

## **PENN ENERGY – BRANTGATE**

**153 BISHOPSGATE ROAD, PART LOTS 1-2, CONCESSION 11**

**COUNTY OF BRANT, ONTARIO**

## **SOLAR ENERGY FACILITY**

FIT Contract No. F-001576-SPU-130-505

FIT Application No. FIT-FCELIHJ

COD: February 25, 2014

## **NATURAL HERITAGE ASSESSMENT**

## **PART 2: SITE INVESTIGATION**

### **Report Prepared For:**

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### **Date:**

May 2012

### **Savanta File:**

7067



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## 1.0 INTRODUCTION

Penn Energy Renewables, Ltd. (Penn) has executed a FIT contract with the Ontario Power Authority (OPA) for the construction of an 8 MW, ground-mounted, Class 3 solar energy facility approximately 14 kilometres southwest of the City of Brantford, in the County of Brant, Ontario. The Subject Lands are located in part of Lots 1 and 2 Concession 11, in the County of Brant, geographic rural community of Burford. The proposed Renewable Energy Generation Facility (REGF) would consist of a collection of solar photovoltaic (PV) modules (each approximately 1.00 m x 1.67 m or 1.00 m x 2.00 m in dimension) that are grouped into arrays tilted and facing south. These stationary arrays are strung together forming a series of rows oriented east to west. The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates Renewable Energy Approvals (REAs) under Part V.0.1 of the act, pursuant to Ontario Regulation 359/09 (O.Reg. 359/09). As part of this act, a Natural Heritage Assessment (NHA) is required in order to identify potential impacts to the natural area. Savanta Inc. (Savanta) has been retained by Penn to conduct the Natural Heritage Assessment (NHA). The Subject Lands occupy 35.6 ha, located on the west side of Bishopgates Road and north of Concession Road 12 (**Appendix A, Figure 1**). The “Project Location” is a subset of the Subject Lands, occupying 19.2 ha.

This Site Investigation Report is part 2 of the NHA reporting submitted. A Records Review Report – Part 1 was also completed. The Records Review found no natural features within 120 m of the Project Location. A review of the Natural Resource Values Information System (NRVIS) determined that the closest natural feature, Fairfield Plain Wetland, was approximately 140m southwest of the Project Location.

## 2.0 SITE INVESTIGATION

A site investigation was conducted on July 2, July 9, 2010 and September 9, 2011 in the Project Location and/or Adjacent Lands (within 120 metres) in order to determine:

- (a) whether the results of the records review analysis are correct, or require correction and identify any required corrections;
- (b) whether any additional natural features exist or requires correction,
- (c) the boundaries, located within 120 metres of the project location, of any natural feature that was identified in the records review or the site investigations; and
- (d) the distance from the project location to the boundaries of each natural feature (Section 26 of the REA Regulation).

“Natural Features” are defined under the Natural Heritage Assessment Guide for Renewable Energy Projects (July 2011) as:

- (a) an area of natural and scientific interest (earth science),
- (b) an area of natural and scientific interest (life science),
- (c) a coastal wetland,
- (d) a northern wetland,
- (e) a southern wetland,
- (f) a valleyland,
- (g) a wildlife habitat,
- (h) a woodland,

- (i) a sand barren, a savannah, a tallgrass prairie and an alvar in the Greenbelt Plan's Protected;  
Countryside Area, or  
(j) a sand barren, a savannah and a tallgrass prairie in the Oak Ridges Moraine Plan Area

Access was obtained for all Adjacent Lands with natural features present. See **Table 1**, below, for list of landowners contacted, their contact information, date(s) of contact and results of access request.

**Table 1. Summary of Effort to Contact Adjacent Landowners for Property Access**

Address	1st Contact Date	2nd Contact Date	Access Granted Y/N
110 Maple Avenue	No natural features on site, landowner not contacted		OBS. FROM ROAD
111 Maple Grove Road	Called on September 7 and 8, voicemail noted that the mailbox for landowner is full, and to please hang up	Called on September 7 and 8, voicemail noted that the mailbox for landowner is full, and to please hang up. Knocked on door on Sept. 9th, no answer. Able to make full observations from the road	OBS. FROM ROAD
127 Bishopsgate	Shares hedgerow with 135 Bishopsgate. No phone, no house.		OBS. FROM ROAD
132 Bishopsgate	Spoke with Karen on September 7th, she granted permission to access lands.		YES
133 Bishopsgate (owns) (lives at 436 Regional 19 Rd)	September 8. Number is not assigned.	Knocked on door on Sept. 9th. Owner gave access.	YES
134 Bishopsgate	On September 7 Left message on voicemail requesting access, and noting I would call again tomorrow	Spoke with landowner on September 8th. Part of her property has a ravine, to the north. She give permission. Knock on her door and she will show you limits of land	YES
135 Bishopsgate	Natural features present on site. Knock on door day of site visit and ask for permission	Knocked on door on Sept. 9th, no answer. Able to make full observations from the road	OBS. FROM ROAD
141 Bishopsgate	No telephone number. Can knock on door and ask if person living there is tenant or owner	Knocked on door on Sept. 9th, no answer. Able to make full observations from the road	OBS. FROM ROAD

Address	1st Contact Date	2nd Contact Date	Access Granted Y/N
144 Bishopsgate	Called September 7, reached landowner. Landowner gave permission to access Friday or Monday, noting he/she would be home Friday for sure	Landowner called back on September 8 and rescinded authorization, noting does not want us to access lands	OBS. FROM ROAD
146 Maple Avenue	No natural features on site, landowner not contacted		OBS. FROM ROAD
146 Bishopsgate	Left message on voice on September 8th, noting that we are in the area tomorrow and would like access to your lands. We will knock on your door tomorrow and ask for access.	Knocked on door on Sept. 9th, no answer. Able to make full observations from the road	OBS. FROM ROAD
152 Bishopsgate	Left message on September 7th for landowner, requesting access.	Landowner called back on September 7 and gave permission to access lands	YES
155 Bishopsgate	Left voice message on September 7 for landowner	Left message on September 8 asking for access and noted that staff would be in area tomorrow and knocking on doors of adjacent landowners where we have not been able to reach them by phone. Knocked on door on Sept. 9th, no answer. Able to make full observations from the road	OBS. FROM ROAD
158 & 163 Bishopsgate	Left voice message for landowner on September 7th noting I spoke with tenant at 163, and pending permission from landowner to access 158 and 163 would like to know if there is tenant at 158.	Spoke with landowner on September 8, who gave permission for us to access his lands (occupied by tenants). If tenants have any questions they can call landowner on cell	YES
163 Bishopsgate	Contacted September 7th. Is ok for us to access, if landowner gives permission. Provided landowner contact information	Tenant to landowner	YES
173 Bishopsgate	No natural features on site, landowner not contacted		OBS. FROM ROAD

Field surveys were carried out by Dr. Christopher Zoladeski and Mr. Doug McRae. Dr. Zoladeski is a botanist and senior ecologist with over 18 years experience in environmental consulting. Mr. McRae is an ornithologist and wildlife biologist and has over 30 years

experience with the ecology of boreal, temperate, neo-tropical and tropical ecosystems. See **Appendix E** for resumes.

## **2.1 Field Study Methodology**

Field surveys were completed across the Project Location and Adjacent Lands and included Ecological Land Classification, botanical surveys, and wildlife habitat assessment.

**Table 2. Summary of Site Investigation Methods**

<b>Purpose</b>	<b>Location</b>	<b>Date(s) (m/d/yr), Time(s) &amp; Duration</b>	<b>Weather Conditions</b>	<b>Source &amp; Dates of Information Used/Applied</b>	<b>Names, affiliation &amp; qualifications of investigators</b>
Ecological Land Classification & Botanical Inventory	Project Location and Adjacent Lands	07/02/2010, 0900 to 1400	21-22C sunny wind <10 km/h	- air photos - NHIC records	Chris Zoladeski, Savanta, Phd
Ecological Land Classification & Botanical Inventory	Project Location and Adjacent Lands	09/09/2011, 0900 to 1500	21-22C sunny wind <10 km/h	- air photos - NHIC records	Chris Zoladeski, Savanta, Phd
Wildlife (mammal, birds, reptiles, amphibians) Habitat Assessment	Project Location and Adjacent Lands	07/09/2010, 1030 to 1230	21-22 C, light overcast, occasional mist/light rain, no wind	- air photos - NHIC records	Doug McRae, Savanta, 30 years experience as naturalist
Wildlife (mammal, birds, reptiles, amphibians) Habitat Assessment	Project Location and Adjacent Lands	05/21/2011 1800-2030	Clear, 25 C, calm	- air photos - NHIC records	Doug McRae, Savanta, 30 years experience as naturalist
Wildlife (mammal, birds, reptiles, amphibians) Habitat Assessment	Project Location and Adjacent Lands	06/17/2011 1045-1145	24C, southwest at 10 km/h; 50% cloud cover	- air photos - NHIC records	Doug McRae, Savanta, 30 years experience as naturalist

### **2.1.1 Vegetation Communities and Vascular Plants**

Botanical investigations were carried out on July 2, 2010 and September 9, 2011. Following interpretation of 2010 aerial photography, preliminary mapping of potential vegetation types was created. During the field survey, these types were identified, sampled and revised, using the sampling protocol of the Ecosystem Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Species names generally follow the nomenclature of Flora Ontario (University of Guelph, FOIBIS website).

