Natural Heritage Evaluation
South Part of Lot 12, Concession 11
City of Barrie

Prepared for:
Sorbara Group of Companies

Prepared by:
Azimuth Environmental
Consulting, Inc.

September 2018

AEC 11-076r

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

September 5, 2018 AEC 11-076r

Sorbara Group of Companies
3700 Steeles Avenue West, Suite 800
Vaughan, ON L4L 8M9

ATTN: Scott Young, Development Manager

Re: **Natural Heritage Evaluation**
Barrie Lockhart Road LP
South Part of Lot 12, Concession 11, City of Barrie

Dear Mr. Young:

Azimuth Environmental Consulting, Inc. was retained to provide a Natural Heritage Evaluation for a proposed residential subdivision at the location described above, a component of the Hewitt's Secondary Plan area. The property contains lands identified within the City of Barrie's Natural Heritage System which has triggered the need for the Natural Heritage Evaluation. The Natural Core Area, a component of the Natural Heritage System, has been approved by Ontario's Municipal Board. The Natural Heritage Evaluation forms a portion of the submission to acquire draft plan approval to permit the proposed development.

This report summarizes investigations undertaken in 2014 through 2016. This study documents the natural environmental features present and provides an assessment of the potential for the presence of Species at Risk and habitats of Endangered or Threatened species, Significant Wildlife Habitat and other significant natural heritage features for the property and adjacent lands. The purpose of this Natural Heritage Evaluation is to identify and confirm natural features and functions within the study area, assess impacts of the proposed residential subdivision to the identified significant natural heritage features confirm that the proposed buffers are adequate to protect the identified features within the Natural Core Area. Mitigation measures are proposed for areas where potential impacts are identified.

Assuming appropriate mitigation measures and recommendations are implemented, the proposed development is not expected to impact negatively any identified significant natural heritage features. Thus, the proposed work is consistent with the policies set out

within the Provincial Policy Statement, Growth Plan for the Greater Golden Horseshoe, Lake Simcoe Protection Plan, City of Barrie Official Plan and the regulations set out within Ontario's *Endangered Species Act*, 2007.

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

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING INC.

Lisa Moran B.Sc.Env.
Terrestrial Ecologist

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by Sorbara Group of Companies (the 'client') to prepare a Natural Heritage Evaluation (NHE) for a property located on the south part of Lot 12, Concession 11, City of Barrie (City) (Figure 1). A map illustrating the property limits in the context of the Hewitt's Secondary Plan Area is shown on Figure 1. The proposed development concept is part of a larger overall concept that extends onto adjacent lands within the Secondary Plan Area. It is our understanding that this NHE is a component of submission to the City toward draft plan approval for the proposed subdivision development. The Lake Simcoe Region Conservation Authority (LSRCA) has requested that a NHE be undertaken due to the presence of lands regulated by LSRCA as well as the presence of lands identified as Natural Core Area within the Official Plan for the City. The Natural Core Areas within the Hewitt's Secondary Plan are components of the Natural Heritage System that were previously approved by the former Ontario Municipal Board (now known as the Local Planning Area Tribunal). The NHE is also a requirement according to the Lake Simcoe Protection Plan.

A review of background information in combination with field surveys undertaken during the 2014-2018 seasons were carried out to detect the presence of the candidate features associated with the study area.

This NHE is intended to identify the candidate significant Natural Heritage Features present on the property and address potential impacts to existing and candidate Significant NHFs. The NHE will assess the proposed buffers to determine if they are adequate to protect the identified features within the Natural Core Area. Azimuth has consulted with the Ministry of Natural Resources and Forestry (MNRF) for matters related to Species at Risk, drainage features in the study area, and local environmental features located within the study area limits. Terms of reference detailing the scope of this assessment have been confirmed with the LSRCA, included in this NHE below.

2.0 PLANNING CONTEXT

2.1 Federal *Fisheries Act*

The *Fisheries Act* requires projects to avoid causing 'serious harm to fish' unless authorized by Fisheries and Oceans Canada (DFO). Projects include those being conducted in or near waterbodies that support a commercial, recreational or Aboriginal fisheries. During the design and construction phases of projects, efforts should be made to protect fish and fish habitat in order to comply with the *Fisheries Act*.

2.2 Provincial Planning Policy (2014)

The Provincial Policy Statement (MMAH, 2014) outlines policies related to natural heritage features (Section 2.1) and water resources (Section 2.2). Ontario's *Planning Act*, (1990) requires that planning decisions shall be consistent with the Provincial Policy Statement. The study area for this assessment is located entirely within **Ecoregion 6E**. According to the Provincial Policy Statement development and site alteration shall not be permitted in:

- *Significant wetlands* in Ecoregions 5E, 6E and 7E; and,
- *Significant coastal wetlands*.

Similarly, Section 2.1.5 of the Provincial Policy Statement states that, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted within:

a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E; and 7E;
b) *significant woodlands* in Ecoregions 6E; and 7E;
c) *significant valleylands* in Ecoregions 6E; and 7E;
d) *significant wildlife habitat*;
e) *significant areas of natural and scientific interest*; and,
f) *coastal wetlands* in Ecoregions 5E, 6E; and 7E that are not subject to policy 2.1.4(b)

Section 2.1.6 of the Provincial Policy Statement states that development and site alteration is not permitted in fish habitat except in accordance with federal and provincial requirements.

Section 2.1.7 of the Provincial Policy Statement states that development and site alteration shall not be permitted in habitat of Threatened and Endangered species, except in accordance with provincial and federal requirements.

Furthermore, under Section 2.1.8 of the Provincial Policy Statement, no development and site alteration will be permitted on lands adjacent to natural heritage features and areas 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 there will be no negative impacts on the natural features and ecological functions.

It is ultimately the responsibility of the Province and/or the Municipality to designate areas identified within Section 2.1.4 of the Provincial Policy Statement as significant. Through the development and creation of the Hewitt's Secondary Plan, a component of the City of Barrie Official Plan, the Natural Heritage System has been defined within the Hewitt's Secondary Plan Area. The Natural Heritage System was identified within a Natural Heritage System report prepared by Natural Resource Solutions Inc. Using a combination of field studies, the review of published background studies, and analysis of the applicable provincial natural heritage planning policies and guidelines (*e.g.*, Provincial Policy Statement, Lake Simcoe Protection Plan, Natural Heritage Guidelines) Natural Resource Solutions Inc. developed their approach to defining the Natural Heritage System. Components of the Natural Heritage System, in general, are large contiguous tracts of natural features that contain a variety of significant features including Significant Woodland, Significant Wetland, cultural meadow and thicket communities contiguous within the Natural Heritage System and watercourses. The staking of the features within the Natural Core Area features took place in July 2015 for all the participating landowners in the Hewitt's Secondary Plan Area. The staking was undertaken with staff from the Lake LSRCA, Natural Resources Solutions Inc., the City, Azimuth, R.J. Burnside, The Jones Consulting Group and the affected landowners. The feature limits were defined, agreed to by all parties and staked. Each stake location was georeferenced and the final survey of the features was circulated to all participants. The buffer width as approved by the Ontario Municipal Board was added to the feature limit to define the development limit for the preparation of the draft plans of subdivision. Therefore, our assessment will identify the significant features as approved by the province, the City and the LSRCA. For completeness, an assessment of Candidate Significant Wildlife Habitat has been conducted within this NHE. The Natural Heritage Reference Manual (OMNR, 2010) and Ecoregion 6E Significant Wildlife Habitat Criterion Schedule were used to identify candidate features considered applicable to the property and adjacent lands.

2.3 Endangered Species Act, 2007

Ontario's *Endangered Species Act,* 2007 (ESA) provides regulatory protection to Endangered and Threatened species prohibiting harassment, harm and/or killing of individuals and destruction of their habitats. Habitat is broadly 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 various schedules of the ESA included under O. Reg. 230/08 identify SAR in Ontario. These include species listed as Extirpated, Endangered, Threatened and Special Concern. As noted above, only species listed as Endangered and Threatened receive protection from harm and destruction to habitat on which they depend.

2.4 Growth Plan for the Greater Golden Horseshoe (2017)

The City of Barrie is within an identified Urban Growth Centre. Urban Growth Centres will be the focal areas for investment, commercial, recreational, cultural and entertainment uses. They will accommodate and support a transit network, will serve as a high-density major employment centre, and will accommodate significant population as per Section 2.2.3 of the Growth Plan (2017).

2.5 Lake Simcoe Protection Plan

The Lake Simcoe Protection Plan (2009) identifies Key Natural Heritage Features (KNHF) and Key Hydrologic Features (KHF). KNHFs include *wetlands*, *significant woodlands*, *significant valleylands*, and natural areas abutting Lake Simcoe. KHFs include *wetlands*, *permanent and intermittent streams*, and *lakes* other than Lake Simcoe. The NHE is required under the LSPP to confirm the buffers approved by the OMB are adequate to protect the features and functions of the Natural Core Areas.

2.6 City of Barrie, Hewitt's Secondary Plan

The property and adjacent lands are designated by the City of Barrie Official Plan (OP; 2018), within the Hewitt's Secondary Plan as Residential Area in the southern portion of the property and Natural Heritage System in the northern portion of the property (Schedule 9A; Appendix A). Further, Schedule 9B (Appendix A) illustrates a Natural Core Area that aligns with the Natural Heritage System boundaries depicted in Schedule 9A.

Policies related to the proposed residential land use as per the Schedule 9A/9B designations above apply as follows within the OP:

> Section 9.3.4 – Natural Heritage System Components (Permitted Uses, Buildings, and Structures): "*Development or site alteration shall be prohibited within the Natural Heritage System...*"

Section 9.5.7 of the OP describes land use policies within the Residential Area designation, permissive of various types of residential subdivision development.

2.7 Lake Simcoe Region Conservation Authority

A large portion of the property is within the jurisdiction of LSRCA (Appendix B) due to the presence of wetland (swamp) comprising the wooded area in the northern portion of the study area. As such, portions of the property are subject to O. Reg. 176/06, Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Approvals will need to be obtained from the LSRCA prior to further works within the regulation limit.

3.0 BACKGROUND

3.1 Study Area

The property is located north of Lockhart Road in the southwest portion of the Hewitt's Secondary Plan Area, depicted in its regional context in Figure 1. For the purposes of this NHE the term "property" refers to the defined property limits shown on Figure 1 through Figure 3. The term "adjacent lands" refers to those areas located outside (lands within approximately 120m) of the property boundary. The term "study area" refers to the combined property and adjacent lands.

Development within the Hewitt's Secondary Plan Area has been divided into Phases and will be developed in sequential order. The property includes lands which are included in Phase II of the Hewitt's Secondary Plan Area which are slated for development as soon as all approvals are in place (Figure 1).

3.2 Background Data

A review of background documents provided information on site characteristics, habitat, wildlife, rare species and communities, and general cultural/historic aspects of the study area. This background data review included:

- Aerial images (Google, VuMap);
- Atlas of the Breeding Birds of Ontario (OBBA) [website];
- The MNRF's Natural Heritage Information Centre Make-A-Map: Natural Heritage Areas application [website];
- Burnside (2016) - Hewitt's Secondary Plan Area Subwatershed Impact Study Lover's, Hewitt's and Sandy Cove Creeks
- MNRF's Species at Risk Ontario list; and
- Ecological Land Classification for Southern Ontario (Lee *et al.*, 1998);

- Natural Heritage Characterization Report (NRSI and Dougan & Associates, 2012).
- Natural Heritage Systems Report (NRSI, 2012)
- Ontario Nature – Ontario Reptile and Amphibian Atlas [website];
- Ontario Partners in Flight – Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (OPIF, 2008);
- Dobbyn, J. (1994) – Atlas of the Mammals of Ontario.

3.3 Background Studies

The property is located within the Hewitt's Secondary Plan Area. Natural Resource Solutions Inc. was retained by the City to prepare a Natural Heritage Characterization report as technical input to the Secondary Plan for the Barrie Annexed Lands. The purpose of the Natural Heritage Characterization Report was to define the natural environmental features that should be retained as environmental protection in public ownership to protect, preserve and enhance the natural environment. The focus of the Natural Heritage Characterization was the protection of the key ecological features and functions within the Secondary Plan Area and to ensure their preservation in the long-term within the urban lands, while recognizing and maintaining linkages between and among natural area features. Natural Resource Solutions Inc. and Dougan & Associates undertook field studies in 2011 and 2012 to characterize the natural heritage features within the Secondary Plan Area. This field study combined with the review of published background studies and analysis of the applicable provincial natural heritage planning policies and guidelines (*e.g.*, Provincial Policy Statement, Lake Simcoe Protection Plan, Natural Heritage Guidelines), Natural Resource Solutions Inc. developed their approach to defining the Natural Heritage System. Throughout the planning process Natural Resource Solutions Inc. undertook consultation with the LSRCA, MNRF and the public, incorporating their comments and concerns into the development of the approach to defining the Natural Heritage System.

3.4 Information Gathering Form

Based on preliminary discussions with the MNRF in late 2016, it is our understanding that MNRF wanted to establish an approach to Species at Risk for the entire Hewitt's Secondary Plan Area to ensure a consistent methodology was established for all landowners. Based on this information, it has been determined that the best method to convey the Species at Risk information to MNRF is through an Information Gathering Form for the entire Hewitt's Secondary Plan Area. Therefore, an Information Gathering Form was submitted (December, 2016) with the relevant information to initiate

discussions with MNRF to ensure that the proposed works can proceed in compliance with Ontario's ESA. Azimuth met with MNRF staff on September 28, 2017 to discuss our general approach in dealing with SAR within the Hewitt's SPA (Appendix C). Formal comments from MNRF were received (October 25, 2017) for each of the properties for which information was submitted (Appendix C). Subsequently, an additional meeting was held with MNRF staff on April 25, 2018 to discuss Species at Risk issues within the overall planning area and generally as it relates to Species at Risk bat habitat related to the property.

4.0 STUDY APPROACH

A combination of field investigations and searches of background information were used to fulfill the objectives of this NHE. Azimuth undertook activities for this study, as outlined within the Terms of Reference which were provided to LSRCA and subsequently approved (Appendix B):

- Searched for rare species observation records for the property and surrounding lands;
- Conducted three evening amphibian call surveys (completed April 28, May 19 and June 29, 2014);
- Conducted two dawn breeding bird surveys (completed June 6 and 21, 2014);
- Identified the vegetation communities, using protocols of the Ecological Land Classification for Southern Ontario (Lee *et al.*, 1998);
- Conducted reconnaissance surveys of vascular plants on the property during the spring, summer and fall (completed 2014-2016); and
- Conducted a SAR screening for the property utilizing available background information, habitat assessments and field data collected for the property.

LSRCA provided approval of Terms of Reference in an e-mail dated March 26, 2018 (Appendix B), and included several additional considerations as they relate to the NHE which have been considered in this report below. As per the approved Terms of Reference, 2014 data will be utilized within this NHE report. The conditions of the property have not changed since our original 2014 studies therefore; this data remains relevant and appropriate. Further discussion regarding the Natural Core Area boundary and Natural Heritage Feature staking exercise is provided in Section 4.1.2 below.

As indicated above, consultation with the MNRF was initiated in 2016 and is ongoing. Azimuth will continue to work with MNRF to ensure that that proposed development is consistent with Ontario's ESA.

4.1 Vegetation Community Mapping and Surveys

The Ecological Land Classification was used as a general guide to the classification of the vegetation community types. Azimuth reviewed the existing Ecological Land Classification data that was prepared by Natural Resource Solutions Inc. and utilized this as a 'base' to our mapping. Prior to undertaking the field studies, Azimuth reviewed the existing Ecological Land Classification data and completed a cursory classification of habitats using recent air photo imagery for the study area. General vegetation community types were confirmed and refined through on-site surveys conducted on June 6, September 8 and October 28, 2014. The staking of the features (*i.e.* wetland) within the Natural Core Area took place in 2015 and detailed Mapping of Snag/Cavity trees for the FOD5-1 vegetation community was completed on February 28, 2018 and is further discussed below.

4.1.1 Wildlife Surveys

Observations of mammals, birds, amphibians, and reptiles were recorded as a matter of course during all field investigations (through direct observation and through interpretation of sign [*i.e.* tracks, scats, vocalizations, *etc.*]. Candidate Significant Wildlife Habitat functions were evaluated according to provincial criteria (*i.e.*, Significant Wildlife Habitat Technical Guide (OMNR, 2000), Ecoregion 6E Criterion Schedule (MNRF, 2015).

4.1.2 Amphibians

Azimuth completed three evening calling amphibian surveys, according to the Marsh Monitoring Program (Bird Studies Canada, 2008) protocol at the sampling locations shown on Figure 2. According to the methodology, surveys are to be conducted 3 times in a year, between April and July 5, with at least 15 days between each survey; beginning one half-hour after sunset and ending by midnight during evenings with suitable conditions [light winds and minimum night air temperatures of 5ºC, 10ºC and 17ºC for each of the three respective survey periods], with an observation period of 3 minutes carried out at each point count station.

4.1.3 Breeding Birds

Two dawn breeding bird surveys were conducted and were based on a combined point count and roving survey methodology based on the Ontario Breeding Bird Atlas Guide for Participants (OBBA, 2007). Point counts were established and all birds identified through visual or auditory confirmation were recorded at each point for a total of five minutes. The locations of the relevant point count stations are shown on Figure 2. Surveys were completed under suitable weather conditions (*i.e.* no precipitation and light winds (Beaufort wind scale <3)), with an observation period of 5 minutes carried out at each point count station, with surveys concluded before 8:30a.m. on both occasions. Breeding evidence was assessed based on the criteria of the OBBA (Cadman *et al.*, 2007).

4.1.4 Bats

The MNRF *Technical Note for Species at Risk (SAR) Bats* published by the Regional Operations Division of the MNRF in 2015 was followed in the habitat assessment of the FOD5-1 forest community. The Technical Note provides direction in the assessment of habitat for Endangered bat species. As outlined within that document, important habitat for Species at Risk bats includes: hibernacula, maternity roosts, day roosts, and foraging habitat. For this assessment, only maternity roosts, day roosts, and foraging habitat were assessed due to the lack of features attributable to hibernacula (*i.e.,* caves, abandoned mines, and tunnels) within the property and general area.

Step 1 - Identification of Ecological Land Classification polygons where Maternity Roost Habitat may occur

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

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

All Ecological Land Classification polygons located outside of the Natural Core Area and falling within the ranges identified above were evaluated using Snag Density Surveys. In this case, the FOD5-1 vegetation community was assessed for potential maternity roost habitat.

Step 5 – Detailed Mapping of Snag/Cavity Trees (Snag Density Calculation)
Snag Density Surveys are currently considered by the MNRF to be of importance in the identification of potential maternity roost habitat for Little Brown Myotis and Northern Myotis – both species are designated Endangered. These Detailed Mapping Surveys represent Step 5 of the Survey methodology provided by the MNRF. Detailed Mapping Surveys generally 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. The surveyors walk transects approximately 10-20m apart throughout the entire polygon and plot all snag/cavity trees. At each snag/cavity tree location, all trees with a Diameter at Breast Height (DBH) of ≥ 25cm are identified and assessed. Information related to the species of tree, presence of snags and location of snags were recorded for each tree. For smaller woodland features, such as the isolated woodlot on the property, the snag density can be calculated by dividing the number of snags mapped by the total area of the woodland. Detailed Mapping of Snag/Cavity trees for the FOD5-1 vegetation community was completed on February 28, 2018. Consultation with MNRF revealed that acoustic field data collection was not required for this isolated woodlot (*i.e.* Step 4 of the Survey methodology provided by MNRF).

4.1.5 Species at Risk

The Species at Risk screening included an analysis of the habitat requirements of Species at Risk reported to occur in the overall planning area to identify those having potential to occur on or adjacent to the property based on habitats present. The MNRF was contacted as a part of the Natural Heritage Characterization report and highlighted several species that have the potential to occur within the general area. These species have been incorporated into our assessment.

Species at Risk specific surveys completed include:

- Dawn breeding bird surveys to determine if any Species at Risk birds are currently utilizing the property and adjacent lands.
- A search for Butternut was conducted in conjunction with Azimuth's field investigations.

Detailed survey of the isolated woodlot located on the western property boundary (*i.e.* outside of the Natural Heritage Core) to identify and map areas of candidate bat maternity roosting trees as per the protocol outlined in Step 5 of the *Technical Note: Species at Risk (SAR) Bats* (MNRF 2015) during leaf-off conditions.

4.2 Fish and Fish Habitat

Background mapping sources were reviewed which did not indicate presence of any watercourses or drainage features within the property limits. Lover's Creek, a permanent watercourse is located approximately 50 m beyond the northern property limit at its closest point and is protected within the Natural Heritage System (Figure 2). As a matter of course during the field program, Azimuth conducted surveys to confirm absence of potential watercourses within the property limits.

4.3 Significant Natural Heritage Feature Staking

The staking of the features within the Natural Core Area took place in July 2015 for all the participating landowners in the Hewitt's Secondary Plan Area, including the property. Staking was undertaken with staff from LSRCA, Natural Resource Solutions Inc., the City, Azimuth, R.J. Burnside & Associates, The Jones Consulting Group and landowners with properties within the Secondary Plan Area that contained Natural Core Areas. The significant natural heritage features within the Natural Core Area limits were defined and staked (Figure 2). The site visit not only confirmed the limits of the natural heritage features but also confirmed the buffer adjacent to these features, which together form the Natural Core Area. The AutoCAD file of the surveyed limits was transferred to all participants for review. All parties endorsed the Natural Heritage System limits.

In an e-mail dated March 26, 2018 (Appendix B), LSRCA commented that the staked Natural Core Area limit is still under review and the NHE will reflect the boundary also agreed upon by LSRCA. However, LSRCA was in attendance when the limits of the Natural Heritage Features were staked in July 2015 and agreed on the limits in the field. The stake locations were then surveyed. Subsequent to the July 2015 staking and surveying exercise, e-mail correspondence dated August 28, 2015 from LSRCA confirmed that the staked and surveyed limits provided in AutoCAD were acceptable (Appendix B). Per this exercise, the significant natural heritage feature limits were staked in July 2015 and depicted in Figure 2 are accurate as illustrated and discussed throughout this report.

