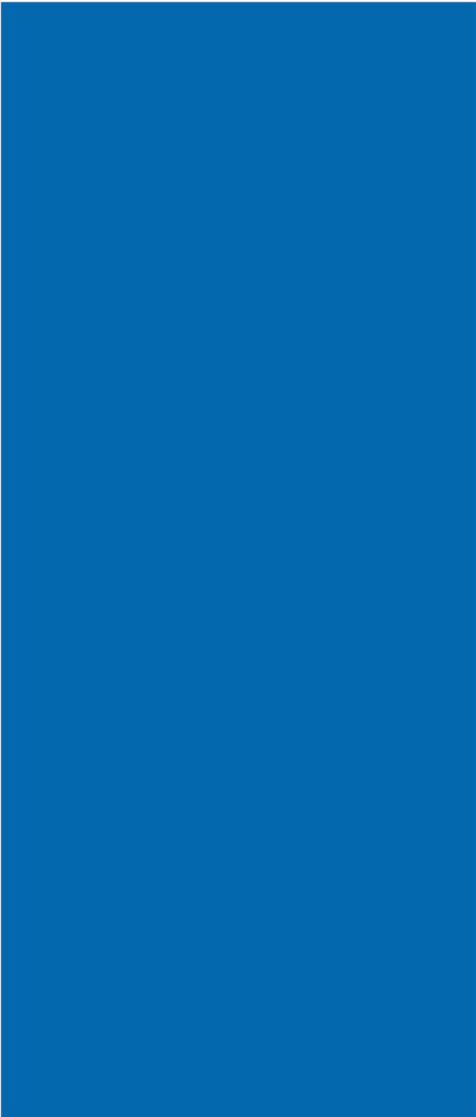




ENVIRONMENTAL IMPACT STUDY



HARBOURVIEW HEIGHTS PROPERTY PENETANGUISENE

Prepared for:

Queen's Court Developments Ltd.

October 2010 (Updated, January 2013)



Michalski Nielsen
ASSOCIATES LIMITED



Michalski Nielsen
ASSOCIATES LIMITED

January 29, 2013

Queen's Court Developments Ltd.
80 Richmond Street W.
13th Floor
Toronto, ON
M5H 2A4

Re: Harbourview Heights; Our File 1709

Dear Mr. Welch:

Michalski Nielsen Associates Limited is pleased to provide you with our report entitled **ENVIRONMENTAL IMPACT STUDY - HARBOURVIEW HEIGHTS PROPERTY, PENETANGUISHENE** (October 2010 [Updated, January 2013]). The original report has been updated to take into account changes in the original development concept plan, stemming from discussions with municipal staff and its consultant team.

Should you have any questions or comments, please do not hesitate to call.

Yours truly,

MICHALSKI NIELSEN ASSOCIATES LIMITED

Per:

Gord Nielsen, M.Sc.
Ecologist
President

GN/be

Enc.

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1 INTRODUCTION

In March, 2009, Michalski Nielsen Associates Limited was retained by Queen's Court Developments Ltd., through their consultant, WMI & Associates Limited, to complete an Environmental Impact Study (EIS) to guide development within a 12 ha property, located at 221 Fox Street in the Town of Penetanguishene. This entire property is woodland, and forms the majority of a 16.1 ha woodland, identified as Site 21, in the **Penetanguishene Urban Woodland Assessment**, a study completed by the Severn Sound Environmental Association (2008). Lands adjacent to this woodland have been, and continue to be, developed; it would appear that the majority of the surrounding area was wooded in the past, with the subject property being the remnant of a once substantially larger forested block. Queen's Court Developments Ltd. wishes to develop the subject property into a residential subdivision, consistent in character with the surrounding neighbourhood.

Clearly, land development within a woodland has environmental consequences. This is particularly true where more traditional residential development, of single family detached homes on urban-sized lots with full municipal services, is contemplated. The purpose of this report is to ascertain the present values of the subject lands in order that the municipality and landowner can make informed decisions on the planning merits of such development. In so doing, it is also useful to look at existing and ongoing stresses on the woodlot which result from surrounding urbanization. This includes the potential for the future extension of Beck Boulevard through the subject property.

Our Environmental Impact Study for this property was first prepared in October 2010. Subsequent to its production, a meeting was held with the Town of Penetanguishene and its consultant team. The development concept plan was changed as a result of that meeting, with the primary change being to eliminate development in areas of steeper forested slope within the eastern end of the property. A Functional Servicing and Stormwater Management Report was also prepared (WMI January 2013). This updated report responds to these changes and additional information.

1.1 Description of Subject Woodlot in Penetanguishene Urban Woodland Assessment

As previously noted, the subject property forms the majority of Site 21, an urban woodland evaluated in the **Penetanguishene Urban Woodland Assessment** (Severn Sound Environmental Association 2008). In

accordance with this study, a total of 25 vacant or “under-developed” woodland areas were examined in order to “rank the sites with reference to their natural heritage values and ecological constraints to development, so as to integrate woodland values into the development lands”. This study included the examination of each of the woodlands, in some cases through site-specific surveys and in other cases (where lands were in private ownership, and landowner permission was not provided), through examination of aerial photographs and roadside surveys.

Site 21 was identified as a gold level site, being the highest rank within the **Penetanguishene Urban Woodland Assessment**. Seven of the 25 urban woodland areas assessed received this ranking. Gold level sites are described by the Severn Sound Environmental Association as being woodlands which “generally are large in area, contain mature trees, have water occurring as seeps, and have moderate to steep slopes.” In specific relation to Site 21, the woodland is described as having a diverse character, with mature oak and maple, a pure black ash stand, and a mixed black ash stand. It is said to contain 5.18 ha of forest interior, of providing hydrological functions (seeps, streams and catchment areas) and a special feature (black ash in standing water). It is further described as having a total of 2.82 ha of steep to moderately steep (>15%) slopes.

Severn Sound Environmental Association recommends retention and protection of gold level sites. This recommendation is made to the Town by a respected organization which is concerned, amongst other matters, with the maintenance of tree cover and woodlands as part of a healthy community. While this goal is important, and the Penetanguishene Urban Woodland Study has attempted to analyze each urban woodland within the municipality in an objective fashion, the Town must consider such information together with other planning considerations. In this regard, existing growth patterns, already approved development, future growth objectives, and future road connections must all be considered by the Town in determining how and where urban woodland areas can be protected as part of an overall growth strategy.

2 METHODOLOGY

2.1 Collection and Review of Background Information

Background information was collected and reviewed prior to the initiation of site investigations. This included the following published literature pertaining to the natural features of the subject property and agency databases: Life Science Areas of Natural and Scientific Interest (ANSI) in Site District 5E8; **Penetanguishene Urban Woodland Assessment** (Severn Sound Environmental Association 2008); the Natural Heritage Information Centre (NHIC) database for information applicable to the study area (NHIC 2010); County of Simcoe Interactive Mapping Interfaces (County of Simcoe 2010); and Town of Penetanguishene Official Plan Official Consolidation (2005).

The Ontario Breeding Bird Atlas (OBBA) web-site was additionally reviewed for data on the typical breeding birds in the area (Bird Studies Canada 2005) and Environment Canada's wild space data base was reviewed (Environment Canada Wild Space 2005).

Contact was also made with Fiona Hessen, Ministry of Natural Resources (MNR), Midhurst District (June 15, 2009) regarding natural features information and species at risk.

2.2 Review of Existing Mapping and Aerial Photography

Digital mapping data sets (Simcoe County internet interface – Ortho Photography 2002), and coloured aerial photography (date unknown but recent); was used to assist in the delineation of vegetation community boundaries and in the preparation of mapping.

2.3 Site Investigations and Methodologies

As outlined above, review of the reports and background information sources listed above provided a context from which to assess the natural features within the study area.

Field surveys were conducted on June 2 and 11, during the early summer of 2009, and during the late spring and summer of 2010 on June 17, July 24 and August 9.

The inventories were based on qualitative survey techniques; two focal areas (vegetation and wildlife) were targeted. The approach taken for each of the target areas is summarized below and expanded upon, as appropriate, in **Section 3**.

Terrestrial Vegetation

Field investigations involved:

- identifying the boundaries of plant communities on the subject property and classifying vegetation communities using the Ecological Land Classification (ELC) System for Southern Ontario (Lee et. al. 1998);
- evaluating the sensitivity and significance of vegetation communities, using the “Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario” (Bakowsky 1996; Natural Heritage Information Centre [NHIC] website 2010)
- evaluating significance and sensitivity of flora recorded during field surveys, using Newmaster et. al. (1998), NHIC website (2010), Varga et. al. (2001), Riley, et al. (1989) and evaluating specific preferences for potential species at risk;
- preparing a vascular plant species list (**Appendix A**);
- clarifying existing disturbances patterns and their impact, to date, on the existing natural features within the study area; and
- taking representative site photographs.

Wildlife

Field investigations involved:

- observations for wildlife, were made during the course of all field visits (**Appendix B**). Species presence and sign (tracks, scats, cavities, etc.), and vocalizations, observed or heard during the field surveys were recorded. Wildlife habitat potential was also evaluated during field surveys;
- Two dedicated Breeding Bird surveys were conducted within the Breeding Bird window (May 1st to July 31st) to assess both resident and migrant bird presence, as well as the quality of various habitats for breeding species and Species at Risk. Supplementary information was also provided through the OBBA;
- one dedicated amphibian survey was conducted on June 11, 2009. Based on a review of available background information, amphibians present on site are restricted to the swamp feature and adjacent lowland forest areas. The survey was intended to confirm vernal pool presence and species usage;
- assessing wildlife habitat characteristics and overall habitat quality, based on qualitative observations. This included the potential of the property to support Species at Risk known to this locale; and
- taking representative site photographs.

2.3 Resource Evaluation

The national, provincial or regional rarity of the vegetation communities and plant species was determined from standard status lists and published literature. Sources included Bakowsky (1997), Argus and Pryer (1990), Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2010), NHIC (2010) and Oldham (2009).

