BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Environmental Impact Study (EIS) Buffalo Bay

Prepared For:

2394735 Ont. Inc. C/o Orion Group Properties Inc.

Prepared By:

Beacon Environmental Limited

Date: *Project:*

September 2016 **214327**

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1. Introduction

Beacon Environmental Limited (Beacon) was retained by 2394735 Ont. Inc. c/o Orion Group Properties Inc. (the proponent) to provide an assessment of natural heritage features for the purposes of preparing an Environmental Impact Study (EIS) for the proposed development of lands located on Part of Lot 17, Concession 14 in the former geographic Township of Harvey, Municipality of Trent Lakes, County of Peterborough (hereafter the subject property) (**Figure 1**). Prior to Beacon being retained, the following ecological consulting firms collected the majority of site-specific natural heritage information on the subject property: Cunningham Environmental Associates (CEA); Azimuth Environmental Consulting, Inc. (Azimuth); and RiverStone Environmental Solutions. Beacon has incorporated the information collected by consultants of these firms into the EIS presented here, and throughout the report has identified which firms conducted the surveys or collected the data. Beacon necessarily relies upon the veracity of the information provided by the other consulting firms when making conclusions regarding impacts and conformity with legislation and policy. Additionally, Beacon relies on the information provided by the planning firm EcoVue Consulting Services Inc. (EcoVue) retained by the propoent.

The subject property is located between the north shore of Pigeon Lake and County Road 36 in the Municipality of Trent Lakes. The subject property features approximately 701 metres (m; 2,300 feet) of frontage on Pigeon Lake (EcoVue 2016). Pigeon Lake is part of the Tri-Lakes Complex (Chemong, Buckhorn and Pigeon lakes) east of Bobcaygeon. Pigeon Lake is part of the Trent-Severn Waterway. Total area of the lake is 5,344 hectares (ha) with a mean depth of 3 m and a maximum depth of 17 m. Specifically, the subject property is situated on Buffalo Bay, which is a relatively small, protected bay that is set back approximately 300 m from the main basin of Pigeon Lake. The entrance to the bay is approximately 60 m wide.

The purpose of this report is to identify constraints and opportunities in relation to the site's natural heritage features, as well as assess impacts of the proposed development.

2. Policy Context

The subject property lies within an area that is not regulated by a conservation authority under the *Conservation Authorities Act, 1990*. The following regulations and policies apply to the subject property.

2.1 Provincial Policy Statement (2014)

The Province released an updated Provincial Policy Statement (2014) under Section 3 of the *Planning Act,* which came into effect on April 30, 2014. The Provincial Policy Statement (2014) is intended to provide policy direction on matters of provincial interest related to land use planning.

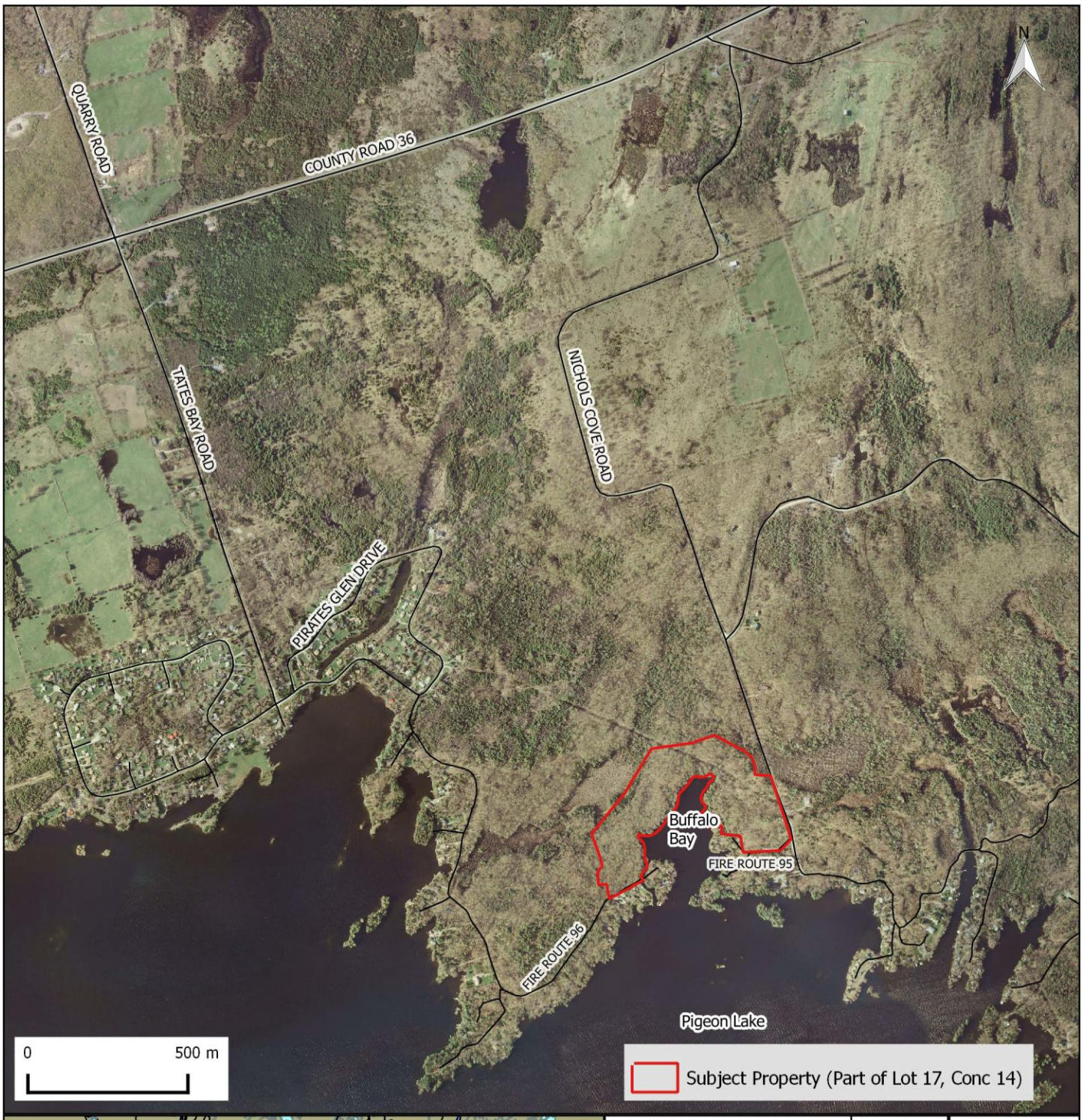
Policy 2.1 of the Provincial Policy Statement (PPS) provides direction to regional and local municipalities regarding planning policies for the protection and management of natural heritage features and resources. The PPS defines eight natural heritage features and provides planning policies for each. Each of these features is afforded varying levels of protection subject to guidelines, and in some cases, regulations. The *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial*

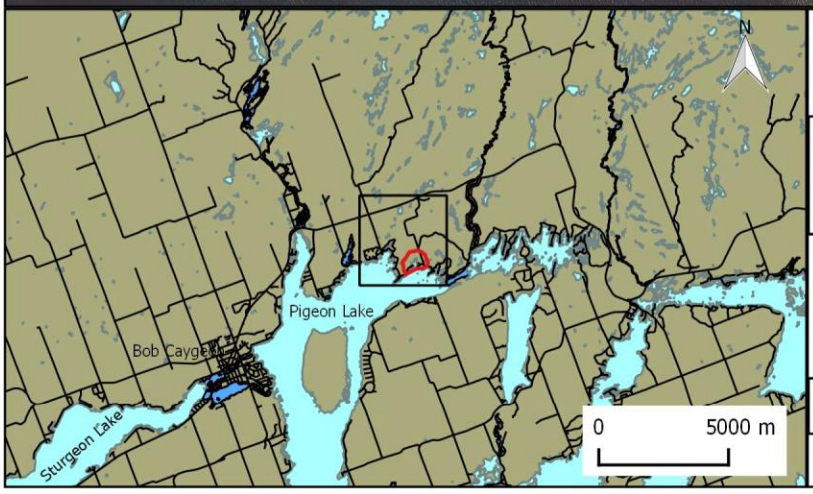
Policy Statement (MNRF 2010) is a technical guidance document used to help assess the natural heritage features listed.

Section 2.1 of the PPS relates to Natural Heritage. The following subsections are provided.

> *2.1.3 Natural heritage systems shall be identified in Ecoregions 6E & 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.*
>
> *2.1.4 Development and site alteration shall not be permitted in:*
> - *a) significant wetlands in Ecoregions 5E, 6E and 7E; and*
> - *b) significant coastal wetlands.*
>
> *2.1.5 Development and site alteration shall not be permitted in:*
> - *a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;*
> - *b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);*
> - *c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);*
> - *d) significant wildlife habitat;*
> - *e) significant areas of natural and scientific interest; and*
> - *f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b)*
>
> *unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*
>
> *2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*
>
> *2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.*
>
> *2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

Some of these natural heritage features are to be identified by the MNRF (i.e., significant wetlands, coastal wetlands and areas of natural and scientific interest), whereas others are to be identified by the local area municipalities or planning authorities (i.e., significant woodlands, significant valleylands, significant wildlife habitat). Significant woodlands are to be identified using criteria established by the MNRF. Habitat of threatened and endangered species are designated and/or confirmed by the MNRF, but these types of features are usually not identified or verified until assessments have been conducted at the site-specific level. It is expected that even where features have been identified at the provincial,





BEACON ENVIRONMENTAL

August 2016

Project: 214327

Location: Part of Lot 17, Concession 14, Municipality of Trent Lakes, County of Peterborough

Orthophoto Baselayer: spring 2008
(First Base Solutions Web Mapping Service)
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Client 2394735 Ontario Inc.

Figure 1. Site location.

regional or local levels that verification and some level of refinement will be required at the site-specific basis.

2.2 Peterborough County Official Plan (2014 Consolidation)

The Official Plan of the County of Peterborough provides direction regarding the protection of the natural environment across the County of Peterborough. The Official Plan policies regarding the protection of natural heritage features reflect the policies of the PPS, and because the PPS was updated in 2014, the latter document reflects recent changes to provincial and federal legislation (e.g., *Endangered Species Act*, *Fisheries Act*).

The County's Official Plan prohibits development or site alteration within provincially significant wetlands and in significant portions of the habitat of endangered and threatened species. Additionally, development and site alteration is not permitted within significant areas of natural and scientific interest, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The County's Official Plan does not prescribe criteria for identifying significant natural heritage features.

The location of the subject property within 150 m the ordinary high water mark of Pigeon Lake requires that it be considered a Shoreland Area as per Section 4.4 of the County's Official Plan. Policies for Shoreland Areas within the Official Plan state that "local plans and zoning by-laws will require that all new development and leaching beds be set back at least 30 metres from the ordinary high water marks of all waterbodies."

The County's Official Plan requires an assessment of environmental impacts to support planning applications as does the lower-tier municipality.

2.3 Municipality of Trent Lakes Official Plan (2010)

The Official Plan of the Municipality of Trent Lakes provides additional guidance regarding the protection of the natural environment.

Under Section 5.1.1 0.1 of the Municipality's Official Plan, the following natural environmental features and their functions are recognized as being important:

a) Floodplains;
b) Steep slopes;
c) Unstable soils;
d) Significant Wetlands and other wetlands;
e) Fish habitat;
f) Significant Wildlife Habitat;
g) Significant Woodlands;
h) Significant Valleylands;
i) Significant Habitat of Endangered Species and Threatened Species; and
j) Significant Areas of Natural and Scientific Interest (ANSIs).

Whereas the potential for a number of these features to occur should be assessed during site-specific impact studies, others, such as significant wildlife habitat, significant woodlands and significant valleylands should be identified by the local municipal planning authority. This requirement is recognized in section 5.1.1 0.2 as follows: “This Plan may be amended accordingly to recognize significant woodlands and valleylands and significant wildlife habitat when mapping of these features is available.” It is Beacon’s understanding that neither significant woodlands nor valleylands have been identified on or adjacent to the subject property.

A portion of the subject property is situated within an environmental/natural feature as shown in Schedule "B1" Natural Features Harvey (**Appendix A)**. The feature has been recognized as a deer wintering area. This feature may be considered an Environmentally Sensitive Area as discussed in section 5.1.10 or an area of significant wildlife habitat as referenced in section 5.1.10.7 (p. 21). Regarding significant wildlife habitat, the official plan contains the following requirements:

> *c) Development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*
>
> *d) Development and site alteration shall not be permitted on adjacent lands to significant wildlife habitat unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*
>
> *e) For the purposes of this policy “adjacent lands” shall mean those lands within 50 metres of significant wildlife habitat.*

Under section 5.1.10.11 (Water Setbacks), “all new development on a lot shall be set back a minimum of 30 metres from the established high water mark of water bodies and watercourses.” Additionally, it is understood that structures such as “structures such as septic tanks, pump houses, boat houses, docks, open decks and stairs shall be a permitted use and may encroach into the 30-metre setback… provided that the property owner can demonstrate to the Township’s satisfaction and, if appropriate, the authority having jurisdiction over the waterway, that it does not negatively affect the waterfront environment.”

2.4 *Endangered Species Act*

Ontario’s *Endangered Species Act, 2007* (ESA) came into effect on June 30, 2008 and replaced the former 1971 Act. The ESA protects species listed as Threatened or Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO). The purposes of the ESA are:

- To identify species at risk based on the best available scientific information, including information obtained from community knowledge and Aboriginal traditional knowledge;
- To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk; and
- To promote stewardship activities to assist in the protection and recovery of species that are at risk.

Recovery Strategies are to be prepared for Threatened and Endangered species. Special Concern species are not protected directly, but a Management Plan is to be prepared for these species. A Threatened or Endangered species is protected, as is its habitat. Specifically, Section 9 of the ESA prohibits the killing, harming, harassing, possession, collection, buying and selling of extirpated, endangered, and threatened species on the Species at Risk in Ontario (SARO) List; and Section 10 prohibits the damage or destruction of protected habitat of species listed as extirpated, endangered or threatened on the SARO list. Depending on the time of a species' listing, habitat is protected either under a General Habitat protection provision or a Species-Specific Habitat protection provision. Under the ESA, "habitat" is defined as either:

- General Habitat (based on the general definition in clause 2(1)(b) of the Act) - *an area on which a species depends directly or indirectly to carry on its life processes including life processes such as reproduction, rearing, hibernation, migration or feeding*; or

- Regulated Habitat (as defined in clause 2(1)(a) of the Act) - *the area prescribed for a specific species in a habitat regulation*.

2.5 Federal *Fisheries Act*

The most applicable portions of the federal *Fisheries Act* related to the current proposal are sections 35, which prohibits causing serious harm to fish that are part of or support a commercial, recreational, or Aboriginal fishery; and sections 20 and 21 that provides for flow and passage. Section 6 and 6.1 outline the framework for Ministerial decisions relating to serious harm to the fishery.

Included in changes to the Fisheries Act (2012) is Section 38 that outlines the obligations of persons responsible for projects including the "duty to notify" and take corrective measures if serious harm to fish occurs during a project. "Failure to notify, take corrective measures or report in such situations may result in penalties" according to the provisions under the Act.

2.6 Federal *Migratory Birds Convention Act, 1994*

Section 6 of the Migratory Birds Regulations under the *Migratory Bird Convention Act* makes it an offence to "disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird."

2.7 Trent-Severn Waterway

Structures built on or over the bed of the Trent-Severn Waterway (which includes Pigeon Lake) require written permission from Parks Canada. Parks Canada has developed policies for in-water and shoreline works and related activities in the Trent-Severn Waterway (Parks Canada 2007).

2.8 Federal *Species at Risk Act* (SARA)

Unless there is an imminent threat to species at risk or their habitat, the provisions of the SARA apply only to federal lands. Because Pigeon Lake is considered to be federal land under the jurisdiction of Parks Canada, any species and/or habitat protected under the Act have to be considered.

Additionally, nests and eggs of birds designated endangered or threatened in Schedule 1 of SARA and protected under the *Migratory Bird Convention Act* are also protected under the SARA (see http://www.registrelep-sararegistry.gc.ca/species/migBirds_e.cfm)

3. Methodology

As indicated in Section 1, the majority of site-specific natural heritage information on the subject property was not collected by Beacon. The consulting firms CEA and Azimuth coordinated, reviewed and conducted the bulk of the on-site assessments in 2014. Consequently, initial background review, agency contact and implementation of survey protocols were completed by these firms. Throughout the report, the firms responsible for collecting the data or relying upon specific background information are identified for clarity.

3.1 Desktop Review

Background information was gathered and reviewed at the outset of the project. CEA relied on the following information sources for its assessment:

- 1998 Peterborough County Natural History Summary (Burke *et al.* 1999);
- Forest Regions of Canada (Rowe 1972);
- Natural Heritage Resources of Ontario: Bibliography of Life Science Areas of Natural and Scientific Interest in Ecological Site Regions 6E and 7E, Southern Ontario (Riley *et al.* 1997);
- Life Science Areas of Natural and Scientific Interest in Site District 6-9 – A Review and Assessment of Significant Natural Areas in Site District 6-9 (Lindsay 1986);
- Soils of Peterborough County (Gillespie and Acton 1981);
- Rare Vascular Plants of Ontario (Oldham and Brinker 2009);
- Distribution and Status of the Vascular Plants of Central Region (Riley 1989);
- Southern Ontario Vascular Plant List (Bradley 2013);
- Ontario Wetland Evaluation System – Southern Manual (MNRF 2013a);
- Survey protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNRF 2014);
- Colour aerial photography of the property (digital orthophotos: leaf-off; spring 2008);
- County of Peterborough Geographic Information Systems (GIS) web-site (www.county.peterborough.on.ca/geographic-information-systems); and
- Topographic Survey of Part of Lot 17, Concession 14, Municipality of Trent Lakes, County of Peterborough (Coe, Fisher, Cameron 2014).

Beacon relied on the following information sources for its assessment:

- Summaries, notes and mapping provided by CEA, Azimuth and RiverStone;
- General Habitat Description for the Blanding's Turtle (*Emydoidea blandingii*) (MNRF 2013b);
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015);
- Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2: Ecodistrict Summaries (Henson and Brodribb 2005);
- Natural Heritage Reference Manual for Natural Heritage Policies of The Provincial Policy Statement, 2005;
- Colour aerial photography of the property (digital orthophotos: leaf-off; spring 2008);
- Ecoregion and ecodistrict mapping layers from Land Information Ontario (LIO); and
- Topographic Survey of Part of Lot 17, Concession 14, Municipality of Trent Lakes, County of Peterborough (Coe, Fisher, Cameron 2014).

3.2 Agency Contacts

The following contacts were made with resource management agency staff for information on the natural environment features of the subject property and adjacent lands. Note: the following only summarizes contacts and communications made prior to 2016.

Specifically, CEA and/or Azimuth contacted or had communications with:

- Graham Cameron – Habitat Biologist, Bancroft District, Ministry of Natural Resources and Forestry (MNRF);
- Chris Lewis – Habitat Biologist, Peterborough District, MNRF;
- Mike Oldham – Botanist and Herpetologist Natural Heritage Information Centre (NHIC);
- Donald Sutherland – Zoologist, NHIC;
- Liz Spang – District Planner, Peterborough District, MNRF; and
- Kathleen Pitt – Species at Risk Biologist, Peterborough District, MNRF.

