Environmental Impact Study- Parkbridge - Craigleith Ridge

Draft Report Prepared for:
Parkbridge Lifestyle Communities Inc.

Report prepared by:
Neil Morris, Consulting Ecologist
Report Reference # 17-08.1

22 April 2018

Executive Summary

Purpose and Scope

An Environmental Impact Study (EIS) has been undertaken to examine the effects possible future development on the environment and natural heritage features in and around the Property at 169 Lakeshore Road in Craigleith, Ontario. The EIS is intended to inform and guide eventual planning efforts and to satisfy requirements of the approval process once it is initiated.

The EIS has included focused assessment of several key natural heritage features, as identified through initial site surveillance and review of the official plans of the County and Municipality. The natural features of concern are as follows:

- woodlands within and immediately adjacent to the Property,
- two watercourses traversing some part of the Property, and
- the possible presence of Species of Conservation Concern (SOCC) within and around the Property.

To facilitate the assessment of potential impacts on the key environmental features and functions, on-site monitoring was conducted through the period of late April to mid-September 2017, following established and accepted protocol.

Monitoring Results

The general hydraulic gradient in the area around the Property is south to north. There are two small streams (Stream 9 and 10) that flow through the Property along this gradient. These streams appear to function primarily in the conveyance of local drainage to Georgian Bay. The length of these streams within the Property is very short (30 m or less) and the Property represents a very small fraction of the drainage areas feeding these streams. In terms of ecological function, Stream 9 supports a low-diversity fish community comprised of warm-water and cool-water species. Stream 10 is characterized by low flow and does not appear to support any fish species.

The terrestrial communities currently encountered within the Lakeshore Road Property reflect the fact that the Property has been subject to past anthropogenic alteration, and that it is exposed on all sides to altered landscapes (roads, trails, residential properties). Existing plant communities include numerous non-native plant species, typical of disturbed sites, and also at least 20 plant species that are considered to be invasive. About 75% of the Property is wooded, dominated by ash and aspen/poplar species. Most specimens are relatively young and small (<30 cm DBH) with a few isolated larger specimens (up to 50 cm DBH), mainly in proximity to Stream 9.

The terrestrial fauna communities found within the Property consist of bird and mammal species that are regionally abundant and common. Without suitable areas of standing water, amphibian presence is very limited, with only a single species (Green Frog) observed in association with pool habitat in Stream 9. No reptile species were observed during monitoring of the Property, although the occasional presence of common reptile species (e.g. Eastern Garter Snake) is considered to be likely.

While existing records indicate the presence of several species of conservation concern (SOCC) in the vicinity of the Property, there was only one SOCC recorded during the on-site monitoring in 2017. There was a single observation of a lone Monarch Butterfly (a species of *Special Concern*) foraging in open areas within the Property. Otherwise, all flora and fauna observed on or near the Lakeshore Road Property are from relatively secure populations and do not warrant any formal consideration as conservation concerns.

Analysis of Impacts

An analysis of potential adverse environmental effects of development has been completed. In absence of specific plans, the analysis is based on general development considerations. The analysis focuses on the various features that have been identified as features of concern.

Woodlands

Overall, the available information does not indicate any uncommon characteristics or critical functions of the woodland communities found within or adjacent to the Lakeshore Road Property. Any loss or interference of the woodland cover would not have meaningful implications to local ecosystem function. The possible exception is the loss of some beneficial functions associated with the presence of riparian woodland cover along Stream 9.

Species of Conservation Concern

On-site surveillance and review of existing information indicates that there is a very low likelihood of occurrence of any SOCC within the Property for any meaningful duration or for critical aspects of their life cycle. In absence of any likelihood of meaningful presence of SOCC within the Property, impacts resulting from possible development activity are considered to be very unlikely, and would be very limited in terms of frequency and numbers of SOCC affected. Any such impacts would not be meaningful from a population perspective.

Watercourses

Overall, there is some possibility that development of the Lakeshore Road Property could affect the quantity and quality of water flowing in Streams 9 and 10. Given the very short length of these streams within the Property, and the relatively small size of the Property relative to total watershed areas, the likelihood of significant shifts in water

quantity or quality in either stream is considered to be very low. The implications of any such changes are very limited for Stream 10, given the absence of direct fish habitat function. For Stream 9, the presence of a warm/cool-water fish community increases the implications of any effects on stream flow, but this fish community is not considered to be highly sensitive to water quality. For both streams, the implications of any changes in water quality or quantity are not expected be at all meaningful at the point of discharge to Georgian Bay.

Conclusions and Recommendations

The Lakeshore Road Property is currently occupied by plant and animal communities composed of regionally common and abundant species. This general condition limits the risk of adverse environmental effects arising as a result of development. Overall, the likelihood and/or significance of any impacts is considered to be very low.

Regardless of any consideration of significance, there are a series of recommendations provided to help avoid, limit or otherwise mitigate the potential impacts that have been identified.

- Minimize loss of woodlands, with priority given to trees inc close proximity to Stream 9

- Maintain the alignment and flow regime of Streams 9 and 10. This measure is facilitated primarily through site plan development and stormwater management planning.

- Establish set-backs and riparian buffers along Streams 9 and 10, with a recommend set-back distance of 30-m or less for Stream 9, and 10 m or more for Stream 10, depending on the nature of the development that may eventually be proposed.

- To protect streams and stream function, institute appropriate measures to mitigate erosion and runoff during construction activities (e.g. silt fencing, avoidance of work in wet weather).

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Acronyms and Abbreviations

ANSI	Area of Natural and Scientific Interest
BBS	Breeding Bird Survey
CCSS	Craigleith Camperdown Subwaterhsed Study
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
DBH	Diameter (of a tree) at breast height
EAB	Emerald Ash Borer
EIS	Environmental Impact Study
ELC	Ecological Land Classification
GSCA	Grey Sauble Conservation Authority
ha	hectare(s)
masl	meters above sea level
mbgs	meters below ground surface
MNRF	Ministry of Natural Resources and Forestry
NHIC	Natural Heritage Information Centre
OBBA	Ontario Breeding Bird Atlas
OP	Official Plan
SAR	Species at Risk
SOCC	Species of Conservation Concern
SWM	Stormwater Management
TOBM	Town of the Blue Mountains

1.0 INTRODUCTION

1.1 Background

Parkbridge Lifestyle Communities Inc. (Parkbridge), has recently acquired Property at 169 Lakeshore Road in Craigleith, Ontario (see Figure 1). The Property is approximately 0.6 hectares (ha) in area and is legally known as Plan 529 E, Part Lot 169 RP;16R3194 PART 2. For the purposes of this report, the property is referred to herein as the "Lakeshore Road Property", or simply the "Property".

The Lakeshore Road Property is bordered by Lakeshore Road to the south, the Georgian Trail and Hwy 26 to the north, a single-family residential lot to the west, and vacant land to the east. The Property itself is also currently vacant. Parkbridge has no specific development plans for the Property at present, but it may be used for various ancillary purposes (e.g. storage or utility buildings) for a multi-residential development proposed by Parkbridge at 208 Lakeshore Road, immediately opposite the Property.

The Town-of-the-Blue Mountains (TOBM) Official Plan (OP) and Grey County OP land-use designations for the Property are " Residential Recreational Area" and "Recreation Resort Area", respectively. The Property lies within the Niagara Escarpment Plan (NEP) area, and is designated "Escarpment Recreation Area" under that plan.

There are no Areas of Natural or Scientific Interest (ANSI), Provincially Significant Wetlands (PSW) or Significant Wildlife Areas, as identified in current mapping, in meaningful proximity to the Property.

The Property is bisected by two watercourses, identified as Watercourse 9 and 10 in the Craigleith Camperdown Subwatershed Study (CCSS) (Gore and Storrie, 1993). The corridors for these two watercourses are designated as Hazard Lands in the TOBM OP, which by default are treated as Natural Heritage Features. The stream corridors are also GSCA-regulated areas.

The Grey County OP identifies the presence of Significant Woodlands within adjacent properties (i.e., the property at 208 Lakeshore Road). At the most proximate point, the southern boundary of the Property is separated from the nearest area of Significant Woodlands by just under 50 m. If development were to occur at the southern boundary of the Property, it would technically be within the "adjacent lands" of the nearby Significant Woodlands, possibly triggering the requirement for an Environmental Impact Study (EIS).

The only formally identified environmental constraints within the Property are the two streams and their corridors (30 m either side of the channel). Any development encroaching within the 30-m setback would be prohibited unless it was demonstrated, through an EIS, that a lesser set-back distance was acceptable.

In absence of a formal development proposal or plan, there is no formal need for an EIS. This EIS has been initiated proactively as a best practice to assess the natural heritage features of the Property and to serve as guidance for any eventual development considerations.

1.2 Scope of Work

The scope and content of this EIS are site-specific and have been developed so that concerns regarding the environment and natural heritage features are addressed to the satisfaction of approval authorities and other concerned agencies.

The scope and content of the Lakeshore Road EIS were developed to be consistent with the general requirements specified in Section 2.8.7 and 6.19 of the Grey County OP (2013) and Section C9 of the TOBM OP (2016). It is assumed that the scope and minimum content of the EIS would be equivalent to that expected for a plan of subdivision. In absence of any specific development proposal, the EIS scope was developed to account for the broadest scope of potential development within the Property.

For this EIS, the core environmental issues of potential concern associated with the Lakeshore Road Property include:

1) potential impacts that site development might have on streams that traverse the property, and their various functions,

2) potential impacts on species of conservation concern (SOCC), including legislated species at risk (SAR), or otherwise significant wildlife or wildlife habitat, that might be present on or near the Property.

3) potential impacts that site development might have on woodlands within the Property and also Significant Woodlands found in close proximity to the Property, and their various functions.

The EIS addresses, at a minimum, the potential impacts of any eventual site alteration or development on these features and functions. The coverage and level of detail of on-site surveillance that has been undertaken are intended to allow adequate description of the general natural environment, and also allow detailed assessment of potential effects on site features and functions of focused concern. Accordingly, core efforts for the Lakeshore Road Property include the following:

- General characterization of the physical and ecological features and functions within and immediately adjacent to the Property,
- Detailed characterization of the streams within the Property,
- Presence and status of wildlife (woody and non-woody vegetation, amphibians, reptiles, mammals, and birds) on and near the Property, and

- Characterization of the wooded areas within and adjacent to the Property.

The characterization of the Lakeshore Road Property and relevant features is based primarily on direct field-level surveillance. To effectively address the identified EIS requirements, this field surveillance has included:

- Direct examination of slope/topography, conveyance features (ditches, swales, streams), and overburden characteristics within and adjacent to the Property, to understand hydrological processes and connectivity between the Property and associated aquatic features.
- Detailed inventories of terrestrial biota with a focus on identification of SOCC that may be present. This includes;
  - a botanical survey, conducted in the spring and early summer following a wandering transect approach,
  - a breeding bird survey (BBS), following the standard point-count approach of the Ontario Breeding Bird Atlas (OBBA) and also a wandering transect approach, and
  - an amphibian survey, conducted in the spring following the protocol of the Marsh Monitoring Program (MMP).
- In addition to the focused wildlife monitoring noted above, general surveillance of animal and plant communities throughout the entire Property.
- Direct assessment of wooded areas within and near the Property, including plant community composition, forest strata characteristics (e.g. species, age/size class, relative density), soil characteristics, and wildlife presence and utilization.

The information acquired through the site-specific surveillance has been combined with previously compiled information for the local area to complete the required site characterization. Further details of ecological monitoring methods are provided in Section 2.

2.0 METHODOLOGY

The work undertaken to allow the preparation of this EIS Report has included two main components;

1. a desktop review of previously recorded information regarding the characteristics of the Property and adjacent lands, and
2. focused field monitoring of the Property.

The assessment herein collectively considers the findings of the desktop review and the on-site monitoring in a weight-of-evidence manner, with primary emphasis on site-specific data.

The following sections describe the methods employed in conducting the various components of environmental monitoring for the purposes of this EIS. In summary, the methodology adopted for the monitoring documented herein was developed to provide results appropriate to the stated objectives, and is based on standard accepted protocol.

A handheld GPS unit (Garmin model "GPSmap 76") was used to delineate key features (e.g. drainage channels), to measure areas of features, and to provide the geographic coordinates of monitoring locations or key natural heritage features of relevance. All coordinates have been obtained using NAD83 datum

2.1 Review of Existing Information

A review of existing information of relevance to the Lakeshore Road Property was completed prior to completion of direct field assessment. Several sources of information were consulted for this purpose, including:

- Grey County's web-based interactive GIS mapping tool,
- the Natural Heritage Information Centre (NHIC) on-line database,
- the Ontario Breeding Bird Atlas (OBBA) (Cadman et al, 2007) and associated database (Bird Studies Canada (BSC) *et al*., 2017),
- the Soil Survey of Grey County (Richards and Gillespie, 1954),
- the Craigleith Camperdown Subwatershed Study (Gore and Storrie, 1993)
- the Ontario Reptile and Amphibian Atlas on-line database (Ontario Nature, 2017), and
- Environmental Impact Studies for other properties on Lakeshore Road in close proximity to this Property (e.g. Azimuth, 2016, and Morris, 2012)

The information obtained in this review has served in part to determine certain ecological characteristics of the Property, and also in part to identify possible features to receive focus during on-site monitoring efforts.