In addition to the identification of any nationally, provincially or regionally rare vegetation communities, features of more local natural interest were identified, on the basis of field investigations.

The significance or rarity of wildlife species and habitats was determined from standard status lists and published literature. Sources included: Province of Ontario (1990); NHIC (2010); Cadman et al. (1987); COSEWIC (2010); Committee on the Status of Species at Risk in Ontario (COSSARO) (2005); Austen et al. (1994); and Bowles et al. (1995). It is noted that bird habitat and nesting information from MNR's Significant Wildlife Technical Guide and Breeding Bird Atlas of Ontario (2005) was also reviewed in determining the potential for significant wildlife species.

3 SITE CHARACTERISTICS

3.1 Physical Setting

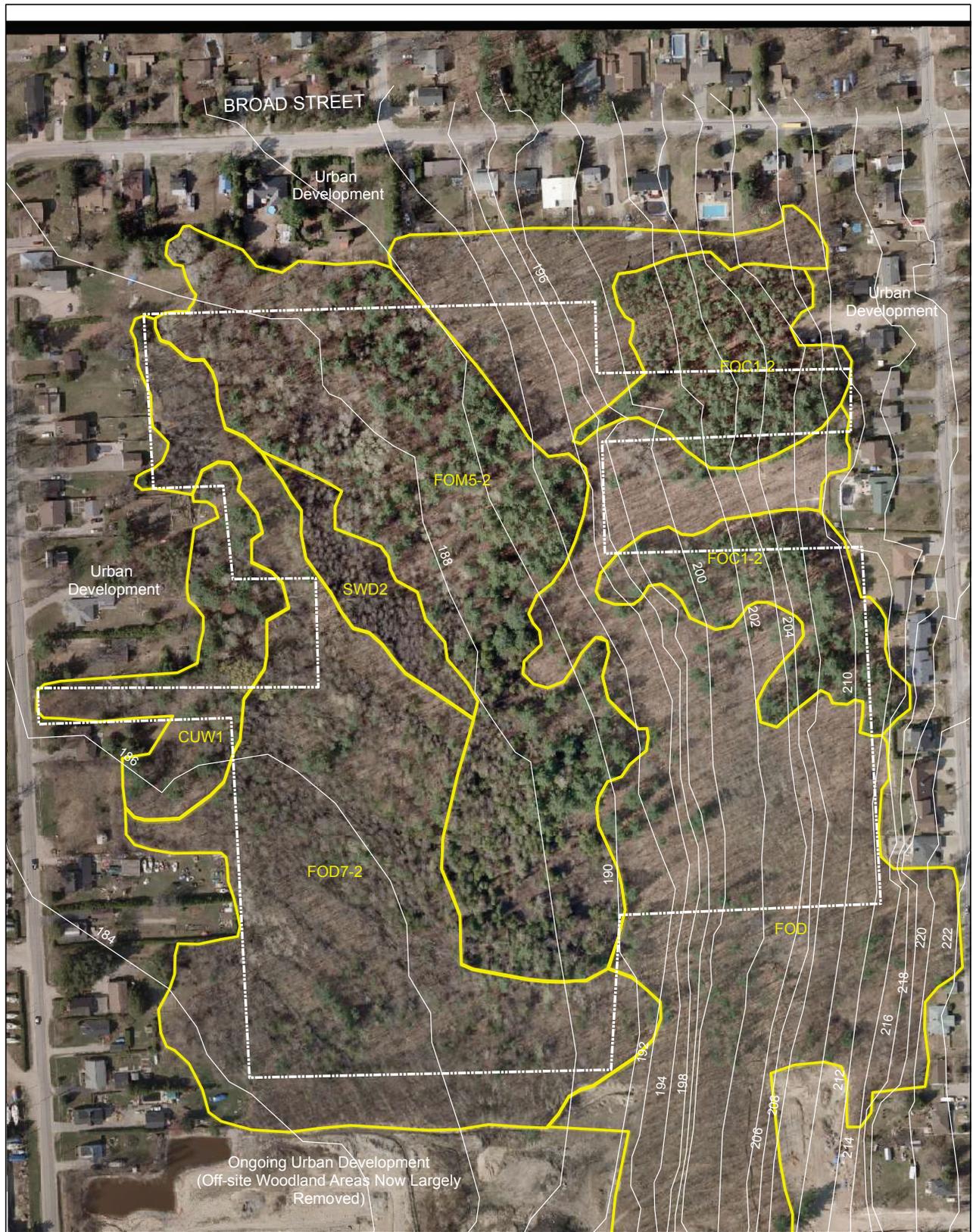
The subject property, together with the majority of Penetanguishene, is located within the Physiographic Region known as the Simcoe Uplands (Chapman and Putnam 1984), an area in which physical conditions have been strongly influenced by glacial Lake Algonquin. On the Penetang Peninsula, the uplands were submerged in this glacial lake, with the resultant presence of a boulder pavement, sand and silt at surface; this peninsula is more broadly defined as a sand plain. A rolling topography characterizes this area.

Soils within the subject property are identified as a sandy loam of the Alliston series (Hoffman 1962). These gray, calcareous, outwash sands are stone-free to moderately stony, with imperfect drainage. Although not identified as part of published soil mapping, organic soils occur within the more poorly drained portions of the site.

Site topography ranges from a high of 222 metres above sea level (masl) to a low of 185 masl (**Figure 1**). Slopes are from east to west, with a steep to moderately steep ridge line which turns north to south through the easterly third of the property accounting for most of this topographic variation. The westerly third of the property, in areas generally below a topography of 188 masl, is imperfectly drained and includes lowland deciduous forest and swamp communities.

The property does not include any watercourses, although runoff from the developed lands to the east have created some erosional gullies. The Functional Servicing and Stormwater Management Report prepared for the subject property (WMI January 2013) indicates that approximately 13.9 ha of external drainage enters these lands, a large portion of which comes from a series of catchbasins and a 300 mm diameter culvert from Church Street to the east. The site includes one wetland feature (an ash mineral deciduous swamp).

As described in the Functional Servicing and Stormwater Management Report (WMI January 2013), a hydrogeological study has been completed for the property by Ian D. Wilson & Associates. That study indicated a westerly flow of shallow groundwater towards Penetang Bay. The water table ranges from 1.9 m to 4.4 m below existing ground, and is within approximately 2.0 m of ground surface in the low-lying westerly portion of the property. A combination of surface runoff and shallow groundwater maintain the wetland feature within the westerly portion of the property.

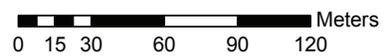


Harbourview Heights

Figure 1: Existing Natural Features

Vegetation Community

FOC1-2: White Pine Coniferous Forest
 FOD: Deciduous Forest
 FOM5-2: Dry-Fresh Poplar Mixed Forest
 SWD2: Ash Mineral Deciduous Swamp
 FOD7-2: Fresh - Moist Ash Lowland Deciduous Forest
 C UW1: Mineral Cultural Woodland



Produced By: GN	Project Name: Harbourview Heights
Date: July, 2009	Project Number: 1709



3.2 Vegetation Communities

Six vegetation units were delineated within the study area, representing six distinct ELC vegetation types, including cultural woodland, coniferous forest, deciduous forest, mixed forest and ash swamp. These communities are described below.

White pine coniferous forest (FOC 1-2): There are two smaller patches of mature white pine forest located along the top of slope in the northeastern portion of the property (**Photograph 1**). These stands also contain Scots pine (*Pinus sylvestris*), red pine (*Pinus resinosa*), balsam fir (*Abies balsamea*), red maple (*Acer rubrum*) and sugar maple (*Acer saccharum*). Shrubs are relatively sparse and include fly honeysuckle (*Lonicera canadensis*) and red-berried elder (*Sambucus pubens*). The ground layer contains Canada mayflower (*Maianthemum canadense*), false Solomon's seal (*Maianthemum racemosum*) and large-leafed aster (*Aster macrophyllus*).

Dry-fresh poplar-white birch deciduous forest (FOD): The patches of coniferous forest are bordered by deciduous forest which continues into the southeastern portion of the site. This forest is predominated by dense American beech (*Fagus americanus*), white birch (*Betula papyrifera*), and large-toothed aspen (*Populus grandidentat*), and is mainly early successional forest (**Photograph 2**). In the eastern-most portion of the site there is an area where Norway maple (*Acer platanoides*) is prominent, and other areas have sugar maple and red oak as prominent canopy constituents. The occasional mature tree is present, particularly along the boundaries with the mixed forest (**Photograph 3**).

Dry-fresh poplar mixed forest (FOM 5-2): As the property slopes to the west, the deciduous forest is replaced by poplar mixed forest (**Photograph 4**). This area is predominantly trembling aspen (*Populus tremuloides*), with white pine and red ash (*Fraxinus pennsylvanicus*) as the next most abundant canopy trees. Several other understory tree species are present including ironwood (*Ostrya virginiana*), red oak, white cedar (*Thuja occidentalis*), basswood (*Tilia americana*) and white elm (*Ulmus americana*). Shrubs include alternate leaved dogwood (*Cornus alternifolia*), wild red raspberry (*Rubus idaeus*), and tree regeneration. Herbaceous layer species include sensitive fern (*Onoclea sensibilis*), herb Robert (*Geranium robertianum*), true forget-me-not (*Myosotis scorpioides*), common wood sorrel (*Oxalis stricta*) and enchanter's nightshade (*Circaea lutiana*). This forest, while still mainly composed of early succession species, is more mature and



Photograph 1. White pine coniferous forest (FOC1-2) with Scot's pine, red pine, and sugar maple (June 3, 2009).



Photograph 2. Poplar-white birch deciduous forest (FOD3) with dense regeneration (June 3, 2009).



Photograph 3. Mature tree amongst early successional forest (June 3, 2009).



Photograph 4. Poplar mixed forest (FOM5-2) along steeper slopes (June 3, 2009).

diverse than the deciduous forest to the east. While the tree diversity and structure in this portion of forest reflect relatively healthy conditions, the presence of non-native and invasive herbaceous species are indications of the high degree of disturbance to the area through trail use.