### **2.1.2 Mammals, Birds, Reptiles and Potential For Significant Wildlife Habitat**

On July 9, 2010, May 21, 2011 and June 17, 2011 the Project Location and Adjacent Lands were surveyed by scope and on foot for wildlife occurrences and habitat.

## **3.0 Verification of Records Review**

The Records Review found no natural feature within the Project Location or within 120 metres of the Project Location (**Figure 2, Appendix A**). Through the site investigation, the Fairfield Plain Wetland (Locally Significant, County of Brant; Non-PSW, MNR) was confirmed to be >120 m from the Project Location. The site investigation confirmed that there are no natural features within the Projection Location or Adjacent Lands (within 120 m).

## **4.0 Description of Natural Features**

Historical aerial photography from 2000-2010 was reviewed prior to site investigations to identify potential natural features on the Project Locations and Subject Lands. Within the Project Location a small medium brown circular area and a larger oval (north-south orientation) of similar shade were observed in 2010 air photos in the south centre and southeast portion of the Project Location. Review of 2000, 2006 and 2007 aerial photography revealed that the larger oval areas was formally an open water feature that was filled in and put into active agricultural use by 2007. The smaller circular area was absent in 2000 aerial photography, and grading was evident across the southern portion of the Project Location, encompassing both features observed in 2010 aerial photography. These two features were investigated during the site investigation and the small medium brown circular area was absent, and the area is now an actively managed hayfield. The larger oval area is best described as a disturbed area; see description in Section 5.1.

### **4.1 Natural Features within Project Location**

The site investigations determined that the Project Location is dominated by agricultural fields (i.e. ginseng, soybean, actively managed hayfields), with a few cedar hedgerows used for windbreak. The site investigations confirmed that the Fairfield Plan Wetlands (non-PSW), identified in the Records Review, are absent from the Project Location. There are no natural features within the Project Location.

### **4.2 Natural Features within Adjacent Lands**

Site investigations of the Adjacent Lands, within 120 metres of the Project Location, determined that the lands are also predominately in agricultural use (i.e. soybean, ginseng, actively managed hayfield, corn, rye) with rural residences and cedar hedgerows for windbreak. A very small cultural meadow is located in the southeast corner of the Adjacent Lands, beside a lilac cultural thicket. This cultural meadow was too small to support any significant species (i.e. grassland birds). A small amount of individual planted trees were present (Cottonwood, Oak, Silver Spruce, White Spruce, Aspen). The site investigations confirmed that the Fairfield Plan Wetlands (non-PSW), identified in the Records Review, are absent from the Adjacent Lands. There are no natural features within the Adjacent Lands.



## 5.0 Summary of Flora and Fauna Observations

### 5.1 *Vegetation Communities and Vascular Plants*

#### ***Vegetation Communities***

The Project Location and Adjacent Lands are almost entirely under agricultural use (**Figure 3, Appendix A**). The northern half is covered by commercial plantations of ginseng, while the southern half consists of hay, rye and soybean fields. There are actively managed hayfields present.

Within the Project Location a small wet disturbed area is present. Review of historical air photos determined that this disturbed area was historically an open water pond. An open water pond is present in April-June 2006 aerial photography. June 2007 aerial photography shows this wetland as filled in. The site investigation determined that the former open water feature, now disturbed area has a cover of common weeds, mostly narrow-leaved hawk's beard, curly-leaf dock and red clover. At the lowest part of disturbed area, which is likely occasionally surface water flooded from storm events, abundantly grow mild water-pepper and water-cress, in addition to common weeds, such as common plantain, Canada blue grass and narrow-leaved hawk's beard. A few shrubs of peach-leaved willow are scattered.

The site investigation confirmed that the Fairfield Plain Wetland is located outside of the Project Location and outside of the Adjacent Lands. The limits of the wetland boundary were updated from 1987 wetland evaluation, to reflect 2011 field observations and current limits are depicted on **Figure 4, Appendix A**.

#### ***Vascular Plants***

Ninety-four species of vascular plants were recorded from the Subject Lands. Of that number, only 35 (or 37%) species are native, and 59 (or 63%) are exotic. This very high proportion of the introduced species reflects the agricultural character of the lands and lack of natural habitats.

All of the native species are ranked S5 (Secure – common, widespread and abundant in Ontario).

No rare, threatened or endangered species were recorded from the Subject Lands or vicinity.

Vegetation communities and vascular plant field memos and field notes provided in **Appendix B**. Plant species list provided in **Appendix C**.

### 5.2 *Wildlife, Birds and Assessment of Candidate Significant Wildlife Habitat*

A Site Investigation was completed at and within 120 metres of the Project Location to determine whether there are any habitats that may meet criteria for designation as Candidate Significant Wildlife Habitat. Most of this land is intensively farmed or used in some other way; therefore, the potential for candidate significant wildlife habitat is rather limited. Wildlife field memos and field notes list provided in **Appendix B**. Wildlife species list is provided in **Appendix D**.

Within the Project Location there are no natural features and are under active agricultural practices; including an actively managed hayfield within the southern portion of the Project Location. Within 120 metres of the Project Location the majority of the lands are also under active agriculture. There is an actively managed hayfield east of Bishopgate Road 1.1 ha is within 120 m of the Project Location; it is a total of 5.5 ha. Continuing south there is a very small cultural meadow, 0.2 ha is within 120 m of the Project Location is it a total of 0.6 ha. Immediately south of this cultural meadow is a lilac cultural thicket, 0.1 ha are within 120 m of the Project Location, it is a total of 0.6 ha.

Table 16 of Appendix G within the Natural Heritage Assessment Guide for Renewable Energy Projects (2011) sets out the candidate significant wildlife habitats that are required to be identified within 120 metres of the Project Location based on Project Location components (i.e. solar arrays, road, etc). Savanta reviewed the following MNR guidance documents to determine whether there are any of these candidate significant wildlife habitats at or within 120 m of the Project Location:

- OMNR. 2011. Appendix D: Process for Identifying and Addressing Significant Wildlife Habitat within the Natural Heritage Assessment Guide for Renewable Energy Projects;
- OMNR 2011. SWH Ecoregion 7E Criterion Schedule (Draft);
- OMNR 2010. Section 9 – Significant Wildlife Habitat with Natural Heritage Reference Manual; and,
- OMNR. 2000. Significant wildlife habitat technical guide. 151p.

**Table 3** of this report, below, summarizes our assessment of Candidate Significant Wildlife Habitat at and within 120 m of the Project Location. This Solar Facility includes the following project components: solar arrays, road system, underground distribution lines, four collection houses, one project substation and an overhead transmission line. There is no Candidate Significant Wildlife Habitat present at or within 120 m of the Project Location.

**Table 3. Summary of Assessment of Candidate Significant Wildlife Habitat at and within 120 m of the Project Location**

	Project Location Component					
	Solar Panel (including all related structures)	Road	Overhead Line (transmission or distribution)	Underground Line (transmission or distribution)	Building/Transformer Station/Distribution Station	Temporary Infrastructure/ Construction Activity/ Balance of Operations
Candidate Significant Wildlife Habitat						
Seasonal concentration areas						
Winter Deer Yards	No Forested Ecosites present.	No Forested Ecosites present.	No Forested Ecosites present.	No Forested Ecosites present.	No Forested Ecosites present.	No Forested Ecosites present.
Moose Late Winter	Not listed as CSWH within Eco-Region 7E	Not listed as CSWH within Eco-Region 7E				
Colonial Birds - Hérons	No treed swamps, wetlands, lakes or islands present.	No treed swamps, wetlands, lakes or islands present.				

