Appendix A
Natural Background Report

APPENDIX A
OSTRANDER POINT WIND ENERGY PARK
ENVIRONMENTAL SETTING

DRAFT

File No. 160960369

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1.0 Physical Features

1.1 PHYSIOGRAPHIC CHARACTERISTICS AND RESOURCES

1.1.1 Physiography and Topography

The Study Area is located on Crown land, in the ward of South Marysburgh, southern Prince Edward County (**Appendix B**, **Figure B-1**). The Study Area, as with all of Prince Edward County, is situated within the Prince Edward Peninsula Physiographic Region, a plain or low plateau of flat limestone (typically between 75 and 100 metres above sea level ("masl")) that projects into the eastern part of Lake Ontario, almost separated from the mainland by the Bay of Quinte (Chapman & Putnam, 1984). The Prince Edward Peninsula is the southerly extension of the Napanee Plain into Lake Ontario. The southern third of Prince Edward County contains limestone bedrock which is covered by a shallow layer of unconsolidated Farmington loam soil (Richards and Morwick, 1948). Soils are generally less than 1 metre ("m") deep. Deeper deposits of clay exist along low-lying areas on the northern shores and in between West Lake and Picton. The region has an irregular shoreline as a result of the widespread bedrock faulting and later inundation of low-lying areas by Lake Ontario. The highest point is 150 masl on an escarpment near Picton that overlooks the hamlet of Glenora, and extends eastward along Adolphus Reach and northward along Long Reach.

The Ostrander Point Crown Land Block, situated within the Study Area, is underlain by fine to medium-grained calcium limestone of the Trenton Formation. The majority of soils within the Study Area are Farmington Loams, which are generally shallow and derived from a thin layer of drift and limestone weathering (Richards and Morwick, 1948). Its southern location, soil texture, drainage patterns, microclimate, and proximity to Lake Ontario all combine to create a unique set of conditions that supports several types of grassland, forest, shrub, wetland and alvars or alvar-like communities. Alvars sharing vegetative features similar to fens or meadow marshes, due to longer periods of water inundation, are a unique feature in this region. The shoreline from Ostrander Point to Prince Edward Point, approximately 2000 hectares ("ha"), is characterized by limestone cliffs or low sloping gravel beaches usually backed by small wetlands (Snetsinger, 2000).

1.1.2 Bedrock

The surficial soils of the Study Area are underlain by Middle Ordovician-aged sedimentary rocks, an unnamed member of the Lindsay Formation (lower member) found throughout most of Prince Edward County (Carson, D. M. 1981). This formation consists of interbedded, very fine to coarse-crystalline limestone with undulating shale partings and interbeds of dark grey calcareous shale. This formation varies in thickness from 60 m to 100 m. It is used extensively for aggregate production and is extracted at Picton, approximately 20 km north of the Study Area, for cement production.

1.1.3 Mineral/Aggregate Resources

Quaternary-aged sediments are thin through Prince Edward County and within the Study Area. Based on well data obtained by Jacques Whitford from the MOE, the surficial deposits of the Study Area consist of either glacial till or sand and gravel overlying bedrock. On average these deposits are thin, ranging from approximately 1 to 3 m thick. Significance of deposits are evaluated and selected according to criteria set by the Ontario Geological Survey, and areas of tertiary significance are not considered to be important resource areas because of their low available resources or because of possible difficulties in extraction. There are no deposits of sand and gravel in the Study Area that have been selected for resource protection by the province (Jagger Hims Limited and the Ontario Geological Survey, 1999).

1.2 SEISMICITY

The probability and risk of seismic activity (i.e. earthquakes) is recorded and estimated by Natural Resources Canada. The 2005 Seismic Hazard Map indicates the relative hazard of the Study Area is on the low end of the spectrum (NRCan, 2005). No earthquakes have been reported in the Study Area between 1991 and 2008 (Southern Ontario Seismic Network, 2008).

1.3 CLIMATE

Prince Edward County is located within the Prince Edward County climatic region of southern Ontario (Brown, et.al 1968). Prince Edward County experiences warm summer temperatures. Typically, the onset of winter is delayed by a week relative to the adjoining mainland. Chief limitations of the climate in the Prince Edward County area include a lack of rain during the summer months, leaving the land susceptible to drought. Droughts are particularly severe on the shallow soils characteristic of much of the region (Chapman and Putnam 1984).

Climate normals for Picton, located approximately 15 km to the north of the Study Area, based on the years 1971-2000 inclusive show that average daily temperatures range from –6.7°C to 20.8°C, with extremes of –36.0°C and 37.8°C. Picton receives approximately 964.5 millimeters (“mm”) of precipitation throughout the year, based on data from 1971-2000 inclusive (Environment Canada, 2004).

1.4 WIND RESOURCES

The Study Area is located in an area with one of the highest average wind speeds in Ontario. The southern shore of Prince Edward County is generally rated very good for wind power production by the MNR (2005). Average wind speed is about 7.0 to 8 m/s in the southern end of the Study Area. For comparison, marginal wind areas such as Guelph and Ottawa experience average wind speeds of below 5 to 6 m/s.

1.5 AIR QUALITY

The MOE collects continuous ambient air quality data at more than 40 monitoring sites across the Province to determine the state of air quality. The Ontario Air Quality Index is based on measurements of six common pollutants: sulphur dioxide, total reduced sulphur, nitrogen dioxide, carbon monoxide, ozone, and volatile organic compounds. In general, air quality in the vicinity of the Study Area is rated "good" during the winter months and "good" or "moderate" during the summer months. Belleville is the closest monitoring station to the Study Area, approximately 41 km away (MOE, 2008).

1.6 HYDROLOGY

1.6.1 Surface Hydrology

The hydrogeology of the Study Area was characterized by Jacques Whitford using water well records, basic potentiometric levels, and the Prince Edward - Hastings Groundwater Management Study (MOE, 2007). The Prince Edward County watershed does not have a well-organized drainage network. The pathways of many streams are controlled by bedrock depressions shaped by bedrock faults, and as the County is surrounded by water, this results in drainage systems that are generally short and outlet to the nearest shoreline. Most of the flow is during periods of heavy precipitation or in the spring months during winter thaw. Marshlands are predominant around low-lying areas adjacent to Lake Ontario and connecting water bodies.

Due to the flat topography of the site and the shallow overburden, most surface water flows overland. Existing roadways are largely incised through what little overburden occurs on the site, and these act as channels for surface water during the spring and fall, when water tables are high and runoff occurs. During the summer, these areas are dry and surface water is restricted to ponds and marshes associated with the Lake Ontario shoreline, and the deciduous swamp at the eastern boundary of the Study Area. Several small seasonally flooded ponds occur in the northern portions of the Study Area, but they are not significant sources of surface water due to their seasonality and small size. As discussed in Section 3.2, most watercourses along the proposed transmission line route possess similar intermittent flow characteristics to the watercourses located on the proposed turbine construction area and generally only flow during very wet times of year.

1.6.2 Groundwater

Groundwater levels are expected to be at or near the elevation Lake Ontario water levels. Seasonal elevation of groundwater levels to near bedrock surfaces around turbines foundations are anticipated (Jacques Whitford, 2008).

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2.0 Agricultural Features

Information about agricultural features in the Study Area is derived from the Canada Land Inventory Capability for Agriculture for Southern Ontario, and data from the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA).

2.1 CANADA LAND INVENTORY CAPABILITY FOR AGRICULTURE

The Canada Land Inventory (CLI) categorizes land into seven classes and thirteen subclasses. These designations reflect the soil's potential to produce field and forage crops. Lands classified as Class 1 are considered the most productive, while those classified as Class 7 are considered the least productive. Class 1 to 4 agricultural lands are generally considered capable of being farmed productively while lands with Class 1, 2 and 3 are considered prime for general field crop production. The classification system reflects limitations such as slope, shallow soils, climate, drainage, and fertility, among others. Organic soils are not rated in the classification system and have been given a Class O rating (ARDA 1965).

The most common soil found within the Study Area is Farmington loam, which has limited agricultural use, and generally large tracts can be used for recreation. The southern portion of Prince Edward County is classified as predominantly CLI Class 6 soil capability for agriculture. There are however some areas of CLI Class 1 to 3 soils capable of arable production. The northern portion of the County (north of Picton) is classed predominantly as CLI Class 2, having moderate limitations that restrict the range of crops, or require moderate conservation practices (NRCan, 2006). Other classes of soil represented in northern Prince Edward County in order of decreasing area are: Class 6 (capable only of producing perennial forage crops, improvement practices are not feasible), Organic, and Class 1 (no significant limitations in use for crops) (NRCan, 2006).

2.1.1 Soil Quality

The soils over the Study Area are predominantly Melanic Brunisols and consist almost entirely of silt loams, underlain by mainly fractured limestone bedrock at depths of 50 cm or less. The majority of the soil present in the Study Area is of gravelly composition (generally coarse fragments from 2 to 8 cm) containing very high sand and characteristically high silt content suggesting ancient lacustrine or beach deposits. See **Figure B-2** for detailed soil composition throughout the Study Area.

Soils of the Study Area consist primarily of the following soil types:

Table 2.1 Soils of the Study Area.

Symbol	Soil Series	Soil Type	Drainage	Slope	Stoniness
Fl	Farmington	Loam	Good	Level to undulating	Stony
Fl-i		Loam Imperfectly drained	Imperfect	Level to undulating	Stony
Ma	Marsh	-	Very poor	-	-
Source:	Soil Map of Prince Edward County, Ontario. Soil Survey Report No. 10 (1947).				

Excluding small wetlands situated behind the beach shoreline, soil drainage is rapid. Soil moisture conditions are variable across the site but tend to range between moderately dry and moderately fresh. In spring, the soils often become saturated with internal drainage restricted due to the underlying bedrock. When the overburden soil dries out by mid-to-late summer drought conditions are often created.

During much of the growing season the soils are typically quite dry. Slight depressions in the limestone bedrock contain moist soils which are more saturated. Deeper soils, consisting of at least some organic material are found in a few areas behind the beach shoreline. The largest such area is the seasonal deciduous swamp woodland found in the southeast corner of the property (Bland, 1997).

During dry summers, wet soil conditions can persist in depressions where water accumulates and remains for longer periods of time. Small stands of shrubs, grasses, and forbs that are more tolerant of wetter soil conditions often signify the presence of one of these depressions.

3.0 Biophysical Features

3.1 FORESTRY AND VEGETATION

3.1.1 Vegetation Communities

The Study Area is located within the Huron-Ontario section of the Great Lakes – St. Lawrence Forest Region (Rowe, 1972). This section covers much of southwestern Ontario, the northern boundary of which generally coincides with the Precambrian Shield. Sugar maple and beech are common over the entire section, with associates such as basswood, white and red ash, yellow birch, red maple, red, white, black and bur oaks, aspen species, butternut, bitternut hickory, hop-hornbeam, black cherry, sycamore and black walnut. In lowlands, other hardwood species can be found, such as blue-beech, silver maple, red and rock elm, black ash, and eastern white cedar. Coniferous species including eastern red cedar, eastern white pine, eastern hemlock and balsam fir can be found amongst hardwood species where appropriate conditions are present.

The mixture of plants presently found within Prince Edward County reflects both the natural and human history of the area. The Study Area was last used for agricultural purposes over 50 years ago. Bland (1997) and Snetsinger (2000) outlined eight main vegetation communities found in the Ostrander Point Crown Land Block:

- Open grassland;
- Grassland-short shrub;
- Short shrubland;
- Tall shrubland;
- Open woodland;
- Seasonal deciduous swamp woodland;
- Graminoid marsh;
- Beach shoreline;
- Meadow marsh; and,
- Thicket swamp.

Local site conditions such as microclimate, slope, aspect, soil texture, moisture and drainage, as well as the proximity of the site to Lake Ontario determine the plant communities on the property. The most distinctive vegetative characteristics of the Study Area, based on Bland (1997), include:

- Grassland – roughly 20% of the Study Area consists of several species of grasses with scattered low shrubs, relatively undisturbed for the last 30 years;
- Graminoid marsh – located in southeast section of the site, this is the only unit of this type in the Study Area. Similar undisturbed marshes are becoming increasingly rare along the Great Lakes;

- Alvar vegetation – found scattered within grassland/shrub communities mostly in the northern half of the site. Plant species found in these areas include narrow-leaved vervain (*Verbena simplex*), bluets (*Hedyotis caerulea*), spike-rush (*Eleocharis compressa*), and false pennyroyal (*Isanthus brachiatus*).

Vegetation communities were classified using Ecological Land Classification (ELC) methodologies based on Lee *et al.* (1998). Community classification was initially assessed using aerial photography. The vegetation communities were further refined based on field visits carried out in the summer and fall of 2008. A botanical inventory was carried out in conjunction with ELC surveys.

Generally, the site could be characterized as having shallow soils (10 to 30 cm), supporting grassy vegetation with shrubby thickets and scattered stunted trees. Although a number of invasive, non-native plants were observed, the vascular plant community contained plant species characteristics of alvar habitat (i.e. plants tolerant of draught conditions). Wet depressions containing thickets were scattered throughout the site. Two permanent wetlands were observed in the southeastern portion of the site: a graminoid marsh and a swamp thicket. **Figure B-6** and **Table 3.1** summarize the vegetation communities found on site.