Fresh-moist ash lowland deciduous forest (FOD 7-2): In the southwestern portion of the property the slope tapers off into lowland deciduous forest. This forest is predominantly red ash, with abundant white elm regeneration in the understorey (**Photograph 5**). In the south, bordering the deciduous forest community, white cedar is also a prominent species. Many ferns can be found in this area such as sensitive fern and ostrich fern (*Matteuccia struthiopteris*), along with other species typical of moist conditions such as scouring-rush (*Equisetum hyemale*), spotted jewelweed (*Impatiens capensis*) and Virginia creeper (*Parthenocissus inserta*). There is vernal pooling in this area, but it does not constitute >20% of the ground coverage (which is what differentiates it from an ash swamp community).

Ash Mineral Deciduous Swamp (SWD 2): In the northern part of the property there is extensive vernal pooling in a strip between the ash lowland and the mixed forest; this area is classified as ash mineral deciduous swamp (**Photograph 6**). The swamp is dominated by red ash, but also contains black ash (*Fraxinus nigra*), white cedar, white elm and balsam poplar (*Populus balsamifera*). Little groundcover species are present due to the extent of seasonal flooding. On the few hummocks present, sensitive fern, fringed sedge (*Carex crinita*) and other sedges occur.

Mineral Cultural Woodland (CUW 1): West of the swamp the land begins to grade upwards again into an area of cultural woodland (**Photograph 7**). This area occurs mainly outside of the property boundaries, but include a thin strip of the property running between two residential lots. It is evident that this area is heavily impacted by the neighboring yards. The herbaceous layer is over-run with non-native invasive species including dense patches of true forget-me-nots, periwinkle (*Vicia cracca*) and English ivy (*Hedera helix*). The tree cover has been thinned, in some areas more than others. Some of the species present include red cedar (*Juniperus virginiana*), white spruce (*Picea glauca*), white pine, Norway maple, sugar maple, black walnut (*Juglans nigra*), red ash, and several others, with no one species discernable as the most abundant. Shrubs include choke cherry (*Prunus virginiana*), smooth blackberry (*Rubus canadensis*) and showy mountain ash (*Sorbus decora*).



Photograph 5. Ash lowland deciduous forest (FOD7-2) (June 3, 2009).



Photograph 6. Ash mineral deciduous swamp (SWD2) (June 3, 2009).



Photograph 7. Cultural woodland (CUW1) (June 3, 2009).



Photograph 8. Erosional gully, from uncontrolled stormwater from east (August 9, 2010).

In total, 81 vascular plant species were recorded during the Michalski Nielsen Associates Limited field surveys. This does not include three species identified only to genus. Points on these species are provided below. A vascular plant list is provided in **Appendix A**.

Of the 81 species recorded, 19 are non-native introduced species, typical of urban fringed areas where residential encroachment and disturbance occurs. These species are generally widespread and abundant in the area of the property where disturbance has been noted.

No Species at Risk (SAR), globally, nationally or provincially significant species were recorded during the field surveys. This includes COSEWIC or COSSARO designated and ESA or SARA-listed species as well as G1-G3 and S1-S3-ranked species. All species recorded are ranked provincially by the NHIC as considered to be 'secure, common and widespread' in Ontario (ranked S5 or SE5) or 'apparently secure, uncommon but not provincially rare' in Ontario (S4, SE4).

However based on review of Riley et al. (1989) four species (prickly rose *Rosa, acicularis ssp sayi*; old-field cinquefoil, *Potentilla simplex*; wood sorrel, *Oxalis stricta*; and mountain holly *Nemopanthus mucronatus*) are considered to be regionally to locally rare for South Central Ontario and Simcoe County. Additionally these above noted species, as well as four others (Virginia creeper, *Parthenocissus quinquefolia*; sweet coltsfoot, *Petasites frigidus* black walnut, *Juglans nigra*; and squaw-root, *Conopholis americana*), totaling seven species; are considered rare and uncommon for Site District 6E-6.

3.3 Wildlife Resources

Wildlife observations are provided in a series of tables provided in **Appendix B**. The wildlife observed are as expected for the habitat characteristics on site. A summary and assessment of wildlife resources is provided in the paragraphs following.

Mammals

Both incidental (2009) and targeted wildlife surveys (2010) were conducted. Detailed results are provided in **Appendix B**. The general landscape setting is dominated by mixed coniferous and deciduous forests, an

ash swamp and cultural woodlands which are surrounded by urban development. Some cultural meadow is found in relation to adjacent urban lots. Penetanguishene Bay and adjacent (although smaller and fragmented) similar forest types complete the landscape mosaic. These habitat areas provide conditions suitable for typical open country and forest edge/forest mammals including grey squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), woodchuck (*Marmota monax*), white-tailed deer; as well as small mammals such as meadow vole (*Microtus pennsylvanicus*), white-footed mouse (*Peromyscus leucopus*), and deer mouse (*Peromyscus maniculatus*). White-tailed deer scat and raccoon tracks were observed by Michalski Nielsen Associates Limited in a few locations within cultural woodland and forest understorey. Several potential den locations for species such as skunk and fox were also seen in these areas.

Birds

The site was surveyed on two days for breeding birds (June 17 and 23, 2010), for a total of ten field hours. Searches concentrated on potential Species at Risk, with all other species recorded concurrently. Detailed results are provided in **Appendix B**. The property supports a variety of bird species that utilize open fields, successional habitat, mixed forests and small wetland features. Typical bird species observed include: American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), common grackle (*Quiscalus quiscula*), red-winged blackbird (*Agelaius phoeniceus*), song sparrow (*Melospiza melodia*), American goldfinch (*Carduelis tristis*), European starling (*Sturnus vulgaris*) and yellow warbler. An old accipiter stick nest and cavity nesting evidence was also observed by Michalski Nielsen Associates Limited within the main forested unit FOM 5-2. Resident, migrant and breeding bird information was compiled and assessed using OBBA datasets and Conservation Priorities for Southern Ontario (Simcoe district). From these data, a number of summary statements can be made relating to the diversity of bird species recorded in the study area and surrounding landscape, as follows:

- A total of 25 species have been recorded within general study area. Of these species, five have been confirmed to be breeding, three have exhibited ‘probable’ breeding evidence and 17 have exhibited ‘possible’ breeding evidence. There was also one species that Michalski Nielsen Associates Limited observed without any breeding evidence. This was a fresh pleated woodpecker hole; indicating that species is utilizing the area, despite not being seen during the survey.

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- When Michalski Nielsen Associates Limited species list was cross referenced with the OBBA data for squares 17NK86 and 17NK85, Region 13, for the second and first atlas; the majority (~90%) of the species recorded were expected to be observed.
 - Several of the species listed by OBBA for squares 17NK86 and 17NK85 were shore birds, grassland/open meadow species or marsh birds where habitat is simply not present on-site. Of the other species listed by the OBBA, accipiter/owl species have the most potential to exist on-site, although none were seen. Habitat on-site would provide suitable opportunities for owls and accipiter's, as mature trees, an old stick nest and tree cavities were observed.
 - All of the species recorded are either very common or demonstrably secure in Ontario (S5, S5B SZN), or common and apparently secure in Ontario (S4, S4B SZN).
 - Six species observed as possible or confirmed breeding are considered "area sensitive" (Significant Habitat Technical Guide MNR 2000), meaning they are species which require large areas of suitable habitat for long term population survival. Fragmentation of essential habitats can result in overall declines in populations.
 - Of the 25 species identified, 10 are ranked under the *Conservation Priorities for southern Ontario (CPSO)* municipal priority list for Simcoe Region. The rankings are included in **Appendix B**. This ranking system goes from Level 1 (Highest) through Level 4 (Lowest). CPSO is a tool for municipalities to assist them in assessing the importance of bird species in land use planning. Ranks have been developed using standard criteria relating to a species' habitat-area requirements, breeding range and biological characteristics. The ranks provide a tool that municipalities might use when identifying significant natural heritage features. *Note: Caution should be used when interpreting this information since it is not a legal designation nor afforded any policy protection.*

Amphibians and Reptiles

A single amphibian survey was conducted on June 11, 2009, between 10:00 p.m. and 10:35 p.m.; this survey was conducted to confirm the use of the subject property by amphibians. There was very little wind (Beaufort wind speed = 1) and no precipitation. The temperature remained a constant 14°C throughout the survey. The three survey stations were located in the western portion of the property, where swamp and lowland communities contain ephemeral ponds capable of supporting amphibian breeding (**Figure 1**). During the survey three species were observed: American toad (*Bufo americanus*); spring peeper (*Hyla crucifera*), and green frog (*Rana clamitans*). The ash swamp has the potential to support other common amphibian species, including wood frog (*Rana sylvatica*), and grey tree frog (*Hyla versicolor*), as well as one species considered at risk, the western chorus frog – Great Lakes/St. Lawrence – Canadian Shield Population (*Pseudacris triseriata pop. 2*); while these species were not recorded, each would be expected to occur within this swamp.

Calling evidence and abundance counts of individuals were limited, with few individuals heard throughout all the stations. Based on habitat conditions it is almost certain that that during early April and May, a full chorus would be heard of earlier breeders (i.e., spring peeper, chorus frogs and wood frogs). These are species which would rely on the swamp community as a breeding pond. The June survey would also have caught later breeders (i.e., pickerel frog, mink frog and northern leopard frog), if they were utilizing these pools; however, none were observed during the survey.

The American toad can breed as early as late March through to early June. In Penetanguishene, due to the higher latitude, breeding would likely be towards the end of this period. It requires a minimum of 50 days from the time the eggs are laid until the tadpoles are ready to transform into toads. Similarly, spring peepers begin calling in early spring and their offspring take 2 – 3 months to go from egg to tadpole to frog. Both of these species can be supported by the types of ephemeral ponds observed on site in the ash swamp and lowland communities (SWD 2, FOD 7-2).

