



Natural Heritage Evaluation

750 Lockhart Road, Barrie, ON

MARCH 2019



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REPORT PREPARED FOR

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1.0 INTRODUCTION

Savanta Inc. (Savanta) was retained by Ballymore Homes to conduct a Preliminary Natural Heritage Evaluation (NHE) for the property located at 750 Lockhart Road, Barrie, Ontario, herein referred to as the Subject Lands (**Figure 1, Appendix A**). The Subject Lands consist of a single parcel of land within the Hewitt's Secondary Plan area.

The Subject Lands are proposed to be developed in two phases, with the northern portion of the Subject Lands consisting of residential units to be developed as part of Phase 1 of Hewitt's Secondary Plan area (the "Phase 1 Lands"). The southern parcel, consisting of medium/high density residential areas, will be developed as part of Phase 3 of the Hewitt's Secondary Plan area (the "Phase 3 Lands"). The two phases are separated by components of the City of Barrie's Natural Heritage System associated with the St. Paul's Swamp (IN5) non-Provincially Significant Wetland; however, the Secondary Plan anticipated development of a collector road connection through the Natural Heritage System (**Figure 2, Appendix A**).

The Preliminary NHE documented the key natural heritage features, key hydrologic features, and associated functions on and adjacent to the Subject Lands. The Preliminary NHE included a characterization of the existing natural heritage conditions, based on a series of inventories and analyses carried out in 2017 and 2018. Identified features were assessed to determine presence of key natural heritage and hydrologic features, and their associated functions on and adjacent to the Subject Lands. Where present, an assessment of potential impacts on any identified features was provided based upon the 2018 Draft Plan.

Since release of the Preliminary NHE in September 2018, the Ballymore Homes consulting team has had the benefit of attending a planning charrette with staff of the City of Barrie and Lake Simcoe Region Conservation Authority (LSRCA) in December 2018. Subsequently, KLM Planning Consultants (KLM) have prepared an updated Draft Plan, and SCS Consulting Group (SCS) and RJ Burnside (Burnside) have been able to advance preparation of the Functional Servicing Report (FSR) and Hydrogeological Assessment, respectively. In particular, these reports have provided guidance on the proposed stormwater management scheme, site servicing and grading, as well as Low Impact Development measures (LIDs) that may be suitable for use on these Subject Lands. In addition, Burnside's investigations have characterized the regional and local groundwater conditions under and surrounding these lands, and they have undertaken pre- and post-development water balance calculations to assess groundwater infiltration volumes across the Subject Lands. In combination, these studies have allowed Savanta to complete a more comprehensive assessment of potential impacts following implementation of the proposed Draft Plan. SCS notes however, that modifications to the road pattern, associated grading, and final pond design details may yet occur and Savanta will revisit components of the impact assessment at that time.

This work considers applicable provincial and municipal requirements and policies including reference to the natural heritage policies of the Provincial Policy Statement (PPS), associated Provincial guidance contained in the Natural Heritage Reference Manual (NHRM; MNR 2010), Lake Simcoe Protection Plan, City of Barrie Official Plan, and the Hewitt's Secondary Plan.

The study components to date have included:

- A review of existing background information, policies and legislation applicable to the Subject Lands in the regional context;

- A field review and description of the natural environmental features and functions on, and immediately adjacent to, the Subject Lands through the completion of various ecological surveys and inventories;
- Identification and delineation of key natural heritage features (KNHF) and key hydrologic features (KHF) in accordance with the Lake Simcoe Protection Plan;
- An evaluation of the sensitivity of the natural heritage features and their functions on the Subject Lands;
- A description of the proposed development based on the current Draft Plan from KLM;
- Identification and discussion of the impacts that could affect the KNHFs and KHFs as a result of the proposed development; and
- Recommendations for mitigation to avoid or minimize impacts.

2.0 NATURAL HERITAGE PLANNING CONSIDERATIONS

An assessment of the quality and extent of natural heritage features found on, and adjacent to, the Subject Lands and the potential impacts to these features from the proposed development applications was undertaken in association with the following agencies/legislation, policies and agency programs:

- The Provincial Policy Statement (PPS) (2014);
- Ontario *Endangered Species Act, 2007* (ESA);
- Lake Simcoe Protection Plan (2009);
- Hewitt's Secondary Plan, of the City of Barrie Official Plan;
- Lake Simcoe Region Conservation Authority; and
- Federal Fisheries Act.

2.1 Provincial Policy Statement

The PPS (2014) provides direction on matters of provincial interest related to land use planning and development. It "...supports a comprehensive, integrated and long-term approach to planning..." The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

This NHE addresses those policies that are specific to Natural Heritage (section 2.1) with some reference to other policies with relevance to Natural Heritage and impact assessment considerations and areas of overlap (e.g., those related to Efficient and Resilient Development and Land Use Patterns, section 1.1; Sewage, Water and Stormwater, section 1.6.6; Water, section 2.2; Natural Hazards, section 3.1).

Eight types of natural features are defined in the PPS:

- Significant wetlands;
- Significant coastal wetlands;
- Habitat of endangered and threatened species;
- Fish habitat;
- Significant woodlands;
- Significant valleylands;
- Significant Areas of Natural and Scientific Interest (ANSI); and
- Significant wildlife habitat (SWH).

Development and site alteration shall not be permitted in significant wetlands, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, significant wildlife habitat or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements. Development and site alteration may be permitted on lands adjacent to fish habitat provided it has been demonstrated that there will be no negative impacts on the natural feature or their ecological functions.

These are discussed in detail in section 5 of this report.

2.2 Ontario Endangered Species Act, 2007

The provincial ESA was developed to:

- Identify species at risk, based upon best available science;
- Protect species at risk and their habitats and to promote the recovery of species at risk; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA protects all threatened, endangered and extirpated species identified on the Species at Risk in Ontario (SARO) list. These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

Species at Risk are discussed throughout the report, including Natural Heritage Information Centre (NHIC) records, MNR records and species and/or their habitat observed during field investigations.

2.3 Lake Simcoe Protection Plan, 2009

The Subject Lands fall within the limits of the Lake Simcoe Protection Act, and therefore the Lake Simcoe Protection Plan (LSPP) applies to these areas. The LSPP generally applies to the Lake Simcoe watershed, which is defined in the Act as Lake Simcoe and any parts of the land in Ontario that drain into Lake Simcoe. The General Regulation made under the Act provides a description of the boundaries of the watershed.

The plan was developed to meet the following objectives:

- Protect, improve or restore the elements that contribute to the ecological health of the Lake Simcoe watershed, including, water quality, hydrology, key natural heritage features and their functions, and key hydrologic features and their functions;
- Restore a self-sustaining coldwater fish community in Lake Simcoe;
- Reduce loadings of phosphorus and other nutrients of concern to Lake Simcoe and its tributaries;
- Reduce the discharge of pollutants to Lake Simcoe and its tributaries;
- Respond to adverse effects related to invasive species and, where possible, to prevent invasive species from entering the Lake Simcoe watershed;
- Improve the Lake Simcoe watershed's capacity to adapt to climate change;
- Provide for ongoing scientific research and monitoring related to the ecological health of the Lake Simcoe watershed;
- Improve conditions for environmentally sustainable recreation activities related to Lake Simcoe and to promote those activities;
- Promote environmentally sustainable land and water uses, activities and development practices;
- Build on the protections for the Lake Simcoe watershed that are provided by provincial plans that apply in all or part of the Lake Simcoe watershed, including the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan, and provincial legislation, including the *Clean Water Act, 2006*, the *Conservation Authorities Act*, the *Ontario Water Resources Act*, and the *Planning Act*; and

- Pursue any other objectives set out in the Lake Simcoe Protection Plan.

Specifically, the LSPP focuses on restoring the health of aquatic life, maintaining and improving water quality, improving the overall ecosystem health and addressing the impacts of invasive species, climate change, and recreational activities. The LSRCA is legally required to ensure that management and development decisions conform to the policies in the LSPP.

Several policies of the Lake Simcoe Protection Plan were incorporated into the development of the Hewitt's Secondary Plan (i.e., the development of the Natural Heritage System addressed Policies 6.21-DP to 6.26-DP of the LSPP). However, this report is required to confirm compliance with LSPP Policies 6.27-DP to 6.29-DP relating to the establishment of buffers from Key Natural Heritage Features (KNHF) and Key Hydrologic Features (KHF). KNHFs identified within the LSPP include wetlands, significant woodlands, significant valleylands, and natural areas abutting Lake Simcoe. Moreover, KHFs identified within the LSPP include wetlands, permanent and intermittent streams, and lakes other than Lake Simcoe.

2.4 Hewitt's Secondary Plan

According to the Hewitt's Secondary Plan (2014) Schedule 9A (Community Structure), a portion of the property has been identified as being within the Natural Heritage System, with a proposed road connection through the Natural Heritage System adjacent to the existing railway tracks. Schedule 9B (Natural Heritage System Components) further identifies it as a Natural Core Area and High Constraint Stream Corridor Area. Regulatory Floodplain is also identified on the Subject Lands. Typically, development and site alteration within such areas are prohibited with the exception of those uses outlined in section 9.3.4 of the Secondary Plan, which includes infrastructure, such as the proposed collector road.

The remainder of the property is Residential Area.

As a part of the Hewitt's Secondary Plan process, a buffer of 30 m was established from the edge of wetlands and woodlands, and a 5 m buffer from an existing meadow or thicket that defines the boundary of the Natural Core Area.

2.5 Lake Simcoe Region Conservation Authority

The LSRCA conducts reviews of planning processes associated with future development of properties within its jurisdictional boundaries. In addition, the LSRCA provides planning and technical advice to planning authorities to assist them with fulfilling their responsibilities regarding natural hazards, natural heritage and other relevant policy areas pursuant to the Planning Act. In addition to their Regulatory responsibilities, the LSRCA provides advice as both a watershed-based resource management agency and through planning advisory services.

The LSRCA administers the Development, Interference with Wetlands, Alteration to Shorelines and Watercourse Permit process under the Ontario Regulation (O. Reg.) 179/06, which defined the areas of interest that allow conservation authorities to:

- Prohibit, regulate, or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland;

- Prohibit, regulate or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development; and
- LSRCA has established regulation limits adjacent to the watercourses that cross the Subject Lands and the wetland communities on the Subject Lands, with the exception of the former treatment lagoon and associated drainage channel, which are excluded from that limit.

Development or site alteration proposed within these lands requires an LSRCA-issued permit. The regulated lands are associated with the presence of wetland habitat and watercourses.

3.0 DATA COLLECTION AND ANALYSES

3.1 Background References

The following resources were reviewed for information relating to natural features and species that may be found on the Subject Lands:

- Land Information Ontario (LIO) database;
- NHIC database;
- Online Atlas Data;
- Aquatic species at risk distribution maps; and
- Other sources (e.g., subwatershed studies, watershed management plans, fisheries management plans).

The results of the background review are discussed in the following sections. This information assisted in defining the search effort and target species for studies on and immediately adjacent to the Subject Lands.

3.1.1 LIO Natural Features Summary

Based on the MNRF LIO geographic database, the natural heritage features listed below are found both on and adjacent to the Subject Lands (**Figure 2, Appendix A**):

- Woodland;
- Lover's Creek Swamp (IN4); and
- St. Paul's Swamp (IN5) – Evaluated Non-provincially Significant Wetland.

3.1.2 NHIC Database

The NHIC database (MNRF 2018) was searched for records of provincially significant plants, vegetation communities and wildlife on, and in the vicinity of the Subject Lands. The database provides occurrence data by 1 km² area squares, with two squares overlapping at least a portion of the Subject Lands (17PK0910 and 17PK1010). Within these squares, the search revealed one record: Snapping Turtle (*Chelydra serpentina*), which is listed as Special Concern on the SARO list.

3.1.3 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (Bird Studies Canada et al. 2006). The data are presented on 100 km² area squares with two squares overlapping a portion of the Subject Lands (17PK01 and 17PK11). It should be noted that the Subject Lands are a small component of the overall bird atlas square, and therefore it is unlikely that all bird species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in bird species presence and use.

The following species of interest were noted within the squares that overlap the Subject Lands:

- Species listed as Threatened or Endangered on the SARO list:
 - Bank Swallow (*Riparia riparia*);
 - Barn Swallow (*Hirundo rustica*);

- Eastern Meadowlark (*Sturnella magna*);
- Cerulean Warbler (*Setophaga cerulea*); and
- Eastern Whip-Poor-Will (*Antrostomus vociferous*).
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
 - Common Nighthawk (*Chordeiles minor*);
 - Eastern Wood-Pewee (*Contopus virens*);
 - Red-headed Woodpecker (*Melanerpes erythrocephalus*);
 - Canada Warbler (*Cardellina canadensis*); and
 - Wood Thrush (*Hylocichla mustelina*).

3.1.4 Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2018). The data are presented on 100 km² area squares with two squares overlapping a portion of the Subject Lands (17PK01 and 17PK11). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all herpetofauna species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

A total of 23 species was recorded in the atlas squares that overlap with the Subject Lands, of which four are salamander species, ten are frog and toad species, four are turtle species and five are snake species. Of these species, the following species of interest are noted:

- Species listed as Threatened or Endangered on the SARO list:
 - Blanding's Turtle (*Emydoidea blandingii*).
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
 - Snapping Turtle (*Chelydra serpentina*); and
 - Western Chorus Frog (Great Lakes/St. Lawrence – Canadian Shield Population) (*Pseudacris triseriata*).

3.1.5 Ontario Insect Atlas

The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2018a, 2018b) contain detailed information on the population and distribution status of Ontario butterflies and moths. The data are presented on 100 km² area squares with two squares overlapping a portion of the Subject Lands (17PK01 and 17PK11). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all butterfly and moth species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in butterfly and moth species presence and use.

No species of conservation concern were recorded in the atlas squares that overlaps with the Subject Lands.

3.1.6 Fisheries and Oceans Canada Review

Aquatic species at risk distribution mapping (DFO 2017a) was reviewed to identify any known occurrences of aquatic species at risk, including fish and mussels, within the subwatershed where the Subject Lands are located. The Subject Lands are located on Maps 4 and 5 (Ontario South West). DFO's Aquatic Species at Risk Distribution 2017 Open Maps Data Viewer (DFO 2017b) was also reviewed.

No aquatic species at risk were identified on or within 120 m of the Subject Lands or within the subwatershed.

3.2 Consultation and Agency Correspondence

3.2.1 Ontario Ministry of Natural Resources and Forestry (MNRF)

A request for information pertaining to species at risk and natural features on, and adjacent to, the Subject Lands was submitted to MNRF Midhurst District on January 16, 2018. This request included Savanta's assessment of species with the potential to occur on the Subject Lands based on a desktop review.

A response to this request was received on July 20, 2018. The response noted that the preliminary screening completed by Savanta was comprehensive. In addition to those species identified through the desktop review, MNRF noted the potential for occurrence of Butternut (*Juglans cinerea*) within the vicinity of the Subject Lands.

MNRF also provided the wetland evaluation record and associated mapping for the St. Paul's Swamp.

3.2.2 Lake Simcoe Region Conservation Authority (LSRCA)

The LSRCA was contacted to participate in a field staking of the limits of the Natural Heritage System on the Subject Lands. This staking occurred on November 14, 2017 with representatives of LSRCA and the City of Barrie in attendance. Following the site walk, a meeting was held at LSRCA on February 12, 2018 to discuss the results of the site walk and the scope of the NHE report. A planning charrette took place in December 2018 that involved staff of both the LSRCA as well as City of Barrie, and guidance from that meeting informed the preparation of the present Draft Plan.

3.3 Technical Methods and Field Studies

Ecological investigations were completed on the Subject Lands in 2018 by a team of ecologists with various specializations. These field investigations included Ecological Land Classification (ELC) and botanical inventories, breeding bird surveys, amphibian calling surveys, bat habitat assessment and acoustic monitoring surveys, and incidental wildlife observations. The surveys, dates and protocols employed are summarized in **Table 1 (Appendix B)**. The findings are discussed in the following sections.

3.3.1 Vegetation and ELC Methods

Vegetation communities were first identified on aerial imagery and then verified in the field. Vegetation community types were confirmed, sampled and revised, if necessary, using the sampling protocol of the ELC for Southern Ontario (Lee et al. 1998). ELC was completed to the finest level of resolution (Vegetation Type) where feasible. Species names generally follow nomenclature from the Database of Vascular Plants of Canada (Brouillet et al. 2010+).

The provincial status of all plant species and vegetation communities is based on NHIC (2016). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

3.3.2 Breeding Bird Survey Methods

Breeding bird surveys were conducted following protocol set forth by the Ontario Breeding Bird Atlas (Cadman et al. 2007) and the Ontario Forest Bird Monitoring Program (Cadman et al. 1998). Surveys were conducted between dawn and 5 hours after dawn with suitable wind conditions, no thick fog or precipitation (Cadman et al. 2007). Point count stations (shown on **Figure 3, Appendix A**) were located in various habitat types within the Subject Lands and combined with area searches to help determine the presence, variety and abundance of bird species. Each point count station was surveyed for 10 minutes for birds within 100 m and outside 100 m. All species recorded on a point-count were mapped to provide specific spatial information and were observed for signs of breeding behaviour. Surveys were conducted at least 10 days apart.

During breeding bird surveys, vegetation was assessed for potential presence of Species at Risk habitat. If suitable habitat was encountered for individuals were observed standard protocols were utilized (in consultation with MNRF).

Both the NHIC (2018) database and the SARO list (O.Reg. 230/08) were reviewed to determine the current provincial status for each bird species.

3.3.3 Amphibian Call-count Surveys (AMC)

These surveys followed standard protocols outlined in the Great Lakes Marsh Monitoring Program (BSC 2003). Surveys were conducted on warm nights with little wind. Surveys commenced one half hour before dusk and end before midnight. Visits were 15 days apart and as per protocols. The first occurred with a minimum nighttime air temperature of 5°C, the second visit with a minimum of 10°C and the third visit with a minimum of 17°C. If noise from plane, road traffic and/or trains was present, monitoring was delayed and began during a quiet period.

Each station (shown on **Figure 3, Appendix A**) was surveyed for three minutes and a three level call category system was used to identify the level and type of frog activity.

The standard call levels are:

- 1) Individual calls do not overlap and calling individuals can be discreetly counted;

- 2) Calls of individuals sometimes overlap but number of individuals can still be estimated; and
- 3) Overlap among calls seems continuous (full chorus) and a count estimate is impossible.

Anurans were recorded as within the station if they were within 100 m. All other species were recorded as incidental records heard outside the station.