2.2 On-Site Monitoring

On-site monitoring was intended to provide a sufficient understanding of all relevant characteristics of the Property. Elements of the monitoring program were focused on the priority endpoints, including the two streams and the possible presence of species of conservation concern (SOCC). In terms of SOCC, focus was based in part on known presence of legislated species at risk (SAR) in the general vicinity of the Property.

On-site surveillance was conducted on seven separate visits to the Property over the period of late April to September of 2017, providing appropriate seasonal coverage for the various specific monitoring efforts.

2.2.1 Avian Monitoring

A focused survey of birds was completed at the Lakeshore Road Property during the breeding season. The Breeding Bird Survey (BBS) used a combination of two methods; 1) the point-count method, and 2) incidental surveillance. The point-count method was implemented following protocol consistent with that employed for the Ontario Breeding Bird Atlas (OBBA) (Cadman et al., 2007) and the Marsh Monitoring Program (BSC, 2003).

For breeding bird point-count surveys, each individual bird heard or seen within a 100 meter radius (3.142 ha) of a fixed location was recorded over two successive five-minute periods (10 continuous minutes per survey episode). The distance from the observation point was approximated for each individual bird occurrence. Breeding evidence for each bird species was documented using OBBA Evidence Codes.

A total of two point-count stations were established at the Lakeshore Road Property for BBS purposes. Following OBBA protocol, the preferred station separation distance is 250 m for wooded areas and 500 m for open areas. The stations established within the Lakeshore Road Property were located approximately 150 m apart to effectively represent the entirety of the Property with limited overlap. The habitat representation of the two established stations was effectively similar (i.e., primarily wooded, with peripheral open meadow habitat). The location of BBS point-count stations is depicted in Figure 2, and GPS coordinates and station descriptions are provided in Table 2. It should be noted that the 100-m radius of each point-count station extends well beyond the Property boundary. This factor is taken into consideration in the interpretation of the results of the BBS (see Section 4.4).

Incidental surveillance was also conducted, noting all individual bird occurrences and breeding evidence while traversing the Lakeshore Road Property throughout day and evening hours. Incidental surveillance was used to augment the temporal and spatial coverage of point-count monitoring and to provide a more complete assessment of avian diversity. The habitat and location of each bird observed during transect surveys was noted, along with notes regarding activity (foraging, in flight, singing, etc.).

Point-count monitoring was conducted on two occasions; 1) 19 June, and 2) 10 July 2017. Point-count monitoring was conducted between sunrise and 10:00 a.m.. Incidental surveillance was completed on these same dates, and also on five other days on which the Property was visited. Avian monitoring efforts gave focused attention to any indications of the possible presence of SOCC.

2.2.2 Amphibian Monitoring

The amphibian monitoring protocol established for the Marsh Monitoring Program (MMP) (BSC, 2003) was initially employed for the purpose of this EIS. A single amphibian point-count monitoring station was established at the Lakeshore Road Property, effectively overlapping with the BBS point-count station at the west end of the Property (see Figure 2). The associated 100-m radius encompassed a topographical depression on the Property where standing water was present on occasion in the spring (see Figure 3). All amphibian species that were heard or seen at the monitoring locations were recorded, indicating a Call Level Code and the general abundance of individuals calling, where possible. Monitoring in this manner was conducted at least 30 minutes after sunset on the nights of 18 April and 18 June. These nights represented the standard conditions defined in the protocol, relating largely to night-time temperatures. Timing also reflected the broader activity trends observed in southern Ontario through the spring and early summer of 2017.

It should be noted that relatively cool and wet conditions were experienced throughout the region in 2017, leading to some delays in the typical progression of onset of breeding calls of various species. It should also be noted that the only area of standing water within the Property was completely dry by the latter half of June, and that no amphibian activity had been recorded during previous monitoring periods. For these reasons, a third iteration of point-count monitoring, as normally required under the MMP protocol, was not conducted.

In addition to point-count monitoring, instances of any amphibian seen or heard at any location or time were recorded throughout the full period of study.

2.2.3 Mammal Surveillance

During all site visits, all observations of mammals on or near the Lakeshore Road Property were recorded, along with all other evidence of mammal presence (e.g. foot prints, scat, burrows).

In addition, specific attention was paid to the possible presence of bats in flight around the Property at and after sunset on the evenings of 18 June and 25 July. The Property was also surveyed for the presence of features that might serve as habitat features for bats (e.g. old dead trees possibly providing hollows or bark crevices for roosting or hibernating).

2.2.4 Reptile Surveillance

The Lakeshore Road Property was monitored for any evidence of the presence of reptiles during all site visits. This included turning of larger rocks or logs to detect possible snake presence within the Property. The Property does not encompass aquatic features that might serve as habitat for turtles. The gravel bed of the Georgian Trail is known to be attractive for turtle nesting, and the stretch of the Trail immediately adjacent to the Property was inspected for the presence of turtle nest sites.

2.2.5 Botanical Inventory

Surveillance of terrestrial vascular plant species was completed following a basic "wandering transect" approach to determine the presence and general distribution of plant species within the Lakeshore Road Property. The Property is small and narrow, and the survey route was set to effectively traverse the entire area of the Property. Three-season botanical surveillance was conducted over the full period of study (i.e., from late April to early-September).

2.2.6 Ecological Land Classification

The Lakeshore Road Property has been assessed following the Ecological Land Classification (ELC) methodology described by Lee *et al*. (1998). This approach generates classification and mapping of ecological communities down to a size of approximately 0.5 hectares, and allows much more detailed classification of communities than broad scale Landsat imagery. ELC of the Property was completed through the following general task sequence:

- Initial site reconnaissance to ascertain major community types, topography, and soil characteristics (completed in April 2017)
- Subsequent delineation of community distribution using satellite imagery and aerial photos for a first approximation of ELC.
- Further detailed site monitoring to refine initial ELC approximation. Each distinct community was examined to determine soil characteristics and to determine the major woody and non-woody plant species present.

To facilitate characterizations of soil conditions (texture, moisture regimes) vertical soil profiles were completed in multiple locations in each distinct ecological unit. Soil profiles were completed to a depth of approximately 0.5 to 1 m using a hand-auger.

The detailed site monitoring included examination of physiographic attributes such as topography/slope, surface soil profiles, and the possible presence of elevated water table. Within each identified unit, the following information regarding vegetation cover was recorded:

- Relative species composition and percent cover of trees and shrubs,
- Caliper and height range of trees in wooded units, and
- General under-storey characteristics and non-woody species composition.

2.2.7 Aquatic Features

The on-site surveillance of the Lakeshore Road EIS included direct examination of the two watercourses that traverse the Property. Examination included the visual assessment of several standard habitat variables (substrate type, in-stream and riparian cover, channel morphology).

For the purposes of this EIS, the hydrology of the site has been examined with particular attention paid to the hydrological connectivity between the streams and the land within the confines of the Property. Hydrological characterization included the identification of any discernable sources of hydrological input, qualitative observations of flow volume, and measures of water temperature.

The streams were visited on repeat occasions over the period of study (April to September) to ascertain seasonal changes in quality and quantity of flow.

Observations of visual indicators of quality (e.g. turbidity) and relative volume of stream flow were recorded during multiple site visits over the period of Aril to September, 2017. It should be noted that records for the nearest climate station (Collingwood) indicate that above average rainfall was received in this area during the study period. The observed stream flows are thus considered to represent normal to above-normal conditions for the Property.

In addition, the streams in question were previously subject to *in-situ* water quality monitoring as part of an EIS (unpublished) for adjacent properties. The results of that water quality analysis are presented and discussed herein to provide a general understanding of the nature of these streams in the current context.

3.0 PHYSICAL CHARACTERISTICS

3.1 Topography

The Lakeshore Road Property is in close proximity the shoreline of Georgian Bay. The Property is relatively flat, with elevation generally ranging from ~180 meters above sea level (masl) at the west end of the Property to ~182 masl at the east end. There is a slight depression (~179 masl) at the west end of the Property. Immediately adjacent to this depression, the raised bed of the Georgian Trail represents an abrupt rise of almost 2 m. The trail bed sits slightly below grade at the east end of the Property.

3.2 Soils

According to the Grey County soil survey (Gillespie and Richards, 1954), the soil encountered within the Lakeshore Road Property is Granby Sand. This soil type consists of a sandy rooting zone (up to 20 cm bgs) sourced from lacustrine sandy outwash. This soil type is reported to be poorly drained.

Soil profiling conducted throughout the Property has confirmed the wide-spread presence of the sand or sandy-loam surface soil. In the slight depression at the west end of the Property, the sandy-loam surface soil exhibits a slightly greater content of silt and organic matter, likely resulting from occasional inundation with sediment-laden stormwater conveyed from adjacent properties.

3.3 Hydrology

Hydrological characteristics of the Lakeshore Road Property have been determined on the basis of direct visual surveillance and also in consideration of information obtained from previously completed studies (i.e., Gore and Storrie, 1993, AEC, 2016).

The general hydraulic gradient in the area around the Property is south to north. There are two small streams that flow through the Property along this general gradient. These streams were previously identified as Streams 9 and 10 in the Craigleith Camperdown Subwatershed Study (CCSS - Gore and Storrie, 1993). This same naming scheme is applied in this EIS. The streams and other hydrological features are depicted in Figure 3. These streams appear to function primarily in the conveyance of stormwater to Georgian Bay, but they do not function as meaningful inputs to any larger streams or to the Bay itself.

Stream 10 skirts the western boundary of the Property, while Stream 9 traverses the width of the Property just east of its centre point. The overwhelming majority of flow in both of these streams originates from lands upgradient of the Lakeshore Road Property. Based on mapping provided in the CCSS, the estimated watershed areas are ~105 ha for Stream 9 and ~33 ha for Stream 10. The approximate watershed divide of the two streams is depicted in Figure 3. Flow volume is generally anticipated to be roughly proportional to

watershed area. Qualitative estimates of flow volume made during the period of study of this EIS indicate that average flow volume in Stream 10 is less than half of that in Stream 9.

According to the CCSS, the upper watersheds of Streams 9 and 10 exhibit several factors that alter natural hydrology, including the presence of snow-making, SWM management, and impermeable surfaces associated with residential/recreational development. It is likely that flow in these streams is marked by more pronounced seasonal peaks and greater responsiveness to storm events than they would be under natural conditions.

Within the Property itself, movement of water along the south-north gradient is largely impeded by raised features (Lakeshore Rd, the Georgian Trail and Hwy 26) along the full length of the northern and southern perimeters. Drainage within the Property is largely conveyed towards the Trail, and then effectively funneled from east to west along the base of the raised trail bed.. Based on the subwatershed boundaries depicted in the CCSS, and corroborated by field observations in 2017, drainage from over 70% of the Property is ultimately conveyed toward Stream 10 where it exits the property via culvert under the Georgian Trail and Hwy 26. The remaining area of the Property drains to Stream 9. The area within the Property constitutes a very small percentage of the entire drainage basins of the two streams. It is estimated that about 0.45 ha of the Property drains to Stream 10, which represents about 1.4% of the total area contributing to total flow in this stream. For Stream 9, roughly 0.15 ha of the Property, or only 0.15% of total watershed area, contributes to stream flow. Overall, the role of the Property in the hydrological balance of Streams 9 and 10 is very minor.

As discussed in Section 3.1, there is a slight depression on the west half of the Property where there is occasional pooling of stormwater conveyed from adjacent properties. The intermittent pooling appears to originate almost entirely from property on the south side of Lakeshore Road, conveyed via culvert under the road (see Figure 3). This culvert was dry during most site visits to the Property in 2017, as were areas immediately adjacent to either end of the culvert. There are no defined channels on either side of the culvert and the areas adjacent to both ends of the culvert are primarily grass-covered. Based on mapping in the CCSS, the flow through this culvert originates from within the subwatershed for Stream 10. This flow initially traverses the Property in diffuse form, and then temporarily pools in the low spot during periods of relatively high flow volume. All runoff delivered to the Property via this culvert, pooled or otherwise, is eventually conveyed to an east-to-west swale at the base of the bed of the Georgian Trail. The swale flows into Stream 10 at the point where another culvert conveys the combined flows under the Georgian Trail and then under Hwy 26.

4.0 ECOLOGICAL CHARACTERISTICS

The following sections describe the ecological characteristics of the Lakeshore Road Property. A description of the regional ecology is provided for context. Results of on-site monitoring are summarized in Tables 1 to 6, and additional detailed results are provided in Appendix A.

4.1 Regional Ecology

The Lakeshore Road Property is situated within the Mixedwood Plains *Ecozone*, and more specifically it is within the Manitoulin – Lake Simcoe *Ecoregion*, equivalent to Site Region 6E under Provincial classification. This Ecoregion is characterized by warm summers, mild winters, and relatively abundant precipitation (700 to 1000 mm/a) that is evenly distributed throughout the year. The dominant land cover is cropped land with significant areas of mixed forest. Climax vegetation is characterized by mixed hardwoods, including Sugar Maple, American Beech, Eastern Hemlock, Red Oak, and Basswood. Pioneer species include White Pine, Paper Birch, and Trembling Aspen. Yellow Birch, White and Slippery Elm, Red Maple, Black Ash and White Cedar are typical forest cover species in depressions and moist areas.

4.2 Ecological Communities

The delineation of ecological communities completed for the Lakeshore Road Property is intended to identify vegetation communities at a scale that has meaning and relevance to the overall objectives of the EIS.