Green frogs on the other hand breed from early summer through to August. Their eggs hatch within three weeks, but the tadpoles overwinter in water and transform the next spring. This means that they require permanent or semi-permanent water bodies (i.e., water bodies that dry up only during dry years), for

successful reproduction. On the basis of the field survey conducted on June 11, 2009, and subsequent follow-up visit on August 9, 2010, the pools of water on-site are ephemeral, retaining some spring recharge and partially drying up in the summer. It is expected these areas will retain some water after larger rain events, given the limited ground flora and evidence of saturated soils.

The three amphibian species observed on-site are amongst the most common to Ontario; however, amphibians and reptiles are known to be particularly sensitive to human disturbances such as habitat alteration and fragmentation. Considering the surrounding developed areas, a loss of breeding habitat for these species could result in a significant decrease in their abundance within the more immediate environs. The preservation of the ash swamp together with portions of the surrounding woodlands would likely maintain sufficient amounts of amphibian breeding habitat to sustain the populations observed.

Michalski Nielsen Associates Limited observed two species of snakes, eastern gartersnake (*Thamnophis sirtalis sirtalis*) and Dekay's brownsnake (*Storeria dekayi*) within CUWI and FOD3-1 during the August 9, 2010 survey. These are widely distributed species often found near human habitation in urban or suburban areas. The study area has potential to support other common reptiles, particularly snakes. This includes a species of conservation concern, milk snake.

Species of Conservation Concern

Based on a review of available background sources and Michalski Nielsen Associates Limited's field work, there are no direct records of Species at Risk (SAR) or provincially rare species recorded within the immediate study area. This includes species designated by COSEWIC, COSSARO and species listed by the *Species At Risk Act (SARA)* and the *Endangered Species Act*. This also includes S1 to S3-ranked (provincially rare) species. Fiona Hessen of Midhurst District MNR was consulted for *known occurrences* within the surrounding area, to ensure the subject property was appropriately screened. In this regard, there are three species known to the immediately surrounding area: butternut (*juglans cinerea*), listed as both endangered federally and provincially; hooded warbler (*Wilsonia citrine*), listed as threatened federally and special concern provincially; and eastern milksnake (*Lampropeltis triangulum*), listed as special concern both federally and provincially, are species which have not been found, but which could occur within the subject property, given appropriate habitat conditions. The MNR recommended that the contractors become familiar with these species' visual appearance during the course of the project.

Within the broader context, the NHIC's Biodiversity Explorers was used to assess species occurrences within the project vicinity using the both the 1 km squares search (**Table 1**; SAR and rare species) and 10 km square search (**Table 2**; SAR only). These tables describe each species habitat preferences in relation to site conditions. This list has been refined to exclude species where habitat is simply not present on site and/or where records for surrounding areas are more than 15 years old. From this refined list, four species were further assessed as they relate to on site conditions. They are: Cerulean Warbler (*Dendroica cerulean*), designated as special concern federally and provincially; American lotus (*Nelumbo lutea*) (S2); northern long-eared bat (*Myotis septentrionalis*) (S3?); and northern long sedge (*Carex folliculate*) (S3).

Based on these analyses there are three species with known local occurrences, and four species which have the potential to occur in this locale. These species are described in further detail below.

Butternut (END/END)

- Butternut was not observed by Michalski Nielsen Associates Limited within the study area during the vegetation community surveys and subsequent field visits.
- Butternut has been designated as an Endangered Species in Ontario and Canada and added to Schedule 1 of the SARA. There are policies and procedures in place for the identification and management of butternut, and provisions for removal of specimens which have been identified by a butternut health assessor as non-retainable. For retainable trees, there are a variety of possible options, which can include the removal of a limited number of specimens.
- The endangered designation is a result of severe decline caused by a fatal disease, Butternut Canker (*Sirococcus clavigignenti-juglandacearum*), rather than a loss of habitat.
- Although habitat for this species is present on site, this species would likely have been identified were it present. A more detailed survey of woodland areas to be disturbed should be undertaken by a qualified butternut health assessor prior to development (during leaf-on period, between May and September).

Table 1. Species at Risk and rare species documented in the NHIC database that occur within two 1 km blocks overlapping the subject property.

Common name	Scientific name	Prov. Status	Key habitats	Site relevance
Butternut*	<i>Juglans cinerea</i>	END	Deciduous forest	Not observed
Eastern massasauga rattlesnake	<i>Sistrurus catenatus</i>	THR	Fen (bog), swamp, marsh, rock barren	No suitable open areas for thermo-regulation within the subject lands; no fen, marsh or rock
Five-lined Skink - Great Lakes / St. Lawrence Population	<i>Eumeces fasciatus (pop. 2)</i>	SC	Rock barren	No rock barrens present
American Lotus	<i>Nelumbo lutea</i>	S2	Mostly flood plains of major rivers in ponds, lakes, pools in marshes and swamps, and backwaters of reservoirs	ash swamp provides marginal habitat
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	S3?	Associated with boreal forest; maternity roosts under loose bark/cavities of trees; hibernates in caves and underground mines	No suitable hibernation sites; some of the more mature trees have cavities and loose bark that would be suitable for roosting
Northern Long Sedge	<i>Carex folliculata</i>	S3	Wet forests, bogs, seeps, wet meadows, marsh edges, stream banks, lakeshores, in acidic, sandy, or peaty soils	May occur in swamp or lowland forest
Low Nutrush	<i>Scleria verticillata</i>	S3	Wet, marly, sandy, or peaty soils in marshes, bogs, savannas, moist meadows, wet pinelands, lakeshores	No suitable habitat found within the subject lands

*No NHIC records but the subject property falls within the range of this species and communications with the Midhurst MNR indicate that this species may be present.

Bolding indicates some degree of potential to occur on the subject lands.

Habitat information based on Natural Heritage Information Center's Biodiversity Explorer, the Species at Risk Public Registry [<http://www.sararegistry.gc.ca>], the Flora of North America, and the IUCN Red List.

Note: Provincial status is first listed by Species at Risk in Ontario (SARO) status; if no SARO designation applies then an NHIC S Rank is provided.

SARO: END = Endangered; THR = Threatened; SC = Special concern

S Rank: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable

Table 2. Species at Risk documented in the NHIC database that occur within two 10 km blocks overlapping the subject property.

Common name	Scientific name	Prov. Status	Key habitats	Site relevance
Forked Three-awned Grass	<i>Aristida basiramea</i>	END	areas that are dry, open, and sandy or disturbed	No open areas exist on the subject lands
Least Bittern	<i>Ixobrychus exilis</i>	THR	Marsh (cattail)	No marsh is present in the subject lands
*Hooded Warbler	<i>Wilsonia citrina</i>	THR	mature hardwood forests with tall trees and a well-closed canopy; area sensitive species	the forested area is < 30 ha., has limited amounts of interior forest, and has a number of trails. Sufficiently large tracts that are more suitable for this species can be found nearby in Awenda and Georgian Bay Islands parks.
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR	Fen (poor fen), marsh, swamp, open areas of sand or fine gravel, rock barren	No suitable wetlands are present within the subject lands.
Stinkpot	<i>Sternotherus odoratus</i>	THR	Marsh, swamp, fen (bog)	No suitable wetlands are present within the subject lands.
Eastern massasauga rattlesnake	<i>Sistrurus catenatus</i>	THR	Fen (bog), swamp, marsh, rock barren	No suitable open areas for termo-regulation within the subject lands
Cerulean Warbler	<i>Dendroica cerulea</i>	SC	mature deciduous forest with open understorey; area-sensitive species (as small as 10 ha)	the forested area is < 30 ha., has limited amounts of interior forest, and several trails. Sufficiently large tracts that are more suitable for this species can be found nearby in Awenda and Georgian Bay Islands parks.
Northern Map Turtle	<i>Graptemys geographica</i>	SC	Basking sites along open water	No open waters present
Five-lined Skink - Great Lakes / St. Lawrence Population	<i>Eumeces fasciatus</i> (pop. 2)	SC	Rock barren	No rock barrens present

Table 2 (Cont'd).

Common name	Scientific name	Prov. Status	Key habitats	Site relevance
*Milksnake	<i>Lampropeltis triangulum</i>	SC	Ambiguous species, can utilize a variety of habitats including: farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites (Significant Wildlife Habitat Technical Guide 2000), wet meadows, woodlot edges and old field habitats.	Limited potential onsite. May occur within successional field habitats along edge of rear lots and edge of mixed lowland woodland.
Peregrine Falcon	<i>Falco peregrinus</i>	SC	Cliffs, Urban high-rise buildings typical in Large cities	No cliffs present or High-rise buildings not within a large city core

*No NHIC records but the subject property falls within the range of this species and communications with the Midhurst MNR indicate that this species may be present.

Bolding indicates some degree of potential to occur on the subject lands.

Habitat information based on Natural Heritage Information Center's Biodiversity Explorer, the Species at Risk Public Registry [<http://www.sararegistry.gc.ca>], the Flora of North America, and the IUCN Red List.

Note: Provincial status is first listed by Species at Risk in Ontario (SARO) status; if no SARO designation applies then an NHIC SRank is provided.

SARO: END = Endangered; THR = Threatened; SC = Special concern

SRank: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable

SARO: END = Endangered; THR = Threatened; SC = Special concern

Hooded Warbler (THR/SC)

- Although listed within the NHIC search, this species was not observed during Michalski Nielsen Associates Limited's breeding bird surveys. Furthermore, communications with MNR indicated this species was only historically present in the broader area.
- A review of OBBA point count data and atlas of the Breeding birds in Ontario (2001-2005 second atlas) indicates this species habitat range is concentrated along the Lake Ontario shoreline. It was, however, observed within the 10 km atlas square which overlays our study site, and was recorded as a probable breeder (Cadman et.al 2005).
- Habitat preferences are large mature forests with canopy gaps that have been created either naturally or through logging. They have been found in woodlands smaller than 10 ha, but typically occur in areas with high regional forest cover (Cadman et.al. 2005).
- Vegetation communities onsite (FOM, and FOD) do provide some open canopy, however; the woodlot has limited amounts of interior forest. Sufficiently large tracts that are more suitable for this species can be found nearby in Awenda Provincial Park and Georgian Bay Islands parks.

