns, garages, and sheds that are near to open habitats including

farmland and wetlands over which they forage (COSEWIC 2011). The existing barn structure on the property provides suitable nesting habitat and one inactive Barn Swallow nest was identified within this structure. Barn Swallow is discussed in further detail in Section 4.7.2 of this report.

Bobolink and Eastern Meadowlark are obligate grassland species. In Ontario, the two species still breed in a variety of natural grassland habitat types, including remnant prairies, savannahs and alvar grasslands. Both species were observed on the property early in the year, prior to the breeding season. All breeding activity documented in the study area for these species was on agricultural lands off the property and none of the mapped territories would extend onto the property.

Two species designated Special Concern under the ESA were documented within the forested portions of the property, Eastern Wood-pewee and Wood Thrush. The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests (COSEWIC 2012a) while the Wood Thrush lives in mature deciduous and mixed (conifer-deciduous) forests (COSEWIC 2012b). One Wood Thrush and two Eastern Wood-pewee males were documented within the FODM5-1 (*i.e.,* recorded at survey points 2, 3, and 4). Eastern Wood-pewee and Wood Thrush are discussed in more detail in Section 4.4.7 of this report.

All of the bird species observed during the surveys are provincially ranked S4 (apparently secure - uncommon but not rare), S5 (secure - common, widespread and abundant in the province), or SNA (not applicable - species is not a target for conservation).

Nocturnal Species at Risk, including Eastern Whip-poor-will and Common Nighthawk were not documented within the study area.

4.4.3 Amphibians

Amphibian breeding habitat on the property is limited to the wetland unit SWDM2-1 where temporary shallow standing water was observed in the breeding season. Wood Frogs, Spring Peepers, and Gray Treefrogs were documented in the SWDM2-1 wetland community. A formal amphibian list has not been compiled for inclusion in this report but will be appended to the NEL 2 technical report and can be provided upon request.

Survey location 2 (Figure 3) targeted an off-property flooded field associated with the study area where Wood Frogs, Spring Peepers, Green Frogs, American Toads, and Gray Treefrogs were identified.

<u>Significant and Sensitive Species</u>

All amphibian species documented during the surveys are provincially ranked S5 and G5, or very common provincially and globally. No amphibian species designated as Threatened under the ESA were identified during the field surveys.

4.4.4 Reptiles

Observations of reptiles on the property were limited to a single Northern Ring-necked Snake hiding underneath a board in the MEMM3 vegetation community and an Eastern Gartersnake identified in the old maintained yard. There was no obvious overwintering habitat for turtles identified on the property or the surrounding lands and so there is no expectation that turtles would be associated with the property.

Significant and Sensitive Species

All reptile species documented during the surveys are provincially ranked S5 and G5, or very common provincially and globally. No reptile species designated as Threatened under the ESA were identified during the field surveys.

4.4.5 Significant Wildlife Habitat

A review of the MNRF's Significant Wildlife Habitat Technical Guide (2000) and the accompanying Ecoregion 6E Criteria Schedules (MNRF 2015a) was undertaken to assess the potential for Significant Wildlife Habitat presence in the study area. The full assessment table is included as Appendix D. Based on that assessment it was determined that the following candidate SWH functions may be associated with the property and adjacent lands:

- Seasonal Concentrations of Areas of Animals
  - Bat Maternity Colonies (Assumed)
- Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)
  - Special Concern and Rare Wildlife

These functions are directly linked to the presence of the woodland on the property and adjacent lands.

Seasonal Concentration Areas of Animals

As outlined within the criteria for Significant Wildlife Habitat in Ecoregion 6E Schedules, Seasonal Concentration Areas are areas where wildlife species occur annually. These seasonal aggregations result in large numbers of individuals, sometimes highly concentrated within relatively small areas. As a result, the loss of, or damage to, these features can result in a significant impact to populations.

Bat Maternity Colonies for Silver-haired Bat and Big Brown Bat are identified as candidate Significant Wildlife Habitat because known locations of forested bat maternity colonies are extremely rare in Ontario. According to the Significant Wildlife Habitat Technical Guide (MNR 2000) and Ecoregion 6E Criterion Schedules (MNRF 2015a), maternity colonies located in mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees are candidates for SWH designation. A snag density survey was completed in 2018 within the FODM5-1 community which yielded a composite snag density of 88 snags per hectare (Appendix B). Therefore, the FODM5-1 community would be considered candidate for SWH designation.

It remains extremely difficult to confirm this Significant Wildlife Habitat designation as it requires that confirmation of use by more than 10 Big Brown Bats or more than five Silver-haired Bats. Notwithstanding, the largest aggregations of these two species were recorded at the control point

(SM5700) which was situated at the wetland in the southwest corner. This location still had sufficient water in June to support bats. The other location where a large number of Big Brown and Silver-haired Bats was recorded was in proximity to the old barn and maintained area (SM5717). The remaining four monitors located within appropriate forest habitat recorded only 13 passes of EPFU/LANO complex which includes recordings of Big Brown Bat (*Eptesicus fuscus* - EPFU) and Silver-haired Bat (*Lasionycteris noctivagans* - LANO). Over a recording period of ten days, that accounts for less than a one pass per evening which is an extremely low occurrence rate. Most locations where there are a large number of bats indicative of a maternity colony would be expected to have more than 40 passes per evening on a bad night. There is no indication from the recordings that the FOD5-1 community should be confirmed as candidate Significant Wildlife Habitat Bat Maternity Colony for Silver-haired Bat and Big Brown Bat.

Habitat for Species of Conservation Concern

Significant Wildlife Habitat is intended to protect large areas of habitat which are important for the long-term survival and success of species which are either quite rare in the Province or have experienced significant population decline. Habitat for Species of Conservation Concern is therefore considered Significant Wildlife Habitat on the basis that the wildlife species are listed as Special Concern or rare, or otherwise important species that are declining. According to the Significant Wildlife Habitat Technical Guide Ecoregion 6E Criteria Schedules (MNRF 2015a), habitat for Special Concern and Rare Species is characterized by the presence of any species considered provincially rare (ranked S1-S3) or designated Special Concern under the ESA.

Eastern Wood-pewee and Wood Thrush are commonly found in woodlots within agricultural lands. The Eastern Wood-pewee lives in the mid-canopy layer of deciduous or mixed forests with little understory vegetation, forest clearings, or the edges of deciduous and mixed forests. The deciduous FODM5-1 community provides suitable habitat. The Wood Thrush is regularly associated with mature deciduous and mixed (conifer-deciduous) forest where there is a well-developed undergrowth. As outlined in Section 4.4.2, one Wood Thrush and two Eastern Wood-pewee males were documented within the FODM5-1 (*i.e.,* recorded at survey points 2, 3, and 4). One Eastern Wood-pewee male was observed in the FODM5-1 community during both surveys calling within the same locale. This is indicative of territorial behaviour and the area is probable breeding habitat. The other incidence for Eastern Wood-pewee and the identification of Wood Thrush are only indicative of possible breeding as there was no strong evidence of successful nesting.

According to the Significant Wildlife Habitat Technical Guide (MNR 2000), Ecoregion 6E Criterion Schedules (MNRF 2015a), the area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH. Therefore, the FODM5-1 community would be considered candidate for SWH designation as it provides nesting habitat for Eastern Wood-pewee with evidence of probable breeding.

4.5 Areas of Natural and Scientific Interest

There are no Area of Natural or Scientific Interest identified within 1 km of the study area.

4.6 Fish Habitat

No features that would be considered direct or indirect fish habitat were associated with the property. All aquatic features are temporal in nature. The temporary pond, surface drainage and wetland marsh dry up early in the season and contain no significant standing water which would allow fish to survive. Further, all features drain onto the property to the central pooling area before the water quickly infiltrates into the ground. At no time during the year is there any connection or potential for connection to nearby fish bearing water bodies.

4.7 Habitat of Threatened and Endangered Species

4.7.1 Endangered Bat Species

As discussed in Section 3.4.1, important habitat functions for Little Brown Myotis, Northern Myotis, and Tri-colored Bat could include hibernacula, maternity roosts, day roosts, and foraging habitat. Of these habitat types, no features with potential to function as hibernacula exist on the property, nor are hibernacula suspected to occur in the study area. Potential foraging habitat would be associated with areas of the property providing water or an abundance of flying insects. Foraging habitat is widely available within the matrix of open field and wooded areas common to throughout the County. Unless the foraging habitat was in proximity to a maternity roost, the loss of potential foraging habitat is unlikely to result in a contravention of the ESA. Day roosts are those that are used by males and non-reproductive females as they move across the landscape and can take the form of any tree with appropriate snag features such as loose bark, cracks or crevices. There is no indication that there is any fidelity to specific day roost sites. The loss of potential day roost habitat is unlikely to result in a contravention of the ESA. Thus, maternity roost habitat is the only habitat function considered in detail on the property.

According to the COSEWIC Status report, Little Brown Myotis, Northern Myotis, and Tri-colored Bat use a wide variety of habitats for summer roosting including rock crevices, buildings, bridges, caves, mines, and large snags (>25 cm diameter at breast height) in the early stages of decay (COSEWIC 2013). The habitat characteristics on the property were not representative of typical habitat for Eastern Small-footed Myotis. A total of 17 locations were surveyed within this community to determine the snag density (Step 2). Results of the survey indicate that habitat conducive to roosting bats is available within the FODM5-1 community, with a snag density of 88 snags/hectares. According to the MNRF *Technical Note for* Species at Risk *Bats* protocol, if the snag density is calculated to be 10 snags/hectare or more then this ELC polygon should be considered potential high-quality maternity roost habitat. As a result, the property is considered to provide potential roosting bat habitat for Little Brown Myotis, Northern Myotis, and Tri-colored Bat within the mature forest community FODM5-1. Other forested portions of the property did not contain appropriate characteristics to provide suitable habitat, including tree species, age and distribution (*i.e.,* young woodland), and closed understory.