5.0 EXISTING CONDITIONS

5.1 Land Use

5.1.1 On-site Land Use

Lands within the southern portion of the study area are reflective of active and recent agricultural land use including row crop agriculture, hedgerows, and a section of fallow (cultural) meadow. There are currently no structures on the property. A small isolated deciduous woodlot is located in the southwest corner of the property. The northern portion of the property consists of an extensive deciduous and mixed swamp complex with southern fringes consisting of shallow marsh, comprising the southern portion of the Lover's Creek floodplain and is within the identified Natural Core Area (Figure 2). The swamp/marsh is included within the Lover's Creek Swamp Provincially Significant Wetland (Appendix C).

5.1.2 Adjacent Land Use

Land use to the north of the property are lands within the Natural Core Area, are a part of the City's Natural Heritage System and are composed of a mosaic of woodland, wetland and a watercourse. Lands to the west are urbanized and comprised of residential properties. Lands to the east are within the City limits and designated for residential development but are currently undeveloped and in agricultural production. Outside of the City limits, to the south of Lockhart Road, agricultural and rural residential lands largely dominate the landscape.

5.2 Vegetation

The property comprises a mix of anthropogenic vegetation communities associated with farmland/rural areas in approximately the southern half of the property, including bare soils/row crop agriculture (AGR), treed hedgerows (HR), and an old-field cultural meadow unit (CUM1-1; Figure 2). An isolated upland dry-fresh Sugar Maple deciduous forest (FODM5-1), measuring approximately 1.1 hectares (ha) is located in the southwestern corner of the property. A large natural wetland complex (Lover's Creek Swamp Provincially Significant Wetland) is located in the northern portion of the property and is comprised of various swamp units (SWD, SWM; all of which consist of organic soils) and small shallow marsh (MAM) units along the complex's southern fringes (Figure 2). All of these wetland units are considered to occur within the City's

Natural Core Area and belong to the Lover's Creek Swamp Provincially Significant wetland.

Ecological Land Classification and mapping was refined and completed during site visits completed to the property in 2014. The Ecological Land Classification for Southern Ontario was used to classify vegetation community types. Table 1 describes the vegetation communities identified on site and Figure 2 depicts their location. A complete list of the vegetation species observed on the property is presented in Table 2.

A survey for Butternut was completed in conjunction with Azimuth's field investigations. One Butternut was documented on the property (Figure 2). The Butternut is located away from the proposed development (>50 m) and therefore was not assessed according to the Butternut Assessment Guidelines (MNRF, 2014). No other Species at Risk plants were observed within the study area limits. Further, no provincially or LSRCA rare species were observed during the course of the field program.

5.3 Wetland

A portion of the Lover's Creek Provincially Significant Wetland occurs on the property and within the study area (Appendix C). Several wetland communities have been identified within the limits of the Provincially Significant Wetland (Figure 2). These wetland features are located within the limits of the City's Natural Core Area. The outermost limits of the Natural Core Area were staked according to the protocol discussed in Section 4.4 of this report.

5.4 Woodland

Woodland and treed swamp communities are present on the property and within the study area. The majority of the identified woodland is located within the Natural Core Area. The dripline of the core woodland were staked according to the protocol discussed in Section 4.3 of this report.

An isolated upland Dry-fresh Sugar Maple Deciduous Forest (FOD5-1), measuring approximately 1.1 ha is located in the southwestern corner of the property. The woodlot was not included within the Natural Heritage System because it was assessed to be an isolated feature with no significant natural heritage functions that warranted its retention.

5.5 Wildlife Habitat

5.5.1 Mammals

Mammal species utilizing the property included: Eastern Cottontail and Eastern Grey Squirrel. Given the variation in vegetation communities within the study area and greater landscape, it is expected the following other mammals could conceivably be encountered on the property: small mammal species (various mice, voles, and shrews), Red Squirrel, Eastern Chipmunk, Least Weasel, Ermine, Long-tailed Weasel, Striped Skunk, Porcupine, Raccoon, Mink, Muskrat, Beaver, Red Fox, Coyote, and White-tailed Deer. None of the species observed or listed above are of federal or provincial conservation concern.

The results of our Detailed Snag Mapping Survey revealed a snag density to be >10 snags/hectare and are depicted on Figure 2b.

5.5.2 Amphibians

Three evening calling amphibian surveys were conducted on site. Three survey stations were established in proximity to the wetland habitat (Figure 2). Table 3 lists the dates, weather conditions and species documented during amphibian surveys. Amphibian activity was documented at Survey Station 2 only. A seasonal pond is situated in proximity to Survey Station 2 that offers suitable amphibian breeding habitat. A full chorus of Spring Peepers was heard calling off-site to the northwest of the property. None of the species observed are of federal or provincial conservation concern.

5.5.3 Birds

Two dawn breeding bird surveys were conducted on site utilizing four point count stations (Figure 2). A total of 30 bird species were documented to be utilizing the property (Table 4). Of these species, four area-sensitive forest birds – Black-and-white Warbler, Pileated Woodpecker, Hairy Woodpecker and Winter Wren, were recorded. White-breasted Nuthatch was another area-sensitive bird species observed on site but this observation was incidental and is not included in our assessment. The term area-sensitive indicates that a species requires a large area of suitable habitat in order to sustain their populations. There is no protection status afforded to area-sensitive bird species.

One species of conservation concern was observed, Eastern Wood-pewee (Special Concern), within the small isolated woodlot located along the southwestern limits of the

property. With the exception of the Eastern Wood-pewee, none of the other bird species documented on site are of federal or provincial conservation concern.

5.6 Aquatic Habitat

There are no watercourses present on the property. A tributary of Lover's Creek exists approximately 50m to the north of the property.

The nearest monitoring station for fish community data to the north of the property was classified as a coolwater thermal regime with warmwater fish species present (LSRCA, 2012).

5.7 Species at Risk

Species at Risk and their preferred habitat were screened to determine whether there is potentially suitable habitat within the study area (Table 5). The MNRF's Natural Heritage Information Centre online mapping tool indicated that there are records for Snapping Turtle and Bobolink within the general area. Of the species identified with potential to exist within the general area, the following were confirmed or identified based on habitat requirements to have potential to exist within the study area.

- Mammals: Little Brown Myotis (Endagered), Northern Myotis (Endangered), Tri-colored Bat (Endangered);
- Reptiles and Amphibians: Blanding's Turtle (Threatened), Eastern Musk Turtle (Special Concern), Eastern Ribbonsnake (Special Concern) and Snapping Turtle (Special Concern);
- Birds: Canada Warbler (Special Concern), Eastern Wood-pewee (Special Concern), Red-headed Woodpecker (Special Concern) and Wood Thrush (Special Concern); and
- Plants: Butternut (Endangered).

The results of breeding bird surveys indicated presence of the Eastern Weed-pewee only. Additionally, one (1) Butternut was documented on site within the limits of the Provincially Significant Wetland. No other Species at Risk were documented on the property. Currently, only species designated as Endangered or Threatened are afforded protection (including habitat) according to Ontario's Endangered Species Act. Species designated as Special Concern are not currently protected according to Ontario's Endangered Species Act, although their habitat may qualify as Significant Wildlife

Habitat as per the Provincial Planning Policy. The assessment for potential Significant Wildlife Habitat can be found within Section 6.4.

6.0 NATURAL HERITAGE FEATURES AND FUNCTIONS

6.1 Significant Wetland

The Provincial Policy Statement affords ultimate responsibility for the designation of natural features as "significant" to the Municipality and/or the Province. The Lover's Creek Wetland Provincially Significant Wetland consists partially of SWD, SWM, and MAM within the property limits as illustrated on Figure 2. As such, these wetland types associated with the Natural Core Area and Lover's Creek Swamp Provincially Significant Wetland are considered Significant Wetland in accordance with Provincial Policy Statement direction.

6.2 Significant Woodland

The Provincial Policy Statement affords ultimate responsibility for the designation of natural features as "significant" to the Municipality and/or the Province. Swamp polygons (SWD, SWM; Figure 2) associated with the Natural Core Area and Lover's Creek Swamp Provincially Significant Wetland could be considered Significant Woodland in accordance with Provincial Policy Statement direction.

An isolated deciduous woodlot (FOD5-1; Figure 2) is located in the southwestern portion of the property, and is not defined as Natural Core Area or similar designation in the City of Barrie OP or provincial resources (*e.g.* Natural Heritage Information Centre). The following criteria detailed in the Natural Heritage Reference Manual (OMNR, 2010) have been considered in the evaluation of this woodlot:

- **Woodland Size**: The woodlot is located within the Lover's Creek Subwatershed, comprised of 26.7% woodland cover as of 2009 (LSRCA, 2012). Per the Natural Heritage Reference Manual, for areas with 15-30% woodland cover, woodlands >20 ha in size should be considered significant. As such, this woodlot (approximately 1.1 ha) falls well below the threshold required to be considered a Significant Woodland.
- **Woodland Interior**: No portion of the woodlot exists >100 m from a woodland edge, and as such there is no woodland interior associated with the feature.

- **Proximity to Other Woodlands and Other Habitats**: The woodlot is located >30 m from other natural heritage features, and is isolated in its landscape context.
- **Linkages**: The woodlot tapers to a hedgerow feature at its northern and southern ends, however the distance between the main body of the woodlot and the Lover's Creek Swamp Provincially Significant Wetland is approximately 400 m. Lockhart Road is located approximately 165 m south of the woodlot. The Natural Heritage Reference Manual suggests 120 m is a reasonable maximum distance for an intervening feature to be considered potentially significant, and as such this woodlot does not meet the linkage criterion and should be considered isolated in its landscape context.
- **Water Protection**: The woodlot is not located within 50 m of a valley feature, nor does it contain sensitive groundwater discharge or recharge, watercourses or other drainage features.
- **Woodland Diversity**: The woodlot does not feature unusual terrain and/or composition that would meet the woodland diversity criterion.
- **Uncommon Characteristics**: The woodlot does not contain any provincially or regionally-rare species, tree species of restricted distribution or old growth characteristics that could qualify as an uncommon characteristic.

With the above considerations, there is sufficient evidence to demonstrate that the woodlot in the southwestern corner of the property (FODM5-1; Figure 2) does not qualify as a Candidate Significant Woodland feature, and therefore should be considered Non-Significant Woodland. Our assessment aligns with the decision not to include this isolated woodlot within the City's Natural Heritage System that was made during the establishment of the Natural Heritage System as a part of the Hewitt's Secondary Plan process. The above woodlot assessment supports that the Natural Heritage System was appropriately defined.

6.3 Candidate Significant Valleyland

There are no valley land features located within the study area according to the City of Barrie OP, or standards presented in the Natural Heritage Reference Manual. Lover's Creek is present within a relatively flat bottomland basin (Figure 2), and lacks the well-defined valley morphology and landform prominence required to be considered Candidate Significant Valley Land.

6.4 Candidate Significant Wildlife Habitat

Table 6 provides an assessment of candidate Significant Wildlife Habitat functions. Based on provincial criteria our findings indicate that there are several potential candidate Significant Wildlife Habitat functions related to the property including:

- Bat Maternity Colony;
- Turtle Wintering Area;
- Reptile Hibernaculum;
- Amphibian Breeding Habitat (Woodlands); and
- Special Concern & Rare Wildlife Species.

6.4.1 Bat Maternity Colony

The Natural Core Area on the property is dominated by forest/swamp habitat and is composed, in part, of deciduous and mixed forest/swamp communities. These communities located on the property and extending off-site could be potentially use by bats to give birth and rear young (*i.e.* maternity colony). The contiguous forested areas between Mapleview Drive and Lockhart Road amounts to approximately 80ha. These potential bat maternity colonies are located entirely within the Natural Core Area.

The isolated woodlot located along the western portion of the property may also provide maternity habitat for bats. Our detailed bat snag mapping exercise revealed the presence of a snag density that is >10 snags per hectare thus it has the potential to function as Significant Wildlife Habitat for bats (maternity colonies).

6.4.2 Turtle Wintering Area

Potential turtle overwintering habitat is present within Lover's Creek Swamp Provincially Significant Wetland (*i.e.* Natural Heritage System), particularly within areas where standing water is present throughout the year. These areas may have enough water in pockets to prevent freezing in the winter, and have the potential to have suitable substrate based on the surrounding lands.

6.4.3 Reptile Hibernaculum

Potential reptile hibernaculum habitat is present within Lover's Creek Swamp Provincially Significant Wetland (*i.e.* Natural Heritage System) within the conifer swamps or areas where shrub cover is present.

6.4.4 Amphibian Breeding Habitat (Woodlands)

Amphibian call surveys did not provide evidence for a high concentration or variety of frog/toad species utilizing the property. This does not preclude the potential for the pond within the Provincially Significant Wetland to provide potential habitat for salamanders. This potential function was not confirmed and as such will be assumed as present within the Provincially Significant Wetland feature (*i.e.* Natural Heritage System).

6.4.5 Special Concern & Rare Wildlife Species

According to the Significant Wildlife Habitat Technical Guide for Ecoregion 6E Criteria Schedules (MNRF, 2015), Significant Wildlife Habitat for Rare and Special Concern Species is characterized by the presence of any species considered provincially rare (ranked S1-S3) or designated Special Concern under the ESA. Species of Special Concern identified on the property, and those with potential to be present on the property are addressed in Table 5 of this report and considered on an individual basis, including the following species:

- Eastern Musk Turtle;
- Eastern Ribbonsnake;
- Snapping Turtle; and
- Eastern Wood-pewee

6.5 Area of Natural and Scientific Interest

There are no Areas of Natural and Scientific Interest on or adjacent to the property (Appendix C).

6.6 Species at Risk

Potential habitat for species listed as Threatened or Endangered was identified on and adjacent to the property. Our preliminary screening considered in combination with data acquired through species specific surveys has identified habitat potential as follows:

- Confirmed presence of one (1) Butternut;
- Potential habitat for Blanding's Turtle; and
- Potential roosting habitat for Endangered bat species including Little Brown Myotis, Northern Myotis, and Tri-colored Bat.

6.7 Fish and Fish Habitat

There is no potential fish habitat on the property. Lover's Creek is located on adjacent lands approximately 50 m to the north at its closest point (Figure 2 and 3).

7.0 NATURAL HERITAGE FEATURES AND FUNCTIONS

The results of our field studies and review of background information indicate the potential for the following significant natural heritage features and functions to be located within the study area:

- Significant Woodland;
- Significant Wetland;
- Potential Significant Wildlife Habitat (Bat Maternity Colony, Turtle Wintering Area, Reptile Hibernaculum, Amphibian Breeding Habitat (woodland) and Special Concern & Rare Wildlife Species (Eastern Wood-pewee, Eastern Musk Turtle, Eastern Ribbonsnake and Snapping Turtle);
- Potential Habitat for Threatened or Endangered Species
    - (Confirmed presence of one (1) Butternut;
    - Potential habitat for Blanding's Turtle; and
- Potential roosting habitat for Endangered bat species including Little Brown Myotis, Northern Myotis, and Tri-colored Bat; andFish and Fish Habitat.

8.0 PROPOSED DEVELOPMENT

The proposed development consists primarily of residential use. The subdivision will include a connection to Thicketwood Ave and Fenchurch Manor with an internal road network. A community park will be located mid-property, adjacent to a school. (Figure 3).

The proposed development will be serviced with municipal water and sewer.
A block of land adjacent the environmental buffer has been established for a Stormwater Management facility for the treatment of stormwater runoff. Drainage patterns will generally follow existing conditions, with all development area drainage to be directed through the proposed Stormwater Management facility before it discharges to the wetland. As per the Hewitt's Secondary Plan Area Subwatershed Impact Study: Lover's Hewitt's and Sandy Cove Creeks, it is understood that where storm water management facilities are located adjacent to a 30m buffer within the City's Natural Heritage System, some encroachment to the buffer may be permitted. Within the first 15m of the buffer

adjacent to development, transition grading and integrated maintenance (*i.e.* access/pedestrian trails) may be permitted if no significant vegetation exists. No Stormwater Management facility related grading works are permitted in the remaining 15m of the buffer adjacent to the natural heritage features within the Natural Heritage System, with the exception of Stormwater Management Facility outfalls where required (R.J. Burnside & Associates Limited, 2016).

The remainder of the lands consist of City Natural Core Area lands (Appendix A) which will be retained in the long term.

9.0 IMPACT ASSESSMENT

9.1 Significant Wetland

The Lover's Creek Swamp Provincially Significant Wetland is encompassed within the identified Natural Core Area (Figure 2). There is no development proposed within the limits of the Lover's Creek Swamp Provincially Significant Wetland. As a result there will be no direct impacts associated with the Significant Wetland. A self-sustaining vegetated buffer of 30m will remain adjacent to the majority of wetland features within the Natural Core Area.

As per direction provided by LSRCA, a feature-based water balance will be required prior to final plan approval and any major site alteration to determine if any indirect impacts will result from the proposed development.

9.1.1 Buffer Analysis

A buffer adjacent to the Significant Wetland within the Natural Core Area will remain post-development.

The buffer will be vegetated with native self-sustaining vegetation and will provide a screen to the wetland features that will act as a barrier to noise and light associated with the development. The vegetated buffer to the wetland community will also help to prevent access and encroachment into the wetland itself.

The wetland buffer will aid in the attenuation of any potential excess nutrients and pollutants including sediments that may migrate towards the wetland community, and improve the water quality and clarity within the wetland itself (Boyd, 2001). As

discussed further below, this buffer is more than sufficient to maintain the quality of water by filtering excess sediment/nutrients/pollutants from the surface water runoff.

Minor encroachment into the wetland buffer will be required for the extension of Thicketwood Avenue, as confirmed during July 2015 site walk (Appendix B). The resulting buffer, at this location, is sufficient to protect the overall form and function of the wetland.

As depicted on Figure 3, the proposed Stormwater Management Facility will be constructed adjacent to a portion of the lands buffering the Natural Core Area. This includes areas that are in proximity to wetland habitat. The Stormwater Management Facility will serve as additional intervening land between the Natural Core Area and the residential development. Stormwater controls should be implemented to meet Ministry of the Environment and Climate Change standards for water quality and quantity.

As indicated above, within the first 15m, some encroachment to the Significant Wetland buffer may be permitted provided that no significant vegetation exists (*i.e.* if the buffer is predominantly agricultural field under existing conditions). At the location of the proposed Stormwater Management Facility, the lands within the Natural Heritage System buffering the Significant Wetland are currently cultivated. The potential use within the first 15m of the buffer adjacent to the development for grading and integrated maintenance related to the storm water pond facilities will continue to provide sufficient setback to the Natural Core Area to protect critical root zone while allowing for some site alteration in the form of transition grading, periodic maintenance access or pedestrian use. Each of these potential uses within the first 15m of the Natural Heritage System buffer are considered to be low/no impact activities.

Provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 8), we anticipate no negative ecological impacts to the Significant Wetland feature or functions will result from the proposed development.

9.2 Significant Woodland

The Significant Woodland on the property is contained within the Lover's Creek Swamp Provincially Significant Wetland Natural Core Area. No vegetation clearance will occur within the limits of the woodland. Further, a 30 m naturalized buffer will be established adjacent to the majority of the woodland, to mitigate potential indirect impacts from the proposed development.

9.2.1 Buffer Analysis

A setback from the dripline of the woodland will ensure protection of the critical root zone for the trees within the woodland. This zone is essential in order to maintain the health of individual trees. According to Johnson (1999), the critical root zone can be estimated through measuring the tree's Diameter Breast Height in inches. This number is then multiplied by 1 or 1.5 for sensitive or tolerant species respectively. The resulting number is the number of feet that should be left undisturbed from the base of the tree.

In general, the Diameter Breast Height (in metric measurements) of trees located within the property largely range from 'whip size' to 50cm with limited potential for some to be greater than 50cm. Using 50cm as the max DBH and the critical root zone multiplier for sensitive species (1.5), the following critical root zone equation illustrates that a 30m setback is more than triple the distance required to protect the health of the largest trees within the woodland:

50cm = ~20"
20 x 1.5 = 30 (expressed in feet)
30' = 9.1m
Critical root zone = 9.1m

Based on this information, at the location where the buffer was reduced for the municipal road connection, there is still sufficient setback (*i.e.* ~10m) to ensure protection of the trees within the Natural Core Area and the overall form and function of the woodland.

Currently, active agricultural lands dominate the landscape outside of the Natural Core Area. As indicated above, the limit of the staked feature was based on the woodland dripline. The buffer adjacent to Significant Woodland will provide a screen to the Natural Core Area features and act as a barrier to noise and light associated with the development.

As depicted on Figure 3, Stormwater Management Facilities will be constructed adjacent to the lands buffering the Natural Core Area. The storm water pond facilities will act as an additional intervening land use between the Natural Core Area and the residential development.

As indicated above, within the first 15m of the Natural Heritage System buffer, some encroachment to the buffer may be permitted provided that no significant vegetation exists (*i.e.* if the buffer is predominantly agricultural field under existing conditions). At the location of the proposed Stormwater Management Facility, the lands buffering the Natural Heritage System are currently cultivated. The potential use within the first 15m of the buffer adjacent to the development for grading and integrated maintenance related to the storm water pond facilities will continue to provide sufficient setback to the Natural Core Area to protect critical root zone while allowing for some in the form of transition grading, periodic maintenance access or pedestrian use. Each of these potential uses within the first 15m of the Natural Heritage System and Natural Core Area buffer are low/no impact activities.

Provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 8), we anticipate no negative ecological impacts to the Significant Woodland feature or functions will result from the proposed development.

9.2.2 Non-Significant Woodland

The woodlot located in the southwest corner of the property (Figure 2) will be subject to removal as a result of the proposed development. An Ecological Offsetting Strategy should be prepared to the satisfaction of the LSRCA for the removal of non-significant woodland on the property. We anticipate compensation measures detailed within the Ecological Offsetting Plan, will serve as a suitable mitigation plan for removal of non-significant woodland on the property.

9.3 Potential Significant Wildlife Habitat

According to the Provincial Policy Statement development and site alteration are not permitted within Significant Wildlife Habitat located in Ecoregion 6E, unless it can be demonstrated there will be no negative impacts upon the feature and its ecological functions. Within the Provincial Policy Statement (2014), negative impact is defined as "*degradation that threatens the health and integrity of the natural features or ecological functions for which the area is identified due to single, multiple or successive development or site alteration activities*". The Natural Heritage Reference Manual (MNR 2010) defines ecological integrity as "*the condition of an ecosystem in which (a) the structure, composition and function are unimpaired by stresses from human activity, (b) natural ecological processes are intact and self-sustaining, and (c) ecosystem*

evolution is occurring naturally and that ecological integrity includes hydrological integrity".