3.3.4 Bat Habitat Assessment and Acoustic Monitoring

A bat habitat assessment, consisting of a cavity density survey, was completed on the woodland on the Subject Lands on January 26, 2018. The surveys followed the protocols identified in the MNRF guidance document *Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR 2011), as recommended in the *Significant Wildlife Habitat Technical Guide Ecoregion Criteria Schedule for Ecoregion 6E* (MNRF 2015). The protocol consisted of surveying 10 random plots (each 0.05 ha in size) within the SWM1-1b unit as that is the only feature that will be directly impacted by the proposed development. Within each plot, each tree containing suitable cavities, or peeling bark (preferred by the Tri-coloured Bat), had the following information recorded: UTM, species, DBH, approximate height, decay class, canopy cover, total number of cavities and height information for the top three cavities. Each tree was also photographed.

These results were then used to assess the quality of the area to provide bat maternity roost habitat, with areas with ≥ 10 cavity trees/ha determined to provide the highest quality bat maternity roost habitat in accordance with MNRF guidelines.

Bat acoustic monitoring surveys were recommended for the Subject Lands. These surveys enable, with reasonable certainty, the identification of bat species using analysis of sonographic characteristics from recordings of ultrasonic calls used by bats to echolocate.

Survey methods were developed based on professional experience and using a combination of MNRF survey guidelines as outlined in “*Bats and Bat Habitats: Guidelines for Wind Power Projects*” (MNRF 2011) and “*MNRF Survey Protocols for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, and Tri-Coloured Bat*” (MNRF 2017).

Surveys to detect bat species were carried out in June 2018 and were completed using Wildlife Acoustics Song Meter SM3BAT/SM4BAT recording devices over a duration of ten consecutive evenings.

Survey stations (shown on **Figure 3, Appendix A**) were selected based on aerial interpretation, Ecological Land Classification (ELC) vegetation community types, and ground-truthing for suitable bat micro-habitat such as clusters of ≥ 10 cm Diameter at Breast Height (DBH) trees with peeling bark, leaf clusters, and cavities. Due to the small size of the Subject Lands, one station was sited based on microhabitat conditions and locations of suitable roosting trees.

Passive acoustic recorders were programmed to begin recording at sunset and to end recording at sunrise. In addition, the SM3BAT/SM4BAT passive recorder microphones were elevated approximately 2 m above the ground to reduce background noise and echo.

All ultrasonic recordings were filtered to eliminate recordings with high levels of noise or with no bat calls, and then further analyzed using SonoBat’s auto-classification tool. All species of bats can make calls that range in frequencies and sonogram characteristics, depending on the

behavior at the time of call recording (i.e., social calls, foraging calls, feeding buzzes). Calls recorded during a bat's search phase are the most reliable for an accurate species identification, and these calls were used preferentially to identify recorded species from the Subject Lands.

Any calls with a positive identification were manually vetted by a wildlife ecologist with training in bat species identification by sonogram. Calls can be classified as not identifiable by the program due to the high level of confidence needed when classifying recordings, quality of the calls, overlap of multiple bat calls, and/or too much environmental background noise). The four species of bats listed on the SARO list all show characteristics of high frequency calling within the search phase, and therefore are readily distinguished from most other species of bats. High frequency calls that were not identifiable to species were also manually reviewed by a wildlife ecologist with training in bat species identification by sonogram to identify those calls with characteristics of Species at Risk bats (i.e. calls with frequencies greater than 40 kHz).

Both the NHIC (2018) database and the SARO list (O.Reg. 230/08) were reviewed to determine the current provincial status for each bat species detected.

4.0 BIO-PHYSICAL CHARACTERIZATION

4.1 Physiography

The Subject Lands gently slope towards the Natural Heritage System, and ultimately down to the watercourse predominantly east of the Subject Lands.

Soil Engineers Ltd. completed a soils investigation on the Subject Lands, with the results identifying that portions of the Subject Lands have been the subject of previous filling, ranging in depth from 1 to 3 m below ground surface. Beneath these layers sand, silt or sandy/silt till were encountered. The Subject Lands are situated on a generally shallow groundwater table, with groundwater was encountered at depths ranging from at the surface, to 4 m below ground surface.

Burnside's groundwater investigations identified that typically, in shallow wells in southern Ontario, a seasonal groundwater level fluctuation pattern is apparent with highest levels occurring in the spring, declining throughout the summer and early fall and then rising again in the late fall/early winter. This seasonal pattern is observed at the wells on the subject lands with season variations ranging from 0.8 m to 1.2 m. Burnside indicates that the groundwater table is interpreted to generally reflect the topography of the area.

4.2 Landscape Ecology

Figure 2 (Appendix A) depicts the Subject Lands within a larger landscape setting. The Natural Heritage System on the Subject Lands connects along the watercourse north to Lake Simcoe, and linkages have been proposed to connect with other natural features in the Hewitt's Secondary Plan Area. South of the Subject Lands agricultural communities predominate, with no connections to large natural heritage features evident.

At present, wildlife movement through the Natural Heritage System is well-sheltered through the Subject Lands, however wildlife corridors along Hewitt's Creek south of the Subject Lands are smaller and would provide less shelter for wildlife movement. These areas south of the Lockhart Road are identified as a component of the Natural Heritage System (Undifferentiated) of the Growth Plan for the Greater Golden Horseshoe Area. East of the St. Paul's Swamp, a linkage within the Natural Heritage System has been proposed to connect the St. Paul's Swamp with additional wetland and woodland communities east of the Subject Lands. Once fully implemented, these connections will provide significant opportunities for protected wildlife movement through the local and regional area.

4.3 Vegetation

4.3.1 Ecological Land Classification

The Subject Lands consist of a mixture of agricultural land and naturalized vegetation communities (predominantly swamp).

ELC mapping of the Subject Lands is shown on **Figure 4 (Appendix A)**. A detailed list and description of ELC units is provided in **Table 2 (Appendix B)**. No provincially rare vegetation communities were present on the Subject Lands (NHIC 2018).

4.3.2 Vascular Plants

Botanical inventories completed on the Subject Lands identified a total of 227 species of vascular plants. Of that number, 145 (or 64%) are native and 82 (or 36%) are exotic. A full species list is included in **Table 3 (Appendix B)**.

The majority of the native species (92%) are ranked S5 (secure in Ontario) and 11 species (8%) are ranked S4 (apparently secure in Ontario; NHIC, 2018). No species ranked S1 to S3 were observed. Four regionally rare plants were observed, as per the Simcoe Region rarity rankings (Riley 1989). None of the regionally rare species are considered rare in Ontario. None of the species recorded from the Subject Lands had a co-efficient of conservation value of 9 or 10.

An NHIC search was conducted for the Subject Lands using the MNRF Biodiversity Explorer. No plant species have been historically documented (within the last 20 years) on or in the vicinity of the Subject Lands.

4.3.3 Wetlands

The Land Information Ontario (LIO) database was accessed to determine if any wetlands known to the MNRF occur on or in the vicinity of the Subject Lands. Such wetlands could include PSWs, MNRF evaluated wetlands, unevaluated wetlands, or wetlands identified as “other”. The results of this search show that no PSWs occur on the Subject Lands; rather, a wetland identified as “other” does occur on the Subject Lands, occupying the majority of the naturalized vegetation communities. The designation of “other” indicates that the wetland was evaluated but did not receive a sufficient score to qualify as being Provincially Significant. This wetland was evaluated previously by staff from the Nottawasaga Valley Conservation Authority and accepted by the Ministry of Natural Resources and Forestry. The wetland is known as the St. Paul’s Swamp, and is the largest identified woodlot in the Hewitt’s Creek subwatershed (LSRCA 2012). It is suggested from previous hydrogeological works completed within St. Paul’s Swamp that it is fed by shallow groundwater discharge (NRSI 2012).

The next closest PSW (Lover’s Creek Swamp PSW) is approximately 940 m southwest of the Subject Lands.

An additional small, 0.13 ha wetland, was identified in the middle of the agricultural field on the Subject Lands (**Figure 4, Appendix A**). The Ontario Wetland Evaluation System states that wetlands should be mapped and considered only when greater than 0.5 ha or if they represent a specialized community. As this feature does not represent a specialized community, the mapping in **Figure 4 (Appendix A)** is provided for clarity, but does not warrant further assessment.

4.3.4 Invasive Species

The weediness index, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance (Oldham et al. 1995). While most species deemed to be exotic to Ontario have a weediness index value, some do not. Of the 82 exotic species present on the Subject Lands, 78 have a weediness index assigned by Oldham et al. (1995). Seventeen percent (or 13) of these species have an index of -3. This proportion of invasive species is not unusual, given the size of the Subject Lands and proximity to urbanized areas; none of the species appeared to dominate naturalized areas.

4.4 Wildlife

4.4.1 Breeding Bird Surveys

A total of 40 bird species were observed within the Subject Lands. Of this total, one species is confirmed, 21 are probable and 17 are possible breeders on the Subject Lands. The remaining bird species was considered a non-breeders or flyover. The observed breeding bird species are discussed in the sections below. All species observed on the Subject Lands are listed in **Table 4 (Appendix B)**.

All of the confirmed, probable or possible breeders are provincially ranked S5 (common and secure), S4 (apparently common and secure) or SNA (species not native to Ontario).

The following Species at Risk were observed on the Subject Lands:

- Barn Swallow: Threatened in Ontario;
- Wood Thrush: Special Concern in Ontario; and
- Eastern Wood-Pewee: Special Concern in Ontario.

Barn Swallows were confirmed as nesting within the barn on the Subject Lands. As a result, the barn is considered to be habitat for this species under the ESA.

Both Eastern Wood-Pewee and Wood Thrush were recorded within the large wooded swamps on the Subject Lands. The locations where these individuals were observed were along the eastern property boundary, away from the proposed road connection through the Natural Heritage System.

4.4.2 Amphibian Calling Surveys

No amphibians were recorded during the first round of amphibian calling surveys in April 2018, and by the time of the second round of amphibian calling surveys in May 2018, all surveyed areas no longer contained sufficient water depth to provide suitable breeding opportunities (**Table 5, Appendix B**).

As a result, amphibian breeding habitat is not found within the Natural Heritage System in proximity to the development lands.

4.4.3 Bats

Bat Habitat Assessment

A bat habitat assessment was completed within the woodland community on the Subject Lands.

The bat habitat assessment within the SWM 1-1b unit identified suitable bat roost trees within 4 of the 10 survey plots, with a total of 16 suitable bat roost trees identified. This would equate to a density of 32 roost trees per hectare, which is greater than the minimum 10 roost trees per hectare, and therefore the SWM1-1b unit was considered to be candidate habitat for significant bat maternity colonies.

Bat Acoustic Monitoring

Four bat species were confirmed to be present within the woodlands: Big Brown Bat (*Eptesicus fuscus*), Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Lasiurus cinereus*), and Little Brown Myotis (*Myotis lucifugus*). During the 48 detector nights of acoustic surveys, a total of 1099 recorded calls were low frequency calls and eight recorded calls were high frequency calls.

Of the 1099 low frequency calls recorded, 224 calls were confirmed to be Big Brown Bat, 29 calls were confirmed to be Silver-haired Bat, and 39 calls were confirmed as Hoary Bat. The remaining 807 low frequency calls were not identifiable to species (**Table 6, Appendix B**). Of the eight high frequency calls recorded, one call was confirmed as Little Brown Myotis. The remaining seven high frequency calls were not identifiable to species, but did not show Myotis characteristics (i.e., calls with frequencies greater than 40 kHz).

One species recorded is listed as Endangered on the SARO List: Little Brown Myotis, which was recorded once at station 8004C. Given that only one call was recorded during the entirety of the monitoring period, this suggests that the contact was likely incidental and not indicative of key habitat for the species. However, consultation is ongoing with MNRF to ensure compliance with the ESA.

4.4.4 Incidental Wildlife Observations

A total of 20 species were incidentally recorded on the Subject Lands during ecological surveys: seven mammals, one amphibian and twelve insects. All of the species are provincially ranked S5 (common and secure) or S4 (apparently common and secure) (NHIC 2018), except for Monarch (*Danaus plexippus*), which is listed as Special Concern in Ontario and was recorded in mid-July 2017.

All wildlife species recorded on the Subject Lands are listed in **Table 7 (Appendix B)**.

4.5 Fisheries

Along the eastern Subject Land boundary, is Hewitt's Creek, which is associated with St. Paul's Swamp (evaluated non-PSW). Information on the Hewitt's Creek watershed was obtained from the Barrie Creeks, Lovers Creek and Hewitt's Creek Subwatershed Plan (LSRCA 2012).

The catchment area of Hewitt's Creek is 17.5 km². The subwatershed is primarily dominated by agricultural land-uses with KNHF occupying approximately 20% of the area. Hewitt's Creek subwatershed is characterized as having little streambank cover, wetland area and interior forest area.

Hewitt's Creek is a coldwater tributary with warm water fish species found in the headwater features of the Subject Lands. Currently there are healthy populations of Brook Trout (*Salvelinus fontinalis*) and Mottled Sculpin (*Cottus bairdii*) that have been documented in Hewitt's Creek since 1975. A Hilsenhoff analysis indicates poor ecological integrity within the headwater features, while the rest of the aquatic system is classified as having mainly good or fair health. There is little alteration or fish barriers known within the aquatic system. Reaches upstream of Lockhart Road have been designated as Type F municipal drains, as this section of the aquatic system is not a permanent feature (it is dry >2 months of the year).

5.0 ANALYSIS OF ECOLOGICAL AND NATURAL HERITAGE SIGNIFICANCE (PPS/LSPP)

To help assess how natural heritage features are defined and how they relate to land development proposals, the Natural Heritage Reference Manual (NHRM; MNR 2010) was referenced to address the identification of natural heritage features with respect to the Natural Heritage Policies of the PPS and LSPP.

5.1 Wetlands

The LSPP considers all wetlands mapped in accordance with Ontario Wetland Evaluation System protocols to be KNHF/KHF, while the PPS only discusses significant wetlands.

As previously noted, the St. Paul's Swamp is present on and adjacent to the Subject Lands, and therefore does represent a KNHF/KHF per the LSPP.

In respect of the PPS, within Ontario, significant wetlands are identified by the MNRF or by their designates. The wetland on, and adjacent to, the Subject Lands (the St. Paul's Swamp) has been previously assessed by MNRF as a non-provincially significant wetland.

5.2 Significant Coastal Wetlands

Significant coastal wetlands are not present on or adjacent to the Subject Lands.

5.3 Habitat of Endangered and Threatened Species

Endangered and threatened species occurrences, and their habitats, are considered provincially sensitive information. The survey methods, results and potential impacts to these species and their habitats will be submitted to the MNRF Midhurst District through the Information Gathering Form (IGF) process. Due to the sensitive nature of this information, all correspondence and precise location-related information will remain with the MNRF. Two endangered species were recorded within the Subject Lands and are discussed below.

Barn Swallow

Barn Swallows are listed as Threatened in Ontario and Canada. Confirmed breeding evidence was recorded during breeding bird surveys on the Subject Lands as nests were observed within a barn structure. Additionally, suitable foraging habitat is present (i.e., agricultural lands and a mosaic of forested habitats) within the Subject Lands. Impacts to this species will be addressed under specific assessment by the MNRF through the IGF process.

Little Brown Myotis

Little Brown Myotis is listed as Endangered in Ontario and Canada due to the increasing mortality associated with white-nose syndrome. Little Brown Myotis was recorded once using passive acoustic bat detectors (SM3Bat) within St. Paul's Swamp. As noted previously, this low level of detection suggests incidental contact as opposed to the presence of regulated habitat. As a result, potential impacts on this species are not addressed further herein. However, this will be considered further under specific assessment by the MNRF through the IGF process.

5.4 Fish Habitat

Fish habitat, as defined in the federal Fisheries Act, c. F-14, means... spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly to carry out their life processes. Fish, as defined in s.2 of the Fisheries Act, c. F-14, includes parts of fish, shellfish, crustaceans' marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

Hewitt's Creek is considered to provide direct fish habitat. In addition, St. Paul's Swamp may contribute allochthonous materials to downstream reaches of Hewitt's Creek.

Hewitt's Creek is also considered to be a KHF.

5.5 Significant Woodlands

The City of Barrie Official Plan does not explicitly define significant woodlands and refers to the definitions contained in either the PPS or the LSPP. Both the PPS and the LSPP note that, significant woodlands should be defined and designated by the planning authority using criteria established by the MNRF, which are outlined in the NHRM.

Under the NHRM, woodlands are defined as *"treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels."*

In accordance with this definition, natural treed communities (FOC, FOD, FOM, SWC, SWD, SWM) and cultural forest/plantation communities (CUW, CUP) are considered woodlands (i.e., meet the Forestry Act woodland density requirements). Woodland patches are considered part of the same continuous woodland if they are within 20 m of each other.

The criteria suggested by the NHRM for designating significant woodlands include size, shape, proximity to other woodlands or natural features, linkages, species diversity, uncommon characteristics, and economic and social values. The woodland size criterion depends on the amount of forest cover in the planning area. For instance, where there is less than 5% forest cover, it is suggested that woodlands 2 ha in area or larger should be evaluated for significance compared to 4 ha in areas with 5% to 15% forest cover, and 20 ha for areas with 15% to 30% forest cover.

The woodland on the Subject Lands is considered to be a contiguous feature which also occurs off-site. Given that the overall woodland community is greater than 20 ha in size, provides interior forest habitat, encompasses Hewitt's Creek, and is part of a defined Natural Heritage System, it is determined to be a significant woodland community.

5.6 Significant Valleylands

Significant Valleylands should be defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM for Policy

2.1 of the PPS. Recommended criteria for designating significant valleylands include prominence as a distinctive landform, degree of naturalness, and importance of its ecological functions, restoration potential, and historical and cultural values.

No significant valleylands are identified on the Subject Lands.

5.7 Significant Areas of Natural and Scientific Interest (ANSIs)

An ANSI is identified in the NHRM as “areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education”.

A review of mapping from MNR’s LIO and NHIC databases did not indicate the presence of ANSIs within or adjacent to (within 120 m of) the Subject Lands.

5.8 Significant Wildlife Habitat (SWH)

SWH is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that discuss identifying and evaluating SWH including the NHRM (MNR 2010), the Significant Wildlife Habitat Technical Guide (MNR 2000), and the SWH Eco-Region Criterion Schedule (MNR 2015). The Subject Lands are located in Eco-Region 6E and were therefore assessed using the 6E Criterion Schedule (MNR 2015).

There are four general types of SWH:

- Seasonal concentration areas;
- Rare or specialized habitats;
- Habitat for species of conservation concern; and
- Animal movement corridors.

Table 8 (Appendix B) provides the detailed assessment of significant wildlife habitat based primarily on the Savanta 2017 and 2018 field data, and is summarized below.

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. Seasonal concentration areas include: deer yards; wintering sites for snakes, bats, raptors and turtles; waterfowl staging and molting areas, bird nesting colonies, shorebird staging areas, and migratory stopover areas for passerines or butterflies. Only the best examples of these concentration areas are usually designated as significant wildlife habitat. Areas that support Special Concern species or provincially vulnerable to imperiled species (S1-S3), or if a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant.

