Appendix B
Natural Environment

City of Barrie
Hewitt's Secondary Plan Schedule C Class Environmental Assessment

Natural Heritage Impact Assessment Report

Date	Rev.	Status	Prepared By	Checked By	Approved By
August 8, 2016	A	Draft for Client Review	Melissa Torchia Hatch	Melissa Alexander Hatch	Robert Shamess Hatch
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Signatures					
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1. Introduction

The City of Barrie retained Hatch to carry out a Natural Heritage Impact Assessment (NHIA) to characterize the terrestrial and aquatic environmental features to support the Schedule C, Class Environmental Assessment (EA) for the Hewitt's road widening and grade separation project. It is understood that in 2010, lands were transferred from the Town of Innisfil to the City of Barrie as part of the *Barrie-Innisfil Boundary Adjustment Act*, 2009, and were then subject to a master planning exercise (City of Barrie RFP-2015-011P). A total of six master plans were prepared in accordance with the Municipal Class EA process. The six plans include:

1. Water Supply
2. Water Storage and Distribution
3. Wastewater Collection
4. Wastewater Treatment
5. Drainage and Stormwater Management
6. Multi-Modal Active Transportation.

As part of these master plans, land use plans for the annexed lands were prepared, and two secondary plans were completed: The Salem Secondary Plan (Official Plan Amendment 38) and the Hewitt's Secondary Plan (Official Plan Amendment 39). The City of Barrie has completed Phase 1 and 2 of the Municipal Class EA for Salem and Hewitt's secondary planning areas as part of the Multi-Modal Active Transportation Master Plan (MMATMP), whereby the City of Barrie now intends to proceed with Phase 3 and 4 of the Municipal Class EA process for the road widening and grade separation projects within both the Salem and Hewitt's Secondary Plan (City of Barrie RFP-2015-011P).

The requirements for Phase 3 and 4 for each of these two planning areas has been split, whereby this NHIA report will focus solely on the Hewitt's Secondary Plan Assignment, which will move the project through Phases 3 and 4 of the Municipal Class EA process, for arterial road widening, two grade separation railway crossings, conceptual design for drainage works associated with the road, and design of trunk watermain and trunk waste water sewers. More specifically:

- Big Bay Point Road trunk watermain and road widening;
- Mapleview Drive East road widening, trunk watermain, trunk sanitary sewer , and grade separation;
- Lockhart Road, grade separation and road widening; and,

- Yonge Street road widening.

Refer to Figure 1 for Project Study Area. The study areas are split into four separate areas:

- Area 1 is a smaller area of disturbance, and is located along Big Bay Pointe Road that extends from Versailles Cres east approximately 620 m;
- Area 2 is along Mapleview Drive East, which extends from Huronia Road east to 20th Side Road;
- Area 3 is along Yonge Street from Lockhart Road to Mapleview Drive East; and,
- Area 4 is along Lockhart Road, which extends from Huronia Road east almost to 20th Side Road.

It is important to note that a series of natural heritage studies have been previously completed as part of the Secondary Plan for the City of Barrie annexed lands. Data collected as part of these reports was used as part of the preparation of this assessment, whereby this NHIA aims to incorporate information as obtained through a series of data gap analyses in order to provide corresponding updates on features and species listing since the previous reports have been completed.

1.1 Scope of Work

As part of this NHIA the following scope of work was undertaken:

- Conduct a literature review of background information (e.g. key natural heritage features);
- Consult with the Ontario Ministry of Natural Resources and Forestry (MNRF) and Lake Simcoe Region Conservation Authority (LSRCA);
- Conduct a field investigation to collect baseline data for data gaps on natural features not limited to the following:
    - Terrestrial inventory through Ecological Land Classification (ELC) including targeted surveys for endangered species Butternut (*Juglans cinerea*);
    - Two breeding bird surveys based on the Ontario Breeding Bird Atlas (OBBA) protocol;
    - Three amphibian surveys according to the Marsh Monitoring Program (MMP) protocol; and,
    - Incidental observations of other wildlife, including reptiles and mammals.
- Prepare a report which outlines the above noted information to be included as part of the EA including a description of:
    - any consultation and the results of the consultation;

- existing Study Area conditions based on 2016 field investigations and relevant information provided from previous investigations;
- assessment of the impacts associated with the alternative designs for each of the four areas; and,
- recommendations of best management practices (BMPs) and other impact avoidance or mitigation measures that can be used to prevent or minimize the predicted negative effect(s) of the construction.

Note all assessments were made from the road corridor and extend approximately 25 metres from the right-of-way (ROW).

Figure 1 Hewitts Infrastructure Improvements Class Environmental Assessment: Project Area and Study Limits

Key

Infrastructure Improvements

Study Limit- 25 Meter Buffer

Innisfil Municipal Boundary

0 250 500 1,000 1,500 Meters

*The information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

Coordinate System: NAD 1983 UTM Zone 17N

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2. Policy Context

This section of the Report summarizes the various federal, provincial and municipal planning policies and regulations related to natural heritage that apply to the proposed Transportation Improvements. Thus, they provide the policy context for this NHIA. For documented natural heritage features refer to Figure 2.

2.1 Municipal Policies

The Project Study Area located within the City, which is a single-tier municipality that is administratively separate from the County of Simcoe. As such, the City is responsible for regulating land use and establishing policies for physical, economic and social development within its respective jurisdiction. However, this responsibility is conducted within a provincial framework.

2.1.1 City of Barrie

The City of Barrie Official Plan was adopted by City Council in 1994 and was approved by the Minister of Municipal Affairs and Housing (MMAH) in July 1997, and has since been amended and further consolidated in February 2014. The policies that pertain to natural heritage features are contained mainly in Section 3.5 of the Plan (Natural Heritage, Natural Hazards and Resources) and Section 4.7 of the Plan (Environmental Protection Areas (EPA)).

Environmental Protection Areas are defined as:

- Aquifer recharges, headwaters;
- Wetlands;
- Rare species including unique plants;
- Important ecological functions;
- Significant habitat of threatened and endangered species;
- Areas of natural and scientific interest life science and earth science (ANSI);
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Surface water features, valley and stream corridors; and,
- Fish habitat.

As such, no buildings or structures are permitted in the EPAs other than those necessary for flood and erosion control or for conservation purposes as approved by the City with approval from applicable agencies. Additional policies and permissions as they relate to certain features (e.g. wetlands, habitat of threatened and endangered species) are identified within their respective sections.

According to Schedules (F and H) of the Official Plan:

- Watercourses that transverse the Project Study Area include: Lovers Creek and Hewitt's Creek;
- 30 metre setback limits have been established for both creeks and associated tributaries;
- Areas associated with the floodplain of these creeks are regulated by Lake Simcoe Region Conservation Authority (LSRCA);
- There are Level 1, 2 and 3 resources within the Project Study Area which include:
- Level 1
    - Provincially Significant Wetlands;
    - Non-provincially Significant wetlands greater than 0.5 hectares;
    - Significant Woodlands greater than 10 hectares;
    - Significant habitat of endangered and threatened species;
    - Watercourses with minimum vegetation protection zones and connectivity linkages; and,
    - Lands identified as EPAs.
- Level 2
    - Significant Valleylands;
    - Life Science ANSI;
    - Significant Wildlife Habitat; and,
    - Woodlands greater than 4 hectares but less than 10.
- Level 3
    - Regionally significant life science ANSI;
    - Woodlands greater than 0.5 hectares but less than 4;
    - Woodlands that are within 30 metres of Level 1 and 2 features;
    - Cultural thicket or meadow that are contiguous with woodland or wetland patches; and,
    - Connectivity linkages.

It is important to note that along the roadway each of the mapped features has been heavily disturbed, and any impacts to these features can likely be mitigated using best management practices (BMPs) during the road construction.

2.1.2 *Hewitt's Secondary Plan*

The Hewitt's Secondary Plan drafted in September 2012, provides a planning framework for urban development of the Hewitt's Secondary Plan Area. The planning period for the Secondary Plan is from 2012 to 2031. Section 9.3.2 (Natural Heritage System Components) is comprised of four components.

- Natural Core Area;
- Natural Linkage Area;
- High Constraint Stream Corridor Area and High Constraint Stream Corridor Area Special; and,
- Medium Constraint Street Corridor Area.

Additional policies and permissions as they relate to these four components are provided in their respective sections along with permitted and non-permitted uses within the natural heritage system.

According to the Draft Schedules 9A and 9B, natural heritage system components in terms of natural core areas and high constraint street corridor areas are mapped for areas along Lockhart Road, east of the rail corridor (east of Yonge Street) which transverse north towards Mapleview Drive East, along with a section just north of Lockhart Road, west of Yonge Street.

2.1.3 *City of Barrie Multi-Modal Active Transportation Master Plan*

The Multi-Modal Active Transportation Master Plan (MMATMP) identifies how the City of Barrie will address transportation challenges associated with growth and rapid development and expansion in a sustainable manner within the City. The MMATMP was completed in 2014 and includes an assessment of all transportation infrastructure including cycling, sidewalks, trails, paths, bus networks and terminals, train stations, current road networks and parking. This plan focused on the lands that the City of Barrie annexed from the Town of Innisfil. The MMATMP provides the basis for the Hewitt's Secondary Plan Schedule C Class EA.

2.1.4 *Town of Innisfil*

The Town of Innisfil Official Plan was adopted by Town Council on July 26, 2006 and approved by the Ontario Municipal Board (OMB) in 2009, 2010 and 2011 (Town of Innisfil (TOI), 2006). There are portions of the plan that may not have been approved which require reference to the 1993 Official Plan (TOI, 2006). Additional amendments were submitted in 2013 and 2014 (TOI, 2006).

Within the Official Plan (2006), sections that pertain to natural heritage features are outlined in Section 2.3.7 (Natural Environment) and Section 4.4

(Environment), whereby the Town promotes protection and enhancement of the natural environment by ensuring development considers effects on the natural environment and surrounding land use including no loss of provincially significant wetlands, to preserve other wetlands that are not provincially significant and to protect regionally and locally significant wetlands, deer wintering areas and other natural areas (TOI, 2006).

According to the Natural Areas mapping (Appendix A of the Official Plan) wetlands are located north of Lockhart Road, just east of Yonge Street and at the north, east, west and south corners of Mapleview Drive East and 20th Side Road. Additionally, stream corridors are located north and south of Lockhart Road, and along the south side of Mapleview Drive East, with Significant Woodlands located north of Lockhart Road, just east of Yonge Street, the south west corner of Lockhart Road and Huronia Road, and the north east corner of Mapleview Drive and 20th Side Road.

2.1.5 Conservation Authority

The LSRCA regulates watercourses, wetlands, and hazard lands (valleylands, shorelines, floodplains) through application of Ontario Regulation 179/06, under Section 28 of the *Conservation Authorities Act*. Ontario Regulation 179/06 applies to hazardous lands that are defined in Section 28(25) of the *Conservation Authorities Act* as lands that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock. The regulation limit for Ontario Regulation 179/06 is the applicable hazard limits for a property.

The main purpose of Ontario Regulation 179/06 is to ensure public health and safety, and protection of life and property in relation to natural hazards. This regulation establishes guidelines for development, interference with wetlands and alterations to shorelines and watercourses.

Based a review of the project, a number of areas within the Project Study Area are regulated by LSRCA. As such, a permit under Ontario Regulation 179/06 will be required prior to commencement of Project works.

Figure 2 Hewitts Infrastructure Improvements Class Environmental Assessment: Natural Areas

Key

- Infrastructure Improvements
- Study Limit- 25 Metre Buffer
- Provincially Significant- Evaluated Wetland
- Locally Significant- Evaluated Wetland
- Innisfil Municipal Boundary
- Watercourse
- MNR Unevaluated Wetland
- Potentially Significant Wetland
- Wooded Area
- Hedgerow

0 215 430 860 1,290 Meters

*The information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

Coordinate System: NAD 1983 UTM Zone 17N

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2.2 Provincial Legislative Requirements

2.2.1 Provincial Policy Statement – Planning Act

The Provincial Policy Statement (PPS) is the complimentary policy document to the *Planning Act*. The PPS was issued under section 3 of the *Planning Act* and came into effect April 30, 2014, replacing the PPS issued March 1, 2005. The PPS provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial "policy-led" planning system that recognizes and addresses the complex interrelationship among environmental, economic and social factors in land use planning (MMAH, 2014).

The PPS provides for enhanced protection of the environment by identifying the significance of the natural heritage system and water resources, including natural hazards and water quality, air quality and energy use. It also supports the provincial goal to enhance the quality of life for all Ontarians.

The policies of the PPS may be complemented by provincial plans or by locally-generated policies regarding matters of municipal interest. Provincial plans and municipal official plans provide a framework for comprehensive, integrated, place-based and long-term planning that supports and integrates the principles of strong communities, a clean and healthy environment and economic growth for the long term.

The PPS (2014) identifies the natural heritage features and areas which are to be afforded protection within the Province of Ontario. The proposed road work must recognize these features/areas, and the City must carry out the necessary investigations so as to adhere to these regulatory requirements. For the purpose of this NHIA, it is that the term 'development' is defined within the PPS (2014) as the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*, but does not include "activities that create or maintain infrastructure authorized under an EA process" (MMAH, 2014).

The PPS (2014) defines seven (7) natural heritage features and provides planning policies for each under Natural Heritage Policy 2.1. The Natural Heritage Reference Manual (MNRF, 2010) is a technical document used to help assess the natural heritage features listed below, in addition to the Province's Significant Wildlife Habitat Ecoregion Criteria Schedules for each respective Ecoregion (i.e., 5E, 6E and 7E) (MNRF, 2015). Those natural heritage features identified within the PPS (2014) include:

- Significant wetlands;
- Significant habitat of endangered and threatened species;
- Fish habitat;

- Significant woodlands;
- Significant valleylands;
- Significant areas of natural and scientific interest (ANSIs); and
- Significant wildlife habitat.

Each of these features is afforded varying levels of protection subject to guidelines, and in some cases, regulations. Significant woodlands and valleylands and even wetlands can be designated by municipalities and/or the MNRF (e.g., under the Ontario Wetland Evaluation System). Fish habitat information can be identified by Conservation Authorities, the MNRF and DFO, however the management of fish habitat is governed by DFO. Significant wildlife habitat, habitat of endangered and threatened species, and ANSIs are designated by MNRF.

Municipalities use the PPS to develop their Official Plans. Based on a review of available information within the PPS, the Project Study Area is situated within Ecoregion 6E, the Lake Simcoe-Rideau Region (termed Site Region 6E as per the ELC for Southern Ontario: First Approximation and Its Application Manual (Lee et al., 1998)). Based on a review of available mapping from the MNRF Make a Natural Heritage Mapping Tool (2015a), provincially significant wetlands (PSWs), unevaluated wetlands, fish habitat, and woodlands are located within the Project Study Area (refer to Figure 2).

2.2.2 Provincial Endangered Species Act

The Ontario *Endangered Species Act, 2007* (ESA) was passed into law in 2007 and came into effect on June 30, 2008. Under the ESA, there are more than 200 species in Ontario that are identified as extirpated, endangered, threatened, or of special concern. Section 9 of the ESA generally prohibits the killing or harming of a threatened or endangered species, as well as the destruction of its habitat. Section 10 of the ESA prohibits the damage or destruction of the habitat of all endangered and threatened species. Habitat is broadly characterized within the ESA as the area prescribed by a regulation as the habitat of the species or an area on which the species depends directly or indirectly, to carry on its life processes, including reproduction, rearing of young, hibernation, migration or feeding.

The MNRF provided a list of SAR that are known to the Project Study Area. Based upon consultation, no targeted surveys for SAR were required by MNRF with the exception of Butternut. Consultation and SAR listing is provided in Appendix A.

2.3 Federal Legislative Requirements

2.3.1 Federal Fisheries Act

The Federal *Fisheries Act* was established in 1985 with amendments made came into effect on November 25, 2013. This Act provides protection to fish and fish habitat such that:

> "*No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery*" (Section 35 (1)).

Fish habitat is defined by the Act as "*spawning grounds, and any other areas, including nursery, rearing food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes*".

The *Fisheries Act* requires that any development project avoid causing serious harm to fish unless authorized by Fisheries and Oceans Canada (DFO). This applies to any works being undertaken in or near waterbodies that support fish that are part of, or that support a commercial, recreational, or Aboriginal fishery. If mitigation measures cannot be applied, and residual effects will cause serious harm to fish then a Request for Review to DFO must be submitted. If DFO identifies that authorization (i.e., approval) for the Project is needed, offsetting measures may be required.

2.3.2 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) was passed in 1917 and updated in 1994. The MBCA protects migratory bird populations by regulating potentially harmful anthropogenic activities. The MBCA (1994) and the *Migratory Bird Regulations* (MBR) are federal legislative requirements that are binding on members of the public and all levels of government, including federal and provincial governments.

Bird species[1], protected are listed under Article I of the MBCA, and are native or naturally occurring in Canada, and are species that are known to occur regularly in Canada. The legislation protects certain species, controls the harvest of others, and prohibits commercial sale of all species. As described in Section 6 of the associated MBR:

"*Subject to subsection 5(9), no person shall:*

[1] Bird species not regulated under the Act include: Rock Dove, American Crow, Brown-headed Cowbird, Common Grackle, House Sparrow, Red-winged Blackbird, and European Starling. In addition, raptors are not regulated under the MBCA, 1994. However, they are protected under provincial legislation which restricts and regulates the taking or possession of eggs and nests. Furthermore, if the species identified is protected under Ontario's *Endangered Species Act*, 2007 or the federal *Species at Risk Act*, additional restrictions may apply.

- *Disturb, destroy or take a nest, egg, nest shelter, Eider Duck shelter or duck box of a migratory bird, or*
- *Have in his possession a live migratory bird, or a carcass, skin, nest or egg of a migratory bird except under authority of a permit therefor."*

The "incidental take" of migratory birds and the disturbance, destruction or taking of the nest of a migratory bird is prohibited. "Incidental take" is the killing or harming of migratory birds due to actions, such as economic development, which are not primarily focused on taking migratory birds. No permit can be issued for the incidental take of migratory birds or their nest or eggs as a result of economic activities. These prohibitions apply throughout the year.

Environment and Climate Change Canada (ECCC) and the Canadian Wildlife Service have compiled nesting calendars that show the variation in nesting intensity by habitat type and nesting zone, within broad geographical areas distributed across Canada. While this does not mean nesting birds will not nest outside of these periods, the calendars can be used to greatly reduce the risk of encountering a nest. It is noted that ECCC advises that avoidance is the best approach.

The MBCA applies to all of Canada. As such, the MBCA is applicable to the entire Project Study Area. Therefore, if a species or their nest, that are listed under the MBCA are encountered during Project works, they must comply with the Act. As vegetation removal is part of future Project works, it is recommended that it occur outside of the core breeding time-period identified by the MBCA which takes place from April 1 to August 31 in any given year.

3. Methodology

The methodology used for this NHIA was guided by information provided by the LSRCA, as well as by regulatory requirements contained within legislation and policies including the *ESA,* and the PPS made under the *Planning Act*.

3.1 Literature Review

The following is a list of information and documentation reviewed as part of this NEA:

- Azimuth Environmental Consulting Inc. 2010. Appendix C: Phases 3 & 4 Natural Environmental Impact Assessment Report: Huronia Road Improvements. Prepared for C.C Tatham and Associates Ltd.
- Lake Simcoe Region Conservation Authority (LSRCA). 2012a. Barrie Creeks, Lovers Creek, and Hewitt's Creek Subwatershed Plan.
- Lake Simcoe Region Conservation Authority (LSRCA). 2012b. Innisfil Creeks Subwatershed Plan.

- Natural Resource Solutions Inc. (NSRI). 2012. City of Barrie Annexed Lands Natural Heritage System Report. Prepared for the City of Barrie, Project No. 1202 September 2012.
- Natural Resource Solutions Inc. and Dougan & Associates Ecological Consulting and Design (NSRI; DA). 2012. City of Barrie Annexed Lands Natural Heritage Characterization Report. Prepared for the City of Barrie, April 2012.
- City of Barrie Official Plan;
- Simcoe County Official Plan;
- Town of Innisfil Official Plan;
- Hewitt's Secondary Plan;
- City of Barrie Multi-Modal Active Transportation Master Plan;
- MNRF Midhurst District Office Endangered Species Screening information request;
- LSRCA information request;
- Provincial Policy Statement (2014);
- *Endangered Species Act* (2007, as amended);
- *Fisheries Act* (1985, as amended);
- Lake Simcoe Region Conservation Authority Ontario Regulation179/06;
- Aerial photos; and,
- Topographic maps.

3.2 Agency Consultation

An endangered species screening information request form was sent to the MNRF Midhurst District Office (Ms. Maria Jawaid) on December 17, 2015 to request information on species-at-risk (SAR) and additional natural heritage features.

Information was provided by MNRF on February 24, March 2 and 11, 2016 and is included within Appendix A of this report. Subsequently, a meeting was held with LSRCA on December 9, 2015, with additional follow-up via email on December 17, 2015 with data provided by LSRCA on February 8 and 24, 2016. This correspondence is also reflected in Appendix A.

3.3 Field Investigations

A series of field investigations were completed in Spring and Summer 2016 to collect baseline data. All field investigations were carried out by qualified professionals specializing in terrestrial and aquatic biology, and during the appropriate season and respective timing windows in accordance with applicable protocols as discussed within this report. A summary of investigations is provided in Table 1.

Table 1: Field investigations 2016

Date (2016)	Field Investigation Type	Time	Weather Conditions
April 21	Amphibian Survey	8:30p.m. – 10:30pm	Damp - 14°C
May 17	Amphibian Survey	9:20p.m. – 11:30pm	Dry - 12°C
June 9	Breeding Bird & Terrestrial Survey	6:30a.m. – 1:30p.m.	Dry – 15°C
June 22	Amphibian Survey	9:30p.m. – 11:30p.m.	Dry - 20°C
June 24	Breeding Bird & Terrestrial Survey	6:00a.m. – 12:00p.m.	Dry - 26°C

3.3.1 Terrestrial & Vegetative Species at Risk

Terrestrial investigations were completed on June 8, 28, and July 6, 2017. Vegetation communities were identified and delineated with the use of aerial photographs and during the field investigation by applying the ELC for Southern Ontario: First Approximation and its Application (Lee et al., 1998). This information was collectively used to classify and describe vegetation communities within the Project Study Area. Observations on natural and anthropogenic disturbances were also made including documenting observations of vegetative SAR species.

3.3.2 Amphibians – Frogs and Toads

Surveys were completed in order to identify amphibians present within the Project Study Area, according to the Marsh Monitoring Program (MMP) protocol for Surveying Amphibians (2008). Three separate surveys were completed in the evening on April 21, May 17 and June 22, 2016 when night-time air temperature was greater than 5ºC during the first survey and 10ºC during the second survey and 17ºC for the third survey.

In accordance with the MMP protocol, amphibians were surveyed from pre - determined point count stations located near the stream and riparian area along the project limit (Refer to Figure 3 for point count locations. An unlimited distance, 180º arc sampling area was surveyed three times for three minutes at a total of eleven point count stations. Thus, a total of three listening surveys were conducted at each station.

At each station, one observer recorded the call level heard from all frog and/or toad species to assess the abundance and intensity of the calls. Call levels for each species heard was categorized into 1 of 5 levels:

- Level 1 – No calls heard;
- Level 2 – Frog(s) or toad(s) seen or heard
- Level 3 – Frog(s) or toad(s) can be counted, calls do not overlap;
- Level 4 – Frog(s) or toads can be counted, while others are overlapping; or,
- Level 5 – Full chorus, continuous and overlapping, cannot distinguish frogs or toads.

3.3.3 Breeding Birds

Surveys were completed in order to identify birds present along the road corridors based on the Ontario Breeding Bird Atlas (OBBA) protocol (2001). Surveys were conducted in the spring and early summer during the core breeding season for birds on June 9 and June 24 at a minimum 30 minutes after sunset to not more than five hours afterwards. During these surveys, additional efforts to denote presence or absence of SAR birds were also completed. Refer to Figure 4 for point count locations. It is important to note that existing data pertaining to breeding bird evidence was documented within the annexed land Master Plan completed in the 2012 Characterization Report (NSRI; DA, 2012), and as such efforts made as part of this NHIA were mainly focused on areas where data gaps existed.

3.3.4 Incidental Wildlife Observations

Incidental (visual) observations of wildlife species were also recorded at the time of the aforementioned 2016 field investigations.