Acoustic surveys were employed due to the presence of potential high-quality maternity roost habitat on the property. Bioacoustic recorders were deployed on the property to provide additional information for use in determining what bat species were present in the area and how those species are

using potential maternity roost habitat on the property. The recorders were situated on the property for that purpose as illustrated in Figure 3 with the following rationale and results:

- SM3672 – Monitor SM3672 was placed in the site which was expected to be the most likely roost location in the FODM5-1 vegetation community. A combination of relatively open canopy and mature maple trees with features including holes and loose bark which could promote bat use were present in this location. The understory in the location was also very open. A total of 40 bat passes recorded in this location were determined to be Little Brown Myotis or Northern Myotis;
- SM3697 – Monitor SM3697 was placed along an old trail which was expected to facilitate bat movement through the forest. As with the other locations within the FODM5-1 vegetation community, this monitor was situated in a cluster of snag trees which could be expected to provide roosting opportunity. The canopy was closed which detracts from the potential value of the site. A total of 7 bat passes recorded in this location were determined to be Little Brown Myotis or Northern Myotis;
- SM5696 – Monitor SM5696 was focused on a grouping of large trees in an area of open understory close to the forest edge. This location contained enough snag trees to be considered a cluster and was one of four areas within the FODM5-1 vegetation community which was expected to provide roosting opportunity. The appropriate microhabitat in the trees was sheltered from sunlight by the canopy which would reduce the likelihood of use. A total of 3 bat passes recorded in this location were determined to be Little Brown Myotis or Northern Myotis;
- SM5700 – Monitor SM5700 was placed as a control to provide a better understanding of the species present in the area. The presence of standing water and abundance of insects associated with the wetland were expected to draw bats to this location. By June, there were no other sources of water present on the property. Notwithstanding, it is expected that woodland pools, farm ponds, and water present in the adjacent land would also function for the same purposes. A total of 53 bat passes recorded in this location were determined to be Little Brown Myotis or Northern Myotis;
- SM5716 – Monitor SM5716 was focused on a grouping of large decrepit trees close to the forest edge. This location contained enough snag trees to be considered a cluster and was one of four areas within the FODM5-1 vegetation community which could provide roosting opportunity. Again, the appropriate microhabitat within the trees was sheltered from sunlight by the canopy which was expected to reduce the likelihood of use. Only a single bat pass was recorded in this location which was determined to be Little Brown Myotis or Northern Myotis; and,
- SM5717 – Monitor SM5717 was placed as a both a control to provide an overview of species present in the area and a monitor to determine if large numbers of bats were present in this area of the property. The presence of a large number of calls could be indicative that the abandoned barn was being used as a roost. A total of 11 bat passes recorded in this location were determined to be Little Brown Myotis or Northern Myotis.

As expected, the results of the acoustic field data collection indicate the presence of Myotis sp. at all acoustic monitoring locations. The results of the acoustic surveys are included in Appendix B. Overall, the bat activity recorded on the property was low and there is no indication from the recordings that a large maternity colony for Species at Risk bat species was present within the FODM5-1 vegetation

community or elsewhere in the study area. A large number of recordings in the first half hour after sunset with constant returns through the evening would be indicative of likely maternity roost function provide. Instead, the recordings indicate a low level of use by Species at Risk bats with an average of 4 recordings per evening at the highest recorder in the FODM5-1 vegetation community and only 5 recordings per evening at the control. This level of activity would be more likely to suggest day roost activity in the woodlot or single roosting females.

4.7.2 Barn Swallow

As outlined in Section 4.4.2, one inactive Barn Swallow nest was observed within the existing structure on the property. Barn Swallow is listed as a Threatened Species and is protected under the provincial ESA.

It is our understanding that a Notice of Activity as prescribed in Section 23.5 of O. Reg. 242/08 made under the ESA will be submitted for the removal of the structure is being completed in parallel with this submission. As a result, habitat will be created off property to compensate for the loss of potential nesting habitat within the existing structure. Barring the removal of the structure, habitat categorization for Barn Swallow would include the nest (Category 1), the area within 5 m of the nest (Category 2) and the area between 5 m and 200 m of the nest (Category 3) as habitat for the species.

4.8 Natural Heritage Features and Functions Summary

The results of field surveys, review of background information and analysis indicate the that several candidate significant natural heritage features and functions are located on or adjacent to the property. A summary is included in Table 3 on the following page which outlines what Natural Heritage Features were considered and what features were identified in the study area.

Table 3. Summary of Level 1 Screening (ARA)

Natural Heritage Feature	Within Property	Within 120 metres of Property	Actions Required
Significant Wetland	None Identified		No actions required
Significant Woodlands	Candidate: • Considered potentially significant on the basis of proximity to other woodland or other habitats - Includes wetland habitat and an area of seasonal surface drainage. • Considered potentially significant on the basis of water protection - the study area is mapped as being within a Significant Recharge Area by the County and Township.		Natural Environmental Level 2 assessment once site plan has been created to determine impacts.
Significant Valleylands	None Identified		None
Significant Wildlife Habitat	Potential: • Bat Maternity Colonies for Silver-haired Bat and Big Brown Bat Confirmed • Special Concern and Rare Wildlife Species - Breeding Habitat for Eastern Wood-pewee	Potential: • Bat Maternity Colonies for Silver-haired Bat and Big Brown Bat. • Special Concern and Rare Wildlife Species - Breeding Habitat for Eastern Wood-pewee and Wood Thrush.	Natural Environmental Level 2 assessment once site plan has been created to determine impacts.
Provincial Areas of Natural and Scientific Interest	None Identified		No actions required
Fish Habitat	None Identified		No actions required
Significant Habitat of Threatened or Endangered Species	Potential: • Abandoned Nest of Barn Swallow. No current use to demonstrate functioning habitat. • Day Roost Habitat for Endangered Bat Species	Potential: • Bank Swallow • Roost Habitat for Endangered Bat Species Confirmed • Breeding Habitat for Eastern Meadowlark • Breeding Habitat for Bobolink	Natural Environmental Level 2 assessment once site plan has been created

5 NATURAL HERITAGE CONSTRAINTS

The objective of the NEL 1 Technical Report is to identify and assess the potential functions associated with natural heritage features present in the study area. Most of the property represents no constraint to the proposed Melancthon Pit License Expansion from a natural heritage perspective when considering the conditions present in the study area during the 2017/2018 field season and available background information. The natural heritage features identified in the study area which represent constraints to the proposed Melancthon Pit License Expansion are focused in two distinct areas. The first, Area A, is the forest complex present in the southwest corner of the property and the second, Area B, is the woodlot present on the adjacent property to the west. Both areas are identified in Figure 4. There is no expectation that potential habitat of Threatened or Endangered Species associated with Bank Swallow, Eastern Meadowlark, or Bobolink would be impacted by the proposed expansion.

5.1 AREA A

Area A is comprised of the approximately 13-hectare woodland on the property which extends off of the property to the south, the wetland pocket present in the northwest corner of that woodland, and the overland drainage that flows through the wetland during the spring freshet.

Constraints

Due to the presence of the following of features and functions within Area A it should be considered a moderate constraint to the proposed Melancthon Pit License Expansion:

- Potential Significant Woodland – Provincial Policy Statement – meets two criteria for consideration as potential Significant Woodland.
    - Considered potentially significant on the basis of proximity to other woodland or other habitats - Includes wetland habitat and an area of seasonal surface drainage.
    - Considered potentially significant on the basis of water protection - the study area is mapped as being within a Significant Recharge Area by the County and Township.
- Other Wetland – Nottawasaga Valley Conservation Authority Regulated Wetland
- Potential Significant Woodland – Township of Melancthon Official Plan
    - Mapped in Schedule E of the Township Official Plan as Significant Woodlands – Primarily 20+ Hectares.
- Potential Significant Wildlife Habitat – Provincial Policy Statement – Seasonal Concentration Areas of Animals
    - Assumed to provide roost habitat for Silver-haired Bat and Big Brown Bat
- Potential Significant Wildlife Habitat – Provincial Policy Statement – Habitat for Species of Conservation Concern
    - Assumed to provide breeding habitat for Eastern Wood-pewee.
- Potential Habitat for Threatened or Endangered species – Provincial Policy Statement, ESA, SARA
    - Assumed to provide day roost habitat for Endangered bat species.

The 30 metre buffer surrounding Area A is considered a low constraint.

Considerations

Proximity to Area A will need to be considered when planning the extent of the proposed Melancthon Pit License Expansion. Any extraction within Area A or the 30 metre set-back from the Area A will require evaluation in the NEL 2 technical report to demonstrate that no negative impacts will result. When creating the site plan consideration could be given to avoiding removal of all or part of Area A. While removal of the feature is unlikely to result in negative impacts to the natural features and functions present within the study area additional discussion may be required with the Ministry of Natural Resources and the Ministry of Environment Conservation and Parks. Specifically, where there is potential for habitat of Endangered species, although it is unlikely that removal of day roost habitat would be considered a contravention of the ESA this would need to be confirmed.

Two alternatives to complete removal are available. Consideration could be given to a setback to ensure that extraction areas are outside of a dripline area for the woodland to avoid any negative impacts to the forest edge. It is expected that if the extraction area is outside of the dripline for the trees then there is no potential for negative impacts to the Area A of the functions assumed to be encompassed by that area. Alternatively, consideration could be given to removing only portions of Area A. Maintaining the Wetland area and a portion of the woodland connecting to the retained woodland south of the property would result in better protections for potential functions associated with the area and ensure that connectivity is maintained between the forest to the northwest and the forest to the south.

5.2 AREA B

The woodlot illustrated as Area B is included because of the location within the study area being directly adjacent to the property line. Area B is considered a moderate constraint to the proposed Melancthon Pit License Expansion. The constraint mapped with this feature is a low constraint because it is situated on adjacent land within the study area.

Constraints

Area B is comprised of the approximately 11-hectare woodland on the property to the west. This woodland is assumed to maintain the following functions:

- Potential Significant Woodland – Provincial Policy Statement – Given that the woodland is present on adjacent lands, significant woodland criteria not fully considered. The woodland was assumed to be Significant for the purpose of this assessment and impacts would be considered based on the potential functions of the Area.
- Potential Significant Woodland – Township of Melancthon Official Plan
    - Mapped in Schedule e of the Township Official Plan as Significant Woodlands – Primarily 20+ Hectares.
- Potential Significant Wildlife Habitat – Seasonal Concentration Areas of Animals
    - Assumed to provide roost habitat for Silver-haired Bat and Big Brown Bat
- Potential Significant Wildlife Habitat – Habitat for Species of Conservation Concern
    - Assumed to provide breeding habitat for Wood Thrush and Eastern Wood-pewee.