Of the seasonal concentration areas assessed, only bat maternity colony habitat was considered as present on the Subject Lands. This habitat feature was considered to be confirmed SWH given the relatively high number of Big Brown Bat calls recorded over the eleven nights of surveys (an average of 10/night). Though it is not possible to know based on acoustic data whether these

calls are made by separate individuals or a single individual, a conservative approach was applied in respect of confirming this habitat as SWH.

Rare or Specialized Habitats

Rare and specialized habitat are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the 'state', or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (extremely rare to rare-uncommon in Ontario), as defined by the NHIC (2018), could qualify. It is to be assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. The NHRM (MNR 2010) defines specialized habitats as those that provide for species with highly specific habitat requirements; areas with exceptionally high species diversity or community diversity; and areas that provide habitat that greatly enhances species' survival.

Of the rare or specialized habitats assessed, the woodland community was considered to be candidate seeps and springs habitat given the high groundwater table evident on the Subject Lands, and reports that the wetland community is groundwater fed. Though no seeps and springs were confirmed during baseline investigations on the Subject lands, it is considered likely that the woodland as a whole contains at least 2 such features.

Habitat for Species of Conservation Concern

Species of conservation concern include those that are provincially rare (S1 to S3), provincially historic records (SH) and Special Concern species. Several specialized wildlife habitats are also included in this SWH category, i.e., terrestrial crayfish habitat and significant breeding bird habitats for marsh, open country and early successional bird species.

Habitats of species of conservation concern do not include habitats of endangered or threatened species as identified by the ESA. Endangered and threatened species are discussed in section 5.3.

Of the special concern species identified on the Subject Lands, portions of the woodland community on the eastern limit of the Subject Lands, and off-site to the East are confirmed as significant habitat for species of conservation concern for both Eastern Wood-Pewee and Wood Thrush. Though Monarch were noted once on the Subject Lands, the extent of available habitat is small and associated with the cultural meadow communities that are subject to occasional disturbance associated with the ongoing agricultural operations on the Subject Lands.

Animal Movement Corridors

Animal movement corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements, including areas used by amphibians between breeding and summer/over-wintering habitats, called amphibian movement corridors. As neither significant deer wintering habitat nor amphibian breeding habitat were confirmed on the Subject Lands, no further assessment was required.

5.9 Summary of PPS/LSPP Ecological Components Subject to Impact Assessment

An analysis of existing natural heritage features on the Subject Lands was completed, followed by an evaluation of their significance against criteria in the SWH Technical Guide and Ecoregion 6E Criteria Schedule, as well as under criteria recommended in the NHRM.

The results of this analysis identified the following significant natural heritage features as present, within and/or adjacent to the Subject Lands. These features were therefore carried forward to the impact assessment presented in section 7:

- PPS:
 - Habitat of Endangered and Threatened Species (Barn Swallow);
 - Significant Woodlands;
 - Fish Habitat; and
 - Significant Wildlife Habitat:
 - Bat Maternity Colonies;
 - Seeps and Springs; and
 - Habitat of Special Concern Species (Eastern Wood Pewee and Wood Thrush).
- LSPP:
 - KNHF:
 - Evaluated Non-PSW (St. Paul's Swamp); and
 - Significant Woodlands.
 - KHF:
 - Evaluated Non-PSW (St. Paul's Swamp); and
 - Hewitt's Creek.

6.0 DESCRIPTION OF PROPOSED DRAFT PLAN

As previously noted, the Subject Lands are proposed to be developed in two phases. The first phase will be developed as part of the Phase 1 Lands of the Hewitt's Secondary Plan, while the second phase will be developed as part of the Phase 3 Lands of the Hewitt's Secondary Plan. The Phase 1 lands are located north of the central natural heritage area and will consist of low density residential with associated roads. The remaining lands are considered Phase 3 lands and are located south of the natural heritage area and are composed of the following land uses:

- Medium density residential;
- High density residential;
- SWM facility block, and
- Proposed roads.

A Draft Plan for the Phase 1 and Phase 3 lands has been developed and is shown on **Figure 5 (Appendix A)**. The Draft Plan proposes 87 townhome units within Phase 1 and has been designed to respect the identified buffers from the staked limits of the Natural Heritage System to the greatest extent possible. The arrangement within the Phase 1 lands is dictated primarily by the Draft Plan-approved locations of road connections to the lands to the north, as well as the required collector road (Kneeshaw Drive) that will cross through the western portion of the Natural Heritage System to connect to the Phase 3 lands, south of Phase 1. In an effort to protect the buffers to the Natural Heritage System on the east side of the Phase 1 lands, Ballymore has reduced the width of the local access road (identified as "Street 2" on the Draft Plan) and the depth of the lots east of the collector road to the greatest extent possible. This will result in an average buffer of 30 m from the Natural Heritage System, however given the constraints identified above, a net loss of 240 m² from the buffer will occur within Blocks 13 through 16, as shown on **Figure 5 (Appendix A)**. The buffers will be planted with natural self-sustaining vegetation, though LID's may be incorporated within the outer 15 m of the buffers.

Along the southern limits of the Phase 1 lands, the Draft Plan now depicts the presence of the east-west alignment of Kneeshaw Drive, which will direct traffic up into and out of Phase 1 and which then will connect to the Phase 3 lands via the north-south portion of the road. Through the Planning Charrette in December 2018, it was agreed that the collector road would be aligned as close to the western property boundary as permissible to ensure that impacts on the Natural Heritage System are restricted to an existing edge and will not result in the creation of an isolated fragment from the system. In terms of road width, the Draft Plan identifies a standard 24 m road allowance as per the City of Barrie's requirements. Consideration had been discussed during the Charrette regarding the potential to provide a reduced road cross-section to further limit encroachment into the natural heritage system, however, it was ultimately determined that the standard ROW would be required. The alignment of Kneeshaw Drive through the Phase 1 lands, and along the north-south alignment through the Natural Heritage System, will ultimately result in a loss of 0.413 ha from the Natural Heritage System.

Within the Phase 3 lands, Kneeshaw Drive again travels in an east-west direction, before ultimately turning south to connect with Lockhart Road. Widening of Lockhart Road is currently being assessed by the City of Barrie, and is subject to a municipal class Environmental Assessment. This study has determined that based on the overpass requirements for the GO Transit rail line, the connection between Kneeshaw Drive and Lockhart Road will need to be

situated at the extreme eastern edge of the property. As a result, an additional 0.119 ha encroachment into the Natural Heritage System will be required at this location.

As described above, and depicted on **Figure 5 (Appendix A)**, the FSR identifies that the Phase 3 lands are proposed to be a mixture of medium and high density residential development accompanied by a stormwater management pond along the northern extent of the Phase 3 lands. The FSR indicates that the SWM pond will provide 80% TSS removal per MECP criteria. In addition, the proposed LID's, as described within the FSR will provide additional quality control via a treatment train approach.

Development of the Phase 3 lands will require removal of the small isolated wetland within the agricultural fields. Additional consultation with LSRCA will occur through the detailed design phase in order to ensure compliance with O.Reg. 179/06.

7.0 IMPACT ASSESSMENT, MITIGATION, ENHANCEMENT OPPORTUNITIES, and Community Benefit Plan

This section of the NHE assesses the potential effects on the identified natural heritage features, KNHFs and KHF that could occur over the short-term and long-term following implementation of the Concept Plan. It also suggests appropriate mitigation measures to limit negative impacts and/or to enhance features and functions where practical. See **Table 9** below (Predicted Effects, Mitigation, Enhancement and Net Effects). Finally, this section also speaks to the components of a Community Benefit Plan that identify how the required 30m buffers can be generally achieved through averaging within the Phase 1 lands while also achieving benefits to the Phase 1 Plan.

7.1 Habitat of Endangered and Threatened Species (Barn Swallow)

Barn Swallow breeding habitat was identified in association with one of the structures on the Subject Lands that will be removed to support the development of the Phase 3 lands.

7.1.1 Impact Assessment

The structure that provides the nesting habitat will be removed to accommodate development on the Phase 3 lands. At this time, it is anticipated that a registration under O.Reg. 242/08 under the ESA will occur to permit the removal of this structure. A compensation habitat will be constructed and installed within the buffer to the Natural Heritage System. This structure will provide replacement nesting habitat for Barn Swallow and will be situated immediately adjacent to the foraging habitat associated with the St. Paul's Swamp. As a component of the registration under O.Reg. 242/08, the structure will be monitored following construction and removal of the barn to assess use by Barn Swallows.

7.2 Fish Habitat/Hewitt's Creek

The Phase 1 lands are a minimum of 170 m from Hewitt's Creek, while the Phase 3 lands are located more than 300 m from the main channel of Hewitt's Creek, and approximately 50 m from the tributary which passes east of the Subject Lands.

7.2.1 Impact Assessment

7.2.1.1 Construction Impacts

Potential indirect impacts during construction on Hewitt's Creek and the associated fish habitats include:

- Erosion and sedimentation from the construction area;
- Effects due to stormwater management during construction;
- Effects during the construction of the southeastern leg of Kneeshaw Drive, extending north from Lockhart Road; and
- Accidental spills (e.g., fuel or oil from machinery) with transport of spilled material to watercourses.

Each of these potential impacts is discussed in the following sections.

Table Predicted Effects, Mitigation, Enhancement and Net Effects

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
PPS NATURAL HERITAGE FEATURES						
1. Significant Wetlands	The wetlands on the Subject Lands were previously evaluated, and determined not to be provincially significant wetlands	N/A	N/A	N/A	N/A	N/A
2. Significant Coastal Wetlands	Not Present/not applicable	N/A	N/A	N/A	N/A	N/A
3. Significant Woodlands	The following ELC vegetation communities were assessed to determine their significance on the landscape: - FOM (Mixed Forest) - SWM (Mixed Swamp) - SWM1-1a and SWM1-1b(White Cedar-Hardwood Mineral Mixed Swamp) Patch sizes were measured and each patch was considered in terms of the presence of other indicators for potential significance. One significant woodland is identified on the Subject Lands within the Key Natural Heritage Feature (KNHF)/Natural Heritage System (NHS) that is associated with St. Paul's Swamp as shown on Figure 5 (Appendix A). The woodland on the Subject Lands is considered to be significant under the Natural Heritage Reference Manual (NHRM) criteria, as it is greater than 20 ha in size, provides interior forest habitat, encompasses	Potential impacts to the Significant Woodland includes the following: - Direct removal of woodland vegetation in associated with the installation of the proposed collector road - Vegetation clearing adjacent to significant woodlands to facilitate construction of the proposed development; - Development and site alteration adjacent to slopes within woodlands; - Increased pedestrian use of the woodlands; - Increase in lighting from residential development; and, - Construction activity adjacent to dripline.	Without mitigation, the following effects to the Significant Woodland is predicted to occur given the proposed development: - Direct loss of 0.5 ha of woodland vegetation - Potential alterations in water balance within woodlands from adjacent site alteration and development; - Wildlife disturbance due to increase in human access in the woodland – invasive species transport is likely; - Wildlife disturbance due to increase in light penetrating the woodland; - Potential construction-related impacts from on-site grading and other machinery including: - Soil compaction and potential for micro-drainage changes that could cause localized ponding and	With the exception of the collector road identified in the Hewitt's Secondary Plan, the proposed development plan respects the NHS (see Figure 5, Appendix A). An average 30 m vegetated buffer will be planted along the extent of the NHS to protect the integrity of the Significant Woodland and St. Paul's Swamp. The 30 m vegetated buffer will be measured from the staked dripline. LID measures proposed to maintain water balance. Native species plantings (shrubs and trees) will be established within vegetated buffer zones. Native thorny shrubs (i.e., raspberry species – <i>Rubus ssp.</i>) will be installed throughout the vegetated buffer to discourage pedestrian access. New lighting along the streetscape will be directed away from the natural vegetation communities to limit impacts to wildlife activity.	A minor removal from the edge of the woodland will occur, however overall the feature will increase in size once vegetated buffers mature. No negative effects on ecological function are anticipated.	Construction monitoring to ensure that woodland setbacks are maintained, and that tree protection fencing and ESC measures functioning.

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
	Hewitt's Creek and is a part of a defined NHS.		- inundation of rooting systems; - Introduction of non-native plant species throughout disturbed margins of the development footprint – displacement of some native flora is possible; - Stress/dieback (root impact, contaminants, increased sediment).	Tree protection fencing, and erosion and sediment control (ESC) measures will be installed adjacent to all natural heritage features and aide in eliminating excess disturbance through vegetation removals, ground disturbance and dislodgement of sediment. Heavy equipment use will be managed to prevent inadvertent damage to woodlot features and transportation of non-native and invasive species.		
4. Significant Valleylands	Not Present/not applicable	N/A	N/A	N/A	N/A	N/A
5. Significant Wildlife Habitat	The following SWH types are confirmed on the Subject Lands: - Bat Maternity Colonies; - Seeps and Springs; and, - Species of Conservation Concern (Eastern Wood Pewee and Wood Thrush) Habitat. All SWH types are found within the St. Paul's Swamp NHS.	Minor encroachment into the bat maternity colony SWH associated with installation of the proposed collector road. No direct impacts to Eastern Wood-Pewee and Wood Thrush are anticipated as the identified locations of these species are more than 100 m from the proposed location of the collector road. The proposed residential development will be 30 m from the remainder of the NHS. The NHS will not be removed from the landscape, therefore habitat for all SWH types will remain on the landscape. Potential indirect impacts include:	Minor encroachment into the bat maternity colony SWH associated with installation of the proposed collector road Potential indirect effects include: (1) Increased soil disturbance: - Soil compaction reduces the pore space within soils, limiting what plant species are able to root in the substrate - Colonization of invasive species on disturbed soils (2) Loud Disturbances: - Disturbance of wildlife patterns and behaviours (i.e., interfere with bird breeding calls)	- Bat boxes to be installed within the buffer to the NHS to provide alternate habitat for any maternity colony trees that are removed. - Tree protection fencing, and erosion and sediment control measures will be installed along the limits of the NHS to protect the integrity of the feature and eliminate excess disturbance from ground disturbance and dislodgement of sediment. - Noise associated with construction is only temporary and will have short term impacts on wildlife behavior. The development limit will be within 30 m of the NHS. Wildlife in this area will be somewhat tolerant of anthropogenic	No negative effects are anticipated.	Construction monitoring to ensure the effectiveness and maintenance of the erosion and sediment control measures.

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
		- Short-term impacts (i.e., related to construction activities) - Increased soil disturbance (e.g., soil compaction or erosion) - Loud disturbances Potential long-term impacts (i.e., related to residential development) include: - Increased pedestrian usage - Introduction of pets - Increased traffic - Increased lighting	- Temporarily vacate habitats near construction Indirect effects from long-term impacts could include: (1) Increased pedestrian usage: - Increased invasive species transport - Degradation of surrounding vegetation (2) Introduction of pets: - Predation of wildlife (i.e., bird nests) (3) Increased traffic - Injury or mortality of wildlife crossing roadways - Increased road runoff (decrease water quality) (4) Increased lighting: - Disrupt wildlife behaviours (i.e., disturb day/night cycles) - Shade tolerant vegetation unable to prosper in areas of intense light	disturbance due to existing noise from nearby rail line and roadways. - Native plantings (shrubs and trees) will be planted within vegetated buffer zones protecting the NHS. Native thorny plant material (i.e.g, raspberry species – <i>Rubus spp.</i>) will be installed at strategic locations to discourage access into the NHS by humans and pets. - New lighting along the streetscape will be directed away from the NHS to limit impact to wildlife activity.		
6. Fish Habitat	No headwater drainage features were identified on the Subject Lands during ecological studies. St. Paul's Swamp contributes flows to Hewitt's Creek (indirect fish habitat). Phase 1 lands are a minimum of 170 m from Hewitt's Creek, while the Phase 3 lands are located more than 300 m from the main channel of Hewitt's Creek, and approximately 50 m from the tributary which	No direct impacts to Hewitt's Creek are anticipated as it is removed from the development footprint (see Figure 5, Appendix A). Indirect impacts associated with site alteration and development include: Use of heavy equipment during construction and associated potential for accidental spills of potentially toxic	Erosion and sediment from the disturbed work area during construction could result in increased turbidity and suspended solids within the watercourse. Increased sediment load could cause negative effects on fish habitat (e.g., infilling of interstitial spaces in riffles, deposition of a thin layer of sediment over aquatic vegetation) and mortality, health effects or altered behaviour of aquatic biota	Erosion and sediment control measures will be used throughout construction to avoid/minimize the potential for negative effects on fish habitat. A spill prevention and response plan will be prepared and implemented to identify measures to avoid negative effects due to accidental spills during construction. Should pumping of groundwater be required during excavation, discharge	Hewitt's Creek is approximately 200 m removed from site alteration and development. Therefore, there is no negative effects anticipated. Potential for effects due to erosion and sedimentation and/or accidental spills within St. Paul's Swamp (which contribute flows to Hewitt's Creek) will be minimized. Water quality will be maintained or enhanced	A construction monitoring program) will be developed and implemented to ensure that the ESC measures are installed correctly and maintained in good working order throughout construction. Monitoring of adherence to and effectiveness of the spill prevention and response measures is recommended throughout the construction period.

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
	passes east of the Subject Lands. Along the eastern Subject Land boundary is Hewitt's Creek, which provides direct fish habitat to a warm water fish assemblage. Hewitt's Creek is considered to be a coldwater tributary. Reaches upstream of Lockhart Road have been designated as Type F municipal drains.	materials (e.g., fuel, oil, hydraulic fluid); - Disturbance and transportation of suspended sediment; - Changes in surface water runoff and groundwater infiltration due to increased imperviousness with potential alteration in surface water quality and quality in Hewitt's Creek; and, - Construction and operation of SWM infrastructure on the Phase 3 lands.	(fish and benthic macroinvertebrates). Accidental spills during construction could impair water quality and have negative effects on aquatic biota and vegetation. Alteration in water delivery (e.g., timing, volume of discharge) to the watercourse via surface and /or groundwater pathways due to changes in stormwater runoff and infiltration could potentially result in negative impacts on fish habitat. Positive effects to surface water quality in Hewitt's Creek could occur as the stormwater management infrastructure will reduce the total suspended solids prior to release into the creek, compared to existing surface water runoff from agricultural fields. Pumping of groundwater from excavations may be required, depending on the depth of excavation and groundwater level at the time. If pumping is necessary, negative impacts to water quality and increased water quantity may occur. Increased erosion may result within Hewitt's Creek.	and mitigation measures will be identified to ensure that discharge water does not erode the soils at the immediate discharge location. Implementation of effective mitigation is anticipated to prevent adverse effects on Hewitt's Creek.	through treatment in SWM infrastructure compared to runoff from existing agricultural fields. No net effects on fish habitat are anticipated due to changes in surface water or groundwater conveyance and infiltration provided water balance is maintained through the use of SWM strategies.	