Table 3.1 Ecological Land Classification Vegetation Types

ELC Type	Description
OPEN ALVAR (ALO)	
ALO1-4 Poverty Grass Open Alvar Meadow	This community occurred in patches where very little shrub cover occurred. The community was dominated by grasses such as Canada blue grass with patches of poverty oat grass and tufted hairgrass. The shallow soils resulted in relatively dry conditions during summer months.
SHRUB ALVAR (ALS)	
ALS1-1 Common Juniper Shrub Alvar	Most of the northern half of the site was comprised of shrub alvar. The community was comprised of grasses with scattered common juniper shrubs. Occasional occurrences of ninebark, bur oak, shagbark hickory and red ash were observed in this community.
TREED ALVAR (ALT)	
ALT/SWD Bur Oak Treed Alvar / Red Ash Deciduous Swamp Complex	The treed alvars were comprised of scattered bur oak with shagbark hickory. Tree cover was sparse (approx 30%) with relatively stunted trees which is characteristic of the shallow soils. Within the treed alvars were swales containing denser stands (approx 50%) of red ash. These two communities were complexed through the southern portion of the site, sometimes occurring in a wave pattern. In the red ash swamp areas and in portions of the bur oak treed alvar were dense thickets of shrubs including silky dogwood, prickly-ash, red-panicled dogwood, ninebark and occasionally meadowsweet. Common juniper were also scattered throughout the bur oak treed alvar portions of the complex.
CONIFEROUS FOREST (FOC)	
FOC2-1 Red Cedar Coniferous Forest	This community occurred on the outskirts of the site. It was comprised of dense stands of red cedar.
MIXED FOREST (FOM)	

Table 3.1 Ecological Land Classification Vegetation Types

ELC Type	Description
FOM Red Cedar / Bur Oak Mixed Forest	This community occurred in two different locations immediately adjacent to the site. It was comprised of a variety of tree species with red cedar and bur oak being the most predominant. Other species included red ash, American Elm and sugar maple. Immediately north of the site this community is complexed with a red ash deciduous swamp where it runs along a watercourse.
DECIDUOUS SWAMP (SWD)	
SWD2-2a Red Ash Mineral Deciduous Swamp	This swamp community was found in the southeastern portion of the site. Surface water appeared to persist year round. The canopy was relatively open and dominated by red ash, swamp maple and a few American elm. The understorey was patchy with open areas interspersed with dense thickets of willow, silky dogwood and meadowsweet. Ground cover was comprised of sedges and grasses with forbs such as water smartweed and *Bidens* sp.
SWD2-2b Red Ash Mineral Deciduous Swamp	This community was similar to that described above, but without persistent surface water. The canopy was dominated by red ash with a dense understorey of silky dogwood, ninebark and meadowsweet. This community was often complexed with the treed alvar.
SWD4-1 Crack Willow Mineral Deciduous Swamp	This community occurred along the shoreline, behind the rock beach. It was comprised of scattered crack willow, Manitoba maple and trembling aspen. The understorey was dense with dogwoods, willows and meadowsweet.
THICKET SWAMP (SWT)	
SWT Mineral Thicket Swamp	This community was dominated by silky dogwood, ninebark and meadowsweet. It occurred along an intermittent watercourse along the northern boundary of the site.
MEADOW MARSH (MAS)	
MAS2-4 Broad-leaved Sedge Mineral Shallow Marsh	This marsh community was located along the shoreline behind the rocky beach. There was no surface water connection to the lake. It was connected to the southern extension of the red ash swamp community (SWD2-2a). This marsh was comprised of sedges with little representation of forbs. Patches of open water occurred within the marsh. Dense thicket swamp surrounded the community, except along the beach side.

3.1.2 Vascular Plants

A total of 167 vascular plant species were identified by Stantec within the site; a complete list is provided in **Attachment 3**. Approximately 27% are non-native, similar to the proportion of non-native flora in Ontario (Kaiser, 1983). The vast majority of species (107) are provincially ranked S5 (secure); thirteen species are provincially ranked S4 (apparently secure); and one species, rigid sedge (*Carex tetanica*), is provincially ranked S3 (vulnerable). None of the species recorded by Stantec or Brand (1997) are considered species of special concern, threatened or endangered according to either the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or the Committee on the Status of Species at Risk in Ontario (COSSARO).

Three species, false pennyroyal, narrow-leaved vervain, and tufted hairgrass (*Deschampsia caespitose*), are considered to be indicators of alvar habitat in southern Ontario (MNR, 2000). Three additional alvar indicator species, Crawe sedge (*Carex crawei*), flat-stemmed spike-rush (*Eleocharis compressa*), and small skullcap (*Scutellaria parvula*), were reported in the area by Brand (1997). These species have correspondingly high coefficients of conservatism, representing a strong fidelity to specific habitat characteristics.

As discussed in **Section 3.2**, the aquatic habitats of the Study Area are generally seasonal and restricted in size. Where surface water is maintained long enough into the summer before the area dries, certain aquatic plants have been able to colonize and persist. Typically, these aquatic species are graminoids (e.g., *Eleocharis* spp., *Juncus* spp., *Carex* spp.), often located along the edges of roadways that are seasonally flooded. The small ponds located in the northern portions of the Study Area host some of these species of graminoids, and other herbaceous species, such as water horehound (*Lycopus americana*) and purple loosestrife (*Lythrum salicaria*), but do not have high species or structural diversity due to their small size and the temporal drying that occurs during midsummer. Greater diversity occurs in the larger wetlands in the eastern portion of the Study Area, including the coastal marsh and the deciduous swamp. The coastal marsh located in the southeastern portion of the Study Area hosts cattails (*Typha* spp.), dogwood (*Cornus* spp.) and several submerged aquatic species (e.g., mermaid-weed [*Proserpinaca palustris*], floating pondweed [*Potamogeton natans*]). The deciduous swamp located at the eastern boundary of the Study Area hosts a number of wetland species, but it is only in those areas toward the eastern boundary and beyond where aquatic species are found. These species include blue flag (*Iris versicolor*), fringed loosestrife (*Lysimachia ciliata*), purple loosestrife and water horsetail (*Equisetum fluviatile*). A complete list of plants recorded within the Study Area is found in **Attachment 3**.

3.2 WATERCOURSES AND FISHERIES

Potential stream crossings associated with the development of the Ostrander Point Wind Energy Park were originally assessed by Jacques Whitford for the Study Area. As part of the original assessment, a visual fish habitat assessment was conducted to determine the quality of fish habitat within the watercourses of the Study Area (October 19, 23, 2006) (**Figure B-3**). Additional assessment, including an electrofishing inventory, was conducted by Stantec on October 16 and 22, 2008. Sampling sites are shown on **Figure B-3**. The assessment of fish habitat followed the criteria established by the MNR (1994), which has been developed based on levels of protection required for proposed developments in and around lakes and streams. This assessment was also used to characterize watercourses according to Fisheries and Oceans Canada (DFO) fish habitat types.

MNR Aquatic Habitat Types

Type 1 fish habitat is critical to maintaining the productive capacity of a local fishery, often representing specialized or limited spawning, rearing and feeding areas. Type 1 fish habitat is generally found in a small or restricted number of sites within a creek, river or lake, or section of a watercourse such that the amount of habitat is considered to be a limiting factor in terms of life functions.

In general, permanent watercourses that support local fish populations are considered to represent Type 2 fish habitat by providing unspecialized spawning, rearing and feeding areas. In this respect the majority of fish habitat in any creek or river system can be considered to represent Type 2 fish habitat.

Small, permanent, or intermittent headwater streams or seasonal watercourses, including ditches and drains, may or may not provide fish habitat and are typically considered to represent lower quality Type 3 fish habitat. Generally, watercourses are identified as Type 3 fish habitat due to their low productive capacity for supporting a local fishery, either as a result of degraded habitat, or due to the intermittent nature of the watercourse.

DFO Fish Habitat Types (Used almost exclusively related to *Fisheries Act* concerns)

Direct Fish Habitat – A term describing a watercourse that contains fish, and thus has fish habitat that is "directly" used by fish.

Indirect Fish Habitat – A term describing a watercourse that may contain water on an intermittent or permanent basis, but due to factors such as permanent barriers to fish passage or infrequent flow periodicity, does not support fish communities in the particular reach being assessed.

No fish habitat (or None) – A designation related to fish habitat potential indicating that no fish habitat exists at a particular site. Usually refers to sites where no defined channel or water is present. Any water present flows on, at most, an intermittent basis. Can also refer to water bodies having no connection to a Canadian Fishery Water.

3.2.1 Fish Habitat in the Siting Area

Within the proposed turbine siting area, only one permanent unnamed watercourse was identified (Site 3) (**Photos 1a, b, c, Attachment 4**). During field assessments, no fish were observed or captured within the unnamed watercourse. The unnamed watercourse is part of a greater wetland complex (Site 4) (**Photos 2a, b, Attachment 4**); however, Jacques Whitford and Stantec field personnel noted there is no direct access to Lake Ontario due to the approximate 1 m change in elevation with a steep slope between Lake Ontario and the location of the watercourse (Site 1) (**Photos 3a, b, Attachment 4**). As a result, the existing watercourse likely has low productive capacity for local fish populations and is assessed as having low-quality, seasonal, Type 3 fish habitat. Site 2 is located immediately to the southeast of the Study Area and contains an ill defined channel conveying water on an apparently ephemeral basis from the Study Area to Lake Ontario. At best, this watercourse is a Type 3 watercourse containing indirect fish habitat.

Based on the surveys conducted, Jacques Whitford noted that the entire Study Area is comprised of a shallow overburden. Due to the shallow nature of the overburden, stormwater does not infiltrate; rather, it is transported via overland flow making many of the area's seasonal roads into makeshift watercourses (Site 4) (**Photo 4, Attachment 4**). These roads are still traversed by local residents and do not offer an opportunity for fish habitat to exist. Additionally, three sites along the northern edge of the proposed turbine siting area were observed to contain channels with some potential to support various qualities of fish habitat. Two sites (Sites 5, 6 on

Helmer Road immediately south of its intersection with Babylon Road) appeared to be intermittent watercourses with no fish presence (**Photos 5a, b, 6a, b, Attachment 4**) and can best be classified as Type 3 watercourses with indirect contributions to fish habitat. Despite possessing similar characteristics to the previous two sites, the low-quality watercourse located at Site 7 (**Photos 7a, b, Attachment 4**) was found to contain fish. Four central mudminnows (*Umbra limi*) were captured during electrofishing efforts at this location.

The shallow overburden also causes areas of the Study Area to be seasonally flooded. Generally, these flooding events do not create aquatic habitat, but in some small areas, the surface water is maintained long enough to facilitate the colonization and maintenance of aquatic vegetation and associated fauna. Several small ponds in the northern portions of the Study Area have hosted individual Blanding's turtles during the early summer (see **Section 3.10.4**). However, these ponds do not support fish species due to seasonal drying and isolation from sources of fish migration.

Associated with the Lake Ontario shoreline are several small ponds that have become isolated from Lake Ontario by barrier beaches. The largest of these areas is a small marsh located in the eastern portion of the Study Area, connected to a deciduous swamp on the eastern boundary of the Study Area. This marsh is separated from Lake Ontario by a cobble barrier beach, but habitat characteristics there suggest a potential for this site to host certain fish species year round despite the presence of a potential barrier to fish passage.

3.2.2 Fish Habitat Along the Transmission Line Route

A total of 22 sites were sampled along the proposed transmission line route in addition to Babylon Road and a portion of County Rd 13 from Babylon Road to Hilltop Road (**Figure B-3**). Seven of the 22 sites (Sites A, H, I, J, K, N, U) (**Photos 8a, b** through **Photos 14a, b**) contained sufficient water to attempt fish community sampling, but only 4 of the 7 sites (Sites A, I, J, U) were found to contain fish. Fish found at these locations were limited to 4 species: fathead minnow (*Pimephales promelas*), finescale dace (*Phoxinus neogaeus*), brook stickleback (*Culaea inconstans*) and central mudminnow. None of these fish species is considered to be sensitive indicator species.

Habitat assessments at all 22 sites were also completed and suggest that in general the watercourses are intermittent in nature with low potential to support direct fish habitat. As such, these watercourses (with the exception of Sites A, I, J, U) are designated either Type 3, with indirect fish habitat or no fish habitat (refer to **Table 3.2** below). Watercourses located at Sites A, I, J, U are designated Type 2 watercourses containing direct fish habitat.

No federally or provincially listed species-at-risk were observed during the field sampling. Additionally, no federally or provincially listed species-at-risk were noted during review of available information from the NHIC and discussions with MNR staff. Watercourses are shown in **Figure B-3**.