Eastern Milksnake (SC/SC)

- NHIC records indicate element occurrence observations from 1978 to as recent as 2003.
- Although this species was not observed during Michalski Nielsen Associates Limited surveys, these species are highly secretive and can utilize a variety of habitat types. Typically these species are observed in transitional habitats, wet meadows and farm land where they utilize the areas abundant in small prey.
- The peripheral edges of the woodland, adjacent to current development, as well as the FOM and CW units, may provide opportunistic habitat for this species.

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- The MNR recommends that contractors are made aware of the visual appearance of this species, with any observations to be reported to the Midhurst District office.

Cerulean Warbler (SC)

- Although listed within the NHIC search, communications with MNR indicated this species was not a *known* occurrence within the vicinity of the study site. This species was not observed during Michalski Nielsen Associates Limited's breeding bird surveys
- A review of OBBA point count data and atlas of the Breeding birds in Ontario (2001-2005 second atlas) indicates this species was observed within the 10 km atlas square which overlays our study site (but also includes portions of Awenda Provincial Park), as well as several adjacent atlas squares. It is listed as both possible and probable breeding (Cadman et.al 2005).
- Typical habitat is described by Cadman as "upland deciduous forest and or swamp forests with a tall canopy and uneven structure"; in Ontario, large core territory is associated with oak and bitternut hickory trees.
- This is an area-sensitive species but can inhabit areas as small as 10 ha.
- The subject woodland has limited amounts of interior forest. Sufficiently large tracts that are more suitable for this species can be found in nearby Awenda Provincial Park and Georgian Bay Islands parks.

The American Lotus (S2); Northern Long Sedge (S3)

- NHIC records indicate element occurrence observations of 1969, 1977, and 1984.
- These species are not officially designated and therefore are afforded a lesser degree of protection.

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- These species were not observed by Michalski Nielsen Associates Limited within the study area during the vegetation community surveys and subsequent field visits.
 - They can occur in habitats of wet forests, bogs, seeps, wet meadows, marsh edges, stream banks, lakeshores, and plains of major rivers, in ponds, lakes, pools in marshes and swamps, and backwaters of reservoirs.
 - The ash swamp and lowland forest provide marginal habitat as they seasonally retain water. The project site lacks permanent open water, and is unlikely to support these species.

Northern Long-eared Bat (S3?)

- NHIC records indicate element occurrence observations of 1969, 1977, and 1984.
- This species is not officially designated and therefore is afforded a lesser degree of protection.
- This species was not observed by Michalski Nielsen Associates Limited within the study area during the vegetation community surveys and subsequent field visits.
- Bats in general are difficult to survey for and properly identify. They are a secretive species and identification is difficult unless the species is captured or the use of specialized equipment is employed to identify the species by sound.
- This particular type of bat has two habitats: a winter hibernation habitat as well as a summer roosting and foraging habitat. Rocky outcrops and caves are typical winter hibernacula sites. There is no suitable winter hibernation sites located within the vicinity of the subject property.
- For summer roosting and foraging they will roost in loose bark and cavities of mature tree (Kurta, A. 1995). Similarly, activity may also be high in the vicinity of artificial light sources such as streetlights and yard lights in association with the increased availability of night-flying insects.

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- Some of the more mature trees have cavities and loose bark that would be suitable for roosting. The presence of adjacent urban development, together with a swamp area which provides a good source of insects, increases the foraging habitat potential for this and other bat species.

Note that, as this project has experienced delays to date, and it may be a considerable time before construction does occur, it is prudent that a review be completed to demonstrate conformity of the development with the *Endangered Species Act* prior to construction, ensuring any newly listed species, as well as new regulations or guidances, are being addressed.

4 RESOURCE EVALUATION AND IMPACT ASSESSMENT

4.1 Environmental Policies and Guidelines Relevant to this Project

A detailed analysis of the planning context for this project is provided under separate cover by Lucas & Associates. This includes an examination of the implications of the Provincial Policy Statement, the County of Simcoe Official Plan and the Town of Penetanguishene Official Plan.

From a Provincial Policy perspective, a key consideration is whether the subject woodland meets the definition of a significant woodland. Development is not permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features or ecological functions of the woodlot. The term significant is, however, quite broadly defined within this Policy Statement, being “an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to its site quality, species composition or past management history”. The Policy Statement further notes that criteria for determining significance are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used. In other words, this determination falls to a municipality, who must consider local context, including percent woodland coverage over their jurisdiction. The Province has published a Natural Heritage Reference Manual (2005) which affords guidance to municipalities on criteria which they may choose to employ in determining woodland significance. **Table 3** provides a brief summary of the criteria in that guideline, and their application to this particular woodland.

In summary, this woodland does have attributes which **could** lead to its determination as significant in accordance with the Provincial Policy Statement, but which equally may not qualify it. The Town of Penetanguishene can only make a determination of its significance in consideration of this woodland’s size and character in relation to other woodland areas within the entire municipality. The study completed by the Severn Sound Association provides a useful assessment and ranking of the subject woodland in relation to other urban woodlands within the more built-up portion of Penetanguishene; while of assistance in understanding its significance, this does not take into consideration the natural heritage features of the broader planning area. In that regard, the Town’s Official Plan (Office Consolidation, September 22, 2011) does not identify the subject woodland under either Schedule A1, to be protected in accordance with its

Table 3. Province’s recommended significant woodland evaluation criteria and standards.

Criteria	Standard	Comments
1. Woodland size	<ul style="list-style-type: none"> • where 5% to 15% of land base is woodland, woodlands of 4 ha in size or larger should be considered significant • where 15% to 30% of land base is woodland, woodlands of 20 ha in size or larger should be considered significant 	<ul style="list-style-type: none"> • woodland is 16.1 ha in size
2. Ecological functions	<ul style="list-style-type: none"> • area >100 m from an edge should be considered significant if any interior habitat is present where <15% woodland cover • where woodland cover is 15% to 30%, 2 ha interior habitat is suggested as standard 	<ul style="list-style-type: none"> • Urban Woodland Assessment suggests 5.2 ha of interior habitat • our calculation suggests approximately 1.5 ha of interior habitat • extension of Beck Boulevard through property would essentially eliminate any interior habitat • although area of interior habitat is not large, six area-sensitive birds have been identified
2. Ecological functions	<ul style="list-style-type: none"> • if woodland is within a specified distance (e.g., 30 m) of a significant natural feature or fish habitat likely receiving ecological benefit from woodland, significance is increased 	<ul style="list-style-type: none"> • Penetang Bay approximately 250 m away • woodland impacted by urban development • two other woodlands occur within approximately 120 m • no other significant features known to occur in close proximity
2. Ecological functions	<ul style="list-style-type: none"> • significance increased if woodlands are part of an identified natural heritage system or provide a connecting link 	<ul style="list-style-type: none"> • no County of Simcoe Greenlands designation • property identified neighbourhood residential in Schedule A1, but as urban woodland in Schedule A2 • two other urban woodland areas within approximately 120 m of site • urban development separates this woodland from other woodland areas

Table 3 (Cont'd).

Criteria	Standard	Comments
2. Ecological functions	<ul style="list-style-type: none"> • significance increased by proximity to areas of sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat 	<ul style="list-style-type: none"> • Penatang Bay approximately 250 m away • lowland forest and swamp communities appear to be fed primarily by surface flow • no evidence of watercourses, sensitive groundwater discharge or recharge, or sensitive headwater areas
2. Ecological functions	<ul style="list-style-type: none"> • significance increased if forest contains native forest species which have declined significantly, or have a high natural diversity (plant species composition plus terrain conditions) 	<ul style="list-style-type: none"> • woodland does have physically diverse conditions, and supports a relatively diverse plant community, albeit one which is effected by surrounding urbanization
3. Uncommon characteristics	<ul style="list-style-type: none"> • significance increased by unique species composition, S1, S2 or S3 ranked plant communities, rare vegetation, or characteristics of older woodlands 	<ul style="list-style-type: none"> • no S1, S2 or S3 plant communities • no federally or provincially designated vegetation • regional rare species for Simcoe Region and Site District 6E-6 observed • portions of the woodland do contain some very mature trees, but no mature stands
4. Economic and social values	<ul style="list-style-type: none"> • significance increased by high productivity of economically valuable products • significance increased by important identified recreational, native appreciation, cultural or historic values 	<ul style="list-style-type: none"> • none of these standards appear to apply • ad-hoc trail development does not satisfy recreational standards

Environmental Protection 1 designation, or under Schedule A2, to be protected in accordance with the Environmental Protection 2 Overlay designation. This implies that, through a broader scale and public planning process, the subject woodland was not been determined to have the same significance as those woodlands where such designations were applied; it is up to the Town of Penetanguishene to determine if that process adequately considered the Province’s criteria for determining woodland significance.

Note that the easterly portion of the woodland area within this property (that portion adjacent to Church Street) is identified as a constraint on Schedule B, Community Improvement Areas, to the Official Plan, however that designation appears to relate to steep slope concerns, not woodland qualities. This constraint area continues through the property to the south (175 Fox Street), on which the Official Plan includes some specific policies. In this regard, Policy 5.12.3.2 reads as follows:

5.12.3.2 Steep Slopes

“The land lease residential community shall not be developed on those lands that are subject to a steep slope. Such steep sloped lands shall be set aside as an open space buffer to protect the slope and be identified as such in a site plan agreement.”

The policy appears to confirm that the municipality’s concern relates strictly to steep slopes.

4.2 Biological Significance

4.2.1 Vegetation Communities and Floristics

The analysis for vascular plant species rarity consisted of a straightforward comparison of the subject property’s plant species with those listed in the previously-mentioned status lists. None of the flora found within the study area has been designated as rare on a federal or provincial level. Nor did the search of the Natural Heritage Information Centre (NHIC) records identify any record of such vegetation for this immediate locale. Species of local or regional rarity have been identified. Further; liaison with MNR

Midhurst did recognize that butternut may be a potential species for this site. This species was not recorded during Michalski Nielsen Associates Limited vegetation surveys or community delineations.