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
7. Habitat of Endangered and Threatened Species	One Threatened species in Ontario and Canada was observed within the Subject Lands: Barn Swallow (<i>Hirundo rustica</i>). Potential impacts to Barn Swallow will be addressed directly with the Province through the Endangered Species Act Information Gathering Form.	N/A	N/A	N/A	N/A	N/A
8. Significant Areas of Natural and Scientific Interest	Not Present/not applicable	N/A	N/A	N/A	N/A	
OTHER PROVINCIAL PLANS						
1. Lake Simcoe Protection Plan	KNHF and Key Hydrological Features (KHF) are found on the Subject Lands, including: • Evaluated Non-PSW (St. Paul's Swamp); • Significant Woodlands; and, • Hewitt's Creek. As discussed above, no direct removals of KNHF and KHF will occur on site. Hewitt's Creek is removed from all development activity, as it is located along the eastern most Subject Land boundary and is buffered by St. Paul's Swamp.	Potential indirect impacts associated with development and site alteration of adjacent lands to KNHF and KHF may include: • Development and site alteration adjacent to significant woodland/St. Paul's Swamp; • Increased pedestrian use of the woodlands; • Increased lighting from residential development; and, • Construction activity adjacent to dripline.	Predicted effects would be as identified with respect to Significant Woodland and Significant Wildlife Habitat.	Avoidance, mitigation and/or restoration measures would be as identified with respect to Significant Woodland and Significant Wildlife Habitat.	No negative impacts are anticipated.	Construction monitoring to ensure the effectiveness and maintenance of erosion and sediment control measures.
OTHER FEATURES AND FUNCTIONS						
1. Other Wetlands	St. Paul's Swamp (IN5) is a non-provincially significant wetland, but is also identified as a KNHF and KHF within the Lake Simcoe Protection Plan. This feature was previously discussed in relation to the LSPP	Development of the Subject Lands.	Direct removal of the small wetland on the Subject Lands.	Consultation with LSRCA will occur to ensure compliance with regulatory requirements.	Removal of a small agricultural wetland that is providing limited ecological function.	None required

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
	A small isolated wetland is also present within the agricultural fields in the Phase 3 Lands					
2. Environmentally Significant Areas	Not Present/not applicable	N/A	N/A	N/A	N/A	N/A
3. Other - Presence of Species Under the Migratory Birds Convention Act	The federal <i>Migratory Birds Convention Act</i> (MBCA) prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or the damaging, destroying, removing or disturbing of nests.	During construction, tree removal, migratory birds, and eggs and nests of these birds could inadvertently be harmed.	Inadvertent harm to migratory birds or their eggs or nests.	Any tree or vegetation removal should occur outside of the migratory bird-nesting window of April 1 – August 31 (approximate). In rare circumstances where this window cannot be avoided, a nest search is recommended and a buffer will be marked off surrounding any active nests that must be maintained until activity in the nest has ceased.	With the implementation of the mitigation measures, no net effect is anticipated.	None

Erosion and Sedimentation

Erosion and sedimentation from the disturbed work area associated with the proposed development could potentially result in adverse effects to water quality (e.g., increased turbidity) or sedimentation and associated effects on fish/amphibians (e.g., injury or mortality due to suspended sediments or altered habitat use) or fish/amphibian habitat (e.g., loss of interstitial spaces in rocky areas, smothering of aquatic vegetation and/or incubating eggs).

It is recommended that the contractor prepare and implement an Erosion and Sedimentation Control (ESC) Plan to minimize the potential for erosion and sedimentation from the construction site. The ESC Plan should be developed based on the guidance provided in the *Erosion and Sediment Control Guideline for Urban Construction* (GGHCA 2006). Basic elements of the plan should include consideration of:

- Requirements and timing for rehabilitation of disturbed areas;
- Stormwater management strategies during construction;
- Erosion prevention measures (e.g., hydroseeding, sodding, erosion control matting, tarping of stockpiles, placement of stockpiles more than 30 m from the watercourse);
- Sedimentation control measures (e.g., silt fences and other barriers); and
- Inspection and performance monitoring requirements and adaptive management considerations.

Implementation of an effective ESC Plan, incorporating both erosion and sedimentation controls, coupled with regular inspection and performance monitoring and implementation of any remedial actions necessary to ensure effective performance, is anticipated to be largely effective in preventing the movement of eroded soil particles off-site towards Hewitt's Creek or the adjacent tributary to the east.

However, should erosion and off-site sedimentation occur during the construction process, the identified separation from the watercourse will assist in mitigating potential effects on fish and amphibians, and their habitat. In addition, though detailed planting plans for the buffer areas have not been prepared to date, once prepared and established, the buffers would be expected to promote retention and infiltration of surface water and filtration (through settling) of suspended sediment eroded from the construction area.

Overall, no adverse effects on Hewitt's Creek or the smaller adjacent tributary and the associated fish habitat are predicted to occur as a result of erosion and sedimentation during construction, provided an effective ESC Plan, including monitoring and adaptive management, is implemented.

Stormwater Management During Construction

Increases in stormwater runoff from the disturbed areas of the construction site or pumping of groundwater from excavations, potentially resulting in higher flows to the watercourse could cause increases in bed and bank erosion with associated potential effects on Hewitt's Creek, aside from the obvious potential increase in erosion from the work area.

It is recommended that the contractor consider management of stormwater throughout the construction period as part of the overall ESC Plan, since stormwater flows through disturbed areas are one of the primary causes of erosion and sedimentation from construction sites. Increased volumes of runoff during construction could also potentially result in increases in

erosion due to overland flow, particularly if stormwater runoff from the construction area is concentrated. To mitigate these potential effects, stormwater management techniques should be implemented prior to construction to control surface water runoff throughout the construction period. Implementation of an effective stormwater control plan during construction is anticipated to prevent adverse effects on Hewitt's Creek.

Accidental Spills

Accidental spills of potentially hazardous materials (e.g., fuel and oil from heavy equipment), if transported to Hewitt's Creek, could cause stress or injury to fish, amphibians and other aquatic biota (e.g., benthic invertebrates).

In order to mitigate the potential for adverse effects on these species and their habitats due to accidental spills during construction, it is recommended that the contractor prepare a spill prevention and response plan to outline the material handling and storage protocols, mitigation measures (e.g., spill kits on-site), monitoring measures and spill response plans (i.e., emergency contact procedures, including MOECC Spills Action Centre, and response measures including containment and clean-up). Implementation of an effective spill prevention and response plan is anticipated to be largely effective in preventing adverse effects on these species and their habitats.

Construction Below the Water Table

The hydrogeological study has indicated that the water table below the Subject Lands ranges from 0 to 4 m below ground surface. Based on this characterization, Burnside suggests that dewatering may be required should servicing construction below the water table be required, and these groundwater volumes could be significant if sand and gravel layers are encountered. To mitigate this effect, services to be installed below the water table should be constructed to prevent redirection of groundwater flow. This will involve the use of anti-seepage collars or clay plugs surrounding the pipes to provide barriers to flow and prevent groundwater flow along granular bedding material and erosion of the backfill materials. More detailed examination of this matter will occur during the Detailed Design phase; however, Burnside suggests that the above mitigation measures are typically effective. If temporary dewatering is deemed to be necessary, Savanta will work with SCS to identify the best locations to direct this discharge and recommend mitigation measures to limit potential soil erosion or impacts to local vegetation.

7.2.1.2 Potential Post-Construction Impacts

Potential indirect impacts on Hewitt's Creek may occur post construction, including:

- Changes in flow and water quality due to stormwater management and changes in groundwater infiltration;
- Effects on water quality associated with runoff from urban areas; and
- Disturbance effects associated with anthropogenic activity at local residences.

These potential impacts and recommended mitigation measures are discussed in the following sections.

Stormwater Management and Changes in Infiltration

The main potential long-term impact on the aquatic environment due to the presence of the proposed development would be potential changes in flows within Hewitt's Creek due to stormwater management practices, as well as increased imperviousness and decreased infiltration of surface water into the ground.

Potential adverse effects on Hewitt's Creek as a result of long-term stormwater management practices could include:

- Increased peak flows resulting in higher rates of bed and bank erosion (with associated effects on fish and fish habitat) and high flow velocities with potential effects on fish movements;
- Higher rates of surface water runoff to watercourses resulting in more rapid increases and decreases in flow and water level (i.e., increased "flashiness") causing adverse effects on fish use of floodplains and prolonged use of the tributaries for other life cycle purposes;
- Altered surface water balance (e.g., flows) and aquatic habitat availability in watercourses should stormwater discharges be located at different locations in the catchment than current discharge vectors (i.e., stormwater infrastructure diverts flows to ponds located near the downstream end of catchment areas, effectively bypassing the watercourses over much of their length upstream from the pond discharge) or changes in water balance result in long-term changes in flow in receiving watercourses; and
- Altered groundwater balance, which could potentially result in reductions in groundwater discharge, particularly to cold-water watercourses, with corresponding reductions in baseflow and aquatic habitat, and increased water temperature.

The FSR prepared by SCS and the hydrogeological assessment prepared by Burnside speak to the anticipated water balance calculations based upon the proposed stormwater management scheme and groundwater characterization. The Burnside report identifies three wetland areas that are interpreted to receive groundwater contributions; Wetland #3, Wetland #4, and Wetland #6 (Figure 10 in the Burnside report). Wetland #4 relates to the large wooded swamp unit located centrally on the Subject lands, between the Phase 1 lands to the north and the Phase 3 lands to the south and is estimated to represent approximately 18.5 ha. Wetland #6 relates to the riparian wooded swamp that is associated with a portion of the Hewitt's Creek tributary to the east of the Subject Lands on the north side of Lockhart Road (estimated to represent 1.6 ha). Wetland #3 relates to a portion of Hewitt's Creek proper, located to the northeast of the Subject Lands (approximately 6.3 ha). Burnside's water balance calculations note that the subject lands will receive about 36% of the current amount of average annual groundwater infiltration after development. The overall deficit in groundwater infiltration has been estimated to be 18,800 m³/year and the report recommends the use of LID's for stormwater management to ensure the post-development groundwater infiltration volume is maintained as close to the pre-development infiltration volume as possible. The FSR identifies a variety of LID practices that are recommended for use on these Subject Lands, including lot level and conveyance controls, in addition to the creation of the end of pipe stormwater control wet pond or constructed hybrid wetland.

Impacts on Water Quality

The FSR identifies that the majority of the stormwater generated on the Subject Lands will be treated within the centrally located SWM facility #5. This is proposed to be a hybrid wetland facility and will provide an enhanced level of treatment. One pond discharge outlet is proposed on the north side of the pond which will outlet within the 30 m buffer and be directed as sheet flow towards the existing wooded edge of the Natural Heritage System. Specific details of the discharge design will occur during the Detailed Design stage, however, based upon the anticipated location of the discharge outlet and Savanta's observations during site visits, the treated stormwater would be released well away from the tributary of Hewitt's Creek that is found to the east of the Subject Lands. At this stage, based upon the FSR, Savanta would not anticipate any measurable changes to the surface water quality within the adjacent watercourse nor indirect impacts to fish habitat in this feature.

Savanta has also considered the potential that some surface water on the Subject Lands could infiltrate through residential lawns and into the shallow groundwater regime flowing eastward towards Hewitt's Creek. This runoff or infiltration water could potentially be impaired due to residential use of potential contaminants (e.g., lawn fertilizers) or other residential land use activities (including accidental spills in rear yards). Discussion with Burnside, however, suggests that attenuation within the shallow interflow horizon would minimize potential effects off-property to the east, as the tributary is located approximately 100 m from the Subject Lands. Notwithstanding, Savanta recommends that educational materials be provided to landowners within the development that informs them of the ongoing efforts to reduce phosphorus loadings into the Lake Simcoe Watershed, and will promote the use of low-phosphate or phosphate-free products for residential uses.

7.3 St. Paul's Swamp/Significant Woodland/Significant Wildlife Habitats

As previously identified the St. Paul's Swamp is a non-provincially significant wetland, but is a KNHF and KHF, is also a significant woodland, and has been identified as providing significant wildlife habitat functions associated with bat maternity colony habitat, habitat for two bird species of conservation concern, and seeps and springs habitat. Combined, these features comprise the entirety of the Natural Heritage System on the Subject Lands.

7.3.1 Impact Assessment

7.3.1.1 Impacts during construction

Potential impacts on the various components of the Natural Heritage System may occur from direct impacts associated with the development of the collector road, or through indirect impacts associated with the remaining development. These impacts are addressed below.

Direct Impacts

As previously noted, the construction of the collector road as identified in the Hewitt's Secondary Plan will require encroachment into this feature in three locations, as shown on Figure 5, for a total removal of 0.53 ha. Potential direct impacts on the identified features are discussed below

- The removal would occur primarily through the mixedwood swamp components of the Natural Heritage System, with removals of portions of the cultural thicket and the marsh/swamp thicket complex.
- This would result in a removal of approximately 3 percent of the total natural cover associated with the feature west of Hewitt's Creek. Overall, this removal would not be expected to impact the classification of the features as a KNHF, KHF, or significant woodland.
- Given that the identified locations of Eastern Wood-Pewee and Wood Thrush within the feature are more than 100 m from the proposed location of the collector roads within the Natural Heritage System, there will be no direct impact on the significant wildlife habitat.
- No seeps have been identified in the vicinity of the proposed collector road, and direct impacts on this habitat type are not expected.
- Tree removal to permit installation of the collector road will result in removal of several trees with features capable of providing bat maternity colony habitat. To compensate for the removal of the trees, alternate bat roosting structures, such as bat boxes, will be installed within the buffers to the Natural Heritage System on the Subject lands.
- Removals will occur outside of the bird and bat active period (typically April 1 through October 31) to avoid potential impacts on migratory birds and bats.

Indirect impacts

As the majority of the Natural Heritage System is comprised of a wetland unit, potential impacts to water quality during construction as previously discussed with respect to Hewitt's Creek, could also impact on the more proximal wetland units. Mitigation measures identified with respect to Hewitt's Creek would be expected to also be effective at mitigating potential impacts to wetland units in the Natural Heritage System.

Additional indirect impacts may occur through the potential for disturbance to wildlife communities within the Natural Heritage System during construction. Noise from construction activities may result in wildlife avoidance of the edges abutting active work areas during the construction period. Where possible, construction activities should be timed outside of the nighttime and early morning periods during the bat and bird breeding seasons (typically April 1 through July 31). Some localized movement of wildlife out of these edge areas may still occur during the construction phase, however wildlife in this area will be somewhat tolerant of anthropogenic disturbance due to the existing noise from the nearby rail line and roadways.

7.3.1.2 Potential impacts post-construction

There will be no direct impacts on the Natural Heritage System during the post-construction phase.

The primary indirect impact associated with the development of the Subject Lands would be potential alterations to the surface water and groundwater contributions to the natural heritage feature within the central portion of the property or on the adjacent tributary to the east. As described within the Burnside Hydrogeological Assessment, mitigation strategies are recommended to minimize the potential development impacts to infiltration through use of LIDs that will assist in maintaining post-development groundwater infiltration volumes as close to the pre-development infiltration volume as possible. The Burnside report identifies a number of LID techniques such as the directing of roof runoff to turfed areas, use of increased soil thicknesses,

use of rain gardens, infiltration trenches and other methods that are effective at increasing infiltration. These techniques (and others) have been considered within the FSR prepared by SCS and discussion is provided in that report regarding use of LIDs in Right-of-Ways such as exfiltration trenches, rain gardens, tree box-based LIDs and hybrid bioswales within the first 15 m of the 30 m Environmental Protection buffer in certain locations. The FSR notes that although a number of LID measures will be utilized to promote infiltration opportunities, the specific application of the most effective techniques will be refined during the Detailed Design stage. Based upon the groundwater assessment and the FSR, the expectation is that sufficient infiltration volumes can be achieved to minimize potential impacts to adjacent natural heritage features.

Following construction, increased noise in vicinity of the woodland community due to residential activities (e.g., lawn mowing, vehicle movement, etc.), and the potential for increased predation pressure from domestic cats allowed to roam free outdoors may occur. Given that the Natural Heritage System is entirely comprised of a wetland unit, it is expected that the potential for anthropogenic encroachment is slightly reduced from an upland forest community (given the likely increased presence of biting insects and wet conditions). These potential effects may be further reduced through the development and distribution of a homeowner's manual that explains the relationship between the development and adjacent significant natural areas. Measurable alterations in wildlife composition within the Natural Heritage System are not anticipated following occupation of the residential subdivision.

7.4 Community Benefit Plan

Through discussions with the LSRCA and the design process for the Phase 1 lands, it was agreed that although a 30 m buffer to staked natural heritage features should be the goal, there would be an opportunity to consider buffer averaging in certain locations, with the aim of achieving an overall net gain or buffer equivalent. The buffers as depicted for the Phase 1 lands are partially achieved based on increased housing density on the site, through smaller building types on smaller lot depths than those approved for the draft plans to the immediate north in the Hewitt's community. For example, the proposed Concept Plan depicts townhouses on 23 m lot depths as opposed to the singles on typical 28 m lot depths. Other elements of the Phase 1 design have been incorporated to provide benefits to the community and have resulted in minor reductions in buffer widths in some areas as discussed below.

The Phase 1 Plan also includes a range of housing size, with smaller units being included to attract entry-level buyers in an effort to address housing affordability. Both the hydrogeological assessment and FSR have identified a range of LID techniques that will be utilized to optimize infiltration opportunities across both the Phase 1 and Phase 3 lands. The buffer reductions in certain locations will be offset with enhanced buffer plantings within both the Phase 1 and 3 lands (outside of the areas that may be proposed for LIDs). The proponent has also indicated the desire to dedicate the Natural Heritage System lands to the City and/or the LSRCA so that they can form part of the larger public natural space.

The issue of the future north-south collector road was discussed at the Design Charrette and although consideration was given to minimizing the width of the road (from 24 m to 18 m), road design criteria ultimately requires that the standard 24 m road width be utilized. Savanta has walked this area and the road footprint has been aligned as far westerly as possible to reduce impacts. As discussed with the LSRCA, the road is not advocated by the proponent but is a requirement by the City through the approved Secondary Plan to provide alternate access for the area between Maplevue Drive and Lockhart Road. Based on this, the proponent has raised the

notion of flexibility in applying the LSRCA offsetting compensation policies and this was discussed in preliminary fashion during the Design Charrette and we expect that this will be a subject for future discussion.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This NHE has been developed to support planning approvals for the proposed development of the Subject Lands and has considered the findings and recommendations from Burnside's Hydrogeological Assessment and the Functional Servicing Report prepared by SCS. An assessment of impacts on natural heritage features and their associated functions has been conducted in consideration of the Draft Plan for the Phase 1 and Phase 3 lands, and discussed in relation to the PPS and the Lake Simcoe Protection Plan.