	<b>Project Location Component</b>					
	Solar Panel (including all related structures)	Road	Overhead Line (transmission or distribution)	Underground Line (transmission or distribution)	Building/Transformer Station/Distribution Station	Temporary Infrastructure/ Construction Activity/ Balance of Operations
Colonial Birds - Terns	No rocky island or peninsula within a large lake or river present.	No rocky island or peninsula within a large lake or river present.				
Raptor Winter Feeding/Roosting			No CSWH Present. Requires one community series from Forest (FOD, FOM, FOC) and Upland (CUM, CUT, CUS, CUW). No Forest present.			
Reptile Hibernacula	No talus, rock barren, and crevice and cave habitats. No rockpiles, stone fences or crumbling fences present.	No talus, rock barren, crevice and cave habitats. No rockpiles, stone fences or crumbling fences present.				
Butterfly Stopover Habitat	Not Present Need to have one community series from each land class – Field and Forest. No forest at or within 120 m of Project Location.					
<b>Rare Vegetation Communities</b>						
Alvar		ELC survey determined there are no alvar habitats present.				
Prairie		ELC survey determined there is no prairie habitat present.				
Savannah		ELC survey determined there is no savannah habitat				

	Project Location Component					
	Solar Panel (including all related structures)	Road	Overhead Line (transmission or distribution)	Underground Line (transmission or distribution)	Building/Transformer Station/Distribution Station	Temporary Infrastructure/ Construction Activity/ Balance of Operations
		present.				
Rare Forest Types		ELC survey determined there are no forests present.				
Cliff/Talus		ELC survey determined that there are no Cliff or Talus habitat present.				
Rock Barrens		Not listed as CSWH within Eco- Region 7E				
Sand Barrens		ELC survey confirmed there are no sand barren habitats present.				
Great Lake Dunes		Not located within shoreline of Great Lakes. No ELC veg. types present, as per Appendix M of SWTG.				
<i>Specialized Habitat for Wildlife</i>						
Turtle Nesting	There are no MAM, SAS, SAM, BOO or FEO Ecosites present.	There are no MAM, SAS, SAM, BOO or FEO Ecosites present.				
Moose Calving	Not listed as CSWH within Eco-Region 7E	Not listed as CSWH within Eco- Region 7E				
Moose Aquatic Feeding	Not listed as CSWH within Eco-Region 7E	Not listed as CSWH within Eco- Region 7E				
Amphibian Breeding Wetlands	Not Present	There are no swamp, marsh, fen, bog, open water aquatic or submergent aquatic community classes				

	Project Location Component					
	Solar Panel (including all related structures)	Road	Overhead Line (transmission or distribution)	Underground Line (transmission or distribution)	Building/Transformer Station/Distribution Station	Temporary Infrastructure/ Construction Activity/ Balance of Operations
		present.				
Wolf Rendezvous Sites	Not listed as CSWH within Eco-Region 7E	Not listed as CSWH within Eco- Region 7E				
Sharp-tailed Grouse Leaks	Not listed as CSWH within Eco-Region 7E	Not listed as CSWH within Eco- Region 7E				
<i>Species of Conservation Concern</i>						
ESA Special Concern & Provincially Rare – Plant Species		No records in NHIC database. No Special Concern species listed in MNR Guelph District database. No special concern or rare vegetation species observed by Savanta botanist.				
ESA Special Concern & Provincially Rare – Other Species		No records in NHIC database. No Special Concern species listed in MNR Guelph District database. No special concern or provincially are fauna observed by Savanta wildlife biologist.				
<i>Animal Movement Corridors</i>						
Deer Migration Corridors	Not listed as CSWH within Eco-Region 7E	Not listed as CSWH within Eco- Region 7E				
Amphibian Corridors	There are no ecosites associated with water present.	There are no ecosites associated with water present.				

The Records Review Report documented that data from the two Ontario Breeding Bird Atlas squares (size), in which the Project Location is found, had records of probable and confirmed breeding birds that occupy open country breeding bird habitat and/or shrub/early successional bird breeding habitat. As per Table 16 in Appendix D (NHAG, 2011) these habitats are not required to be identified for Solar Facilities.

Through the Site Investigation Ecological Land Classification (ELC), botany and wildlife habitat surveys were conducted to assess natural and cultural habitats at and within 120 metres of the Project Location for potential open country breeding bird habitat and shrub/early successional bird breeding habitat. No natural features were present within the Project Location; an actively managed hayfield is present within the southern portion of the Project Location. There is a rectangular portion of actively managed hayfield (10.02 ha), just north of Concession Road 12. On July 9, 2010 this actively managed hayfield area contained multiple Savannah Sparrows, a Horned Lark, as well as two territorial Grasshopper Sparrows. Also present in the portion of fallow hayfield was a brood of eight non-native Gray Partridges (game bird). On May 21, 2011 Savannah Sparrows were observed in the actively managed hayfield, and the vegetation was documented as being short, sparse with bare sand and no soil. On June 17, 2011 the actively managed hayfield was observed to have been cropped just 3-4 days prior.

East of the Project Location, and within 120 m is another actively managed hayfield (5.5 ha total), 1.1 ha are within 120 m of the Project Location. No grassland birds were observed during our 2010 or 2011 site visits.

Under SWH Ecoregion 7E Criterion Schedule (Draft), for open country breeding bird habitat or shrub/early successional bird breeding habitat to be considered Candidate Significant Wildlife Habitat a hayfield must be >30 ha, not Class 1 or 2 agricultural lands, and not actively used for farming. Both of the actively managed hayfield's (one on Project Location and one within 120 m of Project Location) are individually smaller than 30 ha, are under active agricultural use and the majority is classified as Class 2 Agriculture. Neither actively managed hayfield meets the MNR draft (June 2011) criteria for identifying Significant Wildlife Habitat for Ecoregion 7-E for open country breeding bird habitat or shrub/early successional bird breeding habitat.

## **6.0 SITE INVESTIGATION CONCLUSIONS**

The site investigation confirmed that:

- The results of the records review analysis are correct. The northeast edge of the Fairfield Plain Wetland (non-PSW) is located outside of the Project Location and southwest of the Adjacent Lands;
- There is no Candidate Significant Wildlife Habitat at or within 120 metres of the Project Location; and,
- There are no natural features within the Project Location nor the Adjacent Lands.

**Report Prepared by:**



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Ecologist, Savanta Inc.

## 7.0 REFERENCES AND BACKGROUND MATERIAL

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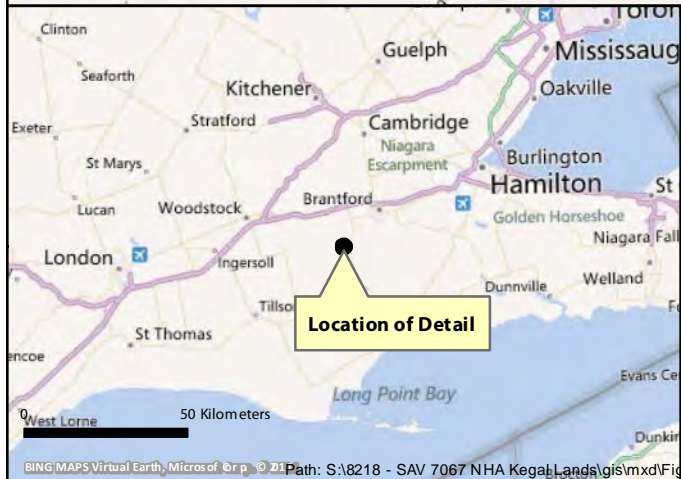
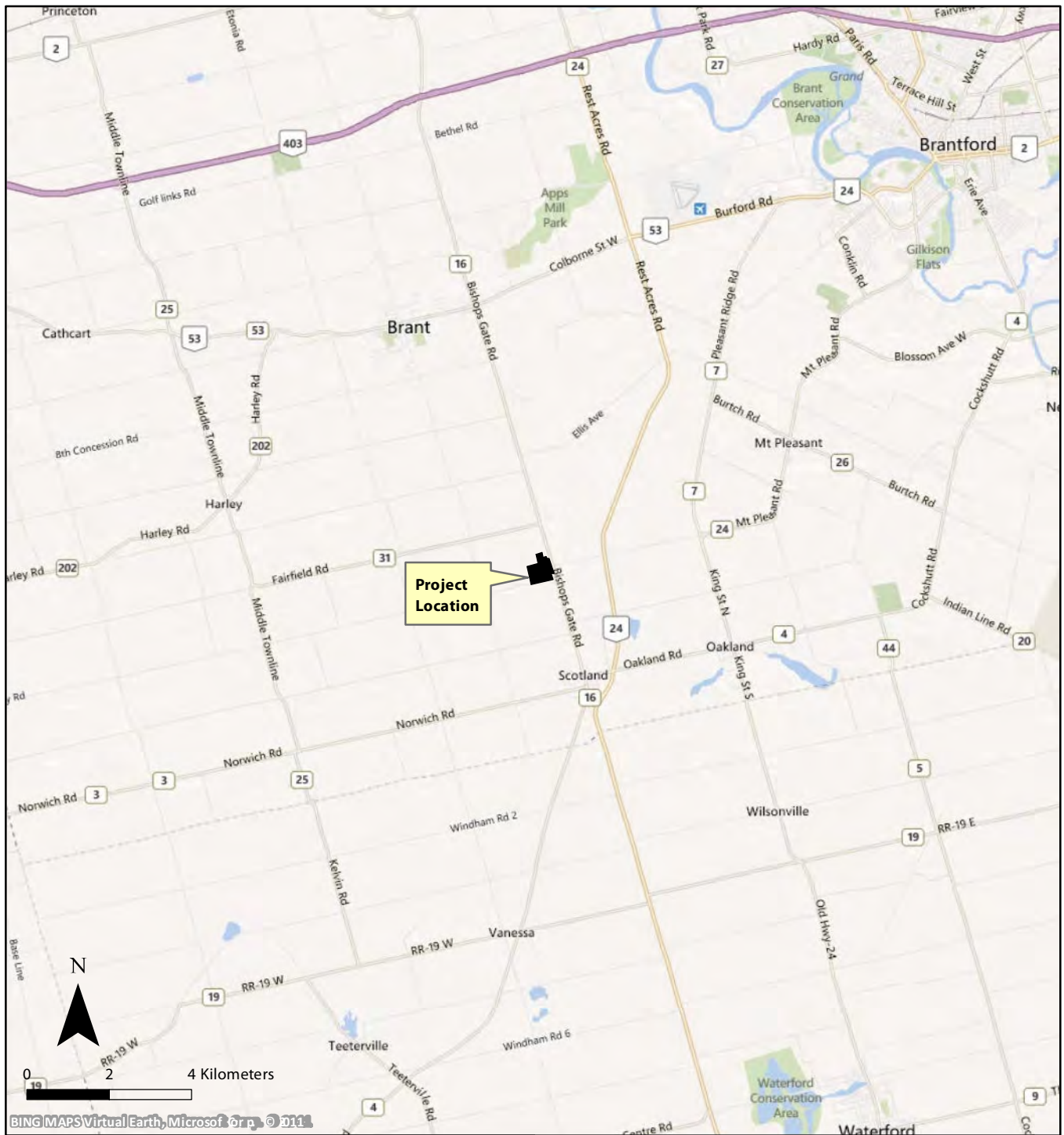
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[www.rom.on.ca/ontario/risk](http://www.rom.on.ca/ontario/risk).