Beacon had communications with:

- Liz Spang – District Planner, Peterborough District, MNRF;
- Kathleen Pitt – Species at Risk Biologist, Peterborough District, MNRF;
- Justin Gerrow – Trent-Severn Waterway Planner; and
- Susan Miller – Parks Canada.

In addition to the agency contacts indicated above, the following meetings were attended by EcoVue:

- Municipality of Trent Lakes and County of Peterborough planning and engineering staff on November 01, 2013 and April 15, 2014; and
- Pre-consultation with representatives of the County of Peterborough and the Municipality in March of 2014 to discuss the supporting documentation required for the proposed development.

The following meetings were attended by EcoVue and Beacon:

- MNRF staff (Peterborough District) on December 3, 2014 to discuss the status of Blanding's Turtle (*Emydoidea blandingii*) and its habitat on the subject property, in addition to other species of interest;
- MNRF staff (Peterborough District) on May 28, 2015 to discuss Blanding's Turtle and ESA permitting.

3.3 Species at Risk

As part of the initial agency contacts, a species at risk (SAR) screening letter was obtained from the MNRF (June 2014**; Appendix B**). A number of SAR were identified by MNRF as potentially occurring within or adjacent to the subject property as follows:

> *"A review of our best available information indicates that there are occurrences of: Bobolink (Threatened), Milk Snake (Special Concern), American Ginseng (Endangered), Barn Swallow (Threatened), Eastern Meadow Lark (Threatened), Cerulean Warbler (Threatened), Least Bittern (Threatened), Canada Warbler (Special Concern), Eastern Musk Turtle (Threatened), and Common Five-lined Skink (Special Concern) in the general area of the proposed activities. Also, there are occurrences of Flooded Jellyskin (Threatened), Eastern Whip-poor-will (Threatened), Eastern Ribbon Snake (Special Concern), Eastern Hog-nosed Snake (Threatened), Mottled Dusky wing (Endangered), (Blanding's Turtle (Threatened), Butternut (Threatened), Chimney Swift (Threatened), Least Bittern (Threatened), and Snapping Turtle (Special Concern) in the area immediately adjacent to the proposed activities. Although no other threatened or endangered species or their habitat have been documented in the area of the proposed projects, these features may be present and this list should not be considered complete."*

The June 2014 screening letter received from MNRF was used to inform the type and number of field-based assessments conducted in 2014 with respect to SAR. Discussions with MNRF staff at the Peterborough office regarding ESA-protected SAR has continued since 2014 as part of the recommended ESA process. These discussions resulted in additional considerations regarding which ESA-protected species should be evaluated further, i.e., whether additional surveys for habitat or individuals should be conducted, as well as which species required no further consideration. In this regard, it was determined in discussions with MNRF that no surveys or further assessment of bat species on the SARO list, such as Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*) were required for the development application being proposed on the subject property (based on a meeting with MNRF and subsequent discussions in December 2014). However, subsequent correspondence from the MNRF (March 2016) regarding a permit application under the ESA, indicated that surveys should be conducted for bats following MNRF's Guidelines for Bats and Bat Habitats.

3.4 Field Investigations

Table 1 summarizes the field investigations undertaken on the subject property. Additional information about the methodologies used is provided in subsequent sections where warranted.

Table 1. Summary of Field Investigations Conducted Prior to 2016

Survey/Assessment Type	Date(s)	Personnel
Vascular plant surveys, Ecological Land Classification (ELC) mapping, including wetlands	Six surveys between April and July 2014	Dave Cunningham (Cunningham Environmental Associates; CEA)
Dawn breeding bird surveys	Two surveys in June 2014	Jim Broadfoot (Azimuth Environmental)
Marsh bird call playback surveys	Two surveys in June 2014	Jim Broadfoot (Azimuth Environmental)
Crepuscular-nocturnal bird surveys	Three survey dates specific to peak activity periods for Whip-poor-will, as per lunar cycle: June 13, 26, July 10	Jim Broadfoot (Azimuth Environmental)
Amphibian Calling Count Surveys	Three surveys from April through June 2014	Dave Cunningham (CEA)
Fish and fish habitat survey, including habitat mapping and mitigation recommendations	One survey on July 10, 2014	Taco den Haas (Azimuth Environmental at time of assessment; now at Beacon)
Winter deer-yard surveys	One survey in April 2014	Jim Broadfoot (Azimuth Environmental)
Basking turtle surveys using the MNRF Survey Protocol for Blanding's Turtle in Ontario at five locations, including four locations on Buffalo Bay and one location in an adjacent wetland	Five surveys in May and June 2014: May 25, 31, June 4, 9 and June 14	Jim Broadfoot (Azimuth Environmental) and Dave Cunningham (CEA)
Habitat-based assessment for Blanding's Turtle	One assessment on June 17, 2014	Rob Willson (RiverStone Environmental at time of assessment; now at Beacon)
Field reconnaissance of the subject property	One assessment September 19, 2014	Brian Henshaw and Cori Carveth (Beacon)
Field assessment to determine what mitigation measures would be most effective for avoiding adverse effects on Blanding's Turtle	Two site visits in 2015	Kari Gunson (Eco-Kare International)
Field assessment to evaluate possible mitigation and overall benefit measures for Blanding's Turtle	One assessment on November 6, 2015	Rob Willson (Beacon)

Vascular Plants and Ecological Land Classification

Ecological communities, including wetlands were mapped and described according to the ELC system for Southern Ontario (Lee *et al*. 1998). Wetland boundaries were delineated according to the methodologies of the Ontario Wetland Evaluation System; however, the boundaries shown in the figures have not been staked by a surveyor or delineated with high accuracy GNSS/GPS.

Calling Amphibians

As indicated in **Table 1**, Amphibian Calling Count Surveys were conducted in April and June 2014. Calling amphibians, if present, were identified to species. Amphibians observed were also recorded.

Basking Turtle Surveys

Basking turtle surveys were conducted following the MNRF Survey Protocol for Blanding's Turtle in Ontario (MNRF 2014). Suitable habitat was scanned from five locations, including four locations on Buffalo Bay and one location in an adjacent wetland. Scanning of suitable habitat from these points was conducted for approximately 10 to 15 minutes before moving on. A high power spotting scope was utilized to accurately identify species.

Breeding Birds

Three different survey methods were applied: dawn breeding bird surveys, marsh bird call playback surveys and nocturnal bird surveys.

Dawn Breeding Bird Surveys
These surveys were completed between sun-up and 9:00 am on two days in June spaced more than one week apart (June 14, 27) under suitable weather conditions (low wind, little or no precipitation) following the methods of the Ontario Breeding Bird Atlas (OBBA). Survey combined Point Count (15 stations, 5-minute duration) and Roving methods. All birds seen and heard on or adjacent to the property were tallied. Observations were coded using the behavioural codes of the OBBA (i.e., S ~ Singing Male, P — Pair, etc.). Survey routes were sampled in reverse order over the two survey days so that stations sampled early during the first sample were surveyed later in the morning on the subsequent date and vice versa. A survey of the old borrow-pit lands was conducted June 27 to assess whether Bank Swallow (*Riparia riparia*) occur in the area or if the old pit faces and material stock piles (if any) showed evidence of nesting by swallows.

Marsh Bird Call Playback Surveys
These surveys were completed between sun-up and 9:00 am at two locations (Buffalo Bay and inland wetland) during the dawn breeding bird surveys conducted on June 14 and 27. Survey methods followed that of the Marsh Monitoring Program — Marsh Bird Survey. The call playback broadcast consisted of calls from Least Bittern (*Ixobrychus exilis*), American Bittern (*Botaurus lentiginosus*), Virginia Rail (*Rallus limicola)*, Sora (*Porzana carolina*), Common Moorhen (Gallinula chloropus), American Coot (*Fulica americana*) and Pied-billed Grebe (*Podilymbus podiceps*).

Nocturnal Bird Surveys
These surveys were completed on three evenings in 2014: June 13, June 26 and July 10.

The primary purpose of these surveys was to detect SAR birds, i.e., Whip-poor-will (*Antrostomus vociferus*) and Common Nighthawk (*Chordeiles minor*). Surveys were conducted as Roadside Point Counts ([RPC], ten minute duration). Surveys began off-site at a control RPC Station established near the north end of Quarry Road — UTM 17T 698499 4945405) where Whip-poor-will are known to occur. Whip-poor-will were heard at the control station on all three nights of the nocturnal bird surveys, confirming the nights surveyed were suitable to assess presence/absence of Whip-poor-will. Three RPC Stations established to cover areas of the property proposed for development were sampled on all three survey dates. Additional information related to nocturnal bird SAR present on and adjacent to the property was gathered during evening calling amphibian surveys conducted by CEA.

Winter Deer-Yard

Surveys were conducted April 22 shortly after snow melt at a time when winter accumulation of deer pellet groups (faeces) and evidence of winter browsing of deer were easily assessed. Surveys were conducted within areas of the property proposed for development with particular attention to the shoreline fringe of Buffalo Bay. Transect data were collected to quantify relative abundance of deer pellet groups and relative intensity of over-winter deer browsing among different habitats of the property (transects approximately 120 m long). Additional information related to areas of the property and adjacent lands containing concentrations of deer during winter were derived from field observations of browsing intensity during all daytime site visits (n = 6).

Incidental Wildlife

Incidental observations of wildlife species, including mammals were made during field investigations that were primarily for other purposes. Evidence for the presence of a species or use of an area was determined from visual and/or auditory observation (e.g., song, call) and observation of nests, tracks, burrows, browse, skins, and scats. Specific attempts were made to detect lizard and snake species through careful searching of suitable habitat (i.e., rock outcrops, around and under logs, etc.).

4. Existing Conditions

The existing natural heritage features and functions have been identified through a review of background information and field investigations and are described in this section.

Much of the subject property is heavily forested and dotted with small ponds, wetlands and drainage features; it is currently undeveloped. There is shoreline development adjacent to the property towards the south and southwest on Pigeon Lake. There are also scattered rural residential dwellings located west and north of the subject lands on Tate's Bay Road and County Road 36 (EcoVue 2016).

4.1 Ecological Land Classification (ELC)

According to mapping from LIO, the subject property is situated within Ecoregion 6E - Lake Simcoe-Rideau and Ecodistrict 6E-9 (Henson and Brodribb 2005). Because the subject property is situated near the transition zone between ecoregions 6E and 5E, it exhibits characteristics typical of Precambrian formations to the north and Ordovician sedimentaries to the south (Chapman and Putnam 1984).

The following paragraphs describe the ELC communities documented on the subject property and adjoining lands owned by the proponent, as shown in **Figure 2**.

Dry-Fresh Sugar Maple-Red Maple Deciduous Forest Type (FOD5-9)

The majority of the upland area on the subject property is dominated by forest that is dominated by Sugar Maple (*Acer saccharum*) in combination with Red Maple (Acer *rubrum*). Other tree species include Basswood (*Tilia americana*), Hop Hornbeam (*Ostrya virginiana*), Black Cherry (*Prunus serotina*), Beech (*Fagus grandifolia*), White Elm (*Ulmus americana*), White Ash (*Fraxinus americana*), Red Oak (*Quercus rubra*), White Birch (*Betula papyrifera*), Trembling Aspen (*Populus tremuloides*) and Yellow Birch (*Betula alleghaniensis*). The sparse to dense shrub stratum contains Choke Cherry (*Prunus virginiana*), Beaked Hazel (*Corylus cornuta*), Common Buckthorn (*Rhamnus cathartica*), Alternate-leaved Dogwood (*Cornus alternifolia*), Common Elderberry (*Sambucus canadensis*) and Red-berried Elder (*Sambucus pubens*).

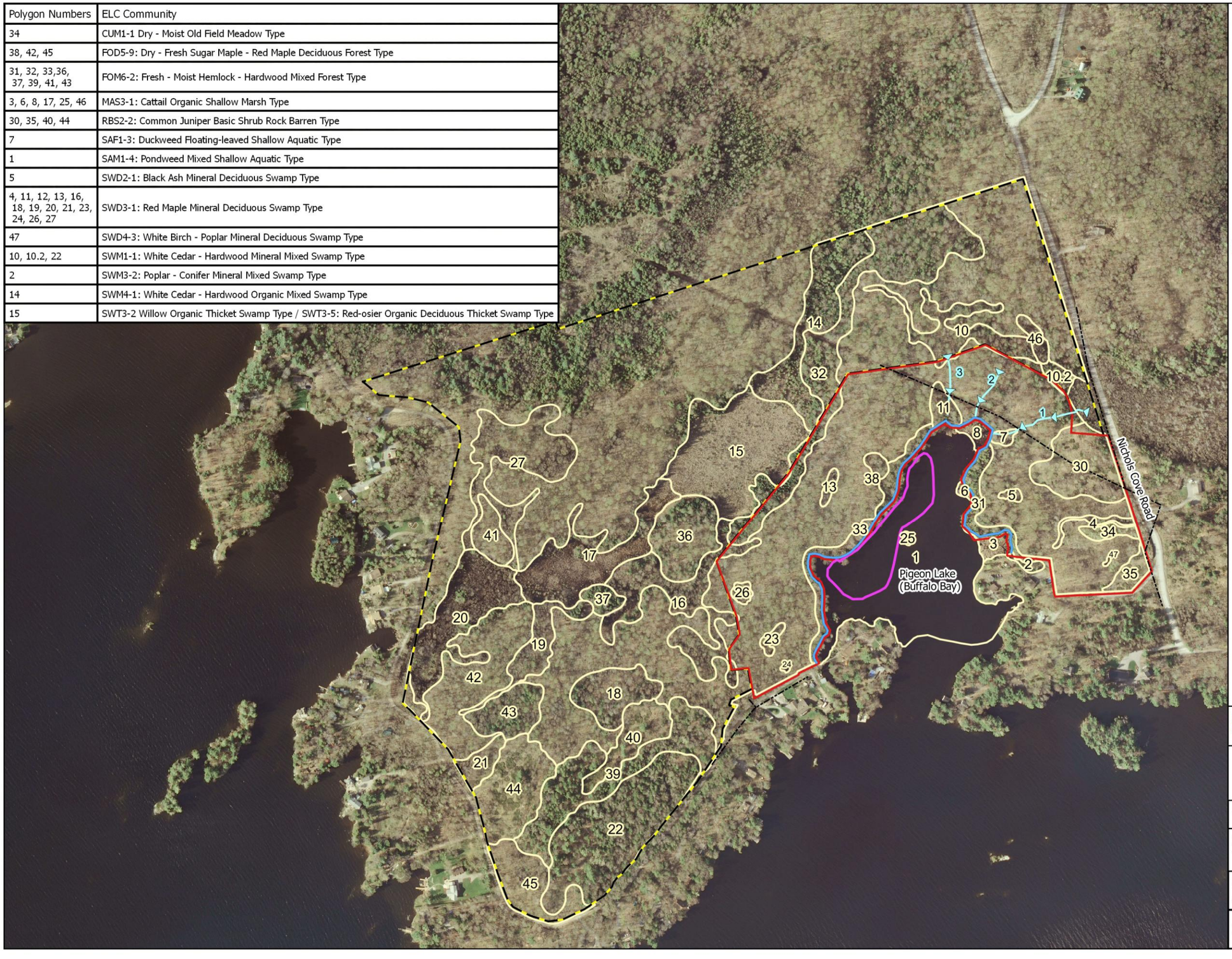
The lush ground flora consists of typical hardwood forest wildflowers, ferns, sedges and grasses. Common wildflowers include White Trillium (*Trillium grandiflorum*), Red Trillium (*Trillium erectum*), Yellow Trout-lily (*Erythronium americanum*), Rose-twisted Stalk *(Streptopus roseus*), Downy Yellow Violet (*Viola pubescens*), Blue Cohosh (*Caulophyllum thalictroides*), Wild Leek (*Allium tricoccum*), wild Sarsaparilla (*Aralia nudicaulis*), Sharp-lobed Hepatica (*Hepatica acutiloba*), Squirrel-corn (*Dicentra canadensis*), Wild Lily-of-the-valley (*Maianthemum canadensis*), Bellwort (*Uvularia grandifolia*), Toothwort (*Dentaria dipylla*), White Baneberry (*Actaea pachypoda*), Zig-zag Goldenrod (*Solidago flexicaulis*), May-apple (*Podophyllum peltatum*), Bluebead Lily (*Clintonia borealis*) and Herb-robert (*Geranium robertianum*).

Typical ferns include Maidenhair Fern (*Adiantum pedatum*), Spinulose Wood-fern (*Dryopteris carthusiana*), Marginal Wood-fern (*Dryopteris marginalis*) and Lady FERN (*Athyrium filix-femina*). Characteristic grasses and sedges include Broad-leaved Sedge (*Carex platyphylla*), Graceful Sedge (*Carex gracillima*), Common Woodland Sedge (*Carex blanda*), Schweinitz's Sedge (*Carex schweinitzii*), Rough Leaved Rice Grass (*Oryzopsis asperifolia*), Tufted Hairgrass (*Deschampsia cespitosa*) and False Melic Grass (*Schizachne purpurascens*).

Fresh-Moist Hemlock-Hardwood Mixed Forest Type (FOM6-2)

This feature is characterized as lowland mixed woods that border Buffalo Bay and edges of the larger internal wetlands. These forested stands are dominated by Eastern Hemlock (*Tsuga canadensis*). Other woody associates include White Spruce (*Picea abies*), Yellow Birch, Eastern White Cedar (*Thuja occidentalis*), Red Maple, White Birch, White Elm, Beaked Hazel, Red-osier Dogwood (*Cornus stolonifera*) and Alternate-leaved Dogwood.

Polygon Numbers	ELC Community
34	CUM1-1 Dry - Moist Old Field Meadow Type
38, 42, 45	FOD5-9: Dry - Fresh Sugar Maple - Red Maple Deciduous Forest Type
31, 32, 33,36, 37, 39, 41, 43	FOM6-2: Fresh - Moist Hemlock - Hardwood Mixed Forest Type
3, 6, 8, 17, 25, 46	MAS3-1: Cattail Organic Shallow Marsh Type
30, 35, 40, 44	RBS2-2: Common Juniper Basic Shrub Rock Barren Type
7	SAF1-3: Duckweed Floating-leaved Shallow Aquatic Type
1	SAM1-4: Pondweed Mixed Shallow Aquatic Type
5	SWD2-1: Black Ash Mineral Deciduous Swamp Type
4, 11, 12, 13, 16, 18, 19, 20, 21, 23, 24, 26, 27	SWD3-1: Red Maple Mineral Deciduous Swamp Type
47	SWD4-3: White Birch - Poplar Mineral Deciduous Swamp Type
10, 10.2, 22	SWM1-1: White Cedar - Hardwood Mineral Mixed Swamp Type
2	SWM3-2: Poplar - Conifer Mineral Mixed Swamp Type
14	SWM4-1: White Cedar - Hardwood Organic Mixed Swamp Type
15	SWT3-2 Willow Organic Thicket Swamp Type / SWT3-5: Red-osier Organic Deciduous Thicket Swamp Type



Legend

Boundaries

- Subject Property (Part of Lot 17, Conc 14)
- Other Lands Owned by Proponent (Part of Lot 17, Conc 14)

Features from Aug 7, 2014 Topo Survey (Coe, Fisher, Cameron; OLS)

- Overhead Wire
- Water's Edge at 246.05 mASL (High Water Mark to be determined)
- Drainage

Natural Features

- ELC Communities (Based on Evaluation Completed by Cunningham Environmental Associates in 2014; Minor Refinements by Beacon)

Survey Results

- Area Where Blanding's Turtles Were Observed During 2014 Surveys

BEACON ENVIRONMENTAL

August 2016

N

1:5,300

0 100 200 m

Client: 2394735 Ontario Inc.