Figure 3 Hewitts Infrastructure Improvements Class Environmental Assessment: Amphibian Map

Key

- Infrastructure Improvements
- Study Limit- 25 Metre Buffer
- (1) Amphibian Point Count Station
- Innisfil Municipal Boundary

0 205 410 820 1,230 Meters

*The information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

Coordinate System: NAD 1983 UTM Zone 17N

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Figure 4 Hewitts Infrastructure Improvements Class Environmental Assessment: Breeding Bird Exhibit

Key

- Infrastructure Improvements
- Approximate Area Covered by Breeding bird surveys 150 m Radius/Buffer
- Study Limit- 25 Meter Buffer
- Innisfil Municipal Boundary
- 1 Breeding Bird Survey Roadside Stop Location

0 205 410 820 1,230 Meters

*The information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

Coordinate System: NAD 1983 UTM Zone 17N

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4. Existing Conditions

As noted there are four separate areas:

- Area 1 is a smaller area of disturbance, and is located along Big Bay Point Road that extends from Versailles Cres east approximately 620 m;
- Area 2 is along Mapleview Drive East, which extends from Huronia Road east to 20th Side Road;
- Area 3 is along Yonge Street from Lockhart Road to Mapleview Drive East; and,
- Area 4 is along Lockhart Road, which extends from Huronia Road east almost to 20th Side Road.

A summary of existing conditions in each of these areas is provided in the following sections.

4.1 Topography and Soils

The topography associated with the Project Study Area is mainly flat with a rolling hill serving as a ditch in most areas.

According to the Canadian Land Inventory Soil Class available on the Simcoe County interactive mapping tool (2016), there are three soil classes within the Project Study Area which include Class 1, 2 or 3 soil, Class 5, 6 or 7 Soil, and Organic Soil. These classes are associated with agricultural capability, whereby Class 1 lands have the highest and Class 7 has the lowest to support agricultural land use.

The Soil Map of Simcoe County (1962) identifies the Project Study Area with good to imperfect drainage soils with the exception of a few areas characterized by muck soils where drainage is poor (Hoffman et al., 1962). Soils dominantly consist of loam and sandy loam, with a slight to moderate level of stoneyness and grey calcareous outwash sand and loam, sandy loam till material of the Podzolica and Grey-Brown Podzolic Great Soil Group (Hoffman et al., 1962). Acidity in these areas are dominantly neutral with some pockets of medium acidity (Hoffman et al., 1962). The areas classified by Muck are associated with known wetland communities south of Mapleview Drive East, north of Lockhart Road, just east of Huronia Road and the areas associated with Hewitt's Creek.

4.2 Terrestrial

The organizational framework contained within the ELC protocol (Lee et al., 1998) describes communities according to six nested levels: Site Region, System, Community Class, Community Series, Ecosite, and Vegetation Type. These nested levels vary in spatial scale, with the Site Region classifying

communities at the largest spatial scale, and Vegetation Type describing communities at the finest spatial scale (Lee et al., 1998).

There are two Site Regions in Southern Ontario: 6E and 7E (after Lee et al., 1998). The two Site locations are situated within Site Region 6E, the Lakes Simcoe-Rideau Site Region, which occupies the northern portion of Southern Ontario. The updated ELC codes 2008 were also applied for communities that were not categorized by the 1998 field book.

An Ecological Classification map was prepared for the Project Study Area (Refer to Figure 5a-f). Due to access, classification of vegetation communities was made from the road side and additional information was collected from the 2012 Characterization Report (NSRI & DA, 2012) and ELC boundaries as provided by LSRCA. Prior to conducting the field investigations, the field surveyor reviewed the background findings including the LSRCA ELC map. Field investigation routes were undertaken to confirm, refine and fill in data gaps. Due to limited access, classification and characterization of vegetation communities was made from the road side.

4.2.1 Vegetation Communities

Characterization of the vegetation observed was undertaken by compiling a generalized botanical inventory then using that information to classify and characterize the vegetation communities according to the ELC protocol (Lee et al., 1998). Plant species were identified in the Spring and early Summer 2016. The locations of vegetation communities are depicted on Figures 5a-f.

For the purposes of this NHIA, those areas not previously surveyed as part of the Characterization Report (NSIA & DA, 2012) were assessed. A list of dominant vegetative species is provided below. Additional information relating to communities can be found in Appendix B. It is important to note that vegetation communities often have variations within their boundaries, these variations have not been mapped except where necessary to depict a significant vegetation community or feature.

There were four different vegetation community classes identified within the Project Study Area which include Cultural, Forest, Swamp and Marsh.

In each of the four areas, residential landscapes were dominantly comprised of manicured lawns with ornamental plantings and native hedgerows. Rural residential was also a dominant coverage which consisted of mainly cash crops of soy and corn fields. A large amount of disturbance was observed in each of the communities along the ROW, which lead to sporadic and occasional occurrences of different species.

4.2.1.1 Area 1: Big Bay Point Road

Communities present along the road corridor in this section of the Project Study Area include:

- Residential (CVR)
- Hedgerow (HR)
- Agricultural (OAG)
- Mineral Cultural Thicket (CUT1)
- Cultural Woodland (CUW)

Table 2: Dominant vegetation species observed in Area 1

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
Herbaceous Plant				
Daucus carota	Wild Carrot	Non-Native	G?/SE5	CUW/CUT1/ HR
Solidago canadensis	Canada Goldenrod	Native	G5/S5	CUW/CUT1/ HR
Vitis spp.	Wild Grape	Native	G5/S?	CUW/CUT1/ HR
Alliaria petiolata	Garlic Mustard	Non-Native	G5/SE5	CUW
Hesperis matronalis	Dames Rocket	Non-Native	G4G5/SE5	CUW
Medicago lupulina	Black medic	Non-Native	G?/SE5	CVR/OAG
Shrub				
Rhamnus carthartica	Common Buckthorn	Non-Native	G?SE5	CUW
Cornus foemina ssp. Racemose	Grey Dogwood	Native	G5?S5	CUW
Rubus idaeus spp. Melanolasius	Wild Red Raspberry	Native	G5T5/S5	CUW
Rhus typhina	Staghorn Sumac	Native	G5/S5	CUW/CUT1
Tree				
Acer negundo	Manitoba Maple	Native	G5/S5	CUW/HR
Acer	Norway	Non-	G?SE5	CUW/HR

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
platanoides	Maple	Native		
Robinia pseudo-acacia	Black Locust	Non-Native	G5/SE4	CUW/CUT1
Juglans nigra	Black Walnut	Native	G5/S4	CUW
Pinus strobus	White Pine	Native	G5/S5	CUW
Populus tremuloides	Trembling Aspen	Native	G5/S5	CUW
Populus grandidentata	Large Tooth Aspen	Native	G5/S5	CUW
Fraxinus americana	White Ash	Native	G5/S5	CUW
Quercus rubra	Red Oak	Native	G5/S5	CUW
Fraxinus pennsylvanica	Green Ash	Native	G5/S5	CUW/HR
Tilia Americana	Basswood	Native	G5/S5	CUW
Ulmus Americana	White Elm	Native	G5?S5	CUW
Picea glauca	White Spruce	Native	G5/S5	CUW/HR
Betula papyrifera	Paper Birch	Native	G5/S5	CUW
Pinus sylvestris	Scots Pine	Non-Native	G?SE5	CUW/HR

COSEWIC: Committee on the Status of Endangered Wildlife in Canada;G5: Very common; demonstrable secure under present conditions; G?: G? Unranked; or, if following a ranking, rank tentatively assigned; S5: Very Common; demonstrably secure under present conditions; S4: Common; usually more than 100 occurrences, usually not susceptible to immediate threats.

4.2.1.2 Area 2: Mapleview Drive East

Communities present along the road corridor in this section of the Project Study Area include:

- Agricultural (OAG)
- Hedgerow (HR)
- Residential (CVR)
- Greenlands (CGL-1)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Meadow (CUM)
- Mineral Cultural Woodland (CUW1)

- Fresh-Moist White Cedar Coniferous Forest Type (FOC4-1)
- Mixed Swamp (SWM)
- Coniferous Swamp (SWC)
- Deciduous Swamp (SWD)
- Thicket Swamp (SWT)
- White Cedar – Hardwood Mineral Mixed Swamp Type (SWM1-1)
- Dry-Fresh Sugar Maple Deciduous Forest Type (FOD5-1)
- Sumac Cultural Thicket (CUT1-1)
- Mineral Cultural Thicket (CUT1)
- Mineral Cultural Savannah (CUS1)
- Mineral Meadow Marsh (MAM)
- Reed Canary Grass Mineral Meadow Marsh Type (MAM2-2)
- Cattail Mineral Shallow Marsh Type (MAS2-1)

Table 3: Dominant vegetation species observed in Area 2

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
Herbaceous Plant				
Daucus carota	Wild Carrot	Non-Native	G?/SE5	SWM1-1; CUM1-1; CUW1;CUT1; CUM
Solidago canadensis	Canada Goldenrod	Native	G5/S5	SWM1-1; CUM; CUM1-1;MAM
Vitis spp.	Wild Grape	Native	G5/S?	SWM1-1; CUW1
Medicago lupulina	Black medic	Non-Native	G?/SE5	SWM1-1; CUM
Pteridium aquilinum	Bracken Fern	Native	G5/S5	SWM1-1; CUW1
Dryopeteris spp.	Wood Fern	Native	G5/S?	SWM1-1; CUW1
Typha latifolia	Common Cattail	Native	G5/S5	MAS2-1

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
Poa pratensis	Kentucky Blue Grass	Native	G5/S5	SWM1-1;CUM1-1; CUS1
Avena fatua	Wild Oat	Non-Native	G?/SE3	SWM1-1;CUM; CUS1
Scirpus validus	Soft-stem Bulrush	Native	G?/S5	SWM1-1; CUM1-1
Phalaris arundinacea	Reed Canary Grass	Native	G5/S5	MAM2-2; MAM
Shrub				
Rhamnus carthartica	Common Buckthorn	Non-Native	G?/SE5	SWM1-1; FOD5-1
Salix nigra	Black Willow	Native	G5/S4?	SWM1-1
Cornus alternifolia	Alternative-leaved Dogwood	Native	G5/S5	FOD5-1
Rubus idaeus spp. Melanolasius	Wild Red Raspberry	Native	G5T5/S5	SWM1-1; FOD5-1
Rhus typhina	Staghorn Sumac	Native	G5/S5	SWM1-1; FOD5-1;CUW1; CUT1-1
Lonicera spp.	Honey Suckle	-	-	CUW1; SWT
Tree				
Acer negundo	Manitoba Maple	Native	G5/S5	CUT1; CUW1; FOC4-1
Acer saccharum	Sugar Maple	Native	G5/S5	FOD5-1
Acer platanoides	Norway Maple	Non-Native	G?SE5	CUW1
Ostrya virginiana	Ironwood	Native	G5/S5	FOD5-1
Robinia pseudo-acacia	Black Locust	Non-Native	G5/SE4	FOC4-1
Pinus strobus	White Pine	Native	G5/S5	FOC4-1
Populus tremuloides	Trembling Aspen	Native	G5/S5	CUM; SWM1-1; CUW1; CUM1-1;

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
				SWD; SWM
Quercus rubra	Red Oak	Native	G5/S5	CUW1
Fraxinus americana	White Ash	Native	G5/S5	FOD5-1; CUW1
Fraxinus pennsylvanica	Green Ash	Native	G5/S5	SWM1-1; CUM1-1; FOD5-1; SWD
Tilia Americana	Basswood	Native	G5/S5	FOD5-1
Picea glauca	White Spruce	Native	G5/S5	SWM1-1
Pinus sylvestris	Scots Pine	Non-Native	G?SE5	CUW1
Salix fragilis	Crack Willow	Non-Native	G5/SE5	CUW1
Thuja occidentalis	Eastern White Cedar	Native	G5/S5	SWM1-1; FOC4-1; CUW1; SWC; SWM
Ulmus rubra	Red Elm	Native	G5/S5	SWM1-1; FOD5-1
Prunus serotina	Black Cherry	Native	G5/S5	FOD5-1
Populus balsamifera	Balsam Poplar	Native	G5/S5	CUW1
Picea abies	Norway Spruce	Native	G?/SE3	CUW1; CUM1-1

4.2.1.3 Area 3: Yonge Street

Communities present along the road corridor in this section of the Project Study Area include:

- Agricultural (OAG)
- Hedgerow (HR)
- Residential (CVR)
- Mineral Cultural Thicket (CUT1)

Along this section of the road corridor, there were a number of residential homes and rural landscapes. As such, the areas consisted of mainly cash crops of soy and corn fields, with sporadic trees that line the road way which includes White Ash (*Fraxinus americana*), Eastern White Cedar (*Thuja occidentalis*), Maple (*Acer spp.*) and herbaceous plants such as Goldenrod

(*Solidago canadensis*), Wild Carrot (*Daucus carota*). Residential landscapes were dominantly comprised of manicured lawns with ornamental plantings and native hedgerows.

4.2.1.4 Area 4: Lockhart Road

Communities present along the road corridor in this section of the Project Study Area include:

- Agricultural (OAG)
- Hedgerow (HR)
- Residential (CVR)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Thicket (CUT1)
- Coniferous Plantation Type (CUP3)
- Naturalized Coniferous Hedgerow Ecosite (FOCM5)
- Dry-Fresh Sugar Maple Deciduous Forest Type (FOD5-1)
- Mixed Forest (FOM)
- White Cedar – Hardwood Mineral Mixed Swamp Type (SWM1-1)
- Mineral Shallow Marsh Ecosite (MAS2)
- Coniferous Swamp (SWC)
- Reed Canary Grass Mineral Meadow Marsh Type (MAM2-2)
- Common Reed Graminoid Mineral Meadow Marsh Type (MAMM1-12)

Table 4: Dominant vegetation species observed in Area 4

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
Herbaceous Plant				
Daucus carota	Wild Carrot	Non-Native	G?/SE5	FOM;CUM1-1;CUT1
Solidago canadensis	Canada Goldenrod	Native	G5/S5	CUT1; SWM1-1; FOM
Vitis spp.	Wild Grape	Native	G5/S?	FOM
Pteridium aquilinum	Bracken Fern	Native	G5/S5	FOM; SWM1-1

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
Typha latifolia	Common Cattail	Native	G5/S5	MAS2; SWM1-1
Poa pratensis	Kentucky Blue Grass	Native	G5/S5	CUP3; SWM1-1; FOD5-1
Vicia cracca	Cow Vetch	Non-Native	G?/SE5	CUP3; SWM1-1; FOD5-1
Chrysanthemum leucanthemum	Oxeye Daisy	Non-Native	G?/SE5	CUP3; SWM1-1; FOD5-1
Rumex crispus	Curled Dock	Non-Native	G?/SE5	CUP3; SWM1-1; FOD5-1
Phragmites australis	Common Reed	Native	G5/S5	SWM1-1; MAMM1-12
Asclepias syriaca	Common Milkweed	Native	G5/S5	SWM1-1
Matteuccia struthiopteris	Ostrich Fern	Native	G5/S5	SWM1-1
Lotus corniculatus	Bird's foot trefoil	Non-Native	G?/SE5	CUT1
Cirsium vulgare	Bull Thistle	Native	G5/S5	CUT1
Ledum groenlandicum	Labrador Tea	Native	G5/S5	MAM2-2
Equisetum spp.	Horsetail	Native	G5/S?	MAM2-2
Carex spp.	Sedges	Native	G5/S5	MAM2-2; MAS2
Juncus spp.	Rushes	Native	G5/S5	MAM2-2; MAS2
Hesperis matronalis	Dames Rocket	Non-Native	G4G5/SE5	CUP3; SWM1-1; FOD5-1
Phalaris arundinacea	Reed Canary Grass	Native	G5/S5	MAM2-2; MAS2
Carex intumescens	Bladder Sedge	Native	G5/S5	MAM2-2
Shrub				
Rhamnus carthartica	Common Buckthorn	Non-Native	G?/SE5	FOD5-1; FOM

Scientific Name	Common Name	Native Status	COSEWIC/ Ontario Rank	Community Association
Salix nigra	Black Willow	Native	G5/S4?	MAS2
Rhus typhina	Staghorn Sumac	Native	G5/S5	CUT1
Crataegus spp.	Hawthorn	Native	G?/S?	CUT1
Tree				
Acer negundo	Manitoba Maple	Native	G5/S5	CUT1; FOM
Acer platanoides	Norway Maple	Non-Native	G?SE5	SWM1-1; FOM
Pinus strobus	White Pine	Native	G5/S5	CUP3; FOM
Populus tremuloides	Trembling Aspen	Native	G5/S5	CUT1; FOM
Quercus rubra	Red Oak	Native	G5/S5	FOM
Fraxinus pennsylvanica	Green Ash	Native	G5/S5	SWM1-1
Picea glauca	White Spruce	Native	G5/S5	SWM1-1
Salix fragilis	Crack Willow	Non-Native	G5/SE5	MAS2; SWM1-1
Thuja occidentalis	Eastern White Cedar	Native	G5/S5	SWM1-1; CUT1; FOCM5; SWC
Ulmus rubra	Red Elm	Native	G5/S5	SWM1-1
Acer saccharinum	Silver Maple	Native	G5/S5	SWM1-1
Populus grandidentata	Large-tooth Aspen	Native	G5/S5	SWM1-1
Pinus resinosa	Red Pine	Native	G5/S5	CUP3
Fraxinus Americana	White Ash	Native	G5/S5	SWM1-1; FOM
Malus spp.	Crab Apple	-	-	CUT1
Populus deltoids	Eastern Cottonwood	Native	G5/S5	CUT1
Picea abies	Norway Spruce	Native	G?/SE3	FOM; SWM1-1

Figure 5a Hewitts Infrastructure Improvements Class Environmental Assessment: Ecological Land Classification

- Infrastructure Improvement
- Study Limit- 25m Buffer
- Municipal Boundary
- CUM1-1 Dry-Moist Field Meadow Type
- CUP3-2 White Pine Coniferous Plantation Type
- CUT1 Mineral Cultural Thicket Ecosite
- CUW Cultural Woodland
- CUW1 Mineral Cultural Woodland Ecosite
- CVR Residential
- FOD5-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest Type
- HR Hedgerow
- OAG Open Agriculture

Coordinate System: NAD 1983 UTM Zone 17N

0 65 130 260 390 520 Meters

* The Information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

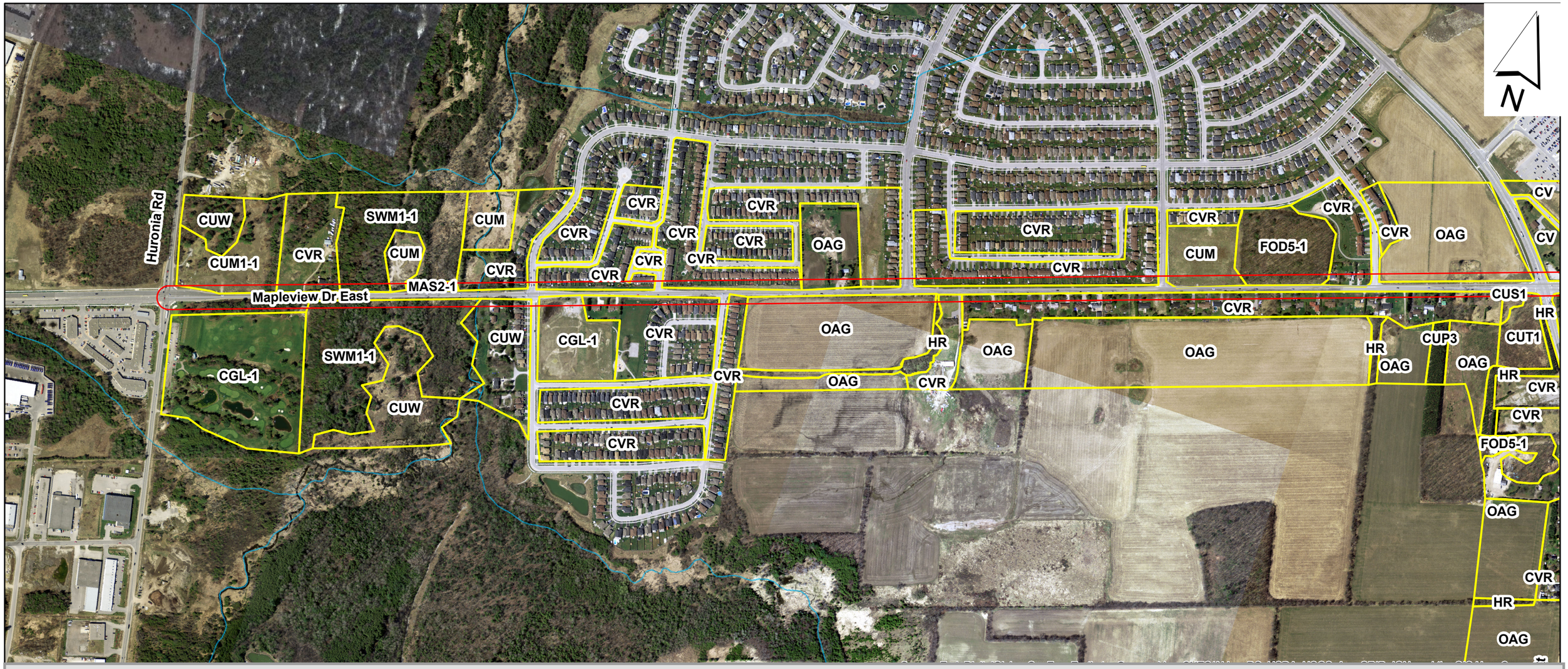


Figure 5b Hewitts Infrastructure Improvements Class Environmental Assessment: Ecological Land Classification

- Infrastructure Improvement
- Study Limit - 25 Meter Buffer
- CGL-1 Golf Course
- CUM Cultural Meadow
- CUM1-1 Dry-Moist Field Meadow Type
- CUP3 Coniferous Plantation
- CUS1 Mineral Cultural Savannah Ecosite
- CUT1 Mineral Cultural Thicket Ecosite
- CUW Cultural Woodland
- CV Constructed
- CVR Residential
- FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest Type
- HR Hedgerow
- MAS2-1 Cattail Mineral Shallow Marsh Type
- OAG Open Agriculture
- SWM1-1 White Cedar-Hardwood Mineral Mixed Swamp Type

Coordinate System: NAD 1983 UTM Zone 17N

0 180 360 720 1,080 1,440 Meters

* The Information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

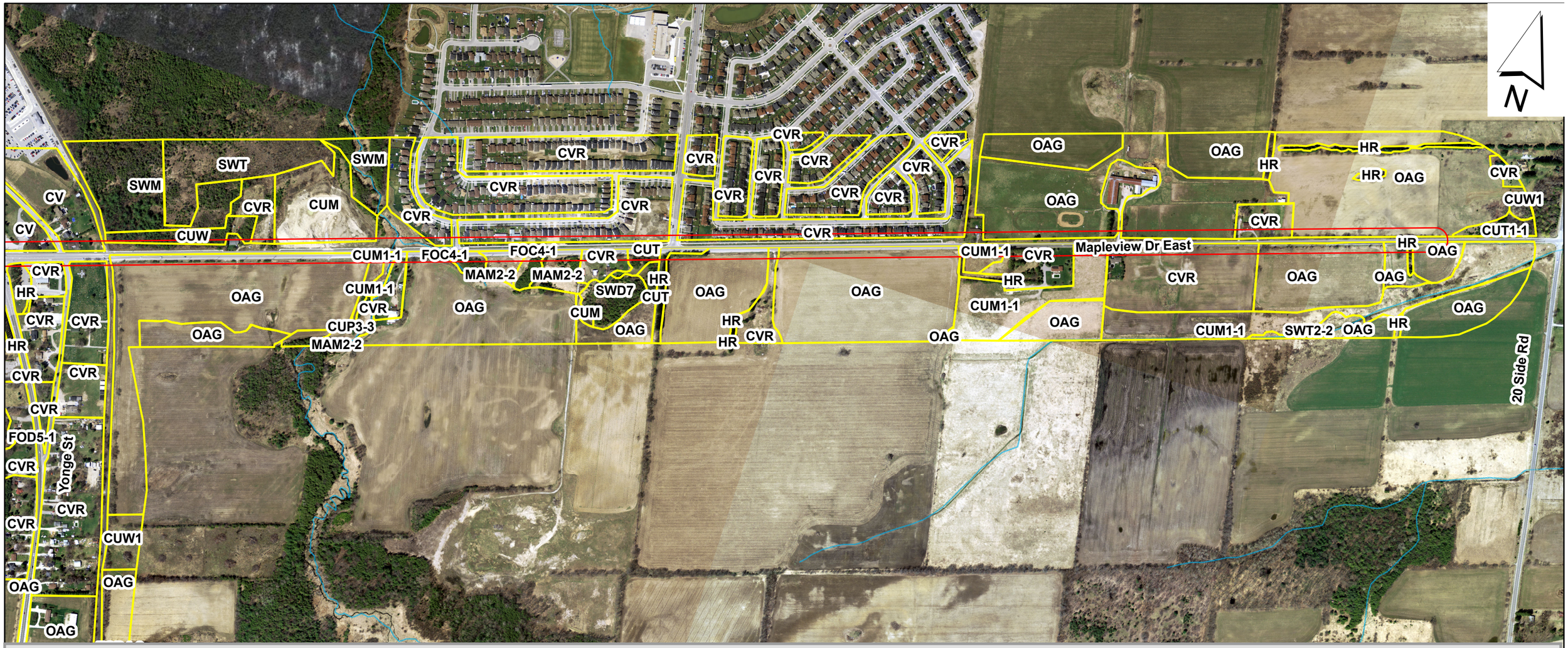


Figure 5c Hewitts Infrastructure Improvements Class Environmental Assessment: Ecological Land Classification