## Appendix A

### *Figures*

- Figure 1. Location of Subject Lands
- Figure 2. Documented Natural Heritage Features Designations  
(Records Review)
- Figure 3. Existing Natural Heritage Features (Site Investigation)
- Figure 4. Recommended Updates to Natural Heritage Features  
Mapping



Penn Energy Renewables, Ltd. - Records Review  
153 Bishopsgate Road, County of Brant, Ontario

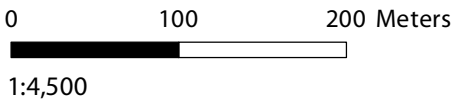
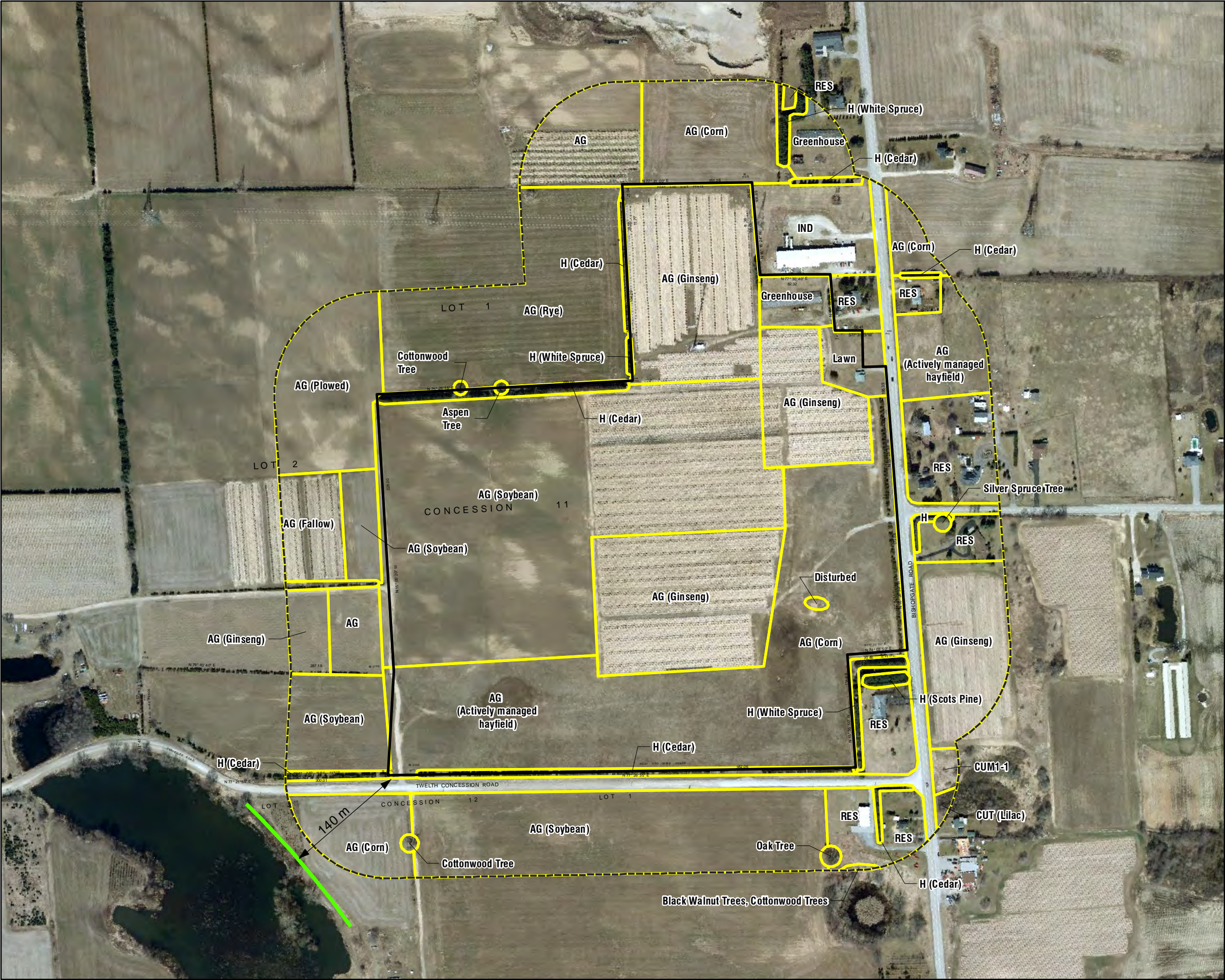
## Figure 1 Location of Subject Lands and Project Location



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Path: S:\8218 - SAV 7067 NHA Kegal Lands\gis\mxd\Figures for Site Investigation\2012 04 04 Figure Updates\Figure 1 Location of Subject Lands.mxd





ELC Code	ELC Description
AG	Agriculture (crop grown)
CUM1-1	Old field cultural meadow
CUT	Lilac cultural thicket
H	Hedgerow (species planted)
IND	Industrial
Lawn	Lawn
RES	Residential

- Map Legend
- Project Location
  - Study Area and Adjacent Lands (120m from Project Location)
  - Ecological Land Classification
  - Fairfield Plain Wetland Limit (Savanta 2011)

Source: Aerial Orthophoto, Grand River Conservation Authority; photo date 2010.

Penn Energy Renewables, Ltd. - Records Review  
153 Bishopsgate Road, County of Brant, Ontario

**Figure 3**  
**Existing Natural Heritage**  
**Features Designations**  
**(Site Investigation)**



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0 100 200 Meters  
1:4,500

- Map Legend**
- Project Location
  - Study Area and Adjacent Lands (120 m from Project Location)
  - Fairfield Plain wetland limit (Savanta 2011)

Source: Aerial Orthophoto, Grand River Conservation Authority; photo date 2010.

Penn Energy Renewables, Ltd. - Records Review  
153 Bishopsgate Road, County of Brant, Ontario

**Figure 4**  
**Recommended Updates to**  
**Natural Heritage Features**  
**Mapping (Site Investigation)**



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## **Appendix B**

### *Field Memos*

- Ecological Land Classification and Botanical Survey
- Bird and Wildlife Survey

### *Scanned Copies of Field Notes*

- July 2, 2010 & September 9, 2011 (CZ)
- July 9, 2010 (DM)



## MEMORANDUM

To: Heather Whitehouse

From: Chris Zoladeski

CC

File: 7067

Date: October 7, 2011

### **Re: Penn Energy - Brantgate, 153 Bishopsgate Road, County of Brant, ON Vegetation and Botanical Survey Results**

The site was surveyed on July 2, 2010, and 9 September, 2011. The 2011 visit included areas within the 120 m setback from the Subject Lands. Following a satellite image interpretation, a preliminary mapping of potential vegetation types was created. During field investigations, these areas were identified, sampled and revised, using the sampling protocol of the Ecosystem Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Species names generally follow the nomenclature of Flora Ontario (University of Guelph, FOIBIS website).

#### **Vegetation**

The subject lands are practically entirely under agricultural use, with alternating plantations of ginseng and various types of crop and an actively managed hayfield. Figure 3 shows the features of the lands and the setback.

There are no natural vegetation areas present on the property. To the west of Bishopsgate Road, a wet disturbed area is present, with mild water-pepper and water-cress, in addition to common weeds, such as common plantain, Canada blue grass and narrow-leaved hawk's beard. A few shrubs of peach-leaved willow are scattered.

In the south-western corner of the lands a small area of Cultural Old Field Meadow is found, while on the south side of the road Duckweed Floating-leaved Shallow Aquatic type occurs within the open pond area.

Several treed hedgerows line the roads and edges of fields. They are mostly composed of young white cedar trees or saplings, with Scots pine, and white and silver spruce refining the several residences.

In the south-east corner, portions of Cultural Old Field Meadow and Lilac Cultural Thicket occur within the setback zone.

Scattered about the site and the setback are several single trees, mostly cottonwoods.

#### **Flora**

Ninety-four species of vascular plants were recorded from the Subject Lands. Of that number, only 35 (or 37%) species are native, and 59 (or 63%) are exotic. This very high

proportion of the introduced species reflects the agricultural character of the lands and lack of natural habitats.