Location: Part Lot 17, Concession 14, Municipality of Trent Lakes, County of Peterborough

Orthophoto Baselayer: spring 2008
(First Base Solutions Web Mapping Service)

Figure 2. Existing Conditions.

Common groundcover species include Sensitive Fern (*Onoclea sensibilis*), Oak Fern (*Gymnocarpium dryopteris*), Herb-robert, Enchanters Nightshade (*Circaea lutetiana*), Jack-in-the-pulpit (*Arisaema triphyllum*), Christmas Fern (*Polystichum acrostichoides*), Partridge-berry (*Mitchella repens*), Rock Polypody (*Podophyllum peltatum*), Fringed Loosestrife (*Lysimachia ciliata*), Ostrich Fern (*Matteuccia struthiopteris*), Downy Yellow Violet, Spotted Jewelweed (*Impatiens capensis*), Deadly Nightshade (*Solanum dulcamara*), Lady Fern, Field Horsetail (*Equisetum arvense*), Large-leaved Aster (*Aster macrophyllus*), Wild Lily-of-the-valley and Marsh Blue Violet (*Viola cucullata*).

Common Juniper Basic Shrub Rock Barren Type (RBS2-2)

Common Juniper (*Juniperus communis*) is dominant with the distribution ranging from sparse to dense, along with barren bolder (erratics), rock and fractured rock outcrops. This upland feature also has a variable tree and shrub cover consisting of White Ash, White Pine (*Pinus strobus*), Sugar Maple, Red Oak, White Elm, Choke Cherry, Tartarian honeysuckle (*Lonicera tatarica*), Common Apple (*Malus domesticus*) and Staghorn Sumac (*Rhus typhina*).

The groundcover is variable, consisting of Black Raspberry (*Rubus occidentalis*), Wild Red Raspberry (*Rubus idaeus*), Orchard Grass (*Dactylis glomerata*), Common Dandelion (*Taraxacum officinale*), Poverty Oat Grass (*Danthonia spicata*), Rock Polypody, Tickle-hair Grass (*Deschampsia flexuosa*), Dame's Rocket (*Hesperis matronalis*), Common Buttercup (*Ranunculus acris*), Common Yarrow (*Achillea millefolium*), Wild Sarsaparilla), Large-leaved Aster, Deptford pink (*Dianthus armeria*), Wild Basil (*Clinopodium vulgare*), Wild Columbine (*Aquilegia canadensis*), Bicknell's Cranesbill (*Geranium bicknellii*), Common Strawberry (*Fragaria virginiana*), Reindeer Moss, Spurge (*Euphorbia spp*.), Wild Carrot *(Daucus carota*), Common Mullein (*Verbascum thapsus*), Poison Ivy *(Rhus radicans*) and Agrimony (*Agrimony gryposepala*).

Dry-Moist Old Field Meadow Type (CUM1-1)/Common Juniper Basic Shrub Rock Barren Type (RBS2-2)

This feature is situated along part of the hydro corridor. It is a combination of old field meadow with common juniper rock barren inclusions. The groundcover is similar to that found in RBS2-2, with additional old field meadow species such as field Pussytoes (*Antennaria neglecta*), Tall Goldenrod (*Solidago altissima*), Canada Goldenrod, Heart-leaved Aster (*Symphyotrichum cordifolium*), Goat's-beard (*Tragopogon dubius*), Spreading Dogbane (*Apocynum androsaemifolium*), Yellow Trout-lily, Rock Polypody, Eastern Bracken Fern (*Pteridium aquilinum*), May-apple, Rough-fruited Cinquefoil (*Potentilla recta*), Field Sorrel (*Rumex acetosella*), Pearly Everlasting (*Anaphalis margaritacea*), Wild Basil, Catnip (*Nepeta cataria*), Deptford pink and Common Blue Violet (*Viola sororia*).

White Birch-Poplar Mineral Deciduous Swamp Type (SWD4-3)

Wetland unit 47 is a 79 m^2 patch of trembling aspen swamp, with a few red maples and barren muck soils and sparse sensitive fern patches.

Poplar-Conifer Mineral Mixed Swamp Type (SWM3-2)

Wetland unit 2 is narrow, consists of treed swamp, and is an inland extension of a pocket of littoral cattail marsh (MAS3-1).

Cattail Organic Shallow Marsh Type (MAS3-1)

The feature type consists of a pocket of littoral zone cattail organic marsh situated along the shoreline of Buffalo Bay, in the bay and inland. These wetlands are dominated by a dense stratum of Broad-leaved Cattail (*Typha latifolia*), along with scattered Lady Fern, Sensitive Fern, Swamp Milkweed (*Asclepias incarnata*), Blue Flag (*Iris versicolor*), Water Horehound (*Lycopus americanus*), Swamp Buttercup (*Ranunculus septentrionalis*), Creeping Buttercup (*Ranunculus repens*), Common Rush (*Juncus effusus*), Soft-stem Bulrush (*Scirpus validus*), Nodding Sedge (*Carex gynandra*), Awl-fruited Sedge (*Carex stipata*), Spotted Jewelweed, Fringed Loosestrife, Common Duckweed (*Lemna minor*), Boneset (*Eupatorium perfoliatum*), Spotted Joe pye-weed (*Eupatorium maculatum*), Canada Blue joint Grass (*Calamagrostis canadensis*), Wild Mint (*Mentha arvensis*), Sensitive Fern, Swamp Candles (*Lysimachia terrestris*), Purple-stemmed Aster (*Symphyotrichum puniceum*), Cursed Crowfoot (*Ranunculus sceleratus*), Ostrich Fern, Tussock Sedge (*Carex stricta*), Bedstraw (*Galium aparine*), and Marsh Fern (*Thelypteris palustris*). The inland wetland #17 also contains scattered woody species such as Speckled Alder (*Alnus rugosa*), Black Ash (*Fraxinus nigra*), Red Maple, White Elm, Red-osier Dogwood and Willow Shrubs.

Red Maple Mineral Deciduous Swamp Type (SWD3-1)

The majority of the inland wetlands are treed swamp features, which are characterized as Red Maple swamp. These wetlands are of varying sizes, some contain permanent pockets of standing water, while most consist of barren saturated mucky soils, with sparse groundcover. Red Maple is the dominant tree species, with other woody associates such as Black Ash, Basswood, White Elm, Red-berried Elder, Common Elderberry, Meadowsweet (*Spiraea alba*), Red-osier dogwood, and Alternate-leaved Dogwood.

The sparse to moderate groundcover typically consists of Marsh Blue Violet, Sensitive Fern, Graceful Sedge, Common Rush, Hop Sedge (*Carex lupulina*), Blue Flag, Early Meadowrue (*Thalictrum dioicum*), Riverbank Grape (*Vitis riparia*), Spotted Jewelweed, Enchanters Nightshade, Deadly Nightshade, Fringed Loosestrife, Ostrich Fern, Lady Fern, Water Horsetail (*Equisetum fluviatile*), Wild Mint, Cursed Buttercup, Graceful Sedge, Bedstraw, Awl-fruited sedge, Tuckerman's Sedge (*Carex tuckermanii*), Nodding Sedge and Marsh Marigold (*Caltha palustris*).

Black Ash Mineral Deciduous Swamp Type (SWD2-1)

Wetland Unit 5 is similar in composition to wetland unit 4 (SWD3-1) except this unit also contains black ash, along with Red Maple and White Elm. The early spring standing water (vernal pool) was dry by May 25, 2014, and the saturated muck soils supported only patches of sensitive fern.

White Cedar-Hardwood Mineral Mixed Swamp Type (SWM1-1)

Eastern White Cedar is a co-dominant in these features along with Trembling Aspen. Associated woody vegetation includes Balsam Poplar (*Populus balsamifera*), White Elm, Basswood, dogwoods, Red Maple, Eastern Hemlock, Yellow Birch, Black Ash, White Spruce, willow shrubs, Red-berried Elder, Common Elderberry and Winterberry (*Ilex verticillata*). The groundcover contained similar species and composition to those found in other mixed treed swamps.

Duckweed Floating-Leaved Shallow Aquatic Type (SAF1-3)

This feature consists of an abandoned beaver pond. There is permanent flow and seepage from a tributary/creek that drains through the on-line beaver pond and into the bay. The pond contains stagnant water at times, with no aquatic plants, with a sparse mat of Common Duckweed when there is stagnant water; otherwise the substrate is saturated muck soils. It is an inclusion within the upland forest FOD5-9, adjacent to the bay.

Red Maple-Conifer Mineral Mixed Swamp Type (SWM2-1)

A relatively large block of Red Maple-Eastern White Cedar swamp is situated along the west edge of Nichols Cove Road, and contains a portion of the permanently flowing tributary/creek that drains southwest to the beaver pond. Other woody associates include Trembling Aspen, Balsam Poplar, Eastern Hemlock, White Spruce, White Elm and dogwoods.

The groundcover contained similar species and composition to those found in other mixed treed swamps.

Willow Organic Thicket Swamp (SWT3-2)/Red-osier Organic Thicket Swamp Type (SWT3-5)

This wetland unit consists of a large block of shrub thicket swamp dominated by willows and Red-osier Dogwood with an old breached beaver dam at its downgradient western edge. Willow species include Pussy Willow (*Salix discolor*), Missouri Willow (*Salix eriocephala*), Bebb's Willow (*Salix bebbiana*), White Willow (*Salix alba*) and Slender Willow (*Salix petiolaris*). Red-osier Dogwood and Alternate-leaved dogwood are the other co-dominant shrubs. Other woody species include Red Maple, Meadowsweet, Winterberry and Red-berried elder.

The lush groundcover is comprised of typical species such as Broad-leaved Cattail, Sensitive Fern, Lady Fern, Ostrich Fern, Royal Fern (*Osmunda regalis*), Boneset, Spotted Jewelweed, Reed Canary Grass (*Phalaris arundinacea*), Water Horehound, Fringed Loosestrife, Purple-stemmed Aster, Swamp Milkweed, Nodding Sedge, Canada Blue-joint Grass, Tussock Sedge, Blue Flag, Bedstraw, Swamp Candle, Purple Loosestrife, Marsh Fern, Swamp Milkweed, Wild Mint and Bulb-bearing Water Hemlock (*Cicuta bulbifera*).

White Cedar – Hardwood Organic Mixed Swamp Type (SWM4-1)

This wetland feature consists of a large block of eastern white cedar and hardwoods. Woody associates include Red Maple, Eastern Hemlock, Yellow Birch, Black Ash, White Elm, Red-osier dogwood, Trembling Aspen, White Spruce, Willow Shrubs, Red-berried elder, Common Elderberry and Winterberry.

Pondweed Mixed Shallow Aquatic Type (SAM1-4)

The entire bay is characterized as a pondweed mixed shallow aquatic, dominated equally by floating-leaved and submergent aquatic plant species. This feature qualifies as wetland, as the average water depth to organics is approximately 1 m and the bay is filled with a dense mat of aquatic vegetation, namely pondweeds and water lilies. The depth of the organics to bedrock ranges from 0.5 to 1.0 m. At the mouth of the bay with Pigeon Lake the water depth increases beyond 2.0 metres and there is a dearth of floating-leaved and submergent aquatic plant species.

4.2 Flora

A list of the vascular plant species found on the subject property and adjoining lands is provided in **Appendix C**. Of the species documented, 106 are non-native to Ontario and six are native to Ontario but not to the municipality (as per assessment by CEA shown in **Appendix C**). The forest communities have a relatively high diversity in terms of structure (e.g., trees of mixed ages) and species composition.

With the exception of Butternut (*Juglans cinerea*; see Section 4.9), none of the plant species found during the 2014 site inventories are considered or designated significant or rare on either a national, provincial or regional level.

4.3 Drainage Features

There are three drainage features that connect the wetland feature in the northeast corner of the subject property to the north side of the Bay (**Figure 2**).

Drainage Feature 1 is a narrow (<0.5m wide), poorly defined channel that connects with the north side of Buffalo Bay. A beaver dam is present on this feature not far from the shoreline (**Appendix D**). Trickle flow was observed by Azimuth in this feature on July 10, 2014. Based on these characteristics Drainage Feature 1 would be considered intermittent.

Drainage Feature 2 has a steep gradient and is considered intermittent. Drainage Feature 3 is also considered to be intermittent.

4.4 Fish Habitat

As per the assessment by Azimuth, Drainage Feature 1 does not provide direct fish habitat due to its small channel size and steep gradient. It would, however, be considered seasonal, indirect fish habitat as it provides nutrients to the fish habitat in Buffalo Bay. Neither Drainage Feature 2 nor Drainage Feature 3 provide direct fish habitat, but similar to Drainage Feature 1 can be considered to provide nutrients to fish habitat in Buffalo Bay.

Buffalo Bay is a protected bay that goes back approximately 300 m from the main basin of Pigeon Lake. The entrance to the bay is approximately 60 m wide. Maximum water depth is 1.5 m and average water depth in the bay is 1 m. The substrate through the bay consists of a thick (~1 m) layer of muck (detritus). The bay is densely vegetated by aquatic macrophytes with only small pockets of open water (**Appendix D**).

On July 10, 2014 approximately 30% of the bay was open water, 40% sparsely vegetated and 30% densely vegetated. The aquatic macrophyte community is diverse with at least 12 species, including: White Water-lily (*Nymphaea odorata*), Bulhead Pond-lily (*Nuphar variegata*), Sago Pondweed (*Potamogeton pectinatus*), Curly Pondweed (*Potamogeton crispus*), Richardson's Pondweed (*Potamogeton richardsonii*), Slender Pondweed (*Potamogeton pusillus*), Common Duckweed, Alternate-leaved Water Milfoil (*Myriophyllum alterniflorum*), Common Coontail (*Ceratophyllum demersum*), Common Arrowhead (*Sagittaria latifolia*), Pickerel Weed (*Pontederia cordata*), and Broad-leaved Cattail.

The Bay provides shallow fish habitat with dense macrophyte growth and abundant woody structure (i.e., fallen trees along the shoreline and submerged logs throughout; **Appendix D**). Woody structure and dense aquatic macrophytes provide ample cover for sunfishes (Centrarchids) and minnows (Cyprinids). The substrate consists of fines (muck) and provides little structure or cover for fish.

4.5 Amphibians

Breeding amphibian call count surveys were conducted in 2014.

Call count surveys revealed the presence of a number of frog (anuran) species breeding on the subject property. Species documented in order of abundance and distribution are as follows: Wood Frog (*Lithobates sylvaticus*), Spring Peeper (*Pseudacris crucifer*), Green Frog (*Lithobates clamitans*), American Bullfrog (*Lithobates catesbeiana*), Gray Treefrog (*Hyla versicolor*), Northern Leopard Frog (*Lithobates sylvatica*), Mink Frog (*Lithobates septentrionalis*) and Western Chorus Frog (*Pseudacris triseriata*).

American Toad (*Anaxyrus americanus*) and Red-backed Salamander (*Plethodon cinereus*) were also observed.

All of the amphibians encountered is expected given the physical characteristics (e.g., numerous wetlands and woodland pools) on the subject property.

4.6 Reptiles

Turtle basking surveys as well as incidental observations during fieldwork resulted in the observation of the following turtle species: Blanding's Turtle, Northern Map Turtle (*Graptemys geographica*), Snapping Turtle (*Chelydra serpentina*) and Midland Painted Turtles (*Chrysemys picta marginata*). Northern Watersnake (*Nerodia sipedon*) and Eastern Gartersnake (*Thamnophis sirtalis*) were observed during the course of fieldwork. Given the physical characteristics of Buffalo Bay it is also possible that Eastern Musk Turtle (*Sternotherus odoratus*) is present.

Given the physical characteristics on the subject property it is likely that Eastern Ribbonsnake (*Thamnophis sauritus*) is present; however, the high vegetation cover on the rock barrens and other canopy openings suggest that Five-lined Skink (*Plestiodon fasciatus*) and Milksnake (*Lampropeltis triangulum*) are unlikely to occur on the subject property. Similarly, the relatively infrequent and highly vegetated rock barrens on the subject property suggest that Eastern Hog-nosed Snake (*Heterodon platirhinos*) is unlikely to use areas of the subject property as nesting habitat; however, the wide-ranging movements of this species make it possible for individuals to occasionally move through the area.

4.7 Breeding Birds

All of the bird species documented during dawn, marsh and nocturnal surveys are listed in **Appendix E**.

Fifty-five bird species showed evidence of breeding on and adjacent to the subject property. Two species designated Special Concern in Ontario were observed on the property: Eastern Wood-pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*). Two species considered regionally rare in Site Region 6 by the MNRF (2013a) showed evidence of breeding on the property: Blue-headed Vireo (*Vireo solitarius*) and Bay-breasted Warbler (*Setophaga castanea*). The woodland habitats of the Buffalo Bay shoreline provide habitat for all four of these bird species of conservation concern.

The forest communities of the property function as breeding habitat for a number of bird species listed as area sensitive by the MNRF (2000; 2015). In general, bird species considered to be area sensitive exhibit higher reproductive success in habitats with little or no fragmentation. For example, species that breed in forests/woodlands and are considered area sensitive will have higher reproductive success when their breeding territories are located greater than 100 m from woodland edges. These edges are often created by roads and other development activities, but can also be the result of a natural transition to non-woodland communities such as prairie or rock barrens. The ecological communities on the subject property are relatively undisturbed and contiguous with wetland and forest communities to the north; as such, the habitat for the area sensitive bird species that are forest breeders is relatively high quality.

The results of the nocturnal bird surveys indicate that Eastern Whip-poor-will is possibly breeding on lands northeast of the subject property. The surveys conducted by Azimuth indicate that the closest vocalizing males were > 110 m from the subject property and no vocalizing males were documented on the subject property. Based on the location of the southernmost RPC Station used by Azimuth along the easternmost extent of the subject property abutting Nichols Cove Road, it is Beacon's opinion that the surveys conducted were adequate to conclude that breeding by Eastern Whip-poor-will on the subject property is unlikely. This is based on the observation that Whip-poor-will vocalizations can be

detected from a distance of approximately 300 m, and the absence of suitable openings in the forest canopy on the western half of the subject property (i.e., negligible habitat potential).

4.8 Mammals

Appendix F shows the mammals observed on or adjacent to the subject property during the course of fieldwork.