Table 3.2 Summary of Watercourse Sampling Site

Site	Photo #	Fish Sampling Attempted	Fish Present	Habitat Type MNR/DFO
1	3a, 3b	No	N/A[2]	Type 3/Indirect
2	N/A[1]	No	N/A[2]	Type 3/Indirect

Table 3.2 Summary of Watercourse Sampling Site

Site	Photo #	Fish Sampling Attempted	Fish Present	Habitat Type MNR/DFO
3	1a, 1b, 1c	Yes	No	Type 3/Indirect
4	2a, 2b	No	N/A[2]	Type 3/Indirect
5	5a, 5b	No	N/A[2]	Type 3/Indirect
6	6a, 6b	No	N/A[2]	Type 3/Indirect
7	7a, 7b	Yes	Yes	Type 2/Direct
A	8a, 8b	Yes	Yes	Type 2/Direct
B	N/A[1]	No	N/A[2]	None/None
C	N/A[1]	No	N/A[2]	Type 3/Indirect
D	N/A[1]	No	N/A[2]	None/None
E	N/A[1]	No	N/A[2]	Type 3/Indirect
F	N/A[1]	No	N/A[2]	None/None
G	N/A[1]	No	N/A[2]	Type 3/Indirect
H	9a, 9b	Yes	No	Type 3/Indirect
I	10a, 10b	Yes	Yes	Type 2/Direct
J	11a, 11b	Yes	Yes	Type 2/Direct
K	12a, 12b	Yes	No	Type 3/Indirect
L	N/A[1]	No	N/A[2]	None/None
M	N/A[1]	No	N/A[2]	None/None
N	13a, 13b	Yes	No	Type 3/Indirect
O	N/A[1]	No	N/A[2]	Type 3/Indirect
P	N/A[1]	No	N/A[2]	None/None
Q	N/A[1]	No	N/A[2]	Type 3/Indirect
R	N/A[1]	No	N/A[2]	None/None
S	N/A[1]	No	N/A[2]	Type 3/Indirect
T	N/A[1]	No	N/A[2]	None/None
U	14a, 14b	Yes	Yes	Type 2/Direct
V	N/A[1]	No	N/A[2]	None/None

N/A[1] – Not Available

N/A[2] – Not Applicable

3.3 DESIGNATED NATURAL AREAS

3.3.1 Wetlands

Significance of wetlands is determined by the Ministry of Natural Resources (MNR) using procedures established in the Ontario Wetland Evaluation System (OWES) (MNR, 1993).

Additionally, the planning authority may designate other wetlands significant if they have limited representation within the planning area or are of high quality within the context of the municipality. Non-provincially significant wetlands are those that have been evaluated but did not receive sufficient points to be considered significant. Wetlands that have yet to be examined are termed unevaluated.

Wetlands are shown in **Figure B-4**. According to MNR correspondence (2008), a section of the provincially significant South Bay Coastal Wetland is found within the Study Area. The South Bay Coastal Wetland PSW is 231 ha in size and comprised of 66% swamp and 34% marsh (MNR, 2008a). A copy of the NHIC description of this feature, including a description of the vegetation communities, representation, landforms, and UTM coordinates of the wetland is located in **Attachment 2** of this report. The wetland polygon, identified at the northwestern portion of the Study Area, that has been complexed with the provincially significant South Bay Coastal Wetland is not readily apparent in the field. Much of this wetland appears to be outside of the Study Area, associated with a watercourse north of Helmer Road, flowing westward towards South Bay. This unnamed watercourse has been mapped by the MNR as originating from within the northern portion of the Study Area, although it is not readily identifiable other than as a slight depression that is seasonally wet.

A second unit of the wetland complex is located to the north of Babylon Road, north of the Study Area. This swamp is hydrologically connected to the rest of the South Bay Coastal Wetland by an unnamed watercourse flowing westward. Babylon Road itself acts as a barrier to flow from the Study Area to this unnamed wetland and watercourse.

Within the southeastern portion of the Study Area is a pair of unevaluated wetlands that are hydrologically connected to each other. A deciduous swamp that straddles the eastern boundary holds standing water in the spring and fall periods. Through a small watercourse, the water flows to a coastal marsh located to the south (**Figure B-4**). A barrier beach separates this coastal marsh from Lake Ontario, but it is expected that there are occasional breaches of the beach to connect this marsh to the waters of Lake Ontario.

Two other wetlands, Black Creek PSW and South Bay Marsh PSW, were found within the vicinity of the Study Area; however, neither PSW was located within the Study Area boundaries.

3.3.2 Areas of Natural and Scientific Interest

The entire Study Area is located within a Candidate Life Science ANSI, the Prince Edward to Ostrander Point ANSI (**Figure B-4**). This Candidate ANSI extends from Prince Edward Point to approximately Petticoat Point and encompasses 2000 ha. As noted by the MNR (2008) “the combination of size, extent of shoreline, known species diversity and special features make this site unique in the Site District”.

Located north of the Study Area, south-east of the Milford Distribution Station is the Black Creek Valley Marshes and Forest Life Science ANSI. Spanning 305 ha, this ANSI is “an extensive,

well developed river valley with wetland and slope forest landforms and vegetation communities which are representative of the Prince Edward Peninsula Physiographic Region (**Figure B-4 and Attachment 2**). The Black Creek PSW is located within this ANSI (NHIC, 2008a). Although this ANSI falls well outside of the Study Area, it is being included in this report as it is will be crossed by the proposed transmission line.

3.3.3 Significant Woodlands

According to Riley and Mohr (1994), Prince Edward County contains approximately 14.2% woodland cover. Based on the NHRM (MNR, 1999), woodlands equal to or greater than 4 ha in size should be considered for significance. Other suggested factors when considering potential woodland significance include Ecological Functions (eg. woodland shape, proximity to other habitats and woodlands, linkages and/or diversity) and Uncommon Characteristics (eg. composition and/or age). According to the MNR (2008), the site contains areas of open woodland/tall shrubland communities (for forested sections) (**Figure B-4**); however, the potential for these areas to qualify as significant woodlands has yet to be assessed by the municipality as per the Natural Heritage Reference Manual (NHRM) for the Provincial Policy Statement (PPS) (MNR, 1999).

3.3.4 Important Bird Areas

The Study Area is part of the much larger Prince Edward County South Shore Important Bird Area (IBA). This IBA includes the entire peninsula from Prince Edward Point to Point Petre as well as the offshore waters. The peninsula acts as a funnel for birds arriving and departing the area during spring and fall migration (**Figure B-5**).

Large numbers of migrant songbirds and migrating raptors filter along the point and gather in concentration towards Prince Edward Point. Due to these concentrations the Prince Edward Point banding station was developed in the 1970s for long term bird population monitoring. As a result of these monitoring initiatives, especially those during the late 1970s, Prince Edward Point was designated as a National Wildlife Area in 1980, specifically to protect the large numbers and diversity of landbirds which use the area during spring and fall migration. The point was also designated as an International Monarch Butterfly Reserve in 1995. The Prince Edward County South Shore IBA Criteria include Globally Significant Congregatory Species, Waterfowl Concentrations, Migratory Landbird Concentrations and Nationally Significant Colonial Waterbird/Seabird Concentrations.

Birds within the Study Area and region are discussed in Appendix C.

3.4 WILDLIFE

The Study Area is largely undeveloped and is one of the most undisturbed areas in the region. The site demonstrates a high diversity of habitat types that support a variety of species. The Study Area hosts animals that are typical of Prince Edward County; however, the area also potentially provides habitat for rare and/or significant species.

Primary and secondary source data were used to determine potential wildlife use of the Study Area. Inventories of wildlife were compiled from available literature and resources (e.g., Holmes et al. 1991; Dobbyn 1994; Holder and Sutherland 1998; MNR, 2002) and from personal observations made by field staff. It is important to note that the exact location of species occurrences are not available from these atlases and, instead, are recorded within 10 km and 100 km squares. Therefore, although they can be useful resources, the identified species recorded from these databases may not occur within the Study Area. To further refine the list of species that occur within the Study Area, field studies were conducted to identify wildlife, including breeding bird surveys and amphibian surveys. Although specific surveys for reptiles and mammals were not conducted, incidental observations made during other field surveys were recorded. Overall, the available information indicates that the fauna of the Study Area are typical for much of southern Ontario.

Based on various atlases, 31 species of mammals, 12 species of amphibians and 12 species of reptiles have been recorded in southeastern Prince Edward County (see **Attachment 1**). The results of field investigation have confirmed that 7 mammals, 6 amphibians and 5 reptiles occur within the Study Area. Detailed information on bird species that use the Study Area is provided in **Appendix C**.

3.4.1 Mammals

Records from the Atlas of the Mammals of Ontario (Dobbyn, 1994) indicate that 31 species of mammals are likely to occur in southeastern Prince Edward County. All of these species are ranked secure or apparently secure (S5, S4) in Ontario with the exception of three bat species; the small-footed bat is considered imperiled to vulnerable (S2S3) and the northern long-eared bat (S3?) and the eastern pipistrelle (S3?) both of which are considered vulnerable, rank uncertain. Further discussion on bats and their potential to occur in the vicinity of the Study Area is presented in **Appendix D**. Field studies have confirmed the presence of seven mammal species within the Study Area, all considered common and secure in Ontario (see **Attachment 1**).

3.4.2 Amphibians

The Ontario Herpofaunal Summary Atlas (MNR, 2002) indicates that 12 species of amphibians are likely to occur in southeastern Prince Edward County. All of these species are Secure or Apparently Secure (S4, S5) in Ontario. One species of concern occurs within the Study Area, the western chorus frog which is considered Threatened by COSEWIC but not at risk by COSSARO. The western chorus frog is discussed further in **Section 3-10**, Special Concern, Threatened or Endangered Species.

Field surveys were conducted for anurans (toads and frogs) on April 22, May 6 and June 10, 2008. The surveys consisted of 16 monitoring stations, distributed throughout the site to identify areas of potential amphibian breeding habitat (**Figure B-7**). The monitoring stations were sited in wetter portions of the site, where amphibians were likely to breed.

The surveys followed protocols outlined in the Marsh Monitoring Program (Environment Canada, 1996) and Environment Canada's Amphibian Road Call Count program (1997). Each survey was conducted within the recommended timing window, between a half hour after sunset and midnight, and within the three recommended seasonal windows (i.e. April, May and June). Weather conditions during each survey were within recommended parameters for each seasonal window. Surveys involved the surveyor standing at each selected station and listening for three minutes. Anurans were recorded as within the station if they were within 100 m. All other species were recorded as outside the station. The number of calling individuals was estimated where possible. All calling activity was ranked using one of the following three abundance code categories:

Call Level Codes:

1 - Calls not simultaneous, number of individuals can be counted;

2 - Some calls simultaneous but distinguishable, number of individuals can be estimated;

3 - Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated.

The Study Area generally consists of grassy and shrubby vegetation communities with areas of open woodland. The shallow soil over bedrock results in poor drainage, which creates pooling water in the spring that appears to persist into early summer. The pooling of water occurs throughout the site, but is concentrated along the roadways which have been excavated/eroded below grade. These pools create habitat for early breeding amphibians, specifically spring peepers, chorus frogs and American toads which were breeding throughout the site. Northern leopard frogs and grey treefrogs were less common, occurring in some of the deeper pools. Amphibian activity was observed at every monitoring station during the first round and all but station 10 and 12 during the second round. During the last round of surveys in June, amphibian calling was restricted to green frogs and grey treefrogs in areas where surface water persisted, specifically the swamp complex along the eastern boundary of the site and the graminoid marsh/thicket swamp in the southeast portion of the site along the lakeshore. The results of the surveys at each station are summarized in **Table 3.3**.

Table 3.3 Summary of amphibian surveys.

Monitoring Station	Habitat	Estimated Number of Individuals (Maximum # observed in one survey)					
		Spring Peeper	Chorus Frog	American Toad	Grey Treefrog	Green Frog	Northern Leopard Frog
1	Pools of water for early breeding species	50	-	8	-	-	-
2	Pools of water for early breeding species	50	5	3	-	-	-

Table 3.3 Summary of amphibian surveys.

Monitoring Station	Habitat	Estimated Number of Individuals (Maximum # observed in one survey)					
		Spring Peeper	Chorus Frog	American Toad	Grey Treefrog	Green Frog	Northern Leopard Frog
3	Swamp; good amphibian breeding habitat	100+	50	15	5	1	2
4	Swamp; good amphibian breeding habitat	100+	6	15	2	1	2
5	Pools of water for early breeding species	65	1	10	-	-	-
6	Swamp; most of breeding habitat in roadside ditch	-	15	15	-	-	3
7	Deep pooling water on roadway; wet through June.	60	-	10	4	-	5
8	Thicket swamp patch; habitat for early breeding species	60	3	10	1	-	5
9	Pools of water for early breeding species	-	5	-	1	-	-
10	Pools of water for early breeding species	10	3	6	-	-	-
11	Pools of water for early breeding species; green frogs and northern leopard frogs heard in marsh community beyond station.	60	10	10	5	-	15
12	Pools of water for early breeding species	-	10	10	-	-	-
13	Pools of water for early breeding species	20	6	5	1	-	-
14	Thicket swamp patch; habitat for early breeding species	60	3	10	-	-	-
15	Pools of water for early breeding species	30	-	10	-	-	-
16	Pools of water for early breeding species	60	-	5	-	-	-

3.4.3 Reptiles

The Ontario Herpetofaunal Summery Atlas (MNR, 2002) indicates that 12 species of reptiles are likely to occur in southeastern Prince Edward County. Most of these species are secure or apparently secure (S4, S5) in Ontario with the exception of four species that are considered to be vulnerable (S3) and at risk. The common musk turtle and Blanding's turtle are considered threatened by COSEWIC and COSSARO and the northern map turtle and eastern milksnake

are considered special concern by COSEWIC and COSSARO. These significant species are discussed in **Section 3.5**.