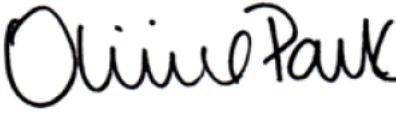
The proposed development consists of 87 townhomes within the Phase 1 lands, with medium and high-density residential planned for the Phase 3 lands.

Based upon the natural heritage feature inventories and analyses carried out, and the assessment of the proposed development, the following observations were made:

- The majority of the natural heritage features on the Subject Lands are already contained within the limits of the Natural Heritage System, and include Hewitt's Creek, St. Paul's Swamp (non-PSW), significant woodlands, and significant wildlife habitat.
- The lone natural heritage feature outside of the Natural Heritage System is Barn Swallow nesting within the existing barn structure located within the Phase 3 portion of the Subject Lands. Compensation for removal of this structure will be provided through installation of an artificial nest habitat structure on the Subject Lands through an 0.Reg. 242/08 registration under the ESA prior to the demolition of the barn.
- Development of the collector road shown in the Hewitt's Secondary Plan, and ultimate connection to Lockhart Road, will require direct encroachment of approximately 0.5 ha through three locations within the Natural Heritage System on the Subject Lands. Installation of the collector road will result in some loss of trees capable of providing bat maternity roost habitat. Compensation for removal of these trees will be provided through the installation of artificial bat roosting structures within the buffers to the Natural Heritage System on the Subject Lands.
- Beyond the collector road, the concept plan generally respects the required 30 m buffer from the staked limits of the wetland and woodland communities associated with the Natural Heritage System. Potential indirect impacts on the Natural Heritage System may still occur both during and following construction of both the Phase 1 and Phase 3 lands. Mitigation measures have been proposed to ensure that there is no significant impact on the Natural Heritage System. A key component of these efforts will be ensuring water balance to these features is provided during the detailed design phase and an aggressive enhancement planting plan in buffer areas adjacent to the staked natural heritage limits that will result in an overall increase in the Natural Heritage System.
- As discussed in Section 8.4 above, the Phase 1 Concept Plan includes a variety of community benefit elements that the team suggests should be considered in the overall evaluation of net gain for the Phase 1 lands.

Based upon current and available technical information and analyses, the predicted effects on the natural features and associated functions will be avoided/minimized through the protection, mitigation and enhancement measures recommended and discussed in this report. The proposed mitigation measures, in association with other Community Benefit initiatives are anticipated to maintain and enhance important natural features and associated functions of the Natural Heritage System.

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APPENDICES

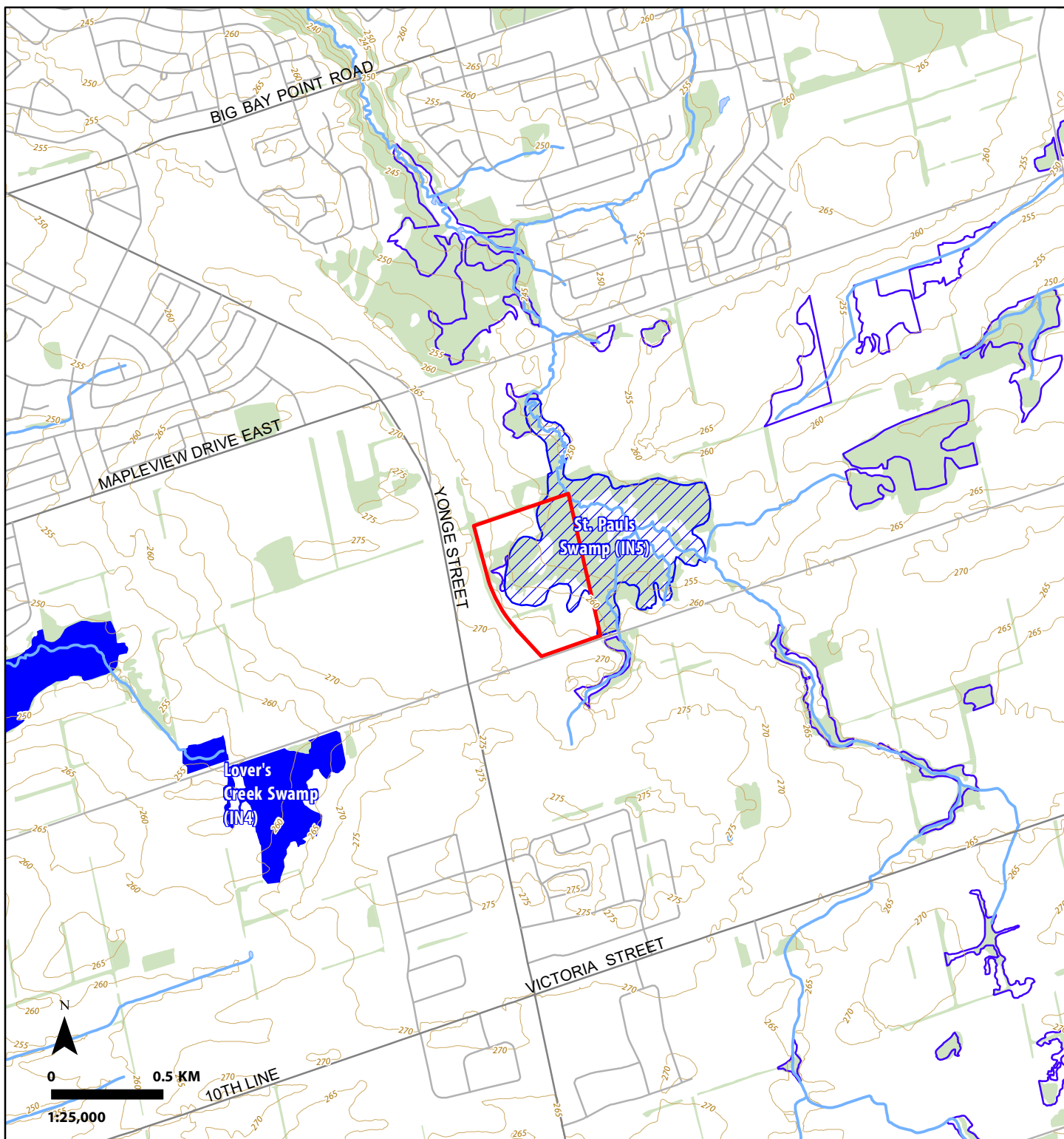
Appendix A – Figures



Ballymore - Barrie Lands

Figure 1
Location of Subject Lands





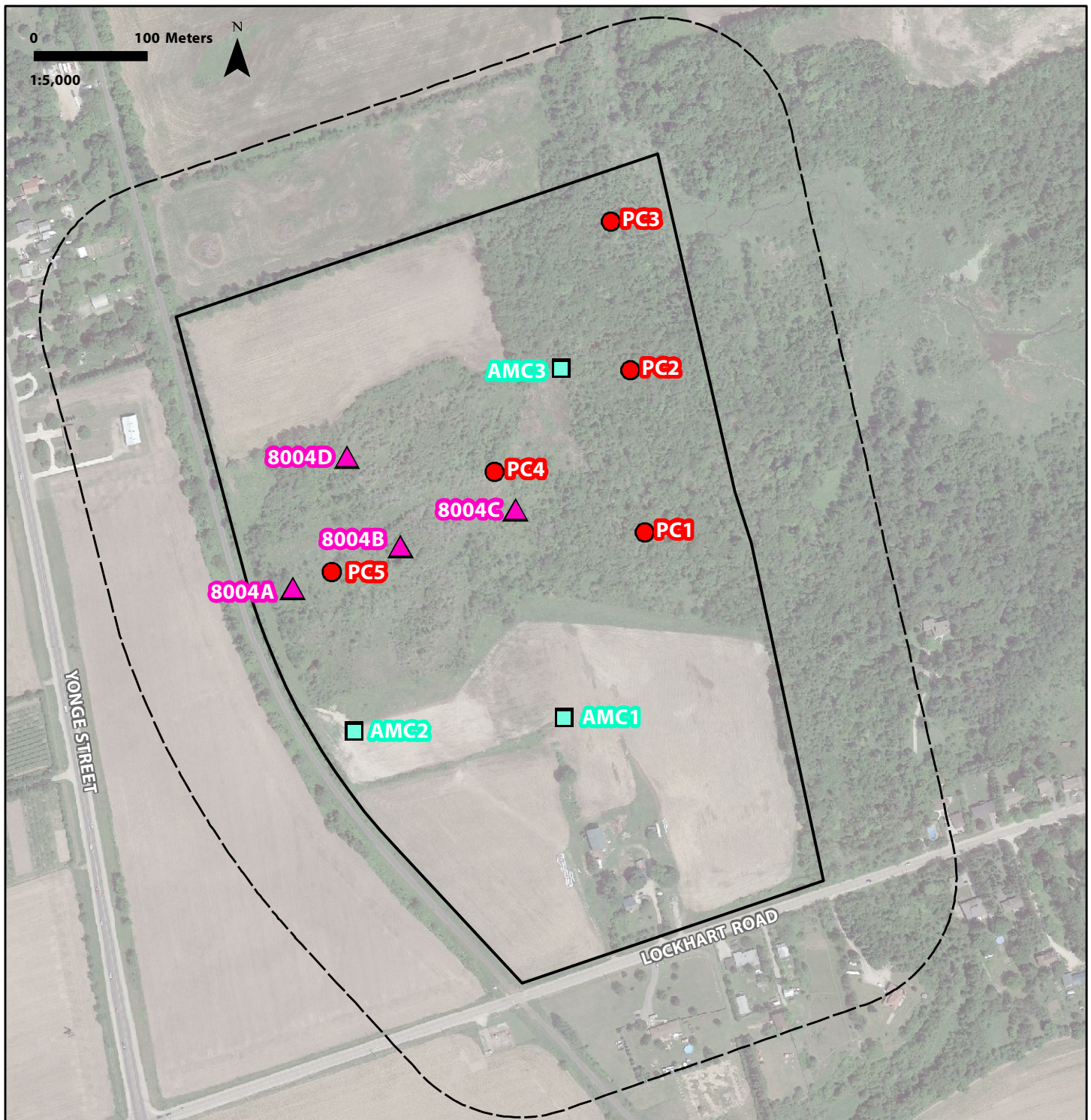
Ballymore - Barrie Lands

Figure 2 Landscape Setting

- | | |
|---|---|
| Subject Lands | Wetland Evaluated-Provincial (MNRF LIO) |
| Waterbody (MNRF LIO) | Evaluated-Other |
| Watercourse (MNRF LIO) | Wetland not evaluated per OWES (MNRF LIO) |
| | Woodland (MNRF LIO) |

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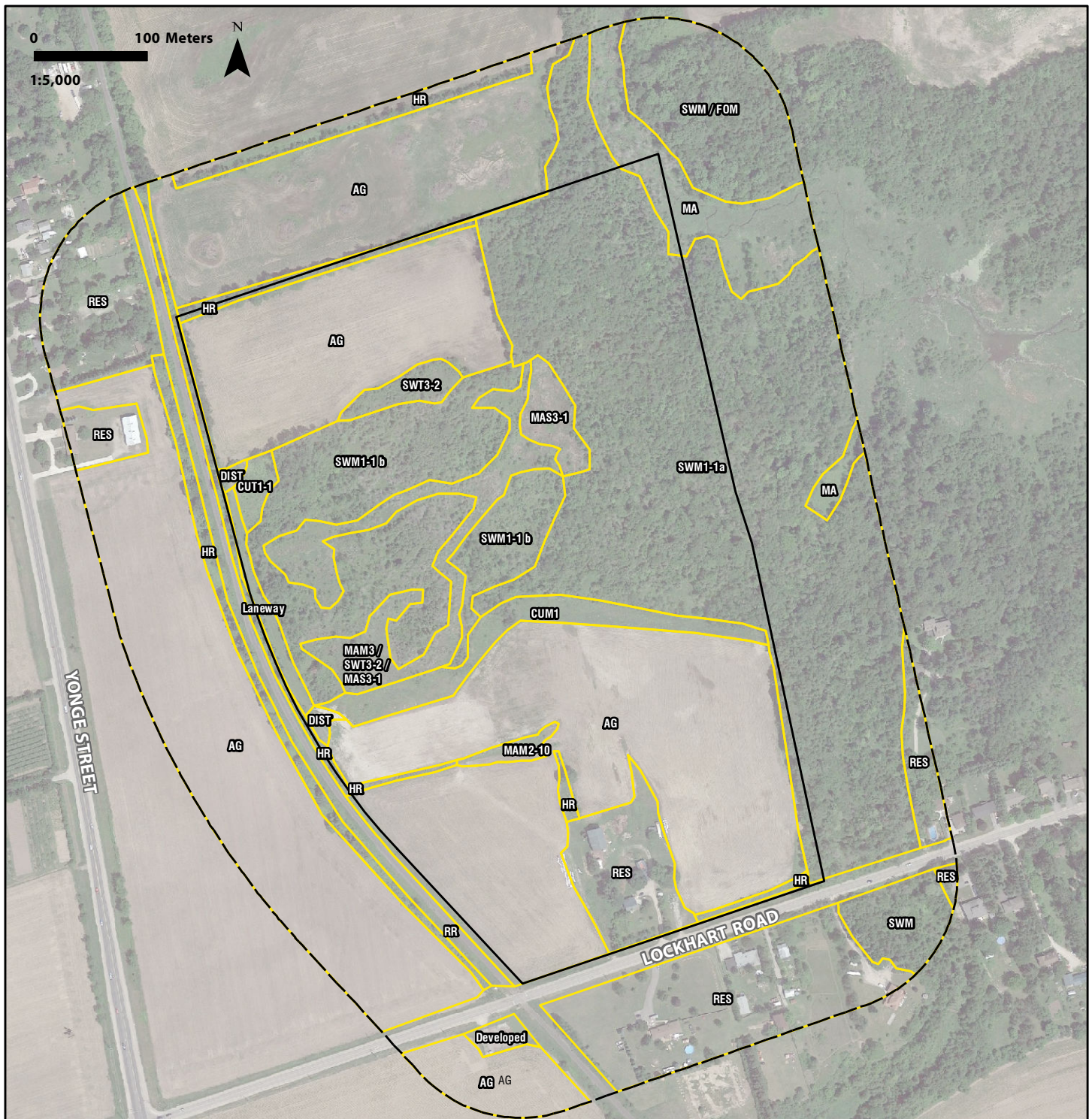




Ballymore - 750 Lockhart Road, Barrie

Figure 3
Ecological Survey Locations

- Subject Lands
- 120m Adjacent Lands
- Amphibian Call Count Station Location
- Breeding Bird Point Count Station Location
- ▲ Bat SM3 Monitoring Location



Ballymore - 750 Lockhart Road, Barrie
Figure 4
Ecological Land Classification

Subject Lands
 120m Adjacent Lands
 Ecological Land Classification

ELC Legend

CUM1 Mineral Cultural Meadow

CUT1-1 Sumac Cultural Thicket

FOM Mixed Forest

MA Marsh

MAM2-10 Forb Mineral Meadow Marsh

MAS3-1 Cattail Organic Shallow Marsh

SWM Mixed Swamp

SWM1-1a White Cedar- Hardwood Mineral Mixed Swamp - closed canopy

SWM1-1b White Cedar- Hardwood Mineral Mixed Swamp - open canopy

SWT3-2 Willow Organic Thicket Swamp

AG Agricultural

Developed Developed

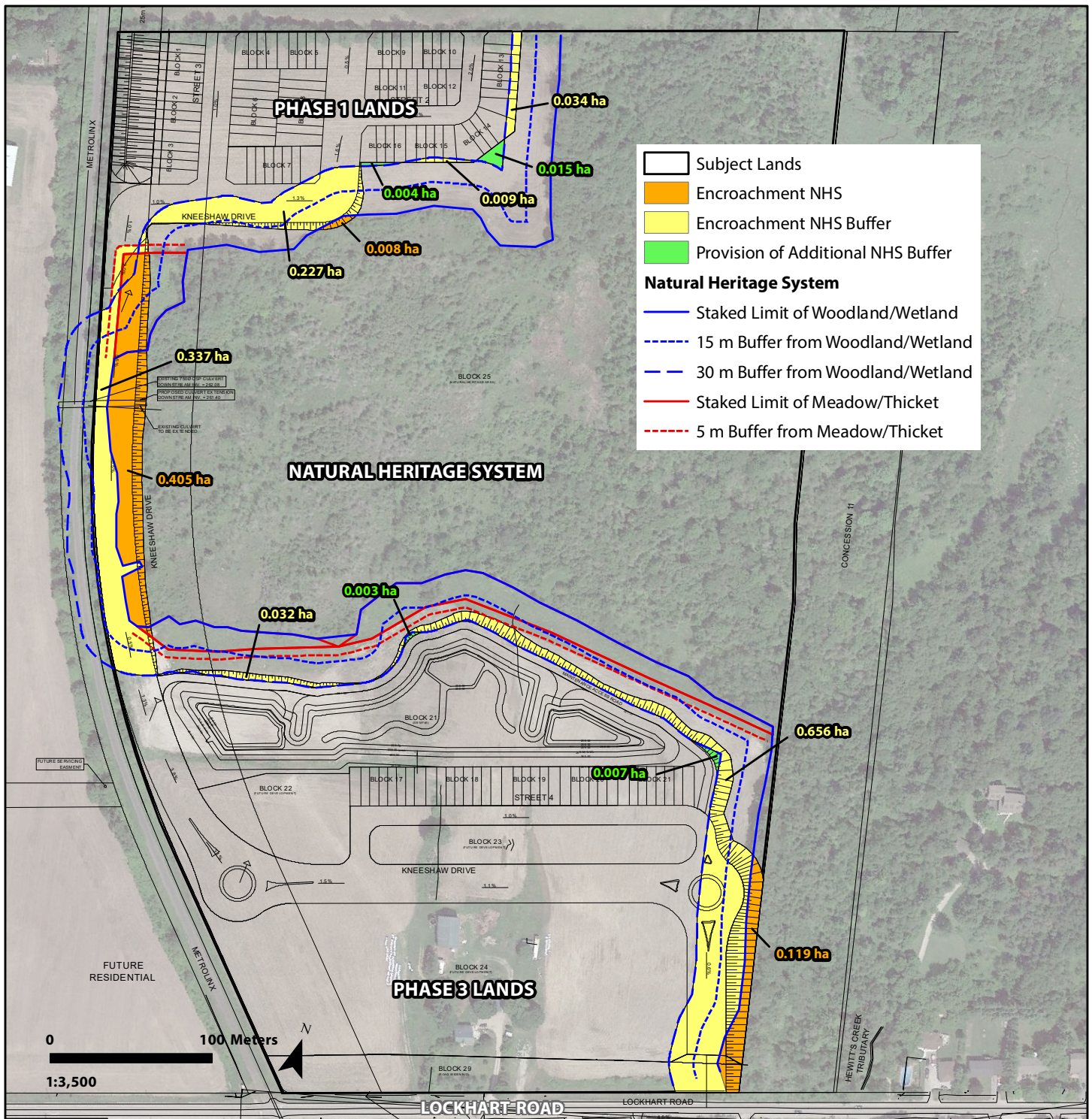
DIST Disturbed

HR Hedgerow

Laneway Laneway

RES Residential

RR Railway



Ballymore - 750 Lockhart Road, Barrie

Figure 5 Concept Plan

SAVANTA
A GEI Company

ELC Legend

CUM1 Mineral Cultural Meadow

CUT1-1 Sumac Cultural Thicket

FOM Mixed Forest

MA Marsh

MAM2-10 Forb Mineral Meadow Marsh

MAS3-1 Cattail Organic Shallow Marsh

SWM Mixed Swamp

SWM1-1a White Cedar- Hardwood Mineral Mixed Swamp - closed canopy

SWM1-1b White Cedar- Hardwood Mineral Mixed Swamp - open canopy

SWT3-2 Willow Organic Thicket Swamp

AG Agricultural

Developed Developed

DIST Disturbed

HR Hedgerow

Laneway Laneway

RES Residential

RR Railway

Appendix B – Tables

Table 1. Savanta Field Studies and Natural Inventories (2017, 2018)