Winter deer-yard surveys were completed in 2014 and indicated that White-tailed Deer (*Odocoileus virginianus*) were using portions of the subject property as wintering habitat. Field data confirmed that portions of the subject property and adjacent lands are accurately mapped as part of a large deer wintering area as shown in Schedule "B1" (**Appendix A**). The relative abundance of deer varied across the property but all areas of the property function as part of the Deer Yard. Highest levels of abundance were noted in association with the cedar conifer cover located on lands northwest of the subject property.

4.9 Species at Risk

Several SAR were determined to have habitat, or be present, on the subject property and adjoining lands. A number of these species were identified in the screening letter provided by the MNRF to Azimuth (**Appendix B**); however, additional species have been added to the SARO list or have been recognized as requiring assessment since the screening letter was provided (e.g., see discussion in Section 3.3 regarding bats). These additional species were considered by Beacon alongside the SAR originally identified and this evaluation is provided in **Table 2**. The provincial conservation status of two species identified in the MNRF screening letter, Eastern Musk Turtle (*Sternotherus odoratus*) and Flooded Jellyskin (*Leptogium rivulare*), changed to special concern and not at risk respectively. These changes are reflected in **Table 2**.

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Table 2. SAR Summary

Common Name	Scientific Name	Rationale for Considering Species as Potentially Occurring in Area of Interest	Habitat and/or Species Confirmed During On-site Assessment or Likely To Be Present Based on Site-specific Attributes (e.g., Ecological System and Landscape Configuration) Assessed from Aerial Photography and Other Information Sources	
			Subject Property	**Adjacent Lands**
Endangered & Threatened (Provincially): status from Species at Risk in Ontario List (O Reg 230/08); updated June 15, 2016				
Blanding's Turtle	*Emydoidea blandingii*	List of potential species provided by local MNRF office	YES, suitable wetlands are present and rock barrens adjacent to suitable wetland communities are present.	YES, three individuals of species documented basking in Buffalo Bay.
Eastern Hog-nosed Snake	*Heterodon platirhinos*	List of potential species provided by local MNRF office	YES, the mosaic of rock barrens and forest communities have the potential to function as habitat; no areas have a higher likelihood of use.	YES, the mosaic of rock barrens and forest communities have the potential to function as habitat; no areas have a higher likelihood of use.
Eastern Whip-poor-will[a]	*Antrostomus vociferus*	List of potential species provided by local MNRF office	NO, although areas with the physical characteristics necessary to function as habitat are present, these areas are not currently being used—as determined by surveys conducted during the breeding season.	NO, although areas with the physical characteristics necessary to function as habitat are present, the closest vocalizing males were > 900 m from subject property—as determined by surveys conducted during the breeding season.
Bobolink	*Dolichonyx oryzivorus*	List of potential species provided by local MNRF office	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.
Cerulean Warbler[a]	*Setophaga cerulea*	List of potential species provided by local MNRF office	NO, species detected during morning breeding bird surveys.	NO, species detected during morning breeding bird surveys.
Least Bittern[a]	*Ixobrychus exilis*	List of potential species provided by local MNRF office	NO, species not detected during targeted breeding bird surveys.	NO, species not detected during targeted breeding bird surveys.
Chimney Swift[a]	*Chaetura pelagica*	List of potential species provided by local MNRF office	Possible, trees suitable for nesting may be present; however, species was not detected during breeding bird surveys.	Possible, trees suitable for nesting may be present; however, species was not detected during breeding bird surveys.
Bank Swallow	*Riparia riparia*	Ontario Breeding Bird Atlas	NO, man-made or natural structures suitable for nesting are absent.	NO, man-made or natural structures suitable for nesting are absent.
Barn Swallow	*Hirundo rustica*	Ontario Breeding Bird Atlas	NO, man-made or natural structures suitable for nesting are absent.	NO, man-made or natural structures suitable for nesting are absent.
Eastern Meadowlark	*Sturnella magna*	List of potential species provided by local MNRF office	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.
Little Brown Myotis	*Myotis lucifugus*	Range map	YES, trees with the physical characteristics necessary to qualify as habitat for Little Brown Myotis are present; species is potentially present.	YES, the forest communities present have the potential to support the types of features necessary to qualify as habitat.
Northern Myotis	*Myotis septentrionalis*	Range map	YES, trees with the physical characteristics necessary to qualify as habitat for Northern Myotis are present; species is potentially present.	YES, the forest communities present have the potential to support the types of features necessary to qualify as habitat.
Eastern Small-footed Myotis	*Myotis leibii*	Range map; although substantial uncertainty regarding species distribution in Ontario	YES, trees with the physical characteristics necessary to qualify as habitat for Eastern Small-footed Myotis are present; species is potentially present.	YES, the forest communities present have the potential to support the types of features necessary to qualify as habitat.
Tri-colored Bat	*Perimyotis subflavus*	Range map	YES, trees suitable for roosting may be present.	YES, trees suitable for roosting may be present.
American Ginseng	*Panax quinquefolius*	List of potential species provided by local MNRF office	NO, species not documented during botanical inventories.	NO, species not documented during botanical inventories.
Butternut	*Juglans cinerea*	List of potential species provided by local MNRF office	NO, species not documented during botanical inventories.	YES, species observed; however, trees are > 800 m from subject property.
Mottled Duskywing	*Erynnis martialis*	List of potential species provided by local MNRF office	NO, species' host plants not documented during vascular plant surveys.	NO, species' host plants not documented during vascular plant surveys.
Endangered or Threatened Nationally but either Not at Risk in Ontario or still to be assessed: status from either Schedule 1 of the *Species at Risk Act* or recent assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)				
Western Chorus Frog	*Pseudacris triseriata*	Range map	YES, species documented during amphibian surveys.	YES, species documented during amphibian surveys.
Special Concern (Provincially): status from Species at Risk in Ontario List (O Reg 230/08); updated June 15, 2016				
Eastern Musk Turtle	*Sternotherus odoratus*	List of potential species provided by local MNRF office	NO, suitable wetland and/or aquatic communities are absent.	YES, suitable wetland and/or aquatic communities are present.
Northern Map Turtle	*Graptemys geographica*	Range map	YES, rock barrens adjacent to suitable wetland and/or aquatic communities are present.	YES, individuals of species documented basking in Buffalo Bay.
Snapping Turtle	*Chelydra serpentina*	List of potential species provided by local MNRF office	YES, suitable wetland and/or aquatic communities are present.	YES, suitable wetland and/or aquatic communities are present. Individual of species observed.
Eastern Ribbonsnake	*Thamnophis sauritus*	List of potential species provided by local MNRF office	YES, open shoreline fronting on aquatic and/or wetland community is present.	YES, open-canopy areas adjacent to wetlands are present.

Common Name	Scientific Name	Rationale for Considering Species as Potentially Occurring in Area of Interest	Habitat and/or Species Confirmed During On-site Assessment or Likely To Be Present Based on Site-specific Attributes (e.g., Ecological System and Landscape Configuration) Assessed from Aerial Photography and Other Information Sources	
			Subject Property	**Adjacent Lands**
Five-lined Skink	*Plestiodon fasciatus*	List of potential species provided by local MNRF office	NO, open-canopy communities are predominantly vegetated and hence unlikely to function as habitat.	NO, open-canopy communities are predominantly vegetated and hence unlikely to function as habitat.
Wood Thrush	*Hylocichla mustelina*	Ontario Breeding Bird Atlas	YES, species was detected during morning breeding bird surveys.	YES, species was detected during morning breeding bird surveys.
Eastern Wood-Pewee	*Contopus virens*	Ontario Breeding Bird Atlas	YES, species detected during morning breeding bird surveys.	YES, species detected during morning breeding bird surveys.
Grasshopper Sparrow	*Ammodramus savannarum*	Ontario Breeding Bird Atlas	NO, species not detected during morning breeding bird surveys.	NO, species not detected during morning breeding bird surveys.
Olive-sided Flycatcher[a]	*Contopus cooperi*	Ontario Breeding Bird Atlas	NO, species not detected during morning breeding bird surveys.	NO, species not detected during morning breeding bird surveys.
Canada Warbler[a]	*Cardellina canadensis*	List of potential species provided by local MNRF office	NO, species not detected during morning breeding bird surveys.	NO, species not detected during morning breeding bird surveys.
Common Nighthawk[a]	*Chordeiles minor*	Ontario Breeding Bird Atlas	NO, species not detected during breeding bird surveys.	NO, species not detected during breeding bird surveys.
Red-headed Woodpecker[a]	*Melanerpes erythrocephalus*	Ontario Breeding Bird Atlas	NO, species not detected during morning breeding bird surveys.	NO, species not detected during morning breeding bird surveys.
Golden-winged Warbler[a]	*Vermivora chrysoptera*	Ontario Breeding Bird Atlas	NO, species not detected during morning breeding bird surveys.	NO, species not detected during morning breeding bird surveys.
Black Tern	*Chlidonias niger*	Ontario Breeding Bird Atlas	NO, species not detected during breeding bird surveys.	NO, species not detected during breeding bird surveys.
Bald Eagle	*Haliaeetus leucocephalus*	Ontario Breeding Bird Atlas	NO, nests of species not observed.	NO, nests of species not observed.
Monarch	*Danaus plexippus*	Range map	YES, Milkweed (Asclepias syriaca) is present; therefore, there are areas that could function as suitable breeding and foraging habitat.	YES, Milkweed (Asclepias syriaca) is present; therefore, there are areas that could function as suitable breeding and foraging habitat.
West Virginia White	*Pieris virginiensis*	Range map	Possible, the species' host plant, Two-leaf Toothwort (Cardamine diphylla) is present in the groundcover of the wooded areas; however, it is unknown whether the species is present in area.	Possible, the species' host plant, Two-leaf Toothwort (Cardamine diphylla) is present in the groundcover of the wooded areas; however, it is unknown whether the species is present in area.
Special Concern Nationally but either Not at Risk in Ontario or still to be assessed: status from either Schedule 1 of the *Species at Risk Act* or recent assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)				
Milksnake	*Lampropeltis triangulum*	List of potential species provided by local MNRF office	NO, open-canopy communities are predominantly vegetated and hence unlikely to function as habitat.	NO, open-canopy communities are predominantly vegetated and hence unlikely to function as habitat.
Flooded Jellyskin	*Leptogium rivulare*		YES, species may be present as surveys were not conducted.	YES, species may be present as surveys were not conducted.

[a]Bird species protected by the *Migratory Birds Convention Act* that are also Listed in Schedule 1 of the federal SARA.

5. Proposed Development

The proponent is proposing 16 lot Plan of Residential Subdivision with a single connection to Nichols Cove Rd and a cul-de-sac at the western end of the subdivision as shown in **Figure 3**. The proposed lots range from 0.34 to 0.50 ha with lot frontages of 45 m, as required by the Municipality's Comprehensive Zoning By-law (EcoVue 2016). The lots are to be serviced by individual on-site sewage and water systems. According to Schedule A1, the lands within which the subject property occurs are designated "Recreational Dwelling Area".

The proposed recreational dwellings are intended to appeal to an upscale market, seeking a quiet, passive or low impact recreational lifestyle in a secluded, yet easily accessible area of the Kawartha Lakes. Fishing and canoeing/kayaking opportunities are associated with the bay itself. A series of low impact nature trails suitable for hiking, trail biking and birdwatching are proposed adjacent to the private lots.

No private docks will be permitted, and two community docks are proposed but are not addressed in this EIS. The individual lots and common docking areas will be accessed *via* the privately owned and maintained road. There is no dredging proposed as part of this project.

The development plan includes a 30 m buffer from the high water mark of Buffalo Bay. The lots will be located beyond the 30 m buffer. The lands within the buffer will either be included as a conservation block with a common elements condominium that also includes the docking areas and private road or they will be assigned to a conservation easement and transferred to a third party to enhance long-term protection. The intent is for the lands within the 30 m buffer to be managed to protect the natural waterfront character, maintain tree cover and minimize the likelihood of adverse effects on species of conservation concern.

6. Impact Assessment and Recommendations

The following section provides a description of impacts anticipated as a result of the proposed development and identifies mitigation and compensation measures to be implemented to avoid and/or minimize adverse effects of the project.

To assess potential impacts associated with the various components of the proposed development and to evaluate their effect on the physical and biological environment, we have prepared an impact assessment matrix. The matrix is presented in **Table 3** and includes a description of the anticipated impacts, mitigation recommendations, as well as the predicted net impact or residual effect.

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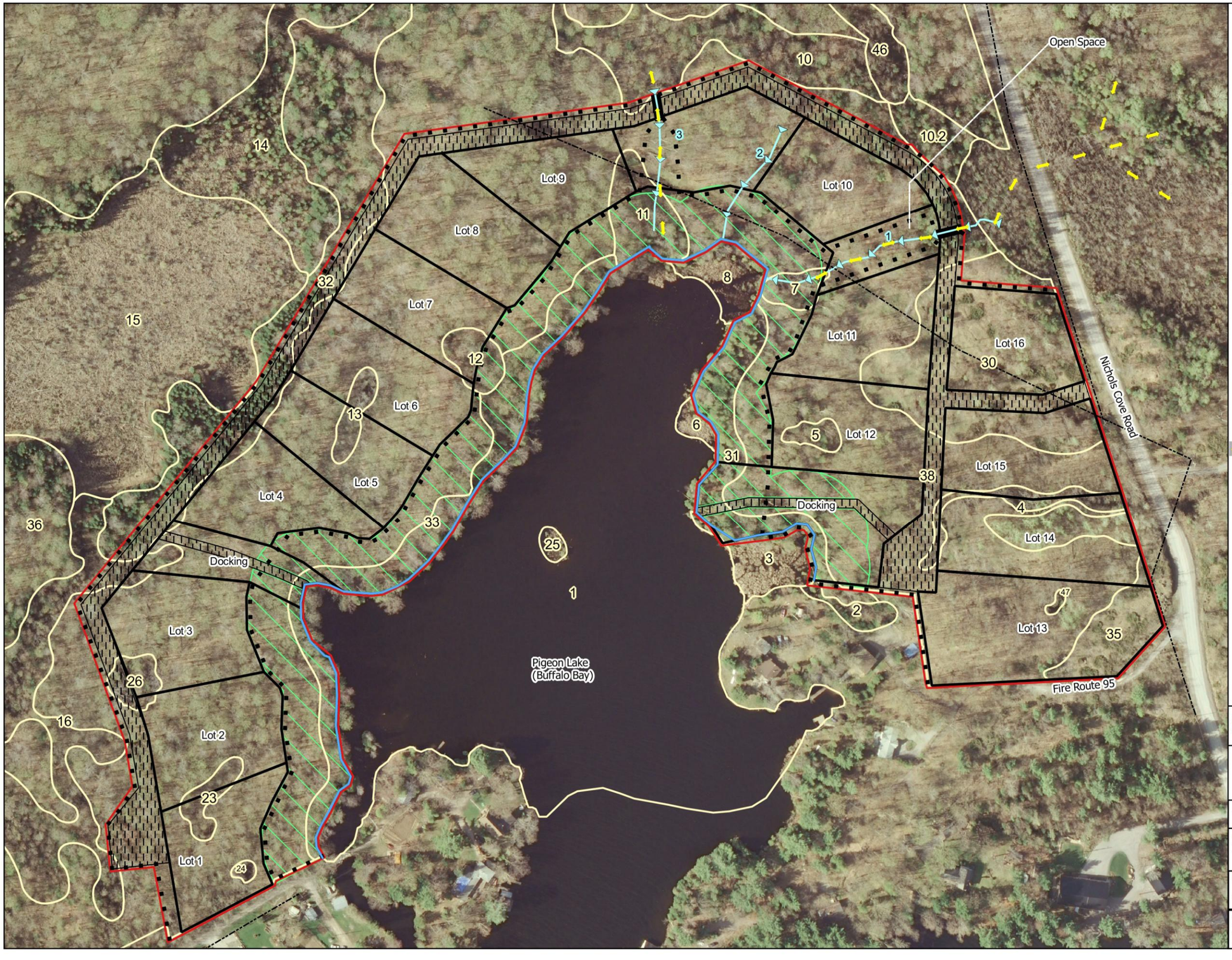

Legend

Boundaries

- Subject Property (Part of Lot 17, Conc 14)

Features from Aug 7, 2014 Topo Survey (Coe, Fisher, Cameron; OLS)

- Overhead Wire
- Water's Edge at 246.05 mASL (High Water Mark to be determined)
- Drainage

Natural Features

- ELC Communities (Based on Evaluation Completed by Cunningham Environmental Associates in 2014; Minor Refinements by Beacon)

Proposed Development

- Proposed Lot Layout
- Proposed Road Layout

Mitigation Measures

- Road Crossing Structure for Blanding's Turtle
- Barrier Fencing for Turtles
- 30 m Buffer
- Turtle Movement Paths: Facilitated by Fencing and Crossing Structures

BEACON ENVIRONMENTAL

August 2016

N

1:2,100

0 30 60 m

Client: 2394735 Ontario Inc.

Location: Part Lot 17, Concession 14, Municipality of Trent Lakes, County of Peterborough

Orthophoto Baselayer: spring 2008
(First Base Solutions Web Mapping Service)

Figure 3. Proposed Development and Mitigation Measures.