The following potential Significant Wildlife Habitat types are located within the study area, however are largely associated with the Lover's Creek Provincially Significant Wetland and/or directly adjacent lands:

- Potential Bat Maternity Colony;
- Potential Turtle Wintering Area;
- Potential Reptile Hibernaculum;
- Amphibian Breeding Habitat (Woodlands); and
- Special Concern & Rare Wildlife Species.

9.3.1 Potential Bat Maternity Colony

There is no development proposed within any forested habitat within the Natural Core Area. Any potential function within the Natural Core Area associated with bat maternity usage will be maintained post-development.

As indicated above, the isolated woodlot (FOD5-1, Figure 2) has the potential to offer suitable habitat for bat use in the summer (*i.e.* maternity colony). Further analysis revealed that the woodlot is relatively small in size (1.1 ha) and is located within an agricultural/urban setting and, therefore, it is not likely a feature that provides a significant function for Big Brown Bat and Silver-haired Bat on the landscape scale. Approximately 10ha of SWD and SWM is contained within the Natural Core Area on the property (approximately 80ha extends off-site), therefore, potential bat maternity function will be maintained on the property post-development.

9.3.2 Potential Turtle Wintering Areas

There is no development proposed within any of the Natural Core Area wetlands. Any potential function associated with Turtle Wintering Areas will be maintained post-development.

Maintaining a setback from this feature will mitigate potential indirect impacts from the proposed development and as such, provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 8), we anticipate

no negative ecological impacts to the above Potential Significant Wildlife Habitat will result from the proposed development.

9.3.3 Potential Reptile Hibernaculum

There is no development proposed within any of the Natural Core Area wetlands. Any potential function associated with Reptile Hibernaculum will be maintained post-development.

Maintaining a setback from this feature will mitigate potential indirect impacts from the proposed development and as such, provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 8), we anticipate no negative ecological impacts to the above Potential Significant Wildlife Habitat will result from the proposed development.

9.3.4 Amphibian Breeding Habitat (Woodlands)

There is no development proposed within the Natural Core Area wetlands. Any potential function associated with Amphibian Breeding Habitat (woodland) will be maintained post-development.

Maintaining a setback from this feature will mitigate potential indirect impacts from the proposed development and as such, provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 8), we anticipate no negative ecological impacts to the above Potential Significant Wildlife Habitat will result from the proposed development.

Habitat for Special Concern and Rare Wildlife Species

Eastern Wood-pewee

One bird species of Special Concern was identified during the breeding bird survey program, the Eastern Wood-pewee, within the isolated deciduous woodlot unit (FOD5-1 community; Figure 2).

Eastern Wood-pewee inhabits the mid-canopy layer of forest clearings and edges of deciduous and mixed forests (MNRF, 2018b). One singing male Eastern Wood-pewee was identified in this community during one of the breeding bird surveys, an indication of possible breeding evidence. Based on this information, there is no evidence that Eastern Wood-pewee is successfully breeding within the isolated woodlot on the property. A single observation on its own does not demonstrate that this species is using a particular

area of habitat. MNRF requires both probable and confirmed breeding evidence as outlined in the OBBA 2001-2005 as breeding evidence within a particular habitat. Furthermore, as per the COSEWIC Assessment and Status Report on the Eastern Wood-pewee (COSWEIC. 2012), territory size of the species averages 1.76 ± 0.24 ha. The FOD5-1 community is to be removed as a result of the proposed development, however given the small size (1.1 ha) of the community the woodlot is too small to provide a significant habitat that would be sustaining local populations and would be considered marginal habitat for Eastern Wood-pewee.

Forest habitat is abundant in the overall planning area, particularly within the Natural Core Area/Lover's Creek Swamp Provincially Significant Wetland that occupies the northern portion of the property (within approximately 400 m of the FOD5-1 feature) which is to be protected from development in the long term as a Significant Woodland feature. Given its prominence within the Hewitt's Secondary Plan Area (~90 ha), Natural Core Area woodlands are expected to provide strongly preferable breeding/nesting opportunities for the species. Given the substantial quantity of available habitat retained as part of the Natural Core Area within the overall planning area, woodland habitat is well represented and this woodlot does not offer any unique function that is not already represented within the Natural Core Areas.

Based on our assessment, the woodlot is not SWH for Eastern Wood-pewee. Therefore, the proposed removal of the isolated woodlot is in compliance with the PPS. Removal of the woodlot will not negatively impact habitat availability for Eastern Wood-pewee populations in the planning area as there were no Eastern Wood-pewee confirmed to be breeding within this woodlot.

There is no evidence based on our studies that the removal of forested vegetation community as outlined within the concept plan would significantly impact habitat availability for Eastern Wood-pewee populations, particularly given the abundance of mature woodland on the property itself and adjacent land that is protected at both the Municipal and Provincial levels. Mitigation measures described in Section 8, including designated vegetation clearance timing to comply with the *Migratory Birds Convention Act,* 1994 (MBCA) will further serve to minimize potential negative impacts to the species. Thus, the proposed development will not have a negative impact on the Habitat for Special Concern Species as defined by the Provincial Policy Statement as it relates to Eastern Wood-pewee.

Special Concern Reptiles (Eastern Musk Turtle, Eastern Ribbonsnake and Snapping Turtle)

Habitat features for Eastern Musk Turtle, Snapping Turtle and Eastern Ribbonsnake are directly related to the habitat contained within Natural Core Area wetlands. The removal of agricultural lands outside of the Natural Core Area on the property and subsequent development of that area will not lead to degradation that threatens the ecological function of the potential Significant Wildlife Habitat.

9.4 Habitat for Threatened or Endangered Species

Impacts with regards to the ESA and Habitat of Threatened or Endangered Species are covered under Section 9 and 10 of the ESA. Section 9 deals directly with killing, harming, or harassing living members of a species while Section 10 covers destruction or damage to habitat of Threatened or Endangered species. The following Threatened and Endangered species have the potential to occur within the limits of the study area:

- Little Brown Myotis, Northern Myotis, Tri-colored Bat;
- Blanding's Turtle; and
- Butternut.

9.4.1 Little Brown Myotis, Northern Myotis, Tri-colored Bat

Deciduous and mixed woodlands have the potential to function as bat maternity roosting habitat if they provide suitable wildlife cavity trees, with preferable roosting "snag" trees measuring >25 cm diameter at breast height or greater providing holes, loose bark, *etc*. The majority of the woodlands will be maintained post-development, however the loss of one woodland measure 1.1 ha in size (FOD5-1; Figure 2) will occur as a result of the proposed development. Suitable wildlife cavity trees within this unit have the potential to provide habitat for Little Brown Myotis, Northern Myotis, and Tri-colored Bat.

Our snag analysis revealed the presence of 44 snag trees. As per MNRF (2015), the best candidate roost trees include:

- Tallest snag/cavity tree
- Exhibits cavities or crevices (originating from cracks, scars, knot holes or woodpecker cavities)
- >25cm diameter breast height
- Within a cluster of snags

- Large amount of loose, peeling bark
- Cavity or crevice is high in snag/cavity tree (>10m)
- Species that provide good cavity habitat
- Canopy is more open
- Exhibits early stages of decay (decay class 1-3)

Based on the above criteria, Figure 2b depicts the locations of the highest quality trees. Our analysis indicates that there are a total of 16 high quality trees.

In a meeting with MNRF (April 25, 2018), it was confirmed that additional surveys (*i.e.* acoustic surveys) are not required as they relate to potential Little Brown Myotis, Northern Myotis, and Tri-colored Bat habitat within the isolated FOD5-1 woodlot. MNRF indicated that the woodlot should be evaluated for potential Species at Risk bats on a landscape level.

The isolated woodlot is located within an agricultural setting and is adjacent to existing residential development. Potential foraging opportunities are limited due to the lack of standing water within the vicinity of the isolated woodlot.

Forest habitat is abundant in the overall planning area, particularly within the Natural Core Area/Lover's Creek Swamp Provincially Significant Wetland that occupies the northern portion of the property (within approximately 400 m of the FOD5-1 feature) which is to be protected from development in the long term as a Significant Woodland feature. Given its prominence within the Hewitt's Secondary Plan Area (~80 ha), Natural Core Area woodlands are expected to provide strongly preferable breeding/nesting opportunities for the species.

Therefore, we can conclude that the forest unit located outside of the Natural Core Area is small (1.1ha), isolated feature that likely does not represent high quality potential habitat for Species at Risk bats. Potentially suitable habitat for Species at Risk bats is well represented within the general area and will be maintained within the Natural Core Area. As such, no potential contraventions of Section 10 of the ESA are expected to result from the proposed tree removals as they relate to maternity roost activity for Species at Risk bats.

Male bats and non-reproductive females roost individually or in small groups as they move across the landscape. This function is inconsistent since bats will not necessarily

return to the same roost on consecutive nights. Thus, the mitigation proposed is intended to avoid accidental contraventions of Section 9 of the ESA should day roosting occur on the subject property (*i.e.* within individual trees within hedgerow). The proposed clearing activities, outside of the timing window, will avoid negative effect upon Endangered bat species or the ability for these species to carry out their life processes and will thus, be compliant with the regulations of the ESA.

Foraging habitat for bats generally occurs over water, in small forest openings and occasionally in floodplains and agricultural lands. There is no expectation that the proposed development would result in a significant reduction in insect production in the area as the majority of the development is restricted to the active agricultural lands. Large natural areas (*i.e.* ~80ha) are being retained within the Natural Core Area including mature forest and wetlands hence retaining their capacity to maintain the natural features and functions. All open water habitat and forest openings present prior to development are retained within the Natural Core Area. These areas are expected to continue to provide readily available food sources for any Species at Risk bats which are present within the area. As such, no potential contraventions of Section 10 of the ESA are expected to result from the proposed tree removals as they relate to foraging activity for Species at Risk bats.

9.4.2 Blanding's Turtle

Blanding's Turtle is an aquatic turtle that occurs in a variety of wetland habitats. Largely a habitat generalist, the species is described as inhabiting "lakes, permanent ponds, temporary ponds, slow flowing brooks, creeks, marshes, river sloughs, marshy meadows, man-made channels, farm fields, coastal areas, and the bays of Lake Erie" (COSEWIC, 2005). Key habitat also includes areas of fen, marsh, swamp, open areas of sand or fine gravel, and rock barren. Potential habitat areas for Blanding's Turtle including overwintering, staging and nesting were identified on the property. While no turtles were identified onsite during the field surveys, there remains potential that they could be present in the area, or migrate to the natural heritage feature on the property in future years.

The General Habitat Description Guidance document produced by the MNRF for the Blanding's Turtle describes habitat as follows:

- Category 1 habitat is considered to be a confirmed nesting or overwintering location and an area within 30 m of that site.

- Category 2 habitat as the wetland complex that extends up to 2 kilometres (km) from an occurrence, and the area within 30 m around those suitable wetlands or water bodies.
- Category 3 habitat is considered to be an area between 30 m and 250 m around suitable wetlands/waterbodies identified in Category 2, within 2 km of an occurrence.

No sand or gravel soils were documented within the property; therefore, potential habitat for Blanding's Turtle exists within Lover's Creek Swamp Provincially Significant Wetland. A buffer will remain adjacent to this feature and it has been recommended that appropriate fencing be installed along the lots backing onto the Provincially Significant Wetland to ensure that the residential development will not directly or indirectly impact the Provincially Significant Wetland or the functions maintained within that feature. Potential for impacts to Blanding's Turtle or their habitat associated with potential development outside of these areas in the future is expected to be minimal and mitigable.

We anticipate no negative ecological impacts to Blanding's Turtle or the habitat upon which it depends as a result of the proposed development following the recommended mitigation below.

9.4.3 Butternut

A single Butternut tree has been identified within the limits of the Lover's Creek Swamp Provincially Significant Wetland (Figure 2), approximately 50 m north of the staked wetland edge. Current direction from MNRF Midhurst related to Butternut is that general habitat for Butternut trees includes suitable areas within a 50m radius centred on the trunk of each Butternut tree in Ontario. The critical zone of the individual tree extends up to 25m from the trunk and potential regeneration habitat extends up to 50m (Figure 2). Based on this information, we can confirm that there will be no development within at least 60m from the tree ensuring that the trees will not be killed or harmed nor will there be any impacts to potential regeneration habitat.

As such the proposed development will not result in ecological impacts to Butternut or the habitat upon which it depends.

9.5 Fish and Fish Habitat

A tributary of Lover's Creek is contained within the identified Natural Core Area on adjacent lands and will be maintained post-development. A naturalized buffer will be maintained adjacent to this feature as it is located approximately 60m to the north of the property.

As per direction provided by LSRCA, a feature-based water balance will be required prior to final plan approval and any major site alteration.

10.0 MITIGATION AND RECOMMENDATIONS

10.1 Significant Wetland and Woodland

10.1.1 Setbacks

A 30m setback should be maintained from the Significant Wetland and Woodland within the Natural Core Area with the exception of where the buffer was reduced for the municipal road connection to Thicketwood Avenue. This buffer should be delineated with a fence. As highlighted within the Hewitt's Secondary Plan Area Subwatershed Impact Study: Lover's Hewitt's and Sandy Cove Creeks (2016), encroachment into the first 15m of the buffer (adjacent to the development) may be permitted for only limited use associated with the Stormwater Management Facility and should not extend beyond the location of the Stormwater Management Facility.

10.1.2 General

Wetland communities are to be protected at all times from any excavated and erodible soils entering the feature. This can be accomplished through the use of properly placed, installed and maintained sediment controls (sediment barriers, flow checks (straw or rock), envirobags, *etc.*). Further, all equipment should be stored, serviced and refuelled more than 30m away from the wetland.

10.2 Species at Risk

10.2.1 General Species at Risk Recommendations

It should be noted that the absence of a protected species within the study area does not indicate that they will never occur within the area. Given the dynamic character of the natural environment, there is a constant variation in habitat use. Care should be taken in

the interpretation of presence of species of concern including those listed under the ESA. Changes to policy, or the natural environment, could result in shifts, removal, or addition of new areas to the list of areas currently considered Significant Natural Heritage Features. This report is intended as a point in time assessment of the potential to impact Species at Risk; not to provide long term "clearance" for Species at Risk. While there is no expectation that the assessment should change significantly, it is the responsibility of the proponent to ensure that they are not in contravention of the ESA at the time that site works are undertaken. A review of the assessment provided in this report by a qualified person should be sufficient to provide appropriate advice at the time of the onset of future site works.

10.2.2 Worker Training

Worker training would assist the on-site workers in the identification of the Species at Risk with potential to occur in the area. Workers should be instructed to stop work immediately and contact the local MNRF office immediately if any Species at Risk are encountered within the work area. Individuals working on site should ensure that Species at Risk are not harmed during construction or killed by heavy machinery, vehicles or other equipment.

The contractor should seek to ensure that all personnel are educated by a Species at Risk expert to ensure that, if identified, the Species at Risk are not wantonly injured or killed, and to ensure that damage to features which could constitute habitat is avoided. Information conveyed through this education should include:

- Species habitat and identification;
- Requirements under the ESA including avoidance of harm to the species and damage to relevant habitat;
- Appropriate action to take if the species is encountered;
- How to record sightings and encounters; and
- That care should be taken when undertaking construction activities in order to avoid harming the species or damaging/destroying habitat.

The expert should be a qualified biologist who specializes in ecology/biology, or Species at Risk.

10.2.3 Species Specific Recommendations

Endangered Bat Species

Care should be taken when clearing vegetation such that all works respect the window for Migratory Breeding Birds as this aligns with the time when bats could potentially be utilizing local structures and forest habitats. Construction activities involving tree removal should be restricted from occurring between April 1 to October 30. This will ensure that no bats actively roosting in trees will be killed or harmed as a result of clearing activities.

Butternut

At this time, there is no development or site alteration proposed within >50m of the Butternut ensuring that there will be no harm to these individuals. If, in the future, additional Butternut(s) are documented on site, there are plans to undertake an activity that may affect Butternut or proposed works will occur within 50m of the Butternut, landowners should review the proposed work to determine if it would constitute a contravention of the ESA.

If, in the future, it is determined that a Butternut tree may be harmed as a result of any proposed works, the MNRF would require that a Butternut Health Assessment occur prior to any development or site alteration that may impact Butternut to determine if further steps are necessary to avoid contraventions of the ESA.

The Butternut Health Assessment must be conducted in the summer (June – August), when the leaves of the trees have emerged and crown health can be assessed.

10.3 Migratory Breeding Birds

Activities involving the removal of vegetation should be restricted from occurring during the breeding season. Migratory birds, nests, and eggs are protected by the MBCA and the *Fish and Wildlife Conservation Act,* 1997. Environment Canada outlines dates when activities in any region have potential to impact nests at the Environment Canada Website (http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_03). In Zones C1 and C2 vegetation clearing should be avoided between **April 1st through August 30th** of any given year. If work requires that vegetation clearing is required between these dates screening by an ecologist with knowledge of bird species present in the area could be undertaken to ensure that the vegetation has been confirmed to be free of nests prior to clearing.

10.4 Sediment and Erosion Controls

Diligent application of sediment and erosion controls is recommended for all future construction activities to minimize the extent of accidental or unavoidable impacts to vegetation communities and wildlife habitat, including Natural Core Area/Provincially Significant Wetland located north of the development limit.

Prior to the commencement of site works, silt fencing should be applied along the length of natural features that abut the work area, and routine inspection/maintenance of the silt fencing should occur throughout construction. Once construction is complete, exposed/disturbed soils should be restored immediately to limit erosion and sediment into nearby drainage features. Where sediment and erosion controls are employed, the contractor should avoid the use of wire mesh fencing and erosion control blankets which have the potential to trap reptiles.

10.5 Operations

Suitable vegetated buffers should be maintained along the limit of the Natural Core Area/PSW feature as discussed in the sections above, in a manner that avoids potential indirect impacts to this feature.

All maintenance activities required during future construction should be conducted at least 30 m away from natural areas including woodlands and wetlands to prevent accidental spillage of deleterious substances that may harm natural environments.

Snow fencing or equivalent should be installed at the limit of the work area to prevent the accidental intrusion of machinery operations into adjacent undisturbed natural areas.

10.6 Woodland Compensation

An Ecological Offsetting Strategy should be developed for the loss of 1.1 ha of Non-Significant woodland in the southwest corner of the property. Compensation ratio or payment-in-lieu should be agreed upon with LSRCA.

11.0 CONCLUSIONS

Based upon our analysis, it is concluded that the environmental conditions are not limiting to implementation of the proposed development through incorporation of the environmental protection measures and criteria as described throughout this report.

At this time, our findings are summarized as follows:

1. The proposed development is consistent with the policies of the Provincial Policy Statement, Places to Grow, ESA, City of Barrie Official Plan, Lake Simcoe Protection Plan, and Lake Simcoe Region Conservation Authority O. Reg. 176/06.

2. An analysis of the defined buffers has been undertaken and it has been determined that the proposed buffers adjacent to the Significant Natural Heritage Features within the Natural Core Area are sufficient to protect the overall form and ecological functions for which the Natural Heritage System has been identified.

3. Our impact assessment has given full consideration to the habitat requirements of all Species at Risk assumed and/or documented to occur in the area and results indicate the proposed development will not result in negative direct or indirect impacts to habitat of Species at Risk providing conformance is demonstrated to mitigation measures described in Section 8.

4. The proposed works will not result in negative impact the ecological functions of Significant Woodland, Significant Wetland, or Candidate Significant Wildlife Habitat outlined in Section 5 if the appropriate mitigation measures outlined in Section 8 are followed.

5. No areas of seepage, intermittent or permanent drainage features were identified within the study area. Wetlands are not expected to be negatively impacted as a result of the proposed development if the appropriate mitigation measures are followed during construction.

6. Appropriate approvals should be acquired from LSRCA prior to any site alteration and development within regulated lands. An Ecological Offsetting Strategy should be prepared to facilitate the removal of the non-significant woodland (1.1ha).