All of the native species are ranked S5 (Secure – common, widespread and abundant in Ontario).

No rare, threatened or endangered species were recorded from the Subject Lands or vicinity.

#### **Results of surrounding areas access visitations**

During the September 2011 site visit, the majority of the outlying setback zone was clearly visible from the edges of the Subject Lands proper and from the main roads.

The following area's owners and/or tenants were asked for permission to enter their lands:

- 133 Bishopsgate (Frank Borghoff). Tenant present and granted permission.
- 163 Bishopsgate. Mr. Boulanger (renter) present and granted permission.
- 144 Bishopsgate (Mrs. Helen Matecsa). Owner absent, lands not accessed.

#### **References**

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray.  
1998. Ecological Land Classification for Southern Ontario. First Application and its Application. SCSS Field Guide FG-02. 225pp.

Varga, S., editor. August 2000. Distribution and status of the vascular plants of the Greater Toronto Area. Ontario Ministry of Natural Resources, Aurora District. 103





MEMORANDUM

To: Heather Whitehouse

From: Doug McRae

CC

File: 7067

Date: October 7, 2011

**Re: Penn Energy - Brantgate, 153 Bishopsgate Road, County of Brant, ON  
Wildlife Survey Results**

The Subject Lands were visited over two years: 9 July 2010; 17 June and 5 July 2011 for bird and wildlife species. The property is mostly made up of open crop fields, covered crops, and a sparse "L" shaped actively managed hayfield area along the south and east boundary. The soil here is very fine and sandy. There are some cedar hedgerows but no other trees or forest to speak of. There is very little habitat variety, or protective cover for birds and wildlife. There is a large pond approximately 140 m southwest of the Project Location attracts a number of birds not typically associated with the Subject Lands, but that might be seen incidentally in passage (i.e.: Great Blue Heron).

A total of 29 species were observed on the Subject Lands during our breeding season field work and of these, only 14 were suspected of actually breeding on site. This very limited avifauna is not surprising given that the Subject Lands are under active agricultural use.

This low breeding diversity seems especially noticeable when compared to the 92 species recorded as either confirmed, possible or probable breeders from this 10x10 km Breeding Bird Atlas Square (2001-2005). Many of these 92 species are associated with habitats not found on the Subject Lands. These include forested and open wetlands (Pied-billed Grebe, Green Heron, Wood Duck, Hooded Merganser, Virginia Rail, Sora), mature forest (Ruffed Grouse, Pileated Woodpecker, White-breasted Nuthatch, Eastern Wood Pewee, Ovenbird) as well as areas of old field in succession and scrub (Brown Thrasher, Eastern Towhee, Field Sparrow).

Common mammals were observed (domestic dog, woodchuck and European Hare). No herptiles (amphibians, salamanders, snakes, turtles) were observed which is expected due to lack of habitat (hibernacula, breeding or foraging habitat).

No. *Kegels Parcel*

Date *Brant Co. 12 July 2010*

Page

*Thyris occident.*

*Zinnia aff.*

*Polygon. arifol.*

*Plant. major + laur.*

*Lepid. densifl.*

*Erigeron strigosus*

*Cela. Tulybur*

*Cerast. ferd.*

*Trifol. repens + prat.*

*Matr. leucoloma* <sup>+ setosa</sup>

*Verb. thapsus*

*Matric. matricar.*

*Arenaria serpyllif.*

*Ambrosia artem.*

*Daucus carota*

*Valer. repens*

*Brassica hirsuta* <sup>+ inermis</sup>

*Crepis acolorum*

*Chenop. album*

*Solid. altissima*

*Achillea Millef.*

*Silene latif.*

*Querc. rubra* (not barked)

*Anemone canad.*

*Potentilla recta*

*Poa compressa*

*Poa annua*

*Trisetum flavescens*

*Lactuca scariola*

*Populus deltoides*

*Apera spico-venti*

*Phlox. ornata*

*Rumex crispus*

*Rorippa poluxia*

*Lolium perenne*

*Lolium flagell.*

*Potentilla norvegica*

*Galium triflorum*

*Polygonum ~~hydropiper~~ <sup>hydropiper</sup>*

<sup>still</sup>  
Not Area - a low-lying sector surrounded

by an area of ~~disturbance~~ (old quading) <sup>correns</sup>

by weeds - esp. *Crepis*, *Rumex crispus*, *Red clover*

The wet area is occasionally flooded

- Dam covers *Rorippa* & *Polygonum*

with clusters of *Scirpus* <sup>grass</sup>

*Scirpus*

in addition to common weeds & flowers,  
Plant. major, *Crepis teranum*, *Poa compressa*

<i>Agrostis gigantea</i>	Beach leaf willow
<i>Caprella</i> b-p.	<i>Lepid. compressa</i>
<i>Dactylis glomerata</i>	<i>Melilotus alba</i>
<i>Corydalis aurea</i> ?	<i>Tragop. dubius</i>
<i>Seleni Canadensis</i>	<i>Phleum pratense</i>
<i>Asclepias syriaca</i>	<i>Cornus Annonum</i>
<i>Polygonum</i> (not <i>Avicular</i> )	
<i>Bromus "mollis"</i> - fallow pasture	
<i>mollis</i> L.	

17549762

ca. 3 km

4766204

NW of  
Scotland Brook &

<i>Elymus repens</i>	<i>Atriplex patula</i>
<i>Eragrostis</i> - (grassy roadside areas)	
<i>poaeoides</i>	grassy plantations
R. & S.	

17549816

4766320

*Senecio vulgaris* *Amaranthus* *Parelli*  
SURVEY 9 Sept 2011

<i>Salix x rubens</i>	<i>Rubus idaeus</i>	<i>Trifol. repens</i>	<i>Rhamnus cath.</i>
<i>Asclepias syriaca</i>	<i>Sambor Willow</i>	<i>Lactuca Scariola</i>	<i>Prun. Virg.</i>
<i>Lemna minor</i>	<i>Rhus typhina</i>	<i>Polyg. Aviculata</i>	<i>Vitis rot.</i>
<i>Phlox subul.</i>	<i>Sedum album</i>	<i>Digit. stramonium</i>	<i>Aster laevis</i>
<i>Impatiens capensis</i>	<i>Coryza canad</i>	<i>Echinoc. lobata</i>	<i>Acer. Neg.</i>

cont on back



21 May - Kegal Bahabank, Surinam

1800-2030, clear, 25°C, calm, active obs.

Red - 6-10-15-2-

Song Sp 1-2-2-2-

Grackle 2-3-8-2-

Rw Billed 4-1-6-10-

Gray Parrot 2-2-

M. Dove 1-1-1-1-

Cowbird 1-2-2-15-

Shrike 1-15-10-10-

H. Lark 1-2-2-

Bark Sw 6-2-2-15-

Song Sp 2-10-4-2-

Crow 3-2-

Pt Hawk 1-

Veg Sp 1-1-

Cardinal 1-1-

GBH 1-2-1-

H. Wren 1-

WT Frog 1-

Goldfinch 2-

Barn Sw 1-4-

Rw Sw 2-

Tree Sw 2-

E. Hawk 1 (ph)

Parrot - 2 dead  
near pond

C. Wren 2-

Mailbird 1-

K. Wren 1

K. Finch 1-

In Pond @

SW corner

1 pr Ph Creeper

22 May - MCZ

General Region to Mike King  
10000 -

H. Wren 1-	Pb Grosbeak 1-
Barn Sw 2	Vesper Sp 1-
Redstart 2-1-	Cyprus Sp 1-
RWBMD 30	Yellow W 3-1-
Cardinal 3-	Turkey T
Say Sp 6-1-	Am Towhee 1-1-
Spotted Sp 1-1-	Raccoon 1-
BCC 1-2-	Catbird 1-
House Sp - 1-	Grackle 2-
Goldfinch 2-2-	Sw Sparrow 1-
Crow 2-1-	<del>Sw</del> Spar. Sp 1-
Robin 15-	Willow Flyc 1-1-
Pigeon 1	Coyote T
Carp. 1	Killdeer 1-
Recurve 1-1-	Cowbird 2-
Kingbird 1-	B Jay 1-
Oriole 1-2-1-	Peromyscus spp / dead
Pb Grack 1-	Green H 1-
E. Chantrel 1-	Painted T. 2-
C. Yellowthroat 3-	RW Swallow
Wb Nuthatch 1-1-	
1 Bunting 1-2-	

Scale: 1 square = 57



17 June

Keged. Betahink Survey

1045h - 1145 on site

24°C, Sw @ 10kph, 50% cc

Obs

Rw 8 Chl 15

Song Sp 6

Woodchuck 1

W. Vireo 1

Sou. Sp ~ 30

Greenhopper Sp 1-10

Betahink 1 - calling overhead,

Cardinal 1

Robin 2

Killdeer 1

Vesper Sp 1

Starling 20

H. Cat 1

Barn Sw

Bank Sw

T. Warbler

- field has been mowed except

for SW corner where ~ 250m

still exist. lots of Sou. Sp. leaping

over cut area. cut 3-5 days ago

Scale: 1 square

- Babobink

- upon arrival had on Babobink  
rally overhead - couldn't  
see it to fix it.

