Ministry of
Natural Resources

Ministère des
Richesses naturelles

Ontario

Renewable Energy Operations Team
300 Water Street
4th Floor, South Tower
Peterborough, ON K9J 8M5

October 26, 2012

Penn Energy Renewables Ltd.
620 Righters Ferry Road
Bala Cynwyd, PA 19004

RE: NHA Confirmation for Penn Energy Ridgefield Solar Facility

Dear Max Frable:

In accordance with the Ministry of the Environment's (MOE's) Renewable Energy Approvals (REA) Regulation (O.Reg.359/09), the Ministry of Natural Resources (MNR) has reviewed the Penn Energy Ridgefield Solar Facility Natural Heritage Assessment and Environmental Impact Study for the Penn Energy Ridgefield Solar Facility north of Lindsay, Ontario in the Geographic Township of Fenelon submitted by Penn Energy Renewables Ltd. on October 25, 2012.

In accordance with Section 28(2) and 38(2)(b) of the REA regulation, MNR provides the following confirmations following review of the natural heritage assessment:

1. The MNR confirms that the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established or accepted by MNR.
2. The MNR confirms that the site investigation and records review were conducted using applicable evaluation criteria or procedures established or accepted by MNR, if no natural features were identified.
3. The MNR confirms that the evaluation of the significance or provincial significance of the natural features was conducted using applicable evaluation criteria or procedures established or accepted by MNR.
4. The MNR confirms that the project location is not in a provincial park or conservation reserve.
5. The MNR confirms that the environmental impact study report has been prepared in accordance with procedures established by the MNR.

In accordance with Section 28(3)(c) and 38(2)(c), MNR also offers the following comments in respect of the project.

<u>Preconstruction Monitoring</u>

In accordance with Appendix D of MNR's NHA Guide, a commitment has been made to complete pre-construction assessment(s) of habitat use for the following candidate significant wildlife habitats:

i) Candidate snake hibernacula (Fencerows 2-5 and Communities 6 & 7)
ii) Turtle wintering area (Community 15)
iii) Amphibian Breeding Habitat (Woodland) (Communities 1, 3, 4, 8, 13 & 14)
•

MNR has reviewed and confirmed the assessment methods and the range of mitigative options. Pending completion of the assessments and determination of significance, the appropriate mitigation is expected to be implemented, as committed to in the environmental impact study.

Post-Construction Monitoring

A commitment must been made in the Environmental Effects Monitoring Plan, part of the Design and Operations Report, to conduct post-construction monitoring (depending on the outcome of pre-construction monitoring) and if deemed necessary, implement mitigation measures. For the Penn Energy Ridgefield Solar Facility this includes:

i) Amphibian Call Surveys for woodland amphibian breeding habitat (communities 1, 3, 4, 8, 13 & 14)
ii) Reptile Hibernacula habitat use surveys (Fencerows 2-5 and Communities 6 & 7)
iii) Turtle wintering area habitat use surveys (Community 15)

This confirmation letter is valid for the project as proposed in the natural heritage assessment and environmental impact study, including those sections describing the Environmental Effects Monitoring Plan and Construction Plan Report. Should any changes be made to the proposed project that would alter the NHA, MNR may need to undertake additional review of the NHA.

Where specific commitments have been made by the applicant in the NHA/EIS with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNR expects that these commitments will be considered in MOE's Renewable Energy Approval decision and, if approved, be implemented by the applicant.

In accordance with S.12 (1) of the Renewable Energy Approvals Regulation, this letter must be included as part of your application submitted to the MOE for a Renewable Energy Approval.

Please be aware that your project may be subject to additional legislative approvals as outlined in the Ministry of Natural Resources' *Approvals and Permitting Requirements Document*. These approvals are required prior to the construction of your renewable energy facility.

If you wish to discuss any part of this confirmation or additional comments provided, please contact me at amy.cameron@ontario.ca or 613-732-5506.

Sincerely,

Amy Cameron
Southern Region Renewable Energy Operations Team Coordinator
Regional Operations Division
Ministry of Natural Resources

cc. Karen Bellamy, District Manager, MNR Peterborough District
Erin Cotnam, Southern Region Renewable Energy Project Manager, MNR Southern Region
Emily Gryck, Southern Region Renewable Energy Project Manager, MNR Southern Region
Narren Santos, Environmental Assessment and Approvals Branch, MOE
Zeljko Romic, Environmental Assessment and Approvals Branch, MOE

Penn Energy Ridgefield
SOLAR FACILITY

In the City of Kawartha Lakes

FIT Contract No. F-001549-SPV-130-505
FIT Application No. FI-FITFRZ1

Natural Heritage Assessment

Prepared for:
Penn Energy Renewables Ltd.
620 Righters Ferry Road, Bala Cynwyd, PA 19004

Prepared by:
Bowfin Environmental Consulting
168 Montreal Road, Cornwall, ON K6H 1B3

October 2012

Bowfin Environmental Consulting

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1.0 INTRODUCTION

Penn Energy Renewables Ltd. (where after referred to as the proponent) has obtained a Feed-in-Tariff (FIT) contract from the Ontario Power Authority (OPA) for the construction of a 8,000 kW Solar Facility approximately 7 km north Lindsay, Ontario (Figure 1). The subject lands are located on Part of Lot 5, Concession 10 (except for pt. 1, 57R5407) in the Geographic Township of Fenelon in the City of Kawartha Lakes, known municipally as 59 Kennedy Bay Road.

The solar facility will consist of single photovoltaic (PV) modules that are approximately 1 m x 2 m in dimension. The modules are grouped in arrays which are aligned in east-west rows; these rows are separated by access aisles approximately 5 m in width. The project area will consist of approximately 44, 000 PV modules and 8 or more modular collection houses. The modules are static.

The construction of this facility will require the upgrading of an existing driveway located on Kennedy Bay Road. A 44kV tap-line will be constructed within the project location and it will connect to Hydro One distribution feeder on Kennedy Bay Road at the end of the access road. The project location will be fenced for safety and security reasons. The total area occupied by the facility will be approximately 25 ha.

The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates Renewable Energy Approvals (REA) under Part V.0.1 of the act. This proposed solar facility falls under the facility class of Ground Mounted Solar Facility, Class 3, > 10kW. As part of this regulation, a Natural Heritage Assessment (NHA) is required in order to identify potential impacts to the natural area. Bowfin Environmental Consulting Inc. (Bowfin) has been retained by the proponent to complete the NHA. A NHA study includes three activities: a review of records (background information), a site investigation and an evaluation of the significance of each natural feature identified. The establishment of the significance of the natural feature are based on methods established or accepted by the Ontario Ministry of Natural Resources (OMNR).

Should any significant natural features be found within the project location or in the surrounding lands (up to 120m of the project location), then an Environmental Impact Study (EIS) is required to identify and assess the potential environmental effects of the project on the natural feature and identify mitigation measures. The following report provides a summary of the records review, site investigations and an evaluation of the significance of the natural features identified, followed by an EIS where required.

Figure 1 Location of the Subject Lands

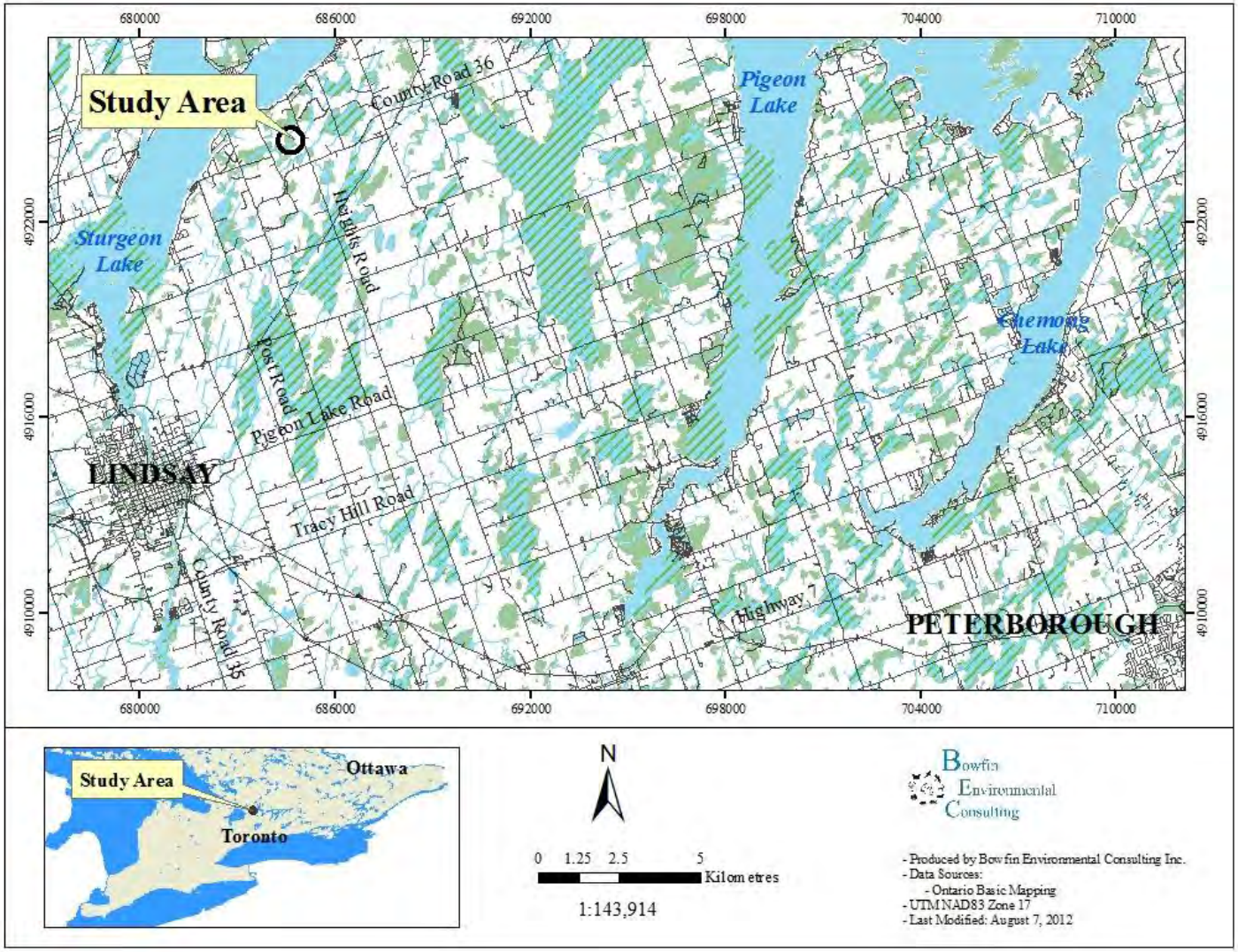
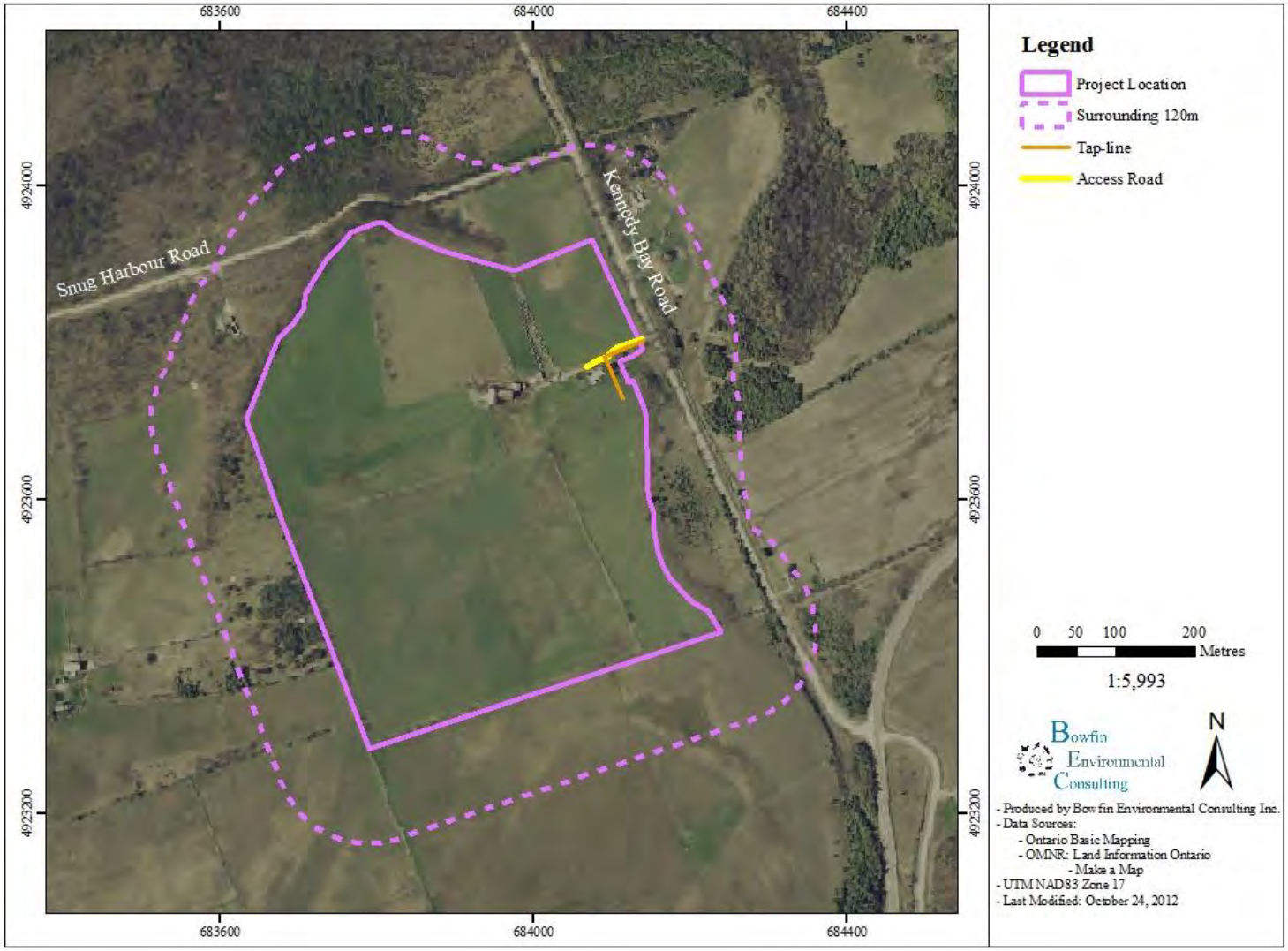


Figure 2 Study Area (project location and up to 120 m from the project location)



2.0 RECORDS REVIEW

The records review includes the identification of the presence of natural features within the project location and up to 120 m from the project location (together this forms the "study area"). These features would include:

- Wetlands (coastal[1], northern, southern);
- Woodlands;
- Valleylands;
- Areas of natural and scientific interest (ANSI) (life science);
- Wildlife habitat;
- Natural features in the Oak Ridges Moraine;
- Natural features in the Greenbelt Plan Areas;
- Provincial parks; or
- Conservation Reserves.

Or up to 50 m from the project location for:

- Areas of natural and scientific interest (ANSI) (earth science)

2.1 Methodology

The records review was conducted in order to identify potential environmental concerns and included identifying natural heritage features within the study area. The natural heritage features which were examined for were: wetlands, areas of natural and scientific interest (ANSIs), woodlands, valleylands and wildlife habitat. This would include the identification of sand barrens, savannah, tallgrass prairie and alvars. The significant wildlife habitat (SWH) features reviewed are those listed in the *Significant Wildlife Habitat Technical Guide* (SWHTG). The Ecoregion 6E of the *Significant Wildlife Habitat Ecoregion Criteria Schedules: Addendum to Significant Wildlife Habitat Technical Guide* (SWHEC) was utilized for guidance (OMNR 2012).

[1] Note that as this project location is located inland, no search for coastal wetlands is required.

The following sources of information were used during the records review (results are in Appendix A):

1. Ministry Of Natural Resources
    a. Natural Heritage Information Centre (NHIC) – Accessed September 17, 2012
        i. Biodiversity explorer: element occurrences (species, plant communities and wildlife concentration areas and natural areas)
    b. Land Information Ontario (LIO) – August 13, 2012
        i. Layers requested from LIO :ANSI, Aquatic Feeding Area, Breeding Zone, Calving / Fawning Site, Conservation Area, Den Site, Feeding Area (wildlife), Forest Cover, FRI Wetland, Mast Producing Area, Mineral Lick, Nesting Site, Nursery Area (wildlife), Resting Area, Sensitive Value, Significant Ecological Area, Staging Area (wildlife), Travel Corridor (wildlife), Tree Improvement Area, Wetland Unit, Wild Rice Stand and Wintering Area
        ii. Layers searched on-line (Make a Map) (September 17, 2012): Conservation Reserves, National Parks, Provincial Parks, Wooded Area (Treed, Plantation, Hedgerow), Wetlands
    c. Ontario Crown Land Use Atlas – Maps obtained September 17, 2012
        i. Provincial Park, Recommended Provincial Park, Conservation Reserve, Recommended Conservation Reserve, Forest Reserve, Wilderness Area, Enhanced Management Area, General Use Area, Provincial Wildlife Area, Private Land, Indian Reserve, Other Federal Land, National Park and Provincial Park Administrative Zone
    d. Renewable Energy Atlas – Map obtained September 17, 2012
        i. Crown Land (patented, unpatented, dispositions, acquisitions), National Parks, Crown Land Use Policy Areas (Provincial Parks, Conservation Reserves, Natural Heritage Values Areas, Enhanced Management Areas, Earth Science ANSIs, Life Science ANSIs, Crown Game Preserves, Wilderness Areas), Natural Resources Information (Evaluated Wetlands, Water and Known Bat Hibernacula)
    e. Peterborough District Office – Letter received September 15, 2011
        i. Records Review (Wetland, ANSI, Woodland, Wildlife Habitat, Provincial Park, Conservation Reserve, Oak Ridges Moraine Plan Area, Greenbelt, Oil, Gas and Salt Resources)

2. Conservation Authority – Kawartha Conservation (January 19, 2012)
    a. Conservation Ontario Website
        i. Contacted for information on Sturgeon Lake Watershed and valleylands

3. Federal Government Websites – Accessed on September 18, 2012
    a. National Wildlife Areas in Ontario
    b. Important Bird Areas in Ontario

4. Municipal Planning Authority or Local Planning Board, and Local and Upper-tier Municipality
    a. City of Kawartha Lakes Official Plan (OP)
        i. Contacted for any information they may have on the natural heritage of the area.

    (Note: this project does not fall within the jurisdiction of either the Local Roads or Local Services Boards)

5. Other
    a. Niagara Escarpment Plan
    b. Atlas of the Breeding Birds of Ontario (ABBO) (2005)
        i. List of bird species from 17PK82 used in list of potential species of conservation concern for the area.
    c. Satellite imaging (Google earth)

See Appendix A for copies of correspondences and results from the above records where applicable.