- Infrastructure Improvement
- Study Limit - 25 Meter Buffer
- CUM Cultural Meadow
- CUM1-1 Dry-Moist Field Meadow Type
- CUP3-3 Scotch Pine Coniferous Plantation Type
- CUT Cultural Thicket
- CUT1 Mineral Cultural Thicket Ecosite
- CUT1-1 Sumac Cultural Thicket
- CUW Cultural Woodland
- CUW1 Mineral Cultural Woodland Ecosite
- CV Constructed
- CVR Residential
- FOC4-1 Fresh-Moist White Cedar Coniferous Type
- FOD4-2 Dry-Fresh White Ash Decidous Forest Type
- FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest Type
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type
- HR Hedgerow
- MAM2-2 Reed-Canary Grass Mineral Meadow Marsh Type
- OAG Open Agriculture
- SWD7 Birch-Poplar Organic Deciduous Swamp Ecosite
- SWM Mixed Swamp
- SWT Thicket Swamp
- SWT2-2 Willow Mineral Thicket Swamp Type

Coordinate System: NAD 1983 UTM Zone 17N

0 175 350 700 1,050 1,400 Meters

* The Information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

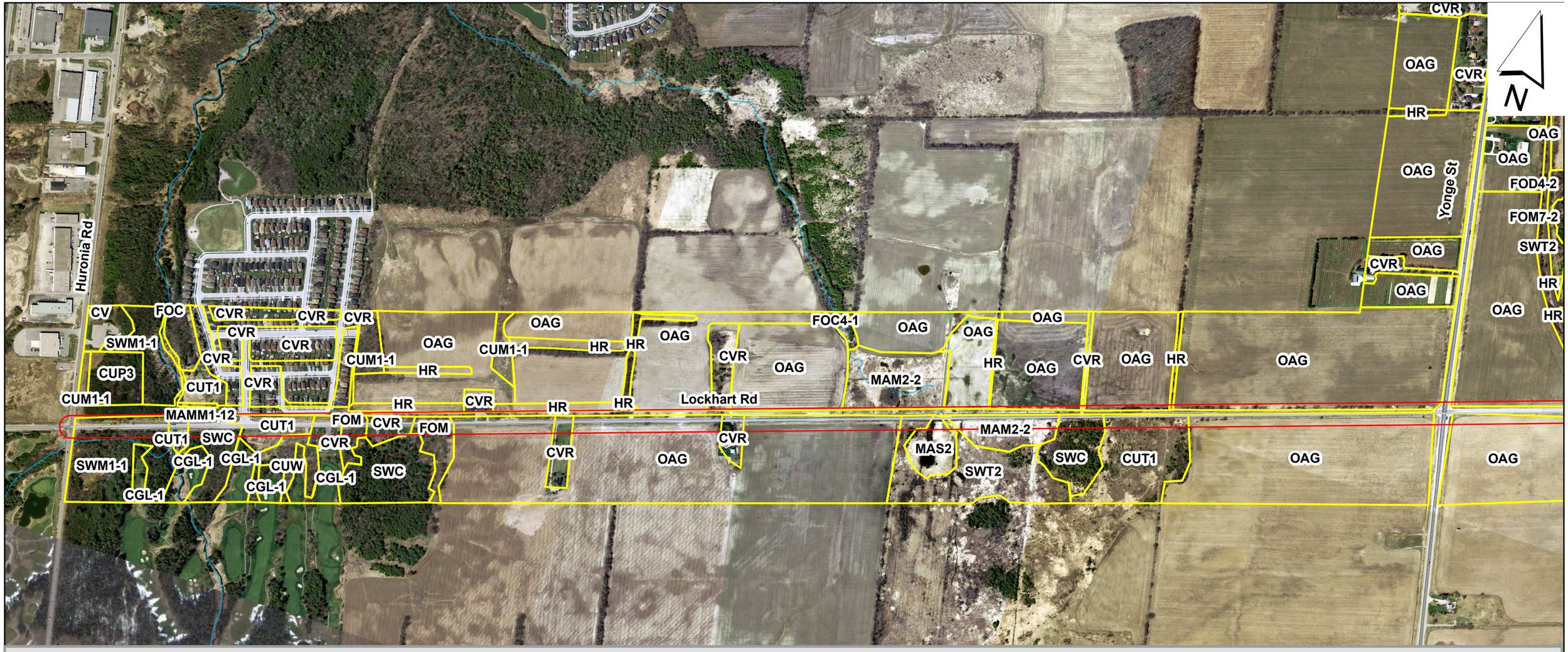


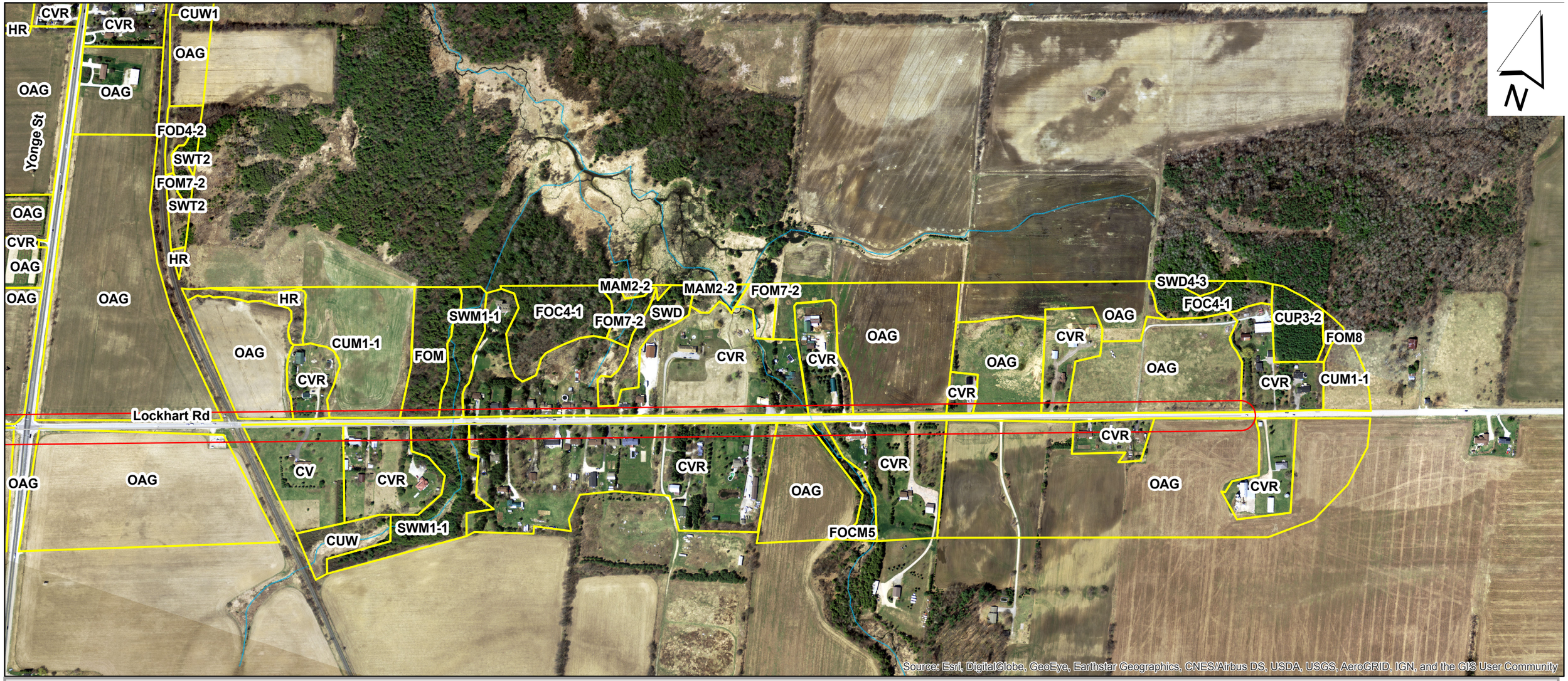
Figure 5d Hewitts Infrastructure Improvements Class Environmental Assessment: Ecological Land Classification

- Infrastructure Improvement
- Study Limit- 25 Meter Buffer
- CGL-1 Golf Course
- CUM1-1 Dry-Moist Field Meadow Type
- CUP3 Coniferous Plantation
- CUT1 Mineral Cultural Thicket Ecosite
- CUW Cultural Woodland
- CUW1 Mineral Cultural Woodland Ecosite
- CV Constructed
- CVR Residential
- FOC Coniferous Swamp
- FOC4-1 Fresh-Moist White Cedar Coniferous Type
- FOD4-2 Dry-Fresh White Ash Decidous Forest Type
- FOM Mixed Forest
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type
- HR Hedgerow
- MAM2-2 Reed-Canary Grass Mineral Meadow Marsh Type
- MAMM1-12 Common Reed Graminoid Mineral Meadow Marsh Type
- MAS2 Mineral Shallow Marsh Ecosite
- OAG Open Agriculture
- SWC Coniferous Swamp
- SWM1-1 White Cedar-Hardwood Mineral Mixed Swamp Type
- SWT2 Mineral Thicket Swamp Ecosite

Coordinate System: NAD 1983 UTM Zone 17N

0 190 380 760 1,140 1,520 Meters

* The Information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 5e Hewitts Infrastructure Improvements Class Environmental Assessment: Ecological Land Classification

- Infrastructure Improvement
- Study Limit- 25 Meter Buffer
- CUM1-1 Dry-Moist Field Meadow Type
- CUP3-2 White Pine Coniferous Plantation Type
- CUW Cultural Woodland
- CUW1 Mineral Cultural Woodland Ecosite
- CV Constructed
- CVR Residential
- FOC4-1 Fresh-Moist White Cedar Coniferous Type
- FOCM5 White Pine Coniferous Plantation Type
- FOD4-2 Dry-Fresh White Ash Deciduous Forest Type
- FOM Mixed Forest
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type
- FOM8 Fresh-Moist Poplar-White Birch Mixed Forest Ecosite
- HR Hedgerow
- MAM2-2 Reed-Canary Grass Mineral Meadow Marsh Type
- OAG Open Agriculture
- SWD Deciduous Swamp
- SWD4-3 White Birch-Poplar Mineral Deciduous Swamp Type
- SWM1-1 White Cedar-Hardwood Mineral Mixed Swamp Type
- SWT2 Mineral Thicket Swamp Ecosite

0 140 280 560 840 1,120 Meters

Coordinate System: NAD 1983 UTM Zone 17N

* The Information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

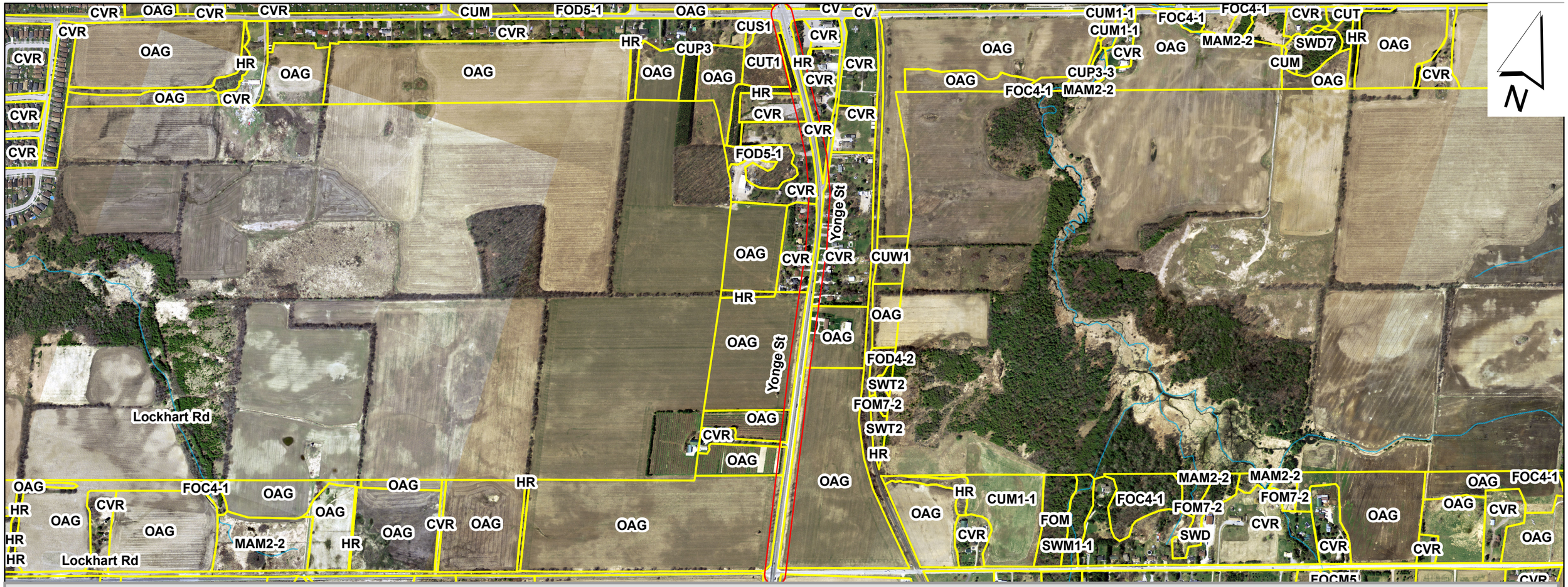


Figure 5f Hewitts Infrastructure Improvements Class Environmental Assessment: Ecological Land Classification

- Infrastructure Improvements
- Study Limit- 25 Meter Buffer
- CUM Cultural Meadow
- CUM1-1 Dry-Moist Field Meadow Type
- CUP3 Coniferous Plantation
- CUP3-3 Scotch Pine Coniferous Plantation Type
- CUS1 Mineral Cultural Savannah Ecosite
- CUT Cultural Thicket
- CUT1 Mineral Cultural Thicket Ecosite
- CUW Cultural Woodland
- CUW1 Mineral Cultural Woodland Ecosite
- CV Constructed
- CVR Residential
- FOC4-1 Fresh-Moist White Cedar Coniferous Type
- FOCM5 White Pine Coniferous Plantation Type
- FOD4-2 Dry-Fresh White Ash Decidous Forest Type
- FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest Type
- FOM Mixed Forest
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type
- HR Hedgerow
- MAM2-2 Reed-Canary Grass Mineral Meadow Marsh Type
- MAS2 Mineral Shallow Marsh Ecosite
- OAG Open Agriculture
- SWC Coniferous Swamp
- SWD Deciduous Swamp
- SWD7 Birch-Poplar Organic Deciduous Swamp Ecosite
- SWM1-1 White Cedar-Hardwood Mineral Mixed Swamp Type
- SWT2 Mineral Thicket Swamp Ecosite

Coordinate System: NAD 1983 UTM Zone 17N

0 205 410 820 1,230 1,640 Meters

* The Information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

4.3 Aquatic

There are a number of watercourses that transverse the Project Study Area as part of the Lake Simcoe Watershed, which contains both the Lovers Creek and Hewitt's Creek subwatersheds and the Innisfil Creeks subwatershed.

Lovers Creek within the Project Study Area contains a range of aquatic habitats from sections of high quality cold water fish habitat that can support Brook Trout (*Salvelinus fontinalis*) to lower quality warmer temperature areas which can support species more tolerable to urban settings such as Brook Stickleback (*Culaea inconstans*) and Creek Chub (*Semotilus atromaculatus*). Lovers Creek flows through woodland, wetlands, agricultural fields and golf courses.

The Hewitt's Creek subwatershed originates in agricultural land and flows north into Lake Simcoe at Kempenfelt Bay. Sections of this creek have been identified as good quality coldwater fish habitat that can support Brook Trout. The St. Paul's Swamp is also within this subwatershed and extends to the ROW along the north side of Lockhart Road.

Sandy Cove Creek, as part of the Innisfil Creeks Subwatershed, is the northern most creek in the subwatershed (NSRI & DA, 2012). Only a section of this creek is in the vicinity of the Project Site as it travels along Mapleview Drive East through the intersection of 20th Side Road on the south side. It is considered a cold water creek supporting cold water fisheries. Sections of this creek have been identified to provide habitat for Brook Trout.

Aquatic characterizations for each of these watercourses were not part of the 2016 field investigations, as confirmed and discussed with LSCRCA. It was determined that information provided within the 2012 Characterization Report (NSRI & DA, 2012) would be used to document the aquatic features. Field investigations completed as part of the 2012 Characterization Report were completed from spring to fall 2011 and consisted of an aerial survey, roadside reconnaissance, headwater origin surveys, Brook Trout spawning surveys and site-specific surveys for landowners (NSRI & DA, 2012).

There are three documented sensitive fish species, Brook Trout, Darter Species and Sculpin Species. Rainbow Darter (*Etheostoma caeruleum*) has been known to Lovers Creek and Johnny Darter (*Etheostoma nigrum*) has been captured in Hewitt's Creek. Slimy Sculpin (*Cottus cognatus*) is known to both Lovers and Hewitt's Creek, and Mottled Sculpin (*Cottus bairdi*) was historically captured in Lovers Creek, but is only now known to inhabit Hewitt's Creek (LSCRCA, 2012). Johnny Darter and Mottled Sculpin have been known to inhabit Sandy Cove Creek along with Brook Trout.

4.3.1 Brook Trout Spawning Habitat

According to field investigations completed in 2011 as part of the 2012 Characterization Report, there was one location within Lovers Creek, and two locations within Hewitt's Creek that had actively spawning Brook Trout, and four locations (including Sandy Creek Cove) where there could be potential spawning within the Project Study Area (NSRI & DA, 2012).

Brook Trout are often associated with clean, clear, cold watercourses where there are groundwater seepages and springs (NSRI & DA, 2012). Spawning for Brook Trout typically occurs between September and November in Southern Ontario. Nested areas are called redds and are usually constructed in the areas near groundwater seepages (LSRCA, 2012a). Brook Trout will then lay the eggs, but do not protect the redds after spawning occurs. During 2011, two field investigations were completed (NSRI & DA, 2012). Spawning confirmation was determined by the presence of Brook Trout and redds, and potential spawning was determined by the documentation of redds. Additional areas that seem suitable were also categorized as potential spawning, however Brook Trout and redds were not observed at the time of the field investigation.

A summary of field investigations completed in 2011 is provided in Table 5 as follows:

Table 5: Summary of Brook Trout spawning surveys (October & November 2011) (NSRI & DA, 2012).

ID	Project Area	Watercourse	Survey Date (2011)	Confirmed Spawning (Redds and Brook Trout)	Potential Spawning Habitat
1	Area 2: Mapleview Drive East	Hewitt's Creek	October 24/25; November 10	No	Yes
2	Area 2: Mapleview Drive East	Hewitt's Creek Tributary	October 24/25; November 10	No	Minimal
3	Area 4: Lockhart Road	Hewitt's Creek	October 24/25	Yes	-
4	Area 4: Lockhart Road	Hewitt's Creek	October 24/25; November 10	Yes	-
5	Area 4: Lockhart	Lovers Creek Tributary	October 24/25;	No	Minimal

ID	Project Area	Watercourse	Survey Date (2011)	Confirmed Spawning (Redds and Brook Trout)	Potential Spawning Habitat
	Road		November 10		
7	Area 2: Mapleview Drive East	Lovers Creek	N/A – Date from Barrie Lovers Creek and Hewitt's Creek Subwatershed Study	Current and historic brook trout	-
8	Area 2: Mapleview Drive East and 20th Side Road	Sandy Cove Creek	October 24/25; November 10	No	Yes

4.3.2 Sculpin Documented Habitat

According to the Barrie Creeks, Lovers Creek and Hewitt's Creek Subwatershed Plan (2012a), historic and current Mottled Sculpin (*Cottus bairdii)* observations have been confirmed in the Project Study Area. There was no historic documentation of Mottled Sculpin in Sandy Creek Cove (LSRCA, 2012b). A summary of this information is included in Table 6 below.

Table 6: Summary of historic and current presence of Mottled Sculpin (LSRCA, 2012)

ID	Project Area	Watercourse	Historic Presence	Current Presence
1	Area 2: Mapleview Drive East	Hewitt's Creek	Yes	Yes
7	Area 2: Mapleview Drive East	Lovers Creek	Yes	Yes
6	Area 4: Lockhart Road	Lovers Creek	Yes	No
3	Area 4: Lockhart Road	Hewitt's Creek	Yes	Yes

Figure 6 **Hewitts Infrastructure Improvements Class Environmental Assessment: Aquatic features and habitat**

Key

- Infrastructure Improvements
- Study Limit- 25 Metre Buffer
- Mottled Sculpin
- BrookTrout
- Watercourse
- Innisfil Municipal Boundary

0 205 410 820 1,230 Meters

*The information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

Coordinate System: NAD 1983 UTM Zone 17N

HATCH

4.4 Wildlife

During the field investigations, the only mammals observed within the Project Study Area were Squirrels (*Sciuridae spp.*). The lack of additional mammalian species might be due to the proximity to the road corridor.

A summary of the additional wildlife investigations including amphibians and breeding birds is provided in the following sections.

4.4.1 Amphibian Field Investigation Results

A total of three amphibian field investigations were completed in Spring and early Summer 2016 on April 21, May 17 and June 22 during the respective timeframes for this area of the Province according to the MMP protocol. Refer to Figure 3 for point count locations. Spring Peeper (*Pseudacris crucifer*), and Green Frog (*Lithobates clamitans*) were the only two documented species within the Project Study Area. When comparing data collected in the Characterization Report 2011, only point count location 10 overlapped which documented a total of four species which included American Toad (*Anaxyrus americanus*), Northern Leopard Frog (*Lithobates pipiens*), Spring Peeper and Western Chorus Frog (*Pseudacris triseriata*) (NSRI & DA, 2012). A summary of results is provided in Table 7 below:

Table 7: Summary of amphibian field investigations 2016

Point Count Location	April 21, 2016	May 17, 2016	June 22, 2016
1	No calls	No calls	No calls
2	No calls	No calls	No calls
3	SPPE Code Level 5 - 50-100 metres south side of Mapleview Drive East - Sandy Cove Creek; SPPE Code Level 5 – 50 metres north side of Mapleview Drive	SPPE Code Level 3 - 3 individuals 100 metres north side of Mapleview Drive East	No calls
4	SPPE Faint calls - 100 metres + south side of Mapleview Drive East	No calls	No calls

Point Count Location	April 21, 2016	May 17, 2016	June 22, 2016
5	No calls	SPPE Code Level 5 - 100 metres north of Mapleview Drive East	No calls
6	SPPE Faint calls - 100 metres + south side of Mapleview Drive East	No calls	No calls
7	No calls	SPPE Faint calls - 100 metres + east of Huronia Road (north of Lockhart Road)	No calls
8	No calls	No calls	No calls
9	No calls	SPPE Faint calls - 100 metres + south side of Lockhart Road	No calls
10	No calls	SPPE Code Level 3 - 4 individuals south side of Lockhart Road; SPPE: Code 3 - 3 individuals north side of Lockhart Road	SPPE Code Level 3 - approximately 6 individuals - south side of Lockhart Road
11	No calls	No calls	No calls

4.4.2 Breeding Birds

A total of 41 point count locations were surveyed during the field investigations in 2016, with a total of 28 different species visually and/or vocally observed to be within the Project Study Area. In addition to the roadside stops, a 150 metres survey radius to each roadside survey stop location was applied. These 150 metres may vary at different point count locations depending on the terrain, traffic noise, type of vegetative cover, and weather conditions. Please refer to Figure 4 for locations.

The majority of birds observed were considered as possible breeders within the Project Study Area. The number of birds is consistent with surveys conducted along road-sides due to the habitat normally associated with road edges, and vehicle traffic which often times may deter birds from breeding near the road-way due to sounds and the ability for males and females to communicate. It is important to note, that although surveys were conducted 30 minutes after sunrise around 6a.m., traffic along each of the roadways was quite high.

All birds documented are common to southern Ontario and for the most part are not considered rare. There were four species that had regional conservation status which included the Eastern Wood Pewee (*Contopus virens*), Eastern Kingbird (*Tyrannus tyrannus*), Savannah Sparrow (*Passerculus sandwichensis*), and Hooded Warbler (*Setophaga cirtina*) (Ontario Partners in Flight (OPIF), 2008). One of the birds is listed as special concern in Ontario, Eastern Wood Pewee (*Contopus virens*). No additional SAR was observed both audibly and visually during the 2016 field investigations. Species considered special concern are not considered endangered or threatened but may become threatened or endangered due to a combination of biological characteristics and identified threats (e.g. habitat loss). Eastern Wood Pewee was recently listed in June 2014. As this species is listed as special concern it does not receive species or habitat protection under the ESA.