- Potential Habitat for Threatened or Endangered species
    - Assumed to provide day roost habitat for Endangered bat species.
    - Not adequately surveyed to rule out presence of potential Maternity Roost Habitat for Endangered bat species.

Considerations

Extraction distance from Area B will need to be considered when planning the extent of the proposed Melancthon Pit License Expansion. Consideration could be given to a setback to ensure that extraction areas are outside of a dripline area for the woodland to avoid any negative impacts to the forest edge. It is expected that if the extraction area is outside of the dripline for the trees then there is no potential for negative impacts to the Area B of the functions assumed to be encompassed by that area. Notwithstanding, extraction within the 30 metre set-back from the woodland will require evaluation in the NEL 2 technical report to demonstrate that no negative impacts will result to the natural heritage features and functions

6 CONCLUSIONS

As required within the policies of the *Aggregate Resources Act*, this NEL 1 technical report provides discussion related to the natural heritage features and functions associated with the study area for the proposed Melancthon Pit License Expansion. The NEL 1 technical report details the criteria and processes used to determine what natural heritage features and functions are associated with the area and their respective significance. As outlined in Table 3 of this report, a NEL 2 technical report will be required to investigate the potential for negative impacts to naturel heritage features and functions identified in the study area. The constraints as discussed in Section 5 of this report should be considered in the production of a Site Plan for the permit application. Following receipt of proposed extraction area and operational details, a NEL 2 Technical Report will be produced for the submission as required under the ARA.

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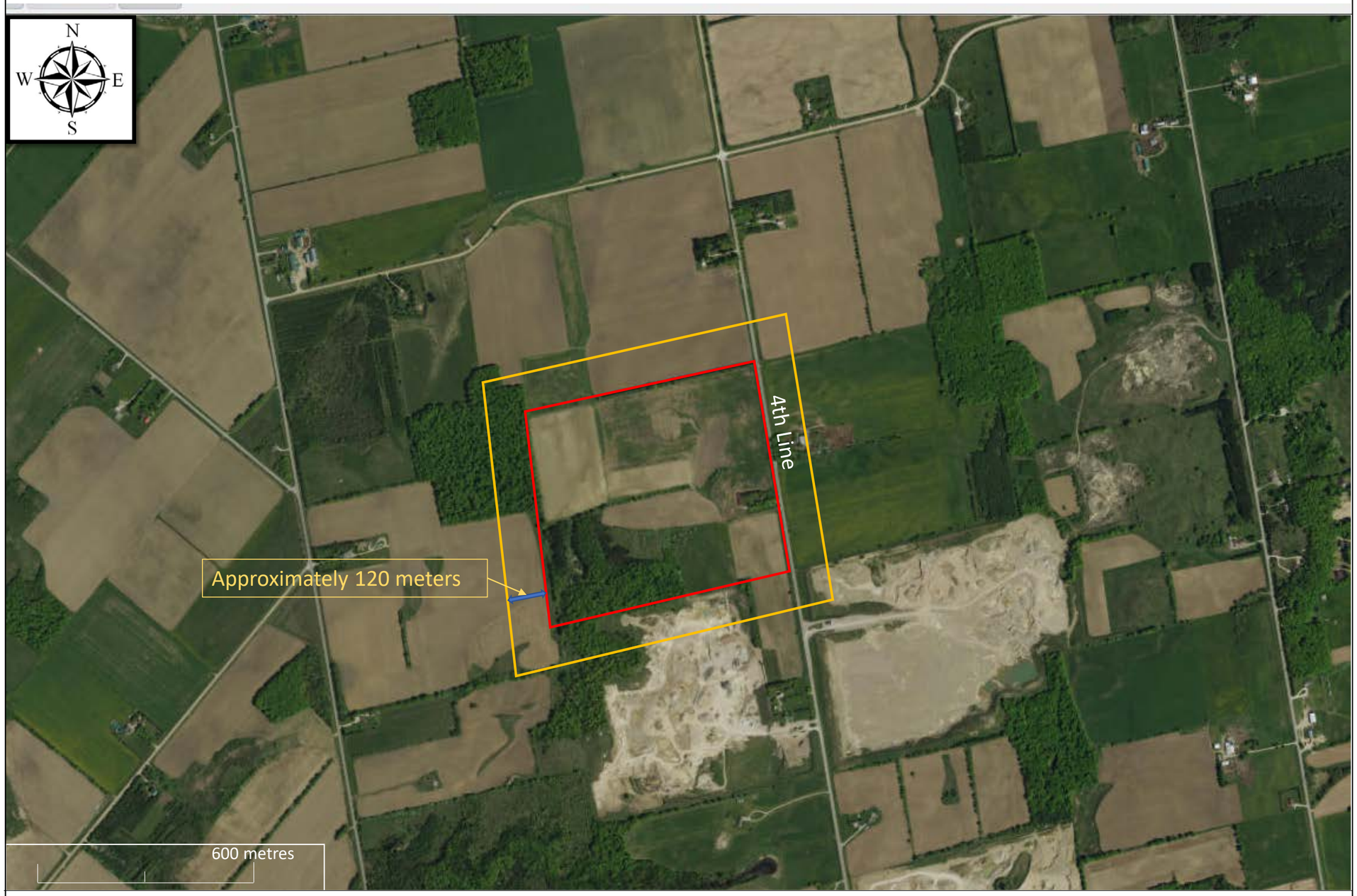


Scale is approximate

Key Map

Legend

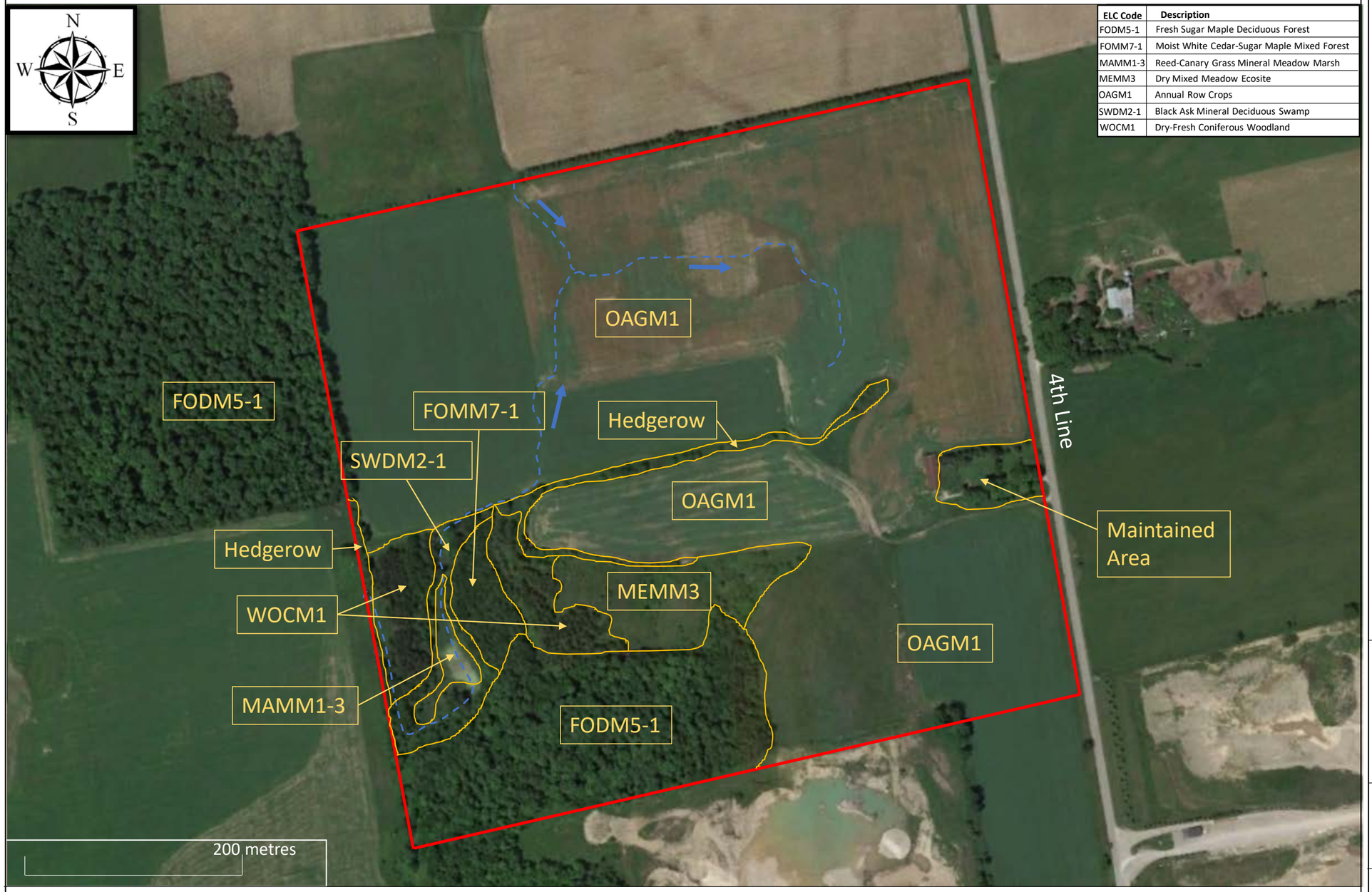
- Property Boundary (approximate)
- Study Area (approximate)

Source: NHIC Make A Map
http://www.gisapplication.lrc.gov.on.ca/mamnh/ (2019)

BIRKS
NATURAL HERITAGE CONSULTANTS

Project: 02-017-2018
Melancthon Pit License Expansion
Natural Environment Level 1
Technical Report

Figure 1
Study Area



ELC Code	Description
FODM5-1	Fresh Sugar Maple Deciduous Forest
FOMM7-1	Moist White Cedar-Sugar Maple Mixed Forest
MAMM1-3	Reed-Canary Grass Mineral Meadow Marsh
MEMM3	Dry Mixed Meadow Ecosite
OAGM1	Annual Row Crops
SWDM2-1	Black Ask Mineral Deciduous Swamp
WOCM1	Dry-Fresh Coniferous Woodland