2.2 Results

The proposed facility is approximately 7 km to the north of the Town of Lindsay, in the City of Kawartha Lakes (Figure 1). The project location is found to the south of Snug Harbour Road, west of Kennedy Bay Road, north of County Road 36 and east of County Road 11 (Figure 2). The subject lands are approximately 25 ha. All construction and operation activities, including the tap-line and access road, will occur within the project location as identified on Figure 2. The surrounding land-uses include primarily agricultural lands (crop lands) with a few rural residential and woodlands.

Table 1 documents which sources of information had data for the study area. Where data was available, it had been included in Appendix A.

A summary of the records review is provided in the paragraphs below and is summarized in Table 2.

Table 1 List of Data Obtained from Information Sources

Source	Data Available
NHIC	Yes
LIO	
Data requested directly from LIO	No data for this area.
Data available on-line (Make-a-Map)	Yes
Ontario Crown Land Use Atlas	Yes
Renewable Energy Atlas	Yes
Peterborough District Office	Yes
Kawartha Conservation	Yes
Federal Government Websites	
National Wildlife Areas in Ontario	No data for this area.
Important Bird Areas in Ontario	No data for this area.
City of Kawartha Lakes Kent	Official Plan
Local and upper-tier municipalities	Not applicable
Local roads board	
Local services board	
Other	
Niagara Escarpment Plan	Not applicable
Atlas of Breeding Birds of Ontario	Yes
Satellite imaging	Yes

The land is zoned rural (OP Schedule A5). There are no constraints listed for the project location. Significant woodlands are identified as occurring within the surrounding 120m lands on the OP and the Kawartha Conservation ELC mapping. Unevaluated wetlands are identified on the on-line LIO mapping as well as on the Kawartha Conservation wetland mapping (Appendix A).

The study area is not located within the jurisdiction of any planning boards, local roads boards or local services boards. The Planner with the City of Kawartha Lakes contacted via email indicated that there was no additional information available other than what was provided in the Official Plan (September 6, 2011).

The study area is located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment. This was confirmed by Peterborough District MNR in their Records Review template (Appendix A).

There are no provincial parks or conservation reserves within the study area as per the Renewable Energy Atlas and as confirmed by Peterborough District MNR in their Records Review template (Appendix A).

The Coordinator, Environmental Protection/GIS Specialist with the Kawartha Conservation, contacted via email January 19, 2012, indicated that there are no valleylands or areas regulated by the conservation authority within the study area.

There are no National Wildlife Areas or Important Birding Areas within the study area (as per Federal websites).

A summary of the record review results pertaining to the presence of significant natural heritage features in the study area is provided in Table 2 and those with known records are shown on Figure 3.

Table 2 Summary of Natural Features Located within the Study Area (based on the records review)

Natural Heritage Feature	Known Records Present in Project Location ?	Known Records Present within 120m of the project location?	Discussion (based on records review)	To be Confirmed during Site Investigation
Wetlands	No	**Yes** (Figure 3)	No PSW or locally significant wetlands identified within the project location or within the 120 m surrounding lands on the OP, on LIO evaluated wetland layer, or Resource Atlas. Peterborough District indicated that no wetlands are located within the project location or the surrounding 120 m (Appendix A). Kawartha Conservation wetland mapping and on-line LIO mapping indicates that unevaluated wetlands are present within the surrounding 120 m. Note that the search for coastal wetlands was not required for this project due to its inland location.	Yes
Woodlands	No	**Yes** (Figure 3)	No woodlands are located within the project location on the OP, LIO woodlands layer and on satellite imaging. Satellite imaging indicates that there is one large woodland in the 120 m surrounding lands. This woodland circles around the project location coming closest to it on the western and northern sides were it abuts the project location (Figure 3). This woodland has been labelled as Woodland 1.	**Yes**

Natural Heritage Feature	Known Records Present in Project Location ?	Known Records Present within 120m of the project location?	Discussion (based on records review)	To be Confirmed during Site Investigation
			The OP identifies part of Woodland 1 nearby but outside of the 120m (Appendix A). The on-line LIO mapping indicated the presence of part of Woodland 1 (Appendix A). Peterborough District indicated that woodlands were present in the surrounding area (Appendix A). The Kawartha Conservation ELC mapping noted the presence of part of Woodland 1 (Appendix A).	
Valleylands	No	No	No significant valleylands are listed as occurring within the project location or the 120 m surrounding on the OP and Kawartha Conservation did not have any mapping.	Yes
ANSIs – Life science	No	No	No Life Science ANSIs are identified within the project location or within the 120 m surrounding lands based on the OP, on LIO ANSI layer, Crown Atlas or Resource Atlas. Peterborough District indicated that no Life Science ANSIs are present within the study area (Appendix A).	No
ANSIs – Earth Science	No	No	No Earth Science ANSIs are identified within the project location or within the 50 m surrounding lands based on the OP, on LIO ANSI layer, Crown Atlas, and Resource Atlas.	No

Natural Heritage Feature	Known Records Present in Project Location ?	Known Records Present within 120m of the project location?	Discussion (based on records review)	To be Confirmed during Site Investigation
			Peterborough District indicated that no Earth Science ANSIs are present within the study area (Appendix A).	
Wildlife Habitat	No	No	There were no wildlife concentration areas available from NHIC. However, satellite imaging suggests that there is a potential for candidate habitat both in the project location and within the 120 m surrounding lands. The following wildlife habitat have been ruled out, for both the project location and within the 120 m of the project location, as per the records requested from LIO (August 13, 2012) (Appendix A). - Deer Yarding area - Deer winter congregation areas Deer movement corridors Bat Migratory stopover areas have no ELC types described within the Ecoregion 6E Criterion Schedule to date and are not required to be considered past the Records Review stage The project study area is not within 5 km of Lake Ontario, thus Migratory butterfly stopover areas and landbird migratory stopover areas are not required to be carried past the Records Review stage according to the Criterion Schedule	Yes

Natural Heritage Feature	Known Records Present in Project Location ?	Known Records Present within 120m of the project location?	Discussion (based on records review)	To be Confirmed during Site Investigation
			All other wildlife habitat will be considered at site investigation and are listed below: **Seasonal Concentration Areas of animals** Waterfowl stopover and staging (terrestrial and aquatic) Shorebird migratory stopover areas Raptor wintering areas Bat hibernacula Bat maternity colonies wintering areas Snake hibernacula Colonially nesting bird breeding habitat (bank and cliff, tree/shrub, and ground) **Rare Vegetation Communities** Cliffs and talus slopes Sand barren Alvar Old growth woodlands Savannah Tallgrass prairies Other rare vegetation communities	

Natural Heritage Feature	Known Records Present in Project Location ?	Known Records Present within 120m of the project location?	Discussion (based on records review)	To be Confirmed during Site Investigation
			Specialized Habitat for Wildlife Waterfowl nesting areas Bald Eagle and Osprey nesting, foraging, and perching habitat Woodland raptor nesting habitat Turtle nesting areas Seeps and springs Amphibian breeding habitat (woodland and wetland) **Habitat for Species of Conservation Concern** Marsh Bird Breeding Habitat Woodland area-sensitive bird breeding habitat Open country bird breeding habitat Shrub/early successional bird breeding habitat Terrestrial crayfish Special concern and rare wildlife species **Animal Movement Corridors** Amphibian movement corridors The Species of Conservation Concern which were considered for the project location and the surrounding lands are discussed in Table 3 below.	

Natural Heritage Feature	Known Records Present in Project Location ?	Known Records Present within 120m of the project location?	Discussion (based on records review)	To be Confirmed during Site Investigation
Provincial Parks	No	No	No Provincial parks documents on Crown Land Use Atlas or Renewable Energy atlas. Peterborough District indicated that no Provincial Parks were present within the Study Area (Appendix A).	No
Conservation Reserves	No	No	No Conservation reserves documents on Crown Land Use Atlas or Renewable Energy atlas. Peterborough District indicated that no Conservation Reserves were present within the Study Area (Appendix A).	No

OP = official plan of the City of Kawartha Lakes

Habitat of Species of Conservation Concern

There were no occurrences of species of conservation concern in or within 1 km of the project location. The following list of potential species of conservation concern was produced based on information available on the NHIC database for the surrounding 10 km as well as the ABBO square for the area. All species will be considered as potentially occurring and discussed further following the site investigations.

Table 3 List of Potential Species of Conservation Concern listed on NHIC for the General Area

Common Name	Scientific Name	Preferred Habitat	SRank	Provincial Status	Federal Status	Reference	Last Observed
Butterflies							
Mottled Duskywing	*Erynnis martialis*	Usually wet sandy roads.	S2			Layberry et al. 1998	21/06/1939
DrangonfliesÉDamselflies							
Cyrano Darner	*Nasiaeschna pentacantha*	Swampy wooded streams, lakes, and ponds.	S3			Dunkle 2000	
Lilypad Clubtail	*Arigomphus furcifer*	Marshy lakes.	S3			Dunkle 2000	19/06/2000
Molluscs							
Tapered Vertigo	*Vertigo elatior*	Open calcareous sites including fens, cobble beaches, alvars, and conifer swamps.	S2S3			Lee 2007	04/07/1941
Reptiles							
Eastern Ribbonsnake	*Thamnophis sauritus*	Prefers meadows or forest edge, often around permanent waterbodies	S3	SC	SC	COSEWIC 2002	09/1986
Milksnake	*Lampropeltis triangulum*	Found within open forest, forest edges, meadows, and cultivated areas.	S3	SC	SC	Fischer 2002	1993?
Common Five-lined Skink	*Plestiodon fasciatus*	Habitat varies and can include rocky outcrops, sand dunes, riparian forest, and deciduous forests.	S3	SC	SC	COSEWIC 2007	1992
Birds							
Black Tern	*Chlidonias niger*	Breed in freshwater marshes	S3B	SC		Peterson 1980	02/06/1991
Mammals							
Northern Long-eared Bat	*Myotis septentrionalis*	Found in treed or shrubbed habitat near water.	S3			Eder 2002	06/10/1939

Common Name	Scientific Name	Preferred Habitat	SRank	Provincial Status	Federal Status	Reference	Last Observed
Eastern Pipistrelle	*Pipistrellus subflavus*	Prefers shrub habitat or open woodland near water.	S3?			Eder 2002	1608/1965
Plants							
Giant Pinedrops	*Pterospora andromedea*	Associated with dry woods containing conifers and a well-developed needle duff.	S2			Voss 1985	02/08/1934
Crested Arrowhead	*Sagittaria graminea var. cristata*	Streams, lake bottoms and shore.	S3			Crow & Hellquist 2000	08/08/1903

Status and Ranking Updated: September 17, 2012

SRANK DEFINITIONS

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

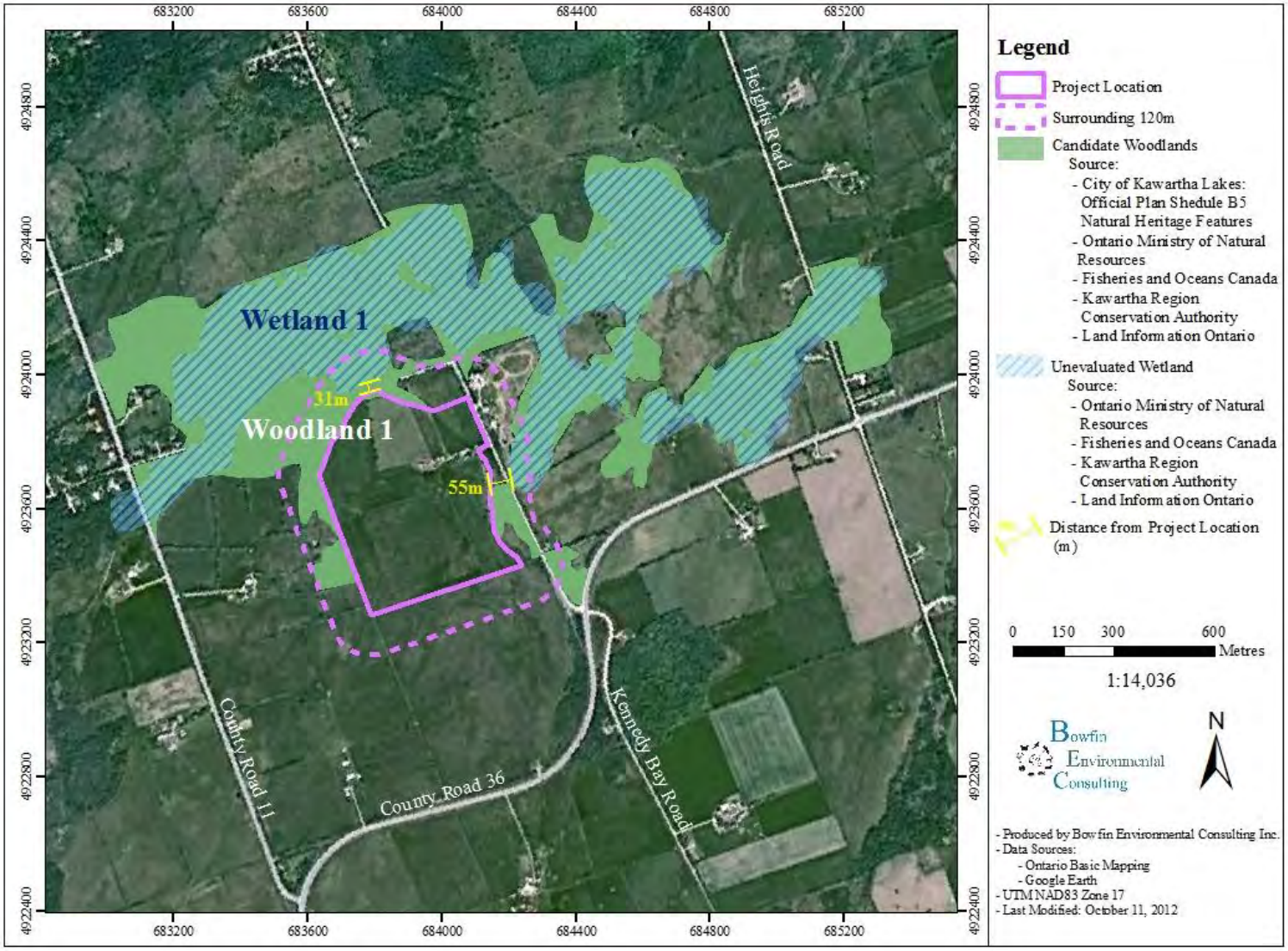
S3 Vulnerable, Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

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

SARO STATUS DEFINITIONS

SC Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

Figure 3 Location of Known Features based on Records Review



3.0 SITE INVESTIGATION

3.1 Methodology

The study area for this proposed facility includes the portion of project location where any construction activities, including support facilities and staging areas, would take place (the project location) as well as the 120 m surrounding area (Figure 2). It is noted that the proponent has indicated that the existing driveway will need to be upgraded and a small (approximately 118 m long) tap-line will need to be constructed. The connection point to the distribution feeder will be located on the edge of the project location. At this time it is unknown if it will be connected by overhead or underground wire and as such, both methods will be included within this report. As per the NHAG, the purpose of the Site Investigation is to:

- Verify whether the analysis of the project location described in the Records Review section above was accurate and make any necessary corrections;
- Determine whether any additional natural features exist within 120 m of the project location, other than those identified in the Records Review section above;
- Determine the boundaries of any natural feature located within 120 m of the project location (these include all natural features identified during the Records Review or the Site Investigations); and
- Determine the distance from the project location to the boundaries of any natural features.

In addition, this Site Investigations report begins with a summary of all vegetation communities found. The summary includes the feature ID (type), size (within the study area) and a description of the attributes. The description includes a summary of canopy cover and dominant plant species. All communities are described regardless of the presence or absence of candidate NHF or SWH in order to provide the reader with a thorough understanding of the site.

The summary of the vegetation community descriptions is then followed by the REA requirements for a candidate NHF or SWH. This includes to the feature ID (type), size (inside and outside of the study area), reference to the attributes described under the vegetation community descriptions and ecological functions. This information is closed by a concluding remark on the potential for candidate significant features to be present and whether the community is being brought forward to the Evaluation of Significance (EoS) section of the report. Those candidate features being brought forward to the EoS are also identified on Figures 5 and 6.

Note that several field visits were completed by Niblett Environmental Associates (Table 4). Bowfin also completed an additional field visit in August 2012 and merged information gathered from both companies to create this report.

Resumes and Field Notes are located in Appendix B.

Table 4 Summary of Site Investigation

Date	Time	Duration	Company (Staff)	Air Temperature (Min-Max) °C	Weather	Purpose
June 30, 2010	0700h-0900	2 hrs	Niblett Environmental (Chris Ellingwood, Katherine Ryan, Ernie Silhanek)	13.0-16.0 (7.3-18.6)	strong breeze	Bird Survey
July 16, 2010	0930h-1230	3 hrs	Niblett Environmental (Kelly Cordick, Gerry Sullivan)	24.0-26.0 (18.4-29.5)	sunny, humid, fresh breeze	Classify Vegetation Community
August 4, 2010	1400h-1600	2 hrs	Niblett Environmental (Kelly Cordick)	31.0 (18.0-31.0)	humid, fresh breeze	Confirmation and Boundary Delineation
April 14, 2011	2037h-2111	34 min	Niblett Environmental (Chris Ellingwood)	6.3 (-0.8-12.2)	no cloud cover, light air	Amphibian Survey
August 15, 2011	1530h-1600	30 min	Niblett Environmental (Ali Giroux)	24.0 (15.3-24.0)	cloudy, rain, fresh breeze	Classify Vegetation Community
September 7, 2011	1415h-1600	1 hr 45 min	Niblett Environmental (Chris Ellingwood, Ali Giroux)	17.0 (12.2-18.1)	light air	Identifying Function
June 19, 2012		1 hr 30 min	Niblett Environmental (Chris Ellingwood, Katherine Ryan, Ernie Silhanek)	(19.0-30.1)	no wind	Bird Survey
August 9, 2012	0830h-1615	7 hrs 45 min	Bowfin Environmental (M. Lavictoire)	18.0 (16.8-19.6)	overcast, no wind	Classify Vegetation Community

3.1.1 Community Descriptions

The entire study area was walked by foot ensuring that each vegetation community type was visited. Specific vegetation community types identified during the preliminary mapping exercise were also targeted for habitat description. Vegetation community types were determined based on the appropriate methodologies such as: *Ontario Wetland Evaluation System, Southern Manual* (OWES) for wetland habitats and the *Ecological Land Classification for Southern Ontario* (ELC) for terrestrial habitats. When the vegetation community meet the OWES definition of a wetland OWES classification system was utilized. OWES defines a wetland habitat is characterized as:

> *"Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants".*

The minimum vegetation community size described was 0.5 ha. Smaller vegetation communities were only described if they contained rare vegetation communities or species. Sufficient level of detail was collected in order to provide a general vegetation community type description and identify the presence/absence of any other natural features that were not already identified through the records review (correction of data obtained through the records review).