The ecological communities currently encountered within the Lakeshore Road Property reflect the fact that the Property has been subject to past anthropogenic alteration, and that it is exposed on all sides to altered landscapes (roads, trails, residential properties).

Following the ELC system of Lee *et al.* (1998), there are only three distinct community types present within the Lakeshore Road Property. The specific community types and their ecological functions are briefly described in the following sections.

<u>Mineral Cultural Meadow Ecosite (CUM1)</u>

The Cultural Meadow (CUM) Ecosite accounts for about 25 % (~0.15 ha) of the Property, mostly on the periphery along Lakeshore Road and also along the Georgian Trail. The plant species assemblages are a mix of common grasses and forbs. Non-native grasses (e.g. Common Timothy, Orchard Grass, Smooth Brome, Meadow Fescue) are both abundant and widespread. Non-graminoid plants are dominated by species that are typical of disturbed or weedy sights. This includes knapweed species, thistles, various asters, plantains, dandelions, and bindweeds among the most common. Many of the common forbs encountered in this community are non-native, with several considered

to be invasive (e.g. Birdfoot Trefoil, Wild Carrot, Field Bindweed). Woody species such as European Buckthorn and Staghorn Sumac are starting to establish in meadow areas immediately adjacent to woody cover.

The ecological function of this community is likely limited primarily to supporting a relatively low diversity of common and unspecialized wildlife. The area of meadow is too small to be functional for any grassland-specialist species of bird or mammal. The results of direct wildlife surveillance support this characterization.

Dry-Fresh White Ash Deciduous Forest Type (FOD4-2)

On the western half of the Property the existing band of wooded cover is predominantly Ash (White and Green) with about 30% exceeding 30 cm DBH and a few approaching 50 cm DBH. Other mature tree species in this area include Black Willow, White Elm, and Balsam Poplar. Most of these species are typical of early succession communities or moist areas. The largest trees are associated with the area adjacent to Stream 9 and the shallow depression that is occasionally saturated with stormwater.

Because the woodland stand is very narrow (30 m wide or less) there is considerable edge habitat and a high density of shrubs in the understory. Common shrub species include European Buckthorn, non-native honeysuckle, Red-osier Dogwood, Choke Cherry, various species of the genus *Ribes* (currants and gooseberries), and Staghorn Sumac mainly on the southern edge.

Fresh-Moist Poplar Deciduous Forest Type (FOD8-1)

The woody cover bordering Stream 9 and eastward is dominated by Cottonwood/Aspen. White Ash, White Elm are also represented in the canopy. Most trees in the canopy are less than 30 cm DBH. A few relatively small conifers (Eastern White Cedar, Scots Pine) are present in the relatively thin sub-canopy, along with young Ash and Cottonwood. The shrub layer is moderately dense, and includes non-native Honeysuckle, European Buckthorn, Lilacs and a few native Dogwoods. Vine species are common, including Wild Grape, Virginia Creeper and numerous specimens of Oriental Bittersweet. Because the wooded stand is very narrow and generally devoid of large trees, ground cover is fairly heavy except in scattered locations of dense clusters of shrubs.

Within a few meters of Stream 9, forest cover includes a number of relatively mature specimens of several species, ranging from 35 to almost 50 cm DBH. This includes specimens of Green Ash, Eastern White Cedar, Black Willow and Basswood.

The ecological function of all wooded habitat within the Property is constrained by the relative immaturity of trees, a low diversity of tree and shrub species, the very narrow dimensions of woodlands, and a general absence of well-develop forest structure. These woods will serve various habitat functions for the relatively common and unspecialized species of wildlife observed on or near the Property, but not in great abundance. This habitat function is not considered significant or critical.

4.3 Vascular Plants

The detailed plant species list for the Lakeshore Road Property is provided in Appendix A. This list reflects three-season monitoring through the period of April to September 2017. A total of 118 vascular plant species have been identified within the Property. Of those that are native to Ontario, all are ranked as "Secure" (S5) or "Apparently Secure" (S4) in the Province. None of the species observed have been subject to assessment by COSEWIC or COSSARO as possible Species at Risk (SAR) or are otherwise considered as SOCC.

The terrestrial plants found within the Lakeshore Road Property consist of a mix of native and non-native species, many of which are typical of sites that have been subject to anthropogenic disturbance. About 60% of the plant species identified within the Property are non-native. At least 20 of the vascular plant species identified at the Lakeshore Road Property are considered by various sources to be invasive in Ontario. This includes Common Buckthorn (*Rhamnus cathartica*) which is both abundant and widely distributed throughout the wooded part of the Property. Other notable invasive species found within the Property are Goutweed, non-native Honeysuckle, and Oriental Bittersweet.

There are only a few tree species that exhibit meaningful abundance and/or distribution within the Property. This includes primarily ash and aspens/cottonwoods that are early-succession species. Specimens of several non-native tree and shrub species (e.g. Scots Pine, White Mulberry, Common Lilac, European Buckthorn) are present.

The Property contains scattered specimens of herbaceous woodland plants, but there is a general absence of plants typically present on the floor of mature forests in the region (e.g. trilliums, wild leeks). There are no locations where regional climax tree species (Beech, Sugar Maple, Ironwood) are a meaningful component of forest cover. Overall, there is a very limited number, abundance and distribution of species typically encountered in mature forest conditions.

Non-native grasses (e.g., Common Timothy, Orchard Grass, Perennial Ryegrass) are dominant in open areas, reflecting the cultural modification of land surrounding the Property for agricultural and also residential purposes.

Only a few of the vascular plant species encountered within the Property are species which grow primarily in wetlands or wet conditions. The distribution of these hydrophytes is limited almost exclusively to the confines of the channels or banks of the two streams that traverse the Property. Some hydrophyitc plant species also occur in the shallow ditch that runs along the base of the bed of the Georgian Trail towards the northwest corner of the Property.

4.4 Birds and Bird Habitat

A breeding bird survey (BBS) has been completed at the Lakeshore Road Property. This has included a focused point-count census in June/July and more general surveillance throughout the full monitoring period (April to September). These monitoring efforts provide a reasonably reliable indication of the status of the Property in terms of avian presence and the provision of habitat for breeding and non-breeding purposes (e.g. foraging, staging). The basic characteristics of the point-count stations are summarized in Table 2, and station location within the Property is depicted in Figure 2. Detailed results of the point-count monitoring program are provided Appendix A. A summary list of all bird species observed at the Property is provided in Table 1. The findings of the point-count inventory are summarized in Tables 2 and 3.

The Lakeshore Road Property lies close to the boundary between Ontario Breeding Bird Atlas (OBBA) squares 17NK52 and 17NK53. Data have been obtained for these squares and considered as regional context for the Property (see Appendix A). The local breeding status determined through the OBBA is included in Table 1. The OBBA surveillance of squares 17NK52/53 has identified 130 species of bird with some evidence of breeding within the 20-km^2 area of those squares. Of these species, 22 have been subject to assessment by COSEWIC and/or COSSARO. As of the date of this report, nine of the 19 have been deemed to be *Not at Risk*. The 13 species on record for the area in question that are currently identified as either *Endangered*, *Threatened* or *Special Concern* include the Alder Flycatcher, Bank Swallow, Barn Swallow, Bobolink, Canada Warbler, Chimney Swift, Common Nighthawk, Eastern Meadowlark, Eastern Wood-pewee, Golden Winged Warbler, Louisiana Waterthrush, Red-headed Woodpecker, and Wood Thrush. The OBBA data indicate most of these species are either “possible’ or “probable” breeders in the squares in question, and several have no breeding evidence on record in one or both squares for the last atlas period (2001-2005). None of these species were observed during the surveillance of the Property and adjacent lands in 2017.

OBBA point-count station #9 (square 17NK53) is established along Lakeshore Road East, overlooking the Property. The data for this station are directly reflective of the avian community that resides in and around the Lakeshore Road Property. A total of only eight species were recorded during OBBA surveillance at point-count station #9 (see Appendix A). These eight species are very common in Ontario and Grey County, and none are currently considered to be species at risk (SAR).

The direct surveillance of the Lakeshore Road Property has revealed the presence of a moderate abundance and diversity of birds that are typical for the region. All of these species are on record for the relevant OBBA squares. In total, 29 species of birds were observed within or in immediate proximity to the Property over the period of study. Only three species were confirmed as breeding within the Property boundary, and another 14 species were indicated as "probable" breeders. The Property was surveyed for the presence of stick nests in early spring prior to the emergence of deciduous foliage. No stick nests were observed.

The Provincial ranking of all of the species observed is "apparently secure" (S4) or "secure" (S5). None of the species observed are listed as Species at Risk (SAR) or otherwise considered to be Species of Conservation Concern (SOCC). The species observed within the Property do not include any forest interior species or species with exclusive aquatic habitat association.

The bird community encountered at the Lakeshore Road Property is dominated by relatively common species that are typical of open or mixed habitat or shrubs (e.g. song sparrow, red-winged blackbird, common grackle, cedar waxwing). The occurrences of these bird species was almost entirely in association with woody vegetation (i.e., perching or foraging in trees or shrubs) and their distribution was relatively uniform throughout the Property.

4.5 Amphibians

During focused amphibian monitoring and broader general surveillance of the Lakeshore Road Property, the presence of only one amphibian species was evidenced. Two specimens of Green Frog (*Lithobates clamitans*) were observed in Stream 9 during surveillance in July 2017. These frogs were observed in a relatively persistent pool located immediately upstream of the culvert passing under the Georgian Trail. The Green Frog population in Ontario is considered "secure" (S Rank = S5). It is considered unlikely that this species would breed in the flowing waters of either Stream 9 or 10. No breeding vocalizations of Green Frog or any other amphibian were heard during focused monitoring of the Property.

Overall, the Lakeshore Road Property does not offer the preferred breeding habitat for most of the amphibian species that occur in the region. Standing water is temporarily present at times in the depressed area on the western half of the Property, but this area is dry for most of the year and not suitable for amphibian breeding purposes.

4.6 Other Fauna

4.6.1 Reptiles

During monitoring conducted in 2017, no reptile species were detected either within or adjacent to the Lakeshore Road Property. The nature of the Property is such that locally common snakes (e.g. Eastern Gartersnake) might be present from time to time. In absence of permanent standing water within or near the Property, the presence of any species of turtles is considered a very low likelihood. The adjacent Georgian Trail offers fine gravel substrate that is often used by turtles in the general area for nesting purposes. However, there was no evidence of turtle nesting observed along the Trial adjacent to the Property.

4.6.2 Mammals

Ecological monitoring of the Lakeshore Road Property revealed direct evidence of the presence of only one mammal species; the Eastern Chipmunk (*Tamias striatus*). It is considered likely that a number of other species of regionally common mammals could be present at the Property from time to time. Recent inventories in immediate proximity of the Property (AEC, 2016, Morris, 2012) have indicated at least occasional local presence of eight species of mammal, as follows:

- Meadow Vole (*Microtus pennsylvanicus*) -
- Northern Raccoon (*Procyon lotor*)
- White-tailed Deer (*Odocoileus virginianus*)
- Muskrat (*Ondatra zibethicus*)
- Coyote (*Canis latrans*),
- Eastern Cottontail (*Sylvilagus floridanus*)
- Red Squirrel (*Tamiasciurus hudsonicus*)
- Unidentified bat species

With the possible exception of unspecified bat species, none of the mammals evidenced in the area of the Lakeshore Road Property are considered to be SOCC. All of these mammal species are ranked as "secure" (S5) in the province of Ontario and are common in Grey County.

In regard to bats, there were no observations of bat activity in or around the Lakeshore Road Property during on-site surveillance, which included surveillance in the period around dusk when bat activity tends to be observed. Rock outcrops, caves or other sites that could serve as hibernation sites are not found on or near the Property. The tree cover found within the Property is composed of relatively young specimens, and there is an absence of large, old trees that might contain hollows, cavities, large bark flakes and crevices that could function as roosting or hibernation sites.

Overall, the likelihood of presence within the Property of mammal species that are of conversation concern is considered to be extremely low.

4.7 Aquatic Ecology

The characteristics and functions of aquatic features associated with the Lakeshore Road Property are based partly on direct surveillance completed in 2017, and partly on existing information and documents (e.g. CCSS, AEC, 2016)

Streams 9 and 10 flow through the Property, or very close to the Property perimeter and have several common core characteristics, as follows;

- they are effectively first-order watercourses, and both streams are relatively shallow and fast flowing through the Property
- flow is generally clear, with mild to moderate turbidity observed immediately following precipitation events,
- water temperature is in general thermal equilibrium with ambient air temperatures (see Table 4),
- the flow of both watercourses is influenced by surface runoff, as evidenced by elevated levels of various water quality indicators (see Table 5),
- substrate is primarily gravel and cobble,
- aquatic macrophytes are present, and
- both watercourses pass through multiple culverts before eventual discharge to Georgian Bay to the north of the Property.

Streams 9 and 10 do differ in a number of respects. Stream 9 has a much larger watershed than Stream 10 (see Section 3.3). As a result, the width and depth of flow are greater in Stream 9, and flow is more substantial in terms of both volume and persistence. Stream 10 flow has been observed to decline to a trickle in the mid-summer period, whereas Stream 9 exhibits relatively constant flow. During surveillance within the Property, invertebrates were not readily observed in Stream 10, but routinely observed in Stream 9. Stream 9 was also typically 1 or 2 degrees cooler than Stream 10, appearing to be slightly less responsive to air temperature than Stream 10 (see Table 4). Stream 10 also appears to be more affected by the influence of surface runoff in terms of water quality, with higher measures of conductivity and dissolved solids, and also lower dissolved oxygen (see Table 5). Stream 10 lacks woody riparian cover within and around the Property, whereas Stream 9 is almost entirely shaded by mature tree cover.