Scale is approximate

Key Map

Legend

Property Boundary (approximate)

Surface Drainage

Source: Google Earth (2019)

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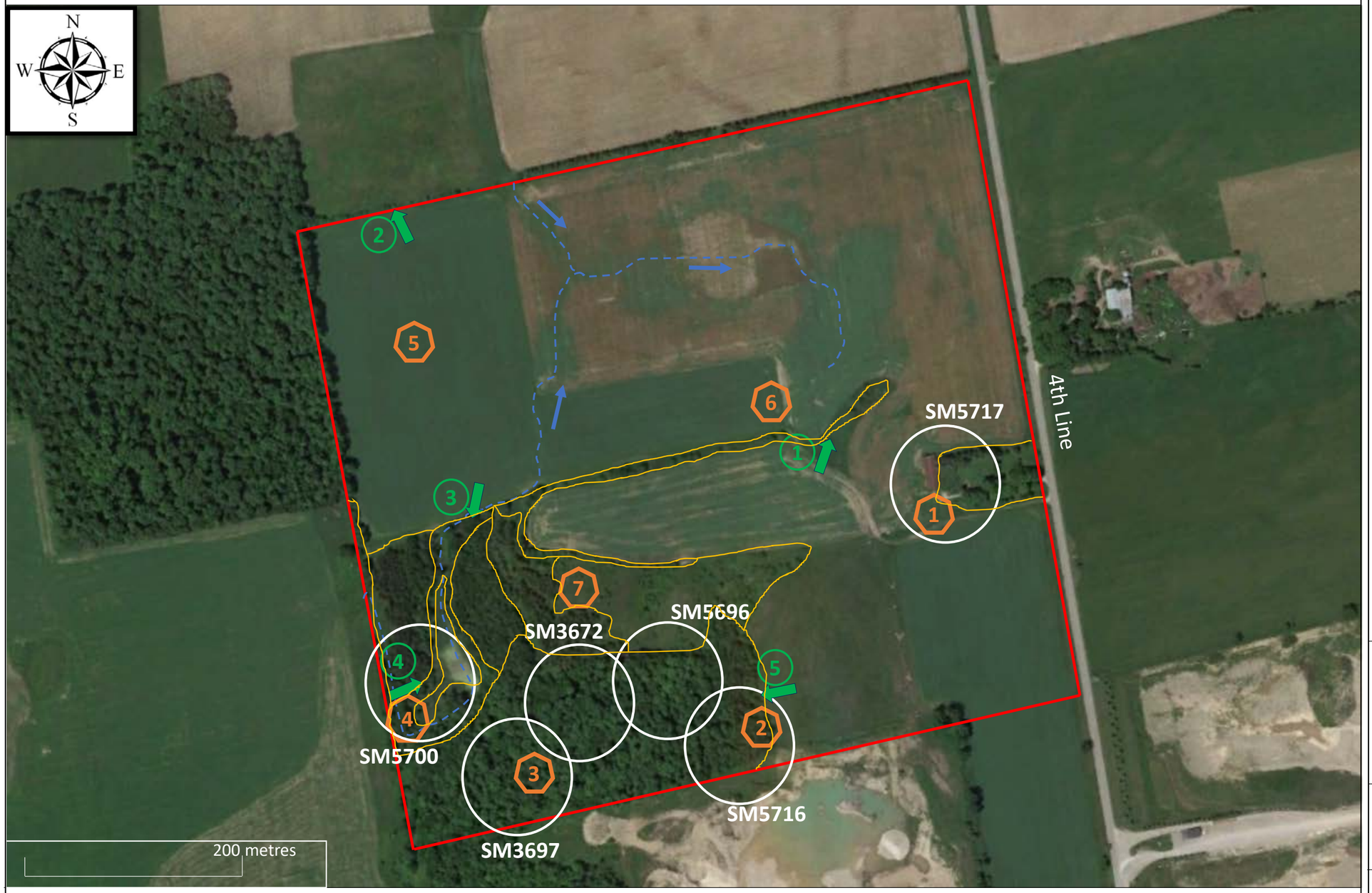
Project: 02-017-2018

Melancthon Pit License Expansion
Natural Environment Level 1
Technical Report

Figure 2
Existing Conditions



Scale is approximate

Key Map

Legend

- Property Boundary (approximate)
- Surface Drainage
- # Bird Survey Locations (Azimuth)
- # Amphibian Survey Locations (Azimuth)
- (White) Bat Acoustic Survey Locations (Azimuth)

Source: Google Earth (2019)

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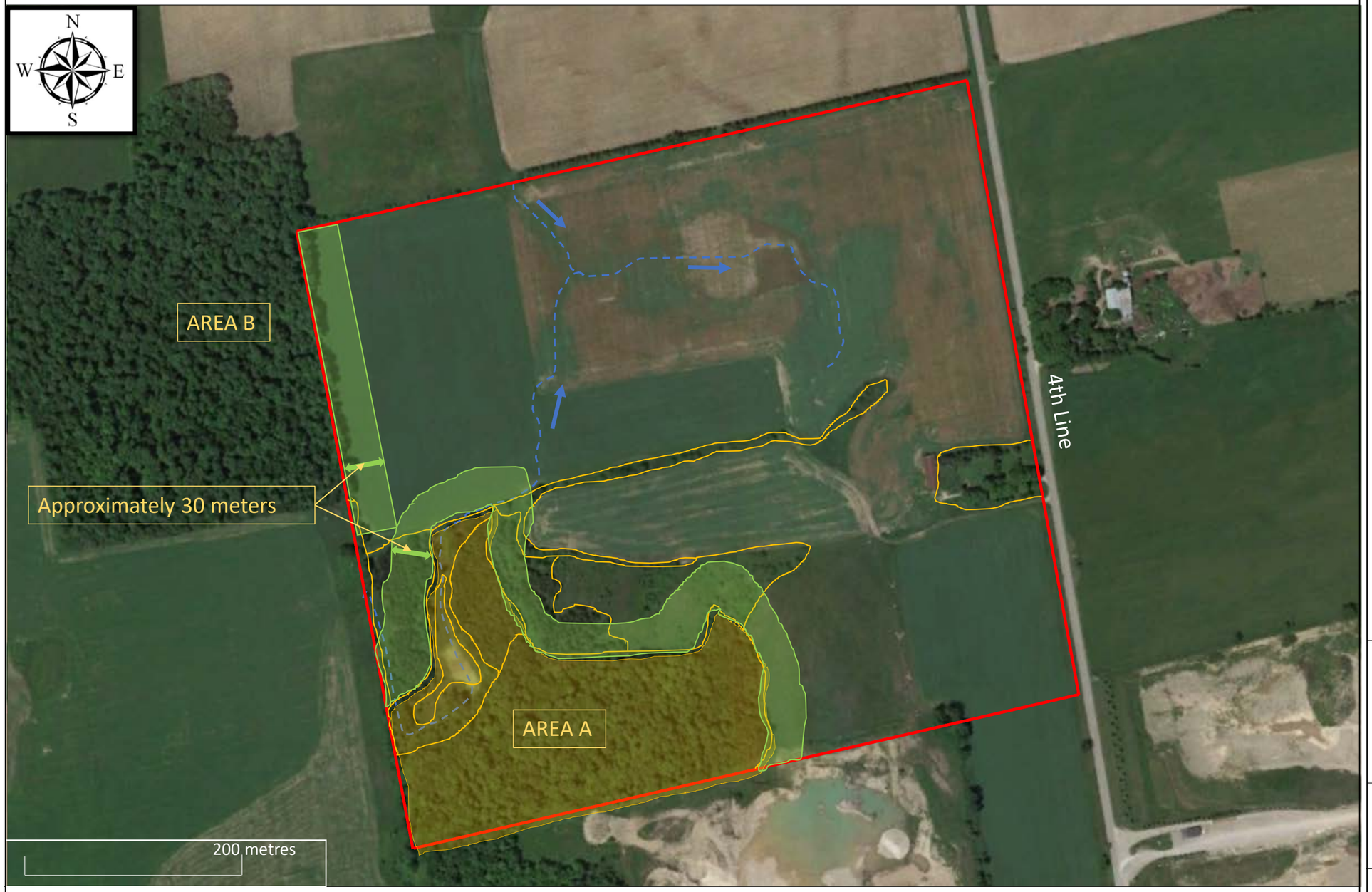
Melancthon Pit License Expansion
Natural Environment Level 1
Technical Report

Figure 3
Ecological Survey Locations



Scale is approximate

Key Map

Legend

- Property Boundary (approximate)
- Surface Drainage
- High Constraint
- Moderate Constraint
- Low Constraint

Source: Google Earth (2019)

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Melancthon Pit License Expansion
Natural Environment Level 1
Technical Report