Table 8: Summary of breeding bird field investigations completed in 2016

Scientific Name	Common Name	Survey Date June 2016	Point Count Locations	Breeding Evidence
Contopus virens	Eastern Wood Pewee[1]	9 & 24	2,19,20,40,41	S
Vireo olivaceus	Red-eyed Vireo	9 & 24	2,3,15,16,21,30,37, 38	S

Scientific Name	Common Name	Survey Date June 2016	Point Count Locations	Breeding Evidence
Turdus migratorius	American Robin	9 & 24	1,2,3,4,5,8,9, 10,11,12,13,21,22, 24,25,26,30,31,41	S
Buteo jamaicensis	Red-tailed Hawk	9	2	X
Picoides pubescens	Downy Woodpecker	9 & 24	2,3,4,5,15,16,20,31 ,40,41	S
Corvus brachyrhynchos	American Crow	9 & 24	15,16,19,20,40,41	X
Sayornis phoebe	Eastern Phoebe	9	4,5	H
Agelaius phoeniceus	Red-winged Blackbird	9 & 24	4,5,11,12,19,20,21, 36,37,38	P
Dumetella carolinensis	Gray Catbird	9 & 24	4,5,37,40,41	S
Molothrus ater	Brown-headed Cowbird	9 & 24	4,5,30,41	H
Setophaga petechia	Yellow Warbler	9 & 24	4,5,21,37	S
Sturnus vulgaris	European Starling	9 & 24	6,7,21,23,24,25	H
Zenaida macroura	Mourning Dove	9 & 24	6,7	X
Tyrannus tyrannus	Eastern King Bird	24	4,5,11,12	H
Spinus tristis	American Goldfinch	9 & 24	11,12,21,37	P
Anas platyrhynchos	Mallard	9 & 24	20	P
Mniotilta varia	Black and White Warbler	9	41	X

Scientific Name	Common Name	Survey Date June 2016	Point Count Locations	Breeding Evidence
Bombycilla cedrorum	Cedar Waxwing	24	40	X
Cardinalis cardinalis	Northern Cardinal	9 & 24	1,13,25,39	S
Colaptes auratus	Northern Flicker	9	19,20,21,41	S
Cyanocitta cristata	Blue Jay	9 & 24	21,40,41	S
Poecile atricapillus	Black-capped Chickadee	24	4,5,20,41	S
Passerculus sandwichensis	Savannah Sparrow	24	36	S
Quiscalus quiscula	Common Grackle	9 & 24	11,12,26	X
Passer domesticus	House Sparrow	9 & 24	1,2,3,26	S
Setophaga cirtina	Hooded Warbler	9	4,5,30,41	S
Seiurus aurocapilla	Ovenbird	9	2	S
Geothlypis trichas	Common Yellowthroat	9 & 24	4,5	S

Regional Conservation Status – Priority Landbird Species

[1] Species listed as special concern within Ontario under the Endangered Species Act, 2007, as amended.

X: Observed: Species observed in its breeding season (no evidence of breeding). Presumed migrants should not be recorded; H: Possible Breeding: Species observed in its breeding season in suitable nesting habitat; S: Possible Breeding: Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat; P: Probably Breeding: Pair observed in their breeding season in suitable nesting habitat

4.5 Reptiles

Background sources of information were reviewed to determine reptile occurrences within the Project Study Area. Based on information collected in the 2011 Characterization Report (NSRI & DA, 2012), Snapping Turtles (*Chelydra serpentina*) were documented by MNRF in the St. Paul's Swamp while completing the wetland evaluation.

Additionally, two snake species were observed during the 2011 field investigations as noted within the 2012 Characterization Report which include Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) and Dekay's Brownsnake (*Storeria dekayi*) (NRSI & DA, 2012). Each of these observations was made outside of the Project Study Area. Both species of snake are considered widespread and abundant in Ontario (NRSI & DA, 2012).

Only one Eastern Gartnersnake was noted during the 2016 field investigations within Area 4, along Lockhart Road by amphibian point count location 10.

4.6 Species-at-Risk

An endangered species screening information request was submitted to the Midhurst District Office on December 17, 2015. A total of three SAR were identified by the MNRF to potentially be within the Project Study Area. A summary of these species is provided below in Table 9 which identifies the species, their preferred habitat, whether that habitat is present within the Project Study Area, and if observations during the 2016 field investigation documented this species. Table 10 provides a list of SAR that were documented during the 2016 field investigation.

Table 9: Species at Risk records provided by the MNRF ESA screening

Scientific Name	Common Name	SARO	Preferred Habitat	Habitat Present within the Project Study Area
Juglans cinerea	Butternut	END	Commonly associated with riparian habitat with rich moist, well-drained soils. They are intolerant to shade.	Potential habitat within the Project Study Area. During the field investigations completed on June 9 and 24, 2016 no Butternut were documented.
Chelydra serpentina	Snapping Turtle	SC	Snapping Turtles prefer shallow waters so they can bury themselves in the soft substrate and/or leaf litter.	Suitable habitat may be located within the Project Study Area. One was documented to be within St. Paul's Swamp associated with Area 4 of this project (NSRI and DA, 2012). No designated Turtle Surveys were required by MNRF, and no evidence of Snapping Turtles were observed along the roadway corridors during the 2016 field investigations.
Somatochlora hineana	Hine's Emerald	END	Prefers groundwater fed wetlands with grassy vegetation.	MNRF indicated there have been a number of observations of Emerald Dragonflies in the area, however, Hine's Emerald is the only species that is protected under the ESA. Through communication with MNRF, no targeted surveys for Hine's Emerald were required (Appendix A). During the field investigations no observations of damselflies were made, but habitat is present within the Project Study Area.

SARO: Species-at-Risk Ontario Listing as protected under the *Endangered Species Act*, 2007 as amended
Source: Ministry of Natural Resources and Forestry Endangered Species Screening results February 24, 2016 (Refer to Appendix A); Government of Ontario: https://www.ontario.ca/page/species-risk

Table 10: Species at Risk documented during the 2016 field investigations

Scientific Name	Common Name	SARO	Preferred Habitat	Habitat Present within the Project Study Area
Contopus virens	Eastern Wood-pewee	SC	Prefers to reside in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate to mature forest stands that have little understory vegetation.	Suitable habitat is located within the Project Study Area. Eastern Wood Peewee was heard during both breeding bird surveys completed on June 9 and June 24, 2016 in areas of suitable breeding habitat.

SARO: Species-at-Risk Ontario Listing as protected under the *Endangered Species Act*, 2007 as amended
Government of Ontario: https://www.ontario.ca/page/species-risk (MNRF, 2015c)

5. Key Natural Heritage Features

Key natural heritage features are defined as those that contain wetlands, fish habitat, woodlands, valleylands, habitat for endangered and threatened species, wildlife habitat, and ANSIs. All of these features are important for their environmental and social values as defined within the *Planning Act* and explained within the PPS (MMAH, 2014).

5.1 Significant Wetlands and Fish Habitat

Wetlands are defined as areas that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface (Lee et al., 1998). A significant wetland is an area identified as a PSW by the MNRF using evaluation procedures established by the Province, as amended from time to time (Lee et al., 1998).

Fish habitats are identified as spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly and or indirectly in order to carry out their life processes (Lee et al., 1998). Fish habitats commonly occur in many natural heritage areas such as wetlands, valleylands, woodlands and ANSIs.

Two PSWs are located within the Project Study Area, which include St. Paul's Swamp and Lovers Creek Swamp along Lockhart Road within Area 4, and Lovers Creek Swamp along Mapleview Drive East within Area 2.

There are a number of watercrossings within the Project Study Area. A total of four are located in Area 2 along Mapleview Drive East, and six along Lockhart Road (Area 4). There is one additional culvert along Mapleview Drive East, just west of Goodwin Drive, however it was dry at the time of the field investigations.

As noted in Section 4.3 of this report, these watercourses are known to provide habitat to Brook Trout and Mottled Sculpin. Both of which are coldwater fish that are typically associated with areas where there are springs and/or groundwater upwelling's.

5.2 Woodlands

Woodlands are treed areas that provide environmental or economic benefits such as erosion prevention, water retention, recreation and the sustainable harvest of woodland products. Woodlands include treed areas, woodlots or forested areas, and vary in their level of significance (MMAH, 2014). Woodland significance is typically determined by evaluating key criteria which relate to woodland size, ecological function, uncommon woodland species, and economic and social value.

Larger woodlands are more likely to contain a greater diversity of plant and animal species and communities than smaller woodlands, and are better buffered against edge effects or agricultural and urban activities.

Woodlands are located within the Project Study Area. Woodlands are located along the north and south sides of Big Bay Point Road, Mapleview Drive East and Lockhart Road. Woodlands pertain to Cultural Woodlands, Deciduous Forests and Cedar Swamps.

5.3 Valleylands

The PPS (MMAH, 2014) identifies significant valleylands as a "natural area that occurs in a valley or landform depression that has water" for some period of the year.

According to data provided by the LSRCA, Significant Valleylands are located within the Project Study Area. Two are located along the south side of Lockhart Road associated with Hewitt's Creek and Hewitt's Creek tributary. There is a third significant valleyland located as part of Lovers Creek tributary on the north side of Lockhart Road.

5.4 Areas of Natural and Scientific Interest

The PPS (2014) defines ANSIs 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. The ANSI program designates natural features in two (2) broad biophysical categories, earth science (geological) or life science (biological) depending on the features present. Specifically, a life science ANSI can contain specific types of forests, valleys, prairies and/or wetlands of ecological importance (MNRF, 2010). That is, they represent examples that are relatively undisturbed in terms of vegetation community and/or landforms associated with that vegetation (MNRF, 2010). Those listed as provincially significant life science ANSIs are the best examples of that particular natural heritage feature in the Province (MNRF, 2010). In contrast, earth science ANSIs are representative examples of geological processes in Ontario (i.e., exposed bedrock on road cuts, fossils and landforms) (MNRF, 2010).

Based on review of the MNRF Make a Map: Natural Heritage Areas and NHIC Data, there are no ANSIs mapped within the Project Study Area.

5.5 Wildlife Habitat

Wildlife habitat is defined as areas where plants, animals and other organisms live and are able to find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitat of concern may include areas where species concentrate at a point in their

annual life cycle, and those areas which are important to migratory and non-migratory species.

A wildlife habitat is considered "significant" if it is deemed ecologically important in terms of feature, function, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System (MMAH, 2014). According to the Significant Wildlife Habitat Ecoregion Criteria Schedules for Ecoregion 6E (MNRF, 2015), significant wildlife habitat may consist of:

- Seasonal concentration areas for animals;
- Rare vegetation communities;
- Specialized habitat for wildlife; and
- Habitat for species of conservation concern.

Seasonal Concentration Areas may consist of Waterfowl Stopover and Staging Areas, Bat Hibernacula, Reptile Hibernacula.

Due to the high level of disturbance (i.e., noise due to its close proximity to the road) seasonal concentration areas associated with the Project Study Area were observed to be absent.

It is important to note that there is a probability that Bat Roosting or Reptile Hibernacula are present within the communities associated with those along the road corridor, however they would be outside the Project Study Area, and thus not impacted by future the proposed infrastructure improvements.

Rare Vegetation Communities are those that contain provincially rare vegetation communities, or those which are rare to the area. Based on a review of the vegetation observed, none of the communities were considered rare.

Specialized Habitats for Wildlife consist of those which support wildlife that have highly specific habitat requirements (e.g., interior forest habitat), those areas that contain high species and community diversity and those which provide habitat that can greatly enhance species survival (MNRF, 2000).

A summary of specialized habitat presence and absence is provided below**:**

Based upon documented Brook Trout spawning, it is likely that seeps and springs are located within the Project Study Area within locations as documented in Figure 6 along both Hewitt's and Lovers Creek.

The data collected during the 2016 field investigation revealed amphibian breeding along Mapleview Drive East (Area 2) and Lockhart Road (Area 4).

However, due to the number of calls observed they were not sufficient enough to deem these locations as significant wildlife habitat.

Documented Snapping Turtle by MNRF through the wetland evaluation of St. Paul's Swamp (NSRI & DA, 2012), would indicate that turtle nesting is present within this area. However, areas suitable for nesting are considered outside of the Project Study Area.

Habitats for Species of Conservation Concern are those that contain species that are rare or substantially declining, or have high percentage of their global population in Ontario and are rare or uncommon in the planning area. These habitats are often associated with special concern species as identified under the ESA or the SAR Ontario list.

The woodlands located along the north and south sections of Mapleview Drive East, and Lockhart Road just east of Huronia Road likely serve as habitat for species of conservation concern, as does St. Paul's Swamp located along Lockhart Road. Typically habitats associated with these species are found within the interior of the woodlands and swamp habitats, and as such, they are not anticipated to be impacted by the proposed infrastructure improvements.

5.5.1 Wildlife Movement Corridors

Wildlife movement corridors are habitats that link two (2) or more other wildlife habitats that are critical to the maintenance of a population of a particular species or group of species. The key ecological function of wildlife movement corridors is to enable wildlife to move to and between areas of significant habitat or core natural areas with minimum mortality. Wildlife movement corridors can provide critical links between shelter, feeding, watering, growing and nesting locations (Lee et al., 1998).

Wildlife and/or habitat corridors can help increase genetic diversity and aid in the re-establishment of populations after random events such as fires or disease outbreaks. These corridors can help to increase biodiversity and population stabilization (Lee et al., 1998).

According to the Significant Wildlife Habitat Ecoregion 6E Criterion Schedule animal movement corridors to be considered include amphibian and deer movement corridors (MNRF, 2012).

The LSRCA has documented deer wintering habitat along Mapleview Drive East within the Project Study Area (Refer to Figure 7), additionally, amphibians were documented within wooded areas in proximity to those that are inundated with water during certain times of the year. As such, both amphibian and deer movement corridors are within the Project Study Area.

Figure 7 Hewitts Infrastructure Improvements Class Environmental Assessment: Wildlife habitat map

Key

- Infrastructure Improvements
- Study Limit- 25 Meter Buffer
- Deer Wintering Area (Stratum 2)
- Innisfil Municipal Boundary
- Watercourse

0 240 480 960 1,440 Meters

*The information displayed is derived from sources with varying accuracies and all boundaries should therefore be considered approximate

Coordinate System: NAD 1983 UTM Zone 17N

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6. Identification and Assessment of Alternatives

During the EA process the project team identified a series of alternatives for different sections of each road-way as identified by Area 1 to Area 4. As part of these alternative design concepts, a total of two or three different alternatives were identified for the various sections of the road way. Preliminary details associated with each of these alternatives for the various sections are provided in Table 11 to Table 14 for the respective Areas.

Each of these different alternatives were assessed based upon existing conditions observed during the 2016 field investigations and those documented in the 2011 Characterization Report. As such, alternatives were assessed based upon their potential impact to all natural heritage features including but not limited to:

- Woodlands;
- Wetlands (Evaluated and Unevaluated);
- Provincially Significant Wetlands;
- Significant Wildlife Habitat;
- Wildlife Movement Corridors; and,
- Species-at-Risk.

Table 11: Area 1: Big Bay Point Road evaluation

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
B1 City Boundary to Collector 11 (5 lanes)	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 34 metre right-of-way (ROW); This alternative incorporates the recommended improvements based on the MMATMP with a 5 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk, 4.2 metre median with landscaping within a 34 metre right-of-way.	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, with 2 metre Low-Impact Development (LID) feature; 38 metre ROW; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the ROW	5 lanes, multi-use trail (MUT) south side, no sidewalk on north side, 4 metre centre-left, north side fixed alignment; 34 metre ROW	Section B1 and B2, Alternative 2 has the greatest impact of the three alternatives as it has the largest footprint. Otherwise the impacts from a natural heritage perspective are generally the same.
B2 Collector 11 to 200 metres west of 20th Side Road	3 lanes, 2 metre buffered bike lane, 2 metre sidewalk, 4.2 metre centre left, 27 metre ROW	3 lanes, 2 metre buffered bike lane, 2 metre sidewalk, 4.2 metre centre left, with 2 metre LID feature; 31 metre ROW	3 lanes, MUT south side, no sidewalk on north side, 4 metre centre-left, north side fixed alignment, 27 metre ROW	

Table 12: Area 2: Mapleview Drive East evaluation

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
M1 Huronia Road to Country Lane (7 lanes)	7 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 41 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a widening to 7 lanes, 2 metre buffered bike lanes, 4.2 metre median with landscaping, high occupancy vehicle (HOV) lane within a 41 metre ROW	7 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 2 metre LID feature; 45 metre ROW; This alternative is the same as Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the ROW	7 lanes, 4.2 metre median, MUT; 41 metre ROW; This alternatives is based on the 2031 ultimate with 7 lanes, a 4.2 metre median with landscaping or a centre-left turn lane, a MUT on the north side, a high occupancy vehicle (HOV) lane and a 41 metre ROW	Section M1, results in a loss of Lovers Creek PSW, with the largest property impact associated with Alternative 2. Alternative 3 appears to have the least impact from a natural heritage perspective as it requires less disturbance to the natural environment on the north side of Mapleview Drive East

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
M2 Country Lane to Madelaine Drive (7 lanes)	7 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 41 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a widening to 7 lanes, 2 metre buffered bike lanes, 2 metre sidewalk, and a 4.2 metre median with landscaping within a 41 metre ROW	7 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 2 metre LID feature; 45 metre ROW; This alternatives builds on Alternative 1, however includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the ROW	7 lanes, 4.2 metre median, 3 metre MUT, 1.6 metre sidewalk boulevard for snow storage; 41 metre ROW; This alternative is based on the 2031 ultimate 7 lane cross-section with a 4.2 metre median including landscaping, a 3 metre MUT on the north side, a 1.5 metre sidewalk on the south side and additional storage along the south side for snow removal	Section M2, the impacts are generally the same for all alternatives, with Alternative 2 having the larger footprint

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
M3 Madelaine Drive to Yonge Street (5 lanes)	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 34 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 5 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk, 4.2 metre median with landscaping within a 34 metre ROW	5 lanes,2 metre bike lanes, 2 metre sidewalk, 4.2m median with 2 metre LID feature; 38 metre ROW; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the ROW	5 lanes, 4 metre centre-left, 3 metre MUT, 1.6 metre sidewalk boulevard for snow storage; This alternative is based on the 2031 ultimate 5-lane cross section with a 4 metre centre-left turning lane, 3 metre MUT on the north side and a 1.5 metre sidewalk on the south side, as well as additional space along the south side for snow removal	Section M3, the impacts are generally the same for all alternatives. There is a woodland FOD5-1 located along the north-side. All three alternatives require impacts to this woodland through removal

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
M4 500 metres East of railway to Prince William Way (5 lanes)	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 34 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 5 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk, 4.2 metre median with landscaping within a 34 metre ROW	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median with 2 m LID feature, 38 metre ROW; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the ROW	4 lanes, MUT, 1.6 metre sidewalk, turning lanes at intersections, 34 metre ROW; This alternative includes a 4-lane cross-section, a MUT on the north side, a 1.5 metre sidewalk on the south side, turning lanes at intersections within a 34 metre ROW	Section M4, there is a tree preservation area where a significant amount of trees is planned for removal. All of the alternatives require tree removal in this location

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
M5 Prince William Way to 20th Side Road	3 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 27 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 3 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk, 4.2 metre median within a 27 metre ROW	3 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, with 2 metre LID feature, 31 metre ROW; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the ROW	3 lanes, MUT, 1.6 metre sidewalk, 4 metre centre-left, 27 metre ROW; This alternative is based on the 2031 ultimate 3-lane cross-section with a MUT on the north side, 1.5 metre sidewalk on the south side, a 4 metre centre-left turn lane within a 27 metre ROW	Section M5, the impacts are generally the same for all alternatives with Alternative 2 having the larger footprint

Section	Alternative 1	Alternative 2	Natural Heritage Alternative Evaluation
MV1 Metrolinx Crossing	Overpass with 5 lanes, centre pier, 2.5 metre sidewalks, 2 metre side clearance and 2 metre bike lanes	Underpass with 4 lanes, centre pier, 2.5 metre sidewalks, 2 metre side clearance and 2 metre bike lanes	Section MV1, from a preliminary review of these alternatives for the grade separation, the overpass will have a larger footprint and therefore will result in greater vegetation removal

Table 13: Area 3: Yonge Street evaluation

Section	Alternative 1	Alternative 2	Natural Heritage Alternative Evaluation
Y1 Mapleview Drive to Lockhart Road	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 34 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 5 metre lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk and 4.2 metre median with landscaping within a 34 metre ROW	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median with 2 metre LID features; 38 metre ROW; This alternatives builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metre for LID features on both sides of the right-of-way	Section Y1, the impacts are generally the same for all alternatives

Table 14: Area 4: Lockhart Road evaluation

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
L1 Huronia Road to 600 metre east of Huronia Road	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 34 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 5 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk, and 4.2 metre median with landscaping in a 34 metre ROW	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median with 2 metre LID features; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metres for LID features on both sides of the ROW	4 lanes, MUT, south side ditch, turning lanes at intersections, 34 metre ROW; This alternative includes a 4-lane cross section with a MUT on the north side, a ditch on the south side, turning lanes at intersections within a 34 metre ROW	Section L1, each of these alternatives will require vegetation removal, however the community associated with the north side of Lockhart is a plantation whereas the south side is naturalized. As such, Alternative 3 poses the greater impact

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
L2 600 metres East of Huronia Road to Yonge Street	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 metre median, 34 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 5 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk and 4.2 metre median with landscaping within a 34 metre ROW	5 lanes, 2 metre bike lanes, 2 metre sidewalk, 4.2 median with 2 metre LID features; 38 metre ROW; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metres for LID features on both sides of the ROW	4 lanes, MUT, south ditch, turning lanes at intersection, 34 metre ROW; This alternative includes a 4-lane cross-section within a MUT on the north side, a ditch on the south side and turning lanes at intersections within a 34 metre ROW	Section L2, Alternatives 1 and 2 appear to have the most impact to natural heritage features associated with the PSW, compared to Alternative 3, however all three alternatives will result in a loss

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
L3 500 metres East of railway to Prince William Way	5 lanes, 2 metre bike lane, 2 metre sidewalk, 4.2 metre median, 34 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 5 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk, 4.2 metre median with landscaping within a 34 metre ROW	5 lanes, 2 metre bike lane, 2 metre sidewalk, 4.2 metre median with 2 metre LID features,; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metres for LID features on both sides of the ROW	4 lanes, MUT, no sidewalk on the south side, south ditch, turning lanes at intersection, 34 metre ROW; This alternative includes a 4-lane cross-section within a MUT on the north side, a ditch on the south side and turning lanes at intersections within a 34 metre ROW	Section L3, all alternatives result in loss to St. Pauls Swamp PSW. As such, they each pose a negative impact

Section	Alternative 1	Alternative 2	Alternative 3	Natural Heritage Alternative Evaluation
L4 Prince Williams Way to just east of Collector 11	3 lanes, 2 metre bike lane, 2 metre sidewalk, 4.2 metre median, 27 metre ROW; This alternative incorporates the recommended improvements based on the MMATMP with a 3 lane roadway, 2 metre buffered bike lanes, 2 metre sidewalk and 4.2 median with landscaping within a 27 metre ROW	3 lanes, 2 metre bike lane, 2 metre sidewalk, 4.2 metre median with 2 metre LID features; 38 metre ROW; This alternative builds on Alternative 1, however also includes an enhanced section between the edge of pavement and the sidewalk to provide 2 metres for LID features on both sides of the ROW	3 lanes, MUT south side, 1.6 metre sidewalk, 4 metre centre-left, 27 metre ROW; This alternative includes a 3-lane cross-section with a MUT on the south side, a 1.5 metre sidewalk on the north side, a 4 metre centre-left turn lane within a 27 metre ROW	Section L4, the impacts are generally the same for all alternatives

Section	Alternative 1	Alternative 2	Natural Heritage Alternative Evaluation
LR1 Metrolinx Crossing	Overpass including 5 lanes, centre median, 2.5 metre sidewalks, 2 metre side clearance and 2 metre bike lanes	Underpass including 4 lanes, centre pier, 2.5 metre sidewalks, 2 metre side clearance and 2 metre bike lanes	Section LR1, from a preliminary review of these alternatives for the grade separation, both alternatives pose similar impacts to natural heritage features, with Alternative 1 having a larger footprint. Given the fact that this area is comprised of agricultural fields near the rail corridor the impacts for both is generally the same and as such, either alternative would be satisfactory

6.1 Recommended Alternative

Based on the evaluation and assessment of alternatives, utilizing natural features criteria**,** from a natural heritage perspective the following is recommended for each of the four areas:

- Area 1: Alternative 2 had the larger footprint compared to Alternative 1 and 3, however the impacts associated with each of them is generally the same.