Four species have been observed within the Study Area during various field surveys in 2008. Three Blanding's turtle observations, two adults and one nesting site, were recorded within the Study Area. Eastern garter snakes were observed throughout the site. Road kills of both smooth green snake and northern watersnake were observed within the Study Area.

3.5 SPECIAL CONCERN, THREATENED, OR ENDANGERED SPECIES

Rare and at-risk species may be determined at national, provincial and municipal levels. Species that have been determined to be at risk by COSEWIC and COSSARO are of special concern, endangered, or threatened throughout Canada and Ontario, respectively. Additionally, the MNR's Natural Heritage Information Centre (NHIC) assigns "S-Ranks" to species based on rarity, from Critically Imperiled (S1) to Secure (S5). A review of the NHIC database identified one species, a hawthorn, which had been identified within the vicinity of the Study Area (NHIC, 2008b). However, upon reviewing the ranking information for the hawthorn, it was determined that this species was falsely reported (SRF).

A total of 20 provincially rare and/or at risk plant and wildlife species were identified in the vicinity of the Study Area through field surveys, or have ranges that overlap with the Study Area according to the NHIC database and wildlife atlases. Other species of local concern may also be present.

Species at risk, which could be found within the Study Area and its vicinity, as designated by COSEWIC and COSSARO, include:

Table 3.4 Rare, Threatened or Endangered Species

Common Name	Scientific Name	S-Rank	Provincial Status (COSSARO)	National Status (COSEWIC)
Monarch[2]	*Danaus plexippus*	S4	Special Concern	Special Concern
King Rail[1,2]	*Rallus elegans*	S2	Endangered	Endangered
Least Bittern[2]	*Ixobrychus exilis*	S3	Threatened	Threatened
Black Tern[1,2]	*Chlidonias niger*	S3	Special Concern	Not at Risk
Short-eared Owl[2,3]	*Asio flammeus*	S3S4	Special Concern	Special Concern
Golden Eagle[3]	*Aquila chrysaetos*	S1	Endangered	Not at Risk
Bald Eagle[3]	*Haliaeetus leucocephalus*	S4	Endangered	Not at Risk
Peregrine Falcon[3]	*Falco peregrinus*	S2S3	Threatened	Special Concern
Red-headed Woodpecker[2]	*Melanerpes erythrocephalus*	S3	Special Concern	Threatened
Loggerhead Shrike[1,2]	*Lanius ludovicianus*	S2	Endangered	Endangered

Table 3.4 Rare, Threatened or Endangered Species

Common Name	Scientific Name	S-Rank	Provincial Status (COSSARO)	National Status (COSEWIC)
Golden-winged Warbler[2,3]	*Vermivora chrysoptera*	S4	Special Concern	Threatened
Yellow-breasted Chat[2]	*Icteria virens virens*	S2S3	Special Concern	Special Concern
Henslow's Sparrow[1,2]	*Ammodramus henslowii*	S1B SZN	Endangered	Endangered
Rusty Blackbird[3]	*Euphagus carolinus*	S5	-	Special Concern
Western Chorus Frog	*Pseudacris triseriata*	S4	Not at Risk	Threatened
Common Musk Turtle[2]	*Sternotherus odoratus*	S3	Threatened	Threatened
Map Turtle[1,2]	*Graptemys geographica*	S3	Special Concern	Special Concern
Blanding's Turtle[1,2]	*Emydoidea blandingii*	S3?	Threatened	Threatened
Milksnake[1,2]	*Lampropeltis triangulum*	S3	Special Concern	Special Concern
Hawthorn[1]	*Crataegus corusca*	SRF	-	-

S2 – Imperiled
S2S3 – Imperiled to vulnerable
S3 – Vulnerable
S4 – Apparently secure
S1B – Critically imperiled and breeding
SZB – Breeding migrants/vagrants
SZN – Non-breeding migrants/vagrants
? – Rank uncertain
SRF – reported falsely from Ontario

Source:

1- NHIC, 2008b

2 – Environment Canada, 2007

3 – observed during 2008 migration surveys (**Appendix C** of the ERR)

The following section describes species at risk and provincially rare species, which could be found within the Study Area and its vicinity, as designated by COSEWIC and COSSARO.

3.5.1 Butterflies

Monarch: The monarch is ranked S4 with a COSEWIC and COSSARO status of special concern. Much of the concern regarding the status of the eastern populations of monarchs is a result of the loss of habitat in their Mexican wintering grounds. In southern Ontario the monarch is considered common and exists primarily wherever milkweed and wildflowers exist. This includes abandoned farmland, along roadsides and other open spaces where these plants grow.

3.5.2 Birds

A brief description of the habitat of significant birds is presented in this section. More detailed discussions on birds are provided in **Appendix C**.

King Rail: This species of waterbird has been recorded in the vicinity of Prince Edward Point (NHIC, 2008b), and was recorded in square 18UP46 in the last Ontario Breeding Bird Atlas ("OBBA") (east of the Study Area). The preferred breeding habitat of King Rail is extensive marshland. It is an area sensitive species, typically breeding in marshes greater than 100 ha in size. It is not known to occur within the Study Area and was not detected during marsh bird surveys.

Least Bittern: The Least Bittern nests in freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs *et al.*, 1992). The majority of Least Bitterns that breed in Canada are found in Ontario. This species of waterbird has been recorded in the vicinity of Big Sand Bay Wetland (NHIC, 2008b), and was recorded in the last OBBA in both squares 18UP36 and 18UP46 (in the vicinity of the Study Area). The preferred breeding habitat of Least Bittern is extensive marshland. It is not known to occur within the Study Area and was not detected during marsh bird surveys.

Black Tern: the Black Tern is a small tern that nests semicolonially in freshwater marshes with emergent vegetation. This species prefers marshes or marsh complexes of more than 20 ha in size for breeding (Dunn and Agro, 1995). It is not known to breed within the Study Area and was not detected during marsh bird surveys.

Short-eared Owl: Short-eared Owls breed in open country, including large expanses of prairie and coastal grasslands, heathlands, shrub-steppe and tundra but also in agricultural areas. In Ontario, Short-eared Owls typically breed in cattail and sedge marshes, adjacent fields, pastures, old fields, heath bogs and tundra (Cadman et al., 2007). It is area-sensitive, preferring to breed in a minimum of 75 ha of suitable habitat. Short-eared Owls have been reported just east of the Study Area, square 18UP46 in the latest OBBA, but are not known to occur within the Study Area.

Golden Eagle: The provincially endangered Golden Eagle was observed in 2008 during fall migration at Prince Edward Point. No observations of Golden Eagles were made in the Study Area during the winter raptor surveys.

Bald Eagle: The Bald Eagle has been designated provincially Endangered in southern Ontario and federally "Not at Risk". The Lake Erie shoreline is the predominant area for breeding Bald Eagles in southwestern Ontario; the species does not nest along the south shore of Prince Edward County (Cadman et al., 2007). The species was detected during fall migration. Bald Eagles are known to overwinter on islands in eastern Lake Ontario and Prince Edward County, where they feed primarily on waterfowl. However, no observations of Bald Eagles were made in the Study Area during the winter raptor surveys.

Peregrine Falcon: A single Peregrine Falcon (provincially threatened and a federal species of special concern) was observed during the 2006 fall raptor migration study. This species experienced DDT-related population crashes in the 1970's but has experienced dramatic recovery since its return to the province in the late 1980's (Cadman et al., 2007).

Red-headed Woodpecker: The Red-headed Woodpecker prefers open deciduous woods, fields, pastures, city parks, river edges and roadsides where scattered large trees occur (Cadman *et al*., 2007). This species shows a preference for dead or dying trees, and at least a few snags or large dead limbs are necessary for its presence in more open habitats (Smith *et al.*, 2000). It was reported in square 18UP46 in the latest OBBA but is not known to breed within the Study Area.

Loggerhead Shrike: The Loggerhead Shrike prefers to nest in shrubland habitat, over 25 ha in size. Both NHIC and OBBA have historical records of the species in the vicinity of the Study Area. There are no recent records of this species breeding in Prince Edward County.

Golden-winged Warbler: The Golden-winged Warbler has experienced a rapid decline in population size over the past decade likely due to natural succession of habitat and hybridization with the Blue-winged Warbler. Breeding occurs in successional scrub habitats bordered by forests and nests which are constructed on the ground (Cadman *et al*., 2007). The OBBA reported this species in the vicinity of the Study Area during the first atlas (1981-1985) but not during the second (2001-2005).

Yellow-breasted Chat: Yellow-breasted Chat is not widespread in Ontario, but most records from the province are from the Carolinian region (Eagles, 1987). This species prefers early second-growth forest and shrub thicket in abandoned agricultural fields, fencerows, forest edges and openings and near streams (Eckerle and Thompson, 2001). In Ontario, it is usually found in shrubby tangles and deciduous thickets (Eagles, 1987). The OBBA reported this species in the vicinity of the Study Area during the first atlas (1981-1985) but not during the second (2001-2005).

Henslow's Sparrow: One of the rarest breeding birds in Canada, Henslow's Sparrow once bred in Prince Edward County and much of southern Ontario. It has been recorded occupying breeding territories near Prince Edward Point in the last few years, including four singing males in 1999 and two in 2000. However, extensive targeted surveys looking for this secretive species in 2001 (Harris, 2000) and in the Study Area in 2008 provided no records.

The Henslow's Sparrow is a species of open habitats, consisting of weedy fields and meadows, preferably moist, with a mixture of grasses, forbs and scattered shrubs (Herkert *et al*., 2002). Factors that affect the quality of breeding habitat for Henslow's Sparrows include litter density and depth, standing dead residual vegetation, forbe and woody-stem densities and size. In general, the species prefers large areas of tall, dense grass with a well-developed litter layer and standing dead forbe vegetation for singing perches. Sparse to no woody vegetation is important. They have also been known to have a preference for flatter portions of fields. Henslow's Sparrows are area sensitive generally requiring 50 ha or more of suitable nesting habitat (Herkert, 1991).

Some of the grasslands within the Study Area are in a successional state to shrub thicket, making the site less attractive to some species such as the Henslow's Sparrow. Ostrander Point, at the southeast boundary of the Study Area, is partly managed for Henslow's Sparrow recovery (Snetsinger, 2000); however, the species has not been found anywhere in Prince Edward County in recent years (OBBA, 2001-2005).

Rusty Blackbird: The Rusty Blackbird breeds in coniferous-dominated forested wetlands and swamps and its breeding range spans across the boreal forest and Hudson's Bay lowlands (Cadman et al., 2007). It is considered a relatively common migrant in southern Ontario and was observed in the Study Area during fall migration.

3.5.3 Amphibians

Western Chorus Frog: The western chorus frog was found to be common and widespread within the Study Area. The Great Lakes/St Lawrence – Canadian Shield population of this species was designated by COSEWIC as threatened in April 2008; however, in the province of Ontario it is currently considered S4 (apparently secure) and not at risk. Western chorus frogs inhabit a range of habitat types including woodlands, meadows, and cultivated land. They overwinter in leaf litter and shallow soil, and breed in open ponds or ditches, and the eggs are laid in small clumps attached to submerged vegetation. The western chorus frog will often move into grassy or weedy fields during the non-breeding summer season.

3.5.4 Reptiles

Common Musk Turtle: This small species of turtle is considered threatened according to both COSEWIC and COSSARO. It has disappeared over most of the southern half of its range and is vulnerable to shoreline development and increased mortality from outboard motors. The specific causes of this species' decline are unclear, but the species does not appear to do well in conjunction with increased anthropogenic activity.

The common musk turtle occupies a variety of permanent aquatic habitats with slow current and soft substrates (Conant and Collins, 1998) and has been known to occupy Great Lakes coastal wetlands. This species is known for its ability to climb riparian shrubs and trees in order to bask, sometimes up to 2 m above the water. Hibernation takes place in soft underwater substrates, under debris or in holes in stream banks. This species lays its eggs up to 50 m from the water's edge in soft soils or debris, but prefers to nest in the walls of muskrat dens (MacCulloch, 2002). While it has been recorded in adjacent areas, there are no records of this species in the Study Area.

Map Turtle: This species of turtle is considered special concern according to both COSEWIC and COSSARO. There have been no quantitative or long-term studies of the map turtle in Canada and, therefore, there is little evidence of recent range contraction or local extirpation of the species. However, the long-lived life history with delayed age of maturity and numerous potential threats to this species and habitat suggest a significant susceptibility to population decline. This species will utilize a wide range of aquatic habitats but prefers large bodies of

water such as rivers or lakes (Conant and Collins, 1998). Hibernation occurs very late in the season, occasionally after ice has formed on the water surface. Eggs are laid in sandy or soft soils, sometimes at great distances from the water's edge. While it has been recorded in adjacent areas, there are no records of this species in the Study Area.

Blanding's Turtle: This species was found in the Study Area during site visits in June 2006 and May and June 2008. During the 2006 site visit, two were seen together in a flooded area approximately 500 m to the southeast of the intersection of Helmer Road and Babylon Road, and another was seen in a pond 100 m south of this intersection, and a fourth was observed crossing Ostrander Point Road at the crossing of the deciduous swamp. In 2008, three Blanding's turtle observations were made: one adult in the center of the site on a flooded roadway and a second adult in the northwestern portion of the site, basking on a roadway. A Blanding's nest site, containing egg shells, was observed in the north eastern portion of the site.