Figure 4
Constraints and Opportunities

APPENDIX A

Nottawasaga Valley Conservation Authority Regulation Mapping

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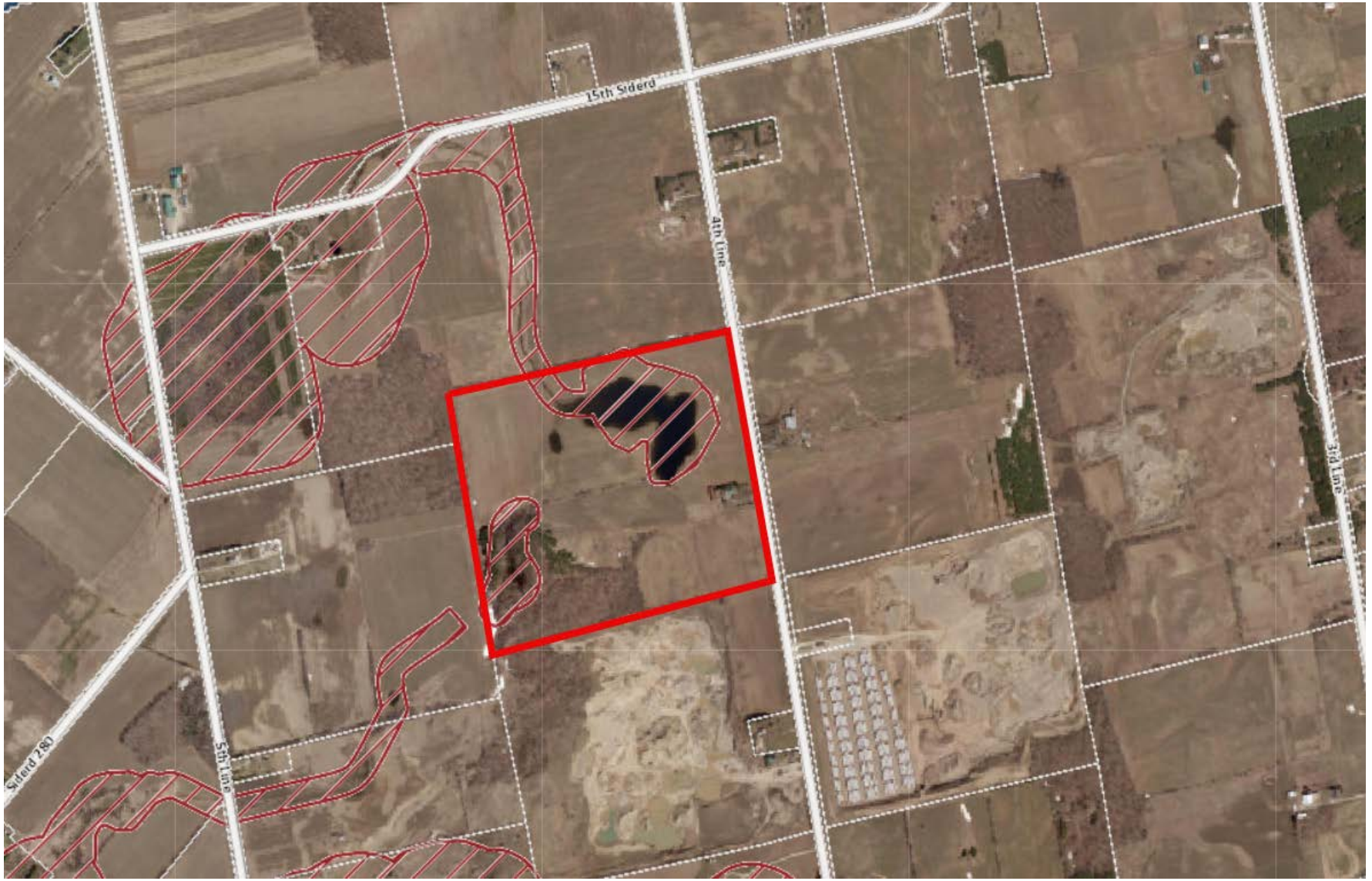
Appendix A: Nottawasaga Valley Conservation Authority Regulation Mapping.



APPENDIX B

Bat Survey Results

Bat Snag Density Calculations

ELC Polygon	Sample Location	Species	DBH	SNAG FEATURES												Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)
				Hollow			Hole			Loose Bark			Cracks						
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m				
FODM5-1	16	Sugar Maple	30													N	-	N	N
		Sugar Maple	46													N	-	N	N
		Sugar Maple	31									x				Y	-	N	N
		Sugar Maple	36							x	x	x				Y	1	Y	Y
		Sugar Maple	36													N	-	N	N
		Sugar Maple	36							x						Y	-	N	N
		Sugar Maple	29									x				Y	-	N	N
		Sugar Maple	36													N	-	N	N
		Sugar Maple	31													N	-	N	N
															TOTAL	4		1	1
	17	Black Cherry	35								x					Y	-	N	N
		Black Cherry	26													N	-	N	N
		Sugar Maple	33													N	-	N	N
		Sugar Maple	37								x					Y	-	N	N
		American Beech	39					x			x	x	x			Y	2	Y	Y
															TOTAL	3		1	1
	14	American Elm	35													N	-	N	N
		American Basswood	34		x	x					x	x		x	x	Y	4	N	N
		American Basswood	31		x			x			x	x				Y	1	Y	Y
		American Beech	25							x	x					Y	5	N	N
															TOTAL	3		1	1
	15	Sugar Maple	48													N	-	N	N
		American Beech	46					x	x		x	x				Y	1	Y	Y
		Black Cherry	27													N	-	N	N
		Sugar Maple	49													N	-	N	N
		Black Cherry	26													N	-	N	N
															TOTAL	1		1	1

FODM5-1	10	Sugar Maple	34													N	-	N	N
		Sugar Maple	27													N	-	N	N
		Sugar Maple	26								x					Y	-	N	N
		Sugar Maple	41					x								Y	-	N	N
		Sugar Maple	34		x						x					Y	-	N	N
		Sugar Maple	33								x				x	Y	1	Y	N
		Sugar Maple	40													N	-	N	N
		Sugar Maple	30													N	-	N	N
		Sugar Maple	30													N	-	N	N
		Sugar Maple	39												x	Y	-	N	N
		Sugar Maple	33									x			x	Y	-	N	N
		Sugar Maple	32													N	-	N	N
															TOTAL	6		1	0
	11	Sugar Maple	31													N	-	N	N
		Sugar Maple	36													N	-	N	N
		Sugar Maple	31								x	x				Y	-	N	N
		Sugar Maple	38													N	-	N	N
		Sugar Maple	29								x					Y	-	N	N
		American Basswood	36	x			x					x				Y	2	Y	Y
		Sugar Maple	36									x				Y	-	N	N
		Sugar Maple	28													N	-	N	N
		Sugar Maple	27					x								Y	-	N	N
		Sugar Maple	34								x					Y	-	N	N
		Sugar Maple	29													N	-	N	N
		Sugar Maple	42													N	-	N	N
		Sugar Maple	43								x					Y	-	N	N
		Sugar Maple	28									x				Y	-	N	N
		Sugar Maple	34													N	-	N	N
		Sugar Maple	27													N	-	N	N
		Sugar Maple	33								x					Y	-	N	N
		Sugar Maple	27													N	-	N	N
		American Basswood	29							x	x	x				Y	3	Y	Y
		American Basswood	31								x	x				Y	3	Y	Y
		American Beech	31								x	x	x	x		Y	2	Y	Y
															TOTAL	12		4	4
	12	Sugar Maple	38													N	-	N	N
		Sugar Maple	46								x	x				Y	1	Y	Y
		American Elm	25													N	-	N	N
															TOTAL	1		1	1

FODM5-1	13	Black Cherry	27													N	-	N	N
		Trembling Aspen	33				x			x						Y	5	N	N
		Trembling Aspen	38							x	x	x			x	Y	2	Y	Y
															TOTAL	2		1	1
	8	Sugar Maple	30													N	-	N	N
		Sugar Maple	42													N	-	N	N
		Sugar Maple	27													N	-	N	N
		Sugar Maple	38								x	x				Y	1	Y	Y
		Sugar Maple	44											x		Y	-	N	N
		Sugar Maple	32									x				Y	-	N	N
															TOTAL	3		1	1
	6	Sugar Maple	29											x		Y	-	N	N
		Sugar Maple	38													N	-	N	N
		Sugar Maple	40		x	x		x	x			x			x	Y	1	Y	Y
		Sugar Maple	41									x			x	Y	1	Y	Y
		Sugar Maple	33						x		x	x		x		Y	1	Y	Y
		Sugar Maple	42								x					Y	-	N	N
		Sugar Maple	36						x		x	x			x	Y	1	Y	Y
		Sugar Maple	36						x		x	x		x		Y	1	Y	Y
															TOTAL	7		5	5
	9	Sugar Maple	39								x					Y	-	N	N
		Sugar Maple	42									x				Y	-	N	N
		Sugar Maple	36													N	-	N	N
		Sugar Maple	30													N	-	N	N
		Sugar Maple	31													N	-	N	N
		Sugar Maple	32													N	-	N	N
		Sugar Maple	47													N	-	N	N
		Sugar Maple	33									x				Y	-	N	N
		Sugar Maple	31													N	-	N	N
		Sugar Maple	26													N	-	N	N
		Sugar Maple	33													N	-	N	N
		Sugar Maple	35								x					Y	-	N	N
		Sugar Maple	29													N	-	N	N
															TOTAL	4		0	0

FODM5-1	5	Sugar Maple	32								x	x				Y	1	Y	Y
		Sugar Maple	37									x				Y	-	N	N
		American Basswood	33													N	-	N	N
		American Basswood	35								x					Y	-	N	N
		American Elm	65									x			x	Y	-	N	N
		Black Cherry	27								x					Y	-	N	N
		American Elm	28													N	-	N	N
		Sugar Maple	46								x					Y	-	N	N
		Sugar Maple	42					x			x					Y	1	Y	N
		Sugar Maple	38								x			x		Y	1	Y	N
															TOTAL	8		3	1
	1	Common Apple	39					x		x	x			x		Y	4	N	N
															TOTAL	1		0	0
	4	Sugar Maple	38				x			x	x	x				Y	3	Y	Y
		Sugar Maple	44													N	-	N	N
		Sugar Maple	30						x		x	x				Y	-	N	N
		Sugar Maple	43													N	-	N	N
		Sugar Maple	35								x					Y	-	N	N
		Sugar Maple	39								x			x		Y	-	N	N
		Sugar Maple	31													N	-	N	N
		Sugar Maple	30													N	-	N	N
															TOTAL	4		1	1
	7	Black Cherry	25													N	-	N	N
		Sugar Maple	34								x			x		Y	-	N	N
		Sugar Maple	37													N	-	N	N
		Sugar Maple	40													N	-	N	N
		Sugar Maple	31													N	-	N	N
		Sugar Maple	44								x					Y	-	N	N
		Sugar Maple	33								x					Y	-	N	N
		Sugar Maple	29								x					Y	-	N	N
		Sugar Maple	29							x	x					Y	-	N	N
		Yellow Birch	26								x					Y	-	N	N
															TOTAL	6		0	0

FODM5-1	3	Sugar Maple	33												N	-	N	N
		Sugar Maple	42					x			x				Y	1	Y	N
		Sugar Maple	35								x	x		x	Y	1	Y	Y
		Sugar Maple	38								x				Y	-	N	N
		Sugar Maple	26								x				Y	-	N	N
		Sugar Maple	29					x							Y	-	N	N
		Sugar Maple	25												N	-	N	N
		Sugar Maple	41							x			x		Y	-	N	N
		Sugar Maple	38								x				Y	-	N	N
		Sugar Maple	27												N	-	N	N
		Sugar Maple	40								x			x	Y	1	Y	N
		Sugar Maple	37								x	x		x	Y	1	Y	Y
														TOTAL	9		4	2
	2	American Elm	32								x				Y	-	N	N
														TOTAL	1		0	0