Table 3. Impact Assessment Matrix

Feature or Function	Potential Impact to Natural Features & Functions	Recommended Mitigation & Enhancement	Residual Effect
Blanding's Turtle	The proposed development has been deemed by the MNRF to have the potential to adversely affect Blanding's Turtle (both individuals of the species and its habitat). As such, a number of avoidance, mitigation and overall benefit measures have been proposed in a 17(2)(c) (overall benefit) ESA permit that has been submitted to the MNRF. These measures, which are described in detail in the permit application are summarized in the Recommended Mitigation & Enhancement column to the right.	• Initial development of construction access road to be completed during winter (inactive seasons) to avoid potential mortality or harm to individuals • Erosion control and sediment fencing will be installed prior to any on-site disturbance • Standard procedures for erosion and sedimentation control will be implemented along the length of the installation • SAR training will be provided for the contractors on site • Response protocols for handling turtles encountered during placement of barriers will follow best practices • Construction of barriers to occur during species-specific timing windows • Selective removal of vegetation with particular attention to avoidance of mature trees • Replanting/reseeding of native vegetation following installation of barriers • Stockpiles will be located within areas from which turtles have been excluded and also outside of areas identified as having habitat potential for Blanding's Turtle • A combination of permanent barriers and temporary exclusion fencing when required to ensure full exclusion, will be used to minimize the likelihood of adverse effects on Blanding's Turtle when (1) roads are being graded, filled or surfaced, (2) site alteration on lots is occurring, (3) communal docks are being constructed (i.e., Blanding's Turtles will be prevented from accessing areas where activities will be occurring) Permanent measures include: • Establishment and maintenance of a 30 m buffer from the high water mark of Buffalo Bay • Installation of specialized barrier walls/fencing for Blanding's Turtle along the 30 m shoreline buffer and along both sides of movement corridors (note: specifications for the barrier walls/fencing to be determined through the ESA permitting process) • Installation of culverts/road crossing structures for turtles within the right-of-way of the internal road to ensure safe movement of individuals through movement corridors (note: specifications for the road crossing structures to be determined through the ESA permitting process) • Installation of turtle crossing signage in strategic locations within subdivision	Adverse effects include loss of habitat and potential alteration of movement patterns. The overall benefit permit being sought under the ESA from MNRF would compensate for these residual effects.
Eastern Hog-nosed Snake	For species that move over long distances such as the Eastern Hog-nosed Snake, any development of roads has the potential for adverse effects via direct mortality on the roads as a result of their use by motor vehicles. For the proposed development, the mitigation measures recommended for Blanding's Turtle, specifically barrier walls/fencing, road crossing structures and SAR training make the likelihood of adverse effects on Eastern Hog-nosed Snake acceptably low.	• None; however, species will benefit from mitigation for Blanding's Turtle	Acceptably Low; avoidance as per ESA requirements is achievable
Bats The proposed development was originally deemed by MNRF to not require permitting under the ESA with respect to potential adverse effects on endangered bat species or their habitat under the ESA. However, as indicated in Section 3.3, recent correspondence from the MNRF (March 2016) has recommended that surveys be conducted for bats following MNRF's Guidelines for Bats and Bat Habitats. As per the assessment provided in **Table 2**, there is forest present on the subject property with the physical characteristics to qualify as habitat for the bat species that are subject to the ESA.	Unknown	• Site alteration (i.e., felling of trees, clearing, etc.) should not occur on the subject property until the requirements of MNRF and the ESA are understood and addressed	Unknown

Feature or Function	Potential Impact to Natural Features & Functions	Recommended Mitigation & Enhancement	Residual Effect
Shoreline or Shoreland Area	The 30 m buffer from the high water mark will substantially reduce the likelihood of sensitive shoreline features and functions from being negatively affected by the development of recreational dwellings on the subject property. Installation of the communal docking facilities and boat launches will initially have adverse effects on upland and wetland vegetation and use of the facilities by boats will have some impacts on aquatic vegetation and possibly alter the behaviour of wildlife, at least in the areas of high boat traffic.	The following general mitigation strategies are recommended to protect the Bay from indirect effects that may result from construction activities, or upon completion of construction: • A sedimentation and erosion control plan should be developed as condition of draft plan approval. Sediment and erosion controls (silt fence) as described in the approved siltation and erosion control plan, should be installed and maintained throughout the duration of the development. All sediment and erosion control should be monitored during construction activities to ensure a protective barrier to sedimentation between any exposed excavations and Pigeon Lake • Avoid and/or halt clearing and construction during periods of heavy precipitation and runoff to minimize soil disturbance	Minor impacts on vegetation and wildlife in the communal docking/boat launch areas
Fish Habitat	Fish habitat identified within Buffalo Bay is unlikely to be adversely affected given the 30 m vegetative buffer and proposed communal docking. The 30 m vegetated buffer should be sufficient to prevent any impacts related to nutrients (e.g., phosphorous) from sewage treatment systems. Additionally, the buffer should be sufficient to protect fish habitat along the shoreline in general and spawning habitat for Muskellunge (*Esox masquinongy*), and is consistent with the shoreline buffers usually recommended by MNRF.	To ensure that fish habitat is not adversely affected by the placement of in-water structures, the following measures are recommended: • A detailed workplan for any in-water and shoreline works be submitted to Parks Canada following the project guidelines that apply to the federally regulated Trent-Severn Waterway (see http://www.pc.gc.ca/docs/r/poli/page01.aspx) • All in-water habitat features, including aquatic vegetation, natural woody debris, and boulders be left in their current locations in the nearshore area	Neutral
Wetlands There are no Provincially Significant Wetlands (PSWs) on or adjacent to the property. Unevaluated wetlands have been identified on the subject property and on lands to the north and west.	A number of small wetlands and small extensions of larger wetlands will be lost to lot and road development as shown in **Figure 3**. The wetlands that will be lost range in size from 79–958 m^2 and total 4769 m^2 (0.48 ha). As identified on **Figures 2** and **3**, the wetland types as per ELC that will be lost are: SWD2-1: Black Ash Mineral Deciduous Swamp Type SWD2-1: Black Ash Mineral Deciduous Swamp Type SWD4-3: White Birch - Poplar Mineral Deciduous Swamp Type	• Use best management practices to ensure that no damage is inflicted upon wetlands and trees that are being retained adjacent to the construction area • Design and plan the development of roads, utilities and building sites with as little soil excavation and disturbance as possible • Physically delineate the limits of clearing and construction with flagging or staking, ahead of construction, to avoid unnecessary disturbance to the surrounding vegetation • Re-vegetate/protect exposed areas and bare soils immediately after construction • Plan seeding and plantings using native species, to allow establishment before end of growing season • Minimize the removal and disturbance of vegetation outside of development envelopes • Use mulches and other organic stabilizers to minimize erosion until vegetation is established on sensitive soils	Loss of some wetland functions related to non-PSWs; loss of function is relatively minor given the size and type of the wetlands
Woodlands (forest communities) It is Beacon's understanding that neither the County of Peterborough, nor the Municipality of Trent Lakes has identified any areas of Significant Woodland on lands within their jurisdiction (EcoVue 2016).	The proposed land use changes will result in the felling of both deciduous and coniferous trees, and vegetation will be removed or substantially modified within the development footprint as follows: All vegetation within the road footprint will be removed and this is equivalent to approximately 1.32 ha of forest. If approximately one third of each lot is cleared for development (e.g., driveway, primary residence, secondary buildings) then approximately 1.81 ha of forest will be removed from the subject property for lot development. Thus, total forest removal is approximately 3.13 ha. Removal of these areas will have adverse effects on the forest/woodland through direct loss of the trees, shrubs and ground cover, as well as indirect loss of ecological function (e.g., areas of interior forest habitat will be replaced with edge habitat and fragmentation effects will increase). Indirect effects also include increased wind throw events and edge effects.	• Use best management practices to ensure that no damage is inflicted upon trees that are being retained adjacent to the construction area • Design and plan the development of roads, utilities and building sites with as little soil excavation and disturbance as possible • Physically delineate the limits of clearing and construction with flagging or staking, ahead of construction, to avoid unnecessary disturbance to the surrounding vegetation • Re-vegetate/protect exposed areas and bare soils immediately after construction • Plan seeding and plantings using native species, to allow establishment before end of growing season • Minimize the removal and disturbance of vegetation outside of development envelopes • Use mulches and other organic stabilizers to minimize erosion until vegetation is established on sensitive soils	Loss of some woodland and ecological functions related to direct loss, disturbance, and fragmentation effects

Feature or Function	Potential Impact to Natural Features & Functions	• Recommended Mitigation & Enhancement	Residual Effect
Other Upland Communities	The proposed land use changes will result in clearing of vegetation from upland communities such as rock barrens within the development footprint. Consequently, the ecological function of these areas will be negatively affected.	• Use best management practices to ensure that no damage is inflicted upon trees that are being retained adjacent to the construction area • Design and plan the development of roads, utilities and building sites with as little soil excavation and disturbance as possible • Physically delineate the limits of clearing and construction with flagging or staking, ahead of construction, to avoid unnecessary disturbance to the surrounding vegetation • Re-vegetate/protect exposed areas and bare soils immediately after construction • Plan seeding and plantings using native species, to allow establishment before end of growing season • Minimize the removal and disturbance of vegetation outside of development envelopes • Use mulches and other organic stabilizers to minimize erosion until vegetation is established on sensitive soils	Loss of some upland functions
Surface Water Drainages	None of the three intermittent, drainage features on the subject property function as direct fish habitat. Flow, sediment and nutrients transported by the intermittent features towards the Bay contributes to fish habitat present in Pigeon Lake. Their flows and functions are to be retained within proposed movement corridors for Blanding's Turtle.	• Pre-development drainage patterns should be maintained to the extent possible to ensure maintenance of flow regimes	Neutral
Seeps and springs (Groundwater Flow Patterns)	Often, grading and servicing can affect shallow groundwater resources by interfering with natural groundwater flow patterns. Evidence of seepage or discharge conditions on the site was observed within 30 m of the shoreline of Buffalo Bay. Thus, negative impacts on these features are not anticipated.	• Same as fish habitat and wetlands	Neutral
Breeding Birds	Because of the forest/woodland loss detailed above, adverse impacts on breeding birds will be largely restricted to species that breed in forests. Both direct (i.e., loss of trees used for nesting) and indirect impacts resulting from edge and fragmentation effects, as well as from increased disturbance levels will occur. Birds affected may move their breeding areas and/or experience decreased reproductive success.	• Site alteration (i.e., felling of trees, clearing, etc.) should not occur on the subject property from mid-April through August, as this time corresponds to the peak nesting period for the majority of bird SAR and encompasses the breeding season for the species being considered here	Direct loss of breeding habitat for forest breeding species and/or decreased function of the remaining habitat
Significant Wildlife Habitat: <u>Seasonal Concentration Areas of Animals</u> Based on the Municipality's Official Plan, the deer wintering area mapped in Schedule B1 (**Appendix A**) may be identified as significant wildlife habitat. With regard to overwintering habitat for turtles (Blanding's Turtle considered separately), Buffalo Bay would qualify as significant wildlife habitat based on the criteria in MNRF's (2015) schedules. However, this type of significant wildlife habitat has not been identified within the municipality.	Any areas where wildlife congregates has the potential to be negatively affected by increased human activity. After the field-based assessment, it is evident that although portions of the subject property are used by deer during the winter, the highest concentration of deer activity was northwest of the proposed development area. This factor combined with the 30 m vegetative buffer along the shoreline and the size of the lots make it likely that there will be no negative impacts on the feature or its ecological function.	• None	Neutral

Feature or Function	Potential Impact to Natural Features & Functions	• Recommended Mitigation & Enhancement	Residual Effect
Significant Wildlife Habitat: <u>Rare Vegetation Communities or Specialized Habitat for Wildlife</u> No rare vegetation communities were documented. A number of area sensitive woodland breeding birds were identified as likely breeding on or adjacent to the subject property. Based on the criteria in MNRF's (2015) schedules, there are areas of the subject property that would qualify as significant wildlife habitat because of use by area sensitive birds that breed in woodlands. However, this type of significant wildlife habitat has not been identified within the municipality. A number of frog species were documented breeding within woodland pools and wetlands on and adjacent to the subject property. Although Buffalo Bay and one additional wetland on lands adjacent to the subject property would qualify as significant wildlife habitat based on the criteria in MNRF's (2015) schedules, this type of significant wildlife habitat has not been identified within the municipality.	See Breeding Birds above	• None	---
Significant Wildlife Habitat: <u>Habitat for Species of Conservation Concern (not including endangered or threatened species)</u> Two bird species designated special concern on the SARO list were identified as likely breeding on or adjacent to the subject property (Eastern Wood-Pewee and Wood Thrush) and two species considered to be regionally rare in Site Region 6 by the MNRF (2013a) showed evidence of breeding on the property: Blue-headed Vireo and Bay-breasted Warbler. Based on the criteria in MNRF's (2015) schedules, there are areas of the subject property that would qualify as significant wildlife habitat because of use by these species during the breeding season. However, this type of significant wildlife habitat has not been identified within the municipality.	See Breeding Birds above	• None	---
Linkages	The subject property provides a natural connection between Buffalo Bay and wetlands to the north. Maintaining these linkages for Blanding's Turtle is one of the primary goals of the ESA permit submitted to MNRF. The movement corridors will be useable by multiple species and as such linkages through the subject property should be maintained. As such, only minor impacts are anticipated.	• Same as Blanding's Turtle	Low level impedance to local movements

7. Policy Conformity

The following commentary describes how the proposed land use changes will be in conformance with the relevant federal, provincial and municipal environmental legislation and policies, provided that development proceeds as indicated and recommendations are followed.

7.1 Provincial Policy Statement (2014)

Significant Wetlands, Coastal Wetlands

MNRF has not identified significant wetlands on the subject property and coastal wetlands are not present.

Significant Woodlands and Valleylands

Beacon has not assessed woodland significance and instead relies on the planning report by EcoVue (2016) which indicates that neither the County of Peterborough, nor the Municipality of Trent Lakes have identified any significant woodlands or significant valleylands on lands within their jurisdiction; as such, further discussion is not provided here. There are no valleylands.

Significant Wildlife Habitat

As indicated in **Table 3**, with the exception of the deer wintering area possibly being identified as significant wildlife habitat, the Municipality has not undertaken a comprehensive analysis as would be required to identify many of the significant wildlife habitat features described in MNRF's (2015) Wildlife Habitat Criteria Schedules for Ecoregion 6E. As such, although there are features on the subject property in addition to the deer wintering area that would qualify as significant wildlife habitat based on the criteria supplied by MNRF (see descriptions in **Table 3**), these features have not been identified within the Municipality.

With regard to the deer wintering area identified on Schedule "B1" (**Appendix A**), field studies demonstrated that the majority of deer activity was concentrated northwest of the subject property. As such, impacts on the feature or its ecological function are not anticipated; thus the proposed development is consistent with this PPS policy.

Areas of Natural and Scientific Interest

There are no significant areas of natural and scientific interest on or adjacent to the subject property.

Fish Habitat

Implementing the recommendations outlined in Section 6 will ensure any potential impacts on fish habitat are managed in accordance with federal and provincial requirements.

Endangered and Threatened Species

There are ESA permits and species that need to be addressed at the subject property prior to site disturbance or alteration occurring as the habitat is regulated under the ESA.

As indicated in **Table 2**, several species and their habitat protected under the ESA (provincially endangered or threatened) were assessed for their potential to occur on the subject property or adjoining lands. Of these species, Blanding's Turtle was identified by the MNRF as a species that would require a 17(2)(c) overall benefit permit given the activities proposed. Given that the proponent has submitted an application for this type of ESA permit for Blanding's Turtle, consistency with policy 2.1.7 will be achieved for this species should the permit be issued.

With respect to Eastern Hog-nosed Snake, Avoidance under the ESA will be achieved, particularly with the mitigation measures that would be implemented under the permit for Blanding's Turtle.

Regarding the endangered bat species identified in **Table 2** as having suitable habitat on the subject property, this issue will need to be dealt with in a future addendum pending further discussions with MNRF. Once these bat species have been accounted for to the satisfaction of MNRF, then consistency with 2.1.7 will be achieved.

Adjacent Lands

The ecological function of the adjacent lands for significant wildlife habitat (identified deer wintering area) and fish habitat have been considered in the assessment of the potential for negative impacts. It has been determined that there will be no negative impacts on the adjacent lands or on their ecological functions. As such, the proposed development is consistent with 2.1.8.

7.2 Peterborough County Official Plan (2014)

The proposed land use change is consistent with the policies of the County's Official Plan with respect to significant wetlands, habitat of endangered species and threatened species, and significant areas of natural and scientific interest, as described in the preceding discussion in Section 7.1.

With respect to the County's requirement that new development and leaching beds be set back at least 30 m from the ordinary high water marks of all waterbodies, with the exception of permitted structures, the 30 m buffer described in Section 6 and shown in **Figure 3** demonstrates consistency with this policy.

7.3 Municipality of Trent Lakes Official Plan (2010)

The proposed land use change is consistent with the policies of the Municipality's Official Plan with respect to significant wetlands, fish habitat, significant wildlife habitat, significant woodlands, significant valleylands, habitat of endangered species and threatened species, and significant areas of natural and scientific interest, as described in the preceding discussion in Section 7.1.

With regard to the deer wintering area identified on Schedule "B1" (**Appendix A**), field studies demonstrated that the majority of deer activity was concentrated northwest of the subject property. As such, the anticipated effects of the proposed subdivision on the ecological function of the deer wintering area will be negligible and be consistent with the policies of the Official Plan.

With respect to the Municipality's requirement that new development be set back 30 m from the high water mark of water bodies, with the exception of permitted structures, the 30 m buffer described in Section 6 and shown in **Figure 3** demonstrates consistency with this policy.

7.4 *Endangered Species Act*

As indicated in **Table 2**, several species and their habitat protected under the ESA (provincially endangered or threatened) were assessed for their potential to occur on the subject property or adjoining lands. Of these species, Blanding's Turtle was identified by the MNRF as a species that would require a 17(2)(c) overall benefit permit given the activities proposed. Given that the proponent has submitted an application for this type of ESA permit for Blanding's Turtle, conformance with Sections 9 and 10 will be achieved for this species should the permit be issued. With respect to Eastern Hog-nosed Snake, avoidance under the ESA will be achieved, particularly with the mitigation measures that would be implemented under the permit for Blanding's Turtle.

Regarding the endangered bat species identified in **Table 2** as having suitable habitat on the subject property, this issue will need to be addressed in a future addendum pending further discussions with MNRF. Once these bat species have been accounted for to the satisfaction of MNRF, then conformance with Sections 9 and 10 will be attained for all of the ESA-protected species being considered here.

There are ESA permits required for the proposed development before activities with the potential to adversely affect the protected species or regulated habitat can begin.

7.5 Federal *Fisheries Act*

As long as the recommendations in this report are followed, including the submission of a detailed work plan for in-water works, including dock construction, to Parks Canada as described below, conformity with the *Fisheries Act* should be attained.

7.6 Federal *Migratory Birds Convention Act, 1994*

The *Migratory Birds Convention Act* protects the nests, eggs and young of most bird species from harassment, harm or destruction. The breeding bird season in southern Ontario is generally from mid-April to late-July; hence the clearing of vegetation should be outside of these dates. Environment Canada considers the risk period to be from mid-March to late August. For any proposed clearing of vegetation within these dates, or where birds may be suspected of nesting outside of typical dates, an ecologist should undertake detailed nest searches immediately prior (within two days) to site alteration to ensure that no active nests are present. However, it is important to note that because many bird nests are difficult or impossible to locate (e.g., cavity nesters, conifer and grassland nesters), this is often not

feasible and the presence of territorial birds during the breeding season would then be taken to indicate that nests are actually present.

7.7 Trent-Severn Waterway Policies; Parks Canada

Structures built on or over the bed of the Trent-Severn Waterway (which includes Pigeon Lake) require written permission from Parks Canada. Parks Canada has developed policies for in-water and shoreline works and related activities in the Trent-Severn Waterway (Parks Canada 2007).

In addition to following the recommendations in this report when installing nearshore and in-water works, including dock construction, landowners will need to submit a detailed work plan for any of these structures to Parks Canada following the project guidelines that apply to the federally regulated Trent-Severn Waterway (http://www.pc.gc.ca/docs/r/poli/page01.aspx)

As long as the guidelines are followed and approval is received prior to initiating construction and site alteration activities, then compliance with the Trent-Severn Waterway policies can be achieved.

7.8 Federal *Species at Risk Act* (SARA)

Because Pigeon Lake is considered to be federal land under the jurisdiction of Parks Canada, Blanding's Turtle and its habitat (e.g., for hibernation, foraging) below the high water mark is protected under SARA. To address this issue with respect to Blanding's Turtle, discussions with Parks Canada staff were initiated and confirmed that the ESA permit being sought for the species, along with the associated negotiations with MNRF, would be sufficient to ensure conformance with SARA. Additional requirements included the submission of a SARA compliant Environmental Impact Analysis. This report has considered all of the species in Schedule 1 of the SARA that potentially occurred on or adjacent to the subject property and should consequently satisfy this condition.