Representative plant species were recorded within the communities and a running list of plants observed within the study area was kept. Specific attention was paid to locating species of conservation concern listed as potentially occurring within the study area. Any species of conservation concern observed was photographed and its coordinates were recorded on a hand held GPS using NAD83. Plants that could not be identified in the field were collected for a more detailed examination in the laboratory. Nomenclature used in this report follows the Southern Ontario Plant List (Bradley, 2007) for both common and scientific names which are based on Newmaster *et al.* (1998). Authorities for scientific names are given in Newmaster *et al.* (1998).

Vegetation communities were classified, at a minimum, to the ELC Community Series or Ecosite level for the upland habitats or using OWES for the wetland habitats (Figure 4). When required to identify rare vegetation community type, the community was classed to vegetation type. Communities not belonging to wetland or woodland features are described separately below. Those communities belonging to a wetland or woodland feature are described under the feature identification. Additional information on the methods used for delineation of wetlands and woodlands are provided below.

3.1.2 Natural Heritage Features and Significant Wildlife Habitats

Wetland Methods

OWES defines the wetland boundary as the location where over 50% of the plant community consists of upland species with the woody vegetation layer (trees and shrubs) taking precedence over the herbaceous layer (OMNR 1994). Furthermore, the presence of large numbers of obligate upland species requires an upland classification.

Woodland Methods

The REA definition of a "woodland" is

> *"treed area, woodlot or forested area, other than a cultivated fruit or nut orchard or plantation established for the purpose of producing Christmas trees, that is located south and east of Canadian Shield"*

During site investigations the presence of woodlands were searched for and the features were delineated along the outer drip line. The distance between this boundary and the infrastructure was measured from the drip line. The woodland size was calculated based continuous patches of woodlands; gaps exceeding 20 m were considered separate feature. The woodland interior was calculated as 100 m from the edge (note that where tree crowns were separated by a maintained public road, even if the opening was less than 20 m, this edge was used for the calculation of the interior habitat only).

Valleylands Methods

The REA definition of a "valleyland" is

> *"a natural area that is south and east of the Canadian Shield and occurs in a valley or other landform depression that has water flowing through or standing for some period of the year."*

During site investigations the presence of valleylands was searched for and the features were delineated along the outer drip line. The delineation of the boundaries was based on the following guidelines provided in NHAG:

> *"For well-defined valleys, the physical boundary is generally defined by the stable top-of-bank or the predicted top-of-bank (also known as top of slope or top of valley); and*

For a less well-defined valley or stream corridor, the physical boundary may be defined in a number of ways including the consideration of riparian vegetation, the flooding hazard limit, the meander belt or the highest general level of seasonal inundation."

Wildlife Habitat Description

SWH located in each habitat type are identified and described. Surveys for the presence/absence of significant wildlife habitat were completed based on the information available in the *Natural Heritage Assessment Guide for Renewable Energy Projects* (NHAG), *Significant Wildlife Habitat Technical* Guide (SWHTG) and the *Significant Wildlife Habitat Ecoregion Criteria Schedules Ecoregion 6E* (SWHEC) (OMNR 2012). The SWHTG was referred to for the methods/criteria for identifying significant wildlife habitat (SWH). These methods were then employed while walking through the site. The vegetation community summaries (following the ELC/OWES) were cross-referenced with the habitat requirements of the species listed in Appendix G of the SWTHG as well as those species of conservation concern listed as potentially occurring within the study area. A search for raptor nests was completed by looking for evidence of nesting (such as stick nests, whitewashing of branches and foliage, accumulation of feathers/fur or prey remains on the ground or in shrubs as per the SWHTG (Appendix O).

The following items were looked for in the project location and within the 120 m surrounding lands:

Seasonal concentrations areas:

- Waterfowl stopover and staging (terrestrial and aquatic)
- Shorebird migratory stopover areas
- Raptor wintering areas
- Bat hibernacula
- Bat maternity colonies
- wintering areas
- Snake hibernacula
- Colonially nesting bird breeding habitat (bank and cliff, tree/shrub, and ground)

Rare vegetation communities or specialized habitats for wildlife:

- Cliffs and talus slopes
- Sand barren
- Alvar
- Old growth woodlands
- Savannah
- Tallgrass prairies
- Other rare vegetation communities

- Waterfowl nesting areas
- Bald Eagle and Osprey nesting, foraging, and perching habitat
- Woodland raptor nesting habitat
- Turtle nesting areas
- Seeps and springs
- Amphibian breeding habitat (woodland and wetland)

Species or Habitats of conservation concern:

- Marsh Bird Breeding Habitat
- Woodland area-sensitive bird breeding habitat
- Open country bird breeding habitat
- Shrub/early successional bird breeding habitat
- Terrestrial crayfish
- Special concern and rare wildlife species

Animal movement corridors:

- Amphibian movement corridors

The identification of significant wildlife habitat (SWH) followed the Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (MNR, 2012).

For the project location all candidate SWH identified during the site investigation will be carried through for a full Evaluation of Significance (EoS).

The remainder of the study area (surrounding 120 m lands) followed a scoped process where only the candidate SWH identified in Table 16 of Appendix D of the NHAG must be identified. While all candidate SWH listed on the previous page will be considered, those not listed in Table 16 of Appendix D of the NHAG will be grouped together and brought forward to the EoS as "Generalized Candidate SWH". The SWH which must be identified varies depending on their proximity to the different project components. Those SWH which, if found, must be identified if they are summarized in Table 5.

Table 5 Summary of SWH which must be Identified if within 120 m of a Project Component

SWH	Project Component				
	Solar Panel and related structures	Road	Overhead Line	Underground Line	Building/Transformer Station/Distribution Station
Seasonal Concentration Areas					
Raptor wintering areas			x		
Snake hibernacula	x	x			
Turtle wintering area	x	x			
Colonially nesting bird breeding habitat (bank and cliff, tree/shrub, and ground)	x	x			
Rare vegetation communities or specialized habitats for wildlife					
Cliffs and talus slopes		x			
Sand barren		x			
Alvar		x			
Savannah		x			
Tallgrass prairies		x			
Other rare vegetation communities		x			
Turtle nesting areas	x	x			
Amphibian breeding habitat (woodland and wetland)	x	x			
Species or Habitats of conservation concern					
Special concern rare plant species		x			
Animal movement corridors					
Amphibian movement corridors	x	x			

Bird Surveys

Breeding bird surveys were completed during the morning on June 30, 2010 by Chris Ellingwood, Katherine Ryan and Ernie Silhanek (all with Niblett). The surveys were timed to coincide with the dawn chorus and within acceptable weather parameters. The surveys were modeled after the Ontario Breeding Bird atlas (2nd) point count methodologies (2001) and used standardized data collection forms. The surveys were a combination of point counts and area searches and covered all portions of the property.

A search for raptor nests was completed by Michelle Lavictoire (with Bowfin) by looking for evidence of nesting (such as stick nests, food caches, whitewashing of branches and foliage, accumulation of feathers/fur or prey remains on the ground or in shrubs as per the *Significant Wildlife Habitat Technical* Guide (SWHTG) Appendix O) as well as the raptors themselves.

Spring Amphibian Surveys

Spring amphibian survey was conducted using the methodologies of the Marsh Monitoring Program (BSC 2008) with slight adaptations. These were completed by Chris Ellingwood (Niblett). Seven stations were established along Snug Harbour and Kennedy Bay roads, (approximately 200 m apart on Snug Harbour Road and 340-390m apart on Kennedy Bay Road, targeting different communities). Each point was surveyed for a duration of 3 minutes. The survey was completed on April 14th, 2011 in the evening. Only one visit was conducted as middle and late breeders were noted during the incidental wildlife observations.

All wildlife observation data has been included within the composition descriptions.

Incidental Wildlife Observations

Incidental observations of birds, mammals, amphibians and butterflies were recorded during all site visits. These include observations made by both Niblett and Bowfin. Incidental observations included observations of an individual, song (birds and frogs), its tracks, burrows, feces and/or kill sights or browsing. Special attention was paid to wetted areas, rocky habitats and potential nesting sites which may provide habitat for amphibians and reptiles. Logs and stones were overturned for salamanders and reptiles.

3.2 Results

3.2.1 Summary of all Vegetation Communities

The following section provides a summary of the feature ID (type), size (of the vegetation community), composition and attributes. The size of the vegetation community includes both the habitat in and outside of the study area. For those communities which form part of features requiring identification under REA additional discussion is provided in section 3.2.2.

The composition description follows the 2nd approximation of the ELC, where appropriate however the codes from the 1st approximation were included to assist with section 3.2.2. (as the

SWHEC schedules uses the 1st approximation). The ELC 1st approximation codes are also included for those communities described using OWES.

Project Location

Feature ID/Type (Size): Field 1 (3.3 ha), Field 2 (0.7 ha), Field 3 (3.0 ha), Field 4 (5.8 ha), Field 5 (10.3 ha) Field 6 (3.9 ha)

Composition: Agricultural Fields (AGR)

Attributes: The majority of the project location consisted of ploughed fields which are now vegetated to varying degrees by: lamb's quarters, common dandelion and common ragweed. Field 2 was an exception; this field was vegetated primarily by barnyard and orchard grass.

The area between Fields 2 & 3, 3 & 4 and 4 & 5 and the area around the abandoned barn contained a thin strip taller and more diverse communities. The vegetation here included: wild grape, wild carrot, orchard grass, oats, rough-fruited cinquefoil, viper's bugloss, cow vetch, field bindweed, doubtful goat's beard, Canada's enchanters nightshade, common strawberry, Virginia creeper, common buckthorn and chokeberry.

Field 2 and the areas between the above mentioned fields were all less than 1 ha and too small to provide Open Country Breeding Bird Habitat. The lamb's quarter fields are considered inappropriate for this habitat type.

The wildlife species noted within the project location included: song sparrow, black-capped chickadee, house wren, American goldfinch, indigo bunting, black-and-white warbler, American robin, chipping sparrow, American redstart, brown-headed cowbird, gray catbird, savannah sparrow, American crow, mourning dove, red-winged blackbird, common grackle, blue jay, red-eyed vireo, and eastern kingbird (Niblett June 30 2010). Other species observed later in the summer were: monarch, ring-billed gull (flying overhead) (Bowfin August 9, 2012).

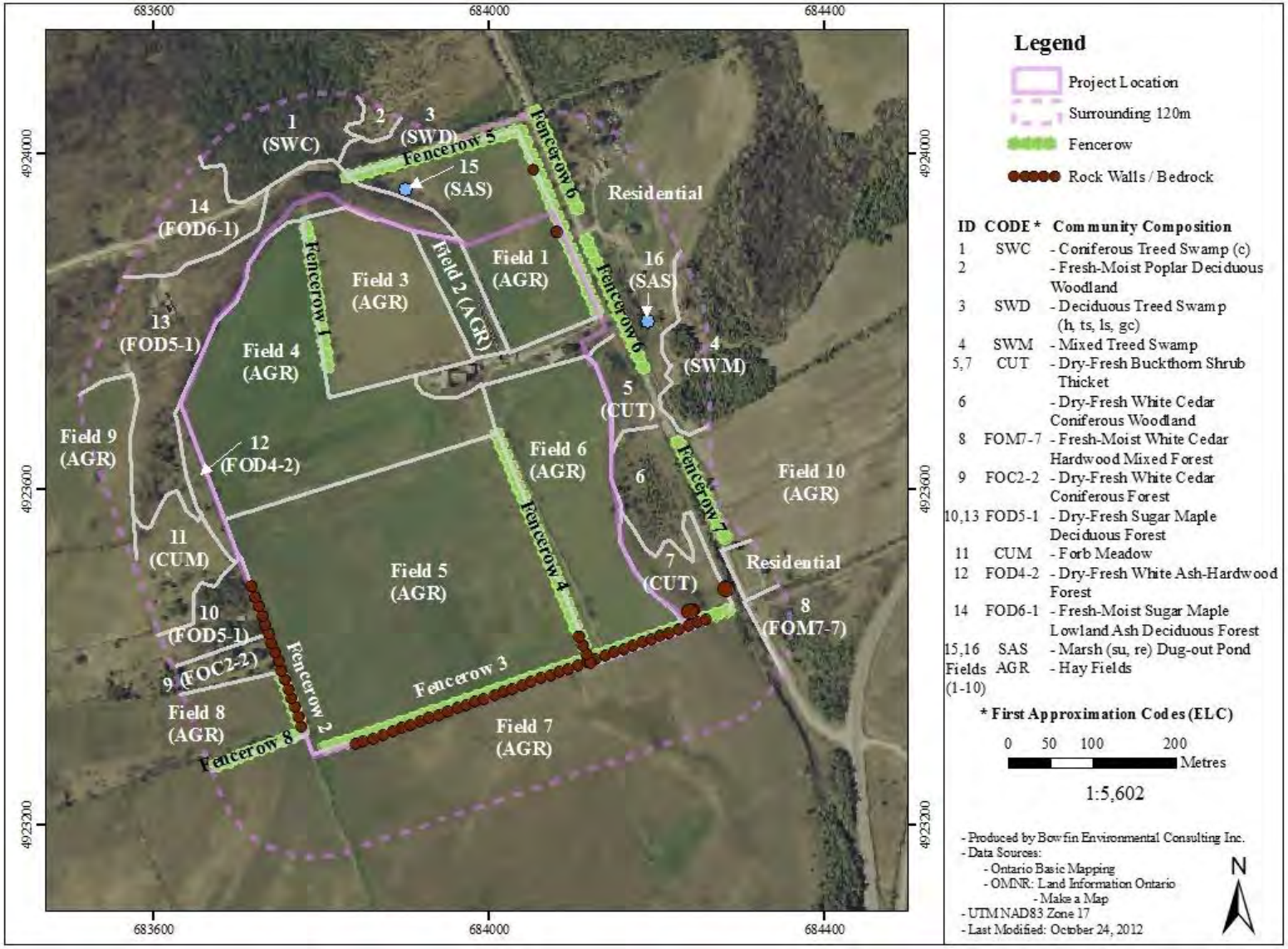
These fields did not show any signs of flooding from annual spring melt or run-off. No concentrations of waterfowl were noted by Niblett during their spring visits and the lack of grains species indicates that this function is not present.

No species of species of conservation concern were noted.

Photo 1 Looking north at the eastern edge of Field 3, August 9 2012

Photo 2 Looking south along the edge of Field 5 with Field 7 in the background, August 9 2012

Figure 4 Vegetation Community Types



Feature ID/Type: Fencerows 1-5

Composition: Deciduous Treed Fencerow

Attributes: All of the fencerows located along the edge of the project location or within the middle of the project location have been included as part of the project location as these may be impacted during the installation of the modules or the perimeter fence.

All were similar though some were more sparsely treed then others. All consisted of single row of deciduous trees with varying densities of accompanying deciduous shrubs. The most common species noted were: barnyard and orchard grasses, alfalfa, doubtful goat's beard, cow vetch, common dandelion, lamb's quarters, white clover, field bindweed, tartarian honeysuckle, staghorn sumac, common buckthorn, white ash, American elm, sugar maple and Manitoba maple.

During the August 9, 2012 visit, eastern kingbirds, blue jays, American goldfinch, and American robin were observed within the fencerows (Bowfin).

Some of the trees located within Fencerow 1 contained large cavities from pileated woodpecker.

Rock piles were noted within Fencerows 2 and 3, within a very short section at the south end of Fencerow 4 and one small pile was noted in Fencerow 5.

No species of species of conservation concern were noted.

Photo 3 Looking north along Fencerow 1, August 9, 2012.

Photo 4 Looking west along Fencerow 3, August 9, 2012.

Surrounding 120 m Lands

Cultural Communities

<u>Feature ID/Type (Size):</u> Field 7 (59 ha), Field 8 (6.1 ha), Field 9 (2.9 ha), Field 10 (6.8 ha)

<u>Composition:</u> Agricultural Field (AGR)

<u>Attributes:</u> Note that a part of Field 1 is also located within the surrounding lands. This was a ploughed field containing bare soil and lamb's quarter and is described above.

Field 7 was located on the south side of the project location. Field 8 was located in the southwest corner of the 120 m surrounding lands, Field 9 was located on the west side of the project location and Field 10 was located to the east, east of Kennedy Bay Road (Figure 4).

All fields had been cut prior to the August 9, 2012 field visit. The fields contained: grasses, alfalfa, wild carrot, bird's-foot trefoil and yarrow.

Wildlife species observed included: wild turkeys and rock doves (August 9, 2012).

No crevices or rock or brush piles were located within the fields in the 120 m surrounding lands.

No species of species of conservation concern were noted.

Photo 5 Looking west at Field 8, August 9, 2012.

Feature ID/Type: Fencerow 5-8

Composition: Deciduous Treed Fencerows

Attributes: These fencerows were located on either side of the Kennedy Bay Road (Fencerows 5 - 7), in the southeast corner of Snug Harbour Road (Fencerow 8), and on the south side of Field 8 (Fencerow 9) (Figure 4). Note that only a portion of Fencerow 5 was considered as part of the surrounding lands; the southern portion was included in the project location.

All were similar though some were more sparsely treed then others. All consisted of single row of deciduous trees with varying densities of accompanying deciduous shrubs. The most common species noted were: barnyard and orchard grasses, alfalfa, doubtful goat's beard, chickory, white sweet-clover, thistle, yarrow, Canada goldenrod, cow vetch, common dandelion, lamb's quarters, white clover, field bindweed, tartarian honeysuckle, staghorn sumac, common buckthorn, trembling aspen, white ash, American elm, sugar maple and Manitoba maple.

Rock piles were noted within Fencerow 5, on the west side of Kennedy Bay Road on the north end of the project location (Figure 4). No snakes were observed.

No Species of Conservation Concern were noted.

Photo 6 Looking north along Kennedy Bay Road at some of the Fencerows, August 9, 2012.

Feature ID/Type (Size): Community 11 (2.6 ha)

Composition: Forb Meadow (CUM)

Attributes: One meadow habitat was located on the western side of the surrounding lands. While there were some 2-6 m tall white ash present, there was less than 25% woody vegetation within this community. The site was dominated by orchard grass, barnyard grass, timothy, viper's bugloss, Canada goldenrod, wild carrot, doubtful goat beard, red clover, bird's-foot trefoil, alfalfa and wild grape.

No wildlife features were noted.

No species of species of conservation concern were noted.

Photo 7 Looking east at Community 11 (forb meadow), edge of Community 12 (white-ash forest) is in background, August 9, 2012.

Feature ID/Type (Size): Community 5 (0.4 ha)

Composition: Cultural Thicket (CUT) – Dry-Fresh Buckthorn Deciduous Shrub Thicket

Attributes: Located on the southeast side of the surrounding lands, to the west of Kennedy Bay Road. This community was located immediately south the access road and consisted of a mixture of small vegetation types which were too small to be delineated on their own. The common theme of the area was the disturbed nature and presence of buckthorns. The southern end of the community includes a small meadow vegetated by orchard grass, barnyard grass, red clover, wild carrot, Canada goldenrod, common milkweed and spreading dogbane. The meadow pocket was surrounded by common buckthorn and regenerating sugar maple and eastern white cedar. The community changed to the north to one dominated by shrub species (40% cover 1-4 m tall) common buckthorn and chokecherry with some tartarian honeysuckle, lilac and common juniper. There was still a dense ground layer composed of the same species listed above. Further north the community consisted almost entirely of common buckthorn with little understory or ground cover. Finally, the community changed to one dominated by 6 m tall American elm with no sub-canopy or understory and a sparely vegetated ground layer.