1 plot = 0.05 ha

20 plots = 1 ha

	Composite Tree	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	<3m	3-10m	>10m
Total	75	20	13	61	33
Avg (total # of snags/total # of plots)	4.41176	1.176470588	0.7647	3.588	1.941
/ha	88.2353	23.52941176	15.294	71.76	38.82

Melanchton Pit NEL 1
SM3672
06/12/2018 - 06/22/2018
Sunset Time: 21:03
Sunrise Time: 5:50

TIMES	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-12:00	12:00-12:30	12:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
SPECIES																			
MYLU																			0
MYSE																			0
MYOTIS			1				4	6	5	7	2	4	6	3	2				40
PESU																			0
EPFULANO			1	1	1									1	5				9
LACI																			0
LABO																			0
LowF																			0
HighF																			0
TOTAL	0	0	2	1	1	0	4	6	5	7	2	4	6	4	7	0	0	0	49

		w/o HI-F	**TOTAL SAR**	**40**
		w/ HI-F	TOTAL SAR	**40**

Melanchton Pit NEL 1
SM3697
06/12/2018 - 06/22/2018
Sunset Time: 21:03
Sunrise Time: 5:50

TIMES	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-12:00	12:00-12:30	12:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
SPECIES																			
MYLU																			0
MYSE																			0
MYOTIS							1			1	4	1							7
PESU																			0
EPFULANO		1	1	1															3
LACI		1																	1
LABO																			0
LowF																			0
HighF																			0
TOTAL	0	2	1	1	0	0	1	0	0	1	4	1	0	0	0	0	0	0	11

		w/o HI-F	**TOTAL SAR**	**7**
		w/ HI-F	TOTAL SAR	7

Melanchton Pit NEL 1
SM5696
06/12/2018 - 06/22/2018
Sunset Time: 21:03
Sunrise Time: 5:50

TIMES	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-12:00	12:00-12:30	12:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
SPECIES																			
MYLU																			0
MYSE																			0
MYOTIS							1							2					3
PESU																			0
EPFULANO		1																	1
LACI			1																1
LABO																			0
LowF																			0
HighF																			0
TOTAL	0	1	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	5
																		w/o HI-F	TOTAL SAR 3
																		w/ HI-F	TOTAL SAR 3

Melanchton Pit NEL 1
SM5700
06/12/2018 - 06/22/2018
Sunset Time: 21:03
Sunrise Time: 5:50

TIMES	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-12:00	12:00-12:30	12:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
SPECIES																			
MYLU																			0
MYSE																			0
MYOTIS		4	4	5	2	4	4	7	9		4	3	1	2	2	2			53
PESU																			0
EPFULANO		15	18	12	5	8	5	1	2	1		5		1	1	2			76
LACI		22	2	6				2				1			1				34
LABO																			0
LowF																			0
HighF																			0
TOTAL	0	41	24	23	7	12	9	10	11	1	4	9	1	3	4	4	0	0	163
																		w/o HI-F	TOTAL SAR 53
																		w/ HI-F	TOTAL SAR 53

Melanchton Pit NEL 1
SM5716
06/12/2018 - 06/22/2018
Sunset Time: 21:03
Sunrise Time: 5:50

TIMES	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-12:00	12:00-12:30	12:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
SPECIES																			
MYLU																			0
MYSE																			0
MYOTIS									1										1
PESU																			0
EPFULANO																			0
LACI				1															1
LABO																			0
LowF																			0
HighF																			0
TOTAL	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2

w/o HI-F **TOTAL SAR** 1
w/ HI-F TOTAL SAR 1

Melanchton Pit NEL 1
SM5717
06/12/2018 - 06/22/2018
Sunset Time: 21:03
Sunrise Time: 5:50

TIMES	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-12:00	12:00-12:30	12:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
SPECIES																			
MYLU																			0
MYSE																			0
MYOTIS				1		1	1	1		3	1	2	1						11
PESU																			0
EPFULANO		16	42	60	47	7	1									17			190
LACI		7	96	27	2	3					1	1		1	2	6			146
LABO																			0
LowF																			0
HighF								1					2						3
TOTAL	0	23	138	88	49	11	2	2	0	3	2	3	3	1	2	23	0	0	350

w/o HI-F **TOTAL SAR** 11
w/ HI-F TOTAL SAR 14

Species ID

MYLU	Myotis lucifugus
MYSE	Myotis septentrionalis
PESU	Perimyotis subflavus
EPFU	Eptesicus fuscus
LANO	Lasionycteris noctivagans
LACI	Lasiurus cinereus
LABO	Lasiurus borealis
MYLE	Myotis leibii

Groupings

MYOTIS	Myotis sp.
EPFULANO	Eptesicus fuscus/Lasionycteris noctivagans
LowF	Low Frequency Bat (<35kHz Fmin)
HighF	High Frequency Bat (>35kHz Fmin) PESU, LABO, or MYLU

Minimum Frequency Range of Species

MYLU	40 - 45kHz
MYSE	40 - 45kHz
PESU	35 - 40kHz
EPFU	25 - 30kHz
LANO	25 - 30kHz
LACI	<25kHz
LABO	30 - 35kHz
MYLE	40 - 45kHz

APPENDIX C

Significant Woodland Assessment

Appendix C. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
Woodland Size Criteria		
• Size refers to the aerial (spatial) extent of the woodland (irrespective of ownership) • Woodland areas are considered to be generally continuous even if intersected by narrow gaps 20m or less in width between crown edges. • Size value is related to the scarcity of woodland in the landscape derived on a municipal basis with consideration of the differences in woodland coverage among physical sub-units (e.g., watersheds, biophysical regions). • Size criteria should also account for differences in landscape-level physiography (e.g., moraines, clay planes) and community vegetation types.	Where woodlands cover: • Is less than about 5% of land cover, woodlands 2ha in size or larger should be considered significant • Is about 5-15% of land cover, woodlands 4ha in size or larger should be considered significant • Is about 15-30% of land cover, woodlands 20ha in size or larger should be considered significant. • **Is about 30-60% of land cover, woodlands 50ha in size or larger should be considered significant** • Occupies more than 60% of the land, a minimum size is not suggested, and other factors should be considered	• According to the Pine River Subwatershed Health Check (NVCA, 2013), there is 41.8% forest cover in the subwatershed which contains the study area. • Therefore, a woodland must be 50 ha in size or larger to be considered significant. • The woodland on the property is part of the continuous woodland that extends to the west and north of the property. The total area of the continuous woodland as mapped by the Township of Melancthon is approximately 27 ha. • ***Therefore, based on Woodland Size Criteria, the woodland unit within the study area would not be considered Significant in the context of the PPS.***
Ecological Function Criteria		
Woodland Interior		
• Interior Habitat more than 100m from the edge (as measured from the limits of a continuous woodland as defined above) is important for some species. • For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20m and did not create a separate woodland.	Woodlands should be considered significant if they have: • Any interior habitat where woodlands cover less than about 15% of the land cover • 2 ha or more of interior habitat where woodlands cover about 15-30% of the land cover • **8 ha or more of interior habitat where woodlands cover about 30-60% of the land cover** • 20 ha or more of interior habitat where woodlands cover about 60% of the land cover	• The continuous woodland does not contain 8 ha or more of interior habitat. • ***Therefore, the woodland unit within the study area does not appear to be significant by the Woodland Interior Criteria in the context of the PPS.***
Proximity to Other Woodlands or Other Habitats		
• Woodlands that overlap, abut or are close to other significant natural heritage features or areas could be considered more valuable or significant than those that are not. • Patches close to each other are of greater mutual benefit and value to wildlife.	Woodlands should be considered significant if: • A portion of the woodland is located within a specific distance (e.g., 30m) of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland and the entire woodland meets the minimum area threshold (e.g., 0.5-20ha, depending on circumstance)	• The woodland on the property contains a surface drainage feature and wetland community expected to be receiving ecological benefit from the contiguous woodland unit. • ***Therefore, based on Proximity to Other Woodlands or Other Habitats Criteria, the woodland unit within the Study Area could be considered potentially Significant in the context of the PPS.***