No bird species protected by the *Migratory Birds Convention Act* and also listed in Schedule 1 of the SARA were documented breeding on or adjacent to the subject property.

8. Summary of Recommendations

Beacon provided a number of recommendations in Section 6 to mitigate the effects of the proposed development on the natural environment. These recommendations are summarized below.

The following mitigation measures are recommended for Blanding's Turtle as part of a submitted ESA permit:

1. Initial development of construction access road to be completed during winter (inactive seasons) to avoid potential mortality or harm to individuals;
2. Erosion control and sediment fencing will be installed prior to any on-site disturbance;

3. Standard procedures for erosion and sedimentation control will be implemented along the length of the installation;
4. SAR training will be provided for the contractors on site;
5. Response protocols for handling turtles encountered during placement of barriers will follow best practices;
6. Construction of barriers to occur during species-specific timing windows;
7. Selective removal of vegetation with particular attention to avoidance of mature trees;
8. Replanting/reseeding of native vegetation following installation of barriers;
9. Stockpiles will be located within areas from which turtles have been excluded and also outside of areas identified as having habitat potential for Blanding's Turtle;
10. A combination of permanent barriers and temporary exclusion fencing when required to ensure full exclusion, will be used to minimize the likelihood of adverse effects on Blanding's Turtle when (1) roads are being graded, filled or surfaced, (2) site alteration on lots is occurring, (3) communal docks are being constructed (i.e., Blanding's Turtles will be prevented from accessing areas where activities will be occurring);

Permanent measures include:

11. Establishment and maintenance of a 30 m buffer from the high water mark of Buffalo Bay;
12. Installation of specialized barrier walls/fencing for Blanding's Turtle along the 30 m shoreline buffer and along both sides of movement corridors (note: specifications for the barrier walls/fencing to be determined through the ESA permitting process);
13. Installation of culverts/road crossing structures for turtles within the right-of-way of the internal road to ensure safe movement of individuals through movement corridors (note: specifications for the road crossing structures to be determined through the ESA permitting process);
14. Installation of turtle crossing signage in strategic locations within subdivision;

Measures to protect the shoreline from indirect effects that may result from construction activities, or upon completion of construction:

15. A sedimentation and erosion control plan should be developed as condition of draft plan approval. Sediment and erosion controls (silt fence) as described in the approved siltation and erosion control plan, should be installed and maintained throughout the duration of the development. All sediment and erosion control should be monitored during construction activities to ensure a protective barrier to sedimentation between any exposed excavations and Pigeon Lake;
16. Avoid and/or halt clearing and construction during periods of heavy precipitation and runoff to minimize soil disturbance;

Measures to ensure that fish habitat is not adversely affected by the placement of in-water structures:

17. A detailed work plan for any in-water and shoreline works, including dock construction, be submitted to Parks Canada following the project guidelines that apply to the federally regulated Trent-Severn Waterway (see http://www.pc.gc.ca/docs/r/poli/page01.aspx);
18. All in-water habitat features, including aquatic vegetation, natural woody debris, and boulders be left in their current locations in the nearshore area;

Measures for wetlands, woodlands and uplands:

19. Use best management practices to ensure that no damage is inflicted upon wetlands and trees that are being retained adjacent to the construction area;
20. Design and plan the development of roads, utilities and building sites with as little soil excavation and disturbance as possible;
21. Physically delineate the limits of clearing and construction with flagging or staking, ahead of construction, to avoid unnecessary disturbance to the surrounding vegetation;
22. Re-vegetate/protect exposed areas and bare soils immediately after construction;
23. Plan seeding and plantings using native species, to allow establishment before end of growing season;
24. Minimize the removal and disturbance of vegetation outside of development envelopes;
25. Site alteration (i.e., felling of trees, clearing, etc.) should not occur on the subject property until the requirements of MNRF and the ESA are understood and addressed; and
26. Use mulches and other organic stabilizers to minimize erosion until vegetation is established on sensitive soils;

Measures for surface water drainages:

27. Pre-development drainage patterns should be maintained to the extent possible to ensure maintenance of flow regimes;

Measures for breeding birds:

28. Site alteration (i.e., felling of trees, clearing, etc.) should not occur on the subject property from mid-April through August, as this time corresponds to the peak nesting period for the majority of bird SAR and encompasses the breeding season for the species being considered here.

9. Conclusions

This EIS is based on information derived from review of available background resources, field assessments, analyses and supporting technical studies prepared by other members of the team. Based upon the findings presented in this report and contingent upon the implementation of the recommendations made herein, it is our conclusion that the proposed development and associated activities will have an acceptably low likelihood of adversely affecting any significant natural heritage features and functions.

We advise that the recommendations in this report be incorporated into the development and site plan agreements for the property.

Report prepared by:
Beacon Environmental

Rob Willson, M.Sc.
Senior Ecologist

Report reviewed by:
Beacon Environmental

Brian E. Henshaw
Principal

10. References

Bradley, D.J.
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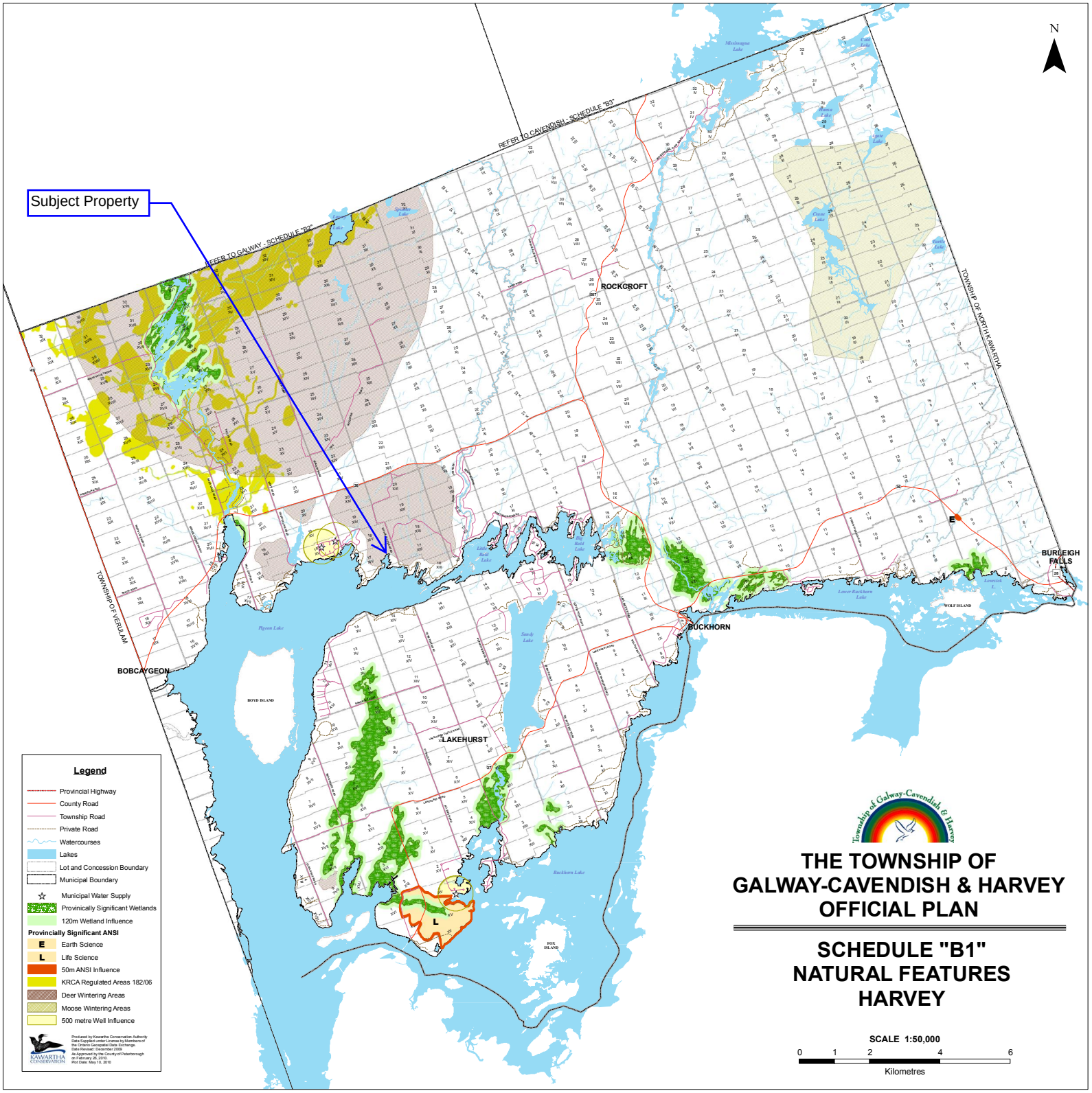
Appendix A

Schedule B1 Natural Features (Municipality of Trent Lakes Official Plan)


N
Subject Property
REFER TO CAVENDISH - SCHEDULE "B3"
REFER TO GALWAY - SCHEDULE "B2"
ROCKCROFT
TOWNSHIP OF NORTH KAWARTHA
TOWNSHIP OF VERULAM
BOBCAYGEON
BUCKHORN
BURLEIGH FALLS
LAKEHURST
BOYD ISLAND
WOLF ISLAND
FOX ISLAND
Pigeon Lake
Sandy Lake
Buckhorn Lake
Lower Buckhorn Lake
E
L
Legend
Provincial Highway
County Road
Township Road
Private Road
Watercourses
Lakes
Lot and Concession Boundary
Municipal Boundary
Municipal Water Supply
Provincially Significant Wetlands
120m Wetland Influence
Provincially Significant ANSI
E Earth Science
L Life Science
50m ANSI Influence
KRCA Regulated Areas 182/06
Deer Wintering Areas
Moose Wintering Areas
500 metre Well Influence
KAWARTHA CONSERVATION
Produced by Kawartha Conservation Authority
Data Supplied under Licenses by Members of the Ontario Geospatial Data Exchange.
Data Revised: December 2009
As Approved by the County of Peterborough on February 26, 2010.
Plot Date: May 10, 2010
Township of Galway-Cavendish & Harvey
THE TOWNSHIP OF GALWAY-CAVENDISH & HARVEY OFFICIAL PLAN
SCHEDULE "B1"
NATURAL FEATURES
HARVEY
SCALE 1:50,000
0 1 2 4 6
Kilometres

Appendix B

Initial SAR Screening Letter provided to Azimuth by MNRF

Jim Broadfoot

From: Lewis, Chris (MNR) <Chris.Lewis@ontario.ca>
Sent: June-09-14 3:54 PM
To: Jim Broadfoot
Cc: David Cunningham (cea@cogeco.ca); hsadler@ecovueconsulting.com; Spang, Elizabeth (MNR)
Subject: RE: SAR Information Request - Pigeon Lake, Buffalo Bay study area

Hi Jim,

A review of our best available information indicates that there are occurrences of: Bobolink (Threatened), Milk Snake (Special Concern), American Ginseng (Endangered), Barn Swallow (Threatened), Eastern Meadow Lark (Threatened), Cerulean Warbler (Threatened), Least Bittern (Threatened), Canada Warbler (Special Concern), Eastern Musk Turtle (Threatened), and Common Five-lined Skink (Special Concern) in the general area of the proposed activities. Also, there are occurrences of Flooded Jellyskin (Threatened), Eastern Whip-poor-will (Threatened), Eastern Ribbon Snake (Special Concern), Eastern Hog-nosed Snake (Threatened), Mottled Dusky wing (Endangered), (Blanding's Turtle (Threatened), Butternut (Threatened), Chimney Swift (Threatened), Least Bittern (Threatened), and Snapping Turtle (Special Concern) in the area immediately adjacent to the proposed activities. Although no other threatened or endangered species or their habitat have been documented in the area of the proposed projects, these features may be present and this list should not be considered complete.

Species listed as endangered or threatened on the Species at Risk in Ontario (SARO) list are protected under the Endangered Species Act, 2007 (ESA). Section 9(1) of the ESA prohibits a person from killing, harming, harassing, capturing or taking a member of a species listed as endangered, threatened or extirpated on the SARO list. Section 10(1) of the ESA prohibits the damage or destruction of habitat of a species listed as endangered or threatened on the SARO list.

A person(s) should ensure their proposed activities will not adversely affect a Species at Risk or its habitat protected under the ESA.

If an impact to a Species at Risk or its habitat cannot be avoided, a person(s) should contact MNR to discuss options, including applying for an authorization under the ESA. In situations where an activity is not registered with or authorized by the MNR, a person(s) must comply with the ESA by modifying proposed activities to avoid impacts to Species at Risk and habitat protected under the ESA.

Should any species at risk or their habitat be potentially impacted by proposed on-site activities, MNR should be contacted immediately and operations should be modified to avoid any negative impacts to species at risk or their habitat until further discussions with MNR can occur regarding opportunities for mitigation. If you have any questions regarding any species at risk, contact the Peterborough District MNR office at 705-755-3134

I hope this helps.

Should you require any more information please feel free to contact me.

Chris

From: Jim Broadfoot [mailto:Jim@Azimuthenvironmental.Com]
Sent: June 6, 2014 2:49 PM
To: Lewis, Chris (MNR); Cameron, Graham (MNR)
Cc: David Cunningham (cea@cogeco.ca); hsadler@ecovueconsulting.com
Subject: FW: SAR Information Request - Pigeon Lake, Buffalo Bay study area

Chris Lewis, Management Biologist – MNR Peterborough

Graham Cameron, Management Biologist – MNR Bancroft

Hello Chris, Graham:

Sorry for the confusion re: Peterborough *vs* Bancroft District but our study area is located in Wildlife Management Unit 60 that according to the hunting summary regulations, is administered by Bancroft.

In any event, we would like someone to respond to the SAR information request I sent to Bancroft District via e-mail on May 23, 2014 (copy attached). Please confirm that the request is being processed.

Chris – thank you for returning my phone message re: SAR turtles. We will follow-up with you in the near future.

Thank you,

Jim Broadfoot, Terrestrial Ecologist

Azimuth Environmental
85 Bayfield Street, Suite 400
Barrie, ON
L4M 3A7
(705) 721-8451 x 206

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

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From: Jim Broadfoot
Sent: May-23-14 1:38 PM
To: 'graham.cameron@ontario.ca'
Cc: David Cunningham (cea@cogeco.ca)
Subject: SAR Information Request - Pigeon Lake, Buffalo Bay study area

Graham Cameron
Management Biologist - BANCROFT DISTRICT
106 Monck St
PO Box 500
Bancroft, ON
K0L 1C0

Hello Graham:

Attached please find a Species at Risk (SAR) information request letter (provided via e-mail only).

As the field season is underway and the site has the potential to provide habitat for various SAR reptiles and birds, a timely response is requested so we can ensure our field surveys are appropriately designed.

Please do not hesitate to call to discuss.

Thank you,

Jim Broadfoot, Terrestrial Ecologist

Azimuth Environmental
85 Bayfield Street, Suite 400
Barrie, ON
L4M 3A7
(705) 721-8451 x 206

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

Appendix C

Vascular Plants

Master List of Vascular Plants Observed on Subject Property and adjoining lands. (Cunningham Environmental Associates; CEA)

STATUS	SCIENTIFIC NAME	COMMON NAME
	LYCOPODIACEAE	**CLUB-MOSS FAMILY**
	Diphasistrum digitatum	crowfoot club-moss
	Huperzia lucidula	shining club-moss
	Lycopodium clavatum	running club-moss
	Lycopodium dendroideum	round-branched ground-pine
	EQUISETACEAE	**HORSETAIL FAMILY**
	Equisetum arvense	field horsetail
	Equisetum fluviatile	water horsetail
	Equisetum hyemale	scouring-rush
	OPHIOGLOSSACACEAE	**ADDER'S-TONGUE FAMILY**
	Botrychium virginianum	rattlesnake fern
	OSMUNDACEAE	**ROYAL FERN FAMILY**
	Osmunda claytoniana	interrupted fern
	Osmunda regalis	royal fern
	DENNSTAEDTIACEAE	**BRACKEN FAMILY**
	Adiantum pedatum	northern maidenhair fern
	Pteridium aquilinum	eastern bracken fern
	THELYPTERIDACEAE	**MARSH FERN FAMILY**
	Phegopteris connectilis	northern beech fern
	Thelypteris palustris	marsh fern
	DRYOPTERIDACEAE	**WOOD-FERN FAMILY**
	Athyrium filix-femina	lady fern
	Cystopteris bulbifera	bulblet fern
	Cystopteris fragilis	fragile fern
	Dryopteris carthusiana	spinulose wood-fern
	Dryopteris cristata	crested wood-fern
	Dryopteris intermedia	evergreen wood-fern
	Dryopteris marginalis	marginal wood-fern
	Matteuccia struthiopteris	ostrich fern
	Onoclea sensibilis	sensitive fern
	Polystichum acrostichoides	Christmas fern

STATUS	SCIENTIFIC NAME	COMMON NAME
	POLYPODIACEAE	**POLYPODY FAMILY**
	Polypodium virginianum	rock polypody fern
	PINACEAE	**PINE FAMILY**
	Abies balsamea	balsam fir
	Larix laricina	tamarack
(+)	*Picea glauca*	white spruce
	Pinus strobus	eastern white pine
	Tsuga canadensis	eastern hemlock
	CUPRESSACEAE	**CEDAR FAMILY**
	Juniperus communis	common juniper
	Juniperus virginiana	red cedar
	Thuja occidentalis	eastern white cedar
	ARISTOLOCHIACEAE	**DUTCHMAN'S-PIPE FAMILY**
	Asarum canadense	wild ginger
	NYMPHAEACEAE	**WATER-LILY FAMILY**
	Nuphar variegata	bullhead pond lily
	Nymphaea odorata	fragrant water-lily
	CABOMBACEAE	**WATER-SHIELD FAMILY**
	Brasenia schreberi	water-shield
	CERATOPHYLLACEAE	**HORNWORT FAMILY**
	Ceratophyllum demersum	common coontail
	RANUNCULACEAE	**BUTTERCUP FAMILY**
	Actaea pachypoda	white baneberry
	Actaea rubra	red baneberry
	Anemone acutiloba	sharp-lobed heptica
	Anemone canadensis	Canada anemone
	Anemone virginiana	thimbleweed
	Aquilegia canadensis	wild columbine
	Caltha palustris	marsh marigold
	Clematis virginiana	Virgin's-bower
	Coptis trifolia	goldthread
+	*Ranunculus acris*	common buttercup
+	*Ranunculus repens*	creeping buttercup