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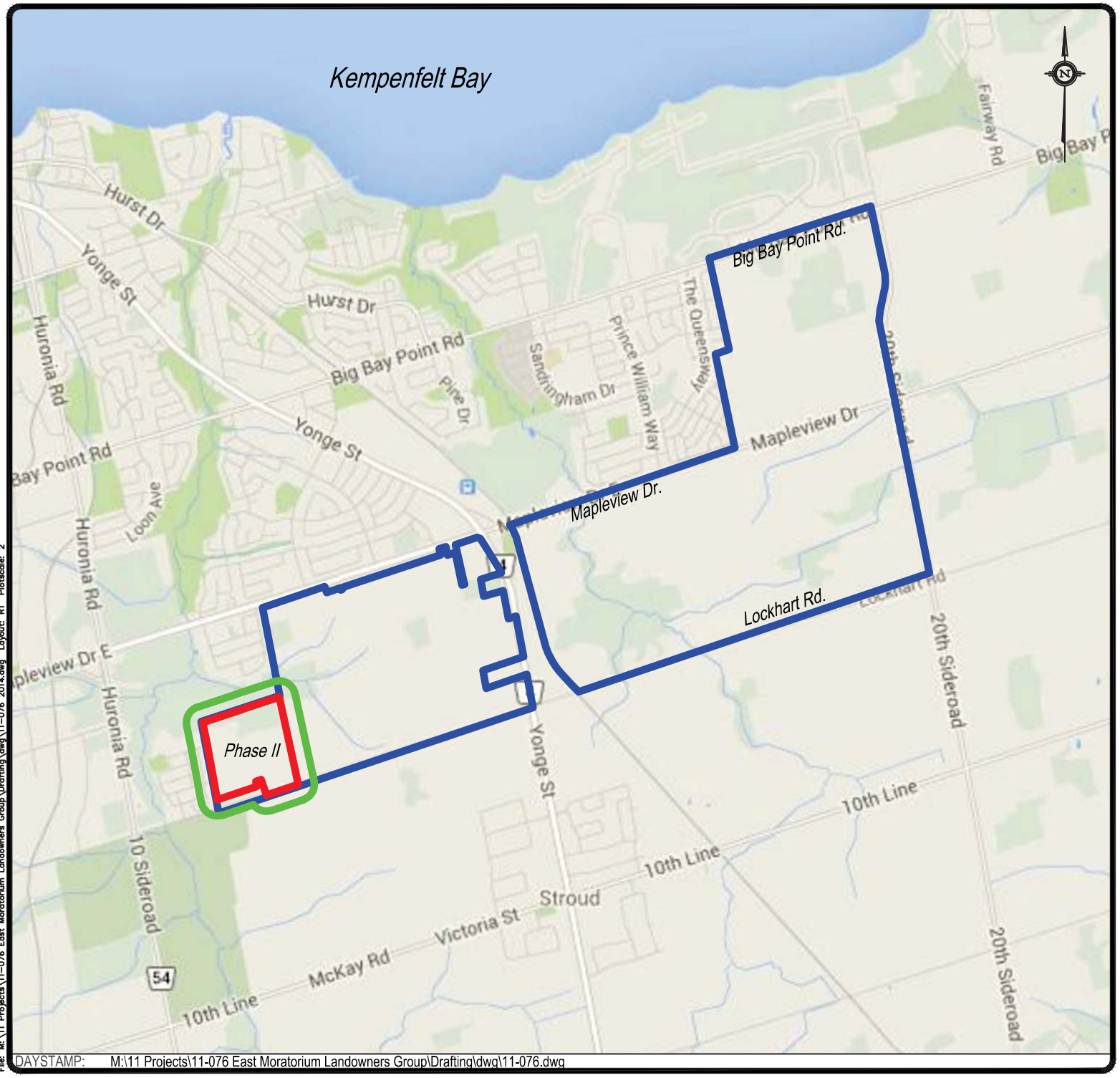

LEGEND:

- *Approx. Property Boundary*
- *Study Area*
- *Hewitt's Secondary Plan Area*

600m 0 1200m

HORIZONTAL SCALE 1: 40,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Barrie Lockhart Road LP

Hewitt's Secondary Plan

Barrie, ON

DATE ISSUED: *April 2018*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *11-076r*	1
REFERENCE: *Google Maps*	

DAYSTAMP: M:\11 Projects\11-076 East Moratorium Landowners Group\Drafting\dwg\11-076.dwg

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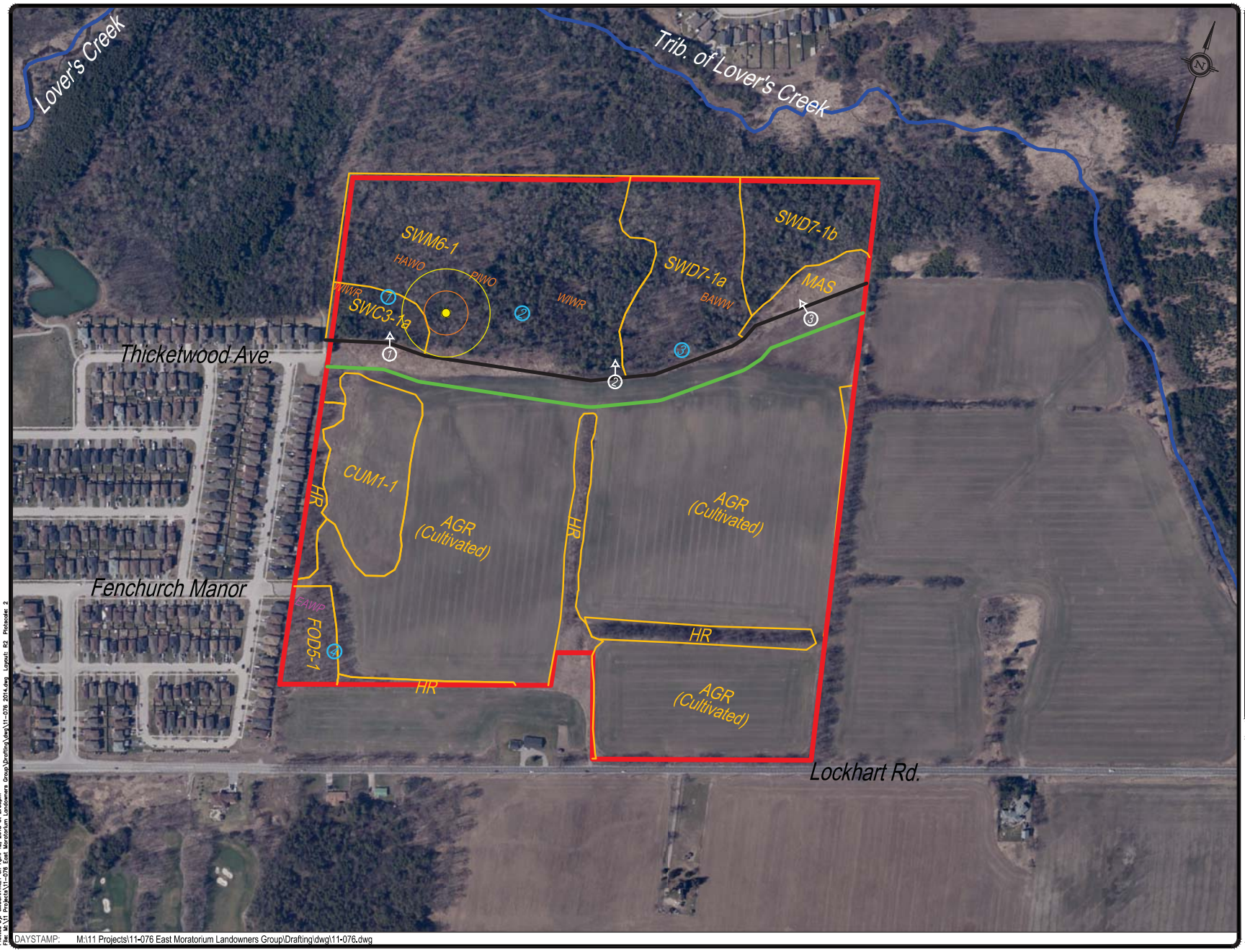

LEGEND:

- Property Boundary
- Watercourse
- Amphibian Survey Stations (white)
- Bird Survey Stations
- Significant Natural Heritage Feature
- Buffer to Significant Natural Heritage Feature (Natural Core Area)
- Butternut (END) w/25m and 50m Setbacks

Vegetation Communities

CUM1-1	Dry-Moist Old Field Meadow Type
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest Type
HR	Hedgerow
MAS	Shallow Marsh
SWM6-1	Birch-Conifer Organic Mixed Swamp Type
SWD7-1a	White Birch-Poplar Organic Deciduous Swamp Type
SWD7-1b	White Birch-Poplar Organic Deciduous Swamp Type
SWC3-1a	White Cedar Organic Coniferous Swamp Type

Area-Sensitive Birds

- BAWW - Black-and-White Warbler
- PIWO - Pileated Woodpecker
- WIWR - Winter Wren
- HAWO - Hairy Woodpecker

Species at Risk

- EAWP - Eastern Wood-Pewee (SC)

60m 0 120m

HORIZONTAL SCALE 1: 4,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Barrie Lockhart Road LP
Hewitt's Secondary Plan, Barrie, ON

DATE ISSUED:	January 2018	Figure No.
CREATED BY:	JLM	2
PROJECT NO.:	11-076r	
REFERENCE:	First Base Solutions	

DAYSTAMP: M:\11 Projects\11-076 East Moratorium Landowners Group\Drafting\dwg\11-076.dwg

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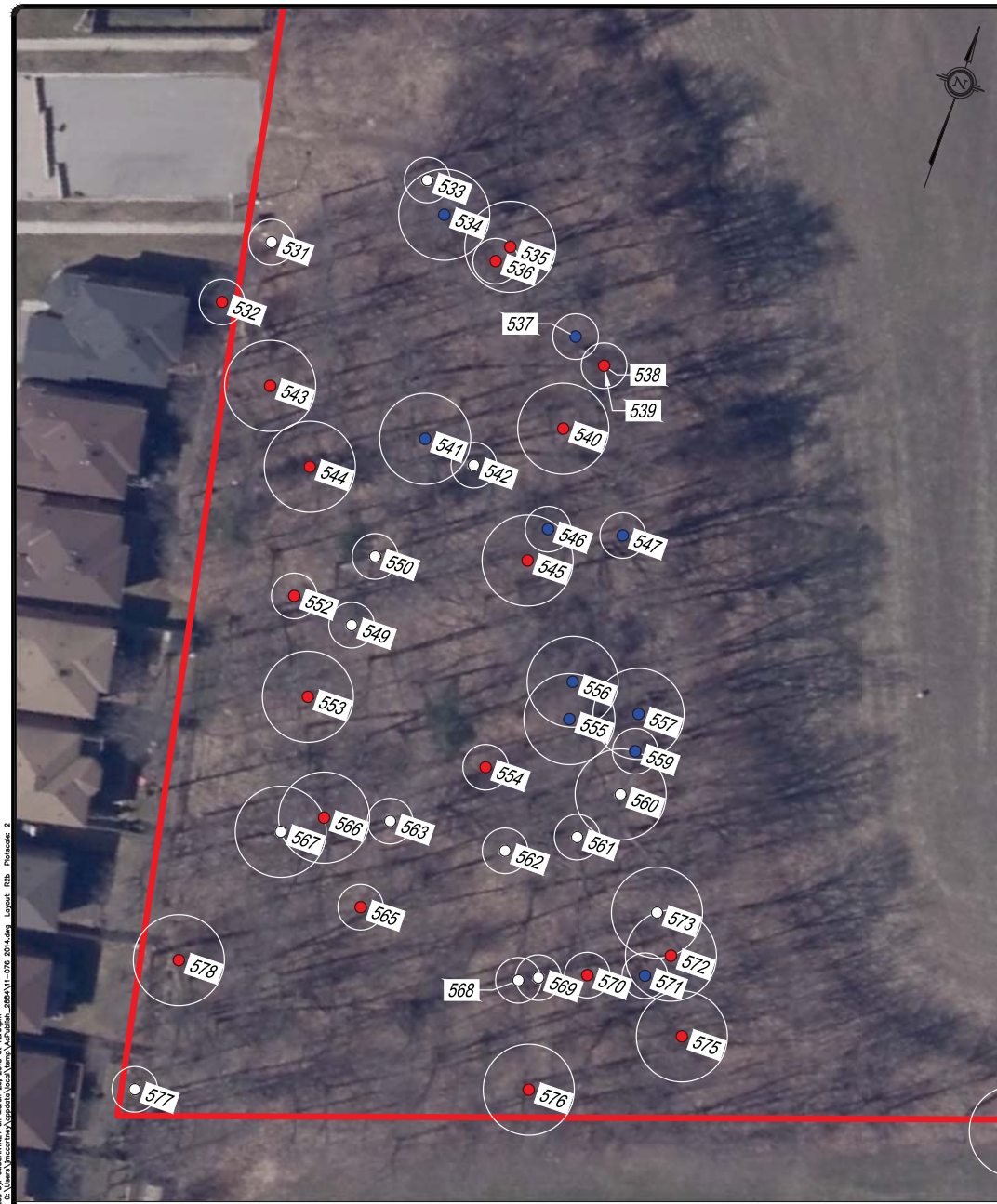

Tree Number	Species	DBH	Snag Features			Decay Class	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)
			<3m	3-10m	>10m			
531	Basswood	41	N	Y	N	0	Y	O
532	Basswood	48	N	Y	N	1	Y	O
533	Sugar Maple	42	Y	Y	N	0	Y	O
534	Basswood (a)	44	N	N	Y	2	Y	O
534	Basswood (b)	33	Y	Y	N	5	Y	O
535	Sugar Maple	65	N	Y	Y	1	Y	O
536	Sugar Maple	40	N	Y	N	1	Y	O
537	Sugar Maple	58	Y	Y	N	2	Y	O
538	Sugar Maple	36	N	Y	N	1	Y	O
539	Sugar Maple	36	N	Y	N	1	Y	O
540	Basswood	60	N	Y	Y	1	Y	O
541	Sugar Maple	49	N	N	Y	2	Y	O
542	Sugar Maple	52	N	Y	N	0	Y	O
543	Sugar Maple	46	N	N	Y	1	Y	O
544	Sugar Maple	34	N	Y	Y	1	Y	O
545	Sugar Maple	55	Y	N	Y	1	Y	O
546	Sugar Maple	34	Y	Y	N	2	Y	O
547	Sugar Maple	43	N	Y	N	2	Y	O
549	Sugar Maple	44	Y	N	N	0	Y	O
550	Sugar Maple	29	Y	N	N	0	Y	O
552	Sugar Maple	46	Y	Y	N	1	Y	O
553	Sugar Maple	45	N	N	Y	1	Y	O
554	Sugar Maple	44	Y	Y	N	1	Y	O
555	Sugar Maple	37	N	Y	Y	2	Y	O
556	Basswood	46	Y	Y	Y	2	Y	O
557	Sugar Maple	37	N	Y	Y	2	Y	O
559	Slippery Elm	27	Y	Y	N	2	Y	O
560	Sugar Maple	60	N	Y	Y	0	Y	O
561	Sugar Maple	45	N	Y	N	0	Y	O
562	Sugar Maple	51	N	Y	N	0	Y	O
563	Sugar Maple	36	Y	N	N	0	Y	O
565	Sugar Maple	35	Y	Y	N	1	Y	O
566	Sugar Maple	43	Y	N	Y	1	Y	O
567	Sugar Maple	43	N	N	Y	0	Y	O
568	Sugar Maple	44	N	Y	N	0	Y	O
569	Sugar Maple	30	N	Y	N	0	Y	O
570	Sugar Maple (a)	38	Y	Y	N	5	Y	O
570	Sugar Maple (b)	47	N	Y	N	1	Y	O
571	Sugar Maple	45	N	Y	N	2	Y	O
572	White Ash	48	N	Y	Y	1	Y	O
573	Sugar Maple	55	N	N	Y	0	Y	O
574	Basswood	28	N	N	Y	1	Y	O
575	Black Cherry	27	N	Y	Y	1	Y	O
576	American Beech	40	N	Y	Y	1	Y	O
577	Sugar Maple	38	N	Y	N	0	Y	O
578	Sugar Maple	32	N	N	Y	1	Y	O

LEGEND:

- Property Boundary

Bat Snag Decay Class

- Decay Class 1
- Decay Class 2
- Decay Class 3
- Decay Class 4
- Decay Class 5
- Decay Class 6
- Decay Class N/A

Bat Snag Tree Details

- Bat Snag Tree Features >10m High
- Bat Snag Tree Features <10m High

5m 0 15m

HORIZONTAL SCALE 1:500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Detailed Bat Snag Mapping

Barrie Lockhart Road LP
Hewitt's Secondary Plan, Barrie, ON

DATE ISSUED:	January 2018	Figure No.
CREATED BY:	JLM	2b
PROJECT NO.:	11-076r	
REFERENCE:	First Base Solutions	

DAYSTAMP: M:\11 Projects\11-076 East Moratorium Landowners Group\Drafting\dwg\11-076.dwg

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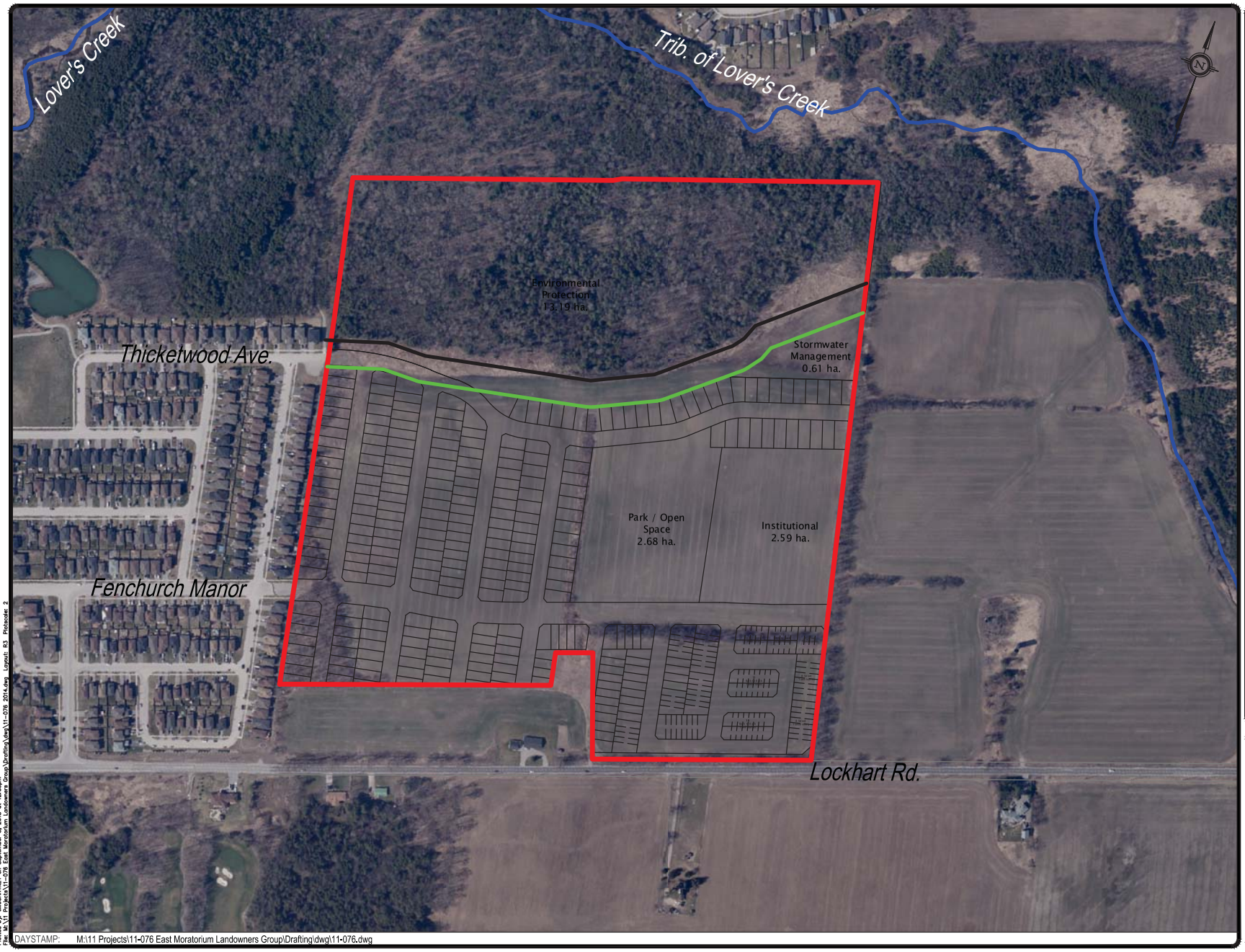

LEGEND:

- *Property Boundary/Study Area*
- *Watercourse*
- *Significant Natural Heritage Feature*
- *Buffer to Significant Natural Heritage Feature (Natural Core Area)*

60m 0 120m

HORIZONTAL SCALE 1: 4,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development

Barrie Lockhart Road LP
Hewitt's Secondary Plan, Barrie, ON

DATE ISSUED:	*January 2018*	Figure No.
CREATED BY:	*JLM*	3
PROJECT NO.:	*11-076r*	
REFERENCE:	*First Base Solutions*	

DAYSTAMP: M:\11 Projects\11-076 East Moratorium Landowners Group\Drafting\dwg\11-076.dwg

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Table 1 - Ecological Land Classification

Ecological Land Classification						
System	**Community Class**	**Community Series**	**Ecosite**	**Vegetation Type**	**Composition**	**Ground Cover**
Wetland	MA, Marsh	MAS, Shallow Marsh			Scattered shrub-sized willow and poplar species, such as Pussy Willow and Trembling Aspen. Occurrence of Red-osier Dogwood	Dominated by Broad-leaved Cattail, Phragmites and Coltsfoot. Occurrence of Common Boneset, Eastern Late Goldenrod, Early Goldenrod, Grass-leaved Goldenrod, Swamp Aster, Spotted Joe-pye Weed and Path Rush
Wetland	SW, Swamp	SWC, Coniferous Swamp	SWC3, White Cedar Organic Coniferous Swamp	SWC3-1-a, White Cedar Organic Coniferous Swamp	Canopy dominated by White Cedar, with no understory	Presence of wood ferns
Wetland	SW, Swamp	SWM, Mixed Swamp	SWM6, Birch-Poplar Organic Mixed Swamp	SWM6-1, Birch-Conifer Organic Mixed Swamp	Dominated by White Cedar, White and Yellow Birches, American Elm. occurrence of **Butternut**, Sugar Maple, American Beech, Balsam Poplar, Red Ash, Tartarian Honeysuckle and Trembling Aspen	Lady fern, Crested Fern, Sensitive Fern, wood fern species, Canada Mayflower, Enchanter's Nightshade, Jewelweed, Virginia Waterleaf, Jack-in-the-puplit, Herb-robert, Helleborine
Wetland	SW, Swamp	SWD, Deciduous Swamp	SWD7, Birch-Poplar Organic Deciduous Swamp	SWD7-1-a, White Birch-Poplar Organic Deciduous Swamp	Canopy dominated by birches (White and Yellow) and poplars (Trembling Aspen and Balsam), with occurrence of Green Ash, Black Ash, White Cedar. Occurrence of Round-leaf Dogwood	Ferns, sedges
Wetland	SW, Swamp	SWD, Deciduous Swamp	SWD7, Birch-Poplar Organic Deciduous Swamp	SWD7-1-b, White Birch-Poplar Organic Deciduous Swamp	Canopy co-dominated by Balsam Poplar and Green Ash, with occurrence of White Birch and Silver Maple.Understory dominated by White Cedar, with occurrence of Balsam Fir and Round-leaf Dogwood	Occasional Woodland Sedge, Canada Mayflower, wood fern species, horsetail, Herb-robert. Rare occurrence of Sensitive Fern and Cinamon Fern
Terrestrial	FO, Forest	FOD, Deciduous Forest	FOD5, Dry-Fresh Sugar Maple Deciduous Forest	FOD5-1, Dry-Fresh Sugar Maple Deciduous Forest	Canopy dominated by Sugar Maple, with occasional Basswood, White Ash and Eastern Hemlock. Understory with occasional Eastern Hemlock and White Ash, and rare occurrences of Hop-hornbeam	Abundant Herb-robert and Mitrewort, with occasional White and Red Trilliums. Rare occurrence of Blue Cohosh, Black Raspberry, Helleborine, Canada Mayflower, Bloodroot, Ginger, Round-leaved Violet, Leek, Sharp-lobed Hepatica and Virginia Waterleaf
Terrestrial	CU, Cultural	CUM, Cultural Meadow	CUM1, Mineral Cultural Meadow	CUM1-1a, Dry-Moist Old Field Meadow	N/A	Highly disturbed fresh-moist meadow, with occurrence of Wild Carrot, Ragweed, Bull Thistle, Millet, Milkweed, Dandelion, Chicory, Raspberry, Burdock, violets, horsetails, willows, sedges and goldenrods .