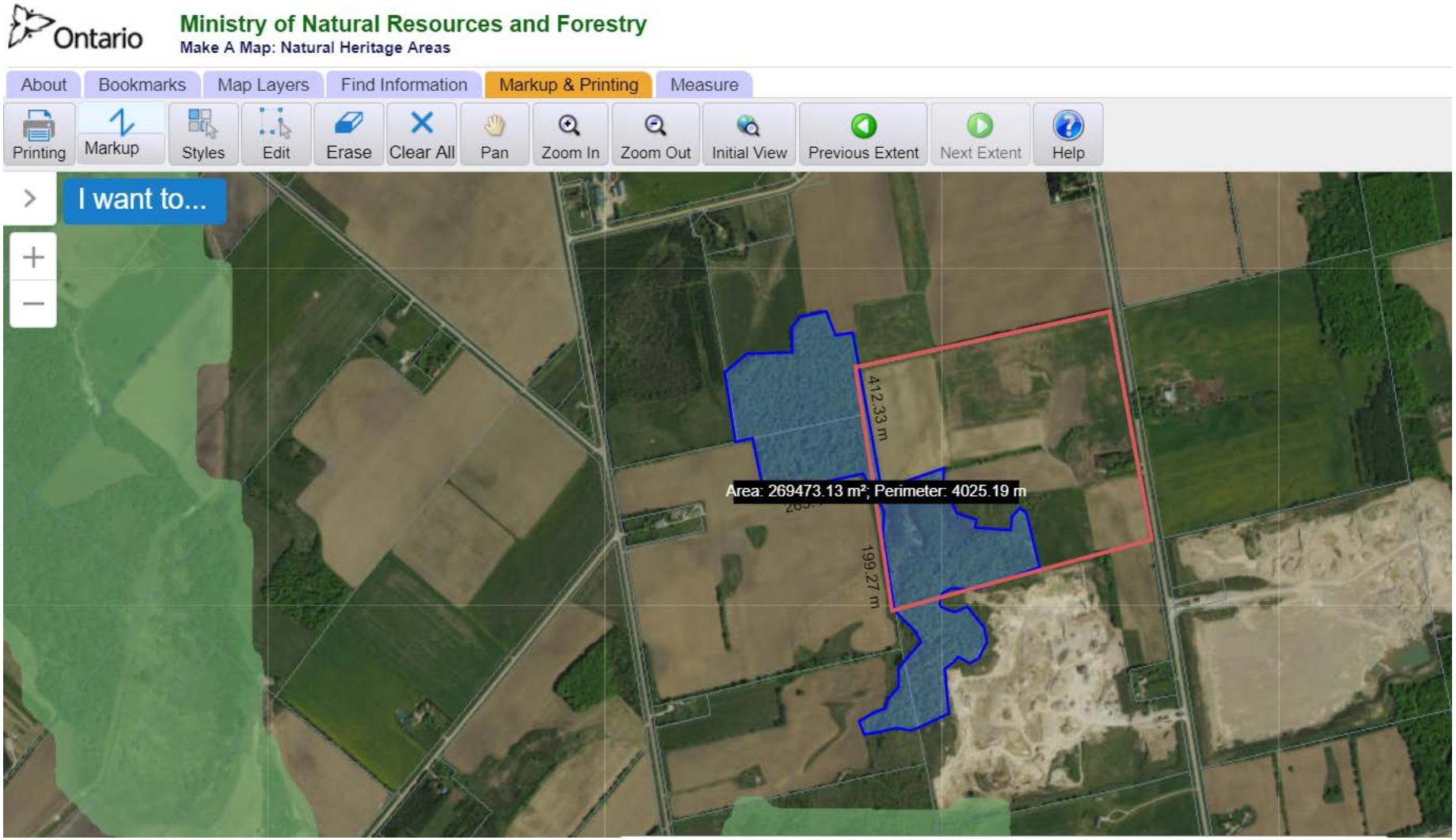
Appendix C. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
Linkages		
• Linkages are important connections providing for movement between habitats. • Woodlands that are located between other significant features or areas can be considered to perform an important linkage function as "stepping stones" for movement between habitats.	Woodlands should be considered significant if they: • Are located within a defined natural heritage system or provide a connecting link between two other significant features, each of which is within a specified distance (e.g., 120m) and meets minimum area thresholds (e.g., 1-20ha, depending on circumstance)	• Woodland on the property is not located within a defined natural heritage system. • The woodland on the property is not located between other significant features that could be considered to perform linkage function. • ***Therefore, based on Linkages Criteria, the woodland unit within the study area would not be considered Significant in the context of the PPS.***
Water Protection		
• Source water protection is important. • Natural hydrological processes should be maintained.	Woodlands should be considered significant if they: • Are located within a sensitive or threatened watershed or a specific distance (e.g., 50m or top of valley bank if greater) or a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds (e.g., 0.5-10ha, depending on circumstance)	• According to Appendix 2 (Source Water Protection) of the Dufferin County Official Plan, the study area is mapped as being within a Significant Recharge Area • **Therefore, based on Water Protection Criteria, the woodland unit within the study area could be considered potentially Significant in the context of the PPS.**
Woodland Diversity		
• Certain woodland species have had major reductions in representation on the landscape and may need special consideration. • More native diversity is more valuable than less diversity.	Woodlands should be considered significant if they have: • A naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield and meet minimum area thresholds (e.g., 1-20ha, depending on circumstance) • A high native diversity through a combination of composition and terrain (e.g., a woodland extending from a hilltop to a valley bottom or to opposite slopes) and meet minimum area thresholds (e.g., 2-20ha, depending on circumstance)	• The woodland unit within the study area does not contain native forest tree species that have declined significantly (*i.e.,* Butternut). • ***Therefore, the woodland unit within the study area does not appear Significant by the Woodland Diversity Criteria in the context of the PPS.***
Uncommon Characteristics Criteria		
• Woodlands that are uncommon in terms of species composition, cover type, age or structure should be protected. • Older woodlands (i.e., woodlands greater than 100 years old) are particularly valuable for several reasons, including their contributions to genetic, species and ecosystem diversity.	Woodlands should be considered significant if they have: • A unique species composition or the site is represented by less than 5% overall in woodland area and meets minimum area thresholds (e.g., 0.5ha, depending on circumstance) • A vegetation community with a provincial ranking of S1, S2 or S3 (as ranked by the NHIC	• The woodland unit within the study area is not uncommon in terms of species composition, cover types (*i.e.,* composition of ELC vegetation types), structure or age. • ***Therefore, the woodland unit within the study area does not appear Significant by the Uncommon Characteristics Criteria in the context of the PPS.***

Appendix C. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
	and meet minimum area thresholds (*e.g.*, 0.5ha, depending on circumstance) • Habitat (e.g., with 10 individual stems or 100m^2 of leaf coverage) of a rare, uncommon or restricted woodland plant species and meet minimum area thresholds (e.g., 0.5ha, depending on circumstance): vascular plant species for which the NHIC's Southern Ontario Coefficient of Conservatism is 8, 9 or 10; tree species of restricted distribution such as sassafras or rock elm; species existing only in a limited number of sites within the planning area • Characteristics of older woodlands or woodlands with larger tree size structure in native species meet minimum area thresholds (e.g., 1-10ha, depending on circumstance): older woodlands could be defined as having 10 or more trees/ha greater than 100 years old; larger tree size structure could be defined as 10 or more trees/ha at least 50cm in diameter, or a basal area of 8 or more m^2/ha in trees that are at least 40cm in diameter	
Economic and Social Function Values Criteria		
• Woodlands that have high economic or social values through particular site characteristics or deliberate management should be protected.	Woodlands should be considered significant if they have: • High productivity in terms of economically viable products together with continuous native natural attributes and meet minimum area thresholds (e.g., 2-20ha, depending on circumstance) • A high value in special services such as air-quality improvement or recreation at a sustainable level that is compatible with long-term retention and meet minimum area thresholds (e.g., 0.2-10ha, depending on circumstance) • Important identified appreciation, education, cultural or historical value and meet minimum area thresholds (e.g., 0.2-10ha, depending on circumstance)	• The woodland unit within the study area does not generate economically viable forest products. • No formal recreational use of property of adjacent lands. • The woodland unit within the study area is not identified as providing education, cultural or historical value. • ***Therefore, the woodland unit within the study area does not appear Significant by the Economic and Social Function Values Criteria in the context of the PPS.***

Appendix C. Significant Woodland Mapping



APPENDIX D

Significant Wildlife Habitat Assessment

Tables 4.1-4.6. Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E

4.1 - Seasonal Concentrations of Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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. 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 • Sites documented through waterfowl planning processes • 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" • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. • 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). • Significant Wildlife Habitat Mitigation Support Tool Index #7 provides development effects and mitigation measures.	Habitat in study area does not meet criteria related to wildlife species. Spring flooding was observed within the agricultural field. The size of this area would not support the number of individuals required under the defining criteria.
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 Ruddy Duck	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 • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Areas	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH • The combined area of the ELC ecosites and a 100m radius area is the SWH • Wetland area and shorelines associated with sites identified within the Significant Wildlife Habitat Technical Guide Appendix K are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • 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). • Significant Wildlife Habitat Mitigation Support Tool Index #7 provides development effects and mitigation measures.	Habitat where open water was observed is small and is not of suitable size to support such aggregation. Further, surveys undertaken during the spring migration period did not identify aggregations of more than 10 individuals at any given time.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shorebird Migratory Stopover Area **Rationale:** High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 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 • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #8 provides development effects and mitigation measures.	The seasonal drainage, wetland habitat, and seasonal pond within the property did not support the required species and number of individuals to be considered Significant Wildlife Habitat.
Raptor Wintering Area **Rationale:** Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland. • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands • 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 Naturalist Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Results of Christmas Bird Counts Reports and other information available from Conservation Authorities.	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 of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) 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" • Significant Wildlife Habitat Mitigation Support Tool Index #10 and #11 provides development effects and mitigation measures.	No meadow/forest communities of sufficient size are located within the study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula **Rationale:** Bat hibernacula are rare habitats in all 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 (e.g. 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, for most development types and 1000m for wind farms • 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. • Significant Wildlife Habitat Mitigation Support Tool Index #1 provides development effects and mitigation measures.	No caves, mine shafts, karst or underground foundations have been identified within the study area.
Bat Maternity Colonies **Rationale:** Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3. • 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 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". • Significant Wildlife Habitat Mitigation Support Tool Index #12 provides development effects and mitigation measures.	**The naturalized forested portion of the property may provide this function for the listed species.**
Turtle Wintering Areas **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 must 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 • 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 • Field Naturalist clubs • 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) • Congregation of turtles is more common where wintering areas are limited and therefore significant • Significant Wildlife Habitat Mitigation Support Tool Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Wetland habitat within the study area where open water was observed is not considered a permanent water body that could support overwintering turtles.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Reptile Hibernaculum **Rationale;** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	**Snakes:** Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Milksnake **Special Concern:** 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, Cave, and Alvar sites may be directly related to these habitats. Observations or 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 or naturalized locations. The existence of features that go below 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 • 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. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from Conservation Authorities. • Field Naturalists clubs • University herpetologists • 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 30 m radius area is the SWH • Significant Wildlife Habitat Mitigation Support Tool Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • Significant Wildlife Habitat Mitigation Support Tool Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Features associated with this function appear to be common in the general landscape, however no evidence of these features which could support a congregation of snakes.
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 Conservation Authorities. • Ontario Breeding Bird Atlas • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist Clubs.	Studies confirming: • Presence of 1 or more nesting sites with 8 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 • 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” • Significant Wildlife Habitat Mitigation Support Tool Index #4 provides development effects and mitigation measures	Habitat in the study area does not meet key criteria to be considered significant – cliffs or banks were not observed within the study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs) **<u>Rationale</u>:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas, colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Center (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 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 • 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 • Significant Wildlife Habitat Mitigation Support Tool Index #5 provides development effects and mitigation measures.	Although the property contains appropriate ELC communities, none of the listed species were observed throughout the course of the field studies. No evidence of nests within these communities was observed.
Colonially -Nesting Bird Breeding Habitat (Ground) **<u>Rationale;</u>** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas , 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. • 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 radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #6 provides development effects and mitigation measures.	Habitat does not meet key criteria to be considered significant. The study area is not conducive to no rocky islands or peninsulas.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate site 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. • 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 • 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. • 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 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). 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, significant variation can occur between years and multiple years of sampling should occur. • 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. • Significant Wildlife Habitat Mitigation Support Tool Index #16 provides development effects and mitigation measures.	Study area is not located within 5km of Lake Ontario and thus this habitat function is not applicable.
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds.: Canadian Wildlife Service Ontario website. All migrant raptor 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 in size and within 5 km of Lake Ontario. • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH . Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. 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" • Significant Wildlife Habitat Mitigation Support Tool Index #9 provides development effects	Study area is not located within 5km of Lake Ontario and thus this habitat function is not applicable.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Yarding Areas **<u>Rationale:</u>** Winter habitat for deer is considered to be the main limiting 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 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm 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%. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual" • 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. • 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. • 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 within this Schedule. • Significant Wildlife Habitat Mitigation Support Tool Index #2 provides development effects and mitigation measures.	The property is not mapped as core/Stratum 1 deeryard by the MNRF (Allan *et al*. 2005). No browse lines or signs of intensive browsing of shrubs/saplings characteristic of core deer yard habitat observed.
Deer Winter Congregation Areas **<u>Rationale:</u>** Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha 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 Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands . • If deer are constrained by snow depth refer to the Deer Yarding Area habitat. • 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 . • Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey. • 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 below. • Significant Wildlife Habitat Mitigation Support Tool Index #2 provides development effects and mitigation measures.	Study area is located in the northern part of Ecoregion 6E in an area that receives >20cm of snow accumulation per year. Thus, this criterion is not applicable.