No Species of Conservation Concern were found.

Photo 8 Looking at part of Community 5, August 9, 2012.

Photo 9 Looking at part of Community 5 closer to the access road, August 9, 2012.

Feature ID/Type (Size): Community 7 (0.6 ha)

Composition: Cultural Thicket (CUT) – Dry-Fresh Buckthorn Deciduous Shrub Thicket

Attributes: Located in the southeast corner and included a meadow inclusion. This area consisted of a buckthorn thicket that was 2-3 m tall and provided up to 40% cover. The shrub layer was almost entirely dominated by common buckthorn with a few eastern white cedars. The ground layer was variable with low coverage under areas that were densely vegetated with buckthorn but up to 100% cover in the meadow inclusion. Ground cover species included orchard grass, barnyard grass, common strawberry, wild grape and bird's-foot trefoil.

Exposed bedrock was noted next to Fencerow 3, no openings were observed.

No species of species of conservation concern were noted.

Photo 10 Looking at part of Community 7, August 9, 2012.

Wetland Communities

Feature ID/Type (Size): Community 15 (<0.02ha)

Composition: Marsh (su, re) (SAS) – Dug-out Pond

Attributes: There was one small dug-out pond located in the northern end of the surrounding lands. This dug-out pond was predominately vegetated with submergent species (su) with robust emergents (re) along the outer edge. The aquatic species identified included: stonewort, sago pondweed, large-leaved pondweed, narrow-leaved cattail and broad-leaved cattail. The banks were very steep and were vegetated with both upland species and wetland species. The wetland bank vegetation included: Crack willow, red-osier dogwood, Bebb's willow, grass-leaved goldenrod, and awl-fruited sedge. Other species included: Canada goldenrod, coltsfoot, field horsetail, daisy fleabane, evening primrose, red clover, wild carrot, ragweed and regenerating sugar maple.

Wildlife species observed within the dug-out pond included 2 spring peppers observed by Niblett during the amphibian breeding survey visit as well as green frog and deer tracks observed by Bowfin (August 9, 2012).

No Species of Conservation Concern were found.

Photo 11 Looking north at the dug-out pond of Community 15, August 9, 2012.

Feature ID/Type (Size): Community 16 (<0.02ha)

Composition: Dug-out Pond – Marsh (SAS)

Attributes: This man-made pond was located within the residential area and was assessed from the road. It is assumed to be a shallow marsh community.

Feature ID/Type (Size): Community 3 (0.6 ha)

Composition: Deciduous Treed Swamp (h, ts, ls, gc) (SWD)

Attributes: A treed swamp was located on the north side of Snug Harbour Road. The swamp was dominated by a deciduous tree layer and also contained a tall shrub, low shrub and ground cover layer. The dominant species were:

h - green ash, American elm, and black ash (treed layer)
ts - red osier, silver maple, green ash, eastern white cedar (tall shrub layer)
ls – red-osier dogwood, white ash, green ash, eastern white cedar (low shrub layer)

gc – grass-leaved goldenrod, spotted joe-pye-weed, poison ivy, Virginia creeper, boneset (ground cover layer)

There was no surface water during the August 9, 2012 visit but the potential for vernal pools was present.

Three spring peppers and two wood frogs were heard calling by Niblett during the spring amphibian breeding survey.

No species of species of conservation concern were noted.

Photo 12 Looking at the treed deciduous swamp of Community 3, August 9, 2012.

Feature ID/Type (Size): Community 1 (3.8 ha)

Composition: Coniferous Treed Swamp (c) (SWC)

Attributes: This community is located north of Snug Harbour Road and consisted of an almost pure stand of eastern white cedar. The canopy layer provided 85% cover and there was little to no sub-canopy, understory or ground cover. The other species scattered throughout this community included: black cherry, sugar maple, American elm, green ash, wild grape, common buckthorn, and devil's beggar ticks.

No rock piles or brush piles were noted within this community. Two wood frogs were heard calling to the north during the April 14, 2011 Niblett visit. Bird observations by Niblett included: White-breasted nuthatch, black-and-white warbler, and ovenbird. Some of the community was located on a gentle slope. There is a potential for vernal pools to be found in the northern portion of the community and thus the potential for amphibian breeding (woodland).

No species of species of conservation concern were noted.

Upland Woodland Communities

Feature ID/Type (Size): Community 2 (1.3 ha)

Composition: Fresh-Moist Poplar Deciduous Woodland

Attributes: A very small section of this community was located within the study area to the east of the cedar forest, north of Snug Harbour Road. The community was a cultural meadow that had undergone sufficient regeneration to now be classed as a woodland. The canopy layer was 2-3 m tall and provided 35% cover. This layer was dominated by white birch which was much more common that eastern white cedar, common buckthorn, and American elm. The only other layer was the ground layer which was 0.5-1.0 m tall and provided 90% cover. This layer was dominated by a mixture of Canada goldenrod, grass-leaved goldenrod, eastern white cedar regeneration, wild carrot, yarrow, and purple loosestrife.

No wildlife features were noted within this community. No species of species of conservation concern were noted.

Photo 13 Looking at Community 2, August 9, 2012.

Feature ID/Type (Size): Community 4 (17.0 ha)

Composition: Mixed Treed Swamp (SWM)

Attributes: This community was located next to a residential house on private property on the opposite side of Kennedy Bay Road. As such limited information is available. This community was located adjacent to the cedar plantation and was too far from the road to collect much information. It was noted that the canopy layer included white cedar, trembling aspen, balsam poplar, American basswood, white ash, Manitoba maple and American elm. The records review mapping has indicated that this area is wetland and it will be treated as such.

Observations collected during the amphibian breeding survey by Niblett included three chorus frogs, thee spring peppers and two wood frogs calling.

No species of species of conservation concern were noted.

Photo 14 Looking towards Community 4, August 9, 2012.

Photo 15 Looking at Community 4, August 9, 2012.

Feature ID/Type (Size): Community 6 (1.3 ha)

Composition: Dry-Fresh White Cedar Coniferous Woodland

Attributes: The canopy layer was 6 m tall and provided 50-60% cover. The layer was primarily dominated by eastern white cedars which were much more than the scattered American elm. The cedars were spaced far apart which allowed the lower branches to grow next to the soil preventing the formation of a sub-canopy or understory layer. Meadow habitat dominated the open species between the cedars however there was also a sparse shrub layer (5% cover; 2-3m tall) consisting of juniper, white ash, common buckthorn, balsam poplar and lilac. The meadow habitat was vegetated with orchard grass, barnyard grass, red clover, bird's-foot trefoil, wild carrot, Canada goldenrod, common vetch, hawkweed and wild grape.

No wildlife features were noted. No species of species of conservation concern were noted.

Photo 16 Looking at Community 6, August 9, 2012.

Feature ID/Type (Size): Community 8 (1.3 ha)

Composition: Fresh-Moist White Cedar – Hardwood Mixed Forest (FOM7-2)

Attributes: This community was located next to a residential house on private property on the opposite side of Kennedy Bay Road. As such limited information is available. The community included a small cedar bush with scattered sugar maple. No sub-canopy, understory or ground cover was noted. Immediately adjacent to it was a trembling aspen forest with eastern white cedar and white ash. These two communities were combined to create the mixed forest.

No species of species of conservation concern were noted.

Photo 17 Looking south towards Community 8, in the background, August 9, 2012.

Feature ID/Type (Size): Community 9 (0.8 ha)

Composition: Dry-Fresh White Cedar Coniferous Forest (FOC2-2)

Attributes: This was a young coniferous forest with a canopy layer that was 2-5 m tall and provided 60-80% cover. The primary species were eastern white cedar with some scots pine and juniper. The ground cover included bird's-foot trefoil, wild carrot, barnyard grass and Canada goldenrod.

No wildlife features were noted. No species of species of conservation concern were noted.

Photo 18 Looking at Community 9, August 9, 2012.

Feature ID/Type (Size): Community 10 (1.5 ha)

Composition: Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1)

Attributes: This community was connected to Woodland 1 feature by a narrow strip of the white ash hardwood forest (community 12 - described below). The canopy vegetation was variable. The main species within this layer were sugar maple, white ash and basswood and the sub-canopy by ironwood and white ash. The ground layer was dominated by wild grape, white ash and sugar maple.

A rock pile was located within the eastern edge of this community. No species of species of conservation concern were noted.

Photo 19 Looking at Community 10, August 9, 2012.

Feature ID/Type (Size): Community 12 (0.5 ha)

Composition: Dry-Fresh White Ash – Hardwood Forest (FOD4-2)

Attributes: This community consisted of a narrow strip of forest vegetation that had a canopy layer which was 5-8 m tall and provided 60% cover. The dominant species were white ash which were much more than American basswood which was more than sugar maple and more than black walnut. The community was young with the diameter at breast height (DBH) ranging between 8-19 cm. There was no sub-canopy. The understory was 1-3 m tall and provided 10% cover and was vegetated almost entirely with white ash. The ground cover provided 95% cover and contained regenerating white ash, wild grape, grasses and wild red raspberry. (See photo 7).

Feature ID/Type (Size): Community 13 (8.6 ha)

Composition: Dry-Fresh sugar Maple Deciduous Forest (FOD5-1)

Attributes: The canopy layer, which provided 80% cover, was 12 m tall. This community included many different slope positions including the crest of the ridge, shoulder, back slope and foot slope. Along the ridge, nearest to the project location, the stand had a canopy cover dominated by sugar maple which was much more than ironwood and white ash which were much more than American elm, black cherry and American basswood. Other species present in the canopy included: bitternut hickory and American beech. The average diameter at breast

height (DBH) was 20 cm. The subcanopy provided 5% cover and was 6 m tall. This layer was dominated by ironwood which was more than sugar maple. There was little understory. Where present it included: alternate leaved dogwood, choke cherry, wild grape, purple-flowering raspberry, common elderberry and prickly gooseberry. The ground cover provided 30% cover and was dominated by herb Robert, zig-zag goldenrod, early meadowrue, white trillium, blue cohosh, prickly gooseberry and sharp-lobed hepatica.

No wildlife features were noted within this community. Note that wild leeks were found within this community.

This community was disturbed by logging, sugar maple tapping, and trails. Garbage piles and old farm equipment were located along the edges of the forest.

Two spring peppers were heard calling from Snug Harbour Road during the amphibian breeding survey (Niblett).

Photo 20 Looking at part of Community 13, August 9, 2012.

Feature ID/Type (Size): Community 14 (19.0 ha)

Composition: Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1)

Attributes: The canopy provided 75% cover and was 14-16 m tall. The dominant plants in this upper layer were sugar maple which was much more abundant that white ash which was more than ironwood. The sub-canopy provided 15% cover and was 4-6 m tall. This layer was vegetated with sugar maple followed by ironwood and some white cedar. The understory was 1-2 m tall and provided 5% cover. Understory vegetation included white ash, green ash, black ash, ironwood, sugar maple, white cedar and prickly gooseberry. The ground layer provided 10% cover and included: zig-zag goldenrod, sensitive fern, yarrow, meadow horsetail and tall meadowrue.

As in the cedar community described above, some of the community was located on a gentle slope however is a potential for vernal pools to be found within this community indicating the potential for amphibian breeding (woodland). This community is divided by Snug Harbour Road.

Two spring peppers and 2 wood frogs were heard calling from Snug Harbour Road during the spring amphibian breeding survey conducted by Niblett.

No species of species of conservation concern were noted.

3.2.2 Natural Heritage Feature and Significant Wildlife Habitat Identification and Verification

A description of the NHF and SWH found within the project location and the surrounding 120 m is presented in the following paragraphs. This description includes the feature ID, total size (in and outside of the study area), composition, distance from infrastructure and function. Note that the attributes are described in the section above. The subsections below include a comment on whether corrections to the records review took place and conclude with a statement on whether the feature will be brought forward to the EoS.

Wetlands

The site investigations confirmed the record review findings that there were no wetland communities identified within the project location.

The records review indentified one large unevaluated wetland of which two sections were located within the surrounding lands. Both of these sections were located on the opposite side of roads from the study area, on private land. Communities 1, 3 and 4 form part of this wetland. The site investigations were corrected in that Community 14 did not form part of the wetland.

The only changes to the records review was the addition of two new wetland features (Wetlands 2 & 3). Both consisted of the isolated dug-out ponds located outside of the project location but within the surrounding lands. Wetland 2 is located 41 m north of the project location (Community 15) and Wetland 3 is 38 m to the east (Community 16). It is noted that Wetland 3 is located on the other side of Kennedy Bay Road within the residential area and adjacent but isolated from Wetland 1 (Community 4).

The attributes are described in Section 3.2.1 (Communities 1, 3, 4, & 5 for Wetland 1, Community 15 for Wetland 2 and Community 16 for Wetland 4). A summary of the size, composition, distance from infrastructure and function is provided in Table 6.

Table 6 Candidate Significant Wetland

Feature ID	Distance from infrastructure	Size (ha) (total size of feature in and outside of study area)	Composition	Function
Wetland 1				
Community 1	12	61	Coniferous Treed Swamp (c)	Amphibian Breeding Habitat – woodland Candidate Significant Wetland.
Community 3	53		Deciduous Treed Swamp (h, ts, ls, gc)	
Community 4	60		Mixed Treed Swamp (h, c)	
Wetland 2				
Community 15 (Dug-out Pond)	41	<0.02	Marsh (su, re)	Candidate Turtle Nesting Areas /Turtle Wintering Habitat Candidate Significant Wetland
Wetland 3				
Community 16 (Dug-out Pond)	38	<0.02	Marsh	Candidate Turtle Nesting Habitat/Turtle Wintering Habitat Candidate Significant Wetland

Conclusion:

There are no wetlands located within the project location.

Three wetlands are found within the surrounding lands: Wetlands 1-3. All will be brought forward to the EoS as Candidate Significant Wetland. The candidate significant wildlife habitat functions will be further discussed under the Significant Wildlife Habitat subsection below.

Woodland

As noted during the Records Review, Woodland 1 is a large woodland, 103 ha, of which a portion is located within the study area. Site investigations confirmed that there were no breaks in the canopy larger than 20 m and as such all communities form part of just one woodland. The only change to the records review was the addition of Community 2 to the Woodland. This area was previously listed as cultural meadow in the Kawartha Conservation mapping (Appendix A), however it appears to be regenerating and should now be classed as woodland as per the ELC. No other corrections were made.

Within the study area, the woodland was composed of eleven polygons with ten different community types; three wetland and seven upland vegetation communities. These are listed below with the community number as depicted on Figure 4 in brackets:

- Coniferous Treed Swamp (1);
- Fresh-Moist Poplar Deciduous Woodland (2);
- Deciduous Treed Swamp (3);
- Mixed Treed Swamp (4);
- Dry-Fresh White Cedar Coniferous Woodland (6);
- Fresh-Moist White Cedar Hardwood Mixed Forest (8)
- Dry-Fresh White Cedar Coniferous Forest (9);
- Dry-Fresh Sugar Maple Deciduous Forest (10 & 13);
- Dry-Fresh White Ash Hardwood (12); and
- Fresh-Moist Sugar Maple Lowland Ash Deciduous Forest (14).

The size, interior, composition, distance of infrastructure to feature, attributes, ecological function and a decision on whether it will be brought forward as a Candidate Significant Woodland is provided in Table 7.

Table 7 Summary of Woodland 1

Feature ID (Size of Community)	Total Size (ha) (in and outside of Study Area)	Distance from infrastructure	Composition	Function
Community 1	103	12	Coniferous Treed Swamp	The woodland provided water protection (however, this function was located outside of the study area). There were no rare or old growth communities. The woodland included portions of a large unevaluated wetland (referred to as Wetland 1 within this report). Woodland included a good diversity of species.
Community 2 (1.3 ha)		84	Fresh-Moist Poplar Deciduous Woodland	
Community 3		53	Deciduous Treed Swamp	
Community 4		60	Mixed Treed Swamp	
Community 6 (1.3 ha)		0.1	Dry-Fresh White Cedar Coniferous Woodland	
Community 8 (1.3 ha)		73	Fresh-Moist White Cedar – Hardwood Mixed Forest (FOM7-2)	
Community 9 (0.8 ha)		0.1	Dry--Fresh White Cedar Coniferous Forest (FOC2-2)	
Community 10 (1.5 ha)		0.1	Dry-Fresh sugar Maple Deciduous Forest (FOD5-1)	
Community 12 (0.5 ha)		0.1	Dry-Fresh White Ash – Hardwood Forest (FOD4-2)	
Community 13 (8.6 ha)		0.1	Dry-Fresh sugar Maple Deciduous Forest (FOD5-1)	
Community 14 (19.0 ha)		13	Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1)	

Conclusion:
There are no woodlands located within the project location

All eleven communities will be brought forward to the EoS as Candidate Significant Woodland. The candidate significant wildlife habitat functions are discussed under the wildlife subsection below.

Valleylands

The site investigations confirmed the record review findings that there were no valleylands as per the REA definition located within the project location or the surrounding lands.

Wildlife Habitat

A summary of changes to the record review, presence/absence of candidate SWH, rational and whether it will be brought forward as candidate SWH or generalized candidate SWH is presented in Table 8.