- Area 2: All the alternatives generally have a similar impact to the natural environment, however, Alternative 2 had the greatest impact due to the increased ROW.

- Area 3: All the alternatives have a similar impact to the natural environment.

- Area 4: All the alternatives for this section of the roadway appear to have similar impact and loss to natural heritage features, with Alternative 3 having a greater impact at Section L1 and Alternative 1 & 2 having a greater impact at L2.

It is important to note that the impacts associated with each of the alternatives is generally the same, with Alternative 2 showing the greatest impact due to the increase in the ROW and requirement for vegetation removal. Overall, Alternative 3 appears to have the least impact and/or similar impact to the other two alternatives.

Overall, it is Hatch's opinion that through the implementation of Best Management Practices (BMPs) and a series of mitigation measures, a number of anticipated impacts can be avoided for all three alternatives.

7. Mitigation Measures

This study has identified key natural features within the Project Study Area. As the Project progresses to detailed design, site-specific mitigation measures should be developed in order to protect both terrestrial and aquatic environments and their respective ecological function. Where possible, avoidance measures should be implemented before resorting to mitigation and lastly rehabilitation to minimize negative effects on natural heritage features. If the mitigation measures and/or BMPs are implemented, they will likely reduce the possible effects from the proposed construction.

7.1 Construction Timing

Construction timing should take into consideration natural heritage features, more specifically the wildlife that inhabit the features within the Project Study Area. Vegetation removal should not take place during the local breeding bird season which is established from April 1 to August 31, to comply with the MBCA. Due to the uncertainty that lies with nest sweeps during construction, especially during leaf-on conditions, it is recommended that all tree clearing occur outside the above-noted breeding bird window.

Due to the presence of Brook Trout and Sculpin spp. spawning activities, no in-water works should occur between October 1 and July 15 in any given year according to DFO timing windows. As such, in-water works can only occur from July 16 to Sept 30, unless otherwise noted by the MNRF and/or DFO. Discussions with respect to the in-water timing window should be discussed with MNRF and/or DFO during the detailed design phase once the design components are better understood. This will also enable the City to confirm whether the proposed works will require a *Fisheries Act* Authorization from DFO.

7.2 Erosion and Sediment Control

No development, construction or grading should occur outside of the development envelope once it is confirmed during the detailed design.

Erosion and sediment control (ESC) measures should be implemented to avoid impacts to woodlands, PSWs and additional unevaluated wetlands.

Efforts should be made to reduce areas of exposed soils, and all types of erosion and sediment transport during staging and construction. Erosion and sediment controls should be installed prior to construction activities, remain through the entire duration, and monitored in order to ensure sufficient controls are in place. All ESC measures (e.g. heavy-duty silt fence, coir logs etc.) should be reflected on all construction drawings with notes on requirements.

7.3 Tree Clearing Protection and Replacement

To address impacts to trees in the Project Study Area, a tree inventory and preservation plan is recommended at the detailed design stage, and is to be completed by a Certified Arborist.

Those areas associated with woodlands should be assigned a loss on an area basis rather than individual tree count, where as those associated within the ROW and along residential and rural properties should be individually picked up where diameter-at-breast height is equal to or greater than 15cm.

Tree and vegetation clearing should be limited as much as possible and follow the City of Barrie tree removal policies and By-law not limited to the Tree Preservation By-law 2014-1150 for those situated on private property with further recommendations provided in the City of Barrie's Tree Protection Manual (2010).

All disturbed areas should be restored with native, non-invasive seed mix, in addition to native trees and shrubs that are reflective of existing communities. Compensation for loss of woodland and wetland should be in line with LSRCA's Ecological Offsetting Plan (2017). Exact details of compensation will be further identified during detailed design through continued consultation with LSRCA. Additional recommendations are as follows:

- The Contractor should be made aware of tree protection measures and no-go zones for material placement and vehicle use;
- Tree removal should not take place during the core local breeding bird season which is established from April 1st to August 31st, as protected by the MBCA (1994);
- Transportation, handling, and storing of petroleum products and other chemicals should not take place within the areas of the new edge;
- Temporary lay-down areas and storage of materials should not be within the areas of the new edge;
- Additional recommendations provided by a Certified Arborist as part of the tree inventory and Arborist report during detailed design should be followed accordingly; and,
- All trees as regulated by the Canadian Food Inspection Agency (CFIA) for pests such as Emerald Ash Borer (pertaining to Ash species), should be disposed of according to City and CFIA recommended standards.

7.4 Wildlife Protection Measures

Efforts should be made for the protection of wildlife during construction, using erosion fencing. Reference should be made to the MNRF *Best Practices Technical Note on Reptile and Amphibian Exclusion Fencing* (2013), and the MNRF *Species at Risk Handling Manual* (2011).

All fencing should be periodically monitored by an environmental monitor who is trained in proper handling of these species should they be encountered in the work area. If a migratory bird happens to nest within the work area, measures should be taken to ensure protection of nest is established such that the fledglings can successfully hatch and requirements under the *MBCA*

are met. Additional guidance on the species observed should be sought from the Canadian Wildlife Service.

The installation of new culverts and/or replacement culverts should follow guidelines as prescribed by the relevant agencies, and should be constructed in a manner that does not impede fish passage. It is recommended that all culverts where feasible be constructed using an open-bottom scenario such that proper substrate can be implemented to sustain and if not improve existing conditions. Depending on discussions with DFO with respect to Brook Trout and Mottled Sculpin spawning, measures for enhancement along the creek banks and restoration of lost spawning habitat may be warranted. If new habitat is created as part of these discussions, proper monitoring following construction will be required to denote whether the species is utilizing the newly restored areas.

8. Permits and Approvals

Based on a preliminary assessment, it is expected that the following permits and approvals will be warranted for this project but not limited to:

- Lake Simcoe Region Conservation Authority Permit under Ontario Regulation 179/06;
- Ministry of the Environment and Climate Change Permit-to-take-Water/Registration;
- Tree Preservation By-law;
- DFO self-assessment; and,
- Wildlife Scientific Collectors Permit.

Please note this list is not exhaustive, and additional permits and approvals may be required depending on the preferred design.

9. Summary of Key Recommendations

A summary of key recommendations and environmental constraints include:

- Based upon the information collected and reviewed, the alternatives for each of the roadways appear to have similar impacts associated with them, with Alternative 2 having the greatest impact due to its larger footprint;
- All natural heritage features impacted should be restored to equal or better condition;
- Vegetation and tree clearing should be kept to a minimum in order to reduce impacts to natural heritage features;

- All vegetation clearing should be mindful and avoid breeding bird, and fisheries timing windows as identified within this NHIA;
- Due to the presence of Brook Trout and Sculpin spp., it is recommended that no in-water works occur between October 1 and July 15 in any given year. As such, in-water works should only occur from July 16 to Sept 30, unless otherwise noted by the MNRF and/or DFO;
- Vegetation clearing and/or grubbing should be kept to a minimum and areas should be restored to equal or better condition with native, non-invasive species that are reflective of vegetation common to the region;
- Compensation for loss of vegetative communities (i.e., woodland and wetland communities) should follow LSRCA Ecological Offsetting Plan (2017);
- Treed areas to be preserved should be protected using protective hoarding according to the City's Tree Preservation By-law and Public By-law following future consultation with the City's Urban Forestry Department;
- Monitoring pre-construction and during construction is recommended with additional monitoring for restoration/compensation as directed that will be further refined during the detailed design phase;
- During detailed design an ESC, spill prevention, fish rescue and restoration plan should be developed and implemented in advance of construction to prevent potential impacts to Whiskey Creek and other natural heritage features within the Project Limits;
- It is recommended that the above mitigation measures be further developed during the detailed design phase, based on further consultation with DFO, the MNRF, and the LSRCA; and,
- Efforts for detailed design should employ the best methodology for works, including open-bottom culverts, and trenchless technology etc.).

10. References

1. Azimuth Environmental Consulting Inc. 2010. Appendix C: Phases 3 & 4 Natural Environmental Impact Assessment Report: Huronia Road Improvements. Prepared for C.C Tatham and Associates Ltd.

2. Bird Studies Canada. 2011. Ontario Breeding Bird Atlas: Guide for Participants.

3. Canadian Land Inventory
http://sis.agr.gc.ca/cansis/nsdb/cli/index.html

4. City of Barrie. 2014. Official Plan.
http://www.barrie.ca/Doing%20Business/PlanningandDevelopment/Pages/default.aspx

5. County of Simcoe. 2007. Official Plan
http://www.simcoe.ca/dpt/pln/official-plan

6. Genivar, 2014. 2014. City of Barrie Secondary Plan, Background Studies and Infrastructure Master Plans – Intensification and Annexed Lands: Multi-Modal Active Transportation Master Plan. Project No. 101-17743.
http://www.barrie.ca/City%20Hall/growth/Pages/DocumentsResources.aspx

7. Hewitt's Secondary Plan. 2012.
http://www.barrie.ca/City%20Hall/growth/Pages/DocumentsResources.aspx

8. Hoffman, D.W., Wicklund, R.E., Richards, N.R. 1962. Soil Survey of Simcoe County Ontario. Report No. 29 of the Ontario Soil Survey. Research Branch, Canada Department of Agriculture and the Ontario Agricultural College.
http://sis.agr.gc.ca/cansis/publications/surveys/on/index.html

9. Lake Simcoe Region Conservation Authority. May 2017. Ecological Offsetting Plan.

10. Lake Simcoe Region Conservation Authority. 2012a. Barrie Creeks, Lovers Creek, and Hewitt's Creek Subwatershed Plan.

11. Lake Simcoe Region Conservation Authority. 2012b. Innisfil Creeks Subwatershed Plan.

12. Lake Simcoe Region Conservation Authority. 2016. Data set pertaining to wildlife habitat, ecological land classification, and significant valleylands. Received February 2016.

13. Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

14. Marsh Monitoring Program Participant's Handbook Surveying Amphibians. 2008 Edition. 20 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2008

15. Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement.

16. Ministry of Natural Resources and Forestry. 2015. Make a Natural Heritage Map. Accessed November 2, 2015. Available online: https://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map

17. Ministry of Natural Resources and Forestry. 2015. How to get an Endangered Species Act permit or authorization.Last updated October 2, 2015. Accessed November 16, 2015. http://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

18. Ministry of Natural Resources and Forestry. 2013. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.

19. Ministry of Natural Resources and Forestry. 2012. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January 2015.

20. Ministry of Natural Resources and Forestry. 2011. Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders. 34pp.

21. Ministry of Natural Resources and Forestry. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

22. Ministry of Natural Resources and Forestry. 2000. Significant wildlife habitat technical guide. 151p.

23. Natural Resource Solutions Inc. 2012. City of Barrie Annexed Lands Natural Heritage System Report. Prepared for the City of Barrie, Project No. 1202 September 2012.

24. Natural Resource Solutions Inc. and Dougan & Associates Ecological Consulting and Design. 2012. City of Barrie Annexed Lands Natural Heritage Characterization Report. Prepared for the City of Barrie, April 2012.

25. Ontario Partners in Flight. 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St.Lawrence Plain, North American Bird Conservation Region 13. Ontario Ministry of Natural Resources, Bird Studies Canada, Environment Canada.

26. Soil Survey of Simcoe County. Soil Survey by the Department of Soils, Ontario Agricultural College, Guelph and the Research Branch, Canada Department of Agriculture, Ottawa. http://sis.agr.gc.ca/cansis/publications/surveys/on/index.html

27. Town of Innisfil. 2006. Official Plan. http://www.innisfil.ca/strategic-planning

APPENDIX A

Agency Consultation

Agency Consultation:

Lake Simcoe and Region Conservation Authority

Torchia, Melissa

From: Darren Campbell <D.Campbell@lsrca.on.ca>
Sent: Wednesday, February 24, 2016 12:39 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Alexander, Melissa; Shauna Fernandes
Subject: RE: Hewitt Class EA - LSRCA Data Request Form
Attachments: HewittsEA.zip

Hi Melissa,

I have attached the data, if you have any questions please don't hesitate to contact me.

Thanks
Darren

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Wednesday, February 24, 2016 10:57 AM
To: Darren Campbell
Cc: Bala.Araniyasundaran@barrie.ca; Alexander, Melissa; Shauna Fernandes
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good morning Darren,

Please see attached agreement.
Let me know if you require anything else.

Kind regards,
Melissa

From: Darren Campbell [mailto:D.Campbell@lsrca.on.ca]
Sent: Tuesday, February 23, 2016 12:23 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Alexander, Melissa; Shauna Fernandes
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

Sorry for the delay as staff are still getting use to the process of releasing data, With that being said I now have all of the forms and everything is signed off so I have attached the data sharing agreement. If you could review the agreement and once you agree with the terms return a signed copy I will send you the data as it is prepared and ready to be delivered.

If you have any questions please don't hesitate to contact me.

Thanks

Darren

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Monday, February 22, 2016 1:00 PM

To: Darren Campbell
Cc: Bala.Araniyasundaran@barrie.ca; Alexander, Melissa
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good afternoon Darren,

Do you have an update on approximately how long it might take to receive the data?

Kind regards,
Melissa

From: Darren Campbell [mailto:D.Campbell@lsrca.on.ca]
Sent: Thursday, February 11, 2016 8:43 AM
To: Torchia, Melissa
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

The only document attached is the word request document as there are no PDFs. If you can send me the PDFs I can look at those and extract which layers where used in those.

Thanks

Darren

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Wednesday, February 10, 2016 3:24 PM
To: Darren Campbell
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Darren,

Please see attached. Essentially the maps and figures Shauna had sent to me, we were expecting shapefiles, not pdfs. Hopefully this clarifies it.

Let me know if not.

Kind regards,
Melissa

From: Darren Campbell [mailto:D.Campbell@lsrca.on.ca]
Sent: Wednesday, February 10, 2016 3:18 PM
To: Torchia, Melissa
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

I did look at that but to ensure you get the correct data it would need to be more specific or else I am making assumptions as to what data you exactly require. I believe Shauna has already provided you some data as well so I would like to make sure you get the correct data as if something is missed than additional agreements will be required which end up taking more time so that is why I would like to make sure you get what you are looking for the first time.

Thanks

Darren

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Wednesday, February 10, 2016 3:13 PM
To: Darren Campbell
Subject: FW: Hewitt Class EA - LSRCA Data Request Form

Please see attached the form that was completed before, and let me know if you need anything else.

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Tuesday, February 09, 2016 11:38 AM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Melissa,

We do have GIS layers that can be provided however we would need to a shapefile from you of the study area.

Frank Pinto, will coordinate the data agreement based upon the data set you requested in the form attached.

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

Twitter: @LSRCA
Facebook: LakeSimcoeConservation

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Tuesday, February 09, 2016 11:17 AM
To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good morning Shauna,

Hope all is well. I just left you a voice message.

We have taken a look at the data that was sent, and they appear to be all pdfs.

We were actually anticipating the shapefiles to overlay onto aerials and our CAD design drawings for the road, esp. in relation to the regulated areas. Is it possible to obtain this data?
Please advise at your earliest convenience.
Also, if you have your property boundary as a shapefile that too will also be useful to overlay.

Kind regards,
Melissa

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Monday, February 08, 2016 12:00 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good Morning Melissa,

Please find attached a link to the DropBox containing all the Natural Heritage Information we have available for the study area requested. As we discussed in the meeting, the area with in the Hewitt's Secondary Plan will have more current information and the defined feature limits however for the areas outside of the Annex Lands, this information is a good starting point.

The information provided includes fisheries sampling and temperature monitoring data, ELC to community series, regulated areas, potential valleylands, wetland boundaries, floodplain, watercourses, Simcoe Greenlands boundary, and Significant Wildlife Habitat. A disclaimer that although wetland locations were provided in pdf format the boundaries of all wetlands should be confirmed with the Ministry of Natural Resources and Forestry to determine if there have been revisions.

https://www.dropbox.com/sh/arb0v6ghig7s58q/AADQm42cohtc5nJDVnbjV4ETa?dl=0

The information will be made available for the next 21 days.

If you have any questions, I will be in the office this week.

Thanks,

Shauna

Shauna Fernandes
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From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Monday, February 01, 2016 2:46 PM
To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good afternoon Shauna,

I am just following up with respect to this request. Do you have a timeframe for when we might receive the information.

Kind regards,
Melissa

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Tuesday, January 19, 2016 4:11 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

Happy New Year to you as well!

The data request has been circulated to our internal departments and I have collected some of the material. I am awaiting all the available resources to coordinate the package. Based upon the information requested it may be better to provide shapefiles which I will confirm at the end of this week after I speak to our GIS department.

Additionally, if this is the case as mentioned before, there may be costs incurred for the staff time which will be coordinated through Frank Pinto who is included on this email.

Thank you,

Shauna

Shauna Fernandes
Natural Heritage Ecologist
Lake Simcoe Region Conservation Authority
120 Bayview Parkway,
Newmarket, Ontario L3Y 3W3
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Facebook: LakeSimcoeConservation

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Tuesday, January 19, 2016 2:37 PM
To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

January 19, 2016

Good afternoon Shauna,

Happy New Year!

Hope all is well. I am just following up with you in relation to the data request submission sent below on December 17th in relation to the Class EA: Hewitts Infrastructure Improvements. If you can kindly identify a timeframe for response to the below request for information that would be greatly appreciated.

We look forward to hearing from you.

Kindest regards,
Melissa

From: Torchia, Melissa
Sent: Thursday, December 17, 2015 9:51 AM
To: 'Shauna Fernandes'
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

December 17, 2015

Good morning Shauna,

Please find attached the data request form, and study location map.

If there is any additional information required on my behalf please do not hesitate to let me know.
If you can kindly confirm receipt of the file, and approximate time frame for this request that would be greatly appreciated.

Kindest regards,
Melissa

Melissa Torchia, M.A.Sc. | Environmental Planner
Hatch Mott MacDonald | Environment
5035 South Service Road, Sixth Floor Burlington ON L7L 6M9
T 289.288.2740 **F** 905.315.3569

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Wednesday, December 16, 2015 2:31 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

You are correct, you only need to complete Section A & B. I would suggest that under Organization you record Hatch Mott MacDonald c/o City of Barrie (Bala Araniyasundaran).

Thanks,

Shauna

Shauna Fernandes
Natural Heritage Ecologist
Lake Simcoe Region Conservation Authority
120 Bayview Parkway,
Newmarket, Ontario L3Y 3W3
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s.fernandes@LSRCA.on.ca | www.LSRCA.on.ca

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Facebook: LakeSimcoeConservation

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Wednesday, December 16, 2015 2:15 PM
To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Thanks Shauna,
Will the City need to fill out some sort of approval form, since I am filling this out on their behalf? Or will they need to send in the form?
Also, just to confirm (as this appears to be a different form than the last one I filled out at LSRCA), are we to complete only parts A and B?

Kind regards,
Melissa

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Wednesday, December 16, 2015 2:10 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford
Subject: Hewitt Class EA - LSRCA Data Request Form

Good Afternoon Melissa,

As I mentioned in our meeting on Dec 9, 2015 please find attached the LSRCA External Information Request Form. If there is any additional information, I will include it with the final data package.

Please note, that although there is no charge for the data through our agreements with our partners, there may be a cost associated with the staff time incurred. Once the form is filled out and I have an understanding of the information requested and what is available internally, I will follow up with you.

Happy Holidays,

Shauna

Shauna Fernandes
Natural Heritage Ecologist
Lake Simcoe Region Conservation Authority
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Twitter: @LSRCA
Facebook: LakeSimcoeConservation

Torchia, Melissa

From: Shauna Fernandes <S.Fernandes@lsrca.on.ca>
Sent: Monday, February 08, 2016 12:00 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good Morning Melissa,

Please find attached a link to the DropBox containing all the Natural Heritage Information we have available for the study area requested. As we discussed in the meeting, the area with in the Hewitt's Secondary Plan will have more current information and the defined feature limits however for the areas outside of the Annex Lands, this information is a good starting point.

The information provided includes fisheries sampling and temperature monitoring data, ELC to community series, regulated areas, potential valleylands, wetland boundaries, floodplain, watercourses, Simcoe Greenlands boundary, and Significant Wildlife Habitat. A disclaimer that although wetland locations were provided in pdf format the boundaries of all wetlands should be confirmed with the Ministry of Natural Resources and Forestry to determine if there have been revisions.

https://www.dropbox.com/sh/arb0v6ghig7s58q/AADQm42cohtc5nJDVnbjV4ETa?dl=0

The information will be made available for the next 21 days.

If you have any questions, I will be in the office this week.

Thanks,

Shauna

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

Twitter: @LSRCA
Facebook: LakeSimcoeConservation

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Monday, February 01, 2016 2:46 PM

To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Good afternoon Shauna,

I am just following up with respect to this request. Do you have a timeframe for when we might receive the information.

Kind regards,
Melissa

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Tuesday, January 19, 2016 4:11 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa; Frank Pinto
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

Happy New Year to you as well!

The data request has been circulated to our internal departments and I have collected some of the material. I am awaiting all the available resources to coordinate the package. Based upon the information requested it may be better to provide shapefiles which I will confirm at the end of this week after I speak to our GIS department.

Additionally, if this is the case as mentioned before, there may be costs incurred for the staff time which will be coordinated through Frank Pinto who is included on this email.

Thank you,

Shauna

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

Twitter: @LSRCA
Facebook: LakeSimcoeConservation

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Tuesday, January 19, 2016 2:37 PM
To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert; Alexander, Melissa
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

January 19, 2016

Good afternoon Shauna,

Happy New Year!

Hope all is well. I am just following up with you in relation to the data request submission sent below on December 17th in relation to the Class EA: Hewitts Infrastructure Improvements. If you can kindly identify a timeframe for response to the below request for information that would be greatly appreciated.

We look forward to hearing from you.

Kindest regards,
Melissa

From: Torchia, Melissa
Sent: Thursday, December 17, 2015 9:51 AM
To: 'Shauna Fernandes'
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford; Shamess, Robert
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

December 17, 2015

Good morning Shauna,

Please find attached the data request form, and study location map.

If there is any additional information required on my behalf please do not hesitate to let me know.
If you can kindly confirm receipt of the file, and approximate time frame for this request that would be greatly appreciated.

Kindest regards,
Melissa

Melissa Torchia, M.A.Sc. | Environmental Planner
Hatch Mott MacDonald | Environment
5035 South Service Road, Sixth Floor Burlington ON L7L 6M9
T 289.288.2740 **F** 905.315.3569

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Wednesday, December 16, 2015 2:31 PM
To: Torchia, Melissa

Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Hi Melissa,

You are correct, you only need to complete Section A & B. I would suggest that under Organization you record Hatch Mott MacDonald c/o City of Barrie (Bala Araniyasundaran).

Thanks,

Shauna

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

Twitter: @LSRCA
Facebook: LakeSimcoeConservation

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: Wednesday, December 16, 2015 2:15 PM
To: Shauna Fernandes
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford
Subject: RE: Hewitt Class EA - LSRCA Data Request Form

Thanks Shauna,
Will the City need to fill out some sort of approval form, since I am filling this out on their behalf? Or will they need to send in the form?
Also, just to confirm (as this appears to be a different form than the last one I filled out at LSRCA), are we to complete only parts A and B?

Kind regards,
Melissa

From: Shauna Fernandes [mailto:S.Fernandes@lsrca.on.ca]
Sent: Wednesday, December 16, 2015 2:10 PM
To: Torchia, Melissa
Cc: Bala.Araniyasundaran@barrie.ca; Lisa-Beth Bulford
Subject: Hewitt Class EA - LSRCA Data Request Form

Good Afternoon Melissa,

As I mentioned in our meeting on Dec 9, 2015 please find attached the LSRCA External Information Request Form. If there is any additional information, I will include it with the final data package.

Please note, that although there is no charge for the data through our agreements with our partners, there may be a cost associated with the staff time incurred. Once the form is filled out and I have an understanding of the information requested and what is available internally, I will follow up with you.