Table 2- Vascular Plant List

			ELC Units							Conservation Status[A]			
Family	**Scientific Name**	**Common Name**	**SWC3-1a**	**SWM6-1**	**SWD7-1a**	**SWD7-1b**	**MAS**	**FOD5-1**	**CUM1-1**	**LSRCA**	**S-Rank**	**G-Rank**	**Provincial Status**
Aceraceae	*Acer rubrum*	Red Maple			X						S5	G5	
Aceraceae	*Acer saccharum*	Sugar Maple		X	X	X		X			S5	G5	
Apiaceae	*Daucus carota*	Wild Carrot					X	X	X	+	SE5	GNR	
Araliaceae	*Aralia nudicaulis*	Wild Sarsaparilla						X			S5	G5	
Asteraceae	*Arctium lappa*	Greater Burdock						X	X	+	SE5	GNR	
Araceae	*Arisaema triphyllum*	Jack-in-the-pulpit			X						S5	G5	
Asteraceae	*Achillea millefolium*	Common Yarrow							X	+	SE	G5	
Asteraceae	*Cirsium vulgare*	Bull Thistle						X	X	+	SE5	GNR	
Asteraceae	*Eupatorium perfoliatum*	Common Boneset					X				S5	G5	
Asteraceae	*Euthamia graminifolia*	Grass-leaved Goldenrod					X		X		S5	G5	
Asteraceae	*Eutrochium maculatum*	Spotted Joe Pye Weed					X				S5	G5T5	
Asteraceae	*Solidago altissima*	Eastern Late Goldenrod					X	X	X		S5	GNR	
Asteraceae	*Solidago juncea*	Early Goldenrod					X		X		S5	G5	
Asteraceae	*Sonchus arvensis ssp. arvensis*	Field Sow-thistle						X	X	+	SE5	GNRTNR	
Asteraceae	*Symphyotrichum lanceolatum*	Panicled Aster					X		X		S5	G5T5	
Asteraceae	*Symphyotrichum lateriflorum*	Starved Aster		X	X			X	X		S5	G5	
Asteraceae	*Symphyotrichum novae-angliae*	New England Aster					X		X		S5	G5	
Asteraceae	*Symphyotrichum puniceum*	Swamp Aster					X				S5	G5	
Asteraceae	*Taraxacum officinale*	Common Dandelion						X	X	+	SE5	G5	
Asteraceae	*Tussilago farfara*	Colt's-foot			X	X	X		X	+	SE5	GNR	
Balsaminaceae	*Impatiens capensis*	Spotted Jewelweed			X						S5	G5	
Berberidaceae	*Caulophyllum thalictroides*	Blue Cohosh		X							S5	G4G5	
Betulaceae	*Betula alleghaniensis*	Yellow Birch		X	X						S5	G5	
Betulaceae	*Betula papyrifera*	Paper Birch		X	X	X		X			S5	G5	
Betulaceae	*Ostrya virginiana*	Eastern Hop-hornbeam		X							S5	G5	
Brassicaceae	*Cardamine diphylla*	Two-leaved Toothwort		X	X	X					S5	G5	
Caprifoliaceae	*Lonicera canadensis*	Canada Fly Honeysuckle			X						S5	G5	
Caprifoliaceae	*Lonicera tatarica*	Tartarian Honeysuckle			X					+	SE5	GNR	
Caprifoliaceae	*Viburnum lentago*	Nannyberry		X	X	X					S5	G5	
Cornaceae	*Cornus alternifolia*	Alternate-leaved Dogwood		X	X	X		X			S5	G5	
Cornaceae	*Cornus rugosa*	Round-leaved Dogwood		X							S5	G5	
Cornaceae	*Cornus stolonifera*	Red-osier Dogwood					X		X		S5	G5	
Cupressaceae	*Thuja occidentalis*	Eastern White Cedar	X	X	X	X					S5	G5	
Cyperaceae	*Carex blanda*	Woodland Sedge		X	X	X					S5	G5?	
Cyperaceae	*Scirpus atrovirens*	Dark-green Bulrush		X			X		X		S5	G5?	
Dipsacaceae	*Dipsacus fullonum*	Fuller's Teasel					X		X	+	SE5	GNR	
Dryopteridaceae	*Athyrium filix-femina*	Northeastern Lady Fern			X						S5	G5T5	
Dryopteridaceae	*Dryopteris carthusiana*	Spinulose Wood Fern		X	X			X			S5	G5	
Dryopteridaceae	*Dryopteris cristata*	Crested Wood Fern			X						S5	G5	
Dryopteridaceae	*Dryopteris sp.*	Wood fern	X	X	X	X							
Dryopteridaceae	*Onoclea sensibilis*	Sensitive Fern		X	X	X					S5	G5	
Fabaceae	*Medicago lupulina*	Black Medic							X	+	SE5	GNR	
Fabaceae	*Trifolium pratense*	Red Clover							X	+	SE5	GNR	
Fabaceae	*Vicia cracca*	Tufted Vetch							X	+	SE5	GNR	

Table 2- Vascular Plant List

			ELC Units							Conservation Status[A]			
Family	**Scientific Name**	**Common Name**	**SWC3-1a**	**SWM6-1**	**SWD7-1a**	**SWD7-1b**	**MAS**	**FOD5-1**	**CUM1-1**	**LSRCA**	**S-Rank**	**G-Rank**	**Provincial Status**
Fagaceae	*Fagus grandifolia*	American Beech			X			X			S4	G5	
Geraniaceae	*Geranium robertianum*	Herb-Robert			X			X		+	S5	G5	
Grossulariaceae	*Ribes americanum*	Wild Black Currant			X	X		X			S5	G5	
Grossulariaceae	*Ribes cynosbati*	Prickly Gooseberry		X	X	X					S5	G5	
Hydrophyllaceae	*Hydrophyllum virginianum*	Virginia Waterleaf			X	X		X			S5	G5	
Juglandaceae	*Juglans cinerea*	Butternut		X	X						S3?	G4	END
Juncaceae	*Juncus tenuis*	Path Rush					X		X		S5	G5	
Liliaceae	*Maianthemum canadense*	Wild Lily-of-the-valley		X	X	X		X			S5	G5	
Oleaceae	*Fraxinus americana*	White Ash		X	X	X		X			S4	G5	
Oleaceae	*Fraxinus nigra*	Black Ash		X	X	X					S4	G5	
Oleaceae	*Fraxinus pennsylvanica*	Green Ash			X	X					S4	G5	
Onagraceae	*Circaea alpina*	Small Enchanter's Nightshade			X						S5	G5	
Onagraceae	*Oenothera biennis*	Common Evening Primrose					X		X		S5	G5	
Orchidaceae	*Epipactis helleborine*	Eastern Helleborine		X	X					+	SE5	GNR	
Papaveraceae	*Sanguinaria canadensis*	Bloodroot						X			S5	G5	
Pinaceae	*Abies balsamea*	Balsam Fir		X	X	X					S5	G5	
Pinaceae	*Tsuga canadensis*	Eastern Hemlock		X				X			S5	G5	
Poaceae	*Phalaris arundinacea*	Reed Canary Grass					X		X	(+)	S5	G5	
Poaceae	*Phragmites australis*	European Reed					X		X	(+)	SE5	G5T5	
Ranunculaceae	*Actaea pachypoda*	White Baneberry						X			S5	G5	
Ranunculaceae	*Thalictrum pubescens*	Tall Meadow-rue		X				X			S5	G5	
Rhamnaceae	*Frangula alnus*	Glossy Buckthorn						X	X	+	SE5	GNR	
Rosaceae	*Fragaria virginiana*	Wild Strawberry					X		X		S5	G5	
Rosaceae	*Malus pumila*	Common Apple			X	X				+	SE4	G5	
Rosaceae	*Prunus pensylvanica*	Pin Cherry			X						S5	G5	
Rosaceae	*Prunus serotina*	Wild Black Cherry		X	X						S5	G5	
Rosaceae	*Prunus virginiana*	Choke Cherry		X	X	X		X			S5	G5	
Rosaceae	*Rubus idaeus*	Common Red Raspberry		X				X	X	+	SE1	G5T5	
Rosaceae	*Rubus occidentalis*	Black Raspberry			X	X					S5	G5	
Salicaceae	*Populus balsamifera*	Balsam Poplar		X	X	X					S5	G5	
Salicaceae	*Populus tremuloides*	Trembling Aspen		X	X	X	X		X		S5	G5	
Salicaceae	*Salix discolor*	Pussy Willow			X	X	X		X		S5	G5	
Saxifragaceae	*Mitella diphylla*	Two-leaf Bishop's-cap				X		X			S5	G5	
Saxifragaceae	*Mitella nuda*	Naked Bishop's-cap			X						S5	G5	
Solanaceae	*Solanum dulcamara*	Climbing Nightshade			X			X		+	SE5	GNR	
Tiliaceae	*Tilia americana*	American Basswood		X	X	X					S5	G5	
Typhaceae	*Typha latifolia*	Broad-leaved Cattail					X		X		S5	G5	
Ulmaceae	*Ulmus americana*	American Elm		X	X	X		X			S5	G5?	
Vitaceae	*Vitis riparia*	Riverbank Grape					X	X	X		S5	G5	

LSRCA - W (Rare in the Lake Simcoe Watershed), + (Non-native), (+) (Invasive)
S-rank - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common
G-Rank - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure
Provincial and Federal Status - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern)

Table 3 - Amphibian List

			Survey Stations[A,B,C] (Code - Est.#)[D]				Conservation Ranks[E]		
Family	**Scientific Name**	**Common Name**	**1**	**2**	**3**	**Outside Stations (Incidental)**	**SARO**	**G Rank**	**S Rank**
Hylidae	*Pseudacris crucifer*	Spring Peeper		1-3[A], 2-4[B]		3[A], 1-2[B]		G5	S5
Ranidae	*Lithobates sylvaticus*	Wood Frog		1-1[A]				G5	S5

Observation Conditions

[A]April 28, 2014; Start Time 2225hrs/End Time 2245hrs; Temperature +8°C; Wind B2 SE; Cloud Cover 20%; Precipitation Nil; Observer L. Moran

[B]May 19, 2014; Start Time 2300hrs/End Time 2320hrs; Temperature +12°C; Wind B1 N; Cloud Cover Nil; Precipitation Nil; Observer L. Moran

[C]June 29, 2014; Start Time 2340hrs/End Time 0000hrs; Temperature +21°C; Wind B0; Cloud Cover 0%; Precipitation Nil; Observer BAC

[D]Codes (according to Marsh Monitoring Protocol)
Code 1: individual calls do not overlap and calling individuals can be discretely counted;
Code 2: calls of individuals sometimes overlap, but numbers of individuals can still be estimated;
Code 3: overlap among calls seems continuous (full chorus), and a count estimate is impossible;

[E]Conservation Rank - from OMNRF, NHIC and SAR Lists 2014
Provincial Rank (S-rank) - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common
Global Rank (G-Rank) - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure
SARO - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern)

Table 4 - Bird List

			Point Count Stations [A,B]							Conservation Ranks[E]			
Family	**Scientific Name**	**English Common Name**	**1**	**2**	**3**	**4**	**Incidental[A,B,C]**	**Breeding Evidence[D]**	**Area-sensitive?***	**RCC**	**S RANK**	**G RANK**	**SARO STATUS**
Accipitridae	*Buteo jamaicensis*	Red-tailed Hawk			X			Observed			S5	G5	NAR
Anatidae	*Anas platyrhynchos*	Mallard					FO[B]	Observed			S5	G5	
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing			S,			Possible			S5B	G5	
Cardinalidae	*Cardinalis cardinalis*	Northern Cardinal		S			X[A]	Possible			S5	G5	
Cardinalidae	*Passerina cyanea*	Indigo Bunting		S	S,	S	X[A]	Possible			S4B	G5	
Cathartidae	*Cathartes aura*	Turkey Vulture					X[A]	Observed			S5B	G5	
Charadriidae	*Charadrius vociferus*	Killdeer					X[C]	Observed			S5B,S5N	G5	
Corvidae	*Corvus brachyrhynchos*	American Crow		X,S	X,	S	X[A,B,C]	Possible			S5B	G5	
Corvidae	*Cyanocitta cristata*	Blue Jay		S			X[C]	Possible			S5	G5	
Emberizidae	*Melospiza melodia*	Song Sparrow	S,S	S	S	S	X[C]	Probable			S5B	G5	
Emberizidae	*Zonotrichia albicollis*	White-throated Sparrow					X[C]	Observed			S5B	G5	
Fringillidae	*Carduelis tristis*	American Goldfinch	S	S		T		Probable			S5B	G5	
Fringillidae	*Carpodacus mexicanus*	House Finch			FO			Observed			SNA	G5	
Icteridae	*Molothrus ater*	Brown-headed Cowbird			P			Probable			S4B	G5	
Icteridae	*Quiscalus quiscula*	Common Grackle				S		Possible			S5B	G5	
Laridae	*Larus delawarensis*	Ring-billed Gull					X[A]	Observed			S5B,S4N	G5	
Paridae	*Poecile atricapillus*	Black-capped Chickadee	T	S			X[C]	Probable			S5	G5	
Parulidae	*Geothlypis trichas*	Common Yellowthroat	S		X,S			Possible			S5B	G5	
Parulidae	*Mniotilta varia*	Black-and-white Warbler			S		X[C]	Possible	Yes		S5B	G5	
Phasianidae	*Meleagris gallopavo*	Wild Turkey					X[C]	Observed			S5	G5	
Picidae	*Colaptes auratus*	Northern Flicker					X[C]	Observed		Yes	S4B	G5	
Picidae	*Dryocopus pileatus*	Pileated Woodpecker		T				Observed	Yes		S5	G5	
Picidae	*Picoides villosus*	Hairy Woodpecker	S					Possible	Yes		S5	G5	
Sittidae	*Sitta carolinensis*	White-breasted Nuthatch					X[C]	Observed	Yes		S5	G5	
Troglodytidae	*Troglodytes troglodytes*	Winter Wren	S	T			X[C]	Probable	Yes		S5B	G5	
Turdidae	*Turdus migratorius*	American Robin				T	X[C]	Probable			S5B	G5	
Tyrannidae	*Contopus virens*	Eastern Wood-pewee				S		Possible		Yes	S4B	G5	SC
Tyrannidae	*Empidonax alnorum*	Alder Flycatcher			S			Possible			S5B	G5	
Tyrannidae	*Myiarchus crinitus*	Great Crested Flycatcher	S	S				Possible			S4B	G5	
Vireonidae	*Vireo olivaceus*	Red-eyed Vireo	T	S		S		Probable			S5B	G5	

* According to Appendix C of the Significant Wildlife Habitat Technical Guide (MNRF, 2000)

Surveys Conditions:

[A]June 06, 2014; Start Time 0723hr/ End Time 0825hr; Temperature Start +11°C/ End +14°C; Wind B2-B3 W; Precipitation Nil; Observer L. Moran

[B]June 21, 2014; Start Time 0724hr/ End Time 0815hr; Temperature +15°C; Wind B0-B1; Cloud Cover 70%; Precipitation Nil; Observer L. Moran

[C]May 02, 2006 (Reconnaissance survey, incidental observations only); Start Time 1030hr/ End Time 1230hr; Temperature +20°C; Wind B1; Cloud Cover <5%; Precipitation Nil; Observer J. Broadfoot

[D]OBBA Breeding Evidence Codes:
OBSERVED
FO - Fly Over

X - Species observed in its breeding season (no breeding evidence)
POSSIBLE
H - Species observed in its breeding season in suitable nesting habitat
S - Singing male present, or breeding calls heard, in suitable nesting habitat in nesting season.
PROBABLE
A - Agitated behaviour or anxiety calls of an adult.
N - Nest building or excavation of nest hole.
P -Pair observed in suitable nesting habitat in nesting season.
T - Permanent territory presumed trhough registration of territorial behaviour (e.g. song) on at least two days, a week or more apart, at the same place.

[E]Conservation Rank - from OMNRF, NHIC and SARO Lists 2014
RCC - Regional Conservation Concern according to Ontario Partners in Flight (2008)**
S-rank - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common
G-Rank - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure
SARO - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern)

Table 5: Species at Risk Habitat Summary and Assessment

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species[1]	Initial Assessment
Restricted Species	*Not Applicable*	END	END	Broadly speaking, this species is associated with hardwood deciduous vegetation units ESA Protection: Species and regulated habitat protection	No Restricted Plant Species was observed during vegetation surveys.
Bald Eagle	*Haliaeetus leucocephalus*	SC	No status	Nests are typically found near the shoreline of lakes or large rivers, often on forested islands (Cadman *et al.* , 2007). ESA Protection: N/A	Habitat is not representative of key habitat - no lakes or large rivers within study area. Species not expected to be present on or adjacent to the property.
Bank Swallow	*Riparia riparia*	THR	No status	Nests in burrows excavated in natural and human-made settings with vertical sand and silt faces. Commonly found in sand or gravel pits, road cuts, lakeshore bluffs, and along riverbanks (COSEWIC, 2013c). ESA Protection: Species and general habitat protection	No evidence of nesting or potential habitat present within the study area.
Barn Swallow	*Hirundo rustica*	THR	No status	Ledges and walls of man-made structures such as buildings, barns, boathouses, garages, culverts and bridges. Also nest in caves, holes, crevices and cliff ledges (COSEWIC, 2011d). ESA Protection: Species and general habitat protection	No suitable nesting habitat present for species *(i.e.* No structures). No Barn Swallow were observed during Azimuth's field investigations.
Black Tern	*Chlidonias niger*	SC	No status	Colonial nesters typically found within marshes. Its preferred nesting habitat is a hemi-marsh (*i.e* . a wetland with 50:50 open water and emergent vegetation). Nests are usually built on an upturned cattail root, floating vegetation mat or patch of mud (Cadman *et al* ., 2007). ESA Protection: N/A	Habitat within study area is not representative of key habitat.
Blanding's Turtle	*Emydoidea blandingii*	THR	THR	Blanding's Turtles are a primarily aquatic species that prefer wetland habitats, lakes, ponds, slow-moving streams, etc., however they may utilize upland areas to search for suitable basking and nesting sites. In general, preferred wetland sites are eutrophic and characterized by clear, shallow water, with organic substrates and high density of aquatic vegetation (COSEWIC, 2005a). ESA Protection: Species and general habitat protection	Potential exists for Blandings Turtle habitat to be present within study area. Wetland features with potential to be used as habitat features are contained within the Lover's Creek Swamp Provincially Significant Wetland (Figure 2).

Table 5: Species at Risk Habitat Summary and Assessment

Bobolink	*Dolichonyx oryzivorus*	THR	No Status	Nests primarily in forage crops (*e.g.* hayfields and pastures) dominated by a variety of species such as clover, Timothy, Kentucky Bluegrass, tall grass, and broadleaved plants. Also occurs in wet prairie, graminoid peatlands, and abandoned fields dominated by tall grasses. Does not generally occupy fields of row crops (*e.g* . corn, soybeans, wheat) or short-grass prairie. Sensitive to habitat size and has lower reproductive success in small habitat fragments (COSEWIC, 2010b). ESA Protection: Species and general habitat protection	Minimum area requirements to support breeding habitat for the species have been reported to range from 5ha to 30ha (MNRF, 2013). Habitat within the study area is not representative of key habitat. No Bobolink were observed during Azimuth's field investigations.
Butternut	*Juglans cinerea*	END	END	Commonly found in riparian habitats, but is also found in rich, moist, well-drained loams, and well-drained gravels. Butternut is intolerant of shade (COSEWIC, 2003b). ESA Protection: Species and general habitat protection	A single Butternut trees was identified on the property within the Natural Core Area (Figure 2).
Canada Warbler	*Cardellina canadensis*	SC	THR	Wet, mixed deciduous-coniferous forests with a well developed shrub layer. Shrub marshes, Red-Maple stands, cedar stands, Black Spruce swamps, larch and riparian woodlands along rivers and lakes (COSEWIC, 2008d). ESA Protection: N/A	Potentially suitable habitat present within forested wetland habitat within the Natural Core Area. Canada Warbler not documented during Azimuth's field investigations.
Cerulean Warbler	*Dendroica cerulea*	THR	SC	Associated with large tracts of mature deciduous forest with tall trees and an open understory. Found in both wet bottomland forests and upland areas (COSEWIC, 2010a).	Habitat present within the study area is not representative of key habitat for this species. Records for this species within Simcoe County are likely associated with Minesing Swamp. Cerulean Warbler not documented during Azimuth's field investigations.
Chimney Swift	*Chaetura pelagica*	THR	THR	Nests primarily in chimneys though some populations (*i.e* . in rural northern areas) may nest in cavity trees (COSEWIC, 2007h). Recent changes in chimney design may be a significant factor in recent declines in numbers (Cadman *et al* ., 2007). ESA Protection: Species and general habitat protection	No suitable nesting habitat present for species (*i.e.* no structures). No Chimney Swift were observed during Azimuth's field investigations.
Common Five-lined Skink (Southern Shield population)	*Plestiodon fasciatus*	SC	SC	Southern Shield population -rocky outcrops embedded in a matrix of coniferous and deciduous forest, and individuals in these populations seek refuge under rocks overlaid on open bedrock (COSEWIC, 2007a). ESA Protection: N/A	Potentially suitable habitat present within Natural Core Area, although typical habitat *(i.e.* rock outcrops) are not present. This species is typically associated with habitat to the north of Barrie along the Canadian Shield. Based on the extremely low potential for presence, Common Five-lined Skink was not considered in our detailed assessment.