Table 8 Summary of Candidate SWH

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
Seasonal Concentration Areas of Animals								
Waterfowl Stopover and Staging Areas (terrestrial)	N	N	N	N/A	N/A	All fields within the study area are under active agricultural use and as such are not typically associated with SWH. Furthermore, discussion with the landowner indicated that no waterfowl other than the occasional mallard is observed.	N	N
Waterfowl stopover and staging areas (aquatic)	N	N	N	N/A	N/A	There are two dug-out ponds both are man-made and are < 0.02 ha. These were not abundant in food supply and were note noted as providing stopover habitat during the spring site visits by Niblett.	N	N
Shorebird migratory stopover area	N	N	N	N/A	N/A	None of the ELC ecosites required by the Criterion Schedule are present in or within 120 m of the project location	N	N
Raptor wintering area	N	N	N	N/A	N/A	There is a large woodland (103 ha) within 120m of the project location and agricultural hay fields adjacent to these communities which are larger than 15ha. However these communities are over 450 m from the tap-line and the hay fields are active. The landowner has indicated that there are very few raptors observed during the winter.	N	N
Bat hibernacula	N	N	N	N/A	N/A	There are no CCR or CCA ecosites present in or within 120 m of the project location	N	N
Bat Maternity colonies	N	N	Y	12 13 14	0.1 0.1 13	There is >10 ha of appropriate ELC community series (FOD, FOM) within 120m of the project location	Y	Y

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
Turtle wintering areas	N	N	Y	15	41	SAS (dug-out ponds) community classes are present within 120 m of the project location which may be suitable for snapping or midland painted s	Y	N
				16	38			
Snake hibernacula	N	Y	Y	Fencerow 2	0.1	Two small rock piles were located within Fencerow 5 and long rock piles were present within Fencerows 2 and 3 and bedrock outcropping was present in Communities 6 and 7. The distances listed in the column to the left are based on a 30 m area around the rock piles.	Y	N
				Fencerow 3	0.1			
				Fencerow 4	0			
				Fencerow 5	0			
				6	35			
				7	0.1			
Colonially-nesting bird breeding habitat (bank and cliff)	N	N	N	N/A	N/A	CUM and CUT ecosites are present in and within 120 m of the project location; however no eroding banks, sandy hills, pits, steep slopes, or sand piles were present in or within 120 m of the project location	N	N
Colonially-nesting bird breeding habitat (tree and shrub)	N	N	N	N/A	N/A	An SWM ecosite was present within 120m of the project location , but no nests or signs of whitewash were observed upon site investigation	N	N
Colonially-nesting bird breeding habitat (ground)	N	N	N	N/A	N/A	There are no rocky islands or peninsulas within a lake or large river in or within 120 m of the project location. For Brewer's Blackbird, there are CUM and CUT ecosites, but not in close proximity to any watercourses or irrigation ditches.	N	N
Rare Vegetation Communities								
Cliff and Talus Slopes	N	N	N	N/A	N/A	There were no TAO, TAS, TAT, CLO, CLS or CLT ecosites matching in or within 120 m of the project location	N	N

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
Sand Barrens	N	N	N	N/A	N/A	There were no SBO1, SBS1 or SBT1ecosites in or within 120 m of the project location	N	N
Alvars	N	N	N	N/A	N/A	There were no ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1 or CUW2 ecosites that have unfractured calcareous bedrock or bedrock overlain by a thin veneer of soil in or within 120 m of the project location. No indicator plants were present.	N	N
Old Growth Forest	N	N	Y	8	73	FOD and FOC communities of 30 ha or greater in size with >10 ha of interior (with a 100 m buffer at the edge) were present within 120 m of the project location.	Y	Y
				9	0.1			
				10	0.1			
				12	0.1			
				13	0.1			
				14	13			
Savannahs	N	N	N	N/A	N/A	There were no TPS, TPW or CUS ecosites in or within 120 m of the project location.	N	N
Tall Grass Prairie	N	N	N	N/A	N/A	There are no TPO ecosites in or within 120 m of the project location	N	N
Other Rare Vegetation communities	N	N	N	N/A	N/A	Upon completion of site investigation, no rare vegetation communities (according to Appendix M of the SWHTG) were observed in or within 120 m of the project location.	N	N
Specialized Habitats For Wildlife								
Waterfowl nesting area	N	N	N	N	N	SWD community is present within 120 m of the project location and is greater than 0.5 ha in size, with adjacent upland habitat greater than 120 m wide, however the upland habitat consists of agricultural lands which are heavily disturbed by	N	N

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
						human activity and would not provide the necessary protection from predators (as required under the SHWEC) and any nests would be destroyed by agricultural activities.		
Bald Eagle and Osprey nesting, foraging, and perching habitat	N	N	N	N/A	N/A	Appropriate community series (FOD, SWC, SWD) were present within 120 m of the project location; however they are not directly adjacent to any riparian areas, nor were any nests observed during site investigations	N	N
Woodland raptor nesting habitat	N	N	N	N/A	N/A	There is a large woodland >30 ha however it does not meet the minimum of 10 ha of interior given the required 200 m buffer from the edge for this feature.	N	N
Turtle Nesting	N	N	Y	16	38	There were two SAS ecosites within 120 m of the project location. Community 15 did not include exposed sand or gravel and is not considered candidate habitat. Community 16 was located on private land and the presence of sand or gravel could not be confirmed. This candidate turtle nesting area (Community 16) will be carried forward to the evaluation of significance.	Y	N
Seeps and Springs	N	N	N	N/A	N/A	No signs of seepage or springs were observed during site investigation on or within 120 m of the project location.	N	N
Amphibian Breeding Habitat – Woodland	N	N	Y	1 3 4 8	12 53 60 73	There is a small pond within 120 m of a woodland and a SWC and SWD communities, all within 120m of the project location.	Y	N

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
				13	0.1			
				14	13			
				15	41			
				16	38			
Amphibian Breeding –Wetlands	N	N	N	N/A	N/A	There are no wetlands or pools >500m^2 that are >120 m from a woodland in or within 120 m of the project location	N	N
Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)								
Marsh bird breeding habitat	N	N	Y	15	41	Two dug-out ponds are located within 120 m of the project location.	Y	Y
				16	38			
Woodland area-sensitive breeding bird habitat	N	N	Y	1	12	There is one large woodland (>30 ha) within 120 m of the project location which has 4.2 ha of interior habitat given the required 200 m buffer from the edge	Y	Y
				3	53			
				4	60			
				8	73			
				10	0.1			
				12	0.1			
				13	0.1			
				14	13			
Open country breeding bird habitat	N	N	N	N/A	N/A	The project location consisted of ploughed fields, unsuitable for grassland species. There are several fields located within 120m of the project location however these are intensively cropped for hay.	N	N
Shrub/early successional breeding bird habitat	N	N	N	N/A	N/A	There are 2 CUT1 ecosites, but they are much less than 10 ha in size and do not qualify	N	N
Terrestrial crayfish	N	N	N	N/A	N/A	There are no ELC ecosites present in or within 120 m of the project location that are required by the Criterion Schedule.	N	N

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
Species of Conservation Concern (S1-S3) - Plant and wildlife Species								
Butterflies								
Mottled dusky wing	Documented in the general area (10 km squares)	N	N	N/A	N/A	This species occurs in wooded areas or scrubby habitats where the host species *Ceanothus* is present. While the habitat was present within 120 m however none of the larval food plants were found.	N	N
Dragonflies/Damselflies								
Cyrano Darner	Documented in the general area (10 km squares)	N	Y	15	41	This species prefers swampy wooded stream, lakes and ponds. There are two small ponds within 120 m of the project location.	Y	Y
Lilypad Clubtail				16	38	There are no marshy lakes or marshes.	N	N
Molluscs								
Tapered Vertigo	Documented in the general area (10 km squares)	N	N	1	12	Community 1 is a coniferous treed swamp and as this species prefers open calcareous sites, fens, beaches, alvars, or conifer swamps, it will be carried forward as generalized candidate SWH.	Y	Y
Reptiles								
Eastern Ribbonsnake Milksnake Common Five-lined Skink	Documented in the general area (10 km squares)	Y	Y	Fencerow 2	0.1	All reptiles will be considered as possibly occurring due to the presence of potential snake hibernacula. The distances listed in the column to the left are based on a 30 m area around the rock piles.	Y	N
				Fencerow 3	0.1			
				Fencerow 4	0			
				Fencerow 5	0			
				6	35			
				7	0.1			
Birds								
Black Tern	Documented in the general area (10 km squares)	N	N	N	N/A	There are no marshes in or within 120 m of the project location	N	N

Candidate Significant Wildlife Habitats	Feature documented in records review (Y/N)	Present in Project Location	Present within 120 m of Project	Community Number	Distance to Project Location or Applicable Infrastructure	Rationale	Carried Forward to Summary and EOS (Y/N)	Generalized Candidate SWH (Y/N)
Mammals								
Northern Long-eared Bat Eastern Pipistrelle	Documented in the general area (10 km squares)	N	Y	12 13 14	0.1 0.1 13	Both bat species were considered with bat hibernacula and bat maternity colonies. Bat maternity colonies will be generalized and carried into the EOS	Y	Y
Plants								
Giant Pinedrops	Documented in the general area (10 km squares)	N	N	N	N/A	This species is associated with dry woods containing conifers and a well-developed needle duff. There are several conifer woodlands within 120m of the project location however based on the records review they have been classed as wetlands.	N	N
Crested Arrowhead		N	N	N	N/A	There are no streams, lakes, or shorelines in or within 120 m of the project location.	N	N
Wild leek (S1)	N	N	Y	13	>120 m from access road 0.1 m from project location	This species prefers rich woodlands. This species was found during site investigations in Community 13.	Y	Y
Animal Movement Corridors								
Amphibian Corridors	N	N	N	N	N/A	There are no candidate amphibian breeding (wetland) habitats in or within 120 m of the project location. Therefore, this feature may be left at the Site Investigation	N	N

3.3 Site Investigation Conclusions

Project Location

The records review indicated that there were no candidate wetlands, woodlands or valleylands within the project location. This was confirmed during the site investigations. The site investigations documented that the project location consisted primarily of agricultural fields with some narrow deciduous treed windrows. The agricultural fields are under active agricultural use (ploughed fields). The deciduous treed windrows for the most part did not meet any of the SWHEC criteria and are not considered significant wildlife habitat. The only exception was the presence of rock piles within Fencerows 2, 3 and 5. These will be brought forward as candidate SWH – Snake hibernacula. These rock piles and a surrounding area of 30 m are identified as Candidate Snake hibernacula on Figure 5.

Surrounding 120 m Lands

The records review indicated that there was both a candidate wetland and woodland within 120 m of the project location (Figure 6). The site investigations corrected the records review in relation to the wetland features by adding two additional wetland features (Wetlands 2 and 3). The vegetation communities which form part of Wetland 1 are 1, 3 and 4, Wetland 2 consists of Community 15 and Wetland 3 of Community 16 (Figure 6).

The presence of the woodland feature was confirmed during the site investigations with the minor addition of an additional forest community to the woodland (Community 2 – an old cultural meadow that is regenerating into a deciduous woodland). Communities 1-4, 6, 8-10, 12-14 form part of the Candidate Woodland 1 (Figure 6).

There were no valleylands documented in the records review and this was confirmed during the site investigations.

The surrounding lands included a variety of habitats including both wetland and upland communities. The wetland vegetation communities consisted of coniferous treed swamp habitats (Communities 1 and 4), deciduous treed swamp (Community 3), and two small dug-out ponds which provide marsh habitat (Communities 15 and 16). The upland habitats included the active agricultural hay fields (Fields 7-10), a small cultural meadow (Community 11), two buckthorn thickets (Communities 5 & 7), woodlands (Community 2 & 6), and forests (Communities 8-10, 12-14). Some of these habitats also included additional features such as rock piles and bedrock (Fencerows 2, 3 & 5 and Communities 6 & 7).

Based on the habitats present and the criteria in the SWHEC the following candidate SWH were identified within the surrounding lands:

1. Bat maternity Colonies
2. Wintering Areas
3. Snake Hibernacula
4. Old Growth Forests
5. Turtle Nesting
6. Amphibian Breeding Habitat (Woodland)
7. Marsh Bird Breeding Habitat
8. Woodland Area-Sensitive Bird Breeding habitat
9. Habitat for Species of Conservation Concern
    a. Cyrano Darner
    b. Tapered Vertigo
    c. Eastern Ribbonsnake
    d. Milksnake
    e. Common Five-lined Skink
    f. Northern Long-eared Bat
    g. Eastern Pipistrelle
    h. Wild Leek

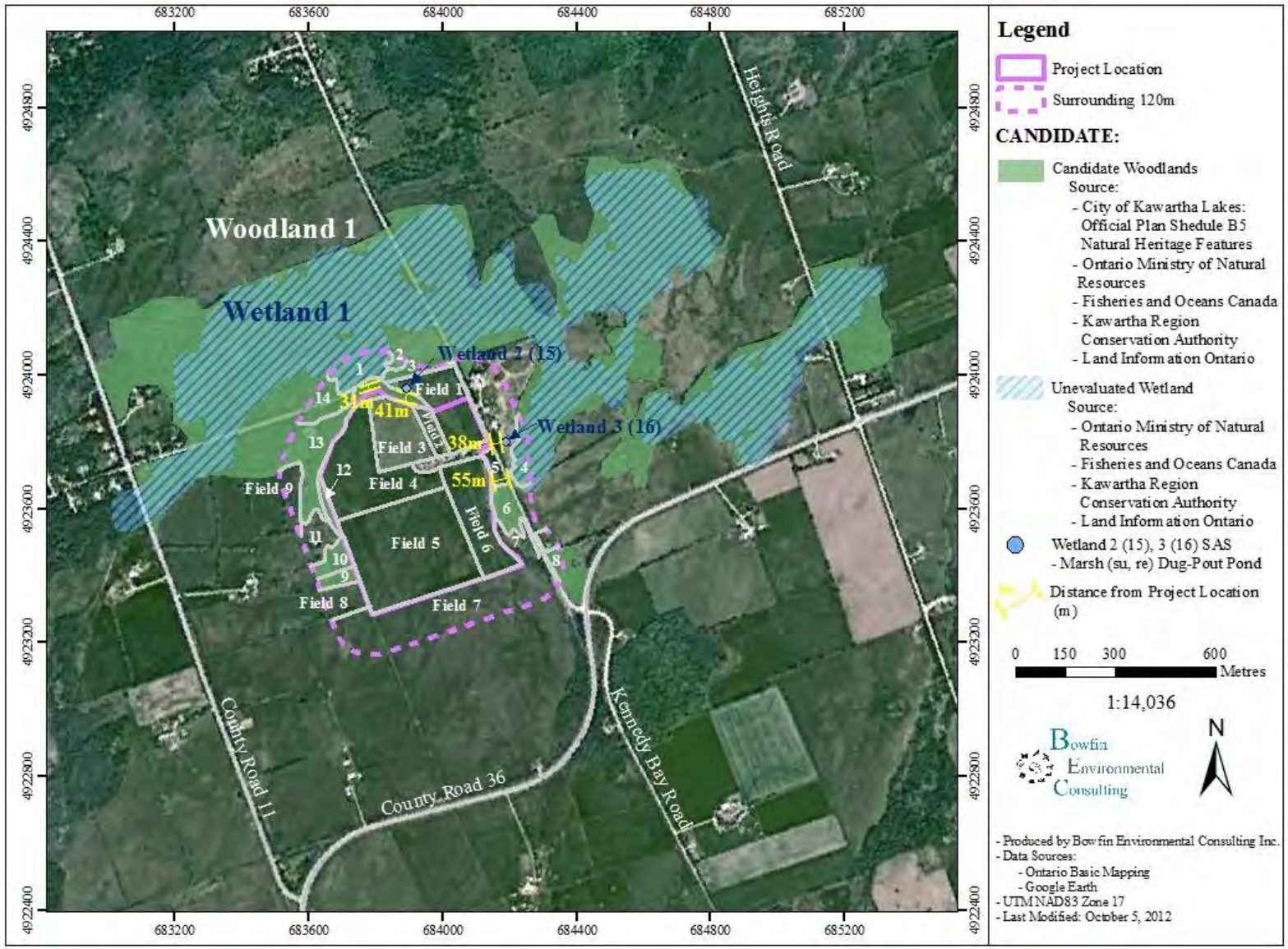
Using Appendix D of the NHAG only certain candidate SWH have to be identified within the 120 m of the project location. All others are to be treated as 'General Candidate SWH'. Of those listed above the only ones that need to be identified for this project are:

- Wintering Areas (Communities 15 & 16)
- Snake Hibernacula (Fencerows 2-5 and Communities 6 & 7)
- Turtle Nesting (Community 16)
- Amphibian Breeding Habitat (Woodland) (Communities 1, 3, 4, 8, 13 & 14)

All other candidate habitats listed above (numbers 1, 4, 7-9) will be grouped as one and treated as Generalized Candidate SWH. The communities associated with these are: 1, 3-5, 8-10, 12-16 and these are all identified as Candidate SWH on Figure 5. Note that Communities 15 and 16 are also brought forward as identified habitat for turtle wintering areas, turtle nesting and amphibian breeding habitat (as noted above).

Figure 5 Location of Known and Candidate SWH based on Site Investigations

Figure 6 Location of Known and Candidate Significant Woodland and Wetlands based on Site Investigations



4.0 EVALUATION OF SIGNIFICANCE

The records review and site investigation sections of this report provided information on the presence / absence of candidate significant natural features. The site investigations confirmed that the vegetation communities within the project location consisted of agricultural fields and deciduous fencerows. The surrounding lands included cultural meadow, thicket, woodland, mixed forest, deciduous forest, coniferous treed swamp, deciduous treed swamp and marsh. These sections confirmed that the study area is located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment and that there were no sand barrens, savannah, alvars or valleylands in or within 120 m of the project location.

The conclusion of the site investigation was that there was only one Candidate SWH within the project location (Snake hibernacula). Several features and candidate SWH were noted within the 120 m surrounding lands, these were:

- Candidate Significant Woodlands (Woodland 1)
- Candidate Significant Wetlands (Wetlands 1-3)
- Candidate SWH (Snake Hibernacula, Turtle Nesting, Turtle Overwintering Habitat, Amphibian Breeding Habitat – Woodland and Species of Conservation Concern - Plants)
- Generalized Candidate SWH.

All of the above were brought forward and are evaluated within this section.

Following the EoS, those items which are determined to be significant, assumed significant or treated as significant are shown on Figures 9 or 10 and will be brought forward to the EIS section of this report. Generalized Candidate Significant Wildlife Habitat will be carried forward to the EIS.

4.1 Methodology

The Evaluation of Significance (EoS) was completed during October 2012 based on the site visits completed during 2010-2012 and methodologies described in the NHAG and the SWHEC. The EoS was completed by Michelle Lavictoire, M. Sc. (Natural Resources) who is certified by OMNR to conduct wetland evaluations.

4.1.1 Wetlands

The methods utilized for the evaluation of significance (EoS) follows the procedures outlined in the NHAG, referencing OWES where applicable. The distance between the project location and the feature is given for those features determined to be, treated or assumed as significant.

4.1.2 Woodlands

Woodlands were evaluated based on the NHAG. A desktop exercise was used in which OMNR mapping; satellite imaging and the Ontario Base Mapping (OBM), LIO on-line mapping and Kawartha Conservation data were combined to locate the extent of the forest patch. The size of the woodlands located within the study area was confirmed during the site investigations. The woodlands were evaluated in context of their size, ecological functions, and uncommon characteristics. In order to be deemed significant, a woodland must meet the minimum standards for one or more criteria listed in the NHAG.

4.1.3 Wildlife Habitat

Within the project location, there was one candidate SWH brought forward – Snake hibernacula. This was evaluated as per the SWHEC.

The majority of the candidate SWH within the surrounding 120 m were grouped together as candidate Generalized SWH and were be brought forward to EIS. As per appendix D of the NHAG only four candidate SWH needed to be identified and confirmed using SWHEC:

- Snake Hibernacula
- Turtle Overwintering
- Turtle Nesting
- Amphibian Breeding Habitat (Woodland)

4.2 Results

4.2.1 Wetlands

Wetland 1

Wetland 1 is a large wetland which circles the north and east side of the study area (Figure 6). It is located within 31 m to the north and 55 m to the east of the project location. Mapping of the wetland feature was completed based on roadside surveys, satellite imaging and mapping collected during the records review [Kawartha Conservation and LIO (make-a-map)]. It is noted that the wetland unit which has been evaluated likely forms part of a wetland complex. Other wetlands located nearby with which it could be complexed are shown on Figure 7. Since this is potentially a very large wetland and is located entirely on the other side of public roads from the proposed solar facility, this wetland will be assumed significant and Appendix C of NHAG was utilized for the evaluation (Table 9).