4.2 - Rare Vegetation Communities

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS 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 available on their website • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes • Significant Wildlife Habitat Mitigation Support Tool Index #21 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
Sand Barren **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. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.	A sand barren area >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information available on their website. • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.) • Significant Wildlife Habitat Mitigation Support Tool Index #20 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
Alvar **Rationale;** Alvars are extremely rare habitats in Ecosregion 6E. Most alvars in Ontario are in Ecoregions 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 Species:** 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover	An Alvar site > 0.5 ha in size. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists. • Ontario Nature – Conserving Great Lakes Alvars. • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	• Field studies that identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses • Significant Wildlife Habitat Mitigation Support Tool Index #17 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
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 areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Districts. • Field Naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the are >140 years old, then the area containing these trees is SWH • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics • Significant Wildlife Habitat Mitigation Support Tool Index #23 provides development effects and mitigation measures.	Forest communities in study area do not meet key criteria related to Woodland areas. Woodland habitat is not considered to be old growth forest.
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 available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • Significant Wildlife Habitat Mitigation Support Tool Index #18 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
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 • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • Significant Wildlife Habitat Mitigation Support Tool Index #19 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
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 Significant Wildlife Habitat Technical Guide. 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 The OMNRF/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 Naturalist clubs. • Conservation Authorities.	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of Significant Wildlife Habitat Technical Guide. • Area of the ELC Vegetation Type polygon is the SWH. • Significant Wildlife Habitat Mitigation Support Tool Index #37 provides development effects and mitigation measures.	No rare vegetation communities have been documented within the study area.

4.3 - Specialized Habitat for Wildlife

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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 120 m 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 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from Conservation Authorities.	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” • 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 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • Significant Wildlife Habitat Technical Guide Index #25 provides development effects and mitigation measures.	Habitat in study area could provide nesting opportunity for waterfowl. Two pairs of Mallard were observed on May 10 in the seasonal pond located within the agricultural fields. Waterfowl nesting for any species was not observed throughout the field program.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat **Rationale;** Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey **Special Concern** Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented • Reports and other information available from Conservation Authorities. • Field Naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area. • 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 300 m radius around the nest or the contiguous woodland stand is the SWH , maintaining undisturbed shorelines with large trees within this area is important . • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. , 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 • 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. • 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”	The listed species were not documented within the study area.

				• Significant Wildlife Habitat Technical Guide Index #26 provides development effects and mitigation measures	
Woodland Raptor Nesting Habitat **<u>Rationale:</u>** Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH (the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. • 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. • Significant Wildlife Habitat Technical Guide Index #27 provides development effects and mitigation measures.	Plantation communities within the study area are not of sufficient size to provide this function.
Turtle Nesting Areas **<u>Rationale;</u>** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • 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. Significant Wildlife Habitat Technical Guide Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Suitable ELC ecosites were not documented within the study area. Some recent areas of exposed mineral sand were present on the property which we understand resulted from archeological assessments on the property. These areas are new and temporal in nature and are not expected to provide turtle nesting function at this time.

Seeps and Springs **<u>Rationale;</u>** 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. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species <u>Information Sources</u> • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and Ministry of the Environment, Conservation and Parks. • 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 an ELC forest ecosite or an ecoelement within 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. • Significant Wildlife Habitat Technical Guide Index #30 provides development effects and mitigation measures	No seeps or springs were documented within the study area.
Amphibian Breeding Habitat (Woodland). **<u>Rationale:</u>** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). 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 <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District. • OMNRF wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service • Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • Significant Wildlife Habitat Technical Guide Index #14 provides development effects and mitigation measures.	Species recorded within the wetland community do not meet the defining criteria of 2 or more frog species at a call level code of 3.

Amphibian Breeding Habitat (Wetlands) **<u>Rationale;</u>** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands>500m2 (about 25m diameter), 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. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. **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 will be required during the spring (March-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 below. • Significant Wildlife Habitat Technical Guide Index #15 provides development effects and mitigation measures.	Species recorded within the wetland community do not meet the defining criteria of 2 or more frog species at a call level code of 3.
Woodland Area-Sensitive Bird Breeding Habitat **<u>Rationale:</u>** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren **Special Concern:** 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, • Interior forest habitat is at least 200 m from forest edge habitat. <u>Information Sources</u> • 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 determine what forests were of greatest value to interior species • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding 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” • Significant Wildlife Habitat Technical Guide Index #34 provides development effects and mitigation measures.	Only one of the listed wildlife species was documented within the forested portion of the property. Forested portions do not meet the size and age criteria (*i.e.,* >30 ha, >60 yrs. old).

4.4 - Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Marsh Breeding Bird Habitat **Rationale;** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Moorhen 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. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • OMNRF District and wetland evaluations. • Field Naturalist clubs • Natural Heritage Information Center (NHIC) Records. • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas.	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. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • 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" • Significant Wildlife Habitat Technical Guide Index #35 provides development effects and mitigation measures	Vegetation communities within the study area are not appropriate to provide this function. None of the listed species were documented during the field surveys.
Open Country Bird Breeding Habitat Sources Defining Criteria **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 Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl Grasshopper Sparrow	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha • 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). • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities.	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 Owls or Grasshopper Sparrow 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" • Significant Wildlife Habitat Technical Guide Index #32 provides development effects and mitigation measures	Vesper Sparrow and Savannah Sparrow were documented within the open areas of the study area, however this area does not meet the size criteria (*i.e.,* >30 ha).
Shrub/Early Successional Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** 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 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). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • 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 • Reports and other information available from Conservation Authorities.	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. • A habitat with breeding 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" • Significant Wildlife Habitat Technical Guide Index #33 provides development effects and mitigation measures.	Habitat in study area does not meet size criteria for significance.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish; (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) 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 meadow marsh, swamp or moist terrestrial sites • 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 in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult • Significant Wildlife Habitat Technical Guide Index #36 provides development effects and mitigation measures.	Chimneys were not documented within the wetland community.
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 Information Sources • Natural Heritage Information Centre (NHIC) will have 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 • 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 be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • Significant Wildlife Habitat Technical Guide Index #37 provides development effects and mitigation measures.	**Special Concern species were documented within the study area**

4.5 - Animal Movement Corridors

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors **Rationale:** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog 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	Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH (**Amphibian Breeding Habitat –Wetland)** Information Sources • MNRF District Office. • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs.	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant • Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20mcxlix . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • Significant Wildlife Habitat Technical Guide Index #40 provides development effects and mitigation measures	Considered only if Candidate Amphibian Breeding Habitat is identified.
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 • A deer wintering habitat identified by the OMNRF as will have corridors that the deer use during fall migration and spring dispersion. • 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 Conservation Authorities. • 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 habitat should be unbroken by roads and residential areas. • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. • Shorter corridors are more significant than longer corridors. • Significant Wildlife Habitat Technical Guide Index #39 provides development effects and mitigation measures	No deer wintering habitat is present on the property.

4.6 - Exceptions for Ecoregion 6E

EcoDistrict	Wildlife Habitat and Species	Candidate			Confirmed SWH	Assessment
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14 **Rationale:** The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bears.	**Mast Producing Areas** Black Bear	All Forested habitat represented by ELC Community Series: FOM FOD	• Black bears require forested habitat that provides cover, winter hibernation sites, and mast-producing tree species. • Forested habitats need to be large enough to provide cover and protection for black bears	Woodland ecosites >30ha with mast-producing tree species, either soft (cherry) or hard (oak and beech), Information Sources Important forest habitat for black bears may be identified by OMNRF.	All woodlands > 30ha with a 50%composition of these ELC Vegetation Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 Significant Wildlife Habitat Technical Guide Index #3 provides development effects and mitigation measures.	Not applicable, study area is not located on the Bruce Peninsula.
6E- 17 **Rationale:** Sharp-tailed grouse only occur on Manitoulin Island in Eco-region 6E, Leks are an important habitat to maintain their population	**Lek** **Sharp-tailed Grouse**	CUM CUS CUT	• The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. • Leks are typically a grassy field/meadow >15ha with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated.	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland. • Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) • Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting Information Sources • OMNRF district office • Bird watching clubs • Local landowners • Ontario Breeding Bird Atlas	Studies confirming lek habitat are to be completed from late March to June. • Any site confirmed with sharp-tailed grouse courtship activities is considered significant • The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat • Significant Wildlife Habitat Technical Guide Index #32 provides development effects and mitigation measures	Not applicable, study area is not located on Manitoulin Island.