These basic characteristics are such that the function and ecological value of these watercourses also differs. In terms of aquatic habitat functions, the available information indicates that Stream 9 supports a fish community but Stream 10 does not. Direct monitoring of fish communities has been conducted immediately upstream of the Property on two recent occasions. Electro-fishing was conducted in 2010 (unpublished EIS, MNR license number 1057363) and again in 2016 (AEC, 2016). Fish species found in Stream 9 included Blacknose Dace (*Rhinichthys atratulus*), Creek Chub (*Semotilus atromaculatu*), Longnose Dace (*Rhinichthys cataractae*), and Brook Stickleback (*Culaea inconstans*). These fish species are native and common in the Great Lakes basin. They are typical of warm-water or cool-water streams in southern Ontario. Creek chub are found in virtually all streams that support fish. In Stream 10, no fish were detected in either period of monitoring. It is likely that the low and inconsistent flow in Stream 10 precludes the presence of a fish community in this Stream.

4.8 Species of Conservation Concern

There are a number of Species of Conservation Concern (SOCC) on record in the vicinity of the Property, as determined through review of existing information. Historic records from the Natural Heritage Information Centre (NHIC, 2017) identify records of several species of conservation interest in proximity to the Lakeshore Road Property. Element Occurrence (EO) records from the NHIC were obtained for two 1-km grid segments overlapping or immediately adjacent to the Lakeshore Road Property (i.e., squares 17NK5430 and 17NK5330). A total of three species are listed, including the Snapping Turtle, Barn Swallow and a lichen species (see Table 6). Other Environmental Impact Studies conducted in close proximity to the Property in recent years have identified the presence of a number of SOCC in the area, including those listed by the NHIC and several others. Combined, the various SOCC on record in proximity to the Property are as follows:

- Snapping Turtle (*Chelydra serpentina*) - *Special Concern*, both Federally and Provincially, Provincially Ranked as "Vulnerable" (S3)
- Monarch Butterfly (*Danaus plexippus*) - *Special Concern*, both Federally and Provincially, Provincially Ranked as "Apparently Secure" (S4)
- Eastern Wood-pewee - *Special Concern*, both Federally and Provincially, Provincially Ranked as "Apparently Secure" (S4).
- Bobolink (*Dolichonyx oryzivorus*) - *Threatened,*, both Federally and Provincially, Provincially Ranked as "Apparently Secure" (S4).
- Eastern Meadowlark (*Sturnella magna)* - *Threatened,*, both Federally and Provincially - Provincially Ranked as "Apparently Secure" (S4).
- Butternut (*Juglans cinera*) - *Endangered*, both Federally and Provincially - Provincially Ranked as "Vulnerable" (S3)
- Barn Swallow (*Hirundo rustica*) - *Threatened*, both Federally and Provincially - Provincially Ranked as "Apparently Secure" (S4).
- Western Chorus Frog (*Pseudacris triseriata) - Threatened* Federally, *Not at Risk* Provincially - Provincially Ranked as "Vulnerable" (S3)

During the direct monitoring of the Property in 2017, the presence of only one of these SOCC was indicated within or immediately adjacent to the Lakeshore Road Property. This consists of a single observation of a Monarch Butterfly foraging in open meadow habitat on the Property's periphery.

The formal legal status of the Monarch Butterfly in both Ontario and Canada is *Special Concern*. However, it should be noted that COSEWIC reassessed the Monarch in 2016 and has reclassified this species as *Endangered*. While its regulatory status under the Species at Risk Act (SARA) currently remains as *Special Concern*, this is likely to change in the near future to reflect COSEWIC's recent decision. Subsequent regulatory

reclassification under the Province's Endangered Species Act is probable. The primary focus in regard to this species' presence in Ontario is the protection of known migratory concentration areas. The open areas on the margins of the Lakeshore Road Property do contain a number of common flowering species that can support foraging activity of the Monarch. In regard to Milkweed, a plant critical to the life-cycle of the Monarch, scattered specimens are present on the Property, but milkweed is neither abundant nor present in concentration. Overall, the characteristics of the Property are such that it is not likely to function as significant or critical habitat for the Monarch.

Other than the Monarch Butterfly, all flora and fauna observed on or near the Lakeshore Road Property are from relatively secure populations and do not warrant any consideration as conservation concerns. The SOCC on record within the general area have not been observed within the Property, and the habitat requirements of most of these species are generally not available within the Property.

5.0 ANALYSIS OF POTENTIAL IMPACTS

The following analysis addresses each of the specific natural features of concern (i.e. woodlands, streams, and species of conservation concern). For each feature, the likelihood and significance of adverse effects due to potential development of the Property are qualitatively assessed. The assessed potential for adverse effects is based in part on the characteristics and functions of the features themselves. In absence of any formal plans for development, the assessment considers hypothetical aspects of possible development, including the possible extent of site alteration and various conditions that might be encountered within the Property both during and after construction.

Conclusions and recommendations drawn from this analysis, including mitigation and monitoring recommendations, are provided in Section 6.

5.1 Woodlands

As noted in Section 4.2, about 75% of the Property is currently occupied by woody vegetation. The wooded cover within the Property can be characterized as a relatively small and isolated woodland feature, composed primarily of relatively young specimens of early succession tree species. The wooded cover does not exhibit well-developed forest structure, does not provide any forest interior habitat, and does not support any known populations of SOCC. Overall, the ecological functions of the woodland are quite limited. The wooded cover immediately adjacent to Stream 9 is expected to provide some of the typical benefits of woody riparian cover to the stream and stream functions. The benefits would include shading/cooling, attenuation of local runoff entering the stream, and provision of allochthonous carbon and nutrients. The cumulative magnitude of benefits associated with tree cover within the Property is anticipated to be relatively limited, simply due to the very short length of the stream within the Property (i.e., approximately 20 m).

Presumably owing to limited size and function, the wooded area within the Property has not been subject to any special designation (e.g. "Significant Woodlands) in either the County or Municipal Official Plans.

At the point of closest proximity, the Property barley encompasses what would be considered Adjacent Lands (i.e., lands within 50 m) to Significant Woodlands. The Significant Woodlands of relevance are located within the neighbouring property on the south side of Lakeshore Road, (see Figure 4). The Significant Woodland area in question consists of a narrow band of woody vegetation that occupies the banks of Stream # 9. It is likely that the Significant Woodland designation is based partly on the fact that this band provides functions typical of a woody riparian zone. In a previous study of the neighbouring property (AEC, 2016), this tree-line is not distinguished from the surrounding thicket habitat and is not reported to have any significant ecological attributes or functions. The ecological connectivity between the Property and the tree-line in question is deemed to be extremely limited, partly due to physical separation by

the presence of Lakeshore Road. The likelihood that any changes to the woodlands within the confines of the Property would have any measurable impact on woodlands on adjacent properties, including the noted Significant Woodlands, is considered to be extremely low. Any such impacts would not affect significant functions or SOCC, and would be very constrained in magnitude.

Overall, the available information does not indicate any uncommon characteristics or critical functions of the woodland communities found within or adjacent to the Lakeshore Road Property. Any loss or interference of the woodland cover would not have meaningful implications to local ecosystem function. The possible exception is the loss of some benefit to Stream 9 due to the presence of riparian woodland cover. This is discussed further in Section 5.2.

5.2 Aquatic Features

Aquatic features associated with the Property include the two streams that flow across or along the periphery of the Property (see Figures 3 and 4). The available data suggest that Stream 10 does not function as direct fish habitat, while Stream 9 supports a fish community that is warm-water or cool-water. Both streams discharge to Georgian Bay and may influence aquatic communities at or in immediate proximity to the point of discharge.

Typically, the development of residential Property entails some modification of the existing ground cover and the installation of buildings and supporting infrastructure (access roads, parking areas, servicing). Alteration of existing grade is also a common aspect of development. Modification of ground surface or grade, particularly the removal of existing vegetation cover, can affect hydrological processes and result in changes in the quantity or quality of drainage flowing through a site. The most likely implications in terms of water quantity would be an increase in volume and rate of runoff owing to a decrease in permeability following installation of built surfaces. In terms of water quality, the typical effects of site alteration are increases in water temperature and increases in certain contaminants (e.g. total suspended solids, road salts, fertilizers, pesticides).

The likelihood and potential significance of any effects on water quantity and quality is dependent in part on the spatial expanse of the development footprint, and also the relative size of the aquatic feature in question. In general, the risk of negative effects is proportional to the area developed and inversely proportional to the stream flow and/or watershed area. As discussed in Section 3.3, the area of the Lakeshore Road Property represents only a very small percentage of the drainage basins of the Streams 9 and 10, and the role of the Property in the hydrological balance of Streams 9 and 10 is very minor. As a result, the risk of adverse effects related to landscape changes is quite limited.

Notwithstanding the potential effects of broader scale landscape alteration, the quality of stream flow can also be adversely affected by the removal of vegetation in immediate

proximity to any water-body. A loss of vegetation adjacent to a stream channel can result in increases in water temperature as result of a loss of shading, and can lead to increased loading of contaminants (e.g. suspended solids) due to a loss of the filtering function of stream-side vegetation. The likelihood and potential significance of such effects is dependent in part on the nature and spatial expanse of vegetation that is removed. For Stream 10, the existing cover within the Property and in proximity to the stream is mainly herbaceous (mixed grasses and forbs) and does not provide shading/cooling benefits. In proximity to Stream 10, the Property is relatively flat and borders only a very short length of the stream (approximately 30 m). For these reasons, the runoff attenuation function is relatively limited. Overall, loss of vegetation adjacent to Stream 10 may result in reduced runoff attenuation, but the impacts would not likely be significant. For Stream 9, there is established woody cover on both sides of the stream which provides some level of shading and cooling benefit. The woody cover also acts a source of nutrients from falling leaves and other plant parts, and also in-stream cover in the form of fallen branches and logs. Loss of the woody cover results in direct loss of these benefits. The woody cover also plays a role in the filtering of local runoff that enters the stream directly from the Property. As with Stream 10, the low relief of the Property and the short length of Stream 9 within the Property are factors that inherently limit the potential for the transport of contaminants via runoff. The attenuation of runoff contaminants provided by tree cover would be reduced by any loss of that cover, but the implications of this loss to the water quality of Stream 9 are not likely to be meaningful.

Overall, there is some possibility that development of the Lakeshore Road Property could affect the quantity and quality of water flowing in Streams 9 and 10. Given the very short length of these streams within the Property, and the relatively small size of the Property relative to total watershed areas, the likelihood of significant shifts in water quantity or quality in either stream is considered to be very low. The ecological implications of any such changes are very low for Stream 10, given the absence of direct fish habitat function. For Stream 9, the presence of a warm/cool-water fish community increases the implications of any effects on stream flow, but this fish community is not considered to be highly sensitive to water quality. For both streams, the implications of any changes in water quality or quantity are not expected be at all meaningful at the point of discharge to Georgian Bay.

The adaptation of standard mitigation measures is expected to eliminate the risk of meaningful impacts on Streams 9 and 10. Mitigation measures are discussed in Section 6.3.

5.3 Species of Conservation Concern

There are a number of SOCC on record in the general area of the Lakeshore Road Property. However, direct surveillance produced no evidence of meaningful SOCC presence within or immediately adjacent to the Property. The Property generally does not exhibit the characteristics or specific habitat elements that would support local populations of the SOCC that might occur in the area. Overall, there is a very low

likelihood of occurrence of those SOCC within the Property for any meaningful duration or for critical aspects of their life cycle.

In absence of any likelihood of meaningful presence of SOCC within the Property, impacts resulting from possible development activity are considered to be very unlikely, and would be very limited in terms of frequency and numbers of SOCC affected. Any such impacts would not be meaningful from a population perspective.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Existing Conditions

The Lakeshore Road Property is occupied by a mix of cultural meadow and woodland cover. Many of the plant species in both wooded and open areas are non-native and typical of disturbed sites, including at least 20 species that can be considered invasive. No plant species of conservation concern (SOCC) have been observed within or near the Property. The associated faunal communities also consist of common species from relatively secure populations. Overall, the terrestrial ecological functions supported within the Property are neither significant nor sensitive, nor are they vital to overall ecosystem integrity on a local or regional scale.

There are two watercourses that traverse at least part of the Property (see Figure 3). These watercourses (Streams 9 and 10) serve basic hydrological and ecological functions. Stream 10 is a warm-water watercourse with flow that significantly diminishes following spring runoff, and does not appear to function as direct fish habitat. Stream 9 exhibits consistent flow that supports populations of fish typical of warm-water or cool-water communities. Both streams discharge to Georgian Bay providing indirect fish habitat functions, but none that is expected to be significant.

6.2 Potential Impacts

The woodland and meadow communities within the Property are expected to serve and/or support various ecological functions, but available information indicates that those functions are neither significant nor sensitive. This inherently limits the implications of any possible loss or impairment of these communities as a result of possible future development.