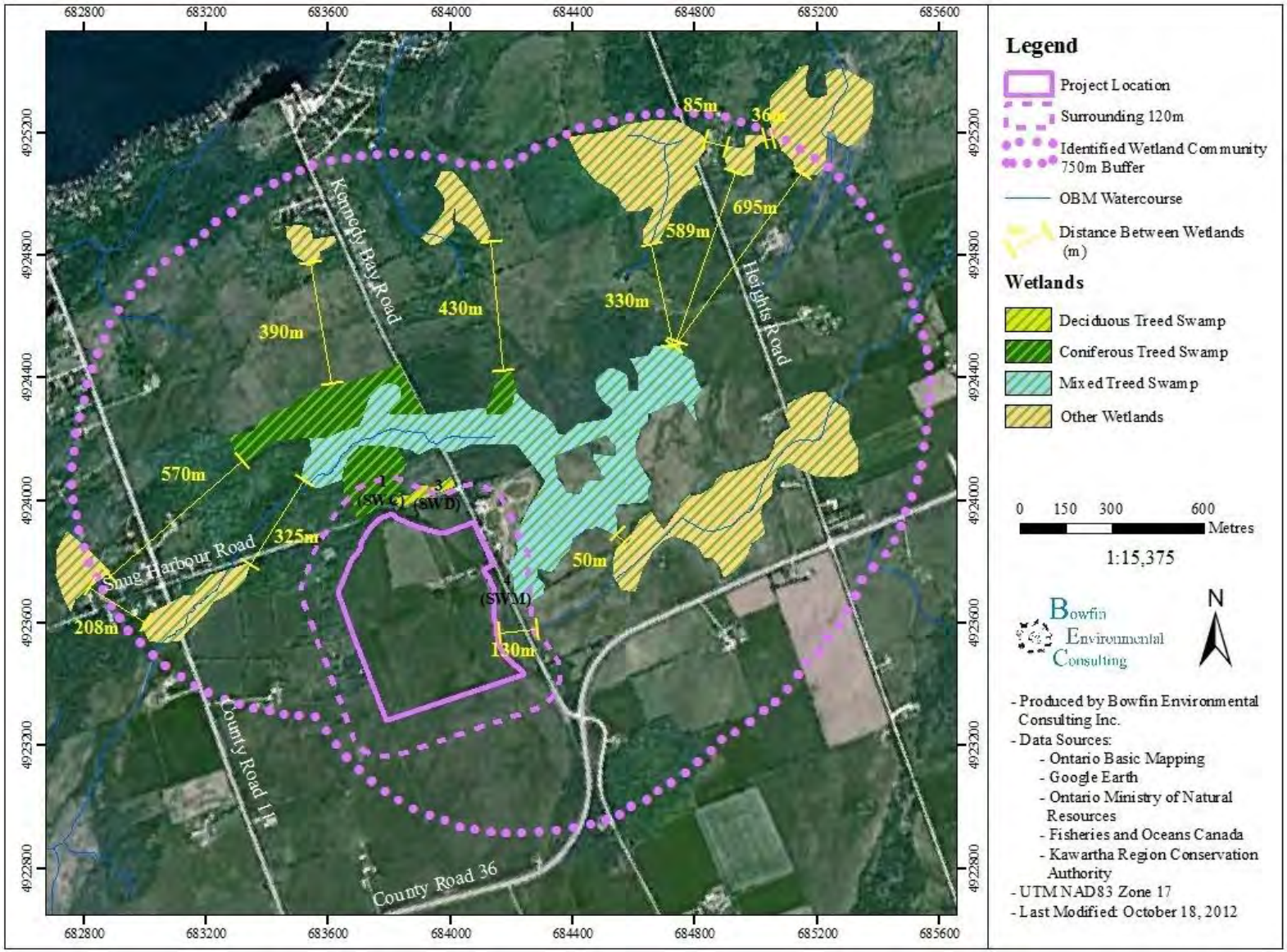
Conclusion: Wetland 1 will be assumed to be significant and will be brought forward to the EIS.

Table 9 Wetland Characteristics and Ecological Functions for Wetland 1

Characteristic/Ecological Function	Details
Wetland Size (ha)	40.6 ha
Biological Component	
Wetland Type	**SWAMP** The entire wetland unit consisted of swamp habitat. Based on the information collected in the field, there was no channeling or evidence of vernal pools in the areas surveyed. The portion of the swamp within the 120 m appeared to consist of common species with the majority of the coniferous community being a pure white cedar stand. The wetland is located on the other side of the roads and there is little to no potential for the solar facility to impact the wetland function.
Site Type	**Riverine** (based on the assumption that the watercourse located within the wetland has a continuously defined channel). While the wetland could be riverine, the portion of the wetland nearest to the project location was dry and did not have any surficial hydrological connection with project location. There is no potential to impact the surficial hydrology (LRL report, see EIS).
Vegetation Communities	Community 1 – c, eastern white cedar Community 2 – h, green ash, American elm; ts, red osier, silver maple; ls, red-osier dogwood, white ash; gc, grass-leaved goldenrod, spotted joe-pye-weed Community 3 – c, eastern white cedar; h, trembling aspen, balsam poplar These were all common community types.
Proximity to Other Wetlands	There is another swamp located downstream within 500 m of the wetland 1. While there was no hydrological connection with the project location, there appears to be a watercourse located in the northern section of the wetland which flows from east to west before heading north to Sturgeon Lake. There are several other potential wetland communities along this watercourse.
Interspersion	This wetland unit was fairly homogenous (based on satellite mapping) and does not provide a high amount of edge habitats for the wetland species.

Characteristic/Ecological Function	Details
Open Water Types	There is no open water within Wetland 1
Hydrological Component	
Flood Attenuation (Total)	The wetland is located within the headwaters, is not isolated and has a very steep slope on the south side (limiting the catchment area). It would have a low flood attenuation.
Water Quality Improvement (Total)	This wetland serves a moderate function for water quality improvement. More than 50% of the upstream catchment land-use consists of forested lands and the watercourse within the wetland is very small (headwaters). However, there are no other wetlands located upstream.
Shoreline Erosion Control	The banks of the small watercourse are well vegetated. This watercourse is over 120 m from the project location.
Groundwater Recharge (Total)	There is a low groundwater or recharge potential with this wetland unit (no evidence of groundwater seepage and soil consisting of loam).
Special Features Component	
Species Rarity (Total)	Swamp habitat is not a rare wetland type within this jurisdiction (OWES). No information obtained during site visits of from the background information indicate a potential for species rarity to occur.
Significant Features and Habitats (Total)	There is no open water features associated with this wetland and as such it does not provide habitat for colonial waterbirds, the wetland has a large coniferous component but is not identified as a deer yard by MNR, it has no waterfowl staging or moulting habitats and poor potential for waterfowl nesting.
Fish Habitat (Total)	No fish information on the watercourse located within the wetland was available.

Figure 7 Location of Wetland 1 in Relation to other nearby Wetlands



Wetland 2

Wetland 2 was located on the south side of Snug Harbour Road, 41 m to the north of the project location. This wetland feature consisted of an isolated dug-out pond. OWES applies a general rule that wetlands which are less than 2 ha in size are not evaluated unless they provide important habitat for wildlife or an important function. Wetland 2 consists of one community (Community 15) and is < 0.2ha in size. This feature is man-made, hydrologically isolated and no special features or functions, which would suggest that this small feature should be evaluated, were documented. However, since there remains the potential for this wetland to provide SWH (turtle overwintering areas and amphibian breeding woodland) pending pre-construction surveys, the wetland will be treated as significant. Additional information on the SWH functions and pre-construction surveys is provided in Sections 4.3.2 and in the EIS.

Conclusion: This wetland is too small to be considered a significant wetland and no significant functions were identified to date. However as there are pending surveys, this wetland will be treated as significant and brought forward. If the wetland is found to provide any SWH, then it will be complexed with Wetland 1, otherwise it will not be.

Wetland 3

Wetland 3 was located on the east side of Kennedy Bay Road, 38 m to the east and on the other side of the road from the project location. This wetland feature consisted of an isolated dug-out pond. Wetland 3 consists of one community (Community 16) and is < 0.2ha in size. While this feature is located on private land, the fact that it is man-made, hydrologically isolated and surrounded by highly disturbed area would suggest that this small feature should not be evaluated. However, since there remains the potential for this wetland to provide SWH (turtle overwintering areas, turtle nesting habitat and amphibian breeding woodland) this wetland will be assumed as significant. (No additional surveys are proposed as this wetland is located on private property and is not anticipated to receive direct impacts as it is situated on the other side of Kennedy Bay Road).

Conclusion: This wetland is too small to be considered a significant wetland and did not provide any significant functions. However as there remains the potential for this wetland to provide SWH it will be brought forward as assumed significant and complexed with Wetland 1.

4.2.2 Woodlands

There was one Candidate Significant Woodlands identified during the records review and confirmed during the site investigations: Woodlands 1. As noted during the Records Review, Woodland 1 is a large woodland, 103 ha, of which a portion is located within the study area. Site investigations confirmed that there were no breaks in the canopy larger than 20 m and as such all communities form part of the one woodland. The change to the records review was the addition

of Community 2 to the Woodland. This area was listed as cultural meadow in the Kawartha Conservation mapping (Appendix A), however it appears to be regenerating and should now be classed as woodland as per the ELC. No other corrections were made.

Within the study area, the woodland was composed of eleven polygons with ten different community types; three wetland and seven upland vegetation communities. These are listed below with the community number as depicted on Figure 4, above, in brackets:

- Coniferous Treed Swamp (1);
- Fresh-Moist Poplar Deciduous Woodland (2);
- Deciduous Treed Swamp (3);
- Mixed Treed Swamp (4);
- Dry-Fresh White Cedar Coniferous Woodland (6);
- Fresh-Moist White Cedar Hardwood Mixed Forest (8)
- Dry-Fresh White Cedar Coniferous Forest (9);
- Dry-Fresh Sugar Maple Deciduous Forest (10 & 13);
- Dry-Fresh White Ash Hardwood (12); and
- Fresh-Moist Sugar Maple Lowland Ash Deciduous Forest (14).

Overall, Woodland 1 was 103 ha in size. This large woodland circled a part of the project location and was found immediately adjacent to the project location on the western and northern sides and within 60 m on the eastern side.

Woodlands are evaluated based on three criteria identified in the NHAG: woodland size, ecological functions and uncommon characteristics. Should a woodland meet any one of these requirements, then the woodland is considered significant.

The woodland coverage of the Kawartha Haliburton Source Protection Area is 25% (City of Kawartha Lakes OP). Woodland 1 is evaluated in Table 10, below.

Summary

Woodland 1 meets the criteria to be considered significant woodland in terms of its size, ecological functions criteria (woodland interior, proximity to other significant habitats, linkages, water protection and woodland diversity) and uncommon characteristics.

Under the NHAG, if a woodland meets a significance criterion found in Table 10 it must also meet a minimum width criteria to be deemed significant. In this instance the minimum average width required is 40 m, Woodlands 1 meets this criterion (Figure 6).

Conclusion: Woodland 1 will be brought forward as a significant woodland.

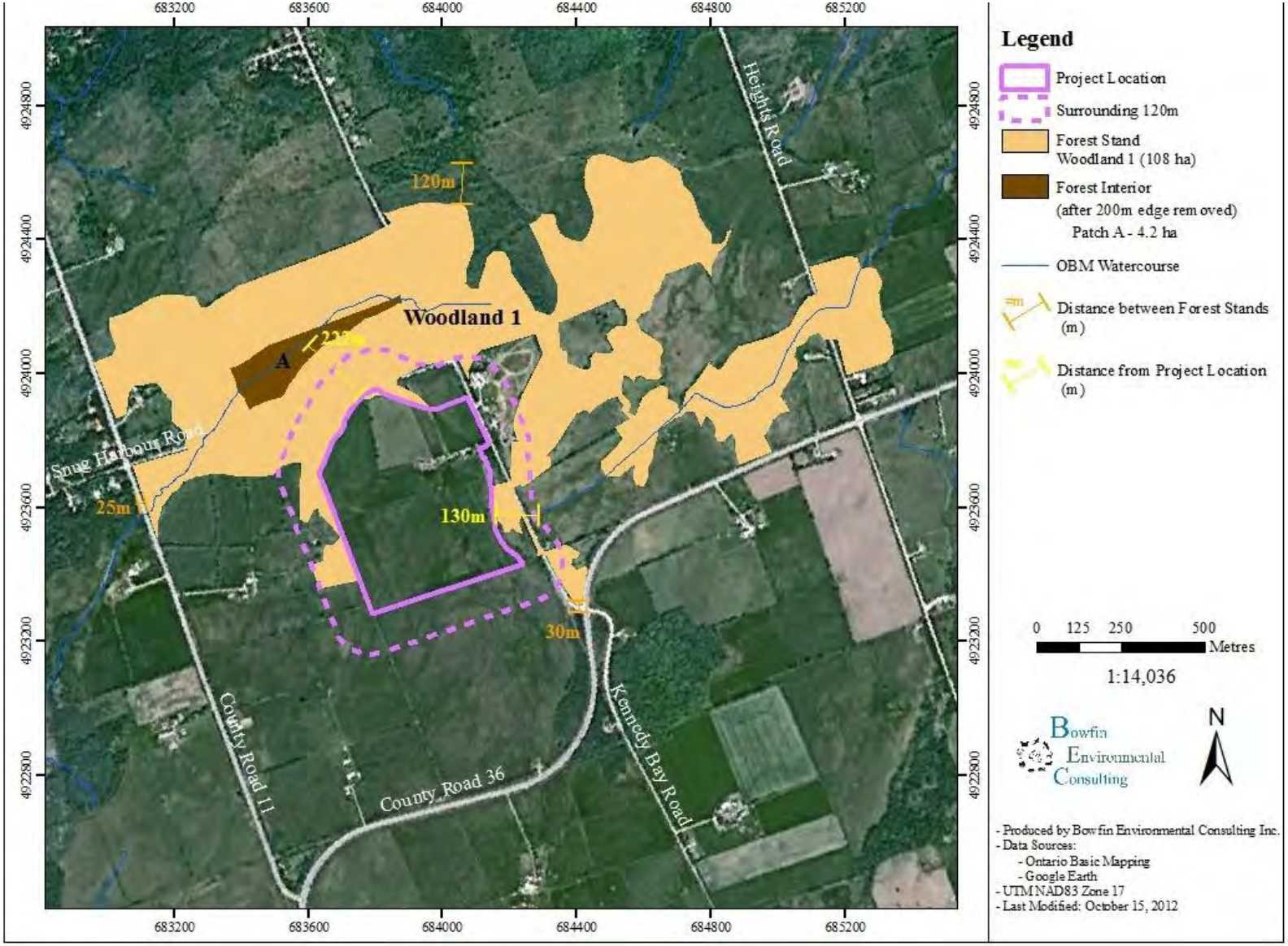
Table 10 Evaluation of Significant Woodlands 1

Criterion	Comments	Meets Minimum Requirements
1. Woodland Size The NHAG states that the minimum size threshold for forests in municipalities with a forest cover of 16-30% is ≥ 20 ha.	The forest stand that abuts portions of the project location forms part of a large, 103 ha forest (Figure 8).	Yes
2. Ecological Functions Criteria **a) Woodland interior** (includes all forest located at least 100 m from the woodland's perimeter) **Minimum size – 2 ha**	There are four interior patches which vary in size from 0.1 ha to 12.6 ha. Patches A and C meet this requirement. The others do not (Figure 8). Note that the interior habitat is located within the surrounding lands. This interior habitat does not meet the minimum size criteria for this area.	Yes
b) Proximity to other woodlands or other significant natural heritage features **Minimum size – 4 ha** In order to meet this requirement the woodland must meet the minimum size threshold and be within 30m of a significant natural feature or fish habitat.	The woodland includes a wetland feature and there is a tributary running along the northern portion which may provide fish habitat. The woodland meets the minimum size for this feature. (Figure 8)	Yes

Criterion	Comments	Meets Minimum Requirements
Linkages In order to meet this criterion the stand must be linked to two other features, each within 120m and have the minimum size. **Minimum size – 4 ha**	Woodland 1 is located near several other woodlands located outside of the study area: 25 m from one to the west, 30 m to the south and 120 m to the north.	Yes
Water protection Includes woodlands located within 50 m or top of valley bank if greater of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and the woodland meets the minimum area threshold **Minimum size – 2 ha**	As mentioned above there is a tributary flowing through the northern portion of the woodland (outside of the study area).	Yes
Woodland diversity This criterion stipulates that the stand needs to be dominated by naturally occurring sugar maple, black maple, silver maple, red maple, yellow birch, hickory, beech, black ash, walnut, tamarack, spruce, pine, oak, basswood or hemlock. **Minimum size –4 ha**	Portions of the woodland were dominated by naturally occurring sugar maple and the woodland meets the minimum size.	Yes

Criterion	Comments	Meets Minimum Requirements
Uncommon Characteristics This criterion refers to woodland stands that are considered uncommon based on the composition, cover type, age or structure **Minimum size –2 ha**	The communities within the study area are not ranked as S1, S2 or S3 and the communities did not meet older woodland or larger tree size criteria. However, Community 13 contained a species with a coefficient of conservation value of 9 (wild leek) and as such this portion of the woodland meets the uncommon characteristics criterion.	Yes

Figure 8 Delineation of Forest Patch (based on NHAG and desktop exercise, ground truthed within the study area)



4.2.3 Significant Wildlife Habitat

Project Location

The only candidate SWH identified within the project location were the rock piles found within fencerows 2-5. These were all located along the outer edge of the project location and some may need to be moved during the installation of the perimeter fence. As such these candidate snake hibernacula were considered as being located within the project location.

All candidate snake hibernacula consisted of rock piles located along the edges of agricultural fields. During the site investigation visits only one watersnake was encountered and this was observed near Community 15 (Wetland 2).

Conclusion: Since no snake hibernacula studies were completed, the proponent will commit to treating the rock piles as significant SWH – Snake Hibernacula and to undertaking a study of the habitat use prior to construction. This feature will be brought forward to the EIS as SWH.

Surrounding Lands

As per appendix D of the NHAG there were four candidate SWH which needed to be identified for this project:

- Snake Hibernacula
- Wintering
- Turtle Nesting
- Amphibian Breeding Habitat (Woodland)

In addition to these four, all other confirmed candidate SWH were grouped together as one and will be brought forward to EIS as generalized candidate SWH.

Snake Hibernacula

Within the surrounding lands, the candidate SWH – Snake Hibernacula consisted of the rock piles located along the edges of the farm field or bedrock outcrops. Two of the rock piles continued outside of the project location. These were located on the eastern side of fencerow 3 (abuts the project location) and the northern rock pile in Fencerow 5 (40 m from the project location). The bedrock was situated in Communities 6 (35m from the project location) and 7 (abuts project location) (Figure 10).

Conclusion: Since no snake hibernacula studies were completed, the proponent will commit to treating the rock piles as significant SWH – Snake Hibernacula and to undertaking a study of the habitat use prior to construction. This feature will be brought forward to the EIS as SWH.