The Great Lakes/St. Lawrence population of Blanding's turtle, although widespread and fairly numerous, is declining. This species has been designated as threatened by both COSEWIC and COSSARO. Subpopulations are increasingly fragmented by the extensive road network that crisscrosses this turtle's habitat. Having delayed age at maturity, low reproductive output and extreme longevity makes this turtle highly susceptible to population declines due to increased rates of adult mortality. Nesting females are especially susceptible to road-kill death because they often attempt to nest on gravel roads or on shoulders of paved roads. Loss of mature females in this long-lived species greatly reduces recruitment and long-term viability of subpopulations. Other threats include degradation of habitat from development, alteration of wetlands and illegal collection for sale in the pet trade.

Blanding's turtle is aquatic, but often ventures onto land near marshes, bogs, lakes and small streams to nest, bask, or travel to other bodies of water (Conant and Collins, 1998). Blanding's turtle over-winters in underwater substrates and nests on land where sandy soils are present. This species will often utilize sites disturbed by human activity, such as agriculture, for nesting and has been known to occupy Great Lakes coastal wetlands.

Two permanent waterbodies occur within the Study Area, both in the southeast portion; the graminoid marsh along the lakeshore and the deciduous swamp area. These areas provide year round habitat including suitable over-wintering habitat. In spring and early summer, Blanding's have been observed throughout the site, using various flooded pools.

Blanding's turtles nest in gravelly sandy soils, in mid to late June. Suitable nesting sites occur throughout the Study Area. Hatchlings emerge in late summer, moving into vegetated wetland where they typically remain for several years. The two permanent waterbodies within the Study Area likely provide habitat for such hatchlings.

Milksnake: The eastern milksnake occurs throughout southern Ontario and is considered uncommon and local throughout its range (Lamond, 1994). This species is a provincial and federal species of special concern. Eastern milksnake favour open woodlands, fields and farm buildings and are commonly associated with rural areas.

3.5.5 Mammals

The Atlas of the Mammals of Ontario (Dobbyn, 1994) indicated that ranges of three species of provincially rare bats, the small-footed bat (S2S3, imperiled to vulnerable), the northern long-eared bat (S3, vulnerable) and the eastern pipistrelle (S3?, vulnerable, rank uncertain), overlap the study area. Bats are further discussed in **Appendix D**. No other mammal species at risk have been identified within the Study Area.

3.5.6 Plants

Hawthorn: A review of the NHIC database (NHIC, 2008) identified one species, a hawthorn (*Crataegus corusca*). However, upon reviewing the ranking information for the hawthorn, it was determined that this species was falsely reported (SRF).

No other plant species at risk have been identified within the Study Area.

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4.0 Existing Infrastructure

4.1 EXISTING LINEAR CORRIDORS

Linear corridors are a common feature of the Study Area. They include road networks and electric and telephone corridors.

4.1.1 Roads and Railways

No highways or roads traverse the Study Area. The Study Area is bordered on the north by Babylon Road, on the east by Ostrander Point Road, on the north-west by Helmer Road, and on the west by Petticoat Point Road.

The 44 kV transmission line will follow existing road right-of-ways off Helmer Road, Hill Top Road, Dainard Road, Maypul Layn Road, Bond Road and Highway 10 to the Milford Distribution Station.

4.1.2 Electricity Transmission Lines and Telephone Lines

Electric power is generally distributed in the vicinity of the proposed transmission line by a system of 44 kV single lines supported on wooden poles inside the municipal road allowances. Telephone lines either use this same network or are buried in the road allowance.

4.2 WASTE DISPOSAL SITES

According to the MOE's Waste Disposal Inventory (1991), there are no active or closed landfills within the Study Area.

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Attachment 1

Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA (ha)	REGION	Local Status Halton	Local Status Hamilton	Local Status TRCA	Region of Waterloo Regionally Significant	Local Status PIF Priority Species	COMMENTS	Area Sensitive Reference		
AMPHIBIANS																
Red-spotted Newt	*Notophthalmus viridescens*	S5	G5T5						m	L1			OHSA			
Blue-spotted Salamander	*Ambystoma laterale*	S4	G5					HR	m	L1			OHSA			
Spotted Salamander	*Ambystoma maculatum*	S4	G5					HU	m	L1			OHSA			
American Toad	*Bufo americanus*	S5	G5										Observed in Study Area			
Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5							L2			Observed in Study Area			
Western Chorus Frog	*Pseudacris triseriata*	S4	G5	NAR	NAR*/ THR**					L2			Observed in Study Area			
Spring Peeper	*Pseudacris crucifer*	S5	G5							L2			Observed in Study Area			
Bullfrog	*Rana catesbeiana*	S4	G5			1		HU	m	L1			OHSA			
Northern Green Frog	*Rana clamitans*	S5	G5										Observed in Study Area			
Pickerel Frog	*Rana palustris*	S4	G5	NAR	NAR			HU	H	L2			OHSA			
Wood Frog	*Rana sylvatica*	S5	G5							L2			OHSA			
Northern Leopard Frog	*Rana pipiens*	S5	G5	NAR	NAR					L3			Observed in Study Area			
REPTILES																
Snapping Turtle	*Chelydra serpentina*	S5	G5							L3			OHSA			
Common Musk Turtle	*Sternotherus odoratus*	S3	G5	THR	THR		7	HR	H	L2			OHSA			
Midland Painted Turtle	*Chrysemys picta marginata*	S5	G5T5										OHSA			
Northern Map Turtle	*Graptemys geographica*	S3	G5	SC	SC	30-50		HR	H				OHSA			
Blanding's Turtle	*Emydoidea blandingi*	S3?	G4	THR	THR			HR	H	L2			Observed in Study Area			
Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5										Observed in Study Area			
Northern Watersnake	*Nerodia sipedon sipedon*	S5	G5T5	NAR	NAR	1		HU	m	L2			Observed in Study Area			
Redbelly Snake	*Storeria occipitomaculata*	S5	G5						m	L3			OHSA			
Brown Snake	*Storeria dekayi*	S5	G5		NAR								OHSA			
Smooth Greensnake	*Opheodrys vernalis*	S4	G5					HR	m	L3			Observed in Study Area			
Ringneck Snake	*Diadophis punctatus*	S4	G5				7	HR	H	L2			OHSA			
Eastern Milksnake	*Lampropeltis triangulum*	S3	G5	SC	SC					L3			OHSA			
BIRDS																
MAMMALS																
Northern Short-tailed Shrew	*Blarina brevicauda*	S5	G5										Atlas of the Mammal of Ontario			
Star-nosed Mole	*Condylura cristata*	S5	G5										Atlas of the Mammal of Ontario			
Small-footed Bat	*Myotis leibii*	S2S3	G3										Atlas of the Mammal of Ontario			
Little Brown Bat	*Myotis lucifugus*	S5	G5										Atlas of the Mammal of Ontario			
Northern Long-eared Bat	*Myotis septentrionalis*	S3?	G4							L3			Atlas of the Mammal of Ontario			
Silver-haired Bat	*Lasionycteris noctivagans*	S4	G5							L3			Atlas of the Mammal of Ontario			
Eastern Pipistrelle	*Pipistrellus subflavus*	S3?	G5				6						Atlas of the Mammal of Ontario			
Red Bat	*Lasiurus borealis*	S4	G5										Atlas of the Mammal of Ontario			
Big Brown Bat	*Eptesicus fuscus*	S5	G5										Atlas of the Mammal of Ontario			
Hoary Bat	*Lasiurus cinereus*	S4	G5										Atlas of the Mammal of Ontario			
Eastern Cottontail	*Sylvilagus floridanus*	S5	G5										Observed in Study Area			
European Hare	*Lepus europaeus*	SE	G5										Atlas of the Mammal of Ontario			
Eastern Chipmunk	*Tamias striatus*	S5	G5										Observed in Study Area			
Woodchuck	*Marmota monax*	S5	G5										Atlas of the Mammal of Ontario			
Grey Squirrel	*Sciurus carolinensis*	S5	G5										Atlas of the Mammal of Ontario			
Red Squirrel	*Tamiasciurus hudsonicus*	S5	G5										Observed in Study Area			
Northern Flying Squirrel	*Glaucomys sabrinus*	S5	G5				7		H	L2			Atlas of the Mammal of Ontario			
Beaver	*Castor canadensis*	S5	G5							L3			Atlas of the Mammal of Ontario			
White-footed Mouse	*Peromyscus leucopus*	S5	G5										Atlas of the Mammal of Ontario			
Muskrat	*Ondatra zibethicus*	S5	G5										Atlas of the Mammal of Ontario			
Meadow Vole	*Microtus pennsylvanicus*	S5	G5										Atlas of the Mammal of Ontario			
House Mouse	*Mus musculus*	SE	G5										Atlas of the Mammal of Ontario			
Meadow Jumping Mouse	*Zapus hudsonicus*	S5	G5							L3			Atlas of the Mammal of Ontario			

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA (ha)	REGION	Local Status Halton	Local Status Hamilton	Local Status TRCA	Region of Waterloo Regionally Significant	Local Status PIF Priority Species	COMMENTS	Area Sensitive Reference		
Coyote	*Canis latrans*	S5	G5										Observed in Study Area			
Red Fox	*Vulpes vulpes*	S5	G5										Atlas of the Mammal of Ontario			
Raccoon	*Procyon lotor*	S5	G5										Observed in Study Area			
Ermine	*Mustela erminea*	S5	G5						H-m	L3			Atlas of the Mammal of Ontario			
Long-tailed Weasel	*Mustela frenata*	S4	G5										Atlas of the Mammal of Ontario			
Mink	*Mustela vison*	S5	G5							L3			Atlas of the Mammal of Ontario			
Striped Skunk	*Mephitis mephitis*	S5	G5										Observed in Study Area			
White-tailed Deer	*Odocoileus virginianus*	S5	G5										Observed in Study Area			

Attachment 2

NHIC: Natural Features

Number of natural areas selected: **2**

BLACK CREEK- WETLAND

AREA_ID: 9899

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Wetland	87.0 ha	18,334500,4868000	30N/14

Description
A Provincially significant wetland, composed of two wetland types (7% swamp and 93% marsh) (Snetsinger and Kristensen, 1993).

Vegetation
Vegetation Communities (Snetsinger and Kristensen, 1993):
3.4% tall shrubs, 10.4% narrow-leaved emergents, 47.2% robust emergents, and 39% submergents;

No vegetation communities list available at this time.

Total number of communities with 1- 3 forms: 4
Total number of communities with 4- 5 forms: 2

Representation

Landform
Soils (Snetsinger and Kristensen, 1993): 20% sand and 80% humic/ mesic;
Site Type (Snetsinger and Kristensen, 1993): 95% riverine, and 5% lacustrine (exposed to lake);

References

- Snetsinger, R. and D. Kristensen. 1993. Southern Ontario Wetland Evaluation Data and Scoring Record- Black Creek. Third Edition (March). Aug 14, 1993. Ecological Services. Manuscript. 41 pp + 9 pp supplement.

BLACK CREEK VALLEY MARSHES AND FOREST

AREA_ID: 5017

Significance	Area Type	Size	Centroid UTM	Map #
Regional	Life Science ANSI	305.0 ha	18,334500,4867500	30N/14

Description

This is an extensive, well developed river valley with wetland and slope forest landforms and vegetation communities which are representative of the Prince Edward Peninsula Physiographic Region. [Macdonald 1987]

Vegetation

The site's vegetation includes a well developed series of regionally representative marshes, thickets and aquatics, and upland deciduous and mixed forests of quite mature ages. The wetlands are dominated by a marsh of broad leaved cattail (Typha latifolia), accompanied by marsh fern (Thelypteris palustris), Canada blue joint (Calamagrostis canadensis), common great bulrush (Scirpus validus) and cutgrass (Leersia oryzoides). Along its periphery are wet graminoid and forb meadows of Canada blue joint, reed canary grass (Phalaris arundinacea), Joe Pye weed (Eupatorium maculatum), spotted jewelweed (Impatiens capensis), sedges (Carex vesicaria, C. pseudo-cyperinus, C. spicata, C. stricta) and others. Discontinuously around the basin's edge and scattered through the marsh are swamp thickets of pussy willow (Salix discolor), red osier dogwood (Cornus stolonifera), nannyberry (Viburnum lentagto), buttonbush (Cephalanthus occidentalis) and others. As well, deciduous groves of crack willow (Salix fragilis), red ash (Fraxinus pennsylvanica) and silver maple (Acer saccharinum) lie along the marsh edge. Along the creek channel and commonly occurring within the marsh are aquatic communities of white pond lily (Nymphaea odorata), greater and lesser duckweeds (Spirodela polyrhiza, Lemna minor), pondweeds (Potamogeton species), Indian rice (Zizania palustris) and others. Occuppying the deeper, mesic sands of the southeastern slopes of the valley are submature to intermediate aged, deciduous and mixed forests dominated by 90 year old sugar maple (Acer saccharum), American beech (Fagus grandifolia) and northern red oak (Quercus rubra), accompanied by black cherry (Prunus serotina), American basswood (Tilia americana), paper birch (Betula papyrifera), eastern hemlock (Tsuga canadensis) and eastern white pine (Pinus strobus). These forests have a rich undergrowth of temperate and southern species. Also occurring are mixed forests dominated by eastern hemlock, with eastern white pine and some eastern white cedar (Thuja occidentalis), and a sparse presence of sugar maple and the other tree species. Along the steep slopes of the narrow escarpment valley are mixed groves of eastern hemlock, eastern white cedar and white ash (Fraxinus americana), and occupying its bottom are thickets of (Alnus incana sp. subsp. rugosa), and narrow floodplain forb meadows of Joe Pye weed Canada goldenrod (Solidago canadensis), virgin's bower (Clematis virginiana), spotted jewelweed, fowl meadow grass (Poa palustris) and others. Active croplands of corn, oats and hay, and pasture occupy the lands adjacent to the site's natural communities. [Macdonald 1987]