Happy Holidays,

Shauna

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

Twitter: @LSRCA
Facebook: LakeSimcoeConservation

Record of Meeting/Discussion

Hatch Mott MacDonald

Project Title	Hewitt's SPA EA	**Division**	WTC
Subject	Meeting with Lake Simcoe Region Conservation Authority (LSRCA)	**Project No.**	353997
Location	Fireplace Lounge (Scanlon Ed Centre) - 2450 9th Line, Bradford West Gwillimbury, ON L3Z 2A5	**Date of Meeting**	Dec. 9 2015

Present

Lisa-Beth Bulford	LSRCA	(LB)
Shauna Fernandes	LSRCA	(SF)
Ralph Scheunemann	Barrie	(RS)
Bala Araniyasundaran	Barrie	(BA)
Robert Shamess	HMM	(RTS)
Melissa Alexander	HMM	(MA)
Melissa Torchia	HMM	(MT)

Recorded by	**Distribution**
BA/RTS	All Present

Item	Text	Action
1	Introductions – members of the group introduced themselves	Info
2	HMM outlined the scope of the Class EA and discussed the specific items that they were looking at including widening of Mapleview Drive East, Lockhart Road, Yonge St and a section of Big Bay Pointe Road, as well as trunk watermain along Mapleview Dr East and trunk sanitary sewer along Mapleview Drive East, the majority of the work included in Hewitt's Secondary Plan, with the exception of some work extending west to Huronia Road. The work will also include 2 grade separations with the Metrolinx Rail corridor on Lockhart Road and Mapleview Ave.	Info
3	With regard to the rail crossings, given the topography, preliminary indications are that the roads would likely go under the rail.	Info
4	There are existing water crossings at Lovers Creek (one at Mapleview Drive East and two along Lockhart Road) and Hewitt Creek (one along Mapleview Dr East and two along Lockhart Rd)	Info
5	RTS presented a map provided by the adjacent land developers group showing projects with Natural Heritage areas identified, based on field work undertaken in the spring/summer of 2015. The majority of proposed improvements west of Hewitt's Secondary Plan will need to be assessed, as there is limited information about this area. City recommended reviewing Huronia Road EA improvements, which may have additional information	Info
6	The team was looking specifically at those natural areas associated with the watercourse crossings.	Info
7	LSRCA noted that there are PSWs north and south of Lockhart Road which will need to be	HMM

Item	Text	Action
	assessed.	
8	HMM intended to cover items that were not covered under the existing work in relation to the annexation lands	Info
9	Aquatic Assessments – HMM plans to use information in the Subwatershed study, however LSRCA indicated that may have been updated since the report was prepared in 2012. HMM to contact LSRCA for updated information…	HMM
10	HMM will develop mapping of the project area which will include those know natural heritage areas within the study area	HMM
11	HMM will initiate screening for SAR with MNRF.	HMM
12	With respect to culverts, HMM is assessing structural, hydraulic, and hydrological aspects to ensure conveyance and sizing of culverts. In addition a geomorphologic assessment will be undertaken to assess stream meander	Info
13	The City advised that 100 year conveyance for the culverts may have been addressed as part of the current widening project on Mapleview. HMM to verify.	HMM
14	The City noted that preliminary sizing was completed by AMEC for Creek crossings as part of the Master Plan	Info
15	HMM advised that given the project started in the fall Natural Heritage field work will not be undertaken until Spring 2016	Info
16	Stormwater Management – LSRCA and the City advised of the following items as pertain to the storm drainage for the widened roadway: • Low Impact Development (LID) techniques should be evaluated for application on the project • Etobicoke exfiltration system should be looked at which includes recommendations regarding LID features to address minor and major flows. Examples include tree wells • The use of Developers SWM ponds should be looked at as part of the overall storm drainage quantity control system • SW treatment should be addressed, this should include both quantity and quality control • LIDS life expectancy should match the projected roadway life expectancy (45 years) • Direct discharge to watercourses is not preferred by LSRCA. Preference is for bioswales instead of direct discharge to increase infiltration.	Info

Record of Meeting/Discussion Continuation Sheet

Hatch Mott MacDonald

Project No. Error! Reference source not found. 252907 **Date of Meeting** Error! Reference source not found. December 9, 2015

Item	Text	Action
17	With respect to data request, provide data request form to LSRCA	HMM
	a. LSRCA advised that a fish assessment was completed for Lovers Creek in 2014.	
	b. Floodplain mapping includes ELC for study area, should help identify data gaps.	
18	Comments on Work Plan:	
	Tree work should address butternut trees	HMM
	HMM should look at ecological migration features or special crossings for wildlife. These are recommended and not mandatory. The LSRCA does not have a guideline for wildlife crossings, using current industry standards	HMM
19	LSRCA does not track/monitor SAR. This information should be attained from MNRF.	HMM
20	LSRCA would provide recommendations regarding ELC after they review their own data before they pass it on.	Info
21	HMM to provide data request by Email to LSRCA with copy to BA at the City	HMM
22	SF of LSRCA to send form for the data request to HMM.	LSRCA
23	HMM to send ESA letter to MNRF to request information on SAR within the Study Area.	HMM
24	Next Meeting likely in April 2016	Info

Agency Consultation:

Ministry of Natural Resources and Forestry

Torchia, Melissa

From: Jawaid, Maria (MNRF) <Maria.Jawaid@ontario.ca>
Sent: Friday, March 11, 2016 11:23 AM
To: Torchia, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Yes, that is correct.

Maria Jawaid
A/ District Planner – Midhurst District
Ministry of Natural Resources & Forestry
2284 Nursery Rd. Midhurst, ON L0L 1X0
Tel: (705) 725-7546

From: Torchia, Melissa [mailto:melissa.torchia@hatch.ca]
Sent: March 11, 2016 10:08 AM
To: Jawaid, Maria (MNRF)
Cc: Torchia, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Ok thanks Maria,

Just to clarify, the MNRF is not seeking any targeted surveys, aside from Butternut for this project?

Thanks in advance,
Melissa

From: Jawaid, Maria (MNRF) [mailto:Maria.Jawaid@ontario.ca]
Sent: Friday, March 11, 2016 10:05 AM
To: Torchia, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Hi Melissa,

I spoke to my biologist again about this file. Given the nature of the project (ie: road widening) simple observational information should suffice (ie: no targeted survey).

Hope this helps,

Maria Jawaid
A/ District Planner – Midhurst District
Ministry of Natural Resources & Forestry
2284 Nursery Rd. Midhurst, ON L0L 1X0
Tel: (705) 725-7546

"In order for us to serve you better, please call ahead to make an appointment with our staff."
Please consider the environment before printing this e-mail

From: Torchia, Melissa [mailto:melissa.torchia@hatch.ca]
Sent: March 10, 2016 3:05 PM
To: Jawaid, Maria (MNRF)
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Hi Maria,

Hope all is well. By chance do you have a field protocol for surveys for Hine's Emerald? i.e. appropriate time and how many surveys are required?

Any guidance you can provide would be greatly appreciated.

Kind regards,
Melissa

From: Jawaid, Maria (MNRF) [mailto:Maria.Jawaid@ontario.ca]
Sent: Wednesday, March 02, 2016 10:45 AM
To: Torchia, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Hi Melissa,

I realized I did not include the timing restriction for in-water works in my previous comments.

Given that Lover's Creek has confirmation of Brook Trout, no in-water works should occur between March 15th – July 15th or from October 1 – May 31st

Maria Jawaid
A/ District Planner – Midhurst District
Ministry of Natural Resources & Forestry
2284 Nursery Rd. Midhurst, ON L0L 1X0
Tel: (705) 725-7546

"In order for us to serve you better, please call ahead to make an appointment with our staff."
Please consider the environment before printing this e-mail

From: Jawaid, Maria (MNRF)
Sent: February 24, 2016 9:38 AM
To: Torchia, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Hi Torchia,

After much delay, I finally got one of my Biologists to review this project. The following is a synopsis of their findings:

Wetland:
The western portions of the project are adjacent to the Provincially Significant Lover's Creek Wetland complex. Depending on the nature of the work being proposed, there may be impacts to the wetland feature. Connectivity for water flow and species migration should be discussed in any EIS or environmental report related to this work.

Species at Risk:

Snapping Turtle – There are observations of this species within the complex. Because the proposed works appears to cross the complex at two different locations, care should be taken to avoid disrupting the migration of this species during future works.

Emerald Dragonflies – There are number of observations of "emerald" dragonflies in this area. Only the Hine's Emerald variety is protected under the ESA, but other varieties are tracked. A survey should be conducted to assess whether Hine's Emerald may be present, and other species should be documented.

Butternut- There is potential for Butternut on or immediately adjacent to the project areas. A survey should be completed, and any Butternut found should be evaluated by a certified Butternut Health Assessor (BHA).

The NHIC database is a good place to start. It can help identify potential survey requirements, and determine whether a restricted species observation has been noted at or near the site. That being said, the District might have other records or information which can inform survey requirements.

Apologies for the delay.

Maria Jawaid
A/ District Planner – Midhurst District
Ministry of Natural Resources & Forestry
2284 Nursery Rd. Midhurst, ON L0L 1X0
Tel: (705) 725-7546

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: February 22, 2016 12:59 PM
To: Jawaid, Maria (MNRF)
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Good afternoon Maria,

Hope you had a nice weekend.
Do you have any updates?

Kind regards,
Melissa

From: Jawaid, Maria (MNRF) [mailto:Maria.Jawaid@ontario.ca]
Sent: Thursday, February 11, 2016 9:54 AM
To: Torchia, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

Hi Melissa,

MNRF should have some information for you by next week. Sorry for the delay.

Regards,

Maria Jawaid
A/ District Planner – Midhurst District

Ministry of Natural Resources & Forestry
2284 Nursery Rd. Midhurst, ON L0L 1X0
Tel: (705) 725-7546

From: Torchia, Melissa [mailto:Melissa.Torchia@hatchmott.com]
Sent: January 19, 2016 2:34 PM
To: Jawaid, Maria (MNRF)
Cc: Bala.Araniyasundaran@barrie.ca; Shamess, Robert; Alexander, Melissa
Subject: RE: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

January 19, 2015

Good afternoon Maria,

Happy New Year!

Hope all is well. I am just following up with you in relation to my email sent below on December 17th in relation to the Class EA: Hewitts Infrastructure Improvements. If you can kindly identify a timeframe for response to the below request for information that would be greatly appreciated.

We look forward to hearing from you.

Kindest regards,
Melissa

From: Torchia, Melissa
Sent: Thursday, December 17, 2015 4:18 PM
To: 'maria.jawaid@ontario.ca'
Cc: Bala.Araniyasundaran@barrie.ca; Shamess, Robert
Subject: Class EA: Hewitts Infrastructure Improvements City of Barrie: ESA and natural heritage information request

December 17, 2015

Good afternoon Maria,

We spoke late last week regarding the above noted project, and identifying that you may be the point of contact. Attached is the study area in question, and a 25 metre buffer that would indicate the likely impact zone based on the centre line of the existing road.

As noted during our conservation, this project is one of 3 infrastructure improvements being undertaken by the City of Barrie. In 2010, the Town of Innisfil transferred land to the City of Barrie pursuant to the *Barrie-Innisfil Boundary Adjustment Act*, 2009., also referred to as the Annexed Lands. These lands have been subject to a master planning exercise which was prepared in accordance with the Municipal Class EA process.

Our project is focusing on the Hewitts Secondary Plan Assignment, which will move the project through Phases 3 and 4 of the Municipal Class EA process, for arterial road widening, two grade separation railway crossings, conceptual design for drainage works associated with the road, and design of trunk watermain and trunk waste water sewers.

Study area associated with the Project is split into four (4) separate areas:

- Area 1 is along Lockhart Road, which extends from Huronia Road east almost to 20th Side Road .
- Area 2 is along Mapleview Drive East, which extends from Huronia Road east just towards 20th Side Road.
- Area 3 is along Yonge Street from Lockhart Road to Mapleview Drive East.
- Area 4 is a smaller area of disturbance, and is located along Big Bay Pointe Road that extends from Versailles Cres east approximately 620 m.

We are looking to obtain information on natural heritage, as well as coordinate an ESA screening for our project. If you can kindly direct us on how to obtain this information that would be great (i.e. if you have a general ESA mailbox and form to be filled out for ESA requests).
Additionally if you wish to discuss this project a bit further, please kindly give me a call or respond to this email. If you require us to conduct and provide a screening using the NHIC database on the Make-a-Map tool and go from there, we can certainly do that.

We look very much to hearing from you and working with you on this project.

Kindest regards,
Melissa

Melissa Torchia, M.A.Sc. | Environmental Planner
Hatch Mott MacDonald | Environment
5035 South Service Road, Sixth Floor Burlington ON L7L 6M9
T 289.288.2740 **F** 905.315.3569

APPENDIX B

NSRI & DA Vegetation Communities

Natural Resources Solutions Inc. & Dougan and Associates: City of Barrie Annexed Lands: Natural Heritage Characterization Report Appendix F & H
April 2012

City of Barrie Annexed Lands

Natural Heritage Characterization Report

April 2012

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN

In association with ***Macaulay Shiomi Howson Ltd***

APPENDIX F

ECOLOGICAL LAND CLASSIFICATION FOR ANNEXED LANDS

Appendix F. ELC Vegetation Community Data Sorted by Polygon Number

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
101.1	AGR	Ag Study	15.38			
101.2	AGR	Ag Study	0.43			
101.3	MAM2	D&A	1.04	MAM2		
101.4	ANTH	D&A	0.56	ANTH		
102.1	FOD7-3	D&A	0.84	FOD7-3		
102.2	FOD8-1	AEC 09-072 EIS, Dave Featherstone	3.77			
103	CUP3-3	D&A	0.75	CUP3-3		
105.1	SWM4-1	DiPoce EIS	0.36			
105.2	SWM3-2	DiPoce EIS	0.86			
105.3	MAM2	D&A	0.43	MAM2	CUW1	
106.1	CUW1	D&A	0.68	CUW1		
106.2	CUM1-1	DiPoce EIS	0.86			
107	ANTH	LSRCA	1.38			
108.1	FOC4-1	D&A, Dave Featherstone, NRSI Observation	5.82	FOC4-1	SWC	MAM2
108.2	MAM2-2	D&A, Dave Featherstone, NRSI Observation	0.95			
109	CUM1-1	D&A	10.13	CUM1-1		CUT1
110	CUP3-1	D&A	20.01	CUP3-1		
111	ANTH	LSRCA	0.99			
201.1	CUP3-1	D&A	1.47	CUP3-1		
201.2	ANTH	D&A	3.23	ANTH		
201.3	CUP3-1	D&A	6.26	CUP3-1		
201.4	MAM2	D&A	0.19	MAM2		
202.1	ANTH	D&A	3.13	ANTH		
202.2	CUM1-1	D&A	4.26	CUM1-1		OAO
203.1	CUM1-1	D&A	0.65	CUM1-1		
203.2	FOM8-1	D&A, Dave Featherstone	18.02	FOM8-1		
204	CUM1-1	Honeywood EIS/ D&A	1.09	CUM1-1		
205.1	ANTH	Honeywood EIS	0.15			
205.2	FOD5-4	Honeywood EIS	2.32			
206	ANTH	LSRCA	0.32			
207	CUM1-1	LSRCA	0.53			
208	CUS1	D&A	4.29	CUS1		
209	CUP3-3	Honeywood EIS	1.39			
210	CUT1	D&A	5.41	CUT1	CUM1-1	

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
211	FOD3-1	D&A	5.26	FOD3-1		FOM4-1
212	MAS2-1	D&A	1.72	MAS2-1		SWT2-2
213	SWD3-3	D&A	0.88	SWD3-3		
214.1	AGR	Ag Study	61.64			
214.2	MAS2-1	Stakeholder Site Walk, Dave Featherstone	0.95			
214.3	ANTH	Ag Study	1.90			
214.4	AGR	Ag Study	0.82			
215	SWD3-3	D&A	1.11	SWD3-3		FOD9-1
216	HR	D&A	1.54	HR		
217	ANTH	D&A	1.33	ANTH		
301.1	ANTH	D&A	1.41	ANTH		
301.2	CUM1-1	D&A	0.35	CUM1-1		
301.3	CUP3	D&A	0.34	CUP3		
301.4	ANTH	D&A	0.63	ANTH		
302.1	HR	D&A	0.19	HR		
302.2	ANTH	D&A	2.20	ANTH		
303.1	CUP3	AEC 09-071 EIS	1.27	CUP3-2		
303.2	CUP3-2	AEC 09-071 EIS	2.19			
303.3	SWD3-3	AEC 09-071 EIS	0.45			
303.4	CUP3-8	AEC 09-071 EIS	12.15			
303.5	SWD3-3	AEC 09-071 EIS	0.17			
303.6	SWM2-2	AEC 09-071 EIS	0.47			
305.1	SWC1-1	AEC 09-071 EIS	0.34	CUP3-2		SWD
305.2	MAM2-10	AEC 09-071 EIS	0.38			
305.3	CUP3-2	AEC 09-071 EIS	1.31			
305.4	SWC1-1	AEC 09-071 EIS	0.57			
305.5	FOM8-1	AEC 09-071 EIS	0.86			
305.6	CUP3-2	AEC 09-071 EIS	6.74			
305.7	FOM8-1	AEC 09-071 EIS	0.86			
306	ANTH	LSRCA	6.30			
401	ANTH	LSRCA	0.41			
402.1	CUM1-1	D&A, NRSI - Air Photo, Dave Featherstone	4.62			
402.2	MAM2	D&A, NRSI – Air Photo, Dave Featherstone	0.64			
403	CUP3-3	D&A	1.54	CUP3-3		
404	CUP3-3	D&A	0.17	CUP3-3		
405	ANTH	D&A	6.74	ANTH		
406.1	CUM1-1	D&A	3.47	CUM1-1		
406.2	CUT1	D&A	2.18	CUT1		
406.3	CUM1-1	D&A	3.28	CUM1-1		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
406.4	AGR	LSRCA	1.06			
407	CUP3-3	D&A	2.42	CUP3-3		
408	CUP3-3	D&A	1.46	CUP3-3		
409	CUP3-3	D&A	1.95	CUP3-3		
410	ANTH	D&A	0.65	ANTH		
411	CUM1-1	Stakeholder Site Walk	8.96	MAM2-2		
412	CUP3-3	D&A	1.77	CUP3-3		
413	ANTH	D&A	3.45	ANTH		
415	ANTH	D&A	0.46	ANTH		
416	SWT2-2	D&A	2.52	SWT2		
417	CUP3-3	D&A	5.47	CUP3-3		
418	ANTH	D&A	0.76	ANTH		
419	CUM1-1	D&A	3.82	CUM1-1		
420	ANTH	D&A	0.14	ANTH		
421	ANTH	D&A	3.35	ANTH		
422.2	SWT	D&A, NRSI Observation	0.67	SWT		
422.3	SWD	D&A, NRSI Observation	44.95	SWD4		
422.4	FOD6-5	D&A, NRSI Observation	4.91			
422.5	FOD6-5	D&A, NRSI Observation	6.09			
422.6	FOD6-5	D&A, NRSI Observation	8.59			
422.7	OAO	NRSI Observation	0.03			
422.8	SWD4-5	NRSI Observation	3.65			
422.9	FOD3-2	NRSI Observation	3.16			
422.11	SWM	NRSI Observation	2.77			
422.12	FOD6-5	NRSI Observation	2.01			
422.13	FOD	NRSI Observation	2.24			
423	FOC4-1	D&A	1.94	FOC4-1		
424.1	SWT2-2	D&A, NRSI – Air Photo	2.17	SWT2-2		
424.2	CUT	D&A, NRSI – Air Photo	2.90			
424.3	SWT2-2	D&A, NRSI – Air Photo	2.35			
425.1	AGR	Ag Study	1.36			
425.2	ANTH	D&A	0.92			
426	CUP3-3	D&A	0.58	CUP3-3		
427.1	AGR	Ag Study	6.69			
427.2	HR	LSRCA/ D&A	0.38			
427.3	HR	LSRCA/ D&A	0.30			
427.4	HR	LSRCA/ D&A	0.42			