The likelihood and significance of any possible impacts of future development are also largely dependent on the extent and nature of that development. The nature of possible future development within the Property has not been established at this time. In considering a worst-case scenario, and without accounting for any mitigating measures, the theoretical impacts include the following;

- loss or impairment of cultural meadow, up to a maximum of approximately 0.15 ha,
- loss or impairment of woodlands, to a maximum of approximately 0.45 ha, and
- disturbance or impairment of two watercourses.

In regard to the cultural meadow habitat within the Property, the ecological value and function are extremely limited. The existing vegetation consists of common species, largely typical of disturbed sites and including any non-native species and also numerous invasive species. The most notable aspect of the cultural meadow is that it can provide occasional foraging habitat for the Monarch butterfly which is an SOCC. The cultural meadow area within the Property is certainly not considered to be critical habitat for Monarchs, so the implications if any loss or impairment of this function are minor. The very small size of the combined cultural meadow area also inherently limits the possible implications of any loss of that habitat. The role of this vegetation community in protecting aquatic features (i.e., Stream 10) is the one function that merits consideration in development planning.

The loss or impairment of woodlands within the Lakeshore Road Property has relatively greater implications. This is in part due to the fact that there is simply more wooded area than there is cultural meadow. The fact that there is a general absence of woodlands in the region and Province also makes the loss of any area somewhat meaningful, regardless of the characteristics and specific functions of the woodland in question. As with the cultural meadow habitat, the intrinsic ecological value of the existing woodland cover within the Property is very limited, which in turn limits the significance of any loss or disturbance of woodlands. The most important function of the woodland cover within the Property is the shading and cooling of Stream 9, and also some degree of runoff attenuation. Removal of the riparian woody vegetation currently found within the Property would result in loss of these functions. However, because only a very short length of the Stream would be affected (i.e. ~30 m), the loss of the functions of the riparian woods would not likely have measurable impacts on Stream 9 as a whole.

Overall, the potential future development of the Property poses a relatively low risk of meaningful loss of ecological features or functions within or near the Property.

6.3 Recommendations

Regardless of any consideration of significance, there should be efforts to mitigate any impacts potentially associated with future development of the Property. Recommendations are provided herein to avoid, limit or otherwise mitigate the potential impacts that have been identified. Figure 4 depicts features and areas identified as priorities for protection and/or mitigation.

6.3.1 Woodlands

The eventual site plan for the Lakeshore Road Property should be developed so as to minimize loss of woodlands within the Property. Highest priority should be given to wooded cover within the riparian zone of Stream 9. Retention of existing woody cover within the defined set-back for Stream 9 is recommended (see Section 6.3.2). Also, to the extent practical, existing woody cover should be retained so that the continuity of

woody cover along the long axis of the Property is preserved. This will optimize ecological linkage functions and will also provide visual screening functions along the Georgian Trial.

To avoid impacts to nesting birds, the clearing of any trees/woodlands within the Property should be timed so as to avoid the period of active nesting (i.e., May to August).

6.3.2 Streams

To minimize the potential for any effects of development on Streams 9 and 10 and their ecological functions, plans for grading and stormwater management should seek to maintain existing drainage patterns to the extent feasible. The drainage divide between Streams 9 and 10 should not be significantly altered if possible. If there is an intent to manage or redirect diffuse flow conveyed across Lakeshore Road by the culvert located between Streams 9 and 10 (see Figure 3), the flow should be directed to Stream 10.

In addition to drainage management, effective set-backs for Streams 9 and 10 should be established to minimize the potential for any effects on water quality and ecological function. As a conservative default, a 30-m set-back can be considered for both Streams to ensure protection of ecological functions. For Stream 9, adoption of a setback appropriate for coldwater streams would be more than adequate in this case. Limited instances of development within 30 m of the stream (but no closer than 15 m) may be acceptable, particularly if the form of that development excludes impermeable surfaces and retains a significant presence of riparian woody vegetation for shading and cooling purposes. For Stream 10, a minimum set-back of 10 m may be sufficient given the relatively limited ecological function of this watercourse, primarily in consideration of an absence of a fish community. It should be noted that the set-back recommendations above do not reflect requirements pertaining to flood protection.

During any eventual construction or landscape alteration, an Erosion and Sediment Control (ESC) plan should be developed and implemented in accordance with established best practices. At a minimum, this would include:

- installation of silt fencing between areas of disturbed ground and each stream,
- avoidance of work during wet conditions,
- minimizing the passage of vehicles over areas of exposed soil,
- placement of stockpiled soil or fill in as far away from streams as practical, and
- minimizing the time between initial exposure of soil and the final construction or restoration of a given area. Restoration should occur as soon as possible.

6.3.3 Species of Conservation Concern

Available information indicates that SOCC are not meaningfully present within the Lakeshore Road Property. However, a few precautionary recommendations are provided for consideration.

As noted in regard to woodlands, any tree removal should be timed to avoid the bird nesting period and also the period when bat maternity roosts may be present (i.e., from May to August).

To the extent practical, green-space vegetation should be retained and managed to maintain and possibly improve conditions for Monarchs. This could include the use of native flowering plants that serve as forage for Monarchs and a variety of other pollinator species. The use of pesticides should be minimized to the extent practical.

The Barn Swallow is a Threatened species that is on record as being present in the area around the Property. Barn Swallows typically nest in man-made structures. There are no suitable structures within the Property at present. However, the culvert under Lakeshore Road between Streams 9 and 10 (see Figure 3) could serve as a nest site for Barn Swallows. If there is any plan to modify or remove the culvert for drainage management purposes, it should be inspected for the presence of Barn Swallow nests in advance of that activity.

6.3.4 Enhancement Opportunities

The management and eventual development of the Lakeshore Road Property also affords a few opportunities for ecological enhancement.

Planting of tree and shrub species along the eastern bank of Stream 10 is recommended to provide shading and cooling function and additional habitat and cover for any birds or mammals that use the stream as a resource. This will also provide visual screening for adjacent residences.

The control or removal of invasive plant species should also be considered, with emphasis on the following:

- European Buckthorn - prevalent throughout the wooded portion of the property
- Gout Weed - patches adjacent to the Georgian Trail
- Oriental Bittersweet - numerous vines on east end of property
- non-native Honeysuckle - scattered throughout the property

A contingency plan should also be developed to address the pending implications of Emerald Ash Borer (EAB). This insect pest is now well-established in southern Ontario

and is spreading into Grey County. In time, it is anticipated that all ash trees will be affected by EAB. Ash species are a significant component of the wooded cover that occupies much of the Lakeshore Road Property. A proactive plan to minimize the implications of the decline of ash and ensure long-term presence of tree cover is recommended.

Artificial nesting structures for Barn Swallows could be installed at the Property in the period prior to development or following development if suitable locations were available. The MNRF should be advised of any installation of Barn Swallow nesting structures to ensure that Safe Harbour provisions will be applied if/when the nest structures ever need to be removed.

7.0 REFERENCES

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TABLES

Table 1: Summary of Bird Species Observed at the Lakeshore Road Property

Species		Breeding Status		Conservation Status		
Common name	**Scientific name**	**Lakeshore Rd. Site[1]**	**OBBA[2]**	**SRANK[3]**	**COSEWIC[4]**	**COSSARO[5]**
American Crow	*Corvus brachyrhynchos*	Possible	Confirmed	S5	-	-
American Goldfinch	*Carduelis tristis*	Probable	Probable	S5	-	-
American Redstart	*Setophaga ruticilla*	Probable	Probable	S5	-	-
American Robin	*Turdus migratorius*	Confirmed	Confirmed	S5	-	-
Black-capped Chickadee	*Poecile atricapillus*	Probable	Confirmed	S5	-	-
Blue Jay	*Cyanocitta cristata*	Probable	Confirmed	S5	-	-
Brown-headed Cowbird	*Molothrus ater*	Possible	Probable	S4	-	-
Cedar Waxwing	*Bombycilla cedrorum*	Confirmed	Confirmed	S5	-	-
Common Grackle	*Quiscalus quiscula*	Confirmed	Confirmed	S5	-	-
Common Yellowthroat	*Geothlypis trichas*	Probable	Probable	S5	-	-
Downy Woodpecker	*Picoides pubescens*	Possible	Possible	S5	-	-
Eastern Kingbird	*Tyrannus tyrannus*	Possible	Confirmed	S4	-	-
European Starling	*Sturnus vulgaris*	Possible	Confirmed	SE		
Gray Catbird	*Dumetella carolinensis*	Probable	Probable	S4	-	-
House Finch	*Carpodacus mexicanus*	Possible	Probable	SE	-	-
House Wren	*Troglodytes aedon*	Probable	Confirmed	S5	-	-
Mourning Dove	*Zenaida macroura*	Probable	Probable	S5	-	-
Northern Cardinal	*Cardinalis cardinalis*	Probable	Probable	S5	-	-
Northern Flicker	*Colaptes auratus*	Possible	Probable	S4	-	-
Northern Oriole	*Icterus galbula*	Possible	Confirmed	S5	-	-
Red-eyed Vireo	*Vireo olivaceus*	Probable	Probable	S5	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	Probable	Confirmed	S4	-	-
Ring-billed Gull	*Larus delawarensis*	Observed	Confirmed	S5	-	-
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Possible	Possible	S4	-	-
Ruby-throated Hummingbird	*Archilochus colubris*	Possible	Probable	S5	-	-
Song Sparrow	*Melospiza melodia*	Probable	Confirmed	S5	-	-
Warbling Vireo	*Vireo gilvus*	Probable	Probable	S5	-	-
Yellow Warbler	*Setophaga petechia*	Probable	Probable	S5	-	-
Yellow-rumped Warbler	*Setophaga coronata*	Observed	Possible	S5	-	-

Table 2: Summary of Point-Count Monitoring Results[1]

Species		Station Total		
Common name	Scientific name	PC-1	PC-2	Total
American Goldfinch	*Carduelis tristis*	5 (4)	1 (1)	6 (5)
American Robin	*Turdus migratorius*	1 (1)	1 (1)	2 (2)
Black-capped Chickadee	*Poecile atricapillus*	4 (3)	2 (2)	6 (5)
Cedar Waxwing	*Bombycilla cedrorum*	2 (2)	7 (2)	9 (4)
Common Grackle	*Quiscalus quiscula*	9 (3)	13 (4)	22 (7)
Common Yellowthroat	*Geothlypis trichas*	1 (1)	0	1 (1)
Eastern Kingbird	*Tyrannus tyrannus*	0	3 (3)	3 (3)
Gray Catbird	*Dumetella carolinensis*	0	1 (1)	1 (1)
House Finch	*Carpodacus mexicanus*	3 (2)	0	3 (2)
House Wren	*Troglodytes aedon*	0	2 (2)	2 (2)
Mourning Dove	*Zenaida macroura*	1 (1)	2 (2)	3 (3)
Northern Cardinal	*Cardinalis cardinalis*	2 (2)	0	2 (2)
Northern Oriole	*Icterus galbula*	3 (2)	2 (2)	5 (4)
Red-eyed Vireo	*Vireo olivaceus*	1 (1)	0	1 (1)
Red-winged Blackbird	*Agelaius phoeniceus*	5 (4)	6 (2)	11 (6)
Song Sparrow	*Melospiza melodia*	9 (4)	2 (2)	11 (6)
Warbling Vireo	*Vireo gilvus*	2 (2)	2 (2)	4 (4)
Yellow Warbler	*Setophaga petechia*	1 (1)	2 (2)	3 (3)

1 - summary counts include only those birds occurring within 150m of the centre of the point count station
Bracketed values indicate the number of survey intervals (5 minutes each) with the species present

Table 3: BBS Point-Count Station Characteristics

Station ID	UTM Coordinates (Centroid)[1]		Main Habitat/Cover Type	Number of Species Observed	Total Individual Bird Count
	Easting	Northing			
PC-1	554005	4930215	Mixed woods and cultural meadow	15	49
PC-2	554160	4930165	Mixed woods and cultural meadow	14	46

1 - coordinates obtained using handheld GPS, NAD83 datum. Reported to the nearest 5 m.

Table 4: Stream Temperature Readings

Date	Air Temperature	Steam Temperature	
		Stream 9	Stream 10
1-May-17	8	6	6
12-May-17	13	13	14
19-Jun-17	22	15	17
11-Jul-17	20	17	19
12-Sep-17	16	19	17

All values in units of degrees Celsius

Table 5: In-stream Water Quality Data

Location	pH	Disolved Oxygen		Conductivity (µS/cm)	Total Disolved Solids (ppm)
		Percentage	PPM		
Stream 9	8.76	90.9	8.82	412	206
Stream 10	8.59	77.6	7.63	544	272
Georgian Bay	8.64	94.7	9.47	198	99

Data collected 04 May 2010 using Hanna Instruments mutliparameter meter, model HI 9828

Table 6: NHIC Element Occurrence Records in Proximity to Property

Common Name	Scientific Name	SRank	COSSARO Status	COSEWIC Status	Last Observation Date
Whiskered Camouflage Lichen	*Melanelixia subargentifera*	S1/S3	-	-	7/27/1976
Snapping Turtle	*Chelydra serpentina*	S3	SC	SC	6/29/1994
Barn Swallow	*Hirundo rustica*	S4B	THR	THR	2004-??-??