## **Appendix C**

### *Botanical Inventory*



## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME REFERENCE	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
<hr/>									
<hr/>									
<b>GYMNOSPERMS</b>		<b>CONIFERS</b>							
<b>Cupressaceae</b>		<b>Cedar Family</b>							
<i>Thuja occidentalis</i>		Eastern White Cedar	4	-3		S5			G5
<b>Pinaceae</b>		<b>Pine Family</b>							
<i>Picea glauca</i>		White Spruce	6	3		S5			G5
<i>Picea pungens</i>		Colorado Spruce				SE1			G5
<i>Pinus sylvestris</i>		Scotch Pine		5	-3	SE5			G?
<b>DICOTYLEDONS</b>		<b>DICOTS</b>							
<b>Aceraceae</b>		<b>Maple Family</b>							
<i>Acer negundo</i>		Manitoba Maple	0	-2		S5			G5
<b>Amaranthaceae</b>		<b>Amaranth Family</b>							
<i>Amaranthus powellii</i>		Powell's Amaranth		5	-1	SE5			G5
<b>Anacardiaceae</b>		<b>Sumac or Cashew Family</b>							
<i>Rhus typhina</i>		Staghorn Sumac	1	5		S5			G5
<b>Apiaceae</b>		<b>Carrot or Parsley Family</b>							
<i>Daucus carota</i>		Wild Carrot		5	-2	SE5			G?
<b>Asclepiadaceae</b>		<b>Milkweed Family</b>							
<i>Asclepias syriaca</i>		Common Milkweed	0	5		S5			G5
<b>Asteraceae</b>		<b>Composite or Aster Family</b>							
<i>Achillea millefolium ssp. millefolium</i>		Common Yarrow		3	-1	SE?			G5T?

## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME REFERENCE	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
<i>Ambrosia artemisiifolia</i>		Common Ragweed	0	3		S5			G5
<i>Symphiotrichum lanceolatum</i> ssp. <i>lanceolatum</i>	<i>Aster lanceolatus</i> ssp. <i>lanceolatus</i>	Tall White Aster	3	-3		S5			G5T?
<i>Symphiotrichum novae-angliae</i>	<i>Aster novae-angliae</i>	New England Aster	2	-3		S5			G5
<i>Cichorium intybus</i>		Chicory		5	-1	SE5			G?
<i>Conyza canadensis</i>		Horseweed	0	1		S5			G5
<i>Crepis tectorum</i>		Narrow-leaved Hawk's Beard		5	-1	SE5			G?
<i>Erigeron strigosus</i>		Daisy Fleabane	0	1		S5			G5
<i>Lactuca serriola</i>		Prickly Lettuce		0	-1	SE5			G?
<i>Matricaria matricarioides</i>		Pineapple-weed				SE5			G5
<i>Senecio vulgaris</i>		Common Groundsel		5	-1	SE5			G?
<i>Solidago altissima</i> var. <i>altissima</i>		Tall Goldenrod	1	3		S5			
<i>Taraxacum officinale</i>		Common Dandelion		3	-2	SE5			G5
<i>Tragopogon dubius</i>		Doubtful Goat's-beard		5	-1	SE5			G?
<i>Tussilago farfara</i>		Coltsfoot		3	-2	SE5			G?
<b>Balsaminaceae</b>			<b>Touch-me-not Family</b>						
<i>Impatiens capensis</i>		Spotted Touch-me-not	4	-3		S5			G5
<b>Brassicaceae</b>			<b>Mustard Family</b>						
<i>Alliaria petiolata</i>		Garlic Mustard		0	-3	SE5			G5
<i>Capsella bursa-pastoris</i>		Shepherd's Purse		1	-1	SE5			G?
<i>Lepidium campestre</i>		Field Cress		5	-1	SE5			G?
<i>Lepidium densiflorum</i>		Common Pepper-grass		0	-2	SE5			G5
<i>Rorippa palustris</i> ssp. <i>palustris</i>		Water-cress				SU			G5T?
<b>Caprifoliaceae</b>			<b>Honeysuckle Family</b>						
<i>Lonicera tatarica</i>		Tartarian Honeysuckle		3	-3	SE5			G?
<i>Sambucus canadensis</i>		Common Elderberry	5	-2		S5			G5

## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME REFERENCE	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
<b>Caryophyllaceae</b>									
		<b>Pink Family</b>							
<i>Arenaria serpyllifolia</i>		Thyme-leaved Sandwort		0	-2	SE5			G?
<i>Cerastium fontanum</i>		Larger Mouse-ear Chickweed		3	-1	SE5			G?
<i>Silene latifolia</i>		Bladder Campion				SE5			G?
<i>Silene vulgaris</i>		Catchfly		5	-1	SE5			G?
<b>Chenopodiaceae</b>									
		<b>Goosefoot Family</b>							
<i>Atriplex patula</i>		Spreading Atriplex	0	-2		S5			G5
<i>Chenopodium album</i> var. <i>album</i>		Lamb's Quarters		1	-1	SE5			G5T5
<b>Convolvulaceae</b>									
		<b>Morning-glory Family</b>							
<i>Convolvulus arvensis</i>		Field Bindweed		5	-1	SE5			G?
<b>Cornaceae</b>									
		<b>Dogwood Family</b>							
<i>Cornus amomum</i> ssp. <i>obliqua</i>		Silky Dogwood	5	-4		S5			G5T?
<b>Cucurbitaceae</b>									
		<b>Gourd Family</b>							
<i>Echinocystis lobata</i>		Prickly Cucumber	3	-2		S5			G5
<b>Euphorbiaceae</b>									
		<b>Spurge Family</b>							
<i>Euphorbia peplus</i>		Petty Spurge		5	-1	SE4			G?
<b>Fabaceae</b>									
		<b>Pea Family</b>							
<i>Medicago lupulina</i>		Black Medick		1	-1	SE5			G?
<i>Medicago sativa</i> ssp. <i>sativa</i>		Alfalfa		5	-1	SE5			G?T?
<i>Melilotus alba</i>		White Sweet-clover		3	-3	SE5			G?
<i>Trifolium pratense</i>		Red Clover		2	-2	SE5			G?
<i>Trifolium repens</i>		White Clover		2	-1	SE5			G?

## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME REFERENCE	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
<b>Fagaceae</b>		<b>Beech Family</b>							
<i>Quercus rubra</i>		Red Oak	6	3		S5			G5
<b>Guttiferae</b>		<b>St. John's-wort Family</b>							
<i>Hypericum perforatum</i>		Common St. John's-wort		5	-3	SE5			G?
<b>Lamiaceae</b>		<b>Mint Family</b>							
<i>Leonurus cardiaca</i> ssp. <i>cardiaca</i>		Common Motherwort		5	-2	SE5			G?T?
<b>Oleaceae</b>		<b>Olive Family</b>							
<i>Syringa vulgaris</i>		Common Lilac		5	-2	SE5			G?
<b>Plantaginaceae</b>		<b>Plantain Family</b>							
<i>Plantago lanceolata</i>		Ribgrass		0	-1	SE5			G5
<i>Plantago major</i>		Common Plantain		-1	-1	SE5			G5
<b>Polygonaceae</b>		<b>Smartweed Family</b>							
<i>Polygonum achoreum</i>		Knotweed	0	5		S5			G5
<i>Polygonum aviculare</i>		Prostrate Knotweed		1	-1	SE5			G?
<i>Polygonum hydropiperoides</i>		Mild Water-pepper	4	-5		S5			G5
<i>Rumex crispus</i>		Curly-leaf Dock		-1	-2	SE5			G?
<b>Ranunculaceae</b>		<b>Buttercup Family</b>							
<b>Rhamnaceae</b>		<b>Buckthorn Family</b>							
<i>Rhamnus cathartica</i>		Common Buckthorn		3	-3	SE5			G?

## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME REFERENCE	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
<b>Rosaceae</b>		<b>Rose Family</b>							
<i>Potentilla norvegica ssp. norvegica</i>		Cinquefoil				SU			G5T?
<i>Potentilla recta</i>		Rough-fruited Cinquefoil		5	-2	SE5			G?
<i>Prunus virginiana ssp. virginiana</i>		Choke Cherry	2	1		S5			G5T?
<i>Rubus idaeus ssp. melanolasius</i>		Wild Red Raspberry	0	-2		S5			G5T
<i>Rubus occidentalis</i>		Thimble-berry	2	5		S5			G5
<b>Rubiaceae</b>		<b>Madder Family</b>							
<i>Galium trifidum ssp. trifidum</i>		Small Bedstraw	5	-4		S5			G5T?
<b>Salicaceae</b>		<b>Willow Family</b>							
<i>Populus deltoides ssp. deltoides</i>		Eastern Cottonwood	4	-1		S5			G5T?
<i>Populus tremuloides</i>		Trembling Aspen		0		S5			G5
<i>Salix amygdaloides</i>		Peach-leaved Willow	6	-3		S5			G5
<i>Salix exigua</i>		Sandbar Willow	3	-5		S5			G5
<i>Salix x rubens</i>		Reddish Willow		-4	-3	SE4			HYB
<b>Scrophulariaceae</b>		<b>Figwort Family</b>							
<i>Linaria vulgaris</i>		Butter-and-eggs		5	-1	SE5			G?
<i>Verbascum thapsus</i>		Common Mullein		5	-2	SE5			G?
<b>Solanaceae</b>		<b>Nightshade Family</b>							
<i>Solanum dulcamara</i>		Bitter Nightshade		0	-2	SE5			G?
<b>Vitaceae</b>		<b>Grape Family</b>							
<i>Vitis riparia</i>		Riverbank Grape	0	-2		S5			G5
<b>MONOCOTYLEDONS</b>		<b>MONOCOTS</b>							

## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME REFERENCE	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
<hr/>									
<b>Lemnaceae</b>		<b>Duckweed Family</b>							
<i>Lemna minor</i>		Lesser Duckweed	2	-5		S5			G5
<b>Liliaceae</b>		<b>Lily Family</b>							
<i>Asparagus officinalis</i>		Garden Asparagus		3	-1	SE5			G5?
<b>Poaceae</b>		<b>Grass Family</b>							
<i>Agrostis gigantea</i>		Red-top		0	-2	SE5			G4G5
<i>Apera spica-venti</i>		Silky Bent Grass		5	-1	SE3			G?
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	<i>Bromus mollis</i>	Soft Brome				SE2?			G?T?
<i>Bromus inermis</i> ssp. <i>inermis</i>		Awnless Brome		5	-3	SE5			G4G5T?
<i>Bromus tectorum</i>		Downy Chess		5	-2	SE5			G?
<i>Dactylis glomerata</i>		Orchard Grass		3	-1	SE5			G?
<i>Digitaria ischaemum</i>		Small Crabgrass		3	-1	SE5			G?
<i>Echinochloa crus-galli</i>		Common Barnyard Grass		-3	-1	SE5			G?
<i>Elymus repens</i>		Quack Grass		3	-3	SE5			G?
<i>Eragrostis minor</i>	<i>Eragrostis poaeoides</i>	Low Love Grass		5	-1	SE5			G?
<i>Lolium perenne</i>		English Rye Grass		3	-1	SE4			G?
<i>Panicum dichotomiflorum</i>		Fall Panicum		-2	-1	SE5			G5
<i>Phalaris arundinacea</i>		Reed Canary Grass	0	-4		S5			G5
<i>Phleum pratense</i>		Timothy		3	-1	SE5			G?
<i>Poa annua</i>		Annual Blue Grass		1	-2	SE5			G?
<i>Poa compressa</i>		Canada Blue Grass	0	2		S5			G?
<i>Poa pratensis</i> ssp. <i>pratensis</i>		Kentucky Bluegrass	0	1		S5			G5T
<i>Setaria pumila</i>		Yellow Foxtail		0	-1	SE5			G?
<b>Typhaceae</b>		<b>Cattail Family</b>							
<i>Typha x glauca</i>		Glaucous Cattail	3	-5		S5			HYB

## Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME		SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank
REFERENCE										
STATISTICS										
Species Richness										
Total Number of Species:			94							
Native Species:			35	37%						
Exotic Species			59	63%						
S1-S3 Species			0	0%						
S4 Species			0	0%						
S5 Species			33	100%						
Floristic Quality Indices										
Mean Co-efficient of Conservatism (CC)			2.2							
CC 0 - 3	lowest sensitivity		21	68%						
CC 4 - 6	moderate sensitivity		10	32%						
CC 7 - 8	high sensitivity		0	0%						
CC 9 - 10	highest sensitivity		0	0%						
Floristic Quality Index (FQI)			12							
Weedy and Invasive Species										
Mean Weediness Index			-1.6							
-1	low potential invasiveness		31	56%						
-2	moderate potential invasiveness		15	27%						
-3	high potential invasiveness		9	16%						
Wetland Species										
Mean Wetness Index			1.5							
upland			26	30%						
facultative upland			20	23%						
facultative			21	24%						

Vascular Plants recorded at Penn Energy - Brantgate

SPECIES LATIN NAME	SYNONYMS	SPECIES COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial		COSEWIC Status	Global Status
						Status S-Rank	OMNR Status		
REFERENCE									



## **Appendix D**

### *Wildlife Inventory*

## Brantgate - Wildlife Inventory

Common Name	Latin Name	Breeding Evidence, notes
<b>BIRDS</b>		
<i>Phasianidae</i>		
Gray Partridge	<i>Perdix perdix</i>	2 adults with 8 small young
<i>Ardeidae</i>		
Great Blue Heron	<i>Ardea herodias</i>	flyover
Turkey Vulture	<i>Cathartes aura</i>	
<i>Charadriidae</i>		
Killdeer	<i>Charadrius vociferans</i>	
<i>Scolopacidae</i>		
Spotted Sandpiper	<i>Actitis macularia</i>	
<i>Columbidae</i>		
Mourning Dove	<i>Zenaidura macroura</i>	
<i>Picidae</i>		
Northern Flicker	<i>Colaptes auratus</i>	
<i>Tyrannidae</i>		
Eastern Kingbird	<i>Tyrannus tyrannus</i>	
<i>Vireonidae</i>		
Warbling Vireo	<i>Vireo gilvus</i>	
<i>Corvidae</i>		
American Crow	<i>Corvus brachyrhynchos</i>	
<i>Alcedinidae</i>		
Horned Lark	<i>Eremophila alpestris</i>	Probable breeder. Single birds were noted on each of three visits (9 July 2010, 17 June and 5 July 2011) and it is likely that these represent birds that are breeding in the cultivated fields on and beside the Project Location.
<i>Hirundinidae</i>		
Bank Swallow	<i>Riparia riparia</i>	Foraging over the fields, no nesting

## Brantgate - Wildlife Inventory

Common Name	Latin Name	Breeding Evidence, notes
		habitat on the property
<i>Turdidae</i>		
American Robin	<i>Turdus migratorius</i>	
<i>Sturnidae</i>		
European Starling	<i>Sturnus vulgaris</i>	
<i>Bombycillidae</i>		
Cedar Waxwing	<i>Bombycilla cedrorum</i>	
<i>Parulidae</i>		
Yellow Warbler	<i>Dendroica petechia</i>	
<i>Emberizidae</i>		
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Probable breeder. In both 2010 and 2011 two singing males were located along the SW section of the actively managed hayfield, and were presumed to be breeding. Mowing in 2011 eliminated the habitat for this species.
Vesper Sparrow	<i>Pooecetes gramineus</i>	Confirmed breeder. This species is numerous in the actively managed hayfield where it breeds. A maximum count of 40 birds was made on 5 July. Mowing in 2011 eliminated the habitat for this species.
Song Sparrow	<i>Melospiza melodia</i>	
<i>Cardinalidae</i>		
Northern Cardinal	<i>Cardinalis cardinalis</i>	
<i>Icteridae</i>		
Baltimore Oriole	<i>Icterus galbula</i>	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	

## Brantgate - Wildlife Inventory

Common Name	Latin Name	Breeding Evidence, notes
Common Grackle	<i>Quiscalus quiscula</i>	
Brown-headed Cowbird	<i>Molothus ater</i>	
Baltimore Oriole	<i>Icterus galbula</i>	
<i>Carduelinae</i>		
American Goldfinch	<i>Carduelis tristis</i>	
House Finch	<i>Carpodocus mexicanus</i>	
<b>MAMMAL</b>		
Domestic Dog	<i>Canine sp.</i>	
Woodchuck	<i>Marmota monax</i>	
European Hare	<i>Lepus europeus</i>	

# **Appendix E**

## *Resumes*



**CHRISTOPHER ZOLADESKI**[www.savanta.ca](http://www.savanta.ca)**Senior Ecologist, Botanist****SELECT PROJECT EXPERIENCE**

- Wind Turbine Farms Environmental Impact Assessments: Botanical, vegetation and forest considerations of wind farm developments; various clients in Southern Ontario
- Kawartha Highlands Provincial Park, Access Route Selection and Assessment: Ecological Land Classification, vegetation mapping and analysis of constraints.
- Aggregate-related Environmental Impact Assessments: Ecological Land Classification and floristic surveys of Lafarge, Capital Paving, Federal White Cement, Dufferin Aggregates and CBM sites throughout Southern Ontario.
- The Don River Watershed Natural Heritage Strategy, Terrestrial Ecosystems: Lead developer of the Don strategy, consisting of a network of natural habitats and their management recommendations.
- Terrestrial Habitat and Species Monitoring, Discussion Paper: Principal writer of the Paper, which consisted of an analysis of existing monitoring programs within the TRCA jurisdiction, gap analysis, and the development of a suite of indicators to assess the ecosystem health of habitat patches, watersheds and regions.

**INTRODUCTION**

Chris Zoladeski has over 18 years of environmental consulting experience on projects ranging from biological surveys to comprehensive natural heritage strategies and sustainable forestry audits. He has an extensive knowledge of forest, wetland and applied plant ecology and Ecological Land Classification in Southern and Northern Ontario, as well as Greater Toronto Area and vicinity.