Turtle Overwintering Area

The two small wetlands Wetland 2 (Community 15) and Wetland 3 (Community 16) were identified as candidate turtle overwintering habitat. Both consisted of dug-out ponds. Community 15 is located 41 m to the north and Community 16 is 38 m to the east of the project location. Community 16 (Wetland 3) is located on the other side of the road from the project area and on private property.

Conclusion:

Community 15 (Wetland 2) – This site is accessible and is located on the same side of Snug Harbour Road as the project location. Since no turtle surveys were completed, the proponent will commit to treating the dug-out pond as significant SWH – turtle overwintering and to undertaking a study of the habitats' use prior to construction. This community will be carried forward to EIS to discuss survey methodology and potential impacts and mitigation measures.

Community 16 (Wetland 3) – This site is on private land, across a public road from the project location. There is no potential for direct impacts. As such, this community will be assumed significant and brought forward to the EIS as SWH.

Turtle Nesting Area

Only Community 16 (Wetland 3) is considered as providing potential turtle nesting area due to the presence of what looks like sandy trails on the satellite imaging. As indicated above, this community is a dug-out pond situated on the other side of Kennedy Bay Road and on private property. The nearest turtle nesting area is 38 m from the project area. There is no potential to cause any direct impacts to this feature and as such it will be assumed significant.

Conclusion: There is no potential for direct impacts. As such, this community will be assumed significant and brought forward to the EIS as SWH.

Amphibian Breeding Habitat (Woodland)

The two small wetlands Wetland 2 (Community 15) and Wetland 3 (Community 16) were within 120 m of woodlands. There is also the potential for vernal ponding to occur within Communities

1, 3, 4, 8, 13 and 14. All of these communities have been identified as candidate amphibian breeding habitat (Woodland) and all are within the 120 m surrounding lands.

In order to be confirmed as significant, there must be the presence of 1 or more of the listed species (eastern newt, blue-spotted salamander, spotted salamander, gray tree frog, spring peeper, western chorus frog or wood frog) with a minimum of 20 individuals in total. This requires three observational visits to determine breeding/larval stages during the spring (April-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland. Based on the initial field work completed during the early spring, including auditory amphibian breeding surveys (Marsh Monitoring Protocol) conducted by Niblett, these communities did not meet this minimum requirement for frogs. However, two additional auditory surveys as well as egg mass surveys of the communities south of Snug Harbour Road and west of Kennedy Bay Road as need to be completed.

Niblett utilized the following protocol:

- Evaluation methods followed the Marsh Monitoring Protocol.
- Amphibian call surveys were performed at a total of 7 stations on a single night in April, 2011, between one half-hour after sunset and before midnight. One of these station locations is no longer associated with any candidate SWH following a change in the project layout (station #6) and no longer applies to any candidate habitat in or within 120 m of the site.
- Monitoring stations were established a minimum of 500 m apart and 3 minute surveys were performed at each station, listening for all amphibian calls within a semi-circular sampling area.
- Survey dates, timing and weather conditions are detailed in Appendix B.

As such additional surveys will be completed meeting the following:

- Two additional visits (in May and June of 2013).
- Since the candidate habitat north of Snug Harbour Rd. and east of Kennedy Bay Rd is now being treated as significant and carried forward to the EIS for mitigation (without post-construction monitoring), only station number 5 will require revisiting. Pre-construction commitments are further discussed in the EIS
- Salamander egg searches in March and April are also required. Pre-construction monitoring protocol will be MNR approved and detailed in the EIS

Conclusion:

<u>Community 13, Community 15 (Wetland 2) and portions of Community 14 on the south side of Snug Harbour Road</u> – Since additional amphibian surveys are required to confirm the presence/absence of significant habitat, the proponent will commit to treating these as significant

SWH – Amphibian Breeding Habitat (Woodland). These communities will be carried forward to EIS as SWH to discuss survey methodology and potential impacts and mitigation measures.

Communities 1, 3, 4 and 13, Community 16 (Wetland 3), and portions of Community 14 on the north side of Snug Harbour Road – These areas are on private land across a public road from the project location. There is no potential for direct impacts. As such, these communities will be assumed significant and brought forward to the EIS as SWH.

Generalized Candidate Significant Wildlife Habitat

All other candidate habitats within the surrounding 120 m listed below were grouped as one and treated as Generalized Candidate SWH. The communities associated with these identified features are: Communities 1, 3-5, 8-10 and 12-16 (note that communities 15 and 16 are also assumed/treated as significant). All are identified as Candidate Generalized SWH on Figure 10. As per Appendix D of the NHAG generalized candidate SWH will be treated as significant and brought forward to the EIS.

- Bat maternity Colonies
- Old Growth Forests
- Marsh Bird Breeding Habitat
- Woodland Area-Sensitive Bird Breeding habitat
- Habitat for Species of Conservation Concern
    - Cyrano Darner
    - Tapered Vertigo
    - Northern Long-eared Bat
    - Eastern Pipistrelle
    - Wild Leek

4.3 Summary of the Evaluation of Significance

Based on the accepted methods for determining significance of natural features (i.e. NHAG, SWHEC, SWTHG, OWES), Woodland 1 was brought forward as Significant (Figure 9). Wetlands 1 and 3 was brought forward and assumed significant. Wetland 2 was brought forward and treated as significant pending the results of the pre-construction surveys. (The difference between Wetlands 2 and 3, is that Wetland 2 is accessible and located on the same side of the public road as the project location whereas Wetland 3 is on private land on the opposite side of a public road).

All snake hibernacula were treated as significant and are being brought forward along with pre-construction survey commitments.

The amphibian breeding habitat (woodland) and turtle overwintering area associated with Wetland 2, Community 13 and part of Community 14 on the south side of Snug Harbour Road were treated as significant and brought forward along with pre-construction survey commitments.

Turtle overwintering, turtle nesting areas and amphibian breeding habitat (woodland) associated with Wetland 3 and Communities 1, 3, 4 and 13 and part of Community 14 were located within the surrounding 120 m and assumed significant.

Several other candidate SWH located outside of the project location were grouped together and assumed significant and brought forward to EIS. As such an EIS is required and is presented in the next section.

Table 11 Summary of Significance of Natural Heritage Features Identified within the Study area and Setback Requirement

Natural Heritage Feature	Present in Project Location?	Present within 120 m of Project Location?	Identified during Records Review	Identified during Site Investigations	Significance Results	EIS Required (yes/no)
Wetlands 1	N	Y	Y	Y	Assumed	Y
Wetland 2	N	Y	N	Y	Treated	Y
Wetland 3	N	Y	N	Y	Assumed	Y
Woodland 1	N	Y	Y	Y	Yes	Y
Valleylands	N	N	N	N	N/A	N
ANSIs	N	N	N	N	N/A	N
Snake Hibernacula (fencerows 2, 3, 4, 5 and communities 6 & 7)	Y	Y	N	Y	Treated	Y
Turtle Overwintering/Amphibian Breeding Habitat (Woodland) (Community 15)	N	Y	N	Y	Treated	Y

Natural Heritage Feature	Present in Project Location?	Present within 120 m of Project Location?	Identified during Records Review	Identified during Site Investigations	Significance Results	EIS Required (yes/no)
Amphibian Breeding Habitat (Community 13 and Community 14, south of Snug Harbour Road)	N	Y	N	Y	Treated	Y
Turtle Overwintering/ Turtle Nesting/Amphibian Breeding Community 16	N	Y	N	Y	Assumed	Y
Amphibian Breeding Habitat (Woodland) (Communities 1, 3, 4 and Community 14 north of Snug Harbour Road)	N	Y	N	Y	Assumed	Y
Generalized Candidate Significant Wildlife Habitat	N	Y	N	Y	Assumed	Y

Figure 9 Significant Wetland and Woodland Features brought forward to EIS

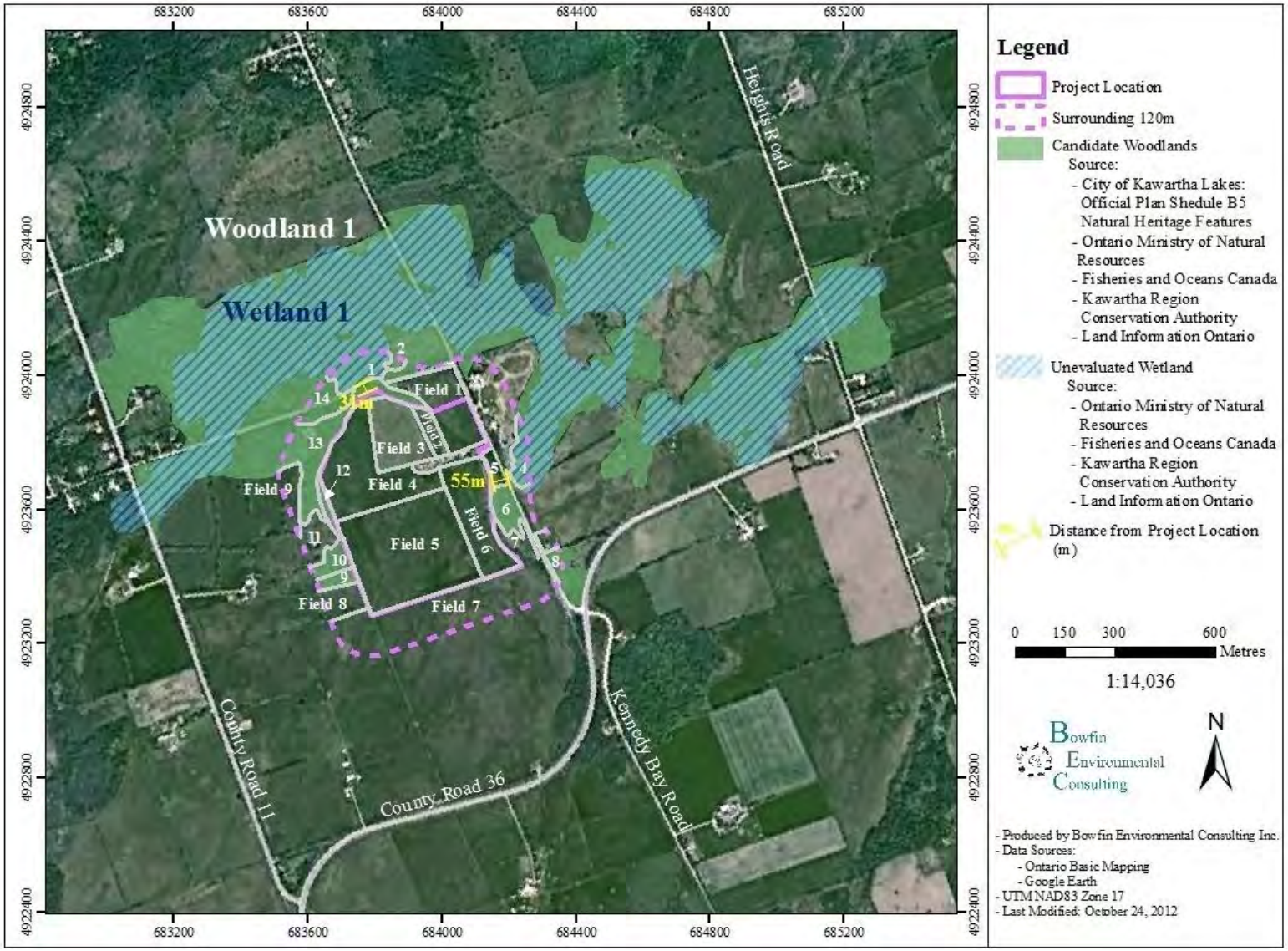
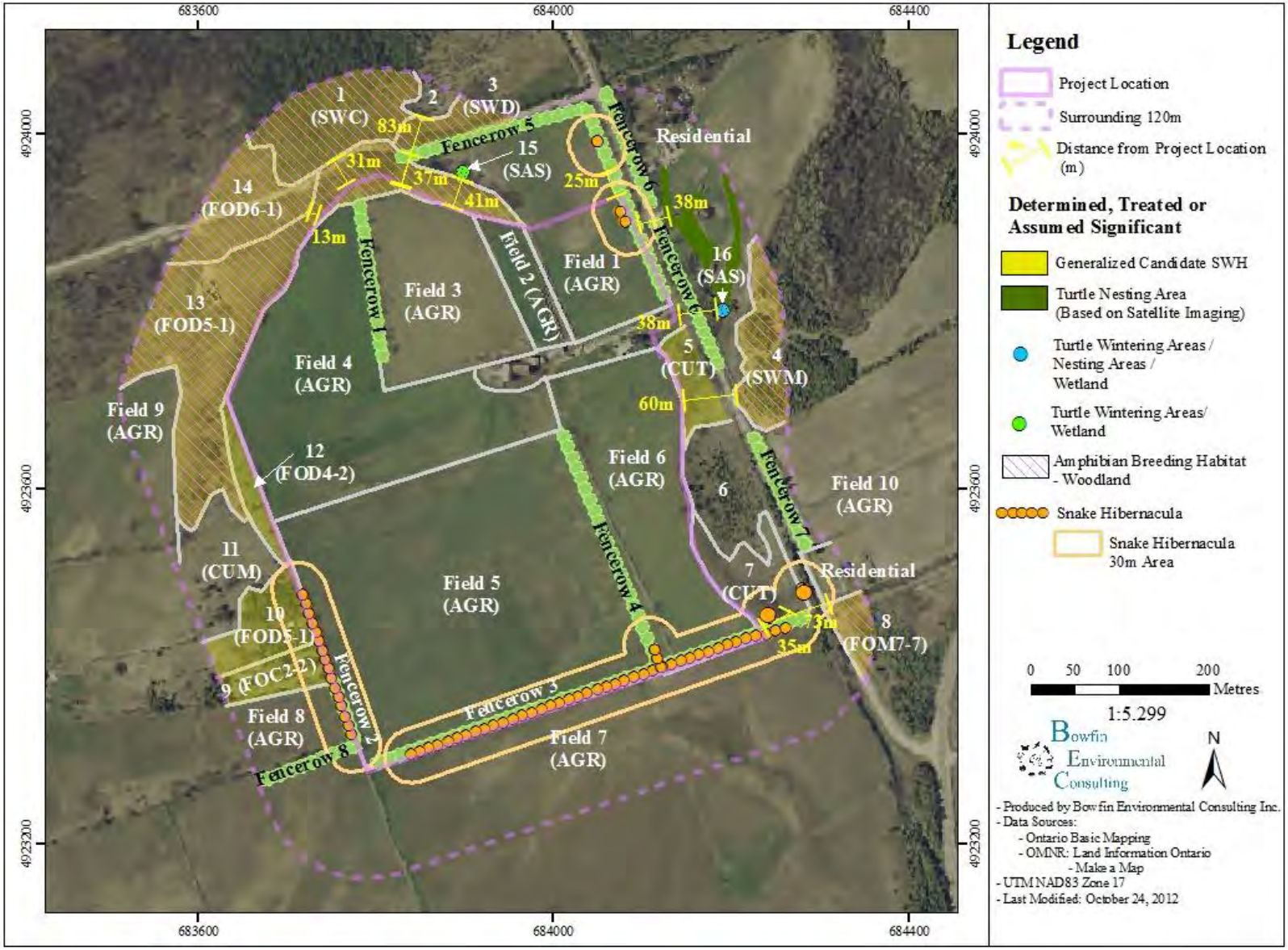


Figure 10 Significant Wildlife Habitat and Generalized SWH brought forward to EIS



5.0 ENVIRONMENTAL IMPACT STUDY REPORT

Pursuant to O.Reg 359/09 section 38, the applicant must prepare an Environmental Impact Study report if they wish to construct, install or expand a renewable energy generation facility in or within 120 m of any of the following locations:

- A provincially significant wetland (southern or coastal);
- A significant valleyland;
- A significant woodland;
- A significant wildlife habitat; or
- A provincially significant life science ANSI.

or

in or within 50 m of any of the following locations:

- A provincially significant each science ANSI.

The evaluation of significance (section 4.0 of this report) found that there was one candidate significant feature located within the project area: candidate SWH – Snake Hibernacula.

The surrounding lands (within 120 m of the project location) included two wetlands that were assumed to be significant (Wetlands 1 and 3), one wetland that was treated as significant, a Significant Woodlands (Woodland 1) and several candidate SWH. As per Appendix D of the NHAG, many of the candidate SWH were grouped together and brought forward as Generalized candidate SWH. There were just four requiring identification [snake hibernacula, wintering area, turtle nesting areas and amphibian breeding habitat (woodland)] which were brought forward.

As such an environmental impact study (EIS) report is required for these features. The boundaries of these features are identified in Figures 9 & 10. The evaluation of these natural heritage features was completed by Michelle Lavictoire during October 2012 (resume is provided in Appendix B).

This section provides a description of the proposed solar facility. This is followed by a discussion of the potential for the project to cause negative environmental effects during construction, operation or decommissioning on any of the features that were found, treated or assumed to be significant. Recommended mitigation measures are provided.

The solar facility will consist of single photovoltaic (PV) modules that are approximately 1 m x 2 m in dimension. The modules are grouped in arrays which are aligned in east-west rows; these rows are separated by access aisles approximately 5 m in width. The project area will consist of approximately 44, 000 PV modules and 8 or more modular collection houses. The modules are static.

The construction of this facility will require the upgrading of an existing driveway located on Kennedy Bay Road. A 44kV tap-line line will be constructed within the project location and it will connect to Hydro One distribution feeder on Kennedy Bay Road near the end of the access road (refer to Figure 2 for component locations). A perimeter fence will be installed around the outer edge of the project location for safety and security reasons. The total area occupied by the facility will be approximately 25 ha. At this time it is unknown if it this interconnection tap-line will be connected by overhead or underground wire and as such, both methods were included within this report.

All construction activities will be restricted to the agricultural lands. The facility has been designed to avoid impacts to the woodland by eliminating vegetation clearing within the drip line of the woodland. All clearing and grading activities will thus be restricted to the agricultural fields and the fencerows within the project location. It is noted that a hedge may be planted along a portion of the east side (as a visual barrier).

This proposed solar facility could impact natural features during construction, operation or decommissioning phases through the following activities:

1. Construction /Decommissioning
    a. Vegetation Removal
    b. Grading
    c. Building Construction/Installation of infrastructure
    d. Road Construction
2. Operation
    a. Groundwater taking
    b. Application of herbicides (if required)

Note that since activities associated with construction and decommissioning phases are similar, they are treated as one.

The significance of the potential impacts is measured using four different criteria:

1. Area affected may be:
    a. local in extent signifying that the impacts will be localized within the project area
    b. regional signifying that the impacts may extend beyond the immediate project area.

2. Nature of Impact:
    a. negative or positive
    b. direct or indirect

3. Duration of the impact may be rated as:
    a. short term (construction phase, 1-2 years)
    b. medium term (3-4 years)
    c. long term (>4 years).
    d. permanent

4. Magnitude of the impact may be:
    a. negligible signifying that the impact is not noticeable
    b. minor signifying that the project's impacts are perceivable and require mitigation
    c. moderate signifying that the project's impacts are perceivable and require mitigation as well as monitoring and/or compensation
    d. major signifying that the project's impacts would destroy the environmental component within the project area.