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
427.5	AGR	Ag Study	2.38			
427.6	AGR	Ag Study	2.90			
427.7	AGR	Ag Study	1.57			
428	ANTH	LSRCA	1.31			
429	CUP3-3	D&A	1.39	CUP3-3		
430.1	AGR	D&A/ Ag Study	14.54	AGR		
430.2	MAM2-6	D&A	1.16	MAM2-6		
430.3	MAM2-6	D&A	0.39	MAM2-6		
431	CUM1-1	D&A	2.99	CUM1-1		
433	AGR	Ag Study	10.63			
434.1	FOD6-5	D&A	8.32	FOD6-5		
434.2	CUM1-1	D&A, Dave Featherstone	2.80	CUM1-1		
435.1	FOC4	D&A, NRSI Observation	2.99	FOM7-2		
435.2	FOM	NRSI Observation	1.79			
436	CUM1-1	D&A, Dave Featherstone	5.25	CUM1-1	MAM	
437.1	CUM1-1	D&A	4.80	CUM1-1		
437.2	AGR	D&A	1.55	AG		
437.3	AGR	D&A	7.09	AG		
438	HR	D&A	2.46	HR		
439	CUM	LSRCA	1.86			
440.1	AGR	Ag Study	13.78			
440.2	HR	D&A	0.55	HR		
441	SWT3-2	D&A	6.34	SWT3-2		SWD6-2
442	AGR	D&A	1.58	AGR		
443.1	HR	D&A	0.49	HR		
443.2	HR	D&A	0.34	HR		
443.3	HR	D&A	0.38	HR		
444	FOD6-5	D&A	7.24	FOD6-5		
445.1	SWM1-1	D&A	6.70	SWM1-1		
445.2	SA	D&A	0.23	SA		
445.3	SWD3-3	D&A	1.36	SWD3-3		
445.4	FOD6-5	D&A, NRSI Observation, Dave Featherstone	4.76	FOD6-5	SWD3-3	
445.5	SWD4	D&A, NRSI – Site Visit	11.91			
445.6	SWD	NRSI Observation	5.86			
446.1	ANTH	D&A	0.28	ANTH		
446.2	CUM	LSRCA	0.87			
447.1	FOD3-1	D&A	0.59	FOD3-1		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
447.2	FOD8-1	D&A	0.54	FOD8-1		SWD
447.3	FOD9-1	D&A	0.61	FOD9-1		
447.4	SWD3-3	D&A	0.30	SWD3-3		
448	ANTH	D&A	1.14	ANTH		
449.1	CUM1-1	D&A	2.20	CUM1-1		
449.2	SBO1	D&A	1.04	SBO1		
450	CUP3-2	D&A	30.83	CUP3-2		
451	ANTH	LSRCA	3.71			
452	AGR	Ag Study	16.65			
453	AGR	Ag Study	4.81			
454	ANTH	D&A	6.39	ANTH		
455	AGR	D&A	8.48	AGR		
456	ANTH	D&A	1.76	ANTH		
501.1	HR	D&A	0.40	HR		
501.2	AGR	D&A	19.50	AGR		
502	CUW1	D&A	2.31	CUW1		
503	CUP3-8	LSRCA, NRSI Observation	8.35			
505.1	FOM2-2	D&A, NRSI Observation	8.92	FOM2-2		
505.2	FOD2-4	D&A	15.21	FOD2-4		
506	SBT1	D&A	9.37	SBT1		
507	CUP3-3	LSRCA	4.71			
508	FOC	LSRCA, NRSI Observation	5.77			
508.1	FOC4	NRSI Observation	2.61			
509	FOD4	D&A, NRSI Observation	7.30	FOD4		
510	ANTH	LSRCA	0.44			
511	HR	D&A	1.34	HR		
512.1	AGR	D&A	28.88	AGR		
512.2	ANTH	D&A	0.45	ANTH		
514	CUM1-1	D&A	7.33	CUM1-1		HR
515	CUP3-3	D&A	3.41	CUP3-3		FOD4
601	CUM1-1	D&A	2.83	CUM1-1		
602	ANTH	D&A	2.83	ANTH		
603.1	AGR	Ag Study	6.56			
603.2	CUM	LSRCA	1.37			
603.3	AGR	Ag Study	2.62			
604.1	FOD3-1	D&A	2.85	FOD3-1		
604.2	FOD3-1	D&A	0.84	FOD3-2		
604.3	FOD3-1	D&A	1.99	FOD3-3		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
604.4	SWM4-1	D&A, NRSI Observation	1.78	SWM4-1		
604.5	CUM1-1	D&A	1.34	CUM1-1		
604.7	SWM4-1	D&A	1.83	SWM4-1		
604.8	SWM4-1	D&A, NRSI Observation	15.92	SWM4-2		
604.9	SWM4-1	D&A, NRSI – Air Photo	19.09	SWM4-3		
604.10	FOD3-1	D&A, NRSI Observation	1.89	FOD		
604.11	FOC4-2	D&A, NRSI – Air Photo	3.10			
604.12	FOC4-2	D&A, NRSI Site visit	8.33			
604.13	FOC4-2	D&A, NRSI Site visit	2.63			
604.14	CUP3-3	D&A, NRSI Site visit	0.85			
604.15	MAS2-1	NRSI Observation	1.16			
604.16	MAS2-1	NRSI Observation	0.81			
604.17	CUP3-3	NRSI Observation	0.98			
604.18	FOC4-2	NRSI Observation	1.08			
604.19	FOD5-8	NRSI Observation	1.19			
605	MAS3-1	D&A	3.75	MAS3-1		
607.1	AGR	D&A	39.58			
607.2	ANTH	D&A	2.58			
607.4	ANTH	D&A	1.29			
607.5	ANTH	D&A	1.29			
608.1	CUW1	D&A	1.80	CUW1		CUP3, MAS2-1
608.2	AGR	Ag Study	9.47			
609.1	AGR	Ag Study	3.29			
609.2	AGR	Ag Study	6.44			
609.3	HR	D&A	0.73	HR		
609.4	HR	D&A	0.86	HR		
701	FOD3-1	D&A	0.90	FOD3-1		
702.1	CUT1-1	D&A	1.13	CUT1-1		
702.2	CUM1-1	D&A	2.44	CUM1-1		
703	CUW1	D&A	0.78	CUW1		MAS2
704	GC	LSRCA	8.01			
705	MAS2-1	D&A	0.65	MAS2-1		
706.1	SWM4-1	D&A, NRSI – Air Photo	1.14	SWM4-1		
706.2	FOC4-2	D&A, NRSI – Air Photo	2.17	FOC4-2		
706.3	FOC4-2	D&A, NRSI – Air Photo	5.25			
707	GC	LSRCA	23.93			
708.1	HR	D&A	1.54	HR		
708.2	FOD6-5	D&A	0.32	FOD6-5		
710.1	AGR	D&A	7.11	AGR		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
710.2	AGR	D&A	36.62	AGR		
711	ANTH	LSRCA	1.18			
712.1	ANTH	LSRCA	0.51	ANTH		
712.2	ANTH	LSRCA	0.37	ANTH		
712.3	AGR	LSRCA	0.89	AGR		
713	FOD5-1	D&A	1.24	FOD5-1		
714.1	CUP3-1	D&A	9.86	CUP3-1		
714.2	CUW1	D&A	2.63	CUW1		CUM1-1
715.1	MAM2-2	D&A	2.66	MAM2-2		
715.2	SWC3	D&A, NRSI – Air Photo	7.92	SWC3		
715.3	FOM	D&A, NRSI – Air Photo	2.37			
801	ANTH	LSRCA	1.46			
802	ANTH	LSRCA	1.20			
803.1	AGR	D&A	13.60	AGR		
803.2	CUM1-1	D&A	4.75	CUM1-1		
804	AGR	Ag Study	13.18			
805	ANTH	LSRCA	0.22			
806	AGR	Ag Study	0.77			
807.1	HR	D&A	0.48	HR		
807.2	CUT1	D&A	0.32	CUT1		
808	CUP3-8	D&A	0.29	CUP3-8		
809.1	AGR	D&A	0.96	AG-A		
809.2	AGR	D&A	0.25	AGR		
810	CUP3-3	D&A	0.91	CUP3-3		
811.1	SWT	D&A, NRSI – Air Photo	0.96	CUW1		
811.2	MAM2-2	D&A	0.63	MAM2-2		
811.3	SWT	D&A, NRSI – Air Photo	0.59	CUW1		
812.1	AGR	D&A	3.90	AGR		
812.2	AGR	D&A	7.30	AG-H		
813	FOM6-1	D&A, Dave Featherstone	5.24	FOM6-1		CUT1
814	SWD3-3	D&A, Dave Featherstone	3.76	SWD3-3		CUT1
815	ANTH	LSRCA	0.62			
816	AGR	D&A	13.22	AG-A		
817	AGR	Ag Study	0.67			
818.1	FOD6/SWD	D&A, NRSI – Air Photo	6.95	FOD6	SWD4	
818.2	SWM4-1	D&A	2.61	SWM4-1		
818.3	MAM2-2	D&A	0.47	MAM2-2		
818.4	HR	D&A	0.48	HR		
820.1	AGR	D&A	28.49	AGR		
820.2	MAM	D&A	1.04	MAM		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
820.3	MAM	D&A	2.19	MAM		SWT2-2
820.4	HR	D&A	0.81	HR		
821	AGR	LSRCA	0.14			
823.1	FOD5-1	D&A	2.99	FOD5-1		
823.2	CUT1	D&A	0.44	CUT1		
823.3	SWD4	D&A, NRSI – Air Photo, Dave Featherstone	2.15	FOD8-1		
824	AGR	Ag Study	0.63			
825	AGR	Ag Study	17.65			
826	OAO	D&A	0.14	OAO		
827.1	MAM2-2	D&A	2.87	MAM2-2	CUW1	
827.2	SWT/MAM	D&A, Dave Featherstone	0.20	CUT1		
828.1	CUW1	D&A	0.78	CUW1		
828.2	CUP3-3	D&A	0.19	CUP3-3		
830	AGR	D&A	21.93	AGR		
831	AGR	D&A	26.65	AGR		
832.1	AGR	D&A	2.06	AG-A		
832.2	CUM1-1	D&A	2.82	CUM1-1		HR
833.1	AGR	D&A	1.18	AGR		
833.2	ANTH	D&A	0.94	ANTH		
901	CUM	LSRCA	2.75			
902	AGR	Ag Study	36.24			
903.1	HR	D&A	0.73	HR		
903.2	CUP3-3	D&A	2.00	CUP3-3		
1001	CUM1-1	D&A	0.91	CUM1-1		
1002	CUW1	D&A	2.19	CUW1		
1003	HR	D&A	0.56	HR		
1004.1	ANTH	D&A	5.25	ANTH		
1004.2	AGR	D&A	5.19	AGR		
1004.3	AGR	D&A	15.09	AGR		
1004.4	ANTH	D&A	1.72	ANTH		
1005.1	CUW1	D&A	11.83	CUW1		
1005.2	SBO1	D&A	23.45	SBO1	SBT1	
1005.3	CUM1-1	D&A	4.67	CUM1-1		
1006	CUP3-3	D&A	8.06	CUP3-3		CUM1-1
1101	ANTH	LSRCA	20.56	CUM1-1	CUW	
1102	ANTH	D&A	0.40	ANTH		
1103.1	AGR	D&A	14.75	AG		
1103.2	MAM2-10	D&A	0.37	MAM2-10		
1103.3	OAO	D&A	0.22	OAO		
1103.4	ANTH	D&A	2.37	ANTH		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
1104	CUS1	D&A	2.18	CUS1		
1105	FOC4-1	D&A, NRSI – Air Photo	3.97	SWC1-1	FOC4-1	
1106	AGR	D&A	2.31	AGR		
1107	CUS1	D&A	0.44	CUS1		
1108.1	HR	D&A	0.09	HR		
1108.2	AGR	D&A	9.00	AGR		
1109	FOD5-8	D&A	3.12	FOD5-8		
1110	HR	D&A	0.07	HR		
1111	AGR	Ag Study	7.59			
1201.1	FOD5-1	D&A	1.26	FOD5-1		
1201.2	HR	D&A	0.45	HR		
1202	HR	D&A	0.25	HR		
1203.1	AGR	Ag Study	6.69	AGR		
1203.2	CUM1-1	D&A	1.58	CUM1-1		
1203.3	ANTH	D&A	0.25	ANTH		
1203.4	CUM1-1	D&A	1.73	CUM1-1		
1203.5	HR	D&A	0.48	HR		
1203.6	AGR	Ag Study	9.93	AGR		
1204.1	HR	D&A	0.56	HR		
1204.2	CUM1-1	D&A	1.41	CUM1-1		
1205.1	SWM4-1	D&A, NRSI – Air Photo	2.74	SWM4-1		
1205.2	FOD5-1	D&A, NRSI – Air Photo	4.64			
1205.3	FOC4-1	D&A, NRSI – Air Photo	6.62			
1206	CUM1-1	D&A, NRSI – Air Photo	5.08	MAM2-5		
1207	HR	D&A	0.79	HR		
1209	SWT	LSRCA	2.03			
1210	MAS	LSRCA	0.49			
1211	SWM	LSRCA, NRSI – Air Photo	1.92	FOC4-1		
1212.1	CUT1	D&A	5.41	CUT1		
1212.2	ANTH	D&A	1.12	ANTH		
1212.3	FOD5	D&A	0.51	FOD5		
1212.4	CUW1	D&A	0.65	CUW1		
1213	ANTH	LSRCA	0.22			
1214	MAM2-5	D&A	0.57	MAM2-5		
1215.1	AGR	D&A	3.80	AGR		
1215.2	CUM1-1	D&A	0.22	CUM1-1		
1215.3	CUM1-1	D&A	0.42	CUM1-1		
1215.4	AGR	D&A	6.02	AGR		
1215.5	AGR	D&A	19.63	AGR		
1216	CUT	LSRCA, NRSI – Air Photo	4.74	SWT		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
1217	FOC4-1	LSRCA, NRSI – Air Photo	2.49	FOC		
1218.1	AGR	Ag Study	4.67			
1218.2	AGR	Ag Study	15.12			
1218.3	ANTH	D&A	0.98	ANTH		
1221	AGR	Ag Study	6.95			
1222	AGR	Ag Study	7.10			
1223	HR	D&A	1.00	HR		
1224.1	CUM1-1	D&A	2.37	CUM1-1		MAS2-1, CUW1
1224.2	MAM2-2	D&A	6.46	MAM2-2	CUT1	CUW1
1225.1	AGR	D&A	21.33	AG		
1225.2	ANTH	D&A	1.59	ANTH		
1226	HR	D&A	0.30	HR		
1227	FOD5-8	D&A	3.21	FOD5-8	CUT1-5	
1228	AGR	LSRCA	36.59			
1230	ANTH	LSRCA	5.80			
1231	HR	D&A	1.85	HR		
1232.1	AGR	D&A	33.60	AG-A		
1232.2	HR	D&A	0.74	HR		
1233.1	ANTH	D&A	0.75	ANTH		
1233.2	AGR	D&A	4.09	AGR-O		
1234	AGR	Ag Study	12.34			
1235	CUP3	D&A	0.91	CUP3		
1236	FOD5-1	D&A	2.87	FOD5-1		
1237.1	CUS1	D&A	0.19	CUS1		
1237.2	HR	D&A	0.65	HR		
1237.3	CUT1	D&A	1.28	CUT1		
1237.5	AGR	LSRCA	2.30			
1238	ANTH	LSRCA	0.95			
1239	ANTH	LSRCA	2.45			
1240	ANTH	LSRCA	1.26			
1241	HR	D&A	0.27	HR		
1242	ANTH	LSRCA	0.49			
1243	ANTH	LSRCA	1.11			
1244	ANTH	D&A	0.32	ANTH		
1245	ANTH	LSRCA	1.59			
1246	ANTH	LSRCA	1.08			
1247	ANTH	LSRCA	4.07			
1248	AGR	Ag Study	11.26			
1301	AGR	Ag Study	9.94			
1302.1	AGR	D&A	10.81	AGR		
1302.2	CUW1	D&A	2.34	CUW1		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
1303	AGR	Ag Study	3.46			
1304.1	FOD4-2	D&A	0.79	FOD4-2		
1304.2	SWT2	D&A	1.34	SWT2		
1305.1	ANTH	LSRCA	0.87	ANTH		
1305.2	AGR	D&A	2.45	AGR		
1305.3	HR	D&A	0.64	HR		
1306	CUM1-1	D&A	6.31	CUM1-1		
1309	MAS2-1	D&A	1.17	MAS2-1		MAM2
1310	FOC4-1	LSRCA	1.17	FOC4-1		
1311	CUW1	D&A	0.67	CUW1		
1312	SWC1	D&A	2.01	SWC1		
1313.1	FOC4-1	D&A	0.46	FOC4-1		
1313.2	SWM1-1	D&A	1.12	SWM1-1	FOM7-2	
1313.3	MAM2-5	D&A	0.51	MAM2-5		FOD8-1
1314.1	HR	D&A	0.28	HR		
1314.2	MAM2-2	D&A	1.81	MAM2-2		
1315.1	CUM1-1	D&A	0.19	CUM1-1		
1315.2	MAM2-2	D&A	0.83	MAM2-2		CUW1
1315.3	CUP3-3	D&A	0.09	CUP3-3		
1316	ANTH	LSRCA	0.60			
1317	FOC4-1	D&A	0.34	FOC4-1		
1318	MAM2-2	D&A	0.78	MAM2-2		
1319	FOC4-1	D&A	0.32	FOC4-1		
1320	MAM2-2	D&A	0.84	MAM2-2	CUW1	
1321	AGR	D&A	20.09	AG-A		
1322	CUM1-1	D&A	8.06	CUM1-1		
1323.1	FOC4-1	D&A, NRSI – Air Photo	3.11	FOC		
1323.2	FOM7-2	D&A, NRSI Observation	8.83	SWM		
1323.3	SWM	D&A	0.27	SWM		
1323.4	FOD5-2	NRSI Observation	0.46			
1324.1	FOM	D&A, NRSI Observation	11.54	FOM7-2	SWM6-1	MAS2-1
1324.2	SWM6-1	Stakeholder Site Walk	0.75	MAS2-1	SWM	SWM
1324.3	FOM0	D&A, NRSI Observation	2.17			
1324.4	FOC4-1	D&A, NRSI – Observation	2.46			
1324.5	SWM1-1	NRSI Observation	2.83			
1324.6	SWM1-1	NRSI Observation	0.95			
1325	ANTH	LSRCA	6.36			
1326	SWD	LSRCA	1.15			

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
1328.1	MAM2-2	D&A	1.92	MAM2-2		SAF1-3
1328.2	MAM3-3	D&A	3.12	MAM3-3		
1328.4	MAM2-2	D&A	3.98	MAM2-2		
1328.5	MAM2-2	D&A	0.37	MAM2-2		
1331.1	ANTH	D&A	0.29			
1331.2	AGR	Ag Study	2.07			
1331.3	ANTH	D&A	1.21			
1332.1	ANTH	LSRCA	1.32			
1332.2	AGR	D&A	6.41			
1333.1	CUM1-1	Stakeholder Site Walk	8.05	CUM1-1		
1333.2	SAS1	D&A	0.06	SAS1		
1334.1	ANTH	D&A	0.50	ANTH		
1334.2	CUM1-1	D&A	0.32	CUM1-1		SAS1
1335.1	MAM2-4	D&A	0.14	MAM2-4		
1335.2	SWD7	D&A	1.65	SWD7		
1337.1	AGR	D&A	33.62	AGR		
1337.2	CUM1-1	D&A	24.26	CUM1-1		MAM
1337.3	ANTH	D&A	1.08	ANTH		
1337.4	HR	D&A	0.19	HR		
1337.5	CUM1-1	D&A	0.32	CUM1-1		
1337.6	ANTH	D&A	1.25	ANTH		
1337.7	HR	D&A	0.07	HR		
1337.8	ANTH	D&A	4.08	ANTH		
1337.9	AGR	D&A	3.44	AGR		
1337.10	ANTH	D&A	0.50	ANTH		
1337.1	AGR	D&A	0.67	AGR		
1337.1	AGR	D&A	3.53	AGR		
1338.1	AGR	Stakeholder Site Walk	3.94	SWT2-2		
1338.2	CUM1-1	D&A, NRSI – Air Photo	2.26	MAM2-2		
1339.1	MAM2-5	D&A	12.37	MAM2-5	SWT2-2	
1339.2	CUM1-1	D&A	2.27	CUM1-1		
1339.3	CUM1-1	D&A	2.82	CUM1-1		
1339.4	MAS2-1	D&A	0.04	MAS2-1		
1339.5	AGR	Stakeholder Site Walk	12.95			
1339.6	MAM2-5	D&A, NRSI – Air Photo	5.02			
1340	SWT2-2	D&A	1.88	SWT2-2		
1341.1	AGR	D&A	9.15	AG		
1341.2	AGR	D&A	7.26	AG		
1341.3	HR	D&A	0.36	HR		
1341.4	AGR	D&A	1.86	AGR		
1341.5	HR	D&A	0.35	HR		
1342	MAM2-2	D&A	2.78	MAM2-2		

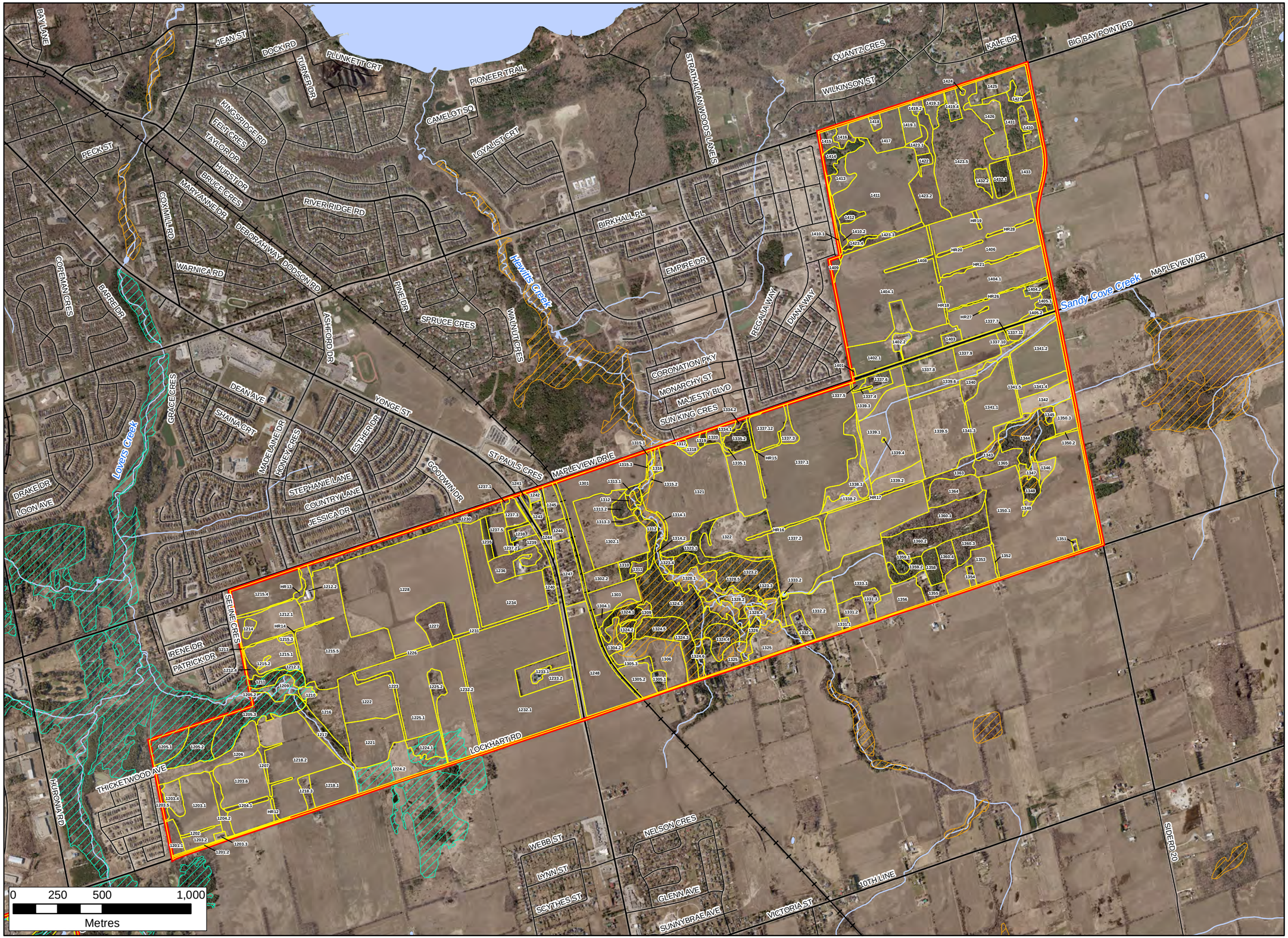
ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
1343	SWD4	D&A	1.54	SWD4		
1344	SWM	LSRCA	5.46			
1345	SWT	LSRCA	0.52			
1346	MAM	LSRCA	0.86			
1347	SWT	LSRCA	0.90			
1348	SWC3-1	D&A	1.23	SWC3-1		
1349	MAM	LSRCA	0.28			
1350.1	AGR	D&A	32.57	AG		
1350.2	HR	D&A	0.17	HR		
1350.3	CUM	D&A	2.04	CUM		
1351	ANTH	D&A	0.21	ANTH		
1352	HR	D&A	0.28	HR		
1353	CUM1-1	D&A	4.20	CUM1-1		
1354	ANTH	LSRCA	0.42			
1355	ANTH	LSRCA	1.69			
1356	AGR	D&A	3.70	AG		
1358	CUP3-2	LSRCA, NRSI Observation	1.67			
1359.1	SWT2-2	D&A	0.29	SWT2-2		
1359.2	FOC4-1	D&A	1.53	FOC4-1		
1360.1	FOD5-1	D&A, NRSI – Air Photo	4.79	SWD4-3		CUS1
1360.2	SWD4-3	D&A, NRSI – Air Photo	7.82			
1360.3	FOD5-1	D&A, NRSI Observation	2.50			
1360.4	FOM8	NRSI Observation	1.65			
1363	FOD3-1	D&A	2.01	FOD3-1		MAM2
1364	FOD5-1	D&A	3.79	FOD5-1	SBO1	
1365	FOD5-1	D&A	2.48	FOD5-1		
1401	ANTH	LSRCA	0.09			
1402.1	AGR	D&A	8.88	AGR		
1402.2	ANTH	D&A	0.83	ANTH		
1403	ANTH	LSRCA	0.73			
1404.1	AGR	D&A/ Ag Study	46.66	AG-A		
1404.2	ANTH	D&A	0.93	ANTH		
1405.1	CUW1	D&A	0.85	CUW1		
1405.2	CUT1-1	D&A	0.43	CUT1-1		
1406	AGR	D&A	16.58	AG -A		
1408	HR	D&A	1.08	HR		
1409	FOD5-8	D&A	0.50	FOD5-8		
1410.1	ANTH	LSRCA	0.33			
1410.2	HR	D&A	0.73	HR		
1411	AGR	D&A	19.15	AG		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
1412	HR	D&A	0.72	HR		
1413	CUM1-1	D&A	1.69	CUM1-1		
1414	CUP3-2	D&A	1.84	CUP3-2		
1415	ANTH	LSRCA	1.02			
1416	CUT	LSRCA	0.96			
1417	CUT1	D&A	4.66	CUT1		
1418	ANTH	LSRCA	0.51			
1419.1	CUM1-1	D&A	1.83	CUM1-1		
1419.2	ANTH	D&A	0.43	ANTH		
1419.3	CUT1	D&A	1.37	CUW1		
1419.4	ANTH	D&A	1.13	ANTH		
1422	CUP3	D&A	0.60	CUP3		
1423.1	CUW1	D&A	1.02	CUW1		
1423.2	FOD5-2	D&A	5.61	FOD5-2		
1423.3	HR	D&A	1.45	HR		
1423.4	CUP3-2	D&A	0.64	CUP3-2		
1423.5	FOD5-2	D&A	17.58	FOD5-2		
1424	ANTH	LSRCA	0.09			
1425	ANTH	LSRCA	3.82			
1426	AGR	Ag Study	3.81	CUM1-1		
1427	CUP3-3	D&A	0.73	CUP3-3		
1430	ANTH	LSRCA	1.70			
1431	FOM2	D&A	4.05	FOM2		
1432.1	CUP3-3	D&A	1.99	CUP3-3		
1432.2	CUW1	D&A	0.98	CUW1		
1433	CUP3	D&A	4.16	CUP3		
HR1	HR	D&A	0.13	HR		
HR2	HR	D&A	0.39	HR		
HR4	HR	D&A	1.01	HR		
HR5	HR	D&A	0.18	HR		
HR6	HR	D&A	0.18	HR		
HR7	HR	D&A	0.79	HR		
HR8	HR	D&A	0.79	HR		
HR9	HR	D&A	0.37	HR		
HR10	HR	D&A	0.41	HR		
HR11	HR	D&A	0.42	HR		
HR12	HR	D&A	0.22	HR		
HR13	HR	D&A	0.78	HR		
HR14	HR	D&A	0.64	HR		
HR15	HR	D&A	0.95	HR		
HR16	HR	D&A	1.13	HR		
HR17	HR	D&A	0.70	HR		

ELC Polygon	Vegetation Community Code	Source of ELC Data	Size (ha)	D&A Field Survey Data		
				Vegetation Community Code	Complex Code	Inclusion Code
HR18	HR	D&A	0.26	HR		
HR19	HR	D&A	0.22	HR		
HR20	HR	D&A	0.43	HR		
HR21	HR	D&A	0.73	HR		
HR26	HR	D&A	0.50	HR		
HR27	HR	D&A	0.09	HR		
HR28	HR	D&A	0.43	HR		

LEGEND

ELC Polygon: Number corresponds with location on Figures 3a or 3b
Vegetation Community Code: see Lee, et. al, 1998 for code
Source of ELC Data: Vegetation community types were determined based on the best available information. **D&A** indicates that the vegetation community type was determined based on Dougan & Associates data from field surveys, roadside surveys, or orthophoto interpretation; **LSRCA** indicates that the vegetation community type was determined based on mapping and data provided by LSRCA; **Ag Study** indicates that vegetation community type was determined based on mapping provided by the Agricultural Study being completed for the Annex Lands in 2011.; **Stakeholder Site Walk** indicates that the vegetation community type was determined based on field observation and discussion during stakeholder site walks held in the fall of 2011; **AEC 09-071 EIS** indicates that the vegetation community type was determined based on a previously completed EIS (Azimuth Environmental Consulting, 2011a); **Honeywood EIS** indicates that the vegetation community type was determined based on a draft EIS (Tarandus 2010a); **DiPoce EIS** indicates that the vegetation community type was determined based on a draft EIS (Tarandus 2010b).
D&A Field Survey Data: This data includes the ELC vegetation community codes recorded in the field by staff of Dougan & Associates. **Vegetation Community Codes** are the primary vegetation community type recorded for the polygon. The majority, but not all, of these match with the **Vegetation Community Code** listed in the second column. **Complex Codes** and **Inclusion Codes** are secondary vegetation community types observed within the polygon. Complexes and inclusions are typically too small to be mapped as individual polygons. Complexes represent community types that occur in multiple patches within the polygon. Inclusions represent community types that occur in one single patch within the polygon.