The study area spans a variety of natural and anthropogenic habitats, including mixed forest (**FOM**), deciduous forest (**FOD**), coniferous forest (**FOC**), cultural woodland (**CUW**), swamp (**SWD**) and urban residential (**UR**). Despite a variety of disturbance factors, some relatively undisturbed and mature forest is present. Apart from the swamp feature, there are no other wetland features within the subject property. Based on available background resources, all of the vegetation communities potentially affected by the proposed development are common and abundant in the Penetanguishene area and Site District 6E-6. The study area does not contain any life or earth science Areas of Natural or Scientific Interest (ANSIs), or Provincially Significant Wetlands (PSWs). Nor have any features been designated by the MNR or municipality as significant wetland. As previously described, the site has been evaluated through an urban woodland study, and given a high ranking.

4.2.2 Species at Risk Implications

Eastern wood peewee, a forest bird species, was observed on site. This species was very recently listed as being of Special Concern federally (November 2012), and is currently under review provincially (as of January 2013). This species does not presently have any status under the *Endangered Species Act*. On the subject property, it was found in the mixed and deciduous forest areas, and was recorded as a probable breeder. This bird nests in mature trees, and forages in areas of partial clearing. There are indications this bird is quite resistant to habitat changes, including removal of some mature trees (COSEWIC 2012).

No other significant wildlife or species of conservation concern were observed during Michalski Nielsen Associates Limited surveys. However portions of the study area may provide suitable habitat for milksnake, a species designated as provincially and federally “at risk”, the American lotus, northern long sedge and northern-long eared bat. These latter three species are ranked at the provincial level (not officially designated and are not afforded legal protection).

Although not observed on site, milksnakes have generalist habitat preferences and are known to occupy a wide variety of habitats, including field, swamp, open woodlots, deciduous forests, and pine forests

COSEWIC 2002. A variety of these habitats do exist on-site, although are limited in size and composition. Michalski Nielsen Associates Limited did observe the presence of associated snake species (eastern garter snake and brown snake).

It is expected that given the ash swamp community features and structure, western chorus and the American lotus both are expected to occur and the northern long sedge have quite limited potential to occur on the site. The northern-long eared bat may utilize the mature trees with peeling bark and cavities features were are present on-site within the mixed forested units.

Habitat for other Species at Risk known to the broader locale does not generally occur on the subject property or in its immediate vicinity. The hooded warbler and the cerulean warbler could utilize the property, but conditions are far from ideal. In this regard, these are area sensitive species, known to prefer forests with interior habitat, meaning habitat greater than 100 m from the forests edge. While the subject woodland does contain some interior forest (approximately 1.5 ha), these areas are limited to the central portion of the forest and are dissected by a trail system that exhibits heavy signs of use, including well worn paths, ATV tracks and constructed bike ramps. The site is surrounded on all sides by residential housing and two-lane paved roads. There is also currently a large development immediately to the south of the site where the lands have been heavily disturbed. In addition, in the broader range where these species were likely observed there are two major parks (Awenda Provincial Park and Georgian Bay Islands), in which these species' preferred interior forest habitats are more abundant.

4.2.3 Other Wildlife and Wildlife Habitat

The primary issues to consider with respect to wildlife and species of conservation concern are: direct removal of higher quality wildlife habitat; indirect impacts (i.e., noise, saltspray and damage to vegetation etc.); and fragmentation of important wildlife movement corridors. The ash swamp habitat block within the central portion of the study area provides some good wildlife habitat conditions/potential and has confirmed amphibian habitat. While the remainder of the woodland affords reasonable wildlife habitat, species observed are all common to the broader area and reflective of a relatively small woodland within an urban setting. Wildlife corridor opportunities are limited by the extent of surrounding urbanization.

4.3 Comments on Future of Woodlot

With recent and ongoing development along the southern perimeter of the subject woodland, this woodland is now fully surrounded by urban development. A variety of impacts are being seen as a result of surrounding urban encroachment, and resultant ad-hoc use of the woodland. This includes:

- evidence of uncontrolled stormwater from the east, which has created erosional gullies (**Photograph 8**) and is likely contributing higher peak flows of runoff into this woodland than occurred under pre-development conditions;
- runoff from construction activities to the south, which is carrying considerable quantities of suspended sediment into portions of the subject woodland (**Photographs 9 and 10**);
- a large number of trails, utilized by ATV's, bicycles and pedestrians, which have been created in an ad-hoc and indiscriminate fashion (**Photographs 11 and 12**);
- the associated creation of bicycle jumps, tree forts, etc., through the use of this area by neighbourhood children;
- the presence, and abundance in some areas, of aggressive exotic plant species, which can outcompete native vegetation; and
- likely ongoing changes in moisture regime, which will manifest itself through changes in vegetation composition within portions of the woodland over time.

While some of these impacts could be reduced by better management of surrounding land uses and the woodland itself, most are the inevitable consequence of surrounding urbanization. The reality is that this woodland is presently in a state of transition and, unless portions of the woodland are more actively managed and protected through parkland acquisition, for example, most of the natural area values of the woodland will continue to decline over time. That is not to say that values will be lost altogether, but that they will be diminished.



Photograph 9. Construction activity to southeast of property, showing erosion and sediment released towards property (August 9, 2010).



Photograph 10. Recently deposited sediment within subject property (August 9, 2010).



Photograph 11. ATV trail within subject property (August 9, 2010).



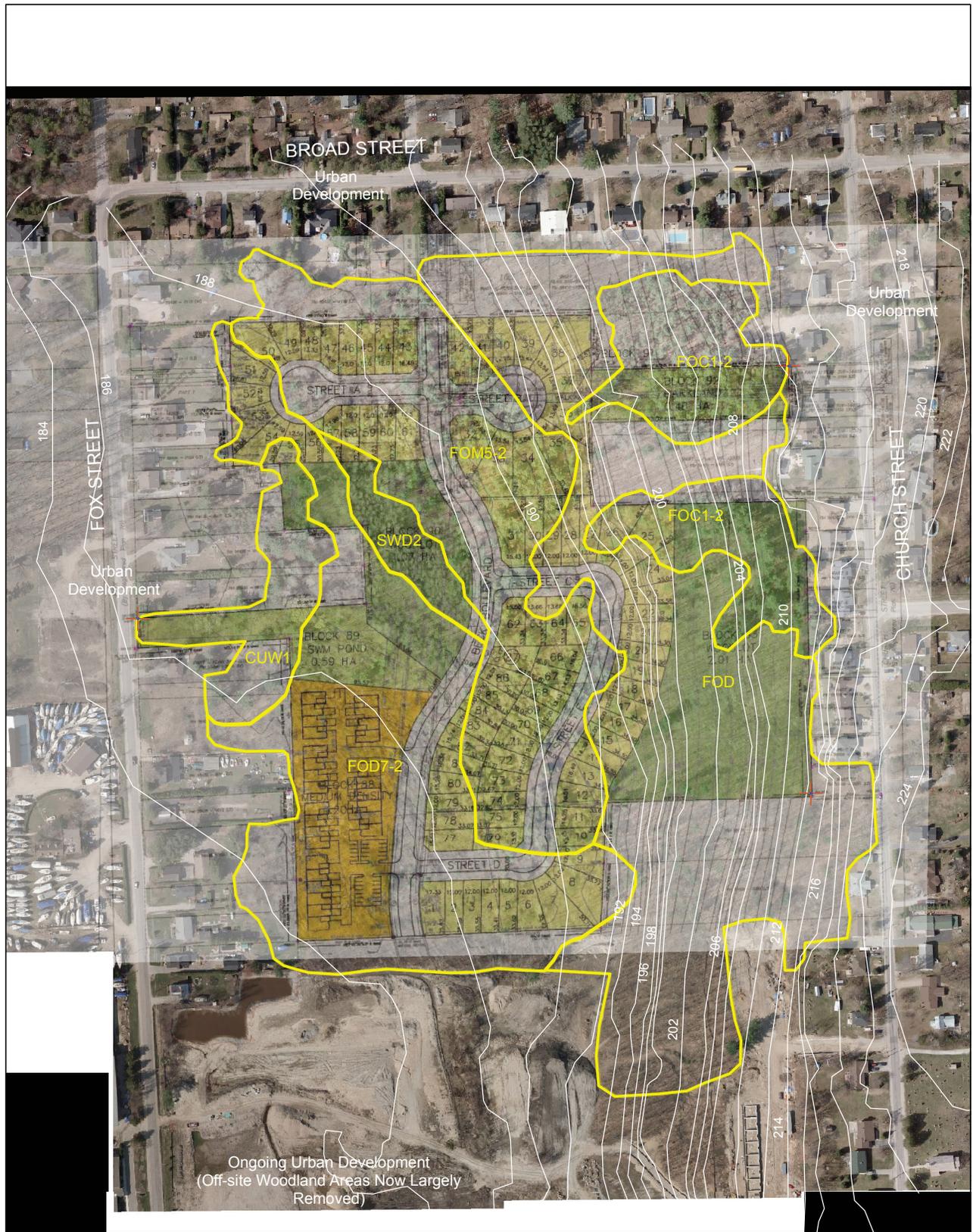
Photograph 12. Ad-hoc trail and bicycle jumps within subject property (August 9, 2010).

It is our understanding that future plans of the municipality include for the extension of Beck Boulevard through the subject property. If that does occur, this remnant woodland would essentially be bisected. No interior wildlife habitat (measured as areas greater than 100 m from areas of significant disturbance, which would include this road) would remain. The hydrology of the woodland would be further impacted, and direct encroachment into the area of mineral ash swamp would occur if the road were extended in a linear fashion. If this road is required as part of the municipality's long-term transportation requirements, its impacts cannot be ignored in considering the implications of development within this woodland.