STATUS	SCIENTIFIC NAME	COMMON NAME
	Ranunculus sceleratus	cursed crowfoot
	Thalictrum dioicum	early meadowrue
	Thalictrum pubescens	tall meadowrue
	BERBERIDACEAE	**BARBERRY FAMILY**
	Caulophyllum thalictroides	blue cohosh
	Podophyllum peltatum	may-apple
	PAPAVERACEAE	**POPPY FAMILY**
	Sanguinaria canadensis	bloodroot
	FUMARIACEAE	**FUMITORY FAMILY**
	Dicentra canadensis	squirrel-corn
	ULMACEAE	**ELM FAMILY**
	Ulmus americana	white elm
+	*Ulmus pumila*	Siberian elm
	URTICACEAE	**NETTLE FAMILY**
	Boehmeria cylindrica	false nettle
	Laportea canadensis	wood nettle
	Pilea pumila	dwarf clearweed
+	*Urtica dioica spp. dioica*	stinging nettle
	JUGLANDACEAE	**WALNUT FAMILY**
	Carya cordiformis	bitternut hickory
END(N), END(P)	*Juglans cinerea*	butternut
(+)	*Juglans nigra*	black walnut
	MYRICACEAE	**WAX-MYRTLE FAMILY**
	Comptonia peregrina	sweet-fern
	Myrica gale	sweet gale
	FAGACEAE	**BEECH FAMILY**
	Fagus grandifolia	American beech
	Quercus alba	white oak
	Quercus rubra	red oak
	BETULACEAE	**BIRCH FAMILY**
	Alnus incana spp. rugosa	speckled alder
	Betula alleghaniensis	yellow birch
	Betula papyrifera	white birch

STATUS	SCIENTIFIC NAME	COMMON NAME
	Carpinus caroliniana	blue beech
	Corylus cornuta	beaked hazel
	Ostrya virginiana	hop hornbeam
	CHENOPODIACEAE	**GOOSEFOOT FAMILY**
+	*Chenopodium album*	lamb's-quarters
+	*Chenopodium glaucum*	oak-leaved goosefoot
	PORTULACEAE	**PURSLANE FAMILY**
	Claytoniana caroliniana	Carolina spring beauty
	CARYOPHYLLACEAE	**PINK FAMILY**
+	*Cerastium fontanum*	field chickweed
+	*Dianthus armeria*	Deptford pink
+	*Saponaria officinalis*	bouncing-bet
+	*Silene latifolia*	bladder campion
+	*Silene vulgaris*	catchfly
+	*Stellaria graminea*	grass-leaved stitchwort
+	*Stellaria media*	common chickweed
	POLYGONACEAE	**BUCKWHEAT FAMILY**
+	*Fagopyrum esculentum*	buck-wheat
	Polygonum amphibium	water smartweed
+	*Polygonum convolvulus*	black bindweed
	Polygonum hydropiper	water-pepper
+	*Polygonum persicaria*	lady's thumb
	Rumex acetosella	field sorrel
+	*Rumex crispus*	curled dock
+	*Rumex obtusifolius*	bitter dock
	GUTTIFERAE	**ST. JOHN'S-WORT FAMILY**
+	*Hypericum perforatum*	common St. John's-wort
	Hypericum fraseri	marsh St. John's-wort
	TILIACEAE	**LINDEN FAMILY**
	Tilia americana	basswood
	MALVACEAE	**MALLOW FAMILY**
+	*Malva neglecta*	common mallow
	VIOLACEAE	**VIOLET FAMILY**

STATUS	SCIENTIFIC NAME	COMMON NAME
	Viola canadensis	Canada violet
	Viola conspera	dog violet
	Viola cucullata	marsh blue violet
	Viola pubescens	downy yellow violet
	Viola sororia	woolly blue violet
	CUCURBITACEAE	**GOURD FAMILY**
	Echinocystis lobata	wild cucumber
	SALICACEAE	**WILLOW FAMILY**
+	*Populus alba*	white poplar
	Populus balsamifera	balsam poplar
	Populus grandidentata	large-tooth aspen
	Populus tremuloides	trembling aspen
+	*Salix alba*	white willow
	Salix bebbiana	Bebb's willow
	Salix discolor	pussy willow
	Salix eriocephala	Missouri willow
	Salix petiolaris	slender willow
+	*Salix x rubens*	reddish willow
	BRASSICACEAE	**MUSTARD FAMILY**
+	*Alliaria petiolata*	garlic mustard
+	*Barbarea vulgaris*	common winter cress
+	*Capsella bursa-pastoris*	shepherd's purse
	Cardamine diphylla	two-leaved toothwort
+	*Erysimum cheiranthoides*	wormseed mustard
+	*Hesperis matronalis*	dame's-rocket
+	*Lepidium campestre*	field cress
(+)	*Lepidium densiflorum*	common pepper-grass
	PYROLACEAE	**WINTERGREEN FAMILY**
	Pyrola elliptica	shinleaf
	MONOTROPACEAE	**INDIAN-PIPE FAMILY**
	Monotropa uniflora	Indian-pipe
	PRIMULACEAE	**PRIMROSE FAMILY**
	Lysimachia ciliata	fringed loosestrife

STATUS	SCIENTIFIC NAME	COMMON NAME
	Lysimachia nummularia	moneywort
	Trientalis borealis	starflower
	GROSSULARIACEAE	**GOOSEBERRY FAMILY**
	Ribes americanum	wild black currant
	Ribes cynosbati	prickly gooseberry
+	*Ribes rubrum*	red currant
	CRASSULACEAE	**STONECROP FAMILY**
	Sedum acre	mossy stonecrop
	SAXIFRAGACEAE	**SAXIFRAGE FAMILY**
	Mitella dipylla	two-leaved bishop's-cap
	Saxifraga virginiensis	early saxifrage
	Tiarella cordifolius	foam flower
	ROSACEAE	**ROSE FAMILY**
	Agrimonia gryposepala	tall hairy agrimony
	Amelanchier arborea	downy juneberry
	Crataegus spp.	hawthorn
	Fragaria vesca	woodland strawberry
	Fragaria virginiana	common strawberry
	Geum aleppicum	yellow avens
	Geum canadense	white avens
+	*Malus pumila*	common crab-apple
+	*Potentilla norvegica*	rough cinquefoil
+	*Potentilla recta*	rough-fruited cinquefoil
	Prunus serotina	black cherry
	Prunus virginiana	choke cherry
+	*Rosa multiflora*	multiflora rose
	Rubus idaeus	wild red raspberry
	Rubus occidentalis	black raspberry
	Spiraea alba	narrow-leaved meadowsweet
	Sorbus aucuparia	European mountain-ash
	FABACEAE	**PEA FAMILY**
	Amphicarpa bracteata	hog-peanut
+	*Lotus corniculatus*	bird's-foot trefoil

STATUS	SCIENTIFIC NAME	COMMON NAME
+	*Melilotus alba*	white sweet-clover
+	*Melilotus officinalis*	yellow sweet-clover
+	*Trifolium aureum*	hop clover
+	*Trifolium hybridum*	alsike clover
+	*Trifolium pratense*	red clover
+	*Trifolium repens*	white clover
+	*Vicia cracca*	cow vetch
	ELAEAGNACEAE	**OLEASTER FAMILY**
	Shepherdia canadensis	Canada soapberry
	HALORAGACEAE	**WATER-MILFOIL FAMILY**
	Myriophyllum spicatum	Eurasian water-milfoil
	LYTHRACEAE	**LOOSESTRIFE FAMILY**
+	*Lythrum salicaria*	purple loosestrife
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**
	Circaea lutetiana	enchanters nightshade
+	*Epilobium hirsutum*	hairy willow-herb
	Epilobium parviflorum	sparse-flowered willow-herb
	Oenothera parviflora	small-flowered evening-primrose
	CORNACEAE	**DOGWOOD FAMILY**
	Cornus alternifolia	alternate-leaved dogwood
	Cornus rugosa	round-leaved dogwood
	Cornus stolonifera	red-osier dogwood
	AQUIFOLIACEAE	**HOLLY FAMILY**
	Ilex verticillata	winterberry
	EUPHORBIACEAE	**SPURGE FAMILY**
+	*Euphorbia esula*	leafy spurge
	RHAMNACEAE	**BUCKTHORN FAMILY**
+	*Rhamnus cathartica*	common buckthorn
	VITACEAE	**GRAPE FAMILY**
	Parthenocissus inserta	Virginia creeper
	Vitis riparia	riverbank grape
	ACERACEAE	**MAPLE FAMILY**
(+)	*Acer negundo*	Manitoba maple

STATUS	SCIENTIFIC NAME	COMMON NAME
	Acer rubrum	red maple
	Acer saccharum	sugar maple
	Acer saccharinum	silver maple
	Acer x freemanii	swamp maple
	ANACARDIACEAE	**CASHEW FAMILY**
	Rhus radicans	climbing poison-ivy
	Rhus typhina	staghorn sumac
	OXALIDACEAE	**WOOD SORREL FAMILY**
	Oxalis acetosella	tree wood sorrel
+	*Oxalis stricta*	European wood sorrel
	GERANIACEAE	**GERANIUM FAMILY**
+	*Geranium robertianum*	herb-robert
	BALSAMINACEAE	**TOUCH-ME-NOT FAMILY**
	Impatiens capensis	spotted jewelweed
	ARALIACEAE	**GINSENG FAMILY**
	Aralia nudicaulis	wild sarsaparilla
	APIACEAE	**CARROT FAMILY**
	Cicuta bulbifera	bulb-bearing water hemlock
+	*Daucus carota*	wild carrot
	Osmorhiza claytonii	wooly sweet-cicely
+	*Pastinaca sativa*	wild parsnip
	Sium suave	hemlock water-parsnip
	APOCYNACEAE	**DOGBANE FAMILY**
	Apocynum androsaemifolium	spreading dogbane
	ASCLEPIADACEAE	**MILKWEED FAMILY**
	Asclepias incarnata	swamp milkweed
	Asclepias syriaca	common milkweed
+	*Cynanchum rossicum*	swallow-wort
	SOLANACEAE	**NIGHTSHADE FAMILY**
+	*Solanum dulcamara*	bittersweet nightshade
	CONVOLVULACEAE	**MORNING-GLORY FAMILY**
+	*Convolvulus arvensis*	field bindweed

STATUS	SCIENTIFIC NAME	COMMON NAME
	HYDROPHYLLACEAE	**WATER-LEAF FAMILY**
	Hydrophyllum virginianum	Virginia waterleaf
	BORAGINACEAE	**BORAGE FAMILY**
+	*Cynoglossum officinale*	hound's-tongue
+	*Echium vulgare*	viper's bugloss
+	*Lithospermum officinale*	common gromwell
+	*Myosotis sylvatica*	woodland forget-me-not
+	*Symphytum officinale*	common comfrey
	VERBENACEAE	**VERVAIN FAMILY**
	Verbena hastata	blue vervain
	Verbena urticifolia	white vervain
	LAMIACEAE	**MINT FAMILY**
	Clinopodium vulgare	wild basil
+	*Galeopsis tetrahit*	hedge nettle
+	*Leonurus cardiaca*	motherwort
	Lycopus americanus	water horehound
+	*Lycopus europaeus*	European water-horehound
	Mentha arvensis	wild mint
+	*Mentha x piperita*	pepper mint
+	*Nepeta cataria*	catnip
+	*Prunella vulgaris*	heal-all
	Scutellaria galericulata	marsh skullcap
	PLANTAGINACEAE	**PLANTAIN FAMILY**
+	*Plantago lanceolata*	English plantain
+	*Plantago major*	common plantain
	OLEACEAE	**OLIVE FAMILY**
	Fraxinus americana	white ash
	Fraxinus nigra	black ash
	Fraxinus pennsylvanica	green ash
+	*Syringa vulgaris*	common lilac
	SCROPHULARIACEAE	**FIGWORT FAMILY**
	Agalinis paupercula	small-flowered agalinis
	Chelone glabra	turtlehead

STATUS	SCIENTIFIC NAME	COMMON NAME
+	*Linaria vulgaris*	butter-and-eggs
+	*Verbascum thapsus*	common mullein
+	*Veronica officinalis*	common speedwell
	CAMPANULACEAE	**BLUEBELL FAMILY**
+	*Campanula rapunculoides*	creeping bellflower
	Lobelia inflata	Indian tobacco
	RUBIACEAE	**MADDER FAMILY**
+	*Galium mollugo*	white bedstraw
	Galium palustre	marsh bedstraw
	Galium triflorum	fragrant bedstraw
	CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
	Diervilla lonicera	bush honeysuckle
+	*Lonicera tartarica*	tartarian honeysuckle
	Sambucus canadensis	common elderberry
	Sambucus pubens	red-berried elder
	Viburnum acerifolium	maple-leaved viburnum
	Viburnum lantanoides	hobblebush
	Viburnum lentago	nannyberry
+	*Viburnum opulus*	guelder rose
	Viburnum rafinesquianum	downy arrow-wood
	DIPSACACEAE	**TEASEL FAMILY**
+	*Dipsacus fullonum*	wild teasel
	ASTERACEAE	**ASTER FAMILY**
+	*Achillea millefolium*	yarrow
(+)	*Ambrosia artemisiifolia*	common ragweed
+	*Arctium minus*	common burdock
	Artemisia biennis	biennial wormwood
	Bidens cernus	nodding beggar-ticks
	Bidens frondosus	devil's beggar-ticks
+	*Centaurea jacea*	brown knapweed
+	*Chrysanthemum leucanthemum*	ox-eye daisy
+	*Cichorium intybus*	chicory
+	*Cirsium arvense*	Canada thistle

STATUS	SCIENTIFIC NAME	COMMON NAME
+	*Cirsium vulgare*	bull thistle
	Conyza canadensis	horseweed
	Erigeron annuus	daisy fleabane
	Erigeron philadelphicus	Philadelphia fleabane
	Eupatorium maculatum	spotted Joe pye-weed
	Eupatorium perfoliatum	boneset
	Eupatorium rugosum	white snakeroot
	Euthamia graminifolia	grass-leaved goldenrod
+	*Hieracium aurantiacum*	orange hawkweed
+	*Hieracium caespitosum*	field hawkweed
	Inula helenium	elecampane
+	*Lactuca serriola*	prickly lettuce
+	*Matricaria matricariodes*	pineapple weed
	Prenanthes altissima	tall white lettuce
	Rudbeckia hirta	black-eyed Susan
	Solidago altissima	tall goldenrod
	Solidago canadensis	Canada goldenrod
	Solidago flexicaulis	zig-zag goldenrod
	Solidago rugosa	rough goldenrod
+	*Sonchus arvensis*	perennial sow-thistle
+	*Sonchus asper*	spiny-leaved sow-thistle
	Symphyotrichum novae-angliae	New England aster
	Symphyotrichum cordifolium	heart-leaved aster
	Symphyotrichum ericoides	white heath aster
	Symphyotrichum lateriflorum	calico aster
	Symphyotrichum novae-angliae	New England aster
	Symphyotrichum puniceum	purple-stemmed aster
+	*Taraxacum officinale*	dandelion
+	*Tragopogon pratensis*	meadow goat's-beard
+	*Tussilago farfara*	coltsfoot
	ALISMATACEAE	**WATER-PLANTAIN FAMILY**
	Alisma plantago-aquatica	water plantain
	Sagittaria latifolia	broad-leaved arrowhead

STATUS	SCIENTIFIC NAME	COMMON NAME
	HYDROCHARITACEAE	**FROG'S-BIT FAMILY**
	Elodea canadensis	Canada waterweed
	Vallisneria americana	water-celery
	POTAMOGETONACEAE	**PONDWEED FAMILY**
	Potamogeton crispus	curly pondweed
	Potamogeton gramineus	variable-leaved pondweed
	Potamogeton pectinatus	sago pondweed
	Potamogeton richardsonii	Richardson's pondweed
	Potamogeton zosteriformis	flat-stemmed pondweed
	ARACEAE	**ARUM FAMILY**
	Arisaema triphyllum	small Jack-in-the-pulpit
	LEMNACEAE	**DUCKWEED FAMILY**
	Lemna minor	common duckweed
	Spirodela polyrhiza	greater duckweed
	JUNCACEAE	**RUSH FAMILY**
	Juncus bufonius	toad rush
	Juncus effusus	soft rush
	Juncus tenuis	path rush
	CYPERACEAE	**SEDGE FAMILY**
	Carex bebbii	Bebb's sedge
	Carex blanda	woodland sedge
	Carex communis	fibrous rooted sedge
	Carex crinita	fringed sedge
	Carex cristatella	crested sedge
	Carex deweyana	Dewey's sedge
	Carex gracillima	graceful sedge
	Carex granularis	meadow sedge
	Carex hystericina	porcupine sedge
	Carex interior	inland sedge
	Carex lupulina	hop sedge
	Carex pedunculata	peduncled sedge
	Carex rosea	curly-styled wood sedge
+	*Carex stipata*	awl-fruited sedge

STATUS	SCIENTIFIC NAME	COMMON NAME
	Carex vulpinoidea	fox sedge
	Dulichium arundinaceum	reed-like three-way sedge
	Eleocharis erythropoda	red-footed spike-rush
	Eleocharis obtusa	blunt spike-rush
	Scirpus atrovirens	dark green bulrush
	Scirpus cyperinus	wool-grass
	Scirpus validus	softstem bulrush
	POACEAE	**GRASS FAMILY**
+	*Agrostis gigantea*	redtop
	Agrostis stolonifera	creeping bent grass
+	*Bromus inermis*	awnless brome grass
	Calamagrostis canadensis	Canada bluejoint grass
+	*Dactylis glomerata*	orchard grass
	Deschampsia flexuosa	tufted hairgrass
+	*Digitaria sanguinalis*	large crabgrass
+	*Elymus repens*	quack grass
	Elymus virginicus	Virginia wild-rye
+	*Festuca pratensis*	meadow fescue
	Glyceria striata	fowl manna grass
	Hordeum jubatum	foxtail barley
	Muhlenbergia mexicana	Mexican muhly grass
+	*Panicum capillare*	witch grass
	Phalaris arundinacea	reed canary grass
+	*Phleum pratense*	timothy
(+)	*Phragmites australis*	common reed
+	*Poa annua*	annual blue grass
+	*Poa compressa*	Canada blue grass
	Poa nemoralis	wood blue grass
+	*Poa pratensis*	Kentucky blue grass
+	*Setaria viridis*	green foxtail
	SPARGANIACEAE	**BUR-REED FAMILY**
	Sparganium emersum	green-fruited bur-reed
	Sparganium eurycarpum	giant bur-reed