Element Occurrences for 1-km squares 17NK5430 and 17NK5330

FIGURES

Figure 4: Environmental Features and Constraints

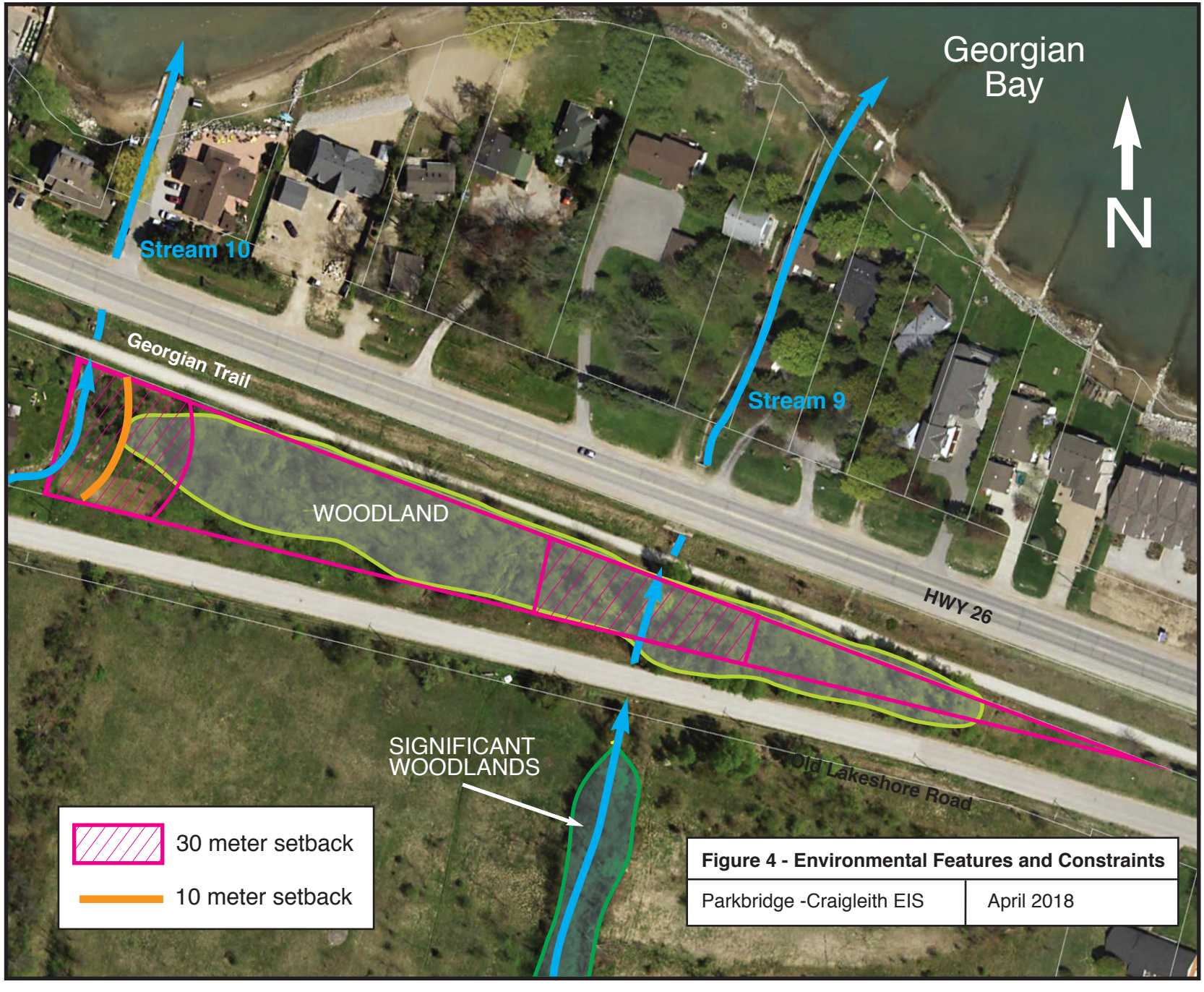
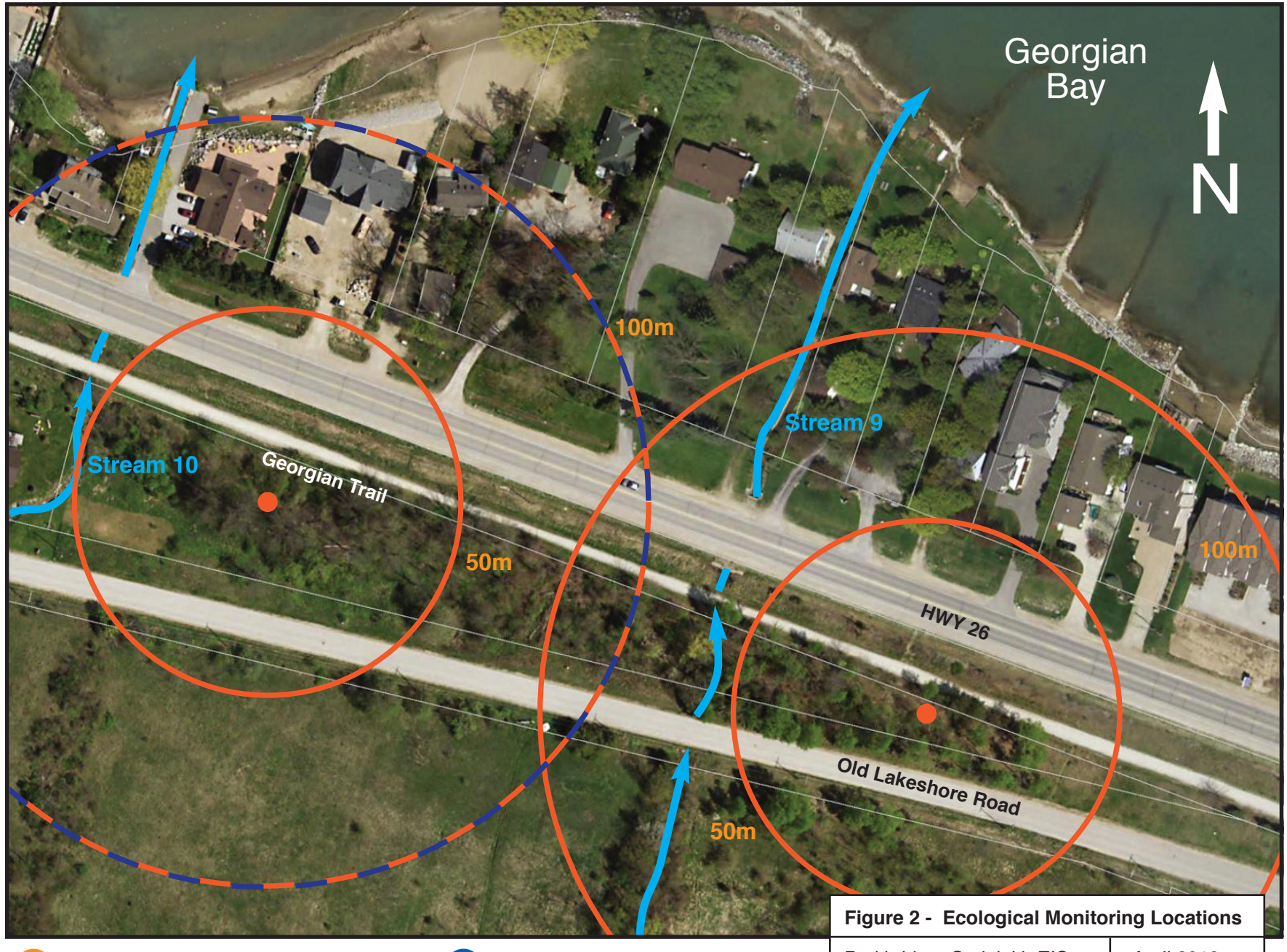


Figure 3: Site Hydrology

Figure 3 - Site Hydrology	
Parkbridge -Craigleith EIS	April 2018

Figure 2: Ecological Monitoring Locations

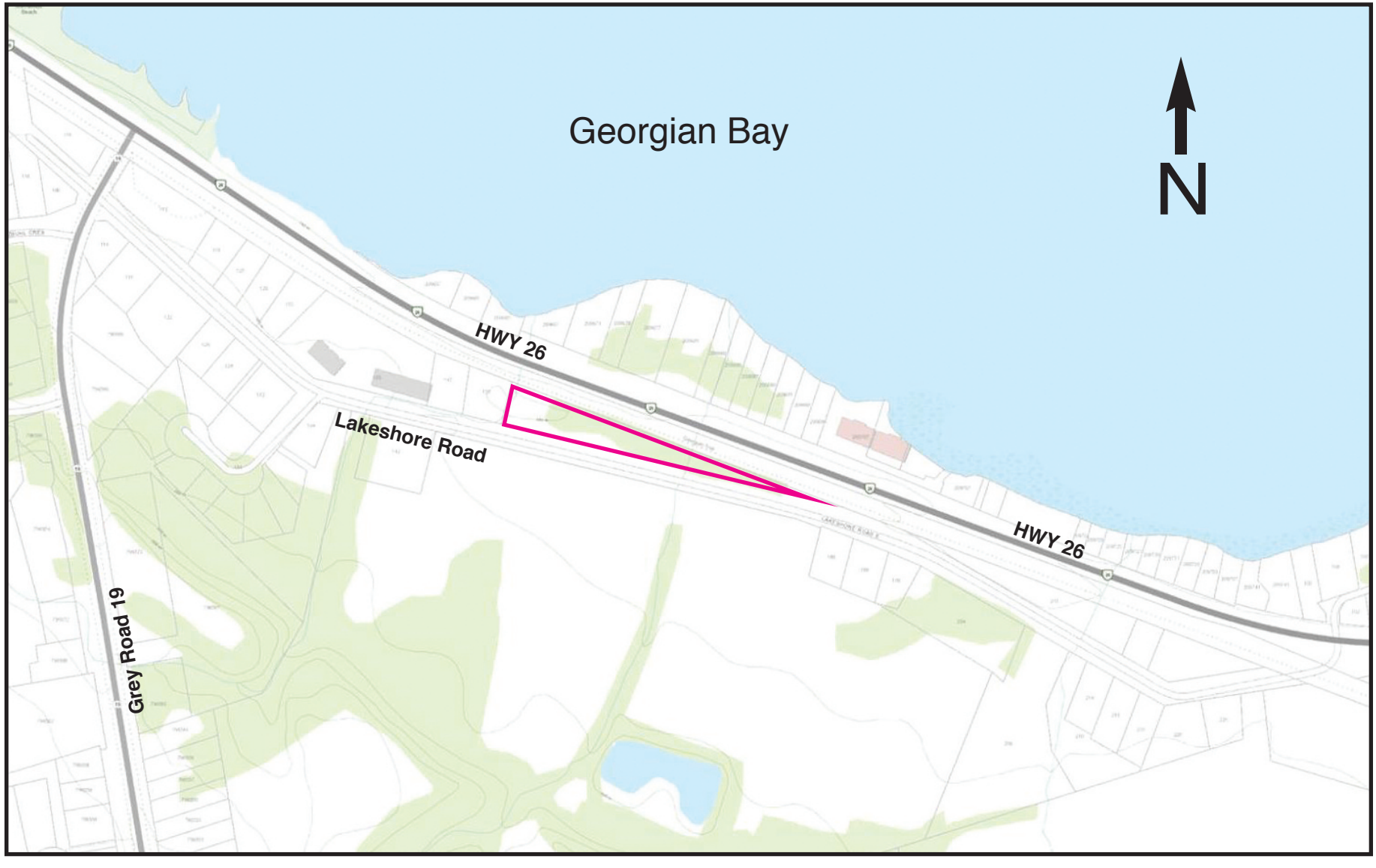


Breeding Bird point-count stations

Amphibian point-count station

Figure 2 - Ecological Monitoring Locations	
Parkbridge -Craigleith EIS	April 2018