4.4 Comments on Development Proposal

Figure 2 includes a development concept plan which has been advanced by Lucas & Associates for the subject lands. Please note that this plan has been updated, as a consequence of comments received from the Town of Penetanguishene and its consultant team. This plan is based largely on a more traditional detached home subdivision design, which Queen's Court Homes feels is the most appropriate and marketable product for this locale. It does, however, include a medium density townhouse block. Michalski Nielsen Associates Limited has had input to this plan insofar as it relates to the protection of the majority of the area of mineral ash swamp. A significant additional change which has resulted from consultation with the Town of Penetanguishene is the preservation of the most easterly portion of the forested block, which coincides with an area of moderately steep slopes. This change was deemed appropriate in order to maintain the integrity of these slopes, with the retention of trees considered integral to that purpose. From the perspective of Michalski Nielsen Associates Limited, that change allows for additional forest retention on site, which has clear aesthetic and ecological benefits. The present development plan occupies only 5.84 ha of this 12.01 ha site, maintaining 6.17 ha (51% of the site) as environmentally protected area, open space and stormwater management blocks. While there will be tree clearing in portions of those areas, the revised plan does retain considerable areas of trees.

The concept plan shown on **Figure 2** does allow for the maintenance of the majority of the area of mineral ash swamp, as well some portion of the adjacent lowland forest. Note that Beck Boulevard has been extended through the property in a manner that substantially protects this feature.



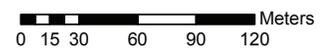
Harbourview Heights

Figure 2: Proposed Development Plan Overlaid onto Site Natural Features

 Vegetation Community

- FOC1-2: White Pine Coniferous Forest
- FOD: Deciduous Forest
- FOM5-2: Dry-Fresh Poplar Mixed Forest
- SWD2: Ash Mineral Deciduous Swamp
- FOD7-2: Fresh - Moist Ash Lowland Deciduous Forest
- CUW1: Mineral Cultural Woodland



 Meters
0 15 30 60 90 120

Produced By: GN	Project Name: Harbourview Heights
Date: July, 2009	Project Number: 1709
Rev. Feb 04, 2013	



As part of the stormwater management strategy, a number of measures are being taken to ensure that opportunities for infiltration of runoff are being substantially maintained. This includes reduced lot and road grades, split grading on lots, and encouragement of infiltration of roof leader runoff using soakaway pits. As a consequence, the post-development infiltration capacity of the site has been calculated to be 82.6% of that at present. Much of the shallow groundwater will continue to feed towards the low-lying forest area containing the mineral ash swamp. Existing surface drainage to this feature will be substantially maintained by directing external drainage from the east through a combination of swales and/or storm sewer (details to be resolved as part of the detailed design process) to this lowlying area. Excess runoff during large infrequent rainfall events will be drained by an interceptor swale to the stormwater management facility outlet. Some local surface runoff to this feature will also be maintained. While these measures are unlikely to exactly replicate existing conditions, they will maintain the seasonally wet character of this area, which contributes to the tree composition and natural attributes of this particular woodland area. The stormwater management pond can also be designed to contribute to the natural area values of the retained woodland block.

The intended park block in the northeast corner of the property does allow for the maintenance of an additional small area of more upland forest, albeit one that will be very fragmented. Depending on intended park uses, there may be an opportunity to maintain more mature trees.

The present plan does allow for the maintenance of portions of the woodland, including much of the low-lying ash swamp component, over the longer term. In doing so, the plan maintains a feature which, while not rare, is less common in this jurisdiction. It will reasonably maintain a large area of seasonal (vernal) pooling, and the majority of amphibian breeding habitat within the property. Further, it protects the forested slopes of the property. The areas which are protected do maintain some diversity of moisture and vegetation communities, and as such will provide habitat for a variety of other wildlife.

The above being said, the proposal still eliminates much of this woodland. Substantial regrading and servicing will be required through areas to be developed and, combined with the relatively small lot sizes, provides little if any opportunity to preserve trees within these developed areas. Woodland diversity will be reduced, effecting its quality as wildlife habitat. While interior habitat is not abundant within this woodland, all of it will be lost; the six area-sensitive birds which have been identified within this woodland

are unlikely to persist. A number of the more mature trees associated with the woodland will be lost and, along with these, the cavity nesting opportunities some of these provide. While a majority of amphibian breeding habitat will be retained, some will be lost. There will also be a substantial reduction in the overall quantity of wildlife habitat provided by the woodland. The aesthetic benefits presently provided by this woodland will also be substantially altered with development.

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APPENDIX A – VASCULAR PLANT LIST

Plant Species List

Family / Species	Common Name	ST	Location						
			1	2	3	4	5	6	
PTERIDOPHYTA	FERNS AND ALLIES								
<u>ASPLENIACEAE</u>	<u>SPLEENWORT FAMILY</u>								
<i>Matteuccia struthiopteris</i> (L.) Todaro	American Ostrich Fern							X	
<i>Onoclea sensibilis</i> L.	Sensitive Fern				X	X	X	X	X
<u>EQUISETACEAE</u>	<u>HORSETAIL FAMILY</u>								
<i>Equisetum arvense</i> L.	Field Horsetail							X	
<i>Equisetum hyemale</i> L.	Scouring-rush							X	
GYMNOSPERMAE	CONIFERS								
<u>CUPRESSACEAE</u>	<u>CYPRESS FAMILY</u>								
<i>Juniperus virginiana</i> L.	Red Cedar								X
<i>Thuja occidentalis</i> L.	White Cedar			X	X	X	X		
<u>PINACEAE</u>	<u>PINE FAMILY</u>								
<i>Abies balsamea</i> (L.) Mill.	Balsam Fir		X					X	
<i>Picea glauca</i> (Moench) Voss	White Spruce								X
<i>Pinus resinosa</i> Ait.	Red Pine		X						
<i>Pinus strobus</i> L.	White Pine			X	X			X	X
<i>Pinus sylvestris</i> L.	Scots Pine	+	X						
LILIOPSIDA	MONOCOTS								
<u>ARACEAE</u>	<u>ARUM FAMILY</u>								
<i>Arisaema triphyllum</i> (L.) Schott	Jack-in-the-pulpit			X				X	
<u>CYPERACEAE</u>	<u>SEDGE FAMILY</u>								
<i>Carex</i> sp.	Sedge						X		
<i>Carex crinita</i> Lam.	Fringed Sedge						X	X	
<i>Carex gracillima</i> Schw.	Graceful Sedge			X	X			X	X
<i>Carex rosea</i> Schk. ex Willd.	Rose-like Sedge			X					X
<u>LILIACEAE</u>	<u>LILY FAMILY</u>								
<i>Convallaria majalis</i> L.	Garden Lily-of-the-valley	+			X			X	X
<i>Maianthemum canadense</i> Desf.	Canada Mayflower		X	X					
<i>Maianthemum racemosum</i> (L.) Link	False Solomon's-seal		X	X					
<u>POACEAE</u>	<u>GRASS FAMILY</u>								
<i>Dactylis glomerata</i> L.	Orchard Grass	+							X
<i>Poa pratensis</i> L.	Kentucky Blue Grass	+							X
MAGNOLIOPSIDA	DICOTS								
<u>ACERACEAE</u>	<u>MAPLE FAMILY</u>								
<i>Acer platanoides</i> L.	Norway Maple	+		X					X
<i>Acer rubrum</i> L.	Red Maple		X						
<i>Acer saccharum</i> Marsh.	Sugar Maple		X	X				X	X
<u>ANACARDIACEAE</u>	<u>CASHEW FAMILY</u>								
<i>Rhus radicans</i> L.	Poison-ivy			X	X			X	X
<i>Rhus typhina</i> L.	Staghorn Sumac								X
<u>APIACEAE</u>	<u>CARROT FAMILY</u>								
<i>Daucus carota</i> L.	Wild Carrot, Queen Anne's Lace	+							X
<u>APOCYNACEAE</u>	<u>DOGBANE FAMILY</u>								
<i>Vinca minor</i>	Periwinkle	+							X
<u>AQUIFOLIACEAE</u>	<u>HOLLY FAMILY</u>								
<i>Nemopanthus mucronata</i> (L.) Loes.	Mountain Holly	RR				X	X	X	
<u>ARALIACEAE</u>	<u>GINSENG FAMILY</u>								
<i>Hedera helix</i> L.	English Ivy	+							X