FIELD DATE	NATURE OF INVESTIGATION	SURVEYOR
2017		
July 13	Breeding Bird Habitat Assessment	P. Burke
August 15	Summer Botanical Survey Butternut Survey Ecological Land Classification (ELC)	J. Leslie
August 25	Boundary Flagging of Natural Heritage Features Butternut Survey	J. Leslie
August 29	Site Walk of Natural Heritage System	S. Male R. Hubbard
November 14	Staking of Natural Heritage System with Lake Simcoe Region Conservation Authority (LRSCA) and the City of Barrie	S. Male R. Hubbard
2018		
April 25	Amphibian Call Count Survey Round 1	O. Park S. Hazen
May 1	Bat Habitat Assessment	R. Rossi E. Lee
May 23	Amphibian Call Count Survey Round 2	O. Park S. Hazen
May 28	Breeding Bird Survey Round 1	P. Burke
May 31	Deployment of Passive Acoustic Bat Recorders (SM3Bat)	O. Park S. Hazen
June 7	Spring Botanical Survey Vegetation Survey	C. Zoladeski
June 11	Collection of Passive Acoustic Bat Recorders (SM3Bat)	O. Park S. Hazen
June 21	Breeding Bird Survey Round 2	P. Burke

Table 2: Ecological Landscape Characterization (ELC) Community Descriptions

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
CULTURAL		
Cultural Meadow		
CUM1 Mineral Cultural Meadow	- Linear-shaped community, occurring between agricultural fields and woodland - Variable species composition, but most commonly composed of Tall Goldenrod (<i>Solidago altissima</i> var. <i>altissima</i>), Canada Thistle (<i>Cirsium arvense</i>), Garden Bird's-Foot Trefoil (<i>Lotus corniculatus</i>), Tufted Vetch (<i>Vicia cracca</i>), Wild Bergamot (<i>Monarda fistulosa</i> var. <i>fistulosa</i>), Awnless Brome (<i>Bromus inermis</i>), and Kentucky Blue-grass (<i>Poa pratensis</i>). Yellow Indiangrass (<i>Sorghastrum nutans</i>) was occasionally observed in this community, with infrequent occurrences of Little bluestem (<i>Schizachyrium scoparium</i> var. <i>scoparium</i>) and Big Bluestem (<i>Andropogon gerardii</i>).	Not Ranked
Cultural Thicket		
CUT1-1 Sumac Cultural Thicket	- Shrub thicket having a canopy of primarily Staghorn Sumac (<i>Rhus typhina</i>) - Understory shrubs often included Alleghany Blackberry (<i>Rubus allegheniensis</i>), Showy Fly Honeysuckle (<i>Lonicera x bella</i>). - Ground cover often consisted of Tall Goldenrod and Kentucky Blue-grass, with associations of Meadow Horsetail (<i>Equisetum arvense</i>), Grass-leaved Goldenrod (<i>Euthamia graminifolia</i>), Tall Buttercup (<i>Ranunculus acris</i>), and Orchard Grass (<i>Dactylis glomerata</i>).	Not Ranked
SWAMP		
Mixed Swamp		
SWM1-1 White Cedar – Hardwood Mineral Mixed Swamp	- Canopy species commonly composed of mid-age to mature White Cedar (<i>Thuja occidentalis</i>) and Yellow Birch (<i>Betula alleghaniensis</i>), with frequent associations of White Elm (<i>Ulmus americana</i>), Paper Birch (<i>Betula papyrifera</i>), Trembling Aspen (<i>Populus tremuloides</i>), and Black Ash (<i>Fraxinus nigra</i>). The sub-canopy was predominantly composed of White Cedar and Black Ash - Understory composed primarily of canopy saplings with associations of Red-osier Dogwood (<i>Cornus stolonifera</i>). - Ground cover was diverse, often having an abundance of Sensitive Fern (<i>Onoclea sensibilis</i>) with frequent associations of Northeastern Lady Fern (<i>Athyrium filix-femina</i> var. <i>angustum</i>), Bulblet Bladder Fern (<i>Cystopteris bulbifera</i>), Spinulose Wood Fern (<i>Dryopteris carthusiana</i>), Meadow Horsetail, Drooping Woodland Sedge (<i>Carex arctata</i>), Wild Sarsaparilla (<i>Aralia nudicaulis</i>), Fowl Meadow Grass (<i>Glyceria striata</i>), Awl-fruited Sedge (<i>Carex stipata</i>), Three-Flowered Bedstraw (<i>Galium triflorum</i>), Wild Lily-Of-The-Valley (<i>Maianthemum canadense</i> ssp. <i>canadense</i>), Calico Aster (<i>Symphotrichum lateriflorum</i> var. <i>lateriflorum</i>), Canada Enchanter's Nightshade (<i>Circaea canadensis</i> ssp.	S5

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
	<i>canadensis</i>), Purple-stemmed Aster (<i>Symphyotricum puniceum</i>), and Fringed Yellow Loosestrife (<i>Lysimachia ciliata</i>). - Depth of organic substrate varied but was typically less than 40 cm deep, underlain by fine sandy clay where gley was present. - Surface water was not present in August, with the exception of a flowing watercourse; ground water was observed at 50 cm depth. - Two variations of this community were observed, where "b" appeared to be younger and had a canopy slightly more open with a higher proportion of coniferous trees. - Small upland forest inclusions were infrequently observed in the overall community, consisting of mid-age White Cedar.	
Thicket Swamp		
SWT3-2 Willow Organic Thicket Swamp	- Canopy species commonly consisted of Bebb's Willow (<i>Salix bebbiana</i>) and Pussy Willow (<i>Salix discolor</i>), with associations of Green Ash (<i>Fraxinus pensylvanica</i>), and White Elm. - Understory species included White Cedar, Green Ash, White Elm, and Red-osier Dogwood - Ground cover had an abundance of Meadow Horsetail, with frequent associations of Spotted Joe-pye-weed (<i>Eutrochium maculatum</i> var. <i>maculatum</i>), Cattail (<i>Typha</i> spp), Giant Goldenrod (<i>Solidago gigantea</i>), Rough-stemmed Goldenrod (<i>Solidago rugosa</i>), Eastern Marsh Fern (<i>Thelypteris palustris</i> var. <i>pubescens</i>), Yellow Sedge (<i>Carex flava</i>), Coltsfoot (<i>Tussilago farfara</i>), and Creeping Bentgrass (<i>Agrostis stolonifera</i>). - Surface water was not present in August, though soil was saturated - Depth of organics varied – sometimes as shallow as 28 cm but often deeper	S5
MARSH		
Meadow Marsh		
MAM2-10 Forb Mineral Meadow Marsh	- Surrounded by agricultural fields, this small marsh may be tilled during drier years but was well established at the time of the survey - Species composition often consisted of Rice-cut Grass (<i>Leersia oryzoides</i>), Meadow Horsetail, Spotted Lady's-Thumb (<i>Persicaria maculosa</i>), Hairy Willowherb (<i>Epilobium hirsutum</i>), Large Barnyard Grass (<i>Echinochloa crus-galli</i>), Purple Loosestrife (<i>Lythrum salicaria</i>), Purple-stemmed Aster, Dark-green Bulrush (<i>Scirpus atrovirens</i>), and Creeping Bentgrass, among others. - Surface water was not present in August	S4S5
MAM3	This community consisted of a complex of three community types, where MAM3 was the prevalent type; the other two community types occupying less area were	S5

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
Organic Meadow Marsh	Willow Organic Thicket Swamp (SWT3-2) and Cattail Organic Shallow Marsh (MAS3-1). • Within the MAM3, a young woody canopy was often present (cover < 25%), consisting of White Cedar, White Elm, Trembling Aspen, Balsam Poplar (<i>Populus balsamifera</i>), and Black Ash. • The ground layer was diverse, often consisting of Meadow Horsetail, Purple-stemmed Aster, Fowl Bluegrass (<i>Poa palustris</i>), with frequent associations of Spotted Jewelweed, Canada Mint (<i>Mentha canadensis</i>), Spotted Joe-pye-weed, Sensitive Fern, White Panicked Aster (<i>Symphotrichum lanceolatum</i> var. <i>lanceolatum</i>), Giant Goldenrod, Common Marsh bedstraw (<i>Galium palustre</i>), Fox Sedge (<i>Carex vulpinoidea</i>), Porcupine Sedge (<i>Carex hystericina</i>), Reed Canary Grass (<i>Phalaris arundinacea</i> var. <i>arundinacea</i>), and Rice-cut Grass • Species composition with the other two community types are described separately within this Table. • Surface water was generally absent in August, though soil was saturated • Depth of organic substrate varied, but was generally deeper than 40 cm.	
Shallow Marsh		
MAS3-1 Cattail Organic Shallow Marsh	• Community dominated by Narrow-leaved Cattail (<i>Typha angustifolia</i>), with frequent occurrences of Spotted Jewelweed (<i>Impatiens capensis</i>) and, less commonly, Purple-stemmed Aster, Common Marsh Bedstraw, Porcupine Sedge, Bulbous Water-Hemlock (<i>Cicuta bulbifera</i>). • Surface water was present in August (approximately 10 cm deep) • Depth of organic substrate was approximately 50 cm	S5

Location	Species Name	Quantity	Notes
Forest A	Oak	120	Common
	Maple	85	Common
	Birch	30	Scattered
	Pine	15	Rare
Forest B	Oak	90	Common
	Maple	60	Common
	Birch	20	Scattered
	Pine	10	Rare

[illegible]

[illegible]

Common Name	Scientific Name	Species Order	Species Family	Provincial Status (S Rank)	Global Status (G Rank)	COSSARO (MNR)	COSEWIC (Federal)	SWH Indicator Species	Highest Breeding Evidence	Round 1 PC1	Round 1 PC2	Round 1 PC3	Round 1 PC4	Round 1 PC5	Incidental Round 1	Off Site Round 1	Round 2 PC1	Round 2 PC2	Round 2 PC3	Round 2 PC4	Round 2 PC5	Incidental Round 2	Off Site Round 2	
Canada Goose	<i>Branta canadensis</i>	Anseriformes	Anatidae	S5	G5			X	OB-X	1														
Mallard	<i>Anas platyrhynchos</i>	Anseriformes	Anatidae	S5	G5			X	PO-H			1												
Mourning Dove	<i>Zenaidura macroura</i>	Columbiformes	Columbidae	S5	G5				PO-S											1				
Wild Turkey	<i>Meleagris gallopavo</i>	Galliformes	Gallinae	S5	G5				PO-S															
Northen Flicker	<i>Colaptes auratus</i>	Psittaciformes	Picidae	S4B	G5				PO-S					1		2			1			1		
Eastern Wood-Pewee	<i>Contopus virens</i>	Passeriformes	Tyrannidae	S4B	G5	SC	SC	X	PR-T		1	1	1	1		1	1		1					
Alder Flycatcher	<i>Empidonax alburnum</i>	Passeriformes	Tyrannidae	S5B	G5				PR-T	1											2			
Eastern Phoebe	<i>Sayornis phoebe</i>	Passeriformes	Tyrannidae	S5B	G5				PR-T														1	
Great Crested Flycatcher	<i>Myiarchus cinerascens</i>	Passeriformes	Tyrannidae	S4B	G5				PR-T	2	1	1	1				1			1				
Red-eyed Vireo	<i>Vireo olivaceus</i>	Passeriformes	Vireonidae	S5B	G5				PR-T					1	1					1				
Blue Jay	<i>Cyanocitta cristata</i>	Passeriformes	Corvidae	S5	G5				PO-H	1	2													
American Crow	<i>Corvus brachyrhynchos</i>	Passeriformes	Corvidae	S5B	G5				PR-P	1	1				1	2								
Barn Swallow	<i>Hirundo rustica</i>	Passeriformes	Hirundinidae	S4B	G5		THR	THR	CO-NE					1									3	
Black-capped Chickadee	<i>Parus atricapillus</i>	Passeriformes	Paridae	S5	G5				PR-P		2		2	2	1				1	1	1	1		
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Passeriformes	Sittidae	S5	G5				PR-T															
House Wren	<i>Troglodytes aedon</i>	Passeriformes	Troglodytidae	S5B	G5				PR-T					2						1	1	1		
Wood Thrush	<i>Hylocichla ustulata</i>	Passeriformes	Turdidae	S4B	G4	SC	THR	X	PO-S								1	1						
American Robin	<i>Turdus migratorius</i>	Passeriformes	Turdidae	S5B	G5				PR-T	1									1				1	
Gray Catbird	<i>Dumetella carolinensis</i>	Passeriformes	Mniotiltidae	S4B	G5				PR-T								1							
European Starling	<i>Sturna vulgaris</i>	Passeriformes	Sturnidae	SNA	G5				PO-H															
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Passeriformes	Bombycillidae	S5B	G5				PR-T	2										1		1		
Purple Finch	<i>Carduelis purpureus</i>	Passeriformes	Fringillidae	S4B	G5				PR-T	1							1							
American Goldfinch	<i>Spinus tristis</i>	Passeriformes	Fringillidae	S5B	G5				PR-P			2	1				1	1		1	3	2		
Northern Waterthrush	<i>Parusua ocoeboracensis</i>	Passeriformes	Parulidae	S5B	G5				PO-S															
Black-and-white Warbler	<i>Mniotilta varia</i>	Passeriformes	Parulidae	S5B	G5				PR-T					1	1		2							
Nashville Warbler	<i>Oreothlypis ruficapilla</i>	Passeriformes	Parulidae	S5B	G5				PO-S					1										
Common Yellowthroat	<i>Geothlypis trichas</i>	Passeriformes	Parulidae	S5B	G5				PR-T				1	2					1	1	1	1		
American Redstart	<i>Setophaga ruticilla</i>	Passeriformes	Parulidae	S5B	G5				PO-S					1	1			</						

[illegible]

Table 5: Amphibian Call Count Results

[illegible]

Table 6: Passive Acoustic Bat Detector Results

SURVEY DATE	STATION ID	SPECIES CODE									
		NOBA	LACI	LANO	EPFU	LABO	PESU	MYLU	MYSE	MYLE	40K MYOTIS
30-May-18	8004A	X									
30-May-18	8004B			X							
30-May-18	8004C	X									
30-May-18	8004D	X									
31-May-18	8004A				X						
31-May-18	8004B		X	X							
31-May-18	8004C		X	X	X						
31-May-18	8004D		X	X	X						
01-Jun-18	8004A		X		X						
01-Jun-18	8004B		X	X	X						
01-Jun-18	8004C			X	X						
01-Jun-18	8004D		X	X	X						
02-Jun-18	8004A		X								
02-Jun-18	8004B		X	X	X						
02-Jun-18	8004C		X	X	X						
02-Jun-18	8004D				X						
03-Jun-18	8004A				X						
03-Jun-18	8004B				X						
03-Jun-18	8004C		X	X	X						
03-Jun-18	8004D				X						
04-Jun-18	8004A	X									
04-Jun-18	8004B	X									
04-Jun-18	8004C		X		X						
04-Jun-18	8004D		X		X						
05-Jun-18	8004A	X									
05-Jun-18	8004B	X									
05-Jun-18	8004C	X									
05-Jun-18	8004D	X									
06-Jun-18	8004A		X								
06-Jun-18	8004B			X	X						
06-Jun-18	8004C			X	X						
06-Jun-18	8004D			X							
07-Jun-18	8004A		X	X							
07-Jun-18	8004B			X	X						
07-Jun-18	8004C				X						
07-Jun-18	8004D			X							
08-Jun-18	8004A			X							
08-Jun-18	8004B	X									
08-Jun-18	8004C				X						
08-Jun-18	8004D				X						
09-Jun-18	8004A		X	X							
09-Jun-18	8004B		X								
09-Jun-18	8004C			X	X						
09-Jun-18	8004D	X									
10-Jun-18	8004A		X		X						
10-Jun-18	8004B				X						
10-Jun-18	8004C		X		X			X			
10-Jun-18	8004D				X						
11-Jun-18	8004A	X									
11-Jun-18	8004B		X		X						
11-Jun-18	8004C		X		X						
11-Jun-18	8004D	X									

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOBA	No Bats	No recorded despite survey effort
LACI	Hoary bat	<i>Lasiurus cinereus</i>
LANO	Silver-haired bat	<i>Lasionycteris noctivagans</i>
EPFU	Big Brown bat	<i>Eptesicus fuscus</i>
LABO	Eastern Red bat	<i>Lasiurus borealis</i>
PESU	Tri-coloured bat	<i>Perimyotis subflavus</i>
MYLU	Little Brown Myotis	<i>Myotis lucifugus</i>
MYSE	Northern Myotis	<i>Myotis septentrionalis</i>
MYLE	Eastern Small-footed Myotis	<i>Myotis leibii</i>