Figure 1: Property Location



Property boundary

Figure 1 - Property Location	
Parkbridge -Craigleith EIS	April 2018

APPENDICES

Table A1: Plant Species List for the Lakeshore Road Property

Common Name	Scientific Name	Provincial Status (S-RANK)[1]	COSEWIC Status	COSSARO Status	Invasive status	Native vs Non-native
Alternate-leaved Dogwood	*Cornus alternafolia*	S5	-	-		Native
American Basswood	*Tilia americana*	S5	-	-		Native
Birdfoot Trefoil	*Lotus corniculatus*	SNA	-	-	Invasive	Non-native
Black Knapweed	*Centaurea nigra*	SNA	-	-	Invasive	Non-native
Black Medic	*Medicago lupulina*	NA	-	-	Invasive	Non-native
Black Nightshade	*Solanum nigrum*	SNA	-	-		Non-native
Black Willow	*Salix nigra*	S4	-	-		Native
Black-eyed Susan	*Rudbeckia hirta*	S5	-	-	Invasive	Native
Bladder Campion	*Silene cucubalus*	SNA	-	-		Non-native
Bouncing Bet	*Saponaria officinalis*	SNA	-	-		Non-native
Brown Knapweed	*Centaurea jacea*	SNA	-	-	Invasive	Non-native
Buckthorn	*Rhamnus cathartica*	SNA	-	-	Invasive	Non-native
Bull Thistle	*Cirsium vulgare*	SNA	-	-		Non-native
Butter-and-eggs	*Linaria vulgaris*	SNA	-	-		Non-native
Canada Anemone	*Aneomone canadensis*	S5	-	-		Native
Canada Goldenrod	*Solidago canadensis*	S5	-	-		Native
Canada Thistle	*Cirsium arvense*	SNA	-	-		Non-native
Chicory	*Chicorium intybus*	SNA	-	-		Non-native
Choke Cherry	*Prunus virginiana*	S5	-	-		Native
Coltsfoot	*Tussilago farfara*	SNA	-	-		Non-native
Columbine	*Aquilegia canadensis*	S5	-	-		Native
Comfrey	*Symphytum officinale*	SNA	-	-		Non-native
Common Burdock	*Arctium minus*	SNA	-	-		Non-native
Common Burdock	*Ranunculus acris*	SNA	-	-		Non-native
Common Dandelion	*Taraxacum officinale*	SNA	-	-		Non-native
Common Goat's-beard	*Aruncus dioicus*	SNA	-	-		Non-native
Common Juniper	*Juniperus communis*	S5	-	-		Native
Common Lilac	*Syringa vulgaris*	SE	-	-		Non-native
Common Milkweed	*Asclepias syriaca*	S5	-	-		Native
Common Mullein	*Verbascum thapsis*	SNA	-	-		Non-native
Common Pear	Pyrus communis	SNA	-	-		Non-native
Common Plantain	*Plantago major*	SNA	-	-		Non-native
Common Ragweed	*Ambrosia artemisiifolia*	S5	-	-		Native
Common St. Johnswort	*Hypericum perforatum*	S5	-	-		Non-native
Common Strawberry	*Fragaria virginiana*	S5	-	-		Non-native
Common Timothy	*Phleum pratense*	SNA	-	-		Non-native
Common Yarrow	*Achillea millefolium*	SNA	-	-		Non-native
Crown Vetch	*Securigera varia*	SNA	-	-		Non-native
Curly Dock	*Rumex crispus*	SNA	-	-		Non-native
Domestic Apple	*Malus pumila*	SNA	-	-		Non-native
Eastern Cottonwood	*Populus deltoides*	S5	-	-		Native
Eastern White Cedar	*Thuja occidentalis*	S5	-	-		Native
English Plantain	*Plantago lanceolata*	SNA	-	-		Non-native
False Nettle	*Boehmeria cylindrica*	S5	-	-		Native
False Solomon's-seal	*Maianthemum racemosum*	S5	-	-		Native
Field Bindweed	*Convolvulus arvensis*	SNA	-	-	invasive	Non-native
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	invasive	Non-native
Golden Willow	*Salix alba*	SNA	-	-		Non-native
Gooseberry	*Ribes oxyacanthoides*	S5	-	-		Native
Goutweed	*Aegopodium podagraria*	SNA	-	-	Invasive	Non-native
Grape Hyacinth	*Muscari neglectum*	SNA	-	-		Non-native
Ground Ivy	*Glechoma hederacea*	SNA	-	-		Non-native
Hairy Willowherb	*Epilobium hirsutum*	SNA	-	-		Non-native
Hawthorn	*Crataegus spp*	-	-	-		Native
Herb-Robert	*Geranium robertianum*	S5	-	-		Native
Jewelweed	*Impatiens capensis*	S5	-	-		Native
Late Goldenrod	*Solidago gigantea*	S5	-	-		Native
Manitoba Maple	*Acer negundo*	S5	-	-	Invasive	Native
Mouse-ear Chickweed	*Cerastium fontanum*	S5	-	-		Non-native
New England Aster	*Symphyotrichum novae-angliae*	S5	-	-		Native
Nipplewort	*Lapsana communis*	SE	-	-		Non-native
Northern Red Currant	*Ribes rubrum*	NA	-	-		Native
Northern White Violet	*Viola macloskeyi*	S5	-	-		Native
Norway Maple	*Acer platanoides*	NA	-	-	Invasive	Non-native
Orange Daylily	*Hemerocallis fulva*	SNA	-	-	invasive	Non-native
Orchard Grass	*Dactylis glomerata*	NA	-	-		Non-native
Oriental Bittersweet	*Celastrus orbiculatus*	SNA	-	-	invasive	Non-native
Oxeye Daisy	*Leucanthemum vulgare*	SNA	-	-	Invasive	Non-native
Peach-leaved Willow	*Salix amygdaloides*	S5	-	-		Native
Pear	*Pyrus communis*	SNA	-	-		Non-native

Table A1: Plant Species List for the Lakeshore Road Property

Common Name	Scientific Name	Provincial Status (S-RANK)[1]	COSEWIC Status	COSSARO Status	Invasive status	Native vs Non-native
Pennsylvania Bittercress	*Cardamine pensylvanica*	S5	-	-		Native
Peppermint	*Mentha piperita*	SNA	-	-	Invasive	Non-native
Perennial Ryegrass	*Lolium perenne*	SNA	-	-	Invasive	Non-native
Pin Cherry	*Prunus pensylvanica*	S5	-	-		Native
Plantain-leaved Sedge	*Carex plantaginea*	S5	-	-		Native
Poison Hemlock	*Conium maculatum*	SNA	-	-		Non-native
Poison Ivy	*Toxicodendron radicans*	S5	-	-		Native
Pussy Willow	*Salix discolor*	S5	-	-		Native
Red Ash	*Fraxinus pennsylvanica*	S5	-	-		Native
Red Clover	*Trifolium pratense*	SNA	-	-	Invasive	Non-native
Red Fescue	*Festuca rubra*	S5	-	-		Native
Red Raspberry	*Rubus idaeus*	S5	-	-		Native
Red-osier Dogwood	*Cornus sericea*	S5	-	-		Native
Reed Canary Grass	*Phalaris arundinacea*	S5	-	-		Native
Rough-fruited Cinquefoil	*Potentilla recta*	SNA	-	-		Non-native
Rugosa Rose	*Rosa rugosa*	NA	-	-		Non-native
Sand Cherry	Prunus x cistena	SNA	-	-		Non-native
Scots Pine	*Pinus sylvestris*	SNA	-	-		Non-native
Self-heal	*Prunella vulgaris*	S5	-	-		Non-native
Serviceberry	Amelanchier canadensis	S5	-	-		Native
Small White Aster	*Symphyotrichum lateriflorum*	S5	-	-		Native
Smooth Brome	*Bromus inermis*	SNA	-	-		Non-native
St. John's-wort	*Hypericum canadense*	S4	-	-		Native
Staghorn Sumac	*Rhus typhina*	S5	-	-		Native
Sugar Maple	*Acer saccharum*	S5	-	-		Native
Sweet Pea	*Lathyrus latifolius*	SNA	-	-		Non-native
Sweetbrier	*Rosa eglanteria*	SNA	-	-		Non-native
Tartarian Honeysuckle	*Lonicera tatarica*	SNA	-	-	invasive	Non-native
Teasel	*Dipsacus sylvestris*	SNA	-	-		Non-native
Trembling Aspen	*Populus tremuloides*	S5	-	-		Native
Tufted Vetch	*Vicia cracca*	SNA	-	-		Non-native
Viper's Bugloss	*Echium vulgare*	SNA	-	-		Non-native
Virginia Creeper	*Parthenocissus quinquefolia*	S4	-	-		Native
Watercress	*Rorippa nasturtium-aquaticum*	SNA	-	-		Non-native
Water Mint	*Mentha aquatica*	NA	-	-		Non-native
White Ash	*Fraxinus americana*	S5	-	-		Native
White Clover	*Trifolium repens*	SNA	-	-	Invasive	Non-native
White Elm	*Ulmus americana*	S5	-	-		Native
White Mulberry	*Morus alba*	SNA	-	-		non-native
White Sweet Clover	*Melilotus albus*	SNA	-	-		Non-native
Wild Blue Phlox	*Phlox divaricata*	S4	-	-		Native
Wild Carrot	*Daucus carota*	SNA	-	-	Invasive	non-native
Wild Grape	*Vitis riparia*	S5	-	-		Native
Wild Madder	*Galium mollugo*	SNA	-	-		Non-native
Wild Raspberry	*Rubus occidentalis*	S5	-	-		Native
Wood Strawberry	*Fragaria vesca*	S5	-	-		Native
Yellow Goat's-beard	*Tragopogon pratensis*	SNA	-	-		Native
Zigzag Goldenrod	*Solidago flexicaulis*	S5	-	-		Native

OBBA Data - Squares 17NK52 and 17NK53

Table A2: OBBA Data - Squares 17NK52 and 17NK53

Species		17NK52		17NK53		STATUS		
Common Name	**Scientific Name**	**1981-1985**	**2001-2005**	**1981-1985**	**2001-2005**	**SRANK[1]**	**COSEWIC[2]**	**COSSARO[2]**
Alder Flycatcher	*Empidonax virescens*	Confirmed	Possible		Probable	S2/S3	END	END
American Black Duck	*Anas rubripes*	Confirmed			Confirmed	S4		
American Crow	*Corvus brachyrhynchos*	Confirmed	Confirmed	Probable	Confirmed	S5		
American Goldfinch	*Carduelis tristis*	Confirmed	Probable	Probable	Probable	S5		
American Kestrel	*Falco sparverius*	Confirmed	Possible		Possible	S5		
American Redstart	*Setophaga ruticilla*	Confirmed	Possible	Possible	Probable	S5		
American Robin	*Turdus migratorius*	Confirmed	Confirmed	Confirmed	Confirmed	S5		
American Woodcock	*Scolopax minor*	Confirmed	Possible	Possible	Possible	S4		
Baltimore Oriole	*Icterus galbula*	Confirmed	Probable	Confirmed	Confirmed	S4		
Bank Swallow	*Riparia riparia*	Confirmed	Confirmed	Confirmed		S4	THR	THR
Barn Swallow	*Hirundo rustica*	Confirmed	Confirmed	Confirmed	Confirmed	S4	THR	THR
Belted Kingfisher	*Ceryle alcyon*	Confirmed			Possible	S4		
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Probable	Possible		Possible	S5		
Blackburnian Warbler	*Dendroica fusca*		Possible			S5		
Black-capped Chickadee	*Poecile atricapillus*	Confirmed	Confirmed	Probable	Confirmed	S5		
Black-crowned Night-heron	*Nycticorax nycticorax*	Possible		Confirmed	Confirmed	S3		
Black-throated Blue Warbler	*Dendroica caerulescens*	Possible	Probable		Possible	S5		
Black-throated Green Warbler	*Dendroica virens*	Possible	Possible		Possible	S5		
Black-and-white Warbler	*Mniotilta varia*	Probable	Possible		Possible	S5		
Blue Jay	*Cyanocitta cristata*	Confirmed	Confirmed	Confirmed	Probable	S5		
Blue-winged Teal	*Anas discors*	Confirmed			Possible	S4		
Blue-winged Warbler	*Vermivora pinus*		Possible			S4		
Bobolink	*Dolichonyx oryzivorus*	Confirmed	Probable	Confirmed	Possible	S4	THR	THR
Brewster's Warbler	*Vermivor Pinus*		Possible			NA		
Brown Creeper	*Certhia americana*	Probable	Possible			S5		
Brown Thrasher	*Toxostoma rufum*	Confirmed	Probable	Possible	Probable	S4		
Brown-head Cowbird	*Molothrus ater*	Confirmed	Probable	Confirmed	Probable	S4		
Canada Goose	*Branta canadensis*	Confirmed	Confirmed		Confirmed	S5		
Canada Warbler	*Wilsonia canadensis*	Possible			Possible	S4	THR	SC
Cedar Waxwing	*Bombycilla cedrorum*	Confirmed	Confirmed	Confirmed	Possible	S5		
Chestnut-sided Warbler	*Dendroica pensylvanica*	Confirmed	Possible		Probable	S5		
Chimney Swift	*Chaetura pelagica*	Probable				S4,S4N	THR	THR
Chipping Sparrow	*Spizella passerina*	Confirmed	Confirmed	Confirmed	Probable	S5		
Clay-colored Sparrow	*Spizella pallida*		Possible			S4		
Cliff Swallow	*Petrochelidon pyrrhonota*	Confirmed	Possible			S4		
Common Grackle	*Quiscalus quiscula*	Confirmed	Confirmed	Confirmed	Confirmed	S5		
Common Loon	*Gavia immer*			Possible	Possible	S5,S5N	NAR	NAR
Common Merganser	*Mergus merganser*	Probable		Confirmed	Confirmed	S5,S5N		
Common Nighthawk	*Chordeiles minor*			Probable	Possible	S4	THR	SC
Common Raven	*Corvus corax*		Probable		Possible	S5		
Common Snipe	*Gallinago delicata*	Confirmed	Possible			S5		
Common Tern	*Sterna hirundo*			Confirmed	Confirmed	S4	NAR	NAR
Common Yellowthroat	*Geothlypis trichas*	Confirmed	Probable	Possible	Probable	S5		
Cooper's Hawk	*Accipiter cooperii*		Possible		Possible	S4	NAR	NAR
Dark-eyed Junco	*Junco hyemalis*	Probable				S5		
Double-crested Cormorant	*Phalacrocorax auritus*				Confirmed	S5	NAR	NAR
Downy Woodpecker	*Picoides pubescens*	Confirmed	Possible	Confirmed	Possible	S5		
Eastern Bluebird	*Sialia sialis*		Confirmed			S5	NAR	NAR
Eastern Kingbird	*Tyrannus tyrannus*	Confirmed	Confirmed	Confirmed	Probable	S4		
Eastern Meadowlark	*Sturnella magna*	Confirmed	Probable	Confirmed	Probable	S4	THR	THR
Eastern Phoebe	*Sayornis phoebe*	Probable	Confirmed	Possible	Confirmed	S5		
Eastern Screech-Owl	*Megascops asio*	Possible	Possible	Possible		S5	NAR	NAR
Eastern Towhee	*Pipilo erythrophthalmus*	Confirmed	Possible	Possible		S4		
Eastern Wood-Pewee	*Contopus virens*	Confirmed	Probable	Possible	Possible	S4	SC	SC
European Starling	*Sturnus vulgaris*	Confirmed	Confirmed	Confirmed	Confirmed	SNA		
Field Sparrow	*Spizella pusilla*	Confirmed	Possible	Possible	Possible	S4		
Gadwall	*Anas strepera*			Probable		S4		
Golden-crowned Kinglet	*Regulus satrapa*	Probable	Possible			S5		
Golden-winged Warbler	*Vermivora chrysoptera*		Probable			S4	SC	SC
Great Crested Flycatcher	*Myiarchus crinitus*	Confirmed	Confirmed	Possible	Probable	S4		
Gray Catbird	*Dumetella carolinensis*	Confirmed	Probable	Possible	Probable	S4		
Great Black-backed Gull	*Larus marinus*				Confirmed	S2		
Great Blue Heron	*Ardea herodias*	Possible		Confirmed	Confirmed	S5		
Great Egret	*Ardea alba*			Probable	Confirmed	S2		
Great Horned Owl	*Bubo virginianus*	Confirmed			Probable	S5		
Green Heron	*Butorides virescens*	Probable	Possible	Possible		S4		
Hairy Woodpecker	*Picoides villosus*	Confirmed	Possible		Possible	S5		
Herring Gull	*Larus argentatus*	Confirmed		Confirmed	Confirmed	S5		
Horned Lark	*Eremophila alpestris*	Confirmed	Possible			S5		