Representation

The significance of the site is its presentation of one of the only river valley systems in the physiographic region with well developed wetland and upland natural communities. The complex of submature forest and diverse marshes is not matched elsewhere. [Macdonald 1987]

Landform

The landform of the site is dominated by a relatively deep, broad valley which has developed in deep lacustrine sandy deposits. This presents an even, gentle slope on its northwestern side, but a steeper and more irregular slope on its southeastern side with notable stream dissection valleys. There is a narrow escarpment valley at the site's western end which has very steep slopes and occasional limestone cliff exposures. A limestone plain with shallow sand and clay extends eastward beyond the site's boundaries. The soils are circummesic sandy loams on the uplands and wet to saturated fibric mucks and clays in the wetlands. The flow channel of Black Creek enters Prince Edward Bay at its northeastern end; its water level is controlled by that of Lake Ontario. [Macdonald 1987]

References

- Macdonald, I.D. 1987. Life Science Areas of Natural and Scientific Interest in Site District 6-15. Draft. Ontario Ministry of Natural Resources, Eastern Region, Kemptville. SR OFER 8603. viii + 149 pp.

- Palilionis, A. 1977. A Study of Big Island, Hay Bay and Rideau Marshes in Relation to Marsh Management. OMNR, Fish and Wildlife Branch, Toronto. 64 pp.

Natural Heritage Information Centre

Natural Areas Report: SOUTH BAY COASTAL- WETLAND

Area Id: 9901
Alias(es):
Size (ha): 231.0

Area Type: WET
Significance Level: Provincial

Site District:	Counties:	Topographic Maps:
	PRINCE EDWARD	30N/14

UTM Centroid: 18 336000 4862000
Decimal Latitude/Longitude: 43.8948669780123 -77.0415923546034

Description: A Provincially significant wetland complex, made up of three individual wetlands, composed of two wetland types (66% swamp and 34% marsh) (Snetsinger and Kristensen, 1993).

Vegetation: Dominant Vegetation Forms (Snetsinger and Kristensen, 1993): 70.3% deciduous trees, 48.2% tall shrubs, 24.5% low shrubs, and 88% narrow-leaved emergents; No vegetation communities list available at this time. Total number of communities with 1- 3 forms: 10 Total number of communities with 4- 5 forms: 3

Landform: Soils (Snetsinger and Kristensen, 1993): 22% sand, and 78% humic/ mesic; Site Type (Snetsinger and Kristensen, 1993): 9% isolated, 10% palustrine (permanent or intermittent outflow), and 81% riverine;

Representation:

Management Agency:

Minimum Elevation: **Maximum Elevation:**

References

Id	Citation
55252	Snetsinger, R. and D. Kristensen. 1993. Southern Ontario Wetland Evaluation Data and Scoring Record- South Bay Coastal. Third Edition (March).. Ecological Services. Manuscript. 41 pp + 9 pp supplement.

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Modified 06-27-2008

Number of natural areas selected: **1**

SOUTH BAY MARSH

AREA_ID: 7078

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Wetland	62.0 ha	18,336000,4864000	30N/14

Description
A Provincially significant, Coastal wetland, composed of two wetland types (3% swamp and 97% marsh) (Mosquin et al., 1986).

Note- Wetland Evaluation (Mosquin et al., 1986) Locational Centroid is inaccurate (362645). More accurate centroid displayed, according to H. Ball.

Vegetation
Vegetation Communities (Mosquin et al., 1986):
One Form
M1: submergents- Vallisneria americana;
M1: robust emergents- Typha angustifolia;

Two Forms
M2: robust emergents- Typha angustifolia; free-floating plants- Lemna minor;
M2: robust emergents- Scirpus validus; submergents- Myriophyllum spp.;
M2: narrow-leaved emergents- Sparganium spp.; submergents- Myriophyllum spp.;
S2: deciduous trees- Salix spp.; narrow-leaved emergents- Juncus spp., Carex spp.;

Three Forms
S3: deciduous trees- Salix spp.; robust emergents- Typha spp.; narrow-leaved emergents- Carex spp.;

Representation

Landform
Soils (Mosquin et al., 1986): 40% clays, loams or silts and 60% organic;
Site Type (Mosquin et al., 1986): 100% lacustrine exposed to lake;

References

- Mosquin, T., J.R. Wilson and P. Mosquin. 1986. Wetland Data Record and Evaluation- South Bay Marsh. Second Edition. July - August, 1986. Mosquin Bio-Information. Manuscript. 12 pp +

1 map + 1 p supplement.

Attachment 3

Plant Inventory

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	PRAIRIE AFFINITY
	LOCAL STATUS SOURCE LAST UPDATE/ INITIALS									
PTERIDOPHYTES		**FERNS & ALLIES**								
Thelypteridaceae		**Marsh Fern Family**								
Thelypteris	*palustris* var. *pubescens*	Marsh Fern	5	-4		S5			G5T?	
GYMNOSPERMS		**CONIFERS**								
Juniperus	*communis*	Common Juniper		3		S5			G5	
Juniperus	*virginiana*	Eastern Red Cedar				S5			G5	
DICOTYLEDONS		**DICOTS**								
Acer X	*freemanii*	Freeman's Maple								
Anacardiaceae		**Sumac or Cashew Family**								
Rhus	*aromatica*	Fragrant Sumac	8	5		S5			G5	p
Rhus	*radicans* ssp. *negundo*	Poison-ivy	5	-1		S5			G5T	
Rhus	*typhina*	Staghorn Sumac	1	5		S5			G5	
Apiaceae		**Carrot or Parsley Family**								
Cicuta	*bulbifera*	Bulb-bearing Water-hemlock	5	-5		S5			G5	
Daucus	*carota*	Wild Carrot		5	-2	SE5			G?	
Sanicula	*marilandica*	Black Snakeroot	5	3		S5			G5	
Sium	*suave*	Hemlock Water-parsnip	4	-5		S5			G5	
Zizia	*aurea*	Golden Alexanders	7	-1		S5			G5	
Apocynaceae		**Dogbane Family**								
Apocynum	*androsaemifolium* ssp. *androsaemifolium*	Spreading Dogbane	3	5		S5			G5T?	
Asclepiadaceae		**Milkweed Family**								
Asclepias	*incarnata* ssp. *incarnata*	Swamp Milkweed	6	-5		S5			G5T5	
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5	
Cynanchum	*nigrum*	Black Swallow-wort		5	-2	SE?			G?	
Asteraceae		**Composite or Aster Family**								
Achillea	*millefolium* ssp. *millefolium*	Common Yarrow		3	-1	SE?			G5T?	
Ambrosia	*artemisiifolia*	Common Ragweed	0	3		S5			G5	
Aster	*ciliolatus*	Ciliolate Aster	6	4		S5			G5	
Aster	*ericoides* ssp. *ericoides*	White Heath Aster				S5			G5T?	
Aster	*lateriflorus* var. *hirsuticaulis*	Calico Aster				S4?			G5T?	
Aster	*novae-angliae*	New England Aster	2	-3		S5			G5	
Bidens	*frondosa*	Devil's Beggar-ticks	3	-3		S5			G5	
Chrysanthemum	*leucanthemum*	Ox-eye Daisy		5	-1	SE5			G?	
Cichorium	*intybus*	Chicory		5	-1	SE5			G?	
Erigeron	*annuus*	Daisy Fleabane								
Erigeron	*strigosus*	Daisy Fleabane	0	1		S5			G5	
Eupatorium	*perfoliatum*	Perfoliate Thoroughwort	2	-4		S5			G5	
Euthamia	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5	
Hieracium	*piloselloides*	Glaucous King Devil		5	-2	SE5			G?	
Senecio	*pauperculus*	Balsam Groundsel	7	-1		S5			G5	
Solidago	*altissima* var. *altissima*	Tall Goldenrod	1	3		S5				
Solidago	*juncea*	Early Goldenrod	3	5		S5			G5	
Solidago	*nemoralis* ssp. *nemoralis*	Gray Goldenrod	2	5		S5			G5T?	
Tragopogon	*pratensis* ssp. *pratensis*	Meadow Goat's-beard		5	-1	SE5			G?T?	
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5	
Boraginaceae		**Borage Family**								
Echium	*vulgare*	Blueweed		5	-2	SE5			G?	
Brassicaceae		**Mustard Family**								
Berteroa	*incana*	Hoary Alyssum		5	-3	SE5			G?	
Erucastrum	*gallicum*	Dog Mustard		5	-1	SE5			G5	
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5	
Campanulaceae		**Bellflower Family**								
Campanula	*rotundifolia*	Blue Bells of Scotland	7	1		S5			G5	
Caprifoliaceae		**Honeysuckle Family**								
Lonicera	*canadensis*	American Fly Honeysuckle	6	3		S5			G5	
Lonicera	*hirsuta*	Hairy Honeysuckle	7	0		S5			G4G5	
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?	
Sambucus	*canadensis*	Common Elderberry	5	-2		S5			G5	
Symphoricarpos	*albus*	Snowberry	7	4		S5			G5	
Triosteum	*aurantiacum*	Wild Coffee	7	5		S5			G5	
Viburnum	*lentago*	Nannyberry	4	-1		S5			G5	
Viburnum	*rafinesquianum*	Downy Arrow-wood	7	5		S5			G5	
Caryophyllaceae		**Pink Family**								
Cerastium	*arvense* ssp. *arvense*	Field Chickweed	8	4		SE4			G5T?	
Dianthus	*armeria*	Deptford Pink		5	-1	SE5			G?	

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	PRAIRIE AFFINITY
	LOCAL STATUS SOURCE LAST UPDATE/ INITIALS									
Minuartia	*michauxii*	Rock Sandwort	8	5		S5			G5	p
Moehringia	*lateriflora*	Blunt-leaved Sandwort	7	3		S5			G5	
Saponaria	*officinalis*	Bouncing-bet		3	-3	SE5			G?	
Silene	*antirrhina*	Sleepy Catchfly	3	5		S5			G5	
Silene	*latifolia*	Bladder Campion				SE5			G?	
Stellaria	*crassifolia*	Fleshy Stitchwort				S4?			G4	
Celastraceae		**Staff-tree Family**								
Celastrus	*scandens*	Climbing Bittersweet	3	3		S5			G5	
Convolvulaceae		**Morning-glory Family**								
Convolvulus	*arvensis*	Field Bindweed		5	-1	SE5			G?	
Cornaceae		**Dogwood Family**								
Cornus	*amomum* ssp. *obliqua*	Silky Dogwood	5	-4		S5			G5T?	
Cornus	*foemina* ssp. *racemosa*	Red Panicled Dogwood	2	-2		S5			G5?	
Cornus	*stolonifera*	Red-osier Dogwood	2	-3		S5			G5	
Sedum	*acre*	Mossy Stonecrop		5	-3	SE5			G?	
Elaeagnaceae		**Oleaster Family**								
Shepherdia	*canadensis*	Canada Soapberry	7	5		S5			G5	
Fabaceae		**Pea Family**								
Lathyrus	*ochroleucus*	Cream-coloured Vetchling	8	5		S4			G4G5	
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5			G?	
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?	
Melilotus	*alba*	White Sweet-clover		3	-3	SE5			G?	
Melilotus	*officinalis*	Yellow Sweet-clover		3	-1	SE5			G?	
Trifolium	*pratense*	Red Clover		2	-2	SE5			G?	
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?	
Fagaceae		**Beech Family**								
Quercus	*macrocarpa*	Bur Oak	5	1		S5			G5	
Quercus	*rubra*	Red Oak	6	3		S5			G5	
Geraniaceae		**Geranium Family**								
Geranium	*maculatum*	Spotted Crane's-bill	6	3		S5			G5	
Geranium	*robertianum*	Herb-robert		5	-2	SE5			G5	
Grossulariaceae		**Currant Family**								
Ribes	*americanum*	Wild Black Currant	4	-3		S5			G5	
Juglandaceae		**Walnut Family**								
Carya	*ovata* var. *ovata*	Shagbark Hickory	6	3		S5			G5	
Lamiaceae		**Mint Family**								
Clinopodium	*vulgare*	Wild Basil	4	5		S5			G?	
Lycopus	*americanus*	Cut-leaved Water-horehound	4	-5		S5			G5	
Monarda	*fistulosa*	Wild Bergamot	6	3		S5			G5	
Origanum	*vulgare*	Wild Marjarom		5	-2	SE5			G?	
Prunella	*vulgaris* ssp. *lanceolata*	Heal-all	5	5		S5			G5T?	
Trichostema	*brachiatum*	False Pennyroyal	9	5		S4			G4G5	
Nymphaeaceae		**Water-lily Family**								
Nymphaea	*odorata*	Fragrant Water-lily				S5			G5	
Oleaceae		**Olive Family**								
Fraxinus	*americana*	White Ash	4	3		S5			G5	
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5	
Fraxinus	*pennsylvanica*	Red Ash	3	-3		S5			G5	
Syringa	*vulgaris*	Common Lilac		5	-2	SE5			G?	
Onagraceae		**Evening-primrose Family**								
Epilobium	*coloratum*	Purple-veined Willow-herb	3	-5		S5			G5	
Oenothera	*biennis*	Common Evening-primrose	0	3		S5			G5	
Plantago	*major*	Common Plantain		-1	-1	SE5			G5	
Polygonum	*amphibium*	Water Smartweed	5	-5		S5			G5	
Rumex	*acetosella* ssp. *acetosella*	Sheep Sorrel		0	-2	SEU			G5T	
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SE5			G?	
Ranunculaceae		**Buttercup Family**								
Anemone	*canadensis*	Canada Anemone	3	-3		S5			G5	
Anemone	*virginiana* var. *virginiana*	Thimbleweed	4	5		S5			G5T	
Aquilegia	*canadensis*	Wild Columbine	5	1		S5			G5	
Ranunculus	*acris*	Tall Buttercup			-2	SE5			G5	
Rhamnaceae		**Buckthorn Family**								
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SE5			G?	
Rosaceae		**Rose Family**								
Amelanchier	*alnifolia*	Saskatoon Berry	8	2		S4?			G5	p
Crataegus	*species*	Hawthorn species								