Table 5: Species at Risk Habitat Summary and Assessment

Common Nighthawk	*Chordeiles minor*	SC	THR	Open habitats including sand dunes, beaches recently logged/burned over areas, forest clearings, short grass prairies, pastures, open forests, bogs, marshes, lakeshores, gravel roads, mine tailings, quarries, and other open relatively clear areas (COSEWIC, 2007d). ESA Protection: N/A	Potentially suitable habitat present within study area but species not observed during Azimuth's field investigations, which included dawn and evening surveys, when the species tends to be most active.
Eastern Meadowlark	*Sturnella magna*	THR	No status	Most common in grassland, pastures, savannahs, as well as anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses, restored surface mines, *etc*. Occasionally nest in row crop fields such as corn and soybean, but there are considered low-quality habitat. Large tracts of grassland are preferred over smaller fragments and the minimum area required is estimated at 5ha (COSEWIC, 2011c). ESA Protection: Species and general habitat protection	Minimum patch area requirements to support breeding habitat for the species have been reported at 5 ha (MNRF, 2013). Habitat within the study area is not representative of key habitat. No Eastern Meadowlark were observed during Azimuth's field investigations.
Eastern Musk Turtle	*Sternotherus oderatus*	SC	THR	Inhabit littoral zones of waterways such as rivers, lakes, bays, streams, ponds, canals, and swamps with slow to no current and soft bottoms. During the active season they prefer shallow water (<2m) with abundant vegetation. Most are found close to shore and do not venture onto land except to nest or access adjacent wetlands (COSEWIC, 2012b). ESA Protection: N/A	Potential exists for Eastern Musk Turtle habitat to be present within study area. Wetland features with potential to be used as habitat features are contained within the Lover's Creek Swamp Provincially Significant Wetland (Figure 2).
Eastern Prairie Fringed-orchid	*Platanthera leucophaea*	END	END	It is a species primarily of mesic prairies, fens and old fields (COSEWIC, 2003a). ESA Protection: Species and general habitat protection	Locations of Prairie Fringed Orchid are well documented and are restricted to approximately 20 small populations within prairie habitat or fens within Ontario. No fen or prairie habitat present on the property. No Eastern Prairie Fringed Orchid was observed during Azimuth's vegetation surveys.
Eastern Ribbonsnake	*Thamnophis sauritus*	SC	SC	Found in wetland habitats with both flowing and standing water such as marshes, bogs, fens, ponds, lake shorelines and wet meadows. Most sightings occur near the water's edge (COSEWIC, 2012c). ESA Protection: N/A	Potential exists for Eastern Ribbonsnake habitat to be present within study area. Wetland features with potential to be used as habitat features are contained within the Lover's Creek Swamp Provincially Significant Wetland (Figure 2).
Eastern Small-footed Myotis	*Myotis Lleibii*	END	END	Generally occurs in mountainous or rocky regions as well as in buildings, on the face of rock bluffs and beneath slabs of rock and stones. Hibernation is typically confined to caves and old mines (Best and Jennings, 1997). ESA Protection: Species and general habitat protection	Species not expected to be present on or adjacent to study area. Property is not located within a mountainous or rocky region with boulders, stones and rocks. No caves present. No suitable habitat for the species.

Table 5: Species at Risk Habitat Summary and Assessment

Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR	Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances, are preferred nesting habitats (COSEWIC, 2009a). ESA Protection: Species and general habitat protection	Open and forested habitat (i.e. Cultural woodland) habitat is not present on the property. Habitat representative of key habitat is not present within the study area. Not expected to occur on the property. Not observed during any of Azimuth's evening frog call surveys when the Whip-poor-will is most active.
Eastern Wood-pewee	*Contopus virens*	SC	No status	Mostly in mature and intermediate-age deciduous and mixed forests having an open understory. It is often associated with forests dominated by Sugar Maple and oak. Usually associated with forest clearings and edges within the vicinity of its nest (COSEWIC, 2012e). ESA Protection: N/A	Potentially suitable habitat for the species can be found within the mixed forest habitat within the Natural Core Area and within the isolated deciduous woodlot. Eastern Wood-pewee was observed within on the property within small isolated woodlot (Figure 2).
Golden-winged Warbler	*Vermivora chrysoptera*	SC	THR	Areas of early successional scrub surrounded by mature forests including dry uplands, swamp forests, and marshes (COSEWIC, 2006a). ESA Protection: N/A	Habitat on site is no representative of ideal habitat for the species, no thicket/scrub habitat present on the property. Golden-winged Warbler was not observed during breeding bird surveys.
Grasshopper Sparrow *pratensis* subspecies	*Ammodramus savannarum pratensis*	SC	No status	Typically breeds in large human-created grasslands (≥5 ha), such as pastures and hayfields, and natural prairies, such as alvars, characterized by well-drained, often poor soil dominated by low, sparse perennial herbaceous vegetation (COSEWIC, 2013d). ESA Protection: N/A	Habitat on site is no representative of ideal habitat for the species. This species requires tracts of grassland that is greater than 10 hectares (ha) (MNRF, 2000). The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) reports similar habitat requirements with a suitable habitat area that is at least 5ha in size (COSEWIC, 2013). Grasshopper Sparrow was not observed during breeding bird surveys.
Henslow's Sparrow	*Ammodramus henslowii*	END	END	Requires grassland habitat and occurs more frequently and at higher densities in large patches of suitable habitat. Nests in tallgrass prairie, wet meadow, and marsh habitats as well as agricultural grasslands, lightly grazed pasture and grasslands on reclaimed surface mines (COSEWIC, 2011a). ESA Protection: Species and general habitat protection	Where regional populations are low, as is currently the case in Ontario, unbroken patches of grassland of at least 30 ha and perhaps in excess of 100 ha are believed to be required to support Henslow's Sparrow populations. (MNRF, 2013). There is no potentially suitable habitat for this species on the property. Henslow's Sparrow was not observed during breeding bird surveys.
Least Bittern	*Ixobrychus exilis*	THR	THR	Breed strictly in marshes of emergents (usually cattails) that have relatively stable water levels and interspersed areas of open water (COSEWIC, 2009b). ESA Protection: Species and general habitat protection	No suitable marsh habitat present on property or adjacent lands.

Table 5: Species at Risk Habitat Summary and Assessment

Little Brown Myotis	*Myotis lucifugus*	END	END	Forests and regularly aging human structures as maternity roost sites. Regularly associated with attics of older buildings and barns for summer maternity roost colonies. Overwintering sites are characteristically mines or caves, but can often include buildings (MNRF, 2014) (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Potentially suitable maternity roosting habitat present within forest communities within study area.
Monarch	*Danaus plexippus*	SC	SC	Breeding habitat is confined to sites where milkweeds, the sole food of caterpillars, grow. Milkweeds grow in a variety of environments, including meadows in farmlands, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairie, river banks, irrigation ditches, arid valleys, and south-facing hills (COSEWIC, 2010c). ESA Protection: N/A	No significant areas of Milkweed present on the property.
Northern Myotis	*Myotis septentrionalis*	END	END	Maternity roost sites are generally located within deciduous and mixed forests and focused in snags including loose bark and cavities of trees. Overwintering sites are characteristically mines or caves (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Potentially suitable maternity roosting habitat present within forest communities within study area.
Northern Map Turtle	*Grapetemys geographical*	SC	SC	Inhabits rivers and lakes where it basks on emergent rocks, banks, logs and fallen trees. Prefer shallow, soft-bottomed aquatic habitats with exposed objects for basking (COSEWIC, 2012d). ESA Protection: N/A	Species not expected to be present on or adjacent to the property. There is no open water habitat (*i.e*. Lakes or rivers) present on or adjacent to the property.
Olive Sided Flycatcher	*Contopus cooperi*	SC	THR	Natural forest openings, forest edges near natural openings (such as wetlands) or open to semi-open forest stands. Occasionally human made openings (such as clear cuts). Presence of tall snags and residual live trees is essential (COSEWIC, 2007j). ESA Protection: N/A	Potentially suitable habitat for this species is present within the coniferous or mixed forest/swamp areas in proximity to any natural openings or watercourse. Potentially suitable habitat would be restricted to the forested lands within the Natural Core Area. Olive-sided Flycatcher was not observed during breeding bird surveys.
Peregrine Falcon	*Falco peregrinus*	SC	SC (*anatum/tundrius*)	Most nest on cliff ledges or crevices, but some will use tall buildings or bridges near good foraging areas. Nests are typically close to bodies of water (COSEWIC, 2007e). ESA Protection: N/A	Habitat is not representative of key habitat - no cliffs or tall buildings. Species not expected to be present on or adjacent to the property.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	SC	THR	Occurs in open deciduous forests, particularly those dominated by oak and beech, grasslands, forest edges, orchards, pastures along rivers and roads, urban parks, golf courses, cemeteries, beaver ponds and timber stands that have been treated with herbicides (COSEWIC, 2007f). ESA Protection: N/A	Potential exists for the Red-headed Woodpecker to use any of the existing forested units within the study area for nesting or foraging habitat. Red-headed Woodpecker was not identified during bird surveys.

Table 5: Species at Risk Habitat Summary and Assessment

Snapping Turtle	*Chelydra serpentina*	SC	SC	Habitat is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats (COSEWIC, 2008a). ESA Protection: N/A	Potential exists for Snapping Turtle habitat to be present within study area. Wetland features with potential to be used as habitat features are contained within the Lover's Creek Swamp Provincially Significant Wetland (Figure 2).
Tri-colored Bat	*Perimyotis subflavus*	END	END	Maternity roost sites include forests and modified landscapes (barns or human-made structures). Overwintering sites include mines and caves (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Potentially suitable maternity roosting habitat present within forest communities within study area.
Wood Thrush	*Hylocichla mustelina*	SC	No status	Found in moist, deciduous hardwood or mixed stands, often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches (COSEWIC, 2012f). ESA Protection: N/A	Potentially suitable habitat present for this species within wooded areas. Wood Thrush not observed during Azimuth's Breeding Bird surveys.

[1] Habitat as outlined within the MNRF's Species at Risk in Ontario website files (https://www.ontario.ca/environment-and-energy/species-risk-ontario-list), or Species Specific COSEWIC Reports referenced in this document.

Species at Risk in Ontario List (June 13, 2017)

Best, T., and J. Jennings. 1997. Mammalian Species, *Myotis leibii* . The American Society of Mammalogists. No. 547, pp. 1-6, 5 figs.

Cadman, M., D. Sutherland, G. Beck, D. Lepage and A. Couturier. 2007. Atlas of the Breeding Birds of Ontario 2001-2005. Bird Studies Canada, Environment

COSEWIC. 2003a. COSEWIC assessment and update status report on the Eastern Prairie Fringed-orchid *Platanthera leucophaea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.

COSEWIC 2003b. COSEWIC assessment and status report on the Butternut *Juglans cinerea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp.

COSEWIC. 2005a. COSEWIC assessment and update status report on the Blanding's Turtle *Enydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.viii +40 pp.

COSEWIC 2006a. COSEWIC assessment and status report on the Golden-winged Warbler *Vermivora chrysoptera* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 30 pp.

COSEWIC 2007a. COSEWIC assessment and update status report on the Five-lined Skink *Eumeces fasciatus* (Carolinian population and Great Lakes/St. Lawrence population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 50 pp.

COSEWIC. 2007d. COSEWIC assessment and status report on the Common Nighthawk *Chordeiles minor* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp.

COSEWIC. 2007e. COSEWIC assessment and status report on the Peregrine Falcon *Falco peregrinus* (*pealei* subspecies - *Falco peregrinus* and *pealei anatum/tundrius* - *Falco peregrinus anatum/tundrius*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp.

COSEWIC. 2007f. COSEWIC assessment and status report on the Red-headed Woodpecker *Melanerpes erythrocephalu* s in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.

COSEWIC. 2007h. COSEWIC assessment and update status report on the Chimney Swift *Chaetura pelagic* a in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 49 pp.

COSEWIC. 2008a. COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.

COSEWIC. 2009a. COSEWIC assessment and update status report on the Whip-poor-will *Caprimulgus vociferus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp.

COSEWIC. 2009b. COSEWIC assessment and update status report on the Least Bittern *Ixobrychus exilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp.

COSEWIC. 2010a. COSEWIC assessment and update status report on the Cerulean Warbler *Dendroica cerulea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.

COSEWIC. 2010b. COSEWIC assessment and update status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp.

COSEWIC. 2010c. COSEWIC assessment and status report on the Monarch *Danaus plexippus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 43 pp.

COSEWIC. 2011a. COSEWIC assessment and update status report on the Henslow's Sparrow *Ammodramus henslowii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 37 pp.

COSEWIC. 2011c. COSEWIC assessment and update status report on the Eastern Meadowlark *Sturnella magna* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.

COSEWIC. 2011d. COSEWIC assessment and update status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp.

COSEWIC. 2012b. COSEWIC assessment and status report on the Eastern Musk Turtle *Sternotherus odoratus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 68 pp

COSEWIC. 2012c COSEWIC assessment and status report on the Eastern Ribbonsnake *Thamnophis sauritus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 39 pp.

Table 5: Species at Risk Habitat Summary and Assessment

COSEWIC. 2012d. COSEWIC assessment and status report on the Northern Map Turtle *Graptemys geographica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 63 pp.
COSEWIC. 2012e. COSEWIC assessment and status report on the Eastern Wood-pewee *Contopus virens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.
COSEWIC. 2012f. COSEWIC assessment and status report on the Wood Thrush *Hylocichla mustelina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.
COSEWIC. 2013b. COSEWIC assessment and update status report on the Little Brown Myotis *Myotis lucifugus* , Northern Myotis *Myotis septentrionalis* and Tri-colored Bat *Perimyotis subfalvus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.
COSEWIC. 2013c. COSEWIC assessment and update status report on the Bank Swallow *Riparia riparia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.
COSEWIC. 2013d. COSEWIC assessment and status report on the Grasshopper Sparrow pratensis subspecies *Ammodramus savannarum pratensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix +
Ministry of Natural Resources and Forestry (MNRF). 2014. Eastern Small-footed Bat. Queen's Printer for Ontario. https://www.ontario.ca/environment-and-energy/eastern-small-footed-bat
Ministry of Natural Resources and Forestry (MNRF). 2016. Species at Risk in Ontario. http://www.ontario.ca/environment-and-energy/species-risk

Table 6.1: Seasonal Concentrations of Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SHW		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 (*e.g.* EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • 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). • SWHMiST Index #7 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. Flooded fields not present. No further evaluation undertaken.
Waterfowl Stopover and Staging Areas (Aquatic) **Rationale:** Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (*e.g.* EHJV implementation plan) • 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 SWHTG 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). • SWHMiST Index #7 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No ponds, marshes, lakes, bays, inlets etc. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		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". • SWHMiST Index #8 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No river/lake/wetland shorelines conducive to shorebird habitat. No further evaluation undertaken.
Raptor Wintering Area **Rationale:** Sites used by multiple species 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 windswept 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". • SWHMiST Index #10 and #11 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. Idle, fallow, or lightly grazed open fields limited to small cultural meadow community (~1.75 ha) on the property, falling well below the >15 ha preferred habitat unit size. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		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. • SWHMiST Index #1 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No caves, mines, or similar habitats present. No further evaluation undertaken.
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 or class 1 or 2. • 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; o >10 Big Brown Bats o >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". • SWHMiST Index #12 provides development effects and mitigation measures.	Potentially suitable habitat within woodland communities within Lover's Creek Swamp Provincially Significant Wetland within the Natural Core Area. Potentially suitable habitat within isolated woodlot.
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 has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. • 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	• 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)	Potentially suitable turtle wintering habitat in wetland habitat within Natural Core Area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
			some of these sites. • OMNRF Ecologist or Biologist • Field Naturalist clubs • Natural Heritage Information Center (NHIC)	• Congregation of turtles is more common where wintering areas are limited and therefore significant • SWHMiST Index #28 provides development effects and mitigation measures for turtle wintering habitat.	
Reptile Hibernaculum Rationale; Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	**Snakes:** Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **Special Concern:** Milksnake Eastern Ribbonsnake **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 (*e.g.* 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. • SWHMiST Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	No obvious features observed that could provide potentially suitable reptile hibernaculum (*i.e.* rock piles etc.) However, potentially suitable snake hibernacula habitat in wetland habitat within Natural Core Area.
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	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	• 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.	Studies confirming: • Presence of 1 or more nesting sites with 8or 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". • SWHMiST Index #4 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No exposed soil banks. No Bank or Cliff Swallows observed within the study area. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
important to local populations. All swallow population are declining in Ontario.		BLS1 BLT1 CLO1 CLS1 CLT1	• Ontario Breeding Bird Atlas • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist Clubs.		
Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas, 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. • SWHMiST Index #5 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No heron nests or heronries observed within the study area. No further evaluation undertaken.
Colonially -Nesting Bird Breeding Habitat (Ground) **Rationale;** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • 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". • SWHMiST Index #6 provides development effects	Habitat with study area is not representative of key habitat. Not a rocky island or peninsula. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
				and mitigation measures.	
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. • SWHMiST Index #16 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. Does not meet key criteria for proximity to Lake Ontario. No further evaluation undertaken.
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 migratory songbirds. Canadian Wildlife Service Ontario website:	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". • SWHMiST Index #9 provides development effects.	Habitat with study area is not representative of key habitat. Does not meet key criteria for proximity to Lake Ontario. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Yarding Areas **Rationale:** 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 in Table 1.4.1 of this Schedule. • SWHMiST Index #2 provides development effects and mitigation measures.	Currently not mapped by MNRF as deer yard within property limits (Appendix C). No obvious deer yard function.
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM	• 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 .	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	Currently not mapped by MNRF as deer yard (Appendix C). No obvious deer yard function.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
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.		SWD Conifer plantations much smaller than 50 ha may also be used.	• If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. • Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	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 in Table 1.4.1 of this Schedule. • SWHMiST Index #2 provides development effects and mitigation measures.	

Table 6.2: 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 • SWHMiST Index #21 provides development effects and mitigation measures.	Not present within study area.
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 • MNRF 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.) • SWHMiST Index #20 provides development effects and mitigation measures.	Not present within study area.
Alvar **Rationale;** Alvars are extremely rare habitats in Ecoregion 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. • SWHMiST Index #17 provides development effects and mitigation measures.	Not present within study area.

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 are >140 years old, then the area containing these trees is Significant Wildlife Habitat. • 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. • SWHMiST Index #23 provides development effects and mitigation measures.	Not present within study area.
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.). • SWHMiST Index #18 provides development effects and mitigation measures.	Not present within study area.
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.). • SWHMiST Index #19 provides development effects and mitigation measures.	Not present within study area.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is	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	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST Index #37 provides development effects and mitigation measures.	Not present within study area.

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
depend on the habitat for survival.	Candidate SWH.		• OMNRF Districts • Field Naturalist clubs • Conservation Authorities		

Table 6.3: 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. • SWHMiST Index #25 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. Shallow Marsh unit <0.5ha in size. No further evaluation undertaken.
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 the entire 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	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:	Habitat with study area is not representative of key habitat. Property not located in vicinity of lakes, rivers, ponds, or open wetlands. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
			• Reports and other information available from Conservation Authorities. • Field Naturalists clubs	Guidelines for Wind Power Projects". • SWHMiST Index #26 provides development effects and mitigation measures.	
Woodland Raptor Nesting Habitat **Rationale:** Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. 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. Information Sources • 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 28 ha 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. • SWHMiST Index #27 provides development effects and mitigation measures.	No Woodland Raptors or nests were observed on the property. No known raptor nests within the study area. No further evaluation undertaken.
Turtle Nesting Areas **Rationale;** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern Species 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. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find	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. • SWHMiST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	No suitable habitat. No exposed sand and/or gravel banks within property limits.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	**Habitat Criteria and Information Sources**	**Defining Criteria**	
			potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs		
Seeps and Springs **Rationale:** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by Conservation Authorities and MOE. • Field Naturalists clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite 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. • SWHMiST Index #30 provides development effects and mitigation measures.	No groundwater seeps identified on the property.
Amphibian Breeding Habitat (Woodland). **Rationale:** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) 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. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records. • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field Naturalist clubs	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. • SWHMiST Index #14 provides development effects and mitigation measures.	Amphibian surveys only documented 2 species of frog on the property and did not document more than 20 individuals of any species calling. The wetland has the potential to offer suitable habitat for salamander, although no salamanders were observed during Azimuth's field investigations.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	**Habitat Criteria and Information Sources**	**Defining Criteria**	
			• Canadian Wildlife Service • Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org		
Amphibian Breeding Habitat (Wetlands) **Rationale:** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (*e.g.* Bull Frog) may be adjacent to woodlands.	• Wetlands>500m^2 (about 25m diameter), 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. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from 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 in Table 1.4.1 of this Schedule. • SWHMiST Index #15 provides development effects and mitigation measures.	All wetlands within 120 m of a woodland, therefore habitat qualifies as Amphibian Breeding Habitat (Woodland), as above. Habitat with study area is not representative of key habitat. No further evaluation undertaken.
Woodland Area-Sensitive Bird Breeding Habitat **Rationale:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren **Special Concern:** Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. • Interior forest habitat is at least 200 m from forest edge habitat. Information Sources • Local bird clubs. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to 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 Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #34 provides development effects and mitigation measures.	Winter Wren was documented on within the swamp community. Property itself not a candidate as SWH for Woodland Area-sensitive Bird Breeding Habitat but may contribute to such habitat off-site.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	

Table 6.4: Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Wildlife Habitat	Wildlife Species	Candidate SWH		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". • SWHMiST Index #35 provides development effects and mitigation measures.	No suitable habitat. Areas of standing shallow water very limited on the property, consisting of shallow marsh along the southern Lover's Creek Swamp Provincially Significant Wetland edge. No further evaluation undertaken.
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	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha. • 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	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 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". • SWHMiST Index #32 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No large (>30ha) grassland areas. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
40 years based on CWS (2004) trend records.			• Reports and other information available from Conservation Authorities.		
Shrub/Early Successional Bird Breeding Habitat **Rationale:** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10haclxiv 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 Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #33 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. No large (>10ha) shrub/early successional areas. No further evaluation undertaken.
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. • SWHMiST Index #36 provides development effects and mitigation measures.	No chimneys documented on the property.
Special Concern	All Special	All plant and animal	When an element occurrence is identified within a 1 or 10 km grid	Studies Confirm:	Eastern Wood-pewee was observed

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
and Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	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.	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.	• 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. • SWHMiST Index #37 provides development effects and mitigation measures.	within isolated woodland community located within the western limits of the property.

6.5: 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 in Table 1.1	Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (**Amphibian Breeding Habitat –Wetland)** of this Schedule. 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 <20m. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • SWHMiST Index #40 provides development effects and mitigation measures.	No Amphibian Breeding Habitat is confirmed as Significant Wildlife Habitat on the property, therefore, no potential function for amphibian movement corridors. No further evaluation undertaken.
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	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when **Deer Wintering Habitat** is confirmed as SWH from Table 1.1 of this schedule. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).	• 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	Habitat with study area is not representative of key habitat. No Deer Wintering Habitat function on the property. No further evaluation undertaken.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
dispersing individuals by minimizing their vulnerability while travelling.			Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs	corridors. • SWHMiST Index #39 provides development effects and mitigation measures.	