Inside Study Area	Outside Study Area	Background Reference	COMMON NAME	SCIENTIFIC NAME	Provincial Status (S RANK)	Global Status (G RANK)	COSSARO (MNR)	COSEWIC (Federal)	SWH Indicator Species 6E
X	X	X							
X	X	X	ODONATA						
X			Eastern Red Damselfly	<i>Amphagrion saucium</i>	S4	G5			
X			Common Green Damselfly	<i>Anax junius</i>	S5	G5			
X			Delta-spotted Spiketail	<i>Cordulegaster diastatops</i>	S4	G5			
X			Four-spotted Skimmer	<i>Libellula quadrimaculata</i>	S5	G5			
X			BUTTERFLIES						
X			Dreamy Duskywing	<i>Erynnis icelus</i>	S5	G5			
X			Peck's Skipper	<i>Polites peckius</i>	S5	G5			
X			Mustard White	<i>Pieris oleracea</i>	S4	G4G5			
X			Cabbage White	<i>Pieris rapae</i>	SNA	G5			
X			Clouded Sulphur	<i>Colias philodice</i>	S5	G5			
X			Northern Crescent	<i>Phycoides pascoensis</i>	S5	G5			
X			Monarch	<i>Danaus plexippus</i>	S2N, S4B	G4	SC	END	X
X			Viceroy	<i>Limenitis archippus</i>	S5	G5			
X			AMPHIBIANS						
X			Northern Green Frog	<i>Lithobates clamitans</i>	S5	G5			X
X			BIRDS						
X			Canada Goose	<i>Branta canadensis</i>	S5	G5			X
X			Mallard	<i>Anas platyrhynchos</i>	S5	G5			X
X			Wild Turkey	<i>Meleagris gallopavo</i>	S5	G5			X
X			Mourning Dove	<i>Zenaidura macroura</i>	S5	G5			
X			Northern Flicker	<i>Colaptes auratus</i>	S4B	G5			
X			Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	G5	SC	SC	X
X			Alder Flycatcher	<i>Empidonax alnorum</i>	S5B	G5			
X			Great Crested Flycatcher	<i>Myiarchus crinitus</i>	S4B	G5			
X			Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B	G5			
X			Blue Jay	<i>Cyanocitta cristata</i>	S5	G5			
X			American Crow	<i>Corvus brachyrhynchos</i>	S5B	G5			
X			Barn Swallow	<i>Hirundo rustica</i>	S4B	G5	THR	THR	
X			Black-capped Chickadee	<i>Poecetes atricapillus</i>	S5	G5			
X			Red-breasted Nuthatch	<i>Sitta canadensis</i>	S5	G5			X
X			House Wren	<i>Troglodytes aedon</i>	S5B	G5			
X			Wood Thrush	<i>Hylocichla ustulata</i>	S4B	G4	SC	THR	X
X			American Robin	<i>Turdus migratorius</i>	S5B	G5			
X			Gray Catbird	<i>Dumetella carolinensis</i>	S4B	G5			
X			European Starling	<i>Sturnus vulgaris</i>	SNA	G5			
X			Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	G5			
X			Purple Finch	<i>Carpodacus purpureus</i>	S4B	G5			
X			American Goldfinch	<i>Spinus tristis</i>	S5B	G5			
X			Northern Waterthrush	<i>Parkesia noveboracensis</i>	S5B	G5			
X			Black-and-white Warbler	<i>Mniotilta varia</i>	S5B	G5			
X			Nashville Warbler	<i>Oreothlypis ruficapilla</i>	S5B	G5			
X			Common Yellowthroat	<i>Geothlypis trichas</i>	S5B	G5			
X			American Redstart	<i>Setophaga ruticilla</i>	S5B	G5			
X			Yellow Warbler	<i>Setophaga petechia</i>	S5B	G5			
X			Vesper Sparrow	<i>Poecetes gramineus</i>	S4B	G5			X
X			Song Sparrow	<i>Melospiza melodia</i>	S5B	G5			
X			Swamp Sparrow	<i>Melospiza georgiana</i>	S5B	G5			
X			White-throated Sparrow	<i>Zonotrichia albicollis</i>	S5B	G5			
X			Northern Cardinal	<i>Cardinalis cardinalis</i>	S5	G5			
X			Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S4B	G5			
X			Indigo Bunting	<i>Passerina cyanea</i>	S4B	G5			
X			Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S4	G5			
X			Common Grackle	<i>Quiscalus quiscula</i>	S5B	G5			
X			Brown-headed Cowbird	<i>Molothrus ater</i>	S4B	G5			
X			Baltimore Oriole	<i>Icterus galbula</i>	S4B	G5			
X			MAMMALS						
X			Little Brown Myotis	<i>Myotis lucifugus</i>	S4	G3	END	END	
X			Silver-haired Bat	<i>Lasiurus noctivagus</i>	S4	G3G4			X
X			Big Brown Bat	<i>Eptesicus fuscus</i>	S4	G5			X
X			Hoary Bat	<i>Lasiurus cinereus</i>	S4	G3G4			
X			Eastern Chipmunk	<i>Tamias striatus</i>	S5	G5			
X			Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	S5	G5			
X			Red Squirrel	<i>Tamiasciurus hudsonicus</i>	S5	G5			
X			Beaver	<i>Castor canadensis</i>	S5	G5			
X			Northern Raccoon	<i>Procyon lotor</i>	S5	G5			
X			Striped Skunk	<i>Mephitis mephitis</i>	S5	G5			
X			White-tailed Deer	<i>Odocoileus virginianus</i>	S5	G5			X
			SUMMARY						
			Total Odonata:	4					
			Total Butterflies:	8					
			Total Other Arthropods:	0					
			Total Amphibians:	1					
			Total Reptiles:	0					
			Total Birds:	39					
			Total Breeding Birds:	39					
			Total Mammals:	11					
			SIGNIFICANT SPECIES						
			Global:	3					

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
1. SEASONAL CONCENTRATION AREAS					
Waterfowl Stopover and Staging Areas (terrestrial)	Yes – CUT1 and CUM1 vegetation communities are present on the Subject Lands.	No – No evidence of sheet water during spring surveys was recorded. Both vegetation communities are highly disturbed from adjacent agricultural practices.	No	N/A	Not Present
Waterfowl Stopover and Staging Areas (aquatic)	Yes – MAS2 vegetation communities are present on the Subject Lands.	No – MAS2 vegetation community does not have large areas of relief to attract or support significant numbers of waterfowl.	No	N/A	Not Present
Shorebird Migratory Stopover Areas	Yes – MAM2 vegetation communities are present on the Subject Lands.	No – this vegetation community does not meet the size criteria to attract or support significant numbers of waterfowl.	No	N/A	Not Present
Raptor Wintering Areas	Yes – FOM vegetation communities are found on adjacent lands (<120 m)	No - the CUM vegetation community on the Subject Lands and the adjacent	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	and CUM are present on the Subject Lands.	offsite FOM vegetation community do not meet the minimum combined size criteria (>20 ha).			
Bat Hibernacula	No – Cave ecosites are absent from the Subject Lands.	No	No	N/A	Not Present
Bat Maternity Colonies	Yes – SWM vegetation communities are present on the Subject Lands.	Yes – FOD vegetation communities do contain trees with dbh greater than 25 cm and decay classes 1-3.	Yes	A total of forty-eight detector nights of survey effort were completed on the Subject Lands using passive detectors (SM3Bat). A total of 224 calls from Big Brown Bat (<i>Eptesicus fuscus</i>) and 29 calls from Silver-haired Bat (<i>Lasionycteris noctivagans</i>) were recorded (see Figure 3, Appendix A for station locations). Abundance criteria for both Big Brown Bat and Silver-haired Bat were met.	Present
Turtle Wintering Areas	Yes – SWM, MAS and MAM vegetation	No – although features are present	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	communities are present on the Subject Lands.	on the site that may provide basking opportunities, all features were dry during March surveys and would be unable to provide water depths that would not freeze during winter.			
Reptile Hibernacula	Yes – Ecosites are present on the Subject Lands.	No – No rock outcrops or natural/naturalized features were identified on the Subject Lands. Some rock piles were identified on the Subject Lands but they are surficial deposits that would not provide access below the frost line.	No	N/A	Not Present
Colonial Bird Nesting Sites (bank/cliff)	No – While CUM1 vegetation communities are present on the Subject Lands, no eroding sandy	No	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	slopes or cliff faces are present.				
Colonial Bird Nesting Sites (tree/shrubs)	No – No SWM2, SWM3, SWM5, SM6, SWD or FET1 vegetation communities are present on the Subject Lands.	No	No	N/A	Not Present
Colonial Bird Nesting Sites (ground)	No – No rocky islands or peninsulas are present on the Subject Lands. Brewer's Blackbird is not known in southwestern Ontario, therefore it is not of consideration.	No	No	N/A	Not Present
Migratory Butterfly Stopover Areas	Yes – FOM vegetation communities are found on adjacent lands (<120 m) and CUM and CUT vegetation communities are present on the Subject Lands.	No – Subject Lands are greater than 5 km away from Lake Ontario.	No	N/A	Not Present
Migratory Landbird Stopover Areas	Yes – SWM vegetation communities are present on the Subject Lands.	No – Subject Lands are greater than 5 km away from Lake Ontario.	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Deer Yarding Areas	No – Mapping from the MNRD LIO database did not depict any deer yarding areas on or adjacent to the Subject Lands.	No	No	N/A	Not Present
Deer Winter Congregation Areas	No – Mapping from the MNRD LIO database did not depict any deer wintering areas on or adjacent to the Subject Lands.	No	No	N/A	Not Present
2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE					
2a. Rare Vegetation Communities					
Rare Vegetation Types (cliffs, talus slopes, sand barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	No	No	No	N/A	Not Present
Other Rare Vegetation Types (S1 to S3 communities)	No	No	No	N/A	Not Present
2b. Specialized Wildlife Habitat					

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Waterfowl Nesting Area	Yes - MAM and MAS vegetation communities are present on the Subject Lands.	Yes – Offsite FOD vegetation community is at least 120 m wide, which is adjacent to a large MA vegetation community (offsite).	Yes	Two rounds of breeding bird surveys were completed on the Subject Lands. One Mallard individual was recorded during round 1 surveys at Point Count (PC) 3 (see Figure 3, Appendix A for station locations). Abundance criteria was not met.	Not Present
Bald Eagle and Osprey Habitats	Yes – SWM vegetation communities are present on the Subject Lands adjacent to the Purpleville Creek (offsite feature; flows east of the Subject Lands).	No – While these species are known to inhabit these types of habitats in Southern Ontario, higher quality habitat along Lake Simcoe is found approximately 3 km north of the Subject Lands.	No	N/A	Not Present
Woodland Raptor Nesting Habitat	Yes – SWM vegetation communities are present on the Subject Lands.	No – The SWM vegetation communities on the Subject Lands do not meet the minimum size criteria (>30 ha	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		with a minimum of 10 ha interior habitat).			
Turtle Nesting Areas	Yes – MAS vegetation communities are present on the Subject Lands.	No – Portions of the Subject Lands are highly disturbed from agricultural practices (row crops). SWD vegetation communities are densely vegetated and would not provide suitable nesting opportunities.	No	N/A	Not Present
Seeps and Springs	Yes – SWM vegetation communities are present on the Subject Lands.	Potentially –Hewitt Creek found adjacent to SWM vegetation communities. However, no headwater drainage features were identified on the Subject Lands.	Yes – data will be collected incidentally during ecological surveys and thoroughly through hydrogeological surveys.	An area with several seeps was identified within the Natural Heritage System	Present
Woodland Amphibian Breeding Habitats (within or < 120m from woodland)	Yes – SWM vegetation communities are present on the Subject Lands.	Yes – presence of wetland communities adjacent to and within SWM vegetation communities. Size	Yes	Two rounds of evening amphibian call count surveys were completed; third round was not completed because	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		criteria (>25 m diameter) is met.		stations were dry or unsuitable to support amphibian breeding habitat during second round assessments. No amphibians were recorded during the surveys and therefore abundance criteria was not met. See Figure 3 (Appendix A) for survey locations.	
Wetland Amphibian Breeding Habitats (wetland >120m from woodland)	Yes – MAM and MAS vegetation communities are present on the Subject Lands.	Yes – size criteria (>25 m diameter) is met.	Yes	Two rounds of evening amphibian call count surveys were completed; third round was not completed because stations were dry or unsuitable to support amphibian breeding habitat during second round assessments. No amphibians were recorded during the surveys and therefore abundance criteria was not met. See Figure 3 (Appendix A) for survey locations.	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Woodland Area-Sensitive Bird Breeding Habitat	Yes – SWM vegetation communities are present on the Subject Lands.	No – SWM vegetation communities do not meet the minimum size criteria (>30 ha).	No	N/A	Not Present
3. SPECIES OF CONSERVATION CONCERN					
Marsh Bird Breeding Habitat	Yes – MAM2 vegetation communities are present on the Subject Lands.	Yes – MAM2 vegetation communities support emergent vegetation (cattails).	Yes	Two rounds of breeding bird surveys were completed on the Subject Lands. Despite survey effort SWH indicator species were not observed (see Table 4, Appendix B for survey results).	Not Present
Open Country Bird Breeding Habitat	Yes – CUM1 vegetation communities are present on the Subject Lands.	No – size criteria is not met (>30 ha) and are highly disturbed from adjacent agricultural land uses.	No	N/A	Not Present
Shrub/Early Successional Bird Breeding Habitat	Yes – CUT1 vegetation communities are present on the Subject Lands.	No – size criteria is not met (>10 ha). Thicket community is also highly disturbed as it is located adjacent to a laneway and active agricultural field.	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Terrestrial Crayfish	Yes – MAM and MAS vegetation communities are present on the Subject Lands.	Yes – no minimum size requirement.	Yes – any observation of crayfish chimneys will be documented during all wildlife and botanical surveys.	No terrestrial crayfish chimneys were observed during ecological investigations.	Not Present
Special Concern and Rare Wildlife Species					
(i) Eastern Wood Pewee (<i>Contopus virens</i>)	N/A	Yes – Forested vegetation communities are present on and adjacent to the Subject Lands.	Yes	Two rounds of breeding bird surveys were completed on the Subject Lands. During first round surveys, one individual was recorded at PC2, PC3 and PC4, and one individual was observed at PC1 and PC3 during second round surveys (see Figure 3, Appendix A for station locations). One individual was heard offsite during first round surveys.	Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
(ii) Wood Thrush (<i>Hylocichla mustelina</i>)	N/A	Yes – Forested vegetation communities are present on and adjacent to the Subject Lands.	Yes	Two rounds of breeding bird surveys were completed on the Subject Lands. One individual was documented at PC1, PC2 and PC3 during second round surveys (see Figure 3, Appendix A for station locations). No individuals were recorded during first round surveys.	Present
(iii) Monarch (<i>Danaus plexippus</i>)	N/A	Yes – While, one CUM vegetation community is present on the Subject Lands, it is highly disturbed because of adjacent agricultural practices.	No – Incidental observations to be gathered during other surveys	No - only 1 Monarch was observed during all surveys on the Subject Lands.	Not Present
4. ANIMAL MOVEMENT CORRIDORS					
Amphibian Movement Corridors	N/A	No - Amphibian breeding SWH types are absent from the Subject Lands.	No	N/A	Not Present
Deer Movement Corridors	N/A	No – Deer Wintering Congregation and Deer Yarding SWH	No	N/A	Not Present

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		types are absent from the Subject Lands.			

Appendix C – Agency Consultation



Sean Male <seanmale@savanta.ca>

Information Request - 750 Lockhart Road, Barrie - Proposed Residential Development

Sean Male <seanmale@savanta.ca>
To: Midhurstsar@ontario.ca

Tue, Jan 16, 2018 at 2:18 PM

Hello,

We are working on a proposed residential development at 750 Lockhart Road in Barrie, ON. The Subject Lands boundary are shown in the attached figure. The proposed development is within the Hewitt's Secondary Plan Area of the City of Barrie. The site is being considered for residential development, with the southern agricultural lands under consideration for medium/high density development. The Hewitt's Secondary Plan requires that a minor collector road be installed through the Natural Heritage System between the two portions of agricultural land, with the initial intent being that the roadway would be placed as close to the rail corridor as possible to minimize impacts on the feature. The boundary of the Natural Heritage System on the Subject Lands is currently being confirmed through on-site stakings with Lake Simcoe Region Conservation Authority. We note from a review of LIO mapping that the wetland within the Natural Heritage System was previously assessed as a non-Provincially Significant Wetland.

We are requesting any information you may have with respect to occurrence of Species at Risk on or near the Subject Lands. We have completed a preliminary screening of existing databases, and are providing that assessment in the attached spreadsheet. Beyond the species listed therein, we would also acknowledge the potential for species at risk bats to be present within the Natural Heritage System.

If you require any further information at this time, please do not hesitate to contact me.

Thank you,

Sean
Sean K. Male, M.Sc.
Senior Terrestrial Ecologist/Senior Project Manager
Savanta Inc.