Legend

- Study Area
- Railway
- Highway
- Primary Road
- Secondary Road
- Watercourse
- Waterbody
- Lover's Creek Swamp (PSW)
- Other Wetland (Non PSW)

Barrie Annex Lands - East

Vegetation Communities

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

PROJECT: 1202

CLIENT: The City of Barrie

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UTM Zone 17 NAD83

DATE: April, 2012

SCALE: 1:20,000

DRAWN BY: G.C.S.

CHECKED BY: D.E.S.

Appendix:

F2

APPENDIX H

PLANT SPECIES LIST

Appendix H. Breeding Bird Species Considered Locally Rare in Simcoe County

Common Name	Scientific Name	Conservation Status				
		National	Provincial		Regional	Local
		COSEWIC[1]	SARO[2]	SRank[3]	BCR 13[4]	Simcoe[5]
Canada Goose	*Branta canadensis*	---	---	S5B	---	56
Mute Swan	*Cygnus olor*	---	---	SE	---	1
Trumpeter Swan	*Cygnus buccinator*	NAR	NAR	S2S3	---	27
Wood Duck	*Aix sponsa*	---	---	S5B	---	50
Gadwall	*Anas strepera*	---	---	S4B	---	4
American Wigeon	*Anas americana*	---	---	S4B	---	8
American Black Duck	*Anas rubripes*	---	---	S5B	---	27
Mallard	*Anas platyrhynchos*	---	---	S5B	---	56
Blue-winged Teal	*Anas discors*	---	---	S5B	---	34
Northern Shoveler	*Anas clypeata*	---	---	S4B	---	8
Northern Pintail	*Anas acuta*	---	---	S5B	---	5
Green-winged Teal	*Anas crecca*	---	---	S4B	---	12
Canvasback	*Aythya valisineria*	---	---	S1B	---	0
Redhead	*Aythya americana*	---	---	S2B	---	2
Ring-necked Duck	*Aythya collaris*	---	---	S5B	---	11
Lesser Scaup	*Aythya affinis*	---	---	S4B	---	1
Bufflehead	*Bucephala albeola*	---	---	S3B	---	0
Common Goldeneye	*Bucephala clangula*	---	---	S5B	---	0
Hooded Merganser	*Lophodytes cucullatus*	---	---	S5B	---	19
Common Merganser	*Mergus merganser*	---	---	S5B	---	22
Red-breasted Merganser	*Mergus serrator*	---	---	S4B	---	8
Ruddy Duck	*Oxyura jamaicensis*	---	---	S2B	---	1
Gray Partridge	*Perdix perdix*	---	---	SE	---	1
Ring-necked Pheasant	*Phasianus colchicus*	---	---	SE	---	9
Ruffed Grouse	*Bonasa umbellus*	---	---	S5	---	52
Wild Turkey	*Meleagris gallopavo*	---	---	S4	---	51
Common Loon	*Gavia immer*	NAR	NAR	S4B	---	27
Pied-billed Grebe	*Podilymbus podiceps*	---	---	S4B	---	17
Red-necked Grebe	*Podiceps grisegena*	NAR	NAR	S3B	---	0
Double-crested Cormorant	*Phalacrocorax auritus*	NAR	NAR	S4B	---	11
American Bittern	*Botaurus lentiginosus*	---	---	S4B	---	26
Least Bittern	*Ixobrychus exilis*	T	THR	S3B	---	13
Great Blue Heron	*Ardea herodias*	---	---	S5B	---	39
Great Egret	*Ardea alba*	---	---	S2B	---	1
Green Heron	*Butorides virescens*	---	---	S4B	---	46
Black-crowned Night-Heron	*Nycticorax nycticorax*	---	---	S3B	---	4
Turkey Vulture	*Cathartes aura*	---	---	S4B	---	50
Osprey	*Pandion haliaetus*	---	---	S4B	---	31
Bald Eagle	*Haliaeetus leucocephalus*	NAR	SC	S4B	PLS	2
Northern Harrier	*Circus cyaneus*	NAR	NAR	S4B	PLS	41
Sharp-shinned Hawk	*Accipiter striatus*	NAR	NAR	S5B	---	35
Cooper's Hawk	*Accipiter cooperii*	NAR	NAR	S4B	---	31
Northern Goshawk	*Accipiter gentilis*	NAR	NAR	S4B	---	18
Red-shouldered Hawk	*Buteo lineatus*	NAR	NAR	S4B	PLS	28
Broad-winged Hawk	*Buteo platypterus*	---	---	S5B	---	39
Red-tailed Hawk	*Buteo jamaicensis*	NAR	NAR	S5B	---	50
American Kestrel	*Falco sparverius*	---	---	S5B	PLS	50
Merlin	*Falco columbarius*	NAR	NAR	S4B	---	11
Peregrine Falcon	*Falco peregrinus anatum*	SC	THR	S2S3B	PLS	1
Yellow Rail	*Coturnicops noveboracensis*	SC	SC	S4B	---	1

Common Name	Scientific Name	Conservation Status				
		National	Provincial		Regional	Local
		COSEWIC[1]	SARO[2]	SRank[3]	BCR 13[4]	Simcoe[5]
King Rail	*Rallus elegans*	END	END	S2B	---	2
Virginia Rail	*Rallus limicola*	---	---	S4B	---	31
Sora	*Porzana carolina*	---	---	S4B	---	28
Common Moorhen	*Gallinula chloropus*	---	---	S4B	---	8
American Coot	*Fulica americana*	NAR	NAR	S4B	---	8
Sandhill Crane	*Grus canadensis tabida*	---	NAR	S4B	---	13
Piping Plover	*Charadrius melodus*	E	END	S1B	---	0
Killdeer	*Charadrius vociferus*	---	---	S5B	---	57
Spotted Sandpiper	*Actitis macularius*	---	---	S5B	---	46
Upland Sandpiper	*Bartramia longicauda*	---	---	S4B	---	27
Wilson's Snipe	*Gallinago delicata*	---	---	S5B	---	40
American Woodcock	*Scolopax minor*	---	---	S5B	---	45
Wilson's Phalarope	*Phalaropus tricolor*	---	---	S3B	---	1
Ring-billed Gull	*Larus delawarensis*	---	---	S5B	---	15
Herring Gull	*Larus argentatus*	---	---	S5B	---	16
Great Black-backed Gull	*Larus marinus*	---	---	S2B	---	0
Caspian Tern	*Hydroprogne caspia*	NAR	NAR	S3B	---	0
Black Tern	*Chlidonias niger*	NAR	SC	S3B	---	14
Common Tern	*Sterna hirundo*	NAR	NAR	S4B	---	10
Forster's Tern	*Sterna forsteri*	DD	DD	S2S3B	---	1
Rock Pigeon	*Patagioena livia*	---	---	SE	---	55
Mourning Dove	*Zenaida macroura*	---	---	S5B	---	57
Yellow-billed Cuckoo	*Coccyzus americanus*	---	---	S4B	---	12
Black-billed Cuckoo	*Coccyzus erythropthalmus*	---	---	S4B	PLS	46
Eastern Screech-Owl	*Megascops asio*	NAR	NAR	S5B	---	35
Great Horned Owl	*Bubo virginianus*	---	---	S5B	---	34
Barred Owl	*Strix varia*	---	---	S4S5	---	29
Long-eared Owl	*Asio otus*	---	---	S4	---	2
Short-eared Owl	*Asio flammeus*	SC	SC	S3S4B	PLS	2
Northern Saw-whet Owl	*Aegolius acadicus*	---	---	S4B	---	6
Common Nighthawk	*Chordeiles minor*	T	SC	S4B	---	24
Eastern Whip-poor-will	*Caprimulgus vociferus*	T	THR	S4B	PLS	22
Chimney Swift	*Chaetura pelagica*	T	THR	S5B	PLS	22
Ruby-throated Hummingbird	*Archilochus colubris*	---	---	S5B	---	56
Belted Kingfisher	*Megaceryle alcyon*	---	---	S5B	PLS	57
Red-headed Woodpecker	*Melanerpes erythrocephalus*	T	SC	S3B	PLS	17
Red-bellied Woodpecker	*Melanerpes carolinus*	---	---	S4	---	8
Yellow-bellied Sapsucker	*Sphyrapicus varius*	---	---	S5B	---	56
Downy Woodpecker	*Picoides pubescens*	---	---	S5	---	57
Hairy Woodpecker	*Picoides villosus*	---	---	S5	---	57
Northern Flicker	*Colaptes auratus*	---	---	S5B	PLS	57
Pileated Woodpecker	*Dryocopus pileatus*	---	---	S4S5	---	56
Olive-sided Flycatcher	*Contopus cooperi*	T	SC	S5B	---	11
Eastern Wood-Pewee	*Contopus virens*	---	---	S5B	PLS	57
Yellow-bellied Flycatcher	*Empidonax flaviventris*	---	---	S5B	---	0
Acadian Flycatcher	*Empidonax virescens*	E	END	S2B	PLS	0
Alder Flycatcher	*Empidonax alnorum*	---	---	S5B	---	51
Willow Flycatcher	*Empidonax traillii*	---	---	S5B	PLS	34
Least Flycatcher	*Empidonax minimus*	---	---	S5B	---	54
Eastern Phoebe	*Sayornis phoebe*	---	---	S5B	---	57
Great Crested Flycatcher	*Myiarchus crinitus*	---	---	S5B	---	57

Common Name	Scientific Name	Conservation Status				
		National	Provincial		Regional	Local
		COSEWIC[1]	SARO[2]	SRank[3]	BCR 13[4]	Simcoe[5]
Eastern Kingbird	*Tyrannus tyrannus*	---	---	S5B	PLS	56
Loggerhead Shrike	*Lanius ludovicianus*	E	END	S2B	PLS	1
Yellow-throated Vireo	*Vireo flavifrons*	---	---	S4B	---	15
Blue-headed Vireo	*Vireo solitarius*	---	---	S5B	---	21
Warbling Vireo	*Vireo gilvus*	---	---	S5B	---	56
Philadelphia Vireo	*Vireo philadelphicus*	---	---	S5B	---	0
Red-eyed Vireo	*Vireo olivaceus*	---	---	S5B	---	57
Blue Jay	*Cyanocitta cristata*	---	---	S5	---	57
American Crow	*Corvus brachyrhynchos*	---	---	S5B	---	57
Common Raven	*Corvus corax*	---	---	S5	---	31
Horned Lark	*Eremophila alpestris*	---	---	S5B	---	34
Purple Martin	*Progne subis*	---	---	S4B	---	17
Tree Swallow	*Tachycineta bicolor*	---	---	S5B	---	57
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	---	---	S5B	---	39
Bank Swallow	*Riparia riparia*	---	---	S5B	PLS	40
Cliff Swallow	*Petrochelidon pyrrhonota*	---	---	S5B	---	41
Barn Swallow	*Hirundo rustica*	T	THR	S4B	---	57
Black-capped Chickadee	*Poecile atricapillus*	---	---	S5	---	57
Tufted Titmouse	*Baeolophus bicolor*	---	---	S2S3	---	0
Red-breasted Nuthatch	*Sitta canadensis*	---	---	S5B	---	54
White-breasted Nuthatch	*Sitta carolinensis*	---	---	S5	---	56
Brown Creeper	*Certhia americana*	---	---	S5B	---	36
Carolina Wren	*Thryothorus ludovicianus*	---	---	S3S4	---	3
House Wren	*Troglodytes aedon*	---	---	S5B	---	57
Winter Wren	*Troglodytes hiemalis*	---	---	S5B	---	56
Sedge Wren	*Cistothorus platensis*	NAR	NAR	S4B	---	12
Marsh Wren	*Cistothorus palustris*	---	---	S5B	---	21
Blue-gray Gnatcatcher	*Polioptila caerulea*	---	---	S4B	---	15
Golden-crowned Kinglet	*Regulus satrapa*	---	---	S5B	---	15
Ruby-crowned Kinglet	*Regulus calendula*	---	---	S5B	---	3
Eastern Bluebird	*Sialia sialis*	NAR	NAR	S4S5B	---	50
Veery	*Catharus fuscescens*	---	---	S4B	---	57
Swainson's Thrush	*Catharus ustulatus*	---	---	S5B	---	13
Hermit Thrush	*Catharus guttatus*	---	---	S5B	---	41
Wood Thrush	*Hylocichla mustelina*	---	---	S5B	PLS	56
American Robin	*Turdus migratorius*	---	---	S5B	---	57
Gray Catbird	*Dumetella carolinensis*	---	---	S5B	---	57
Northern Mockingbird	*Mimus polyglottos*	---	---	S4B	---	11
Brown Thrasher	*Toxostoma rufum*	---	---	S5B	PLS	55
European Starling	*Sturnus vulgaris*	---	---	SE	---	57
Cedar Waxwing	*Bombycilla cedrorum*	---	---	S5B	---	57
Blue-winged Warbler	*Vermivora pinus*	---	---	S4B	PLS	16
Golden-winged Warbler	*Vermivora chrysoptera*	T	SC	S4B	PLS	29
Tennessee Warbler	*Oreothlypis peregrina*	---	---	S5B	---	0
Nashville Warbler	*Oreothlypis ruficapilla*	---	---	S5B	---	51
Northern Parula	*Setophaga americana*	---	---	S4B	---	12
Yellow Warbler	*Setophaga petechia*	---	---	S5B	---	56
Chestnut-sided Warbler	*Setophaga pensylvanica*	---	---	S5B	---	55
Magnolia Warbler	*Setophaga magnolia*	---	---	S5B	---	31
Cape May Warbler	*Setophaga tigrina*	---	---	S5B	---	0
Black-throated Blue Warbler	*Setophaga caerulescens*	---	---	S5B	---	34

Common Name	Scientific Name	Conservation Status				
		National	Provincial		Regional	Local
		COSEWIC[1]	SARO[2]	SRank[3]	BCR 13[4]	Simcoe[5]
Yellow-rumped Warbler	*Setophaga coronata*	---	---	S5B	---	46
Black-throated Green Warbler	*Setophaga virens*	---	---	S5B	---	52
Blackburnian Warbler	*Setophaga fusca*	---	---	S5B	---	33
Pine Warbler	*Setophaga pinus*	---	---	S5B	---	48
Prairie Warbler	*Setophaga discolor*	NAR	NAR	S3S4B	PLS	1
Bay-breasted Warbler	*Setophaga castanea*	---	---	S5B	---	0
Cerulean Warbler	*Setophaga cerulea*	E	THR	S3B	PLS	7
Black-and-white Warbler	*Mniotilta varia*	---	---	S5B	---	55
American Redstart	*Setophaga ruticilla*	---	---	S5B	---	55
Ovenbird	*Seiurus aurocapilla*	---	---	S5B	---	57
Northern Waterthrush	*Seiurus noveboracensis*	---	---	S5B	---	50
Louisiana Waterthrush	*Seiurus motacilla*	SC	SC	S3B	PLS	0
Mourning Warbler	*Geothylpis philadelphia*	---	---	S5B	---	51
Common Yellowthroat	*Geothlypis trichas*	---	---	S5B	---	57
Hooded Warbler	*Setophaga citrina*	SC	THR	S3B	PLS	1
Canada Warbler	*Cardellina canadensis*	T	SC	S5B	PLS	35
Eastern Towhee	*Pipilo erythrophthalmus*	---	---	S4B	PLS	44
Chipping Sparrow	*Spizella passerina*	---	---	S5B	---	57
Clay-colored Sparrow	*Spizella pallida*	---	---	S4B	---	23
Field Sparrow	*Spizella pusilla*	---	---	S5B	PLS	54
Vesper Sparrow	*Pooecetes gramineus*	---	---	S4B	PLS	48
Savannah Sparrow	*Passerculus sandwichensis*	---	---	S5B	PLS	54
Grasshopper Sparrow	*Ammodramus savannarum*	---	---	S4B	PLS	29
Henslow's Sparrow	*Ammodramus henslowii*	E	END	S1B	PLS	0
Le Conte's Sparrow	*Ammodramus leconteii*	---	---	S4B	---	0
Song Sparrow	*Melospiza melodia*	---	---	S5B	---	57
Lincoln's Sparrow	*Melospiza lincolnii*	---	---	S5B	---	0
Swamp Sparrow	*Melospiza georgiana*	---	---	S5B	---	54
White-throated Sparrow	*Zonotrichia albicollis*	---	---	S5B	---	54
Dark-eyed Junco	*Junco hyemalis*	---	---	S5B	---	12
Scarlet Tanager	*Piranga olivacea*	---	---	S5B	---	52
Northern Cardinal	*Cardinalis cardinalis*	---	---	S5	---	52
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	---	---	S5B	PLS	57
Indigo Bunting	*Passerina cyanea*	---	---	S5B	---	57
Bobolink	*Dolichonyx oryzivorus*	T	THR	S4B	PLS	55
Red-winged Blackbird	*Agelaius phoeniceus*	---	---	S5B	---	57
Eastern Meadowlark	*Sturnella magna*	T	THR	S4B	PLS	55
Western Meadowlark	*Sturnella neglecta*	---	---	S4B	---	1
Brewer's Blackbird	*Euphagus cyanocephalus*	---	---	S4B	---	1
Common Grackle	*Quiscalus quiscula*	---	---	S5B	---	57
Brown-headed Cowbird	*Molothrus ater*	---	---	S5B	---	56
Orchard Oriole	*Icterus spurius*	---	---	SZB	---	3
Baltimore Oriole	*Icterus galbula*	---	---	S5B	PLS	57
Purple Finch	*Carpodacus purpureus*	---	---	S5B	---	45
House Finch	*Carpodacus mexicanus*	---	---	SE	---	47
Red Crossbill	*Loxia curvirostra*	---	---	S5B	---	1
White-winged Crossbill	*Loxia leucoptera*	---	---	S5B	---	1
Pine Siskin	*Spinus pinus*	---	---	S5B	---	8
American Goldfinch	*Spinus tristis*	---	---	S5B	---	57
Evening Grosbeak	*Coccothraustes vespertinus*	---	---	S5B	---	7
House Sparrow	*Passer domesticus*	---	---	SE	---	51

LEGEND

General

--- = not significant
n/a = not applicable
? = status uncertain

National Conservation Status

1. Federal (COSEWIC) Status: Status assigned by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2011)

X Extinct. A species that no longer exists.
XT Extirpated. A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
E Endangered. A species facing imminent extirpation or extinction throughout its range.
T Threatened. A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC Special Concern. A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
DD Data Deficient. A species for which there is insufficient information to support a status designation.
NAR Not At Risk. A species that has been evaluated and found to be not at risk.

Provincial Conservation Status

2. Provincial (SARO) Status: Status assigned by the Committee on the Status of Species at Risk in Ontario (COSSARO)(OMNR, 2011).

EXT Extinct. Any species formerly native to Ontario that no longer exists.
EXP Extirpated. Any native species no longer existing in the wild in Ontario, but occurs elsewhere.
END Endangered. Any native species that, on the basis of the best available scientific evidence, is at risk of extinction or extirpation throughout all or a significant portion of its Ontario range if the limiting factors are not reversed. Endangered species are protected under the province's Endangered Species Act.
THR Threatened. Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its Ontario range if the limiting factors are not reversed.
VUL Vulnerable. Any native species that, on the basis of the best available scientific evidence, is a species of special concern in Ontario, but is not a threatened or endangered species.
DD Data Deficient. Any native species for which there is insufficient scientific information on which to base a status recommendation.
NIAC Not In Any COSSARO Category. Any native species evaluated by COSSARO which does not currently meet criteria for assignment to a provincial risk category.

3. Provincial rarity ranks (SRanks) are evaluated and assigned by the (Ontario) Natural Heritage Information Centre (2011)

S5 = Secure—Common, widespread, and abundant in the nation or state/province.
S4 = Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S3 = Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S1 = Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
_ _B = Breeding migrants (*i.e*. S5B). Those without any suffixes are considered resident species.
SE = Exotic; not believed to be a native component of Ontario's fauna.

Regional Conservation Status

4. **Conservation Status** of Birds in Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13) based on Ontario Partner's in Flight (OPIF, 2008).

PLS = Priority Landbird Species

Local Conservation Status

5. Local Conservation Status based on analysis of the 2001–2005 Ontario Breeding Bird Atlas data for the fifty-seven (57) 10 x 10 km atlas squares selected to comprise Simcoe County[1] (Cadman *et al*., 2007). Those species (with "possible", "probable" or "confirmed" breeding evidence) found in 24.6% of the atlas squares or less (*i.e*. 14 squares or less) were considered to be rare in Simcoe County and therefore also rare in the City of Barrie Annexed Lands.

= Breeding bird species considered to be locally rare in Simcoe County. Some these species may also be significant at the national, provincial or local levels.
= Introduced/exotic species ***excluded*** from designation as rare in Simcoe County.
= Irruptive and irregularly occurring species ***excluded*** from designation as rare in Simcoe County.

[1] Simcoe County contains or partially contains 84 atlas squares. However, only those atlas squares where Simcoe County occupied more than approximately 33% of the total area were included in the assessment. That is, it was considered too important to exclude data from consideration in those squares where Simcoe County represented a significant portion of the square. A 50:50 split could have been used to define what atlas squares were used in the analysis but a conservative approach was considered more appropriate. Based on this 33% threshold, 57 atlas squares were included in the analysis.

REFERENCES

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.) 2007. Atlas of the Breeding Birds of Ontario, 2001–2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto. xxii + 706 pp.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2011. Canadian Wildlife Species at Risk. Committee on the Status of Endangered Wildlife in Canada. October 2011. 95 pp. http://www.cosewic.gc.ca/eng/sct0/rpt/rpt_csar_e.cfm [accessed 7 November 2011].

NHIC (Natural Heritage Information Centre). 2011. NHIC List of Ontario Birds. Ontario Natural Heritage Information Centre Home Page. http://nhic.mnr.gov.on.ca/MNR/nhic/species/listout.cfm?el=ab

OMNR (Ontario Ministry of Natural Resources). 2000. Significant Wildlife Habitat Technical Guide. 151pp.

OMNR (Ontario Ministry of Natural Resources). 2011. Species at Risk in Ontario List (updated June 8, 2011). Available at: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html [accessed 28 November 2011].

OPIF (Ontario Partners in Flight). 2008 (Draft). Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain, North American Bird Conservation Region 13. Ontario Ministry of Natural Resources, Bird Studies Canada, Environment Canada.

Appendix C

Study Area Photographs

Photograph No. 1: Area 1: Big Bay Point Rd; facing east

Photograph No. 2: Area 2: Mapleview Drive East approximately 0.25km west of Royal Jubilee Dr; facing west

Photograph No. 3: Area 2: Mapleview Drive East north-side just east of Huronia Rd; facing east

Photograph No. 4: Area 2: Mapleview Drive East south-side just east of Huronia Rd; facing southeast

Photograph No. 5: Area 2: Mapleview Drive East Hewitt's Creek; facing south

Photograph No. 6: Yonge Street just north of Lockhart Rd; facing north

Photograph No. 7: Lockhart Road east of Huronia Rd approximately 0.34km; facing west

Photograph No. 8: Area 4: Lockhart Rd Lovers Creek; facing north

Photograph No. 9: Area 4: Lovers Creek Provincially Significant Wetland south-side of Lockhart Rd; facing south

Photograph No. 10: Area 4: Lovers Creek Provincially Significant Wetland south-side of Lockhart Rd; facing west

Photograph No. 11: Area 4: Lockhart Rd location associated with Hewitt's Creek tributary; facing west

Photograph No. 12: Area 4: Lockhart Rd Hewitt's Creek; facing west