Ostrander Plant Inventory

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	LOCAL STATUS SOURCE LAST UPDATE/ INITIALS									
Crataegus	*crus-galli*	Cockspur Thorn	4	0		S5			G5	
Fragaria	*vesca* ssp. *americana*	Woodland Strawberry	4	4		S5			G5T?	
Physocarpus	*opulifolius*	Ninebark	5	-2		S5			G5	
Potentilla	*anserina* ssp. *anserina*	Silverweed	5	-4		S5				
Potentilla	*arguta*	Tall Cinquefoil	7	5		S4			G5	p
Potentilla	*recta*	Rough-fruited Cinquefoil		5	-2	SE5			G?	
Potentilla	*simplex*	Old-field Cinquefoil	3	4		S5			G5	
Prunus	*serotina*	Black Cherry	3	3		S5			G5	
Prunus	*virginiana* ssp. *virginiana*	Choke Cherry	2	1		S5			G5T?	
Rosa	*blanda*	Smooth Rose	3	3		S5			G5	
Rosa	*carolina*	Swamp Rose	6	4		S4			G4G5	
Rosa	*rubiginosa*	Sweetbrier Rose		5	-1	SE4				
Rubus	*idaeus* ssp. *melanolasius*	Wild Red Raspberry	0	-2		S5			G5T	
Spiraea	*alba*	Narrow-leaved Meadow-sweet	3	-4		S5			G5	
Rubiaceae		**Madder Family**								
Galium	*mollugo*	White Bedstraw		5	-2	SE5			G?	
Galium	*triflorum*	Sweet-scented Bedstraw	4	2		S5			G5	
Hedyotis	*longifolia*	Venus'-pride	8	4		S4?			G4G5	p
Rutaceae		**Rue Family**								
Zanthoxylum	*americanum*	American Prickly-ash	3	5		S5			G5	
Salicaceae		**Willow Family**								
Populus	*tremuloides*	Trembling Aspen		0		S5			G5	
Salix	*amygdaloides*	Peach-leaved Willow	6	-3		S5			G5	
Salix	*discolor*	Pussy Willow	3	-3		S5			G5	
Salix	*exigua*	Sandbar Willow	3	-5		S5			G5	
Salix	*fragilis*	Crack Willow		-1	-3	SE5			G?	
Salix	*petiolaris*	Slender Willow	3	-4		S5			G4	
Santalaceae		**Sandalwood Family**								
Comandra	*umbellata*	Bastard Toad-flax	6	3		S5			G5	p
Scrophulariaceae		**Figwort Family**								
Agalinis	*tenuifolia* var. *tenuifolia*	Slender-leaved Agalinis	7	-3		SU			G5T?	
Penstemon	*digitalis*	Foxglove Beard-tongue	6	1		S4S5			G5	
Verbascum	*thapsus*	Common Mullein		5	-2	SE5			G?	
Solanum	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?	
Ulmaceae		**Elm Family**								
Ulmus	*americana*	White Elm	3	-2		S5			G5?	
Urticaceae		**Nettle Family**								
Laportea	*canadensis*	Wood Nettle	6	-3		S5			G5	
Urtica	*dioica* ssp. *gracilis*	American Stinging Nettle	2	-1		S5			G5T?	
Verbenaceae		**Vervain Family**								
Verbena	*hastata*	Blue Vervain	4	-4		S5			G5	
Verbena	*simplex*	Narrow-leaved Vervain	9	5		S4			G5	
Violaceae		**Violet Family**								
Viola	*sororia*	Woolly Blue Violet				S5			G5	
Vitaceae		**Grape Family**								
Parthenocissus	*inserta*	Inserted Virginia-creeper	3	3		S5			G5	
Vitis	*riparia*	Riverbank Grape	0	-2		S5			G5	
MONOCOTYLEDONS		**MONOCOTS**								
Cyperaceae		**Sedge Family**								
Carex	*bebbii*	Bebb's Sedge	3	-5		S5			G5	
Carex	*gracillima*	Graceful Sedge	4	3		S5			G5	
Carex	*lacustris*	Lake-bank Sedge	5	-5		S5			G5	
Carex	*retrorsa*	Retrorse Sedge	5	-5		S5			G5	
Carex	*tetanica*	Rigid Sedge	8	-3		S3			G4G5	p
Eleocharis	*erythropoda*	Red-footed Spike-rush	4	-5		S5			G5	
Scirpus	*atrovirens*	Dark-green Bulrush	3	-5		S5			G5?	
Scirpus	*pendulus*	Lined Bulrush	3	-5		S5			G5	
Iridaceae		**Iris Family**								
Iris	*virginica*	Southern Blue-flag	5	-5		S5			G5	
Juncaceae		**Rush Family**								
Juncus	*filiformis*	Thread Rush	8	-3		S4S5			G5	
Liliaceae		**Lily Family**								
Maianthemum	*stellatum*	Star-flowered Solomon's Seal	6	1		S5			G5	
Orchidaceae		**Orchid Family**								
Cypripedium	*calceolus* var. *parviflorum*	Small Yellow Lady's Slipper	7	-1		S5			G5T	
Spiranthes	*cernua*	Nodding Ladies' Tresses	5	-2		S5			G5	

Ostrander Plant Inventory

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	LOCAL STATUS SOURCE LAST UPDATE/ INITIALS									
Poaceae		**Grass Family**								
Agrostis	*gigantea*	Red-top		0	-2	SE5			G4G5	
Agrostis	*scabra*	Fly-away Grass	6	0		S5			G5	
Bromus	*inermis* ssp. *inermis*	Awnless Brome		5	-3	SE5			G4G5T?	
Bromus	*tectorum*	Downy Chess		5	-2	SE5			G?	
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5			G?	
Danthonia	*spicata*	Poverty Oat Grass	5	5		S5			G5	
Deschampsia	*cespitosa* ssp. *cespitosa*	Tufted Hairgrass	9	-4		S4S5			G5T?	
Echinochloa	*crusgalli*	Common Barnyard Grass		-3	-1	SE5			G?	
Elymus	*repens*	Quack Grass		3	-3	SE5			G?	
Glyceria	*striata*	Fowl Meadow Grass	3	-5		S5			G5	
Leersia	*oryzoides*	Rice Cut Grass	3	-5		S5			G5	
Panicum	*acuminatum* var. *acuminatum*	Acuminate Panic Grass	2	0		S5			G5T	
Panicum	*flexile*	Wiry Panic Grass	8	-4		S4			G4G5	
Phleum	*pratense*	Timothy		3	-1	SE5			G?	
Poa	*compressa*	Canada Blue Grass	0	2		S5			G?	
Poa	*pratensis* ssp. *pratensis*	Kentucky Bluegrass	0	1		S5			G5T	
Sparganium	*eurycarpum*	Broad-fruited Bur-reed	3	-5		S5			G5	
Typhaceae		**Cattail Family**								
Typha	*angustifolia*	Narrow-leaved Cattail	3	-5		S5			G5	
Typha	*latifolia*	Broad-leaved Cattail	3	-5		S5			G5	
FLORISTIC SUMMARY & ASSESSMENT										
Species Diversity										
Total Species:		**167**								
Native Species:		**122**	73%							
Exotic Species		**45**	27%							
Regionally Significant Species		enter manually								
S1-S3 Species		1	1%							
S4 Species		13	11%							
S5 Species		107	88%							
Co-efficient of Conservatism and Floristic Quality Index										
Co-efficient of Conservatism (CC) (average)		**4.5**								
CC 0 to 3	*lowest sensitivity*	44	39%							
CC 4 to 6	*moderate sensitivity*	45	39%							
CC 7 to 8	*high sensitivity*	22	19%							
CC 9 to 10	*highest sensitivity*	3	3%							
Floristic Quality Index (FQI)		**48**								
Presence of Weedy & Invasive Species										
mean weediness		**-1.9**								
weediness = -1	*low potential invasiveness*	15	35%							
weediness = -2	*moderate potential invasiveness*	18	42%							
weediness = -3	*high potential invasiveness*	10	23%							
Presence of Wetland Species										
average wetness value		**0.9**								
upland		43	27%							
facultative upland		38	24%							
facultative		27	17%							
facultative wetland		32	20%							
obligate wetland		18	11%							

Attachment 4

Photographic Record

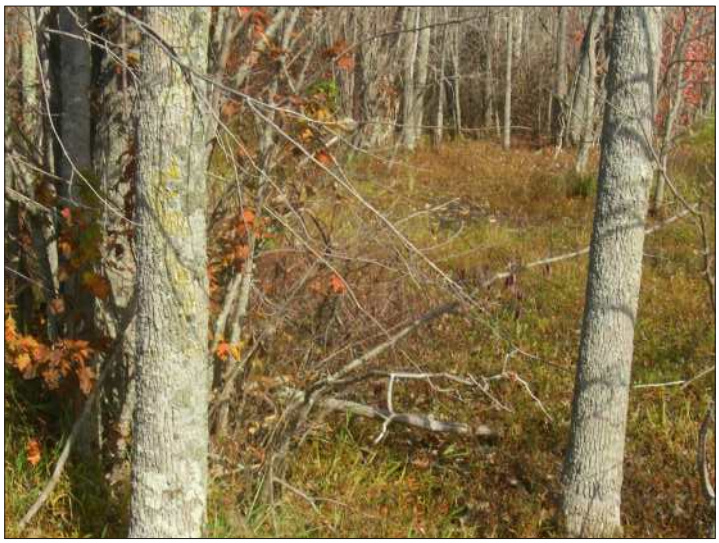

Photo 1a - Site 3.

Photo 1b - Site 3.

Photo 2a - Site 4.

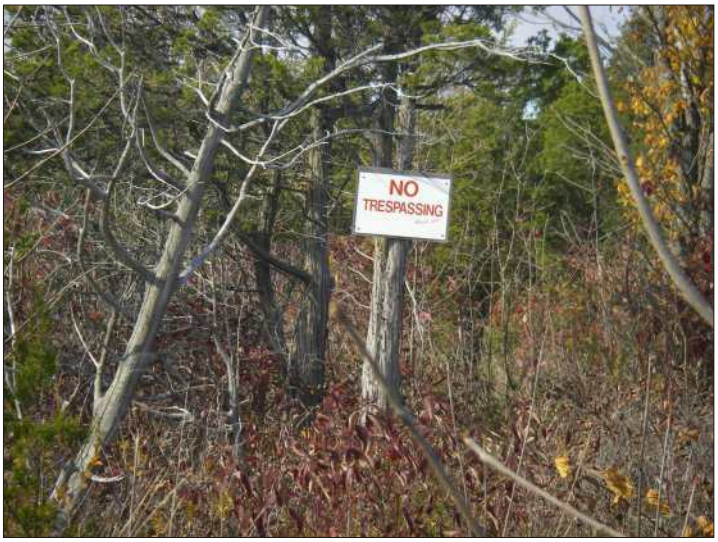

Photo 2b - Site 4

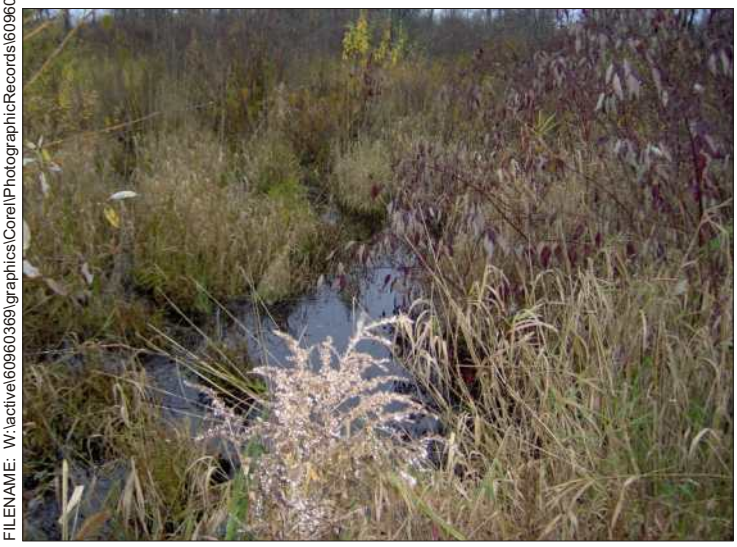

Photo 3a - Site 1.