Cell: 289.407.7483
Toll Free: 1.800.810.3281 x1260
seanmale@savanta.ca

www.savanta.ca

2 attachments

8004 - 750 Lockhart Road Barrie - ELC and Property Boundary.pdf
662K

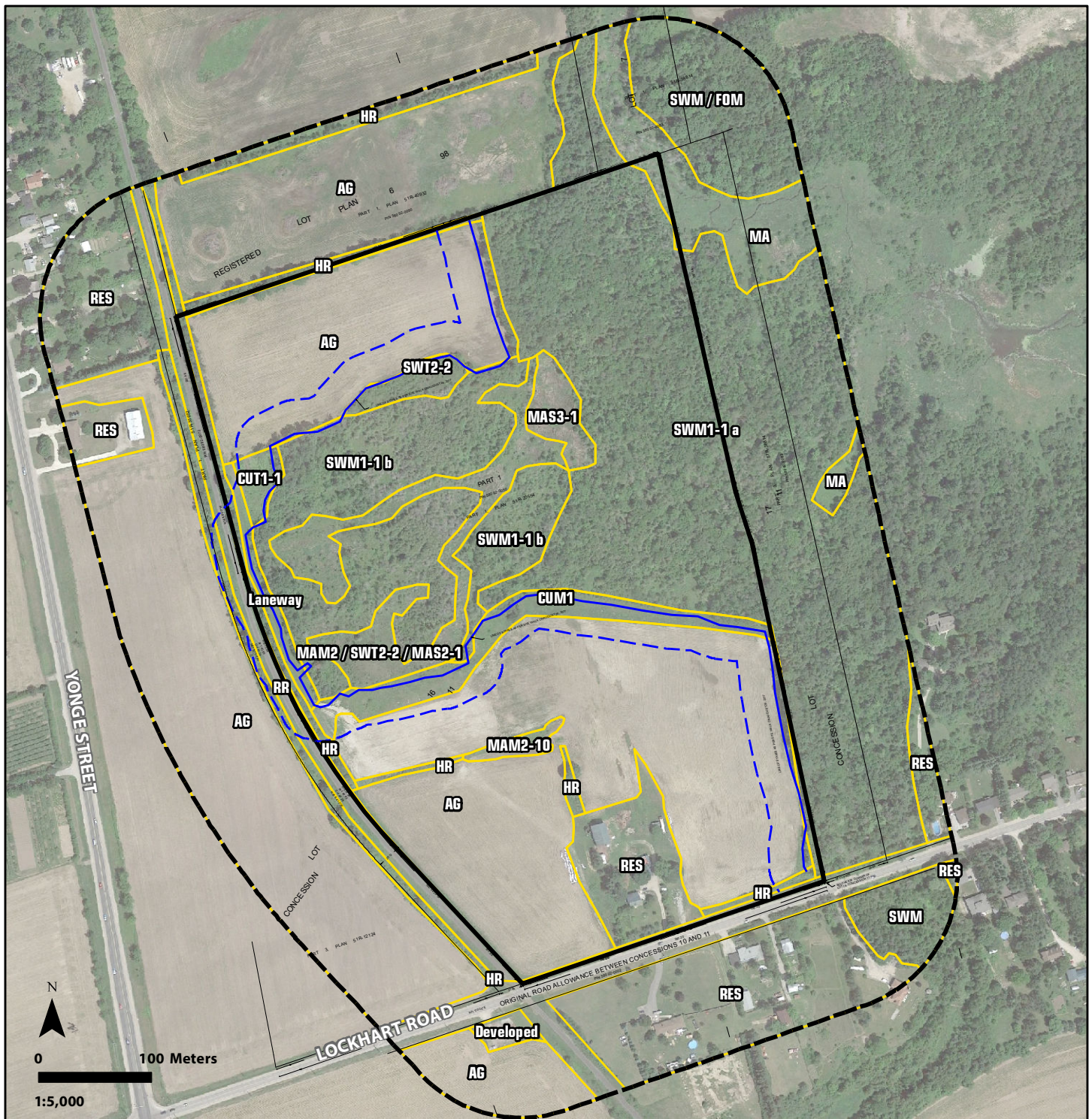
8004 Lockhart Road Background Search.xlsx
21K

750 Lockhart Road (8004) - Background Search

Common Name	Scientific Name	S-Rank	G-Rank	COSSARO	COSEWIC	Last Observed	Extirpated	Preferred Habitat	Potential on the Subject Lands
NHIC									
Snapping Turtle	<i>Chelydra serpentina</i>	S3	G5	SC	SC	1994-00-00	No	Slow moving rivers, lake edges and wetlands	No suitable wetland or waterbodies identified on developable portion of the Subject Lands; may be present within the watercourse and wetlands on and adjacent to the Subject Lands.
Herptiles									
Blanding's Turtle	<i>Emydoidea blandingii</i>	S3	G4	THR	THR	2011-08-25	No	Complex wetland habitats composed of sedge or sphagnum hummocks	No suitable wetland or waterbodies on the Subject Lands.
Snapping Turtle	<i>Chelydra serpentina</i>	S3	G5	SC	SC	2013-09-28	No	Slow moving rivers, lake edges and wetlands	No suitable wetland or waterbodies identified on developable portion of the Subject Lands; may be present within the watercourse and wetlands on and adjacent to the Subject Lands.
Western Chorus Frog	<i>Pseudacris maculata</i> pop. 1	S3	G5TNR	NAR	THR	2005-05-10	No	Woodland vernal pools	Potential for habitat within SWM ELC within the Natural Heritage System on the Subject Lands.
OBBA									
Bank Swallow	<i>Riparia riparia</i>	S4B	G5	THR	THR		No	Nest in vertical desposits of silt or sand along river banks or gravel pits	No habitat present on the Subject Lands
Barn Swallow	<i>Hirundo rustica</i>	S4B	G5	THR	THR		No	Nest in old structures such as barns or houses	Suitable habitat present associaed with farm buildings on the Subject Lands.
Eastern Meadowlark	<i>Sturnella magna</i>	S4B	G5	THR	THR		No	Breeds in tall grasses such as pasture or hayfields	No habitat present on the Subject Lands; agricultural fields in corn in 2017.
Common Nighthawk	<i>Chordeiles minor</i>	S4B	G5	SC	THR		No	Breeds in habitat with little to no ground cover such as forest clearings, logged areas, or rock barrens.	Habitat not present on the Subject Lands
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	G5	SC	SC		No	Breeds and lives in intermediate aged mixed forests	Habitat present within the Natural Heritage System on the Subject Lands.
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S4B	G5	SC	THR		No	Nests in dead trees in open woodlands and woodland edges	Habitat may be present within the Natural Heritage System on the Subject Lands.
Cerulean Warbler	<i>Setophaga cerulea</i>	S3B	G4	THR	END		No	Breeds in old deciduous forests with an open understory	Habitat not present on the Subject Lands

Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	G5	THR	THR		No	Breeds in open mixed mature forests	Habitat may be present within the Natural Heritage System on the Subject Lands.
Canada Warbler	<i>Cardellina canadensis</i>	S4B	G5	SC	THR		No	Breeds in wet deciduous or coniferous forests	Habitat present within the Natural Heritage System on the Subject Lands.
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	G5	SC	THR		No	Breeds and lives in intermediate aged mixed forests	Habitat present within the Natural Heritage System on the Subject Lands.
Insects									
DFO									
MNRF - Regional SAR									
Simcoe Region									
Bald Eagle	<i>Haliaeetus leucocephalus</i>						No	Nest in large trees near large waterbodies such as lakes or rivers	Habitat may be present within the Natural Heritage System on the Subject Lands.
Barn Swallow	<i>Hirundo rustica</i>	S4B	G5	THR	THR		No	Nest in old structures such as barns or houses	Suitable habitat present associated with farm buildings on the Subject Lands.
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	G5	THR	THR		No	Breeds in tall grasses such as pasture or hayfields	No habitat present on the Subject Lands; agricultural fields in corn in 2017.
Cerulean Warbler	<i>Setophaga cerulea</i>	S3B	G4	THR	END		No	Breeds in old deciduous forests with an open understory	Habitat not present on the Subject Lands
Eastern Meadowlark	<i>Sturnella magna</i>	S4B	G5	THR	THR		No	Breeds in tall grasses such as pasture or hayfields	No habitat present on the Subject Lands; agricultural fields in corn in 2017.
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	G5	THR	THR		No	Breeds in open mixed mature forests	Habitat may be present within the Natural Heritage System on the Subject Lands.
Henslow's Sparrow	<i>Ammodramus henslowii</i>	SHB	G4	END	END		No	Breeds in dense tall grasslands	No habitat present on the Subject Lands; agricultural fields in corn in 2017.
King Rail	<i>Rallus elegans</i>	S2B	END	END	G4		No	Breeds in large freshwater marshes	No suitable wetland habitats identified on the Subject Lands.
Least Bittern	<i>Ixobrychus exilis</i>	S4B	G5	THR	THR		No	Breeds in cattail marshes with open pools and channels	No suitable wetland habitats identified on the Subject Lands.
Loggerhead Shrike	<i>Lanius ludovicianus</i>	S2B	G4	END	END		No	Breeds in alvar or grasslands interspersed with shrubs	Habitat not present on the Subject Lands
Louisiana Waterthrush	<i>Parlesia motacilla</i>	S3B	G5	THR	THR		No	Breeds in forested ravines with running water, or swamps with large pools	No suitable wetland or waterbodies identified on developable portion of the Subject Lands; may be present within the watercourse and wetlands on and adjacent to the Subject Lands.

Peregrine Falcon	<i>Falco peregrinus</i>	S3B	G4	SC	SC		No	Nest on steep cliff edges close to large waterbodies or on the ledges of skyscrapers	Habitat not present on the Subject Lands
Piping Plover	<i>Charadrius melodus</i>	S1B	G3	END	END		No	Nests along sand or gravel beaches	Habitat not present on the Subject Lands
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S4B	G5	SC	THR		No	Nests in dead trees in open woodlands and woodland edges	Habitat may be present within the Natural Heritage System on the Subject Lands.
Yellow Rail	<i>Coturnicops noveboracensis</i>	S4B	G4	SC	SC		No	Breed in shallow reed and sedge marshes	No suitable wetland habitats identified on the Subject Lands.
Lake Sturgeon	<i>Acipenser fulvescens</i>	S2	G3G4TNR	THR	THR		No	Live in large deep lakes	Habitat not present on the Subject Lands
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	S3	G4	SC	SC		No	Lives in clear coolwater streams	Habitat may be present within the watercourse on and adjacent to the Subject Lands.
Hine's Emerald	<i>Somatochlora hineana</i>	S1	G2G3	END	END		No	Lives in groundwater fed wetlands with grassy vegetation	No habitat present on the Subject Lands
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	S1	G1	END	END		No	Utilizes open habitat such as farmland and savannahs	No habitat present on the Subject Lands
Hart's-tongue Fern	<i>Asplenium scolopendrium</i>	S3	G4	SC	SC		No	Grows in calcareous rocky areas in maple beech forests	Habitat not present on the Subject Lands; agricultural fields in corn in 2017.
Broad Beech Fern	<i>Phegopteris hexagonoptera</i>	S3	G5	SC	SC		No	Grows in maple beech forests with rich soils	Habitat not present on the Subject Lands
Eastern Prairie Fringed-orchid	<i>Platanthera leucophaea</i>	S2	G2G3	END	END		No	Found in wetlands, swamps and tall grass prairie	Habitat may be present within the Natural Heritage System on the Subject Lands.
Forked Three-awned Grass	<i>Aristida basiramea</i>	S2	G5	END	END		No	Grows on bare ground between patches of other grass species	Habitat may be present on the Subject Lands.
Hill's Thistle	<i>Cirsium pumilum</i> var. <i>hillii</i>	S3	G3	THR	THR		No	Found in alvar grasslands with Cedar and Pine species	Habitat not present on the Subject Lands
Spotted Wintergreen	<i>Chimaphila maculata</i>	S2	G5	END	END		No	Grows in sandy soils of dry oak and pine woodlands	Habitat not present on the Subject Lands
Common Five-lined Skink	<i>Plestiodon fasciatus</i> pop. 2	S3	G5T3	SC	SC		No	Prefers open rocky habitat	No habitat present on the Subject Lands
Massasauga	<i>Sistrurus catenatus</i> pop. 1	S3	G3G4T3	THR	THR		No	Can be found in tall grass prairies, bogs, marshes, shorelines and along rock barrens	No habitat present on the Subject Lands
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	S4	G5	SC	SC		No	Prefers swamp and bog habitats	Habitat may be present within the Natural Heritage System on the Subject Lands.
Blandings Turtle	<i>Emydoidea blandingii</i>	S3	G4	THR	THR		No	Complex wetland habitats composed of sedge or sphagnum hummocks	No suitable wetland or waterbodies on the Subject Lands.



Ballymore - 750 Lockhart Road, Barrie Natural System - Limits and Buffers

- Subject Lands
- 120m Adjacent Lands
- Ecological Land Classification
- Staked Limit of Natural Heritage System
- 30m Buffer from Natural Heritage System



ELC Legend

CUM1	Mineral Cultural Meadow	AG	Agricultural
CUT1-1	Sumac Cultural Thicket	Developed	Developed
FOM	Mixed Forest	HR	Hedgerow
MA	Marsh	Laneway	Laneway
MAM2-10	Forb Mineral Meadow Marsh	RES	Residential
MAS2-1	Cattail Mineral Shallow Marsh	RR	Railway
MAS3-1	Cattail Organic Shallow Marsh		
SWM	Mixed Swamp		
SWM1-1a	White Cedar- Hardwood Mineral Mixed Swamp - closed canopy		
SWM1-1b	White Cedar- Hardwood Mineral Mixed Swamp - open canopy		
SWT2-2	Willow Mineral Thicket Swamp		



Sean Male <seanmale@savanta.ca>

Information Request - 750 Lockhart Road, Barrie - Proposed Residential Development

Findlay, Graham (MNR) <graham.findlay@ontario.ca>
To: "seanmale@savanta.ca" <seanmale@savanta.ca>

Fri, Jul 20, 2018 at 1:40 PM

Hi Sean I apologize for the delayed response to your request for information. Please note however, the province has centralized and made publicly available digital and species data that lends to inform data needs such as the information requests MNR receives. Your information requirements can largely be met through the use of the following data sources and reference documents:

- Digital data for natural heritage features (e.g. wetland and ANSI mapping, fish community data) can be obtained through Land Information Ontario (LIO) and/or through the Make a Map: Natural Heritage Areas tool through LIO at the link below.

Land Information Ontario: https://www.ontario.ca/page/land-information-ontario_

- Make a Map: Natural Heritage Areas: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US_ Natural Heritage Information Centre (NHIC) data is also available through this interactive map tool.

- Other resources to consider include:

"Atlas of the Breeding Birds of Ontario"

"Ontario Reptile and Amphibian Atlas"

You have completed a comprehensive preliminary screening. Considering your screening an additional species to be aware of that could potentially be encountered on site is the butternut tree. Your table speaks to Blanding's turtle, for your information a Blanding's turtle was encountered in 2017 in a yard just north of Mapleview Drive East, backing onto the east side of Hewitt's Creek. The habitat potential for Blanding's turtle within the wetland and adjacent habitats on and east of your study site would warrant consideration against the project you are evaluating. Further, as you are likely aware, the species at risk records found in the NHIC database are not exhaustive and are based on **known** occurrences only. As a result, although there may be no record (or confirmation) of a species at risk on a specific site it does not mean that they are not present if appropriate habitat exists. Due diligence is therefore still required and would include an appropriate consideration of what species

could be present based on available habitat on and adjacent to your study site. Your field work should inform you on what species on the Species at Risk in Ontario (SARO) list (link below) could possibly be encountered based on available habitats in the area of the study as well as the possible survey methodologies required during your site assessments.

SARO List: <https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>

Evaluating for other natural heritage values, for example candidate significant wildlife habitat (SWH) will be informed by direction in the Natural Heritage Reference Manual, the Significant Wildlife Habitat Technical Guide and SWH Criteria Schedule for Ecoregion 6E. Similar to SAR occurrence reports, if mapping for natural heritage features is not available, this is not confirmation that SWH does not exist on a specific site, rather the assessments to identify them have not been completed. Your field work will inform your review of the property for natural heritage features and functions.

The wetland on and adjacent to your study site is the St. Pauls Swamp (not provincially significant wetland). For your reference attached are the wetland evaluation record and map for the wetland.

Threatened and endangered species and their habitat are protected under the Endangered Species Act (ESA), 2007. Avoidance and mitigation measures may need to be considered for the project. The proponent should be aware that if threatened or endangered species or their habitat is found to occur at a site, approvals under the ESA may be required. Additional information on Species at Risk including guides, resources, permits, authorizations and overall benefit information can be obtained at: <https://www.ontario.ca/page/species-risk>

Sean you are familiar with our email address for information request submissions (midhurstinfo@ontario.ca), attached for future use is our **Information Request Form**. After you complete a preliminary screening for a study area, if additional detail is still desired you can submit the form through our generic email address.

Do call with any further questions.

Regards,

Graham Findlay

Management Biologist

Huron Resources Management Team,

Midhurst, MNRF

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graham.findlay@ontario.ca

From: MIDHURSTINFO (MNRF)
Sent: July 19, 2018 3:34 PM
To: Findlay, Graham (MNRF)
Subject: FW: Information Request - 750 Lockhart Road, Barrie - Proposed Residential Development

From: Sean Male [mailto:seanmale@savanta.ca]
Sent: July 19, 2018 3:17 PM
To: MIDHURSTINFO (MNRF)
Subject: Fwd: Information Request - 750 Lockhart Road, Barrie - Proposed Residential Development

[Quoted text hidden]

3 attachments

 **St. Paul's Swamp Data.pdf**
644K

 **St. Paul's Swamp Eval.pdf**
180K

 **StPaulsSwamp_Map.pdf**
340K

DRAFT MEETING MINUTES

February 12, 2018

10:00 a.m.

Lake Simcoe Region Conservation Authority

Re: Ballymore Homes Proposed Residential Development – 750 Lockhard Road, Barrie

In attendance:

Savanta: Rick Hubbard (RH), Sean Male (SM);

Ballymore Homes: Sharon Dionne (SD);

Lake Simcoe Region Conservation Authority: Charles Burgess (CB), Melinda Bessey (MB)

Item Discussed	Action Required
1. Collector Road: SD provided a drawing showing a current concept arrangement for the layout of the collector road. SD noted that the collector road must connect to the location approved for the lands to the north, that Ballymore has confirmed additional setback from the rail berm is not required, and that they are continuing discussions with the City around reducing the width of the collector road to the greatest extent possible (i.e. remove parking lane and one sidewalk within the NHS). LSRCA agreed with approach of reducing width to the greatest extent possible. LSRCA asked if there was a need for the collector road. SD indicated that both the City's and Ballymore's transportation consultant have shown that the road will be required. LSRCA asked if the wetland had been evaluated. SM confirmed that the wetland is identified in Land Information Ontario mapping as an evaluated wetland that is not provincially significant. LSRCA indicated that they would confirm their ability to issue a permit for the access road through the wetland. LSRCA noted that the impact to the NHS from the collector road is a requirement of the City and not a request of the	LSRCA to confirm

developer, and this should be considered in relation to any compensation required.	
2. Phase 1 Development Lands SD outlined the constraints with respect to establishing a development plan within the Phase 1 lands, including the connections to approved roadways on the property to the north. SD provided a plan that showed that it is not possible to provide a 30 m buffer along the eastern limit of the Phase 1 development given the constraints identified above, however opportunities exist within other portions of the site to provide additional buffer areas. LSRCA indicated that they are not opposed “in principle” to an averaging of the buffer in parts, however Savanta’s report must clearly identify where this has occurred and address any ecological impacts/gains. Through preliminary examination of the concept plan during the meeting, the LSRCA indicated that there appears to be sufficient additional planting area to support a “net gain” rationale. SD requested confirmation with respect to placement of Low Impact Development (LID) measures within the buffer. LSRCA confirmed that LID measures are permissible within the buffer but must be located more than 15 m from the staked limit of the feature. LSRCA noted that detailed information on the buffer planting plan is not required at this time, but general planting principles to identify. LSRCA noted that the plan for the Phase 1 lands shows Ballymore’s efforts to reduce the footprint to protect the environment, and this should be clearly identified within the submission.	Savanta to ensure that the NHE report provides detailed assessment of the buffer. Savanta to include general planting principles for the buffer within the NHE report.
3. Additional field investigations Savanta indicated that additional field investigations are proposed for this summer to characterize the area of the Natural Heritage System associated with the collector road. LSRCA confirmed that NHE reports received for the Hewitt’s	Savanta to complete 2018 field surveys to address potential SAR issues as well

DRAFT MEETING MINUTES

Secondary Plan area have varied in the extent of additional studies, with some providing information, while others deferred the studies to later submissions.	as to provide site-specific botanical/wildlife data.
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