Family / Species	Common Name	ST	Location						
			1	2	3	4	5	6	
<u>ASTERACEAE</u>	<u>ASTER FAMILY</u>								
<i>Arctium minus</i> (Hill) Bernh.	Common Burdock	+		X					
<i>Aster macrophyllus</i> L.	Large-leaved Aster		X	X					X
<i>Petasites palmatus</i> (Ait.) Gray	Sweet Coltsfoot	RR		X					
<i>Prenanthes altissima</i> L.	Tall White Lettuce			X					
<i>Tanacetum vulgare</i> L.	Tansy	+							X
<i>Taraxacum officinale</i> Weber	Dandelion	+	X						
<u>BALSAMINACEAE</u>	<u>TOUCH-ME-NOT-FAMILY</u>								
<i>Impatiens capensis</i> Meerb.	Spotted Jewelweed							X	
<u>BETULACEAE</u>	<u>BIRCH FAMILY</u>								
<i>Betula papyrifera</i> Marsh.	Paper Birch			X	X	X			
<i>Ostrya virginiana</i> (Mill.) K. Koch	Hop Hornbeam			X	X				
<u>BORAGINACEAE</u>	<u>BORAGE FAMILY</u>								
<i>Lithospermum officinale</i> L.	Pearl Gromwell	+							X
<i>Myosotis scorpioides</i> L.	True Forget-me-not	+			X		X	X	
<u>CAPRIFOLIACEAE</u>	<u>HONEYSUCKLE FAMILY</u>								
<i>Lonicera canadensis</i> Marsh.	Fly Honeysuckle		X	X					X
<i>Sambucus pubens</i> Michx.	Red-berried Elder		X	X					
<u>CARYOPHYLLACEAE</u>	<u>PINK FAMILY</u>								
<i>Cerastium fontanum</i> Baumg.	Mouse-eared Chickweed	+							X
<i>Silene vulgaris</i> (Moench) Garcke	Bladder Campion	+							X
<u>CORNACEAE</u>	<u>DOGWOOD FAMILY</u>								
<i>Cornus alternifolia</i> L.f.	Alternate-leaved Dogwood			X	X		X		
<i>Cornus stolonifera</i> Michx.	Red-osier Dogwood								X
<u>FAGACEAE</u>	<u>BEECH FAMILY</u>								
<i>Fagus grandifolia</i> Ehrh.	American Beech			X	X			X	
<i>Quercus rubra</i> L.	Red Oak			X	X			X	
<u>FABACEAE</u>	<u>PEA FAMILY</u>								
<i>Trifolium pratense</i> L.	Red Clover	+							X
<i>Vicia cracca</i> L.	Bird Vetch	+							X
<u>GERANIACEAE</u>	<u>GERANIUM FAMILY</u>								
<i>Geranium robertianum</i> L.	Herb Robert	+			X		X		
<u>GROSSULARIACEAE</u>	<u>GOOSEBERRY FAMILY</u>								
<i>Ribes cynosbati</i> L.	Prickly Gooseberry			X			X		
<u>JUGLANDACEAE</u>	<u>WALNUT FAMILY</u>								
<i>Juglans nigra</i> L.	Black Walnut	RR							X
<u>OLEACEAE</u>	<u>OLIVE FAMILY</u>								
<i>Fraxinus nigra</i> Marsh.	Black Ash.					X	X		
<i>Fraxinus pennsylvanica</i> Marsh.	Red Ash		X	X	X	X	X	X	
<u>ONAGRACEAE</u>	<u>EVENING-PRIMROSE FAMILY</u>								
<i>Circaea lutetiana</i> L.	Enchanter's Nightshade			X		X	X		
<u>OROBANCHACEAE</u>	<u>BROOM-RAPE FAMILY</u>								
<i>Conopholis americana</i> (L.) Wallr.	Squawroot	RR		X					
<u>OXALIDACEAE</u>	<u>WOOD-SORREL FAMILY</u>								
<i>Oxalis stricta</i> L.	Common Yellow Wood-sorrel	RR		X				X	
<u>ROSACEAE</u>	<u>ROSE FAMILY</u>								
<i>Agrimonia gryposepala</i> Wallr.	Agrimony						X	X	
<i>Crataegus</i> sp.	Hawthorn sp.								X
<i>Fragaria virginiana</i> Dcne.	Common Strawberry								X
<i>Malus domestica</i> Borkh.	Apple								X
<i>Potentilla simplex</i> Michx.	Common Cinquefoil	RR							X
<i>Prunus serotina</i> Ehrh.	Black Cherry			X					X
<i>Prunus virginiana</i> L.	Choke Cherry			X					X
<i>Rosa acicularis</i> Lindl.	Prickly Rose							X	

Family / Species	Common Name	ST	Location						
			1	2	3	4	5	6	
<i>Rubus canadensis</i> L.	Smooth Blackberry								X
<i>Rubus idaeus</i> L.	Wild Red Raspberry				X				
<i>Rubus pubescens</i> Raf.	Dwarf Raspberry			X					
<i>Sorbus decora</i> (Sarg.) Schneid.	Showy Mountain-ash		X	X				X	
<u>RUBIACEAE</u>	<u>MADDER FAMILY</u>								
<i>Galium asprellum</i> Michx.	Rough Bedstraw			X					
<i>Galium palustre</i> L.	Marsh Bedstraw							X	X
<i>Galium triflorum</i> Michx.	Sweet-scented Bedstraw			X					
<u>SALICACEAE</u>	<u>WILLOW FAMILY</u>								
<i>Populus balsamifera</i> L.	Balsam Poplar					X	X		
<i>Populus grandidentata</i> Michx.	Large-toothed Aspen			X					
<i>Populus tremuloides</i> Michx.	Trembling Aspen			X	X				X
<i>Salix</i> sp.	Willow								X
<u>SCROPHULARIACEAE</u>	<u>FIGWORT FAMILY</u>								
<i>Veronica officinalis</i> L.	Common Speedwell	+							X
<i>Veronica peregrina</i> L.	Purslane Speedwell			X					
<u>TILIACEAE</u>	<u>LINDEN FAMILY</u>								
<i>Tilia americana</i> L.	Basswood			X	X				X
<u>ULMACEAE</u>	<u>ELM FAMILY</u>								
<i>Ulmus americana</i> L.	American Elm				X	X	X	X	X
<u>VITACEAE</u>	<u>GRAPE FAMILY</u>								
<i>Parthenocissus inserta</i> (A. Kerner) Fritsch	Virginia Creeper	RR	X	X			X	X	X
<i>Vitis riparia</i> Michx.	Riverbank Grape		X						X

ST - Status

- + - Non-native species
- PR - Provincially Rare species
- RR - Regionally Rare species

Vegetation Communities

- 1 - FOC 1-2
- 2 - FOD
- 3 - FOM 5-2
- 4 - SWD 2
- 5 - FOD 7-2
- 6 - CUW 1

APPENDIX B – WILDLIFE SPECIES LISTS

Appendix B: Bird Observations: species observed by Michalaki Nielsen Associates Limited within the subject property on June 17, July 23 and Aug 09, 2010.

Scientific Name	Common Name	Evidence Codes ¹	Community Location and Additional Comments ²	Number of Individuals	S Ranks ³	Conservation Ranks ⁴
<i>Corvus brachyrhynchos</i>	American Crow	H	residential edge/open field	5	SSB,SZN	
<i>Carduelis tristis</i>	American Goldfinch	AE	CUW/ residential/open field	3	SSB,SZN	L3
<i>Sialia mexicana</i>	American Redstart	CF	FOD - Area Sensitive Species	1	S4S5	L2
<i>Turdus migratorius</i>	American Robin	FY	CUW/FOD residential/open field	4	SSB,SZN	
<i>Poecetes gramineus</i>	Black-capped Chickadee	H	FOD/FOD/SWD residential/open field	6	SSB,SZN	L4
<i>Dendroica virens</i>	Black-throated Green Warbler	H	FOD/FOD - Area Sensitive Species	1	SSB,SZN	L2
<i>Sylvania pusilla</i>	Blue Jay	S	FOM/S-2/residential edge/open field	5	SSB,SZN	
<i>Spizella passerina</i>	Chipping Sparrow	AE	residential edge/open field	7	S5	
<i>Quiscalus quiscula</i>	Common Grackle	H	FOD	1	SSB,SZN	
<i>Geothlypis trichas</i>	Common Yellowthroat	H	FOM	1	S5	
<i>Sayornis phoebe</i>	Eastern Phoebe	H	FOM	1	SSB,SZN	L4
<i>Contopus virens</i>	Eastern Wood-Pewee	P	FOD/FOM	2	SSB,SZN	
<i>Sturnus vulgaris</i>	European Starling	H	residential edge/open field	11	SSB,SZN	
<i>Spizella pusilla</i>	Field Sparrow	H	residential edge/open field	2	SSB,SZN	
<i>Dumetella carolinensis</i>	Gray Catbird	S	CUW	4	SSB,SZN	L4
<i>Zenaidura macroura</i>	Mourning Dove	H	residential edge/open field	1	SSB,SZN	
<i>Cardinalis cardinalis</i>	Northern Flicker	H	residential edge/open field	1	SSB,SZN	
<i>Colaptes auratus</i>	Northern Cardinal	H	residential edge/open field	3	SSB,SZN	
<i>Sturnus arcticus</i>	Ovenbird	S	MW/ residential edge	4	SSB,SZN	L4
<i>Dryocopus pileatus</i>	Pileated Woodpecker	X	FOD/FC - Cavity observed	4	SSB,SZN	L2
<i>Dendroica pinus</i>	Pine Warbler	S	FOD/FC - Area Sensitive Species	1	SSB,SZN	L3
<i>Vireo olivaceus</i>	Red-eyed Vireo	CF	FOD/ SWD - Area Sensitive Species	2	SSB,SZN	
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S	FOD	1	S5	
<i>Melospiza melodia</i>	Song Sparrow	A	CUW	5	SSB,SZN	
<i>Dendroica petechia</i>	Yellow Warbler	S	FOD/MW	2	SSB,SZN	

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Appendix B: Wildlife Observations: species observed by Michalski Nielsen Associates Limited within the subject property on June 11 2009 and June 17, July 23, and Aug 09, 2010.

Amphibians and reptiles confirmed within the subject property or immediate vicinity		
Scientific Name	Common Name	S-rank¹
AMPHIBIANS		
<i>Hyla versicolor</i>	Gray Treefrog	S5
<i>Pseudacris crucifer</i>	Spring Peeper	S5
<i>Rana clamitans</i>	Green Frog	S5
<i>Bufo americanus</i>	American Toad	S5
REPTILES		
<i>Chelydra serpentina</i>	Dekey's Brown Snake	S5
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5

Mammals confirmed within the study property or immediate vicinity		
Scientific Name	Common Name	S-rank
<i>Odocoileus virginianus</i>	White-tailed Deer	S5
<i>Procyon lotor</i>	Raccoon	S5
<i>Sciurus carolinensis</i>	Gray Squirrel	S5
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5
<i>Tamias striatus</i>	Eastern Chipmunk	S5
<i>Storeria dekayi</i>	Dekay's Brownsnake	S5
Additional wildlife observations		
<ul style="list-style-type: none"> • <i>Cavity holes and potential nest sites within mature trees</i> • <i>Pileated woodpecker evidence (distinctive) hole markings (fresh)</i> • <i>Several den locations i.e. Fox/ skunk and possible groundhog holes</i> • <i>American Gold finch nest</i> • <i>Old Accipiter Stick nest (possible Red-tailed hawk)</i> 		

¹S-Ranks (provincial)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 Secure - Common, widespread, and abundant in the nation or state/province.

S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SAN Non-breeding accidental.

SE Exotic - not believed to be a native component of Ontario's fauna.

SZN Non-breeding migrants/vagrants.

SZB Breeding migrants/vagrants.