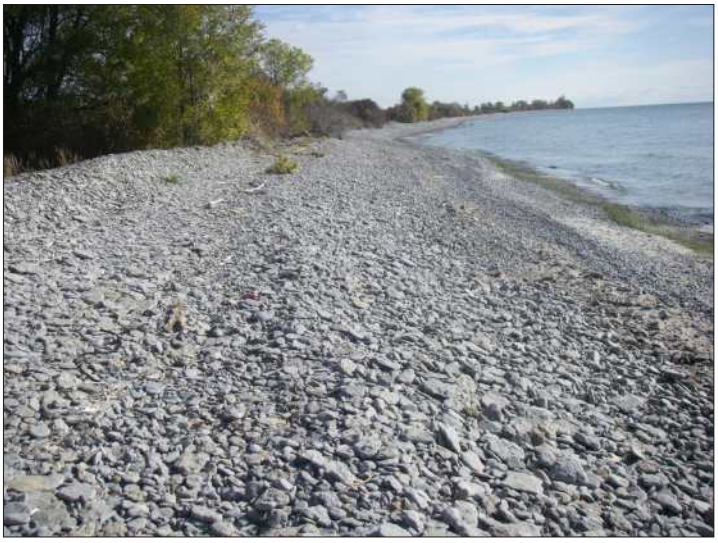

Photo 3b - Site 1.

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GILEAD POWER

OSTRANDER POINT WIND FARM

Initiated: October, 2008

Revised:

FIGURE NO.

1.0

TITLE

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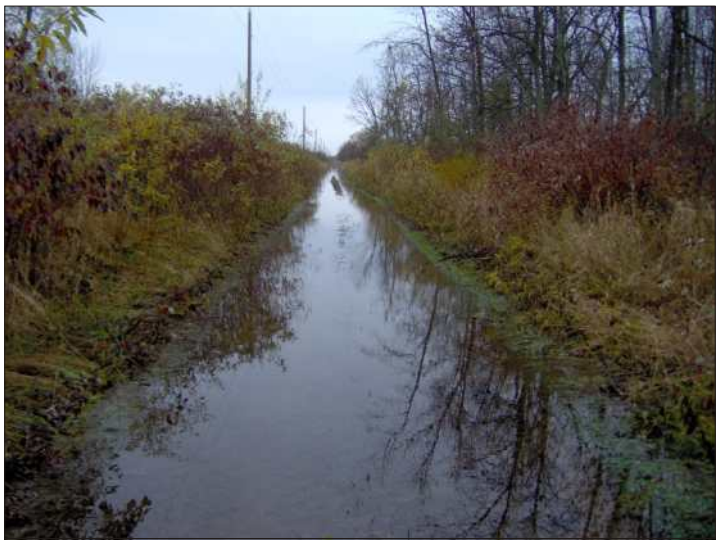

Photo 4 - Typical inundated road.

Photo 5a - Site 5.

Photo 5b - Site 5.

Photo 6a - Site 6.

Photo 6b - Site 6.

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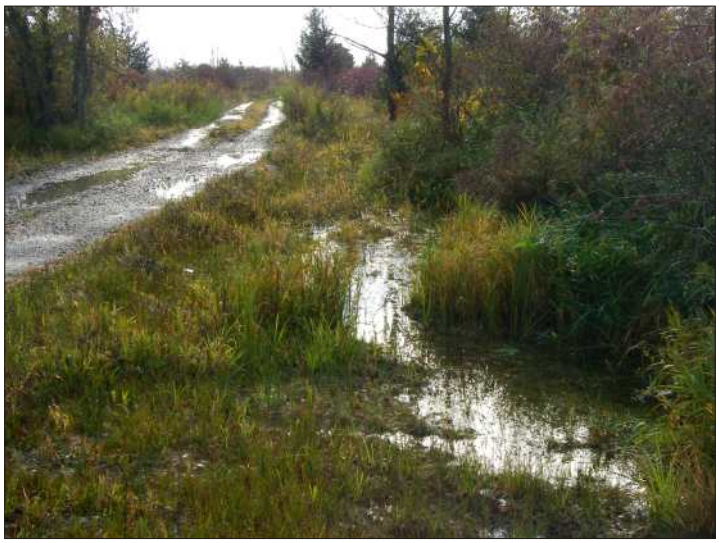

Photo 7a - Site 7.

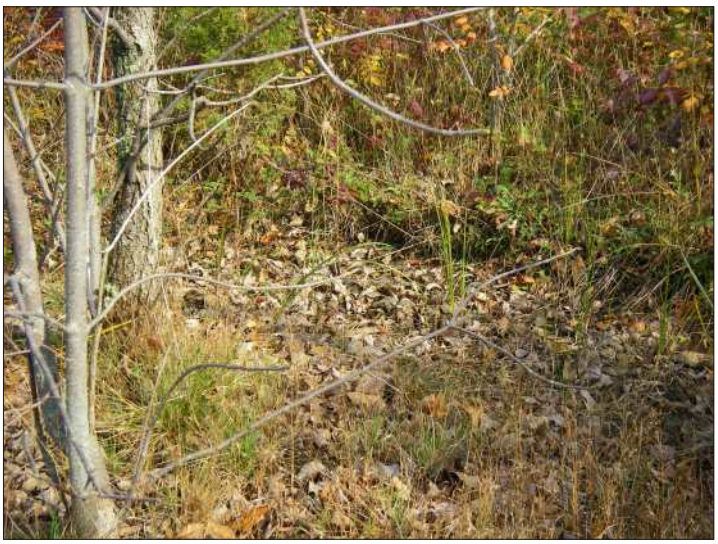

Photo 7b - Site 7.

Photo 8a - Site A.

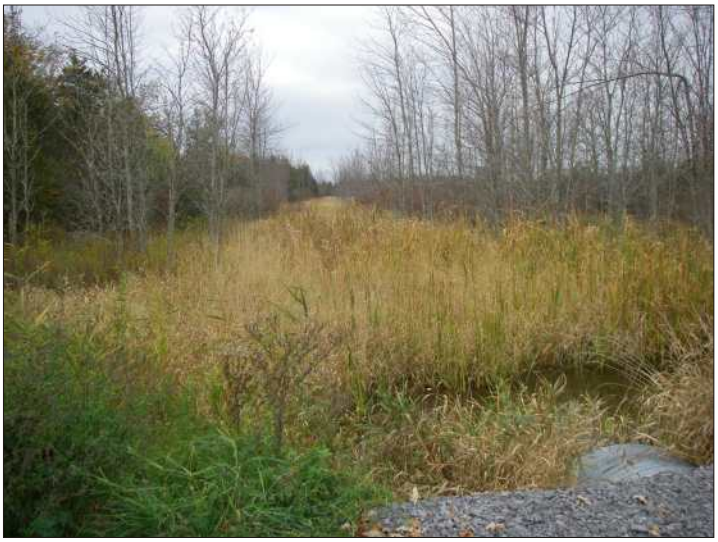

Photo 8b - Site A.

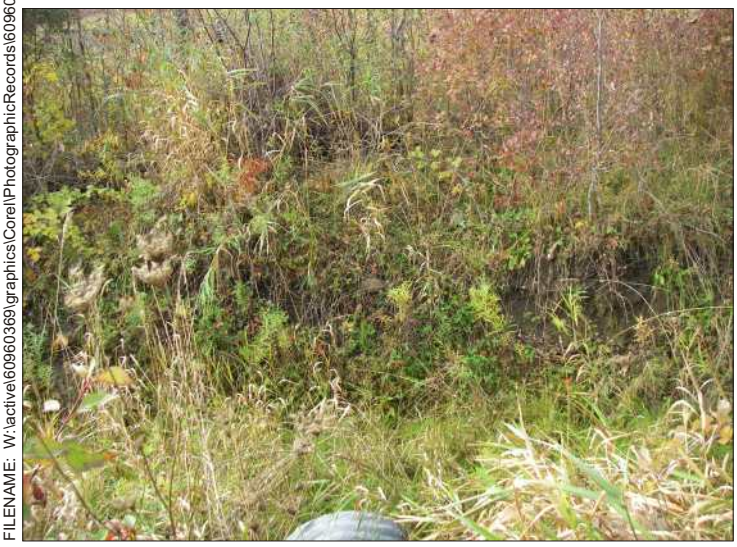

Photo 9a - Site H.

Photo 9b - Site H.

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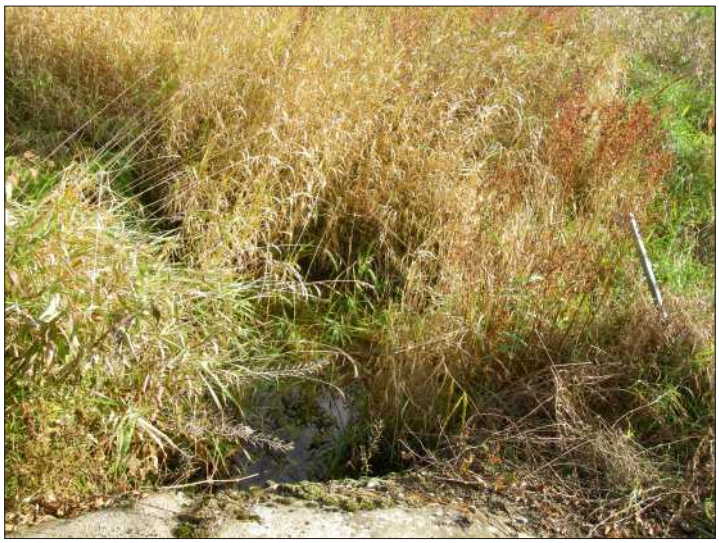

Photo 10a - Site I.

Photo 10b - Site I.

Photo 11a - Site J.

Photo 11b - Site J.

Photo 12a - Site K.

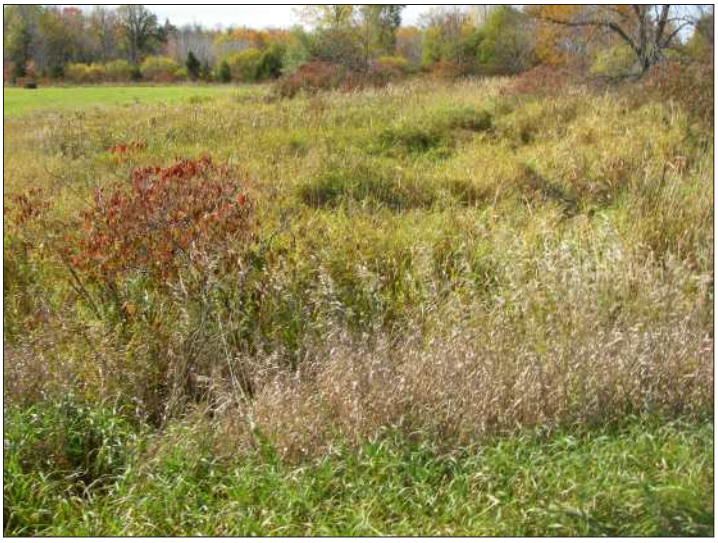

Photo 12b - Site K.

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Photo 13a - Site N.

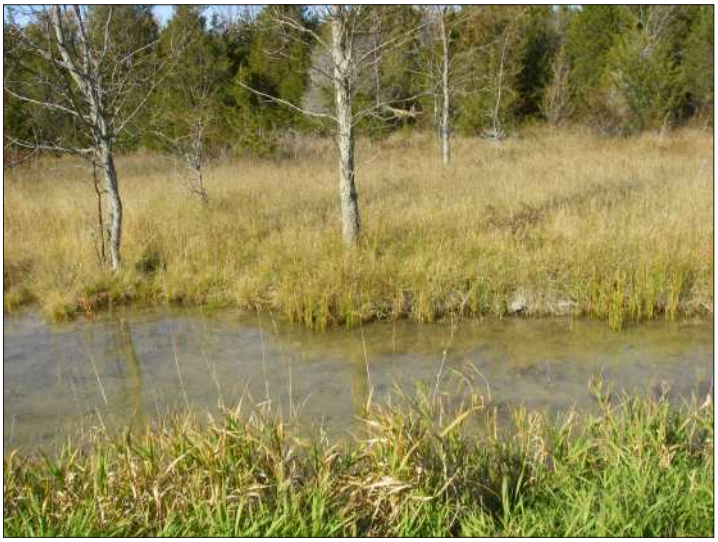

Photo 13b - Site N.

Photo 14a - Site U.

Photo 14b - Site U.

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