6.6: Exceptions for EcoRegion 6E

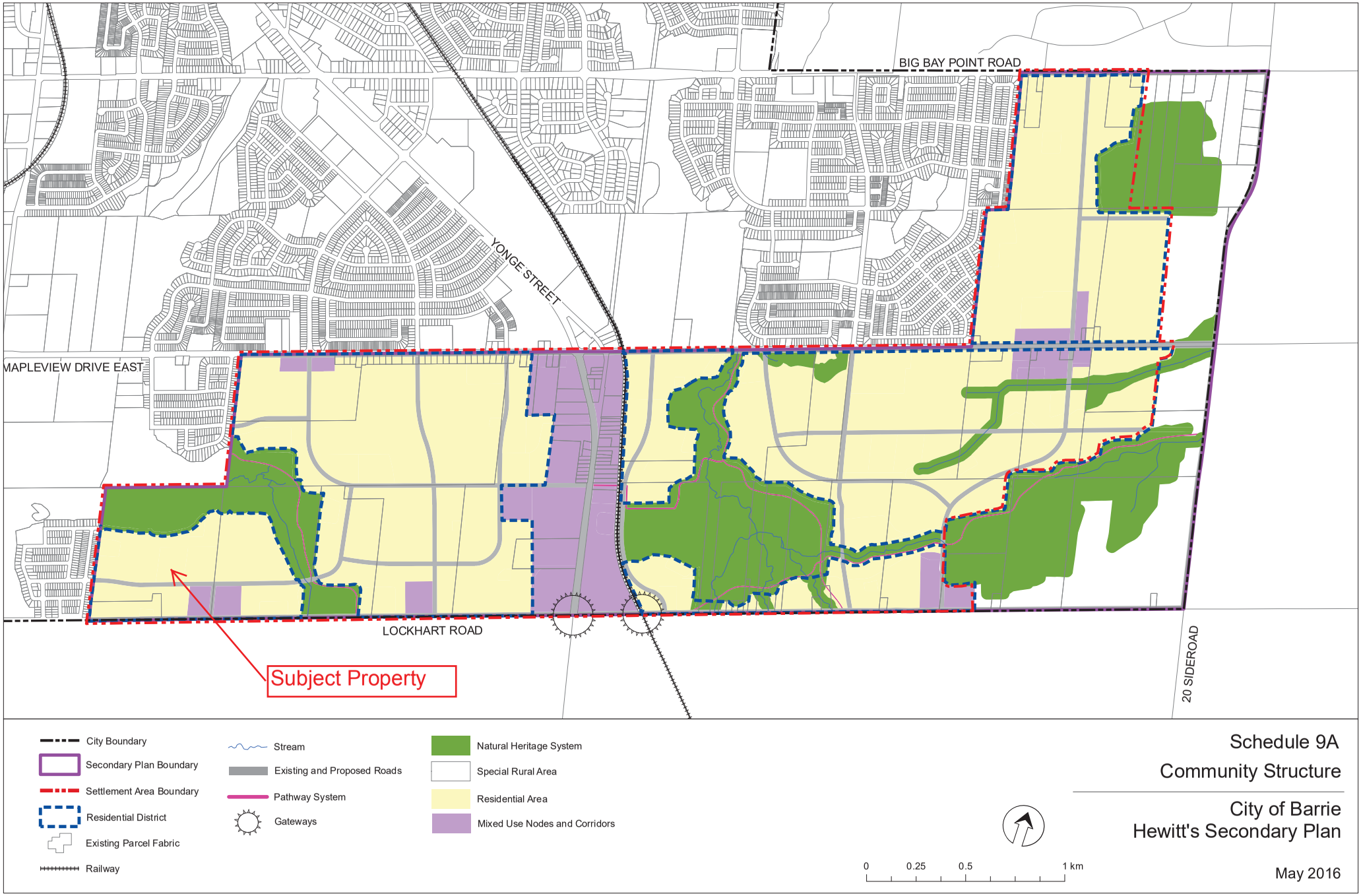
EcoDistrict	Wildlife Habitat and Species	Candidate			Confirmed SWH	Assessment
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14 **Rationale:** The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing 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 SWHMiST Index #3 provides development effects and mitigation measures.	Habitat with study area is not representative of key habitat. The study area does not contain significant abundances of mast-bearing vegetation. No further evaluation undertaken.
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 • SWHMiST Index #32 provides development effects and mitigation measures	Study area not located on Manitoulin Island. No further evaluation undertaken.

APPENDICES

Appendix A: Municipal Background Information
Appendix B: Lake Simcoe Region Conservation Authority Information
Appendix C: Provincial Background Information

APPENDIX A

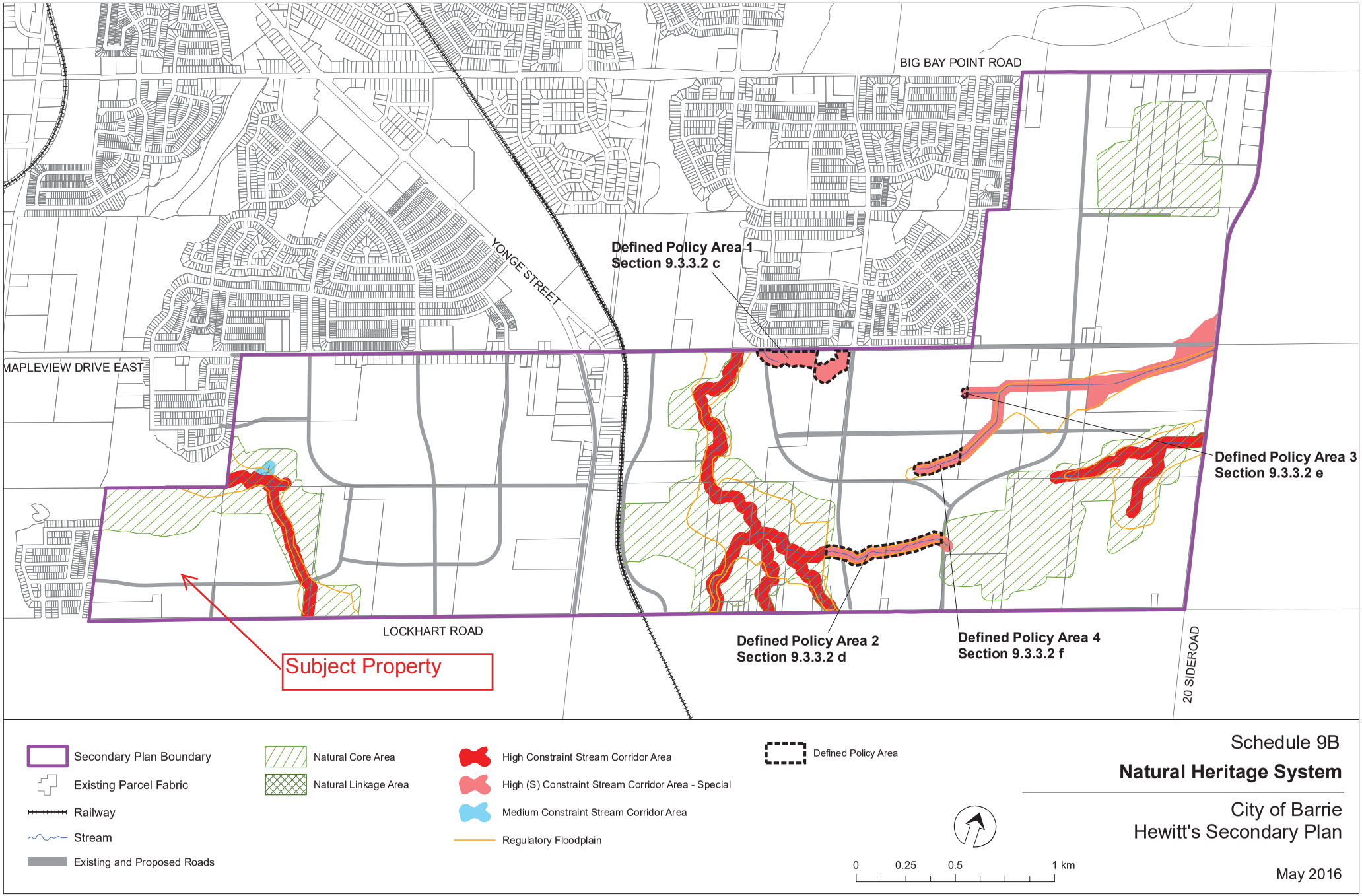
Municipal Background Information



Schedule 9A
Community Structure

City of Barrie
Hewitt's Secondary Plan

May 2016



Schedule 9B

Natural Heritage System

City of Barrie
Hewitt's Secondary Plan

May 2016

APPENDIX B

Lake Simcoe Region Conservation Authority

Lake Simcoe Region conservation authority

Features

- Watercourse
- Lot and Concession
- Regulation Boundary
- Regulation Area
- Assessment Parcel
- LSRCA Boundary
- Lake Simcoe
- Lake Couchiching
- Local Road

Printed On:
7/11/2016

NAD_1983_UTM_Zone_17N
Mapped By:

Scale 1: 4,999

254 0 127 254 Meters

Dan Stuart

From: Lisa Moran
Sent: March-27-18 11:40 AM
To: Dan Stuart
Subject: FW: Barrie Lockhart Road LP - NHE Terms of Reference

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From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: March-26-18 2:51 PM
To: Lisa Moran; Charles Burgess
Cc: Paul Neals; James Bujak; Scott Young; Celeste.Kitsemetry@barrie.ca
Subject: RE: Barrie Lockhart Road LP - NHE Terms of Reference

Good Afternoon Lisa,

The proposed ToR is acceptable with the following additions and conditions:

- It is our understanding that the boundary of the natural heritage features is still under review based upon the staking conducted in the field (i.e./ splitting the difference) and the EIS will reflect the boundary also agreed upon by the LSRCA.
- A feature water balance will be required to demonstrate that pre- to post-ecological and hydrological functions will be maintained or improved.
- A revised Endangered Species Act habitat review is conducted on the property as many species have been uplisted since the undertakings of the original Secondary Plan work and development is subject to *ESA* at the time of application.
- Mitigation plans that include relocation are incorporated for regionally rare species.
- As a reminder the LSRCA Ecological Offsetting Plan are subject to the property, where applicable.

We look forward to review the EIS.

Thanks,

Shauna

Shauna Fernandes Chagani, HBSc, EP
Natural Heritage Planning Coordinator
Lake Simcoe Region Conservation Authority
120 Bayview Parkway,
Newmarket, Ontario L3Y 3W3
905-895-1281, ext. 247 | 1-800-465-0437
s.fernandes@LSRCA.on.ca | www.LSRCA.on.ca

Twitter: @LSRCA
Facebook: LakeSimcoeConservation

From: Lisa Moran [mailto:Lisa@Azimuthenvironmental.Com]
Sent: January 17, 2018 9:30 AM

To: Shauna Fernandes; Charles Burgess
Cc: Paul Neals; James Bujak; Scott Young; Celeste.Kitsemetry@barrie.ca
Subject: Barrie Lockhart Road LP - NHE Terms of Reference

Good Morning Shauna,

Azimuth has been retained to complete a Natural Heritage Evaluation (NHE) for a property located on the South Part of Lot 12, Concession 11, City of Barrie (Hewitt's Secondary Plan Area) (Figure 1).

It is our understanding that a NHE is required under the Lake Simcoe Protection Plan (LSPP) because the property is located in proximity to a Key Natural Heritage Feature and/or Key Hydrologic Feature as defined in the Hewitt's Secondary Plan (i.e. Natural Core Area according to the Hewitt's Secondary Plan) (Figure 2).

The staking of the Natural Core Area on the subject property took place in July 2015 for all the participating landowners in the Hewitt's Secondary Plan Area. The staking was undertaken with staff from the Lake Simcoe Region Conservation Authority (LSRCA), Natural Resource Solutions Inc., the City of Barrie, Azimuth, R.J. Burnside, The Jones Consulting Group and the affected landowners. The feature limits were defined, agreed to by all parties and staked. Each stake location was georeferenced and the final survey of the features was circulated to all participants. The buffer width as approved by the Ontario Municipal Board (OMB) was added to the feature limit to define the development limit for the preparation of the draft plans of subdivision. Therefore, our assessment will identify the significant features as approved by the province, City and LSRCA. For completeness, an assessment of Candidate Significant Wildlife Habitat (SWH) will also be included within the NHE.

Based on this information, the following outlines the activities we would undertake in preparation of the NHE:

- Search for existing rare species observation records for the property and surrounding lands;
- Conduct three evening amphibian call surveys (Completed April 28, May 19 and June 29, 2014);
- Conduct two dawn breeding bird surveys (Completed June 6 and 21, 2014);
- Identify the vegetation communities, using protocols of the Ecological Land Classification (ELC) for Southern Ontario;
- Conduct reconnaissance surveys of vascular plants on the property during the spring, summer and fall (Completed 2014-2016);
- Conduct a Species at Risk Screening for the property utilizing available background information, habitat assessments and field data collected for the property. Note: Consultation with the Ministry of Natural Resources and Forestry (MNRF) was initiated in 2016 and is ongoing. Azimuth will continue to work with MNRF to ensure that there is no contravention with Ontario's Endangered Species Act;
- Overlay identified environmental features on aerial photography so that the relationship between the natural heritage features and functions can be assessed relative and an assessment of the sufficiency of the approved buffers can be undertaken;
- Assess the potential direct, indirect and cumulative impacts of the proposed conceptual development plan on the sensitive or significant environmental features as described above;
- Recommend and develop an appropriate avoidance, mitigation and/or restoration strategy;
- Demonstrate conformity with the applicable policies of the City, LSRCA and Province; and
- Prepare one NHE report for circulation to approval agencies.

We are not proposing to do any additional breeding bird or amphibian surveys given the work in 2014 did not identify any species of conservation concern or SAR species and the habitat conditions are the same as historically present on the site. The above proposed TOR is consistent with the other NHE reports that have already been completed and approved within the Hewitt's SPA. If you could please review the proposed TOR and provide comment on its suitability, it would be appreciated. We would also like to take this opportunity to request any background information that you may have related to this property that may be beneficial to us in completing the NHE.

Thank you for your attention to this matter. Please feel free to contact me if you have any questions or wish to discuss.

Regards,

Lisa Moran
Terrestrial Ecologist

Azimuth Environmental Consulting, Inc
642 Welham Road
Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 202
cell: (705) 331-1479
lisa@azimuthenvironmental.com
www.azimuthenvironmental.com

*Providing services in **hydrogeology**, **terrestrial** and **aquatic ecology** & **environmental engineering***

Gmail **Paul Neals <paul.azimuth@gmail.com>**

Hewitt's NHS Core and Buffer Map

2 messages

Ray Duhamel <RDuhamel@jonesconsulting.com> 21 August 2015 at 14:27
To: Shauna Fernandes <S.Fernandes@lsrca.on.ca>, Charles Burgess <C.Burgess@lsrca.on.ca>, David Stephenson <dstephenson@nrsi.on.ca>, Eric Hodgins <Eric.Hodgins@barrie.ca>, Paul Neals <paul@azimuthenvironmental.com>, "cea@cogeco.ca" <cea@cogeco.ca>, "Bryan Richardson (bryan.richardson@rjburnside.com)" <bryan.richardson@rjburnside.com>
Cc: Elizabeth Howson <howson@mshplan.ca>

Hi Everyone,

I'm following up on my email from last Tuesday August 11th regarding the NHS mapping associated with our site walks on July 15th and 16th.

I have heard back from Dave Stephenson who asked that I round the corners on the buffer adjacent to the Blue Sky woodlot (north-east corner of the plan), as well as Bryan Richardson who asked for a note concerning the connection to Thicketwood Drive at the south-west corner of the plan.

I have made those two minor changes. Does anyone else have any comments? Shauna, you made very detailed notes so I'd like your confirmation that everything looks good on your end.

Thanks and have a good weekend.

Ray

From: Ray Duhamel
Sent: Tuesday, August 11, 2015 9:43 AM
To: Shauna Fernandes <S.Fernandes@lsrca.on.ca>; Charles Burgess <C.Burgess@lsrca.on.ca>; David Stephenson <dstephenson@nrsi.on.ca>; Eric Hodgins <Eric.Hodgins@barrie.ca>; Paul Neals <paul@azimuthenvironmental.com>; cea@cogeco.ca; Bryan Richardson (bryan.richardson@rjburnside.com)< bryan.richardson@rjburnside.com>
Cc: 'Elizabeth Howson' <howson@mshplan.ca>
Subject: Hewitt's NHS Core and Buffer Map

Hi Everyone,

Further to our Hewitt's site walk on July 15th and 16th, we have received the survey information from Dino Astri Surveying and we have created a core area and buffer map.

Can you review the attached plan and confirm that it accurately reflects the consensus reached in the field?

I have included a CAD and PDF file for your use.

Thanks.

Ray

Ray Duhamel, MCP, MCIP, RPP

Partner

The Jones Consulting Group Ltd.

229 Mapleview Drive East, Unit 1 Barrie, ON L4N 0W5

Phone (705) 734-2538 ext. 226 Fax (705) 734-1056

Email rduhamel@jonesconsulting.com

www.jonesconsulting.com

JONES
CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

EAS-11118-NHS-August-2015.pdf
569K

Charles Burgess <C.Burgess@lsrca.on.ca> 28 August 2015 at 14:58
To: Ray Duhamel <RDuhamel@jonesconsulting.com>, Shauna Fernandes <S.Fernandes@lsrca.on.ca>, David Stephenson <dstephenson@nrsi.on.ca>, Eric Hodgins <Eric.Hodgins@barrie.ca>, Paul Neals <paul@azimuthenvironmental.com>, "cea@cogeco.ca" <cea@cogeco.ca>, "Bryan Richardson (bryan.richardson@rjburnside.com)" <bryan.richardson@rjburnside.com>
Cc: Elizabeth Howson <howson@mshplan.ca>

Hi Ray,

Looks good to us (LSRCA).

Charles F. Burgess, MCIP, RPP

Planning Coordinator

LSRCA 120 Bayview Parkway, Newmarket, Ontario L3Y 3W3

905.895.1281 x 299 |1.800.465.0437

c.burgess@LSRCA.on.ca | www.LSRCA.on.ca

From: Ray Duhamel [mailto:RDuhamel@jonesconsulting.com]
Sent: August-21-15 2:28 PM
To: Shauna Fernandes; Charles Burgess; David Stephenson; Eric Hodgins; Paul Neals; cea@cogeco.ca; Bryan Richardson (bryan.richardson@rjburnside.com); Charles Burgess
Cc: Elizabeth Howson

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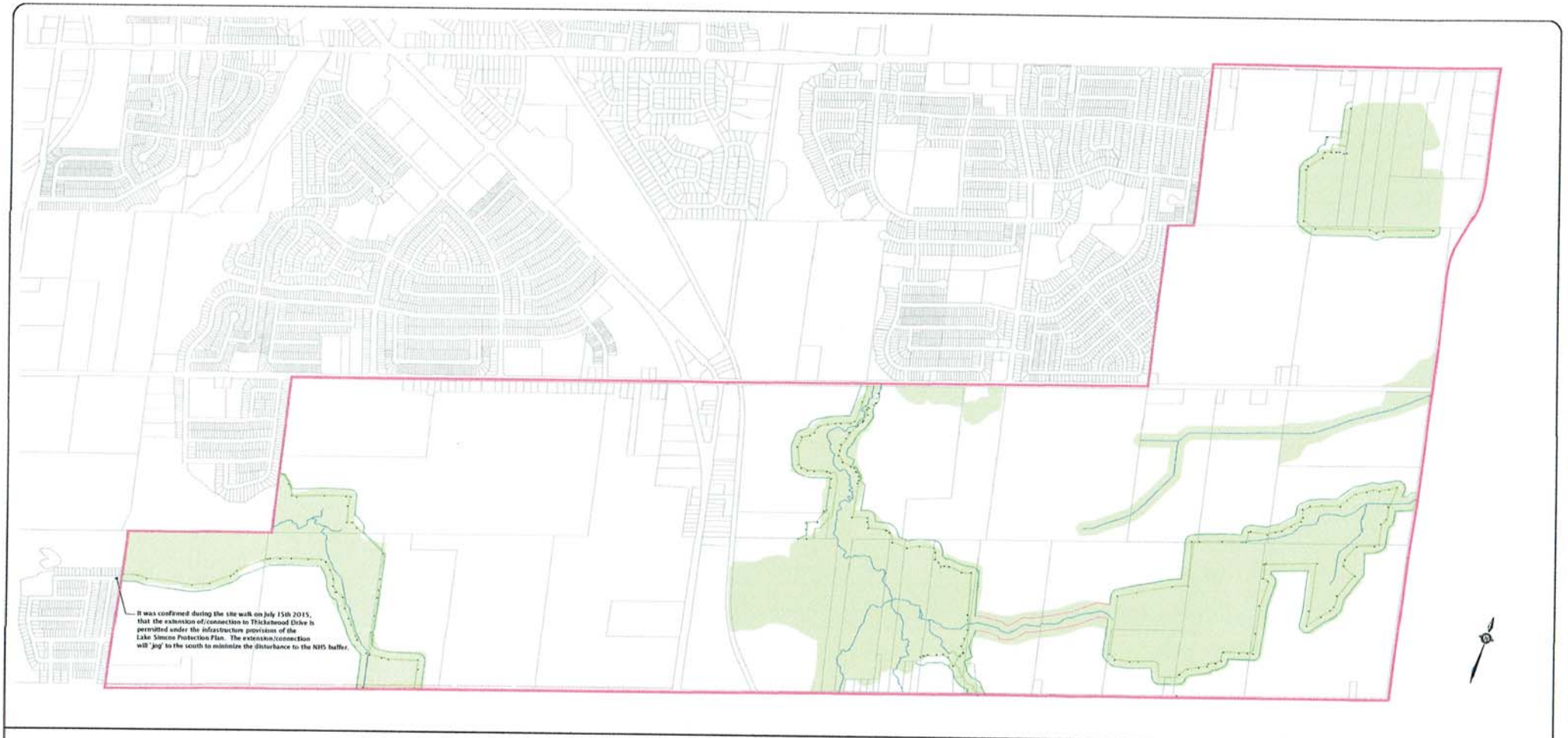

East Moratorium Lands

HS3 Staked / Surveyed Point Number

Natural Heritage System (Secondary Plan)

Proposed Natural Heritage System Buffers August 2015

Proposed Natural Heritage System Core August 2015

60m Linkage August 2015

Creeks / Streams

150 0 150 300 450 600 750m

SCALE = 1:7500 (A1)

HEWITT'S CREEK SECONDARY PLAN AREA

NATURAL HERITAGE SYSTEM

NATURAL HERITAGE SYSTEM

(Site Walk July 15 & 16, 2015)

EAST MORATORIUM LANDOWNERS GROUP
BARRIE, ONTARIO

Raymond J. Duhamel R.P.P.