Table A2: OBBA Data - Squares 17NK52 and 17NK53

Species		17NK52		17NK53		STATUS		
Common Name	**Scientific Name**	**1981-1985**	**2001-2005**	**1981-1985**	**2001-2005**	**SRANK[1]**	**COSEWIC[2]**	**COSSARO[2]**
House Finch	*Carpodacus mexicanus*		Probable		Probable	NA		
House Sparrow	*Passer domesticus*	Confirmed	Probable	Confirmed		NA		
House Wren	*Troglodytes aedon*	Confirmed	Confirmed	Confirmed	Probable	S5		
Indigo Bunting	*Passerina cyanea*	Confirmed	Probable	Possible	Possible	S4		
Killdeer	*Charadrius vociferus*	Confirmed	Probable	Probable	Probable	S5		
Least Flycatcher	*Empidonax minimus*	Confirmed	Possible	Possible	Possible	S4		
Louisiana Waterthrush	*Seiurus motacilla*	Probable	Probable			S3	THR	SC
Magnolia Warbler	*Dendroica magnolia*		Possible			S5		
Mallard	*Anas platyrhynchos*	Confirmed	Probable	Confirmed	Confirmed	S5		
Mourning Dove	*Zenaida macroura*	Confirmed	Probable	Probable	Possible	S5		
Mourning Warbler	*Oporornis philadelphia*	Confirmed	Possible		Possible	S4		
Nashville Warbler	*Vermivora ruficapilla*	Confirmed	Possible		Possible	S5		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Confirmed	Probable			S4		
Northern Waterthrush	*Seiurus noveboracensis*	Confirmed	Possible		Possible	S5		
Northern Cardinal	*Cardinalis cardinalis*	Confirmed	Probable	Probable	Probable	S5		
Northern Flicker	*Colaptes auratus*	Confirmed	Possible	Probable	Probable	S4		
Northern Harrier	*Circus cyaneus*	Probable				S4	NAR	NAR
Northern Pintail	*Anas acuta*			Confirmed		S5		
Orchard Oriole	*Icterus spurius*		Possible			S4		
Ovenbird	*Seiurus aurocapilla*	Confirmed	Probable		Probable	S4		
Pileated Woodpecker	*Dryocopus pileatus*	Probable	Possible			S5		
Pine Warbler	*Dendroica pinus*				Possible	S5		
Purple Finch	*Carpodacus purpureus*	Confirmed	Possible		Possible	S4		
Purple Martin	*Progne subis*	Confirmed			Confirmed	S4		
Red-bellied Woodpecker	*Melanerpes carolinus*				Possible	S4		
Red-breasted Merganser	*Mergus serrator*	Confirmed		Confirmed	Probable	S4/S5		
Red-breasted Nuthatch	*Sitta canadensis*	Probable		Confirmed	Possible	S5		
Red-eyed Vireo	*Vireo olivaceus*	Confirmed	Probable	Possible	Probable	S5		
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Probable				S4	THR	SC
Red-tailed Hawk	*Buteo jamaicensis*	Confirmed	Possible	Probable	Possible	S5	NAR	NAR
Red-winged Blackbird	*Agelaius phoeniceus*	Confirmed	Confirmed	Confirmed	Confirmed	S5		
Ring-billed Gull	*Larus delawarensis*			Confirmed	Confirmed	S4/S5		
Rock Dove	*Columba livia*	Confirmed	Possible	Possible	Possible	NA		
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Confirmed	Possible	Confirmed	Possible	S4		
Ruby-throated Hummingbird	*Archilochus colubris*	Probable	Probable	Possible	Possible	S5		
Ruffed Grouse	*Bonasa umbellus*	Confirmed	Confirmed	Confirmed		S5		
Savannah Sparrow	*Passerculus sandwichensis*	Confirmed	Possible		Probable	S4		
Scarlet Tanager	*Piranga olivacea*	Possible	Probable			S4		
Sedge Wren	*Cistothorus platensis*		Possible			S4	NAR	NAR
Song Sparrow	*Melospiza melodia*	Confirmed	Confirmed	Confirmed	Confirmed	S5		
Sora	*Porzana carolina*	Possible				S4		
Spotted Sandpiper	*Actitis macularius*	Confirmed		Confirmed	Probable	S5		
Swamp Sparrow	*Melospiza georgiana*	Confirmed	Probable		Probable	S5		
Tree Swallow	*Tachycineta bicolor*	Confirmed	Confirmed	Confirmed	Probable	S4		
Turkey Vulture	*Cathartes aura*	Confirmed	Confirmed	Probable		S5		
Upland Sandpiper	*Bartramia longicauda*	Confirmed	Probable			S4		
Veery	*Catharus fuscescens*	Confirmed	Probable	Possible	Possible	S4		
Vesper Sparrow	*Pooecetes gramineus*	Confirmed	Possible		Possible	S4		
Virginia Rail	*Rallus limicola*			Possible		S5		
Warbling Vireo	*Vireo gilvus*	Confirmed	Probable	Possible	Probable	S5		
Western Meadowlark	*Sturnella neglecta*	Possible				S3		
White-breasted Nuthatch	*Sitta carolinensis*	Confirmed	Possible	Possible	Possible	S5		
White-throated Sparrow	*Zonotrichia albicollis*	Confirmed	Possible			S5		
Wild Turkey	*Meleagris gallopavo*		Possible			S5		
Willow Flycatcher	*Empidonax traillii*		Probable		Possible	S5		
Winter Wren	*Troglodytes troglodytes*	Probable	Possible		Possible	S5		
Wood Duck	*Aix sponsa*	Confirmed	Probable		Possible	S5		
Wood Thrush	*Hylocichla mustelina*	Confirmed	Possible		Probable	S4	THR	SC
Yellow Warbler	*Dendroica petechia*	Confirmed	Probable	Probable	Probable	S5		
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Confirmed	Probable	Possible	Possible	S5		
Yellow-rumped Warbler	*Dendroica coronata*	Probable	Possible		Possible	S5		

1. Provincial Rank: SE - Exotic, S2 - Imperiled, S3 - Vulnerable, S4 - apparently secure, S5 - Secure
2. COSEWIC/COSSARO Status: End - Edangered, Thr - Threatened, SC - Special Concern, NAR - not at risk

Table A3: OBBA Results - Square 17NK53, Point-Count Station #9

Species		Total Count	Provincial Rank[1]
Common Name	Scientific Name		
American Goldfinch	*Carduelis tristis*	5	S5
American Robin	*Turdus migratorius*	4	S5
Blue Jay	*Cyanocitta cristata*	7	S5
Cedar Waxwing	*Bombycilla cedrorum*	4	S5
Common Grackle	*Quiscalus quiscula*	1	S5
Mourning Dove	*Zenaida macroura*	2	S5
Ring-billed Gull	*Larus delawarensis*	3	S5/S4
Red-winged Blackbird	*Agelaius phoeniceus*	7	S5

1. S4 - apparently secure, S5 - Secure

BBS Point-count Monitoring Results

Project:	Lakeshore Road EIS
Station:	PC-1
Date:	19-Jun-17
Start Time:	6:10
Wind (Beaufort):	1
Sky:	partly overcast
Observer:	Neil Morris

Species		First 5 minutes			Second 5 minutes			
Common name	**Scientific name**	0 - 50 m	50 - 100 m	>100 m	0 - 50 m	50 - 100 m	>100 m	Total
American Goldfinch	*Carduelis tristis*	1			2			3
Black-capped Chickadee	*Poecile atricapillus*				1			1
Common Grackle	*Quiscalus quiscula*	2	4		2			8
Mourning Dove	*Zenaida macroura*			1			1	2
Northern Cardinal	*Cardinalis cardinalis*		1			1		2
Northern Oriole	*Icterus galbula*	2			1			3
Red-eyed Vireo	*Vireo olivaceus*				1			1
Red-winged Blackbird	*Agelaius phoeniceus*		1	1		1		3
Song Sparrow	*Melospiza melodia*	1	1		1	1		4
Warbling Vireo	*Vireo gilvus*		1			1		2

Notes: Intermittent traffic noise.

Several of the birds recorded were not on the property, but still within auditory range

Project:	Lakeshore Road EIS
Station:	PC-2
Date:	19-Jun-17
Start Time:	6:23
Wind (Beaufort):	1
Sky:	partly overcast
Observer:	Neil Morris

Species		First 5 minutes			Second 5 minutes			
Common name	**Scientific name**	0 - 50 m	50 - 100 m	>100 m	0 - 50 m	50 - 100 m	>100 m	Total
American Robin	*Turdus migratorius*		1	1				2
Cedar Waxwing	*Bombycilla cedrorum*				4			4
Common Grackle	*Quiscalus quiscula*	6			3	1		10
Eastern Kingbird	*Tyrannus tyrannus*				1			1
Gray Catbird	*Dumetella carolinensis*		1					1
Mourning Dove	*Zenaida macroura*					1		1
Northern Cardinal	*Cardinalis cardinalis*			1				1
Northern Oriole	*Icterus galbula*	1			1			2
Red-winged Blackbird	*Agelaius phoeniceus*	1	2	1	1	2		7
Song Sparrow	*Melospiza melodia*	1				1		2
Yellow Warbler	*Setophaga petechia*		1			1		2

Notes: Intermittent traffic noise

Project:	Lakeshore Road EIS
Station:	PC-1
Date:	10-Jul-17
Start Time:	6:37
Wind (Beaufort):	1
Sky:	partly cloudy
Observer:	Neil Morris

Species		First 5 minutes			Second 5 minutes			
Common name	**Scientific name**	0 - 50 m	50 - 100 m	>100 m	0 - 50 m	50 - 100 m	>100 m	Total
American Crow	*Corvus brachyrhynchos*			1				1
American Goldfinch	*Carduelis tristis*		1		1			2
American Robin	*Turdus migratorius*				1			1
Black-capped Chickadee	*Poecile atricapillus*	1			1	1		3
Cedar Waxwing	*Bombycilla cedrorum*		1		1			2
Common Grackle	*Quiscalus quiscula*	1						1
Common Yellowthroat	*Geothlypis trichas*		1					1
House Finch	*Carpodacus mexicanus*	1	1			1		3
Red-winged Blackbird	*Agelaius phoeniceus*		1	1		2		4
Song Sparrow	*Melospiza melodia*	2	1		1	1		5
Yellow Warbler	*Setophaga petechia*	1						1

Notes: Some disturbance due to noise of traffic on nearby Hwy 26

Project:	Lakeshore Road EIS
Station:	PC-2
Date:	10-Jul-17
Start Time:	7:05
Wind (Beaufort):	1
Sky:	partly cloudy
Observer:	Neil Morris

Species		First 5 minutes			Second 5 minutes			
Common name	**Scientific name**	0 - 50 m	50 - 100 m	>100 m	0 - 50 m	50 - 100 m	>100 m	Total
American Goldfinch	*Carduelis tristis*				1			1
Black-capped Chickadee	*Poecile atricapillus*		1		1			2
Cedar Waxwing	*Bombycilla cedrorum*				3			3
Common Grackle	*Quiscalus quiscula*	2		1	1			4
Eastern Kingbird	*Tyrannus tyrannus*	1			1			2
House Wren	*Troglodytes aedon*	1			1			2
Mourning Dove	*Zenaida macroura*			1			1	2
Red-winged Blackbird	*Agelaius phoeniceus*		1			1		2
Warbling Vireo	*Vireo gilvus*		1			1		2

Notes: Considerable traffic noise

Appendix A – Detailed Ecological Data