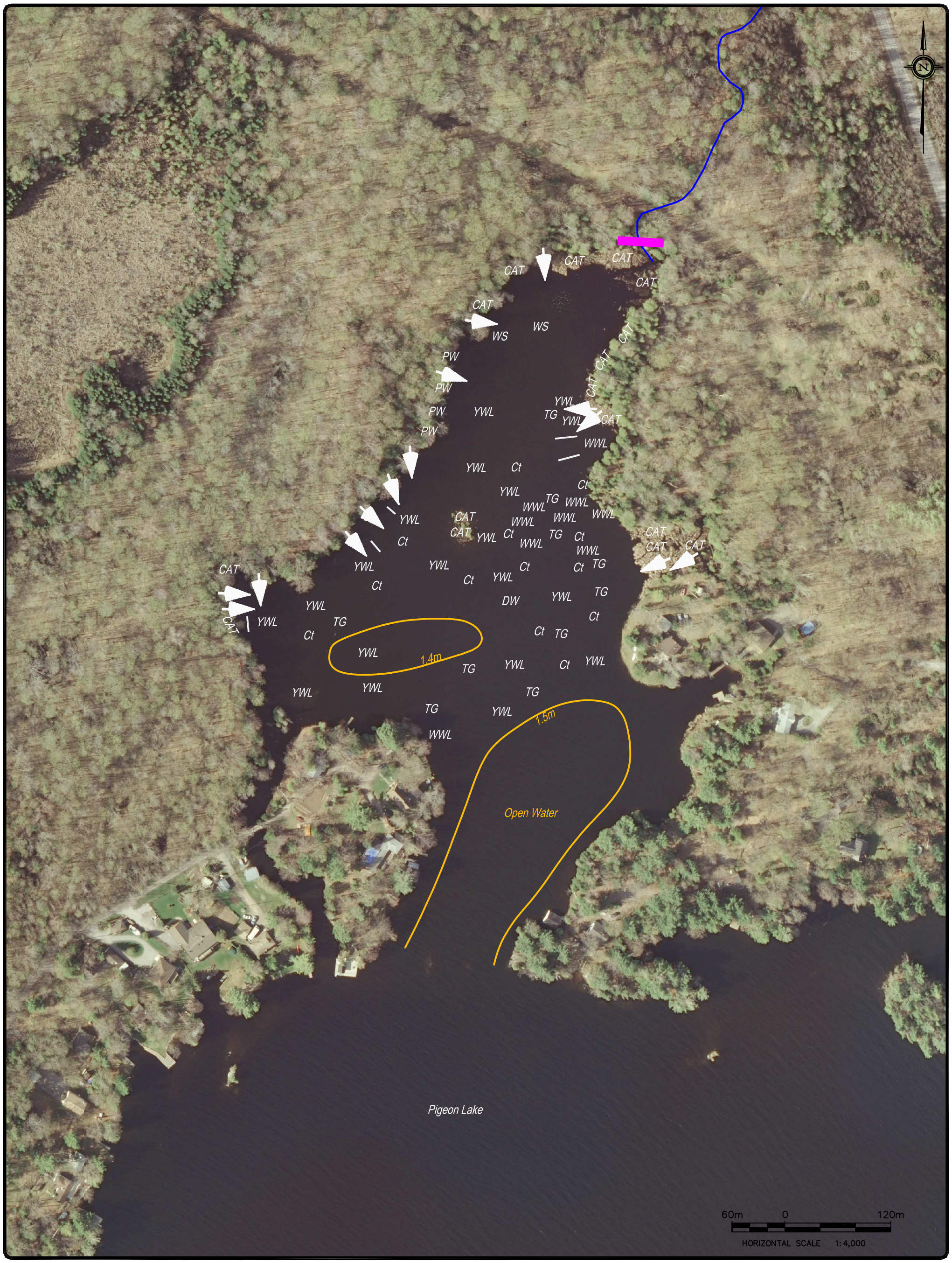
STATUS	SCIENTIFIC NAME	COMMON NAME
	TYPHACEAE	**CATTAIL FAMILY**
+	*Typha angustifolia*	narrow-leaved cattail
	Typha latifolia	common cattail
	Typha x glauca	hybrid cattail
	PONTEDERIACEAE	**PICKERELWEED FAMILY**
	Pontederia cordata	heart-leaved pickerelweed
	LILIACEAE	**LILY FAMILY**
	Allium tricoccum	wild leek
	Asparagus officinalis	garden aspargus
	Clintonia borealis	bluebead-lily
	Erythronium americanum	yellow trout-lily
	Hemerocallis fulva	orange day-lily
	Maianthemum canadense	wild lily-of-the-valley
	Maianthemum racemosum	false Solomon's-seal
	Maianthemum stellatum	star-flowered Solomon's-seal
	Maianthemum trifolium	three-leaved Solomon's-seal
	Polygonatum pubescens	hairy Solomon's-seal
	Streptopus roseus	rose-twisted stalk
	Trillium erectum	red trillium
	Trillium grandiflorum	white trillium
	Uvualaria grandiflora	large-flowered bellwort
	IRIDACEAE	**IRIS FAMILY**
	Iris versicolor	blue flag
	SMILACEAE	**SMILAX FAMILY**
	Smilax herbacea	herbaceous carrion-flower
	ORCHIDACEAE	**ORCHID FAMILY**
	Cypripedium calceolus var. parviflorum	small yellow lady's slipper
+	*Epipactis helleborine*	helleborine
	Spiranthes cernua	nodding ladies' tresses

Plant species status in Peterborough County based on Riley *et al.* (1989) and Burke *et al.* (1999)

+	non-native species
(+)	native species introduced into municipality (i.e., not indigenous to municipality)
END(N)	nationally rare - Endangered (Environment Canada 2014)
END(P)	provincially rare - Endangered (Province of Ontario 2014)
R	rare native species in Peterborough County

Appendix D

Aquatic Habitat



LEGEND:

	Aquatic Plant Species (white)
CAT	*Cattail*
Ct	*Coontail*
DW	*Duckweed*
Tg	*Tapegrass*
YWL	*Yellow Water Lilly*
WWL	*White Water Lilly*
PW	*Pickerel Weed*
	Dead Tree (white)
	Sunken Log (white)

	Depth Contours
	Beaver Dam
	Watercourse

DAYSTAMP: M:\14 Projects\14-161 Buffalo Bay EIS\04.0 - Drafting\14-161.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Aquatic Habitat Map

Buffalo Bay
Kawartha Lakes, ON

DATE ISSUED:	*August 2014*	Figure No.
CREATED BY:	*JLM*	2
PROJECT NO.:	*14-161*	
REFERENCE:	*First Base Solutions*	

Plotted by: JMCCARTNEY on August 22, 2014 at 12:01pm
File: M:\14 Projects\14-161 Buffalo Bay EIS\04.0 - Drafting\14-161.dwg Layout: Fish2 Plotscale: 1

Appendix E

Breeding Birds

Buffalo Bay Bird List, Azimuth 2014.

			Buffalo Bay & Inland Forest							Nichol's Cove Rd Lot Area			Hwy 36 Lot Area									Conservation Rank[6]				
FAMILY	SCIENTIFIC NAME	ENGLISH COMMON NAME	PC1[1]	PC2	PC3 (CPB)	PC4	PC5	PC6	PC7	PC8	PC9	PC10	PC11	PC12	PC13	PC14	PC15 (CPB)	Borrow Pit[2]	Incidental[3]	Adj Only[4]	Breeding Evidence[5]	S RANK	G RANK	SARO STATUS	OWES[7]	Area-sensitive?[8]
Accipitridae	*Buteo lineatus*	Red-shouldered Hawk	,Vo[9]			,Vo															Possible	S4B	G5	NAR		
Anatidae	*Aix sponsa*	Wood Duck															,H				Possible	S5	G5			
Anatidae	*Anas platyrhynchos*	Mallard																	H-April 22		Possible	S5	G5			
Anatidae	*Branta canadensis*	Canada Goose																	H-April 22		Possible	S5	G5			
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing														,H					Possible	S5B	G5			
Cardinalidae	*Passerina cyanea*	Indigo Bunting								,S	S,				S,						Possible	S4B	G5			
Cardinalidae	*Pheucticus ludovicianus*	Rose-breasted Grosbeak										S,									Possible	S4B	G5			
Cardinalidae	*Piranga olivacea*	Scarlet Tanager	,S		,S				S,S			,S	S,S	,S							Probable	S4B	G5			Y
Columbidae	*Zenaida macroura*	Mourning Dove													,S	,S		S			Possible	S5	G5			
Corvidae	*Corvus brachyrhynchos*	American Crow	H,	H,		H,H	H,	,H	H,	H,	H,H	,H	H,	H,	H,H	,H	,H	H			Probable	S5B	G5			
Corvidae	*Corvus corax*	Common Raven		H,																	Possible	S5	G5			
Corvidae	*Cyanocitta cristata*	Blue Jay			,H	,Vo	,Vo	,Vo	Vo,Vo	Vo,Vo	,Vo	Vo,Vo	Vo,	,Vo		Vo,Vo		Vo			Probable	S5	G5			
Cuculidae	*Coccyzus erythropthalmus*	Black-billed Cuckoo										,S				S,					Possible	S5B	G5			
Emberizidae	*Melospiza melodia*	Song Sparrow		S,S	S,	,S				,S			S,		S,S	,S	S,	S			Probable	S5B	G5			
Emberizidae	*Pipilo erythrophthalmus*	Eastern Towhee								,S			S,S	S,	S,S	S,	S,S				Probable	S4B	G5			
Emberizidae	*Spizella pusilla*	Field Sparrow								S,S			,S		S,S	,S	,S				Probable	S4B	G5			
Emberizidae	*Zonotrichia albicollis*	White-throated Sparrow	S,									,S	S,S				,S				Probable	S5B	G5			
Fringillidae	*Carduelis tristis*	American Goldfinch	H,S						H,	,S	H,S		H,S	,H	H,H	H,S	H,	S			Probable	S5B	G5			
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird		P,S	S,S	,S	,S						S,S		,S	S,S	S,H	S			Probable	S4	G5			
Icteridae	*Icterus galbula*	Baltimore Oriole						S,													Possible	S4B	G5			
Icteridae	*Molothrus ater*	Brown-headed Cowbird				Vo,			,Vo					,Vo		Vo,					Possible	S4B	G5			
Icteridae	*Quiscalus quiscula*	Common Grackle					,H					,H					H,H				Probable	S5B	G5			
Mimidae	*Dumetella carolinensis*	Gray Catbird												S,	,S		S,				Possible	S4B	G5			
Mimidae	*Toxostoma rufum*	Brown Thrasher								,S											Possible	S4B	G5			
Paridae	*Poecile atricapillus*	Black-capped Chickadee		S,	S,	S,	,S			,S			S,	,S			,S	S			Possible	S5	G5			
Parulidae	*Geothlypis trichas*	Common Yellowthroat								S,			S,		S,S	S,	,S				Probable	S5B	G5			
Parulidae	*Mniotilta varia*	Black-and-white Warbler														,S					Possible	S5B	G5			Y
Parulidae	*Oreothlypis ruficapilla*	Nashville Warbler											,S					S			Possible	S5B	G5			
Parulidae	*Seiurus aurocapilla*	Ovenbird		,S	S,	S,S	S,S	,S	S,S	,S	,S	,S	,S					S			Probable	S4B	G5			Y
Parulidae	*Setophaga caerulescens*	Black-throated Blue Warbler																	S-June 4		Possible	S5B	G5			Y
Parulidae	*Setophaga castanea*	Bay-breasted Warbler				S,												S			Possible	S5B	G5		R Sig	
Parulidae	*Setophaga pensylvanica*	Chestnut-sided Warbler								S,S				,S							Probable	S5B	G5			
Parulidae	*Setophaga pinus*	Pine Warbler									,S										Possible	S5B	G5			Y
Parulidae	*Setophaga ruticilla*	American Redstart												,S			,S				Possible	S5B	G5			Y
Parulidae	*Setophaga virens*	Black-throated Green Warbler							S,												Possible	S5B	G5			Y
Phasianidae	*Bonasa umbellus*	Ruffed Grouse										,H		NE,A							Confirmed	S4	G5			
Phasianidae	*Meleagris gallopavo*	Wild Turkey								H,				,Vo		,H					Possible	S5	G5			
Picidae	*Colaptes auratus*	Northern Flicker												,H	H,	H,		Vo			Possible	S4B	G5			
Picidae	*Dryocopus pileatus*	Pileated Woodpecker		H,	Vo,	H,			H,				,Vo					Vo			Possible	S5	G5			Y
Picidae	*Picoides pubescens*	Downy Woodpecker																	H-April 22		Possible	S5	G5			
Picidae	*Picoides villosus*	Hairy Woodpecker						H,													Possible	S5	G5			Y
Picidae	*Sphyrapicus varius*	Yellow-bellied Sapsucker			H,H		,Vo		,H												Probable	S5B	G5			
Sittidae	*Sitta carolinensis*	White-breasted Nuthatch			,S			S,													Possible	S5	G5			Y
Strigidae	*Bubo virginianus*	Great Horned Owl																	Vo-June 13		Possible	S4	G5			
Strigidae	*Strix varia*	Barred Owl	H,																		Possible	S5	G5			

			Buffalo Bay & Inland Forest							Nichol's Cove Rd Lot Area			Hwy 36 Lot Area									Conservation Rank[6]				
FAMILY	SCIENTIFIC NAME	ENGLISH COMMON NAME	PC1[1]	PC2	PC3 (CPB)	PC4	PC5	PC6	PC7	PC8	PC9	PC10	PC11	PC12	PC13	PC14	PC15 (CPB)	Borrow Pit[2]	Incidental[3]	Adj Only[4]	Breeding Evidence[5]	S RANK	G RANK	SARO STATUS	OWES[7]	Area-sensitive?[8]
Troglodytidae	*Troglodytes troglodytes*	Winter Wren						,S	S,												Possible	S5B	G5			Y
Turdidae	*Catharus fuscescens*	Veery	S,		S,				,H			,S	,H	S,							Possible	S4B	G5			Y
Turdidae	*Hylocichla mustelina*	Wood Thrush							,S			S,S				,S	S,				Probable	S4B	G5	SC		Y
Turdidae	*Turdus migratorius*	American Robin								,S		S,S	,S		,S	S,H	P,H				Probable	S5B	G5			
Tyrannidae	*Contopus virens*	Eastern Wood-pewee			,S	,S	S,	S,	S,												Possible	S4B	G5	SC		
Tyrannidae	*Myiarchus crinitus*	Great Crested Flycatcher	,Vo			S,		,Vo			Vo,Vo	Vo,Vo	Vo,Vo	Vo,Vo				S			Probable	S4B	G5			
Tyrannidae	*Sayornis phoebe*	Eastern Phoebe	S,	,S																	Possible	S5B	G5			
Tyrannidae	*Tyrannus tyrannus*	Eastern Kingbird		S,P	,S	,S															Probable	S4B	G5			
Vireonidae	*Vireo olivaceus*	Red-eyed Vireo	S,S	,S	S,S	S,S	S,S	S,S	S,S	S,S	S,S	,S	S,	S,S	S,S	,S	,S	S			Probable	S5B	G5			
Vireonidae	*Vireo solitarius*	Blue-headed Vireo		S,		,S															Possible	S5B	G5		R Sig	Y
Accipitridae	*Accipiter cooperii*	Cooper's Hawk																	FO-April 22		None	S4	G5	NAR		
Alcedinidae	*Megaceryle alcyon*	Belted Kingfisher	,For																		None	S4B	G5			
Ardeidae	*Ardea herodias*	Great Blue Heron		,For		For,															None	S4	G5			
Caprimulgidae	*Caprimulgus vociferus*	Eastern Whip-poor-will																		S-2 loc.[10]	None	S4B	G5	THR		Y
Gaviidae	*Gavia immer*	Common Loon						FO,			FO,									Vo-lake	None	S5B,S5N	G5	NAR		
Gruidae	*Grus canadensis*	Sandhill Crane																	FO-April 22		None	S5B	G5		R Sig	

[1]PC - Point Count Station(see Figure x for location), 5 Minute Duration, CPB - Sapling included Call Play Back to detect marsh birds

[2]Borrow Pit - Located on west side of property - sampled for evidence of Bank Swallow (Special Concern) nesting

[3]Incidental - Species observed while conducting other field studies that were not detected during specific breeding bird surveys

[4]Species detected on adjacent lands only (no evidence of use of property)

[5]Breeding Evidence - based on Ontario Breeding Bird Evidence Codes

[6]Conservation Rank - from OMNR&F, NHIC & SARO List 2014

[7]OWES - Species listed as Regionally Significant in Region 6 in Appendix 5 of the OWES Southern Manual, 2013

[8]Species listed as Area-sensitive in Appendix C of OMNR's Significant Wildlife Habitat Technical Guide, 2000

[9]Breeding Evidence Code (Based on OBBA): S - Singing Male, Vo - Vocal (Male territory/display call) , FO - Fly Over (no sign of use of habitat of property), For - Species observed foraging on property only, H - Species observed in suitable breeding habitat during breeding season, P - Pair, A - Aggitated behaviour, NE - Nest with Eggs

[10]Detected on adjacent land through dedicated nocturnal bird surveys conducted on June 13, June 26 and July 10, 2014

Observation Conditions - Point Count Sampling & Nocturnal Bird Surveys

Point Count - June 14, 2014; Start Time 0524hr End Time 0900hr; Temperature Start +9°C End +10°C; Wind Start Variable B1 to B3 NW End Variable B1 to B3 SW; Cloud Cover Start 90% End 100%; Precipitation Light drizzle began at 0800hr ended aftern 15 minutes; Observer - J. Broadfoot.

Point Count - June 27, 2014; Start Time 0514hr End Time 0932hr; Temperature Start +12°C End +20°C; Wind Start B0 End B1 SW; Cloud Cover Start <5% End <5%; Precipitation none; Observer - J. Broadfoot

Nocturnal Bird - June 13, 2014; Start Time 2238hr End Time 0020hr; Temperature Start +10°C End +9°C; Wind Start Variable B1 to B3 N End B1 to B2 NW; Cloud Cover Start <10% End <5%; Precipitation none; Moon Full & Well above horizon during survey; Control Site 4 Whip-poor-will; Observers - J. Broadfoot, D. Cunningham

Nocturnal Bird - June 26, 2014; Start Time 2200hr End Time 2325hr; Temperature Start +17°C End +16°C; Wind Start B0 End B0; Cloud Cover Start 25% End <10%; Precipitation none; No Moon; Control Site 2 Whip-poor-will; Observers - J. Broadfoot, D. Cunningham

Nocturnal Bird - July 10, 2014; Start Time 2120hr End Time 2240hr; Temperature Start +13°C End +13°C; Wind Start B0 End B0; Cloud Cover Start <5% End 20%; Precipitation none; Moon Full & well above horizon during survey; Control Site to 32 Whip-poor-will & 1 Common Nighthawk; Observer - J. Broadfoot

Appendix F

Mammals

Mammal species observations, Buffalo Bay Property, 2014

			Conservation Rank		
FAMILY	**SCIENTIFIC NAME**	**COMMON NAME**	**S RANK**	**G RANK**	**SARO STATUS**
Erethizontidae	*Erethizon dorsatum*	Porcupine	S5	G5	
Sciuridae	*Tamiasciurus hudsonicus*	Red Squirrel	S5	G5	
Procyonidae	*Procyon lotor*	Northern Raccoon	S5	G5	
Ursidae	*Ursus americanus*	American Black Bear	S5	G5	NAR
Mephitidae	*Mephitis mephitis*	Striped Skunk	S5	G5	
Sciuridae	*Sciurus carolinensis*	Eastern Gray Squirrel	S5	G5	
Cervidae	*Odocoileus virginianus*	White-tailed Deer	S5	G5	
Mustelidae	*Lontra canadensis*	North American River Otter	S5	G5	
Canidae	*Canis latrans*	Coyote	S5	G5	
Leporidae	*Lepus americanus*	Snowshoe Hare	S5	G5	
Castoridae	*Castor canadensis*	Beaver	S5	G5	
Sciuridae	*Tamias striatus*	Eastern Chipmunk	S5	G5	

Observation Dates: April 22, May 25, June 4, June 13 [evening]; June 14, June 26 [evening], June 27, July 10 [evening]), 2014
Observer: J. Broadfoot