He implemented conservation biology principles in the development of biodiversity and watershed and natural heritage policy planning for the Don River Watershed. He also conducted numerous Environmental Impact Assessments for projects ranging from housing and golf developments to comprehensive assessments of aggregate sites in Southern Ontario, including habitat restoration, rare species management and wetland delineation.

**EDUCATION**

- Ph.D., Botany, University of Toronto (1989)  
Thesis: A phytosociological analysis of the boreal forests of north-western Ontario.
- M.Sc., Forest Ecology and Soil Science, Laval University, Quebec (1984)  
Thesis: A phytoecological study of Cape Enrage, Bic Park, Quebec.

**SELECT PUBLICATIONS****Books**

- Zoladeski, C.A., Delorme, R.J., Wickware, G.M., Corns, I.G.W. and Allan, D.T. 1998. Forest ecosystem toposequences in Manitoba. Special Report 12, Canadian Forest Service, Northern Forestry Centre, Edmonton, Alberta, 63p.
- Zoladeski, C.A., Cowell, D.W. and Ecosystem Classification Advisory Committee. 1996. Ecosystem classification for the southeast Yukon: field guide, first approximation; Yukon Renewable Resources, Canadian Forest Service, Department of Indian and Northern Affairs and Northern Development, Whitehorse, Yukon, 409p.
- Zoladeski, C.A., Wickware, G.M., Delorme, R.J., Sims, R.A. and Corns, I.G.W. 1995. Forest ecosystem classification for Manitoba: field guide, special report 2; UBC Press, Vancouver, B.C., 205p.

## SELECT PROJECT EXPERIENCE

- Sustainable Forest Licence Audits: As a member of multidisciplinary team, audited Sustainable Forest Licence holders and Crown Forest Management Units (FMU) in northern Ontario for compliance with existing environmental regulations and legislation.
- Survey reports and management guidelines for the City of Toronto woodlots (2000). Quality assessment and control of the reports: review of botanical component, management recommendations, reforestation plans, choice of species, follow-up procedures, weed control, etc.
- Northwest Newmarket Housing Development - Vegetation and Floristic Assessment (2000). Appraised existing reports and the level of information on the projected development; surveyed and classified the area's woodlots, wetlands and meadows with an emphasis on the flora; assessed the quality of woodlots; proposed mitigation measures.
- Life and Earth Science Reconnaissance Inventory of the 14 Sites in Western Part of Northwestern Ontario (2000-2001). Surveyed the sites; sampled the vegetation and flora; assigned vegetation communities to NW Ontario's FEC types, assessed the condition, degree of representation, sensitivity to development and special features of the sites; developed management recommendations for long-term sustainable use.

## Articles in Periodicals

- Zoladeski, C.A. 1991. Vegetation zonation in dune slacks on the Leba Bar, Polish Baltic Sea coast; *Journal of Vegetation Science*, v.2, p.255-258.
- Zoladeski, C.A. and Maycock, P.F. 1990. Dynamics of the boreal forest in northwestern Ontario; *American Midland Naturalist*, v.124, p.289-300.
- Zoladeski, C.A. 1989. Current status of rare vascular plants on Cape Enragé (Bic), Quebec; *Le Naturaliste canadien*, v.116, p.113-116.
- Zoladeski, C.A. 1988. New station for *Malaxis paludosa*, bog adder's-mouth orchid, in northwestern Ontario; *The Canadian Field-Naturalist*, v.102, p.548-549.
- Zoladeski, C.A. 1988. Classification and gradient analysis of forest vegetation of Cape Enragé, Bic Park, Quebec; *Le Naturaliste canadien*, v.115, p.9-11.

## CERTIFICATIONS & TRAINING

- Environmental Impact Study Training Session. Ontario Ministry of Natural Resources and Ecological Services Group, Toronto.
- Ecological Land Classification Training Course.
- Ontario Wetland Evaluation System Training Course.

## EMPLOYMENT HISTORY

- Savanta Incorporated  
2009 – Present: Senior Ecologist, Botanist
- Stantec Consulting  
2002 – 2009: Senior Scientist
- Toronto and Region Conservation Authority  
1999 - 2000: Co-ordinator, Natural Heritage Systems
- Geomatics International Inc.  
1992 – 1999: Senior Ecologist
- Acres International Limited (1990-1992), Ecologist  
1990 – 1992: Ecologist
- M.M. Dillon Ltd. (1990, 1992), Botanist  
1990: Botanist

**DOUG MCRAE**[www.savanta.ca](http://www.savanta.ca)**Ecologist****SELECT PROJECT EXPERIENCE**

- **Ross' Gull in Churchill, Canada**  
  
Under the direction of Dr. Fred Cooke (Queen's University), Doug headed a four-person crew that studied and guarded from human disturbance, a small nesting colony of the rare Ross' Gull. This involved a great deal of public relations work, as well as observational studies.
- **Little and Bonaparte's Gull Nesting in Churchill, Canada**  
  
While working on the Ross' Gull project, Doug documented the first breeding of Little Gull in the Hudson Bay Lowland and published the findings in *American Birds*. He also launched a field study of nesting Bonaparte's Gulls, monitoring twenty nests for the duration of the breeding season.
- **Ruffs in Finland**  
  
Doug worked as a field assistant spending May and June helping a Post Doctoral student, conduct research on wild and captive Ruffs in Finland. The work involved locating all nests, capturing and drawing blood from all males, all nesting females and all of the young to determine parentage through DNA. Doug also completed observational studies on captive males.

**INTRODUCTION**

During the past 40 years, Doug has developed a great deal of expertise with the ecology of boreal, temperate, neo-tropical and tropical ecosystems. In the past 20 years, he has become quite familiar with the regional avifauna and with almost all species and forms in the Caribbean, in particular. His experience was gained principally as a leader with Field Guides Incorporated, an ecotourism company that provides comprehensive Caribbean birding tour programs, focused on studying as many of the endemic species and forms from each island as possible.

During the course of more than 100 trips, Doug has investigated the following destinations: Antigua, Barbados, Belize (including offshore Cays), Cuba, Dominica, Grenada, Guadeloupe, Jamaica, Martinique, Montserrat, St. Lucia, St. Vincent, Trinidad and Tobago. His work involved frequent interaction with local guides, residents, land-owners and business people, as well as Government officials and representatives from conservation organizations.

In addition to leading these birding tours, Doug was heavily involved in a five-year cooperative international program between the Cuban Academy of Sciences, Canadian Wildlife Service and the Long Point Bird Observatory (now Bird Studies Canada). In his representation of Bird Studies Canada, Doug helped to fulfill the two primary goals of the program, to:

- Help train and equip Cuban ornithologists in the techniques of bird banding and to facilitate the reporting of Cuban banding efforts into the North American Banding Scheme; and
- Study the importance of Cuba to wintering Neotropic migrants and to see how they interacted with resident Cuban species.

This Cuban research generated a number of papers and reports, several of which Doug co-authored. Many of the ornithologists Doug and others trained during this program in Cuba have continued their scientific studies using these new skills.

**Biological Inventories and Surveys***Aerial and Colonial Bird Surveys*

Doug has conducted many aerial and ground-based surveys of shorebirds, waterfowl and colonial birds (primarily gulls, terns and

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## SELECT PROJECT EXPERIENCE

- [Towerkills in Peterborough, Canada](#)

Over a five-year span Doug coordinated a spring and fall collection of birds killed striking a TV tower, and reported the results in local naturalist journals. Specimens salvaged were prepared as study skins and given to the Royal Ontario Museum.

herons) for various agencies including Ontario Ministry of Natural Resources, Canadian Wildlife Service, Queen's University, Long Point Waterfowl and Wetlands Research Fund, Presqu'île Important Bird Area. Most of these took place in the Hudson Bay Lowland, but also included work in southern Ontario, New Brunswick, Nova Scotia and Newfoundland.

### *Citizen Science Surveys*

Doug has participated in numerous volunteer-based surveys such as the Breeding Bird Survey, Breeding Bird Atlas projects (Ontario, Maritimes), Ontario Nest Record Scheme, and Christmas Bird Counts, including surveying the large Scarlet Ibis roost in Trinidad's Caroni Swamp.

### *Presqu'île Provincial Park Surveys*

Doug collected, compiled and wrote up all available data on birds of Presqu'île Provincial Park, Ontario, which was published by the Ontario Ministry of Natural Resources (1982). He also conducted a detailed inventory of reptiles and amphibians of the Park, which was published as an internal report (1986), and conducted the only detailed avifaunal survey of High Bluff Island, including its colonial bird groupings, which was also published as an internal report (1979).

### *Hudson Bay Lowland (HBL)*

Doug has worked extensively in the HBL in both Ontario and Manitoba. Over a period of 3 years, he conducted late fall migration surveys of birds along southern James Bay coast, documenting huge movements of birds out of the Bay in relation to freeze-up. This work involved standardized surveys counting very large numbers of birds in adverse weather. Doug was the Field Manager of a major biological inventory at selected sites along the Ontario coast of Hudson and James Bay for the Ontario Ministry of Natural resources, and co-authored the report (1993).