Date Issued:	August 21, 2015
Checked By:	RD
Project No.:	EAS-11118
Drawn By:	mcd.
Drawing Name:	EAS-11118-NHS-August-2015.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

APPENDIX C

Provincial Background Information

Hewitt's and Salem Secondary Plan

Approach To Species At Risk Discussion

Minutes of Meeting

Meeting Date/Time: September 28, 2017 at 10:00 a.m.

Meeting Location: Midhurst District Office Trillium Room

Attendees: Graham Findlay, MNRF Management Ecologist
Megan Eplett, MNRF Management Ecologist
John Almond, MNRF Resources Operations Supervisor
Ken Mott, MNRF District Planner
Brad Allan, MNRF Resource Management Supervisor
Michael Michalski, Michael Michalski Associates
Lisa Moran, Azimuth Environmental
Brad Baker, Azimuth Environmental
David Cunningham, D.G. Cunningham & Associates
Paul Neals, Orion Environmental Solutions

The following is a summary of the issues discussed and commitments made by all parties to move the SAR approval process forward for the Hewitt's and Salem Secondary Plan. Please review and provide any comments you may have to ensure the minutes fully document the discussion.

1. Introduction and Purpose of the Meeting

    - Purpose of the meeting is to obtain MNRF comments on the Information Gathering Form (IGF) submissions for Hewitt's and Salem and determine the next steps to address SAR for the Phase 1 lands

2. Natural Heritage System

    - The process for establishing the Natural Heritage System (NHS) was explained to MNRF. NHS used the Natural Heritage Manual and applicable provincial policy as a guideline to assess the significance of the natural heritage features present
    - NHS undertook field work in 2011 and 2012 to assess the natural heritage features in the study area. This data was used to evaluate features and

functions, assess the impact of the proposed development and determine the features to be retained based on their ecological significance post development and the applicable natural heritage policies.

- The NHS was approved through the Ontario Municipal Board and it has been incorporated into the City of Barrie Official Plan, approved January 2017.
- Features that were excluded from the NHS (e.g., isolated woodlots) will be assessed in detail for the applicable draft plan submission to address Species at Risk (SAR), but there is no expectation that these studies will result in any isolated features being included in the NHS. SAR issues would be dealt with through compensation measures or permitting, if required.
- MNRF stated the isolated or outlier features have species and habitat protection for SAR regardless of the NHS assessment process. Salem's consultants (Michael/David) will be providing MNRF with their historical information on the two outliers in the southern part of the Salem secondary plan that are part of the recent draft plan submission.
- Draft plans for the Phase 1 lands have been submitted.
- Natural Heritage Evaluations in support of the draft plans have been submitted to City of Barrie and Lake Simcoe Conservation Authority and Nottawasaga Valley Conservation Authority.

3. Information Gathering Form Submissions

- MNRF indicated the IGF lacked sufficient detail on the field work and its relation to the draft plan for them to formally comment on the findings and the associated SAR approvals that may be required.
- It was explained the IGF was submitted prior to the development of the draft plans in an effort to move the process forward, although it should be noted that plans were submitted with the IGF forms for the Hewitt's lands. Each IGF for the Hewitt's lands included a key map, site map including ELC communities and locations of known SAR and a development plan. The IGF for the Salem lands included a key map, site map with ELC and locations of known SAR.
- The purpose of the IGF submission was to initiate discussions with MNRF to determine if sufficient data had been collected to date, determine whether additional studies were required and to establish one approach to SAR for both secondary plan areas to help advance the approval process. This would also give the Phase 2 and 3 proponents a process/document they can follow to obtain SAR approvals.

- It was confirmed that any future work in Phases 2 and 3 would require regard for the most current SAR listings.
- M. Eplett (Salem Lands) stated the IGF submissions should have included detailed mapping on species locations, the extent of habitat protection area in accordance with the provincial regulations/guidelines and the proposed measures to mitigate impacts and obtain approvals. Without this detail they cannot comment on specific properties and what is require for SAR approvals.
- G. Findlay (Hewitt's Land) indicated that information related to Butternut and SAR bats was lacking but he was able to comment on the IGF for each individual property.
- Consultants to provide MNRF with the priority for completion of their review for each of the draft plans.
- Consultants indicated that Phase 1 lands were first priority.
- MNRF will submit their comments on the IGF's with two weeks, providing comment on the information required to assess the species and the associated approvals.
- MNRF indicated the supporting information to the IGF for each draft plan should include mapping showing locations where SAR was observed and habitat limits, adjacent land use and potential habitat for the species, implications of the proposed development on the species and proposed actions required for compliance under ESA.
- Details of surveys completed in support of the EIS reports were included within the IGF Form. Additional information regarding the bat surveys is forthcoming.
- Azimuth is to prepare a draft example figure of the SAR mapping for MNRF review to ensure adequate detail is done in EIS submission.
- The SAR impacts should be assessed for each property but also include an assessment of the habitat in the surrounding landscape.
- MNRF told us if we do not receive any response to future submissions within 30 days we are to contact the individual Management Biologist and copy John Almond, MNRF Resources Operations Supervisor. MNRF is working to improve their response times.
- Midhurst is working on a new Background Information Request Form in an effort to help expedite the process, which will be issued Oct 1, 2017.
- MNRF stated any trails in the NHS or buffer need to have regard for the SAR. We indicated it is the City of Barrie's responsibility to define the trails and we recommended MNRF contact them to participate on that committee. We will provide the planner contact to MNRF for the individual draft plans.

4. Approach to Individual SAR

    - Concerns were expressed by the consultants over the length of the review process and the difficulty in working with the SAR evaluation processes (e.g., bats)
    - MNRF staff indicated the District Offices have no ability to alter the SAR evaluation processes even if they feel modifications are warranted to reflect the environmental conditions found in their District. MNRF head office establish the guidelines and they have no ability to alter them. All SAR assessments will be assessed having regard for the MNRF provincial guidelines and suggesting alternative approaches to the evaluation other than those is the approved guidelines is pointless.
    - Any change to the SAR guidelines must be done with MNRF head office and must be initiated by them. Midhurst District will not initiate or participate in that discussion.
    - ESA permits if required will take 6 – 12 months after Midhurst District staff confirm the application is complete. If the preliminary indication is a permit will be required start the process immediately. Provincial election in 2018 could dominate the Minister's schedule which could delay the signing of permits, hence the urgency to start the process.
    - Bobolink/Eastern Meadowlark have a permit exemption for areas up to 30ha in size. Compensating habitat needs to be provided.
    - MNRF has no jurisdiction over species of Special Concern beyond application of the timing window for tree removal or other works.

5. Next Steps

    - Azimuth to provide example of SAR mapping of field data and habitat protection areas for MNRF comment to ensure future EIS has adequate data.
    - Paul Neals to provide City of Barrie contact for trails to MNRF (completed).

Prepared by: Paul Neals

Ministry of Natural Resources and Forestry

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Ontario

October 25, 2017

Azimuth Environmental Consulting, Inc
642 Welham Road
Barrie, Ontario,
L4N 9A1

Attention: Lisa Moran, Terrestrial Ecologist

Subject: Information Gathering Form – Hewitt's Creek Secondary Planning Area, Barrie

Ms. Moran the Ministry of Natural Resources and Forestry (MNRF) has reviewed the Information Gathering Form submitted in support of the review process of the proposed developments within the Hewitt's Creek Secondary Planning Area in the City of Barrie.

The Information Gathering Form (IGF) is intended to provide the details of site evaluations in support of the MNRF determining if a proposed activity might cause a contravention of Section 9 and/or Section 10 of the *Endangered Species Act, 2007* (ESA). The information provided in Tables 2, 3 and 4 of the IGF generally lacked the detail necessary to fully support the MNRF's assessment of the biological inventory work and conclusions made.

Specific evaluation reports (e.g. Butternut Health Assessment report) are referenced as sources for site specific data. Summary of the evaluations and results should be available directly in the IGF. The directions within the IGF document indicate relevant information from source documents can be cut and pasted into the Tables.

The IGF presents ecological assessments for properties involving three Phases of development within the Hewitt's Creek secondary planning area. Table 1 of the IGF summarizes target dates related to implementation stages of the proposed three phases of development – e.g. earthworks proposed in 2018, 2020 and 2022 for Phases 1, 2 and 3 respectively. The IGF summarizes the preliminary SAR surveys completed on all properties regardless of the intended phase of construction within the planning area. Many of the surveys completed date back to 2012-2014. Given the potential lag in time since the initial SAR surveys and implementation of construction activities in later phases, as well as the potential for additional species being designated threatened or endangered on the Species At Risk in Ontario (SARO) list clarification is required related to what follow-up surveys for SAR and/or habitats identified in the present IGF, and for how species added to the SARO list will be addressed.

The explanations in Table 4 concerning interpretation of how protected SAR may be positively or negatively affected should more clearly detail how and to what extent SAR species or habitats will be affected. Similarly, the proposed compensations should more clearly detail what measures and under what direction of the ESA and its regulations the proposed compensations are recommended.

Conceptual site plans were provided for most properties discussed in the IGF, there was a general lack of discussion concerning the presence of SAR or their habitats as that relates to the proposed development footprints provided. For example, should the protective buffer around a butternut tree overlap the proposed development footprint, the IGF should clearly address if a contravention of Sections 9 and 10 of the ESA might occur, and how potential impact can be avoided or might be addressed.

Keeping the above points in mind the following provides comments specific to the individual properties addressed in the IGF.

PHASE 1 Properties

BEMP Holdings 2

Butternut

- MNRF habitat protection guidance (see attached) for butternut is a 50m radius buffer around each butternut regardless of size. The protective buffer should be presented in the maps for the BEMP Holdings 2 property. Identified habitats should be evaluated for direct or indirect impacts from development.
- Regarding the butternut trees identified in the hedgerow along the BEMP2/Lockmaple shared boundary consideration of the butternut trees is required from a BEMP Holdings 2 perspective given the protected habitat zone overlaps onto the BEMP2 property. Given the location of the noted butternut trees and associated habitats (within the 50m buffers) BEMP2 would be non-compliant with the ESA should construction activities proceed within the 50m protection zone prior to the Lockmaple development removing the trees as indicated in the IGF per the O.Reg. 242/08 Exemptions Requiring Notice To Be Given On Registry – Exemption 23.7 for butternut.

Lockmaple Innisfil Investments Inc.

Butternut

- Tables 2 and 3 reference a Butternut Health Assessment (BHA) report had been submitted to MNRF, details of the trees assessed in the BHA report should be provided in the tables (e.g. health category of the trees).
- The 50m protective buffer around each butternut tree should be presented in the maps of the IGF. Identified habitats should be evaluated for direct or indirect impacts from development.
- Clarify the explanations in Table 4 per the comments above.

SAR Bats

- Tables 2 and 3 identify ELC forest community FOD5-8 had been surveyed for bat maternity roost habitat, referencing an Azimuth 2012 report. A summary of the survey methods and results should be provided in the Table 3 and Figure 2 (e.g. sample plot locations, a summary of the cavity trees enumerated).
- It is concluded that SAR bat habitat was absent. The survey protocol used does not address potential habitat from a Species at Risk (SAR) bats and ESA perspective. Based on the available information it cannot be determine if SAR bat habitats will be damaged or destroyed by the proposed activity. We recommend the woodlands be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015 (attached). Potential habitats should be evaluated for direct and indirect impacts of development.

Rainsong Land Development

SAR Bats

- Table 2 does not indicate SAR bat habitat surveys had been completed, however Table 3 indicates potential summer bat maternity roost habitat may be on site. We recommend the woodland communities be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

Chrisdawn Construction (Phase 1 – north part and Phase 3 – south part)

Butternut

- Table 3 and Figure 2 identify three butternut trees in a forest unit (FOM7-2? This is not clear in Figure 2) in the Phase 1 lands. The supplemental mapping you provided on October 18, 2017 provided the 50m protection zone around each butternut tree. Although helpful to visualize the protection zones against the conceptual site plan an explanation regarding potential impacts to butternut habitat from development and implications under the ESA is required.

SAR Birds

- Table 3 indicates barn swallows were documented foraging during breeding bird surveys over both of the Phases 1 and 3 study areas; and nests were found on a house at the north end of Phase 1 study area. Supplemental mapping noted 2017 survey locations and results. This additional information should be provided in clearer detail within the appropriate sections of the IGF.
- Anthropogenic structures are identified in the south end of the Phase 3 study area, it is not clear that surveys for barn swallow nests at those locations have been completed. We recommend that prior to demolition of any buildings they be re-evaluated for SAR and habitats (e.g. barn swallows).

SAR Bats

- Table 2 does not indicate SAR bat habitat surveys had been completed, however Table 3 indicates forest and forest swamp habitats are on site, noting potential summer bat maternity roost habitat

may be present. We recommend the woodland communities be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

- There are a number of anthropogenic structures on the Phases 1 and 3 study areas. Tables 2 and 3 do not indicate any buildings were evaluated for the presence of SAR bats maternity roost habitat/function. Prior to demolition we recommend all buildings be evaluated at the appropriate season for the presence of SAR bat maternity roosts.

Blanding's Turtle

- A Blanding's turtle was confirmed in 2017 on a property north of the Chrisdawn properties, on the north side of Mapleview Drive. Recognizing the IGF was submitted to this office prior to that turtle's occurrence confirmation the IGF should address the potential for Blanding's turtles or their habitats to be present. We recommend the IGF evaluate the potential for Blanding's turtle and their habitats to be present on site (e.g. potential nesting habitat in the ELC community noted as Disturbed in Figure 2). Potential habitats should be evaluated for direct and indirect impacts of development.

LM Barrie Holdings Inc. – 2121191 Ontario Inc.

Butternut

- Table 3 indicates the presence of five butternut trees in the forest community FOD5-8 (NW corner of property). The 50m radius protection zone around each of the identified butternut should be shown on Figure 2 for the property. An evaluation of the proposed activity and potential for impacts to butternut habitat should be provided in order to determine potential ESA authorization requirements.

SAR Bats

- Table 3 indicates there are unconfirmed potential summer bat maternity roost habitats on site. Clarify why SAR bat habitats have not been evaluated. Are any potential habitats at risk of direct or indirect impacts from development?

Blue Sky Private Equity Inc.

Butternut

- Table 3 indicates a butternut was on site during the 2014 site surveys; however it was no longer present in 2016. Table 4 indicates the butternut was mistakenly removed. Clarify the explanations in Table 4 per the comment above.

SAR Bats

- Table 2 does not indicate SAR bat habitat surveys had been completed, however Table 3 indicates forest habitat is on site, and notes potential summer bat maternity roost habitat may be present. We recommend the woodland communities be evaluated for potential SAR bat maternity roost

habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

- Clarification is required concerning the ELC CUW1 community north of the forest community FOD5-2, and perhaps it should be included within the recommended bat habitat survey areas.

PHASE 2 Properties

BEMP Holdings 1

Butternut

- The 2014 surveys identified one butternut in the north end ELC mixed swamp community (SWM6-1). The 50m radius protection zone around the identified butternut should be shown on Figure 2 for the BEMP Holdings 1 property. An evaluation of the proposed activity and potential for impacts to butternut habitat should be provided in order to determine potential ESA authorization requirements.
- This property is in Phase 2 of the planning area development; clarify what additional surveys to confirm the presence of additional butternut on site might be necessary (e.g. potential regeneration of butternut over time). An evaluation of potential impacts to butternut habitat (i.e. the 50m protection zone) would be required at that time.

SAR Bats

- No surveys are noted for SAR bat maternity roost habitat on this property. Table 3 indicates SAR bat habitats are unconfirmed on site, however potential bat maternity habitat (summer) exist in forest communities FOD5-1, SWC3-1, SWM6-1 and SWD 7-1.
- The noted woodlands should be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

Lockhart Innisfil Investments Inc.

SAR Birds

- Table 3 notes an eastern meadowlark (threatened species) was documented during breeding bird surveys in 2014. Table 4 provides no discussion concerning the presence of meadowlark on site as that relates to the proposed development. The potential negative impact to the area it was found relative to the proposed site plan could be noted; and relating recommended follow-up surveys prior to the implementation of Phase 2 of the Secondary Plan.
- Potential summer nesting (silo on site) and foraging habitats were noted for barn swallow (threatened); one foraging barn swallow was observed during 2014 breeding bird surveys. We recommend that prior to demolition the silo be re-evaluation for species and habitats.

SAR Bats

- Table 3 indicates there are unconfirmed potential summer bat maternity roost habitats on site. Clarify why SAR bat habitats have not been evaluated. Are any such habitats at risk of impacts from development?

PHASE 3 Properties

Finger Lakes Estates Inc.

SAR Bats

- Table 3 indicates there are unconfirmed potential summer bat maternity roost habitats on site. Clarify why SAR bat habitats have not been evaluated. Are any such habitats at risk of impacts from development?

Chrisdawn-Phase 3 - property is addressed above.

Should you have any questions contact the undersigned at this office.

Yours truly,

Graham Findlay

Graham Findlay
Management Biologist
Huronia Resource Management Team,
Midhurst District

c.c. Mr. Paul Neals, Orion Environmental Solutions

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Enter map title

Notes:
Enter map notes

Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland
- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)
- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan
- Boundary
- River Valley Connections

Land Use Designations
- Protected Countryside
- Towns and Villages
- Hamlets
- Urban River Valley
- Specialty Crop Area

Niagara Escarpment Plan (NEP)
- Boundary
- Parks and Open Space System

Land Use Designations
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

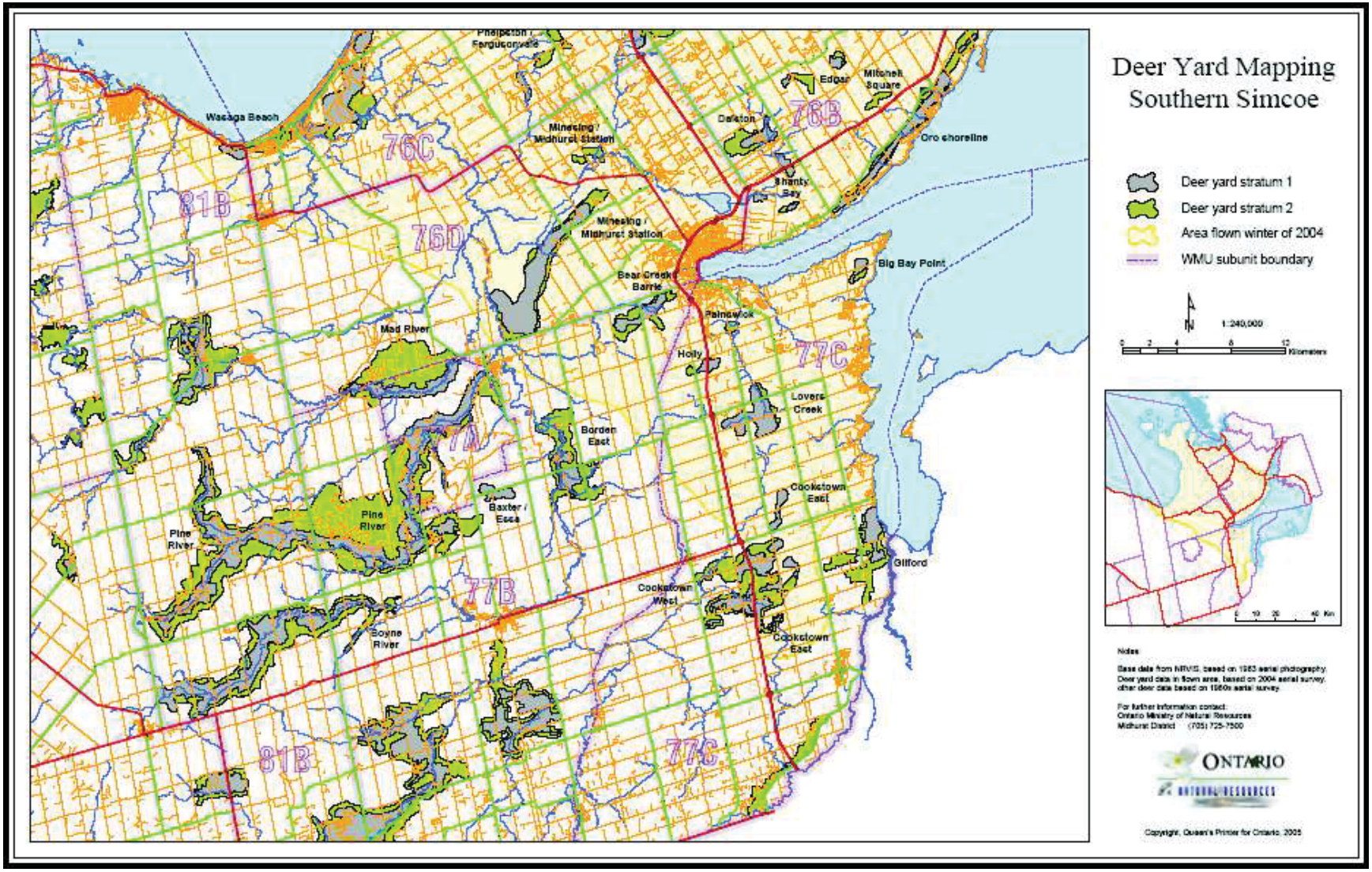
Oak Ridges Moraine Conservation Plan (ORM)
- Boundary

Land Use Designations
- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

0 0.3 km

Projection: Web Mercator

The Ontario Ministry of Natural Resources and Forestry shall not be liable in any way for the use of, or reliance upon, this map or any information on this map. This map should not be used for: navigation, a plan of survey, routes, nor locations.


Deer Yard Mapping
Southern Simcoe
Deer yard stratum 1
Deer yard stratum 2
Area flown winter of 2004
WMU subunit boundary
1:240,000
Kilometers
Wasaga Beach
Minesing / Midhurst Station
Edgar
Mitchell Square
Dalston
Oro shoreline
Shanty Bay
Big Bay Point
Bear Creek / Barrie
Painswick
Holly
Lovers Creek
Mad River
Borden East
Baxter / Essa
Cookstown East
Pine River
Gilford
Cookstown West
Soyne River
76C
76D
76B
77C
77A
77B
77G
81B
Notes
Base data from NRVIS, based on 1983 aerial photography.
Deer yard data in flown area, based on 2004 aerial survey.
other deer data based on 1980s aerial survey.
For further information contact:
Ontario Ministry of Natural Resources
Midhurst District (705) 725-7500
ONTARIO
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