The level of impact and potential effects on the functions and features is discussed for each of the significant features in the paragraphs below beginning with construction/decommissioning phase followed by operational phase. The proposed mitigation measures are listed in Table 12. This table also includes a summary of the potential impacts and effects.

5.1 Significant Wetlands

There were no wetlands located within the project location however three were situated within the surrounding 120 m. Of these wetlands Wetland 1 was assumed to be significant based on Appendix C of NHAG, Wetland 2 was treated as significant pending the outcome of additional SWH studies and Wetland 3 was assumed to be significant and complexed with Wetland 1.

Construction/Decommissioning - Potential Impacts

There is no potential for direct impacts of any of the above activities on the wetland as all three are located outside of the project location.

The potential to indirectly impact any of the wetlands is rather low as there are no surficial hydrological connections between the project location and the wetlands and there will be no work within 30 m of the wetlands (which will result in maintenance of the existing natural vegetation buffer between the project location and the wetlands). The potential to indirectly impact wetlands 1 and 3 is much lower than wetland 2 as these are located on the other side of public roads (Snug Harbour and Kennedy Bay Roads).

Regardless, there continues to be a possibility that any of the activities listed under construction (clearing, grading, building, road construction and upgrading) could result in indirect impacts to the wetland by altering the quality and/or quantity of surface flow (runoff) to the wetlands. These alterations could be the result of:

- An increase in exposed soil within the project location during clearing and grading could result in increased transportation of sediment offsite in the surface runoff.
- A reduction of the permeability of the soil (soil compaction), an increase in the amount of impermeable area and/or an alteration to the contours of the land within the project location could affect the quantity of water contribution to the wetlands.
- Accident or malfunction causing a spill, depending on the volume, location and weather conditions (heavy rainfall could cause runoff towards a wetland).

These potential changes in surface water quality and quantity could in turn affect the vegetation and/or fauna species residing within the wetlands. The potential impacts associated with the construction phase would be local, negative and indirect, short term (period of exposed soil) to long term (i.e. increase in impermeable surfaces) and minor in magnitude. Mitigation measures are provided in Table 12.

Operational Phase - Potential Impacts

During the operation phase the wetland communities could be impacted by the water taking activities and the application of herbicides. Water taking can affect the distribution of water to wetlands (thereby affecting wetland plant and wildlife composition) and the application of herbicides or an accident or malfunction could result in a decrease in water quality. Should runoff containing herbicides or petroleum chemicals reach wetlands it could result in a loss of sensitive vegetation, loss of wildlife habitat, wildlife mortality and/or pollution of the groundwater/surface waters depending on the level of contamination. A hydrogeological statement was prepared by Levac Robichaud Leclerc Associates (LRL) entitled *Hydrogeological Impact Statement for the Proposed Solar Farm Penn Energy – Ridgefield Part of Lot 5, Concession 10 Geographic Township of Fenelon, City of Kawartha Lakes, Ontario*. LRL has concluded that the minor amount of water taking associated with the operation of this facility

will not have any impact on the hydrogeological regime. Based on this information, the operation of this facility will not affect the wetland in terms of water quantity. No mitigation measures are required for the water taking.

With regards to herbicide application, it is noted that the proponent does not intend to utilize herbicides preferring to use regular mowing to control the vegetation. Mowing within the project location would not impact the wetlands. Should herbicides be required at some point in the future, they would have a potential to reduce water quality. While the maintenance activities will have limited number of vehicles, the potential for an accidental spill remains. This impact would be local, negative and indirect, long term and minor (assuming proper application of herbicides and quick response to any spills).

Table 12 summarizes any potential negative impacts to the wetlands and mitigation measure to be implemented to avoid and minimize these impacts during construction/decommissioning and operation. It is anticipated that through proper implementation and monitoring of these mitigations measures that there will be no residual impacts on the wetlands.

No post-construction monitoring or reporting is required for this item.

5.2 Significant Woodlands

The evaluation of significance found that there was a significant woodland located within the study area but none located within the project location (Figure 9). There is no potential for direct impacts of any of the above activities on the woodland as the communities associated with this feature are all located outside of the project location.

Construction/Decommissioning - Potential Impacts

Indirect impacts to the woodland vegetation could result from any clearing and grading activities located within the drip line of the woodland trees which could cause root damage to the trees within the edge. The installation of the perimeter fence and the access road around the outer edge could also impact the root system of the individuals along the edge. Any of the construction activities within the project location could also cause indirect impacts to the woodland in terms of its ecological function through noise and potentially light pollution (if construction activities occur at night). Noise and light pollution can result in impacts to wildlife (such as avoidance, decreased productivity). Finally, should large expanses of exposed soil be present resulting in dust generation, the trees located along the edge could be impacted by settling of dust on their leaves thereby causing decrease in photosynthesis and affecting the health and productivity of these individuals. Prior to mitigation, the potential impacts during construction / decommissioning would be local, negative and indirect, short term and minor in magnitude.

Operational Phase – Potential Impacts

During operation, operation of vehicles along the outer access road could cause soil compaction and damage to the root system of the individuals along the edge. Prior to mitigation, these potential impacts would be local, negative and indirect, long term and minor in magnitude.

Table 12 summarizes any potential negative impacts to the woodland and its function and presents mitigation measure to be implemented to avoid and minimize these impacts during construction/decommissioning and operation. It is anticipated that through proper implementation and monitoring of these mitigations measures that there will be no residual impacts on the woodlands.

No post-construction monitoring or reporting is required for this item.

Table 12 Summary of Potential Impacts and Mitigation Measures for Significant Woodland and Wetland Features

Feature ID	Distance to Project Location	Potential Negative Effects	Mitigation Measures	Objectives, Post-Construction Monitoring, and Contingency Plans
Wetland 1 **Wetland 2** **Wetland 3**	31m 41m 38m	• Sedimentation and/or erosion (construction)	• Design and implement a sediment and erosion control plan prior to any removal of vegetation or grading. • Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the periphery of the construction area. This will also serve to demarcate boundaries to keep workers and equipment out of these features.	Performance Objectives: • Maintain vegetated buffers between wetland and project location. • Minimize impacts to natural features and associated wildlife habitats. Monitoring: • Construction monitoring to ensure proper installation and maintenance of erosion control measures. • Monitoring of silt fencing daily in areas where work is taking place and prior to and after any storm events. • Correcting silt fencing that is not working properly. Contingency Measures: None required.
		• Spills (i.e. oil, gasoline, grease, etc.) (construction and operation)	• All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant natural feature in a designated area where proper precautions (i.e. tarps) have been installed to ensure that no contamination of the soil occurs. • Develop a spill response plan and train staff on appropriate procedures. • Keep emergency spill kits on site. • Dispose of waste material by authorized and approved offsite vendors.	Performance Objectives: • Minimize impacts to natural features and associated wildlife habitats. Monitoring: None required. Contingency Measures: None required.
		• Changes in soil moisture and compaction (construction and operation)	• Implement infiltration techniques to the maximum extent possible. • Minimize paved surfaces and design roads to promote infiltration. • Limit work activities to the area outside of the drip line of the woodland.	Performance Objectives: • Minimize impact to soil moisture regime and vegetation species composition. Monitoring: None required. Contingency Measures: None required.

Feature ID	Distance to Project Location	Potential Negative Effects	Mitigation Measures	Objectives, Post-Construction Monitoring, and Contingency Plans
		• Changes to surface water hydrology (construction)	• Limit changes in land contours. • Maintain direction and quantity of surface flow. • Minimize construction of impermeable surfaces.	Performance Objectives: • Maintain existing surface water flow patterns. Monitoring: None required. Contingency Measures: None required.
		• Contamination of runoff water by herbicides (operational)	• The vegetation within the project location will be mowed on a regular basis. This will minimize and possibly eliminate the need for herbicides thereby reducing/eliminating the potential to create poor water quality of the runoff. • Minimize herbicide application. • Herbicide application will not exceed the manufacturer's directions.	Performance Objectives: • Minimize indirect impacts on wetland habitat and their communities. Monitoring: Monitor operational activities to ensure any herbicide application follows safe practices. Contingency Measures: None required.
Woodland 1	0.1m	• Accidental damage to vegetation, including limbs and root zones (construction and operation)	• No removal of activities will occur within the drip line of the woodland. • Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to significant natural features.	Performance Objectives: • Minimize direct impacts on vegetation communities and protect rare/sensitive habitats. Monitoring: Monitor construction activities to ensure the construction limits are respected. Contingency Measures: Any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.
		• Sedimentation, erosion and dust (construction)	• Design and implement a sediment and erosion control plan. • Sediment and erosion control measures will be installed prior to any clearing or grading. • Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction area. • Water will be used a dust suppressant as required.	Performance Objectives: • Minimize impacts to natural features and associated wildlife habitats. Monitoring: • Construction monitoring to ensure proper installation of erosion and sediment control devices. • Monitoring of silt fencing daily in areas where work is taking place and prior to and after any

Feature ID	Distance to Project Location	Potential Negative Effects	Mitigation Measures	Objectives, Post-Construction Monitoring, and Contingency Plans
				storm events. • Correcting silt fencing that is not working properly. Contingency Measures: Maintain or restore vegetation buffers, including riparian zones.
		• Spills (i.e. oil, gasoline, grease, etc.) (construction and operation)	• All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant natural feature. • Develop a spill response plan and train staff on appropriate procedures. • Keep emergency spill kits on site.	Performance Objectives: Minimize impacts to natural features and associated wildlife habitats. Monitoring: None required. Contingency Measures: None required.
		• Changes in soil moisture and compaction (construction and operation)	• No activities will occur within the drip line of the woodland.	Performance Objectives: • Minimize impact to soil moisture regime and vegetation species composition. Monitoring: None required. Contingency Measures: None required.

5.3 Significant Wildlife Habitat

Four SWH were brought forward: reptile hibernacula (snake), amphibian breeding habitat (woodland) and turtle wintering areas and turtle nesting areas. These were either treated as significant [reptile hibernacula (snake) and turtle wintering areas associated with Community 15 (Wetland 2) and portions of the amphibian breeding habitat (woodland) located south of Snug Harbour Road] or assumed to be significant [amphibian breeding habitat (woodland) associated with Community 1, 3, 4, 8 and Community 16 (Wetland 3) and turtle overwintering and turtle nesting areas both associated with Community 16 (Wetland 3)]. Of these, the reptile hibernacula (snake) are the only features located within the project location and as such the only features which may be directly impacted by the proposed facility.

Pre-construction commitments have been made for the candidate SWH situated within the project location, to the south of Snug Harbour Road or west of Kennedy Bay Road. The significance of these areas will be evaluated through on-site surveys. Details of the proposed survey protocols for each candidate SWH are provided in the sections below. Should any of these features be evaluated as significant, mitigation measures and post-construction monitoring commitments will be implemented and are described below. These mitigation measures and monitoring programs are described in further detail in the Environmental Effects Monitoring Plan Report. For any of the candidate significant wildlife features that are determined to be not significant, no further mitigation or follow-up monitoring than is described below for that feature will be required.

5.3.1 Reptile Hibernacula (snake) (in and within 120 m of the project location)

The reptile hibernacula were not visited during the appropriate time of year to conduct surveys therefore its significance was not determined but treated. This natural feature is found along the edge of the project location or within the surrounding lands. As such additional field work is required to determine if these sites (Fencerows 2-5 and portions of communities 6 and 7) are being used by reptiles.

The additional field work will be scheduled for spring of 2013 and will be conducted based on approved MNR protocols. If the site is not used as a hibernaculum; then post-construction monitoring will not be required and rock piles may be removed as needed.

If the site is confirmed to be utilized by snakes, then monitoring during construction and post-construction will be required.

Pre-Construction Surveys

The snake surveys would consist of three visual surveys from within 50 m, inwards towards each rock pile. The surveys would be completed between late March and late April on warm sunny days (>14°C) during peak daylight hours (10:00 – 15:00) when the snakes are most likely be congregated outside the feature within 30m of the candidate habitat. Surveys will include 5-10 min stationary observations followed by intensive area search of flipping and checking inside logs and debris as well as searching in or along rocky outcrops or ledges. A map will be produced that indentifies the location of the snakes in relation to the rock piles.

Surveys are visual observations that will record the following information (Note: capture/recapture techniques that require handling are not necessary to determine significance):

- Date
- Time (start and end time, duration)
- Weather conditions (temperature, %cloud cover, Beaufort wind scale)
- GPS location
- Species presence and abundance

A pre-construction report will be prepared outlining the data collected (as listed above) and a summary of findings (i.e. are significant snake hibernacula present) and provided to MNR prior to any work within 50 m of the candidate hibernacula. Furthermore, the construction mitigation measures outlined below, will be implemented to avoid mortalities until the EOS is completed. The determination of the significance of any hibernacula will follow the SWHEC. Candidate snake hibernacula are confirmed significant if the following criteria are met:

- Surveys must confirm the presence of congregations of a minimum of 5 individuals of a snake species or individuals of two or more snake species at or near the potential hibernacula
- If there are special concern species, then the site is significant wildlife habitat
- Species to be considered include: Eastern Gartersnake, Northern Watersnake, Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, northern Ring-necked Snake, Milksnake (Special Concern), Eastern Ribbonsnake (Special Concern), Five-lined Skink (Southern Shield population is Special Concern)

Construction/Decommissioning Potential Impacts and Mitigation Measures

Direct impacts to reptile hibernacula could occur during the clearing and grading activities through the removal of rocks. These impacts are local, negative, long term (permanent) and moderate in magnitude. However, should significant snake hibernacula be identified in the

project area, no work will occur within that habitat. The habitat includes the rock pile or bedrock feature that is the hibernacula, plus a 30 m area around the feature to maintain the function of the hibernacula. This will eliminate direct impacts.

Indirect impacts during construction/decommissioning include noise and light pollution from the construction activities which may result in avoidance of the area by the snakes. Furthermore, construction vehicles could cause mortality to snakes. The indirect impacts are local, negative, short term and minor in magnitude. If snake hibernacula are present, these impacts can be avoided through timing windows.

Mitigation Measures:

Should a snake hibernaculum be identified during the pre-construction surveys the Construction Plan Report and EEMP will indicate that the following mitigation measures will be implemented:

- 30marea will be established around the hibernacula. No work would take place within this area.
- The 30 m area will be flagged and demarcated (in field and on construction drawings).
- Construction crew would be educated about the location and significance of these features and will be trained to avoid snakes by conducting a visual inspection of the work site prior to the commencement of the daily activities. The crew would be made aware that they need to avoid harming snakes. Workers will be provided with an ID manual of snakes and protocol of what to do if snakes are present (i.e. wait for snakes to pass, avoid snakes). The contact information of a SAR biologist who will be responsible for safely transporting snakes will be provided. Construction crew will record the number and species of any snakes observed.
- The access road use and vehicular speeds will be minimized during September and October (when snakes are moving towards the hibernacula) and between March 15 and May 15, when snakes are leaving the hibernacula. During these same periods a thorough sweep of the work areas within 100m of the hibernacula will be performed daily prior to any work commencing within this area.
- The 100m buffer area will be flagged and demarcated in field.

Post-construction Monitoring:

If a significant snake hibernaculum is identified it will be monitored using the same protocol as outline above in order to determine impacts to the use of the habitats by snakes. Monitoring will be completed beginning the first spring following the completion of the construction works and will continue for an additional 2 years (total of 3 years of post-monitoring). A report outlining the findings will be provided to MNR by the end of that year.

Contingency:

If the post-monitoring results find that a negative impact occurred, then the proponent will contact MNR to discuss additional measures.

Operational Phase Potential Impacts and Mitigation Measures

No direct impacts would occur during operation. The potential for maintenance vehicles to harm sunning snakes would exist. This impact would be local, negative, repeated and long-term and minor.

Mitigation Measures:

Should a snake hibernaculum be identified during the pre-construction surveys the Construction Plan Report and EEMP will indicate that the same mitigation measures as those listed under the construction/decommissioning phase will be implemented:

5.3.2 Turtle Wintering and Turtle Nesting Areas (within 120 m of the project location)

The turtle wintering and turtle nesting areas associated within Community 16 (Wetland 3) were assumed to be significant and as such mitigation measures are required. No post-construction monitoring is required for these communities. Potential impacts and mitigation measures are described after the description of pre-construction surveys for candidate turtle wintering habitat in other communities.

Pre-Construction Surveys

The turtle wintering areas associated with Community 15 (Wetland 2) was not visited during the appropriate time of year to conduct surveys therefore its significance was not determined but assumed. This natural feature is situated 41 m from the project location. As such additional field work is required to determine if these sites are being used by s for hibernating.

The additional field work will be scheduled for spring of 2013 and will be conducted based on approved MNR protocols. Methodology for wintering surveys is provided below. If a feature is not used for turtle overwintering or turtle nesting; then post-construction monitoring will not be required for that particular feature. If a feature is determined to be significant, then the mitigation and monitoring programs described in Table 12 under the wetland section as well as those identified below will be required.

Turtle Wintering Area Survey Protocol

Monitoring Frequency and Timing:

- 2 visits to candidate turtle over-wintering areas
    - 1st visit will occur in late March
    - 2nd visit will occur in late April
- Visits will be on warm sunny days when the turtles are most likely basking

Data Collection:

- Surveys are visual observations that will record the following information (Note: capture/recapture techniques that require handling are not necessary to determine significance):
    - Date
    - Time (start and end time, duration)
    - Weather conditions (temperature, %cloud cover, Beaufort wind scale)
    - GPS location
    - Species presence and abundance

A pre-construction report will be prepared outlining the data collected (as listed above) and a summary of findings (i.e. is significant turtle wintering area present) and provided to MNR prior to any work within 50 m of the candidate feature. Furthermore, the construction mitigation measures will be implemented until the EOS is completed, since the habitat is being treated as significant. The determination of the significance of the wintering area will follow the SWHEC. Candidate turtle wintering area is confirmed if Community 15 (Wetland 2) meets the following criteria:

- Presence of 5 overwintering midland painted turtles is significant wildlife habitat
- Presence of ≥1 northern map OR snapping turtle overwintering within a wetland is significant
- The mapped ELC ecosite area with the overwintering turtles is considered the SWH.

Construction/Decommissioning Potential Impacts and Mitigation Measures

No direct impacts to either turtle overwintering area or the turtle nesting area will occur as a result of this project as both communities are located over 35 m from the project location.

The indirect impacts during construction/decommissioning include those discussed under the wetland section above. That is, a change in the quantity or quality of surface water runoff from the project location during construction/decommissioning. If significant turtle overwintering or turtle nesting areas are present, then this impact would be local, negative, short term and minor in magnitude.

Mitigation Measures:

As noted previously, Community 15/Wetland 2 is being treated as significant pending the findings of the pre-construction surveys and Community 16/Wetland 3 is assumed as significant. As such, mitigation measures are required and the Construction Plan Report and EEMP will indicate that the mitigation measures listed above in Table 12 under wetland will be implemented as well as the following additional measure:

- Construction crew would be educated about the location and significance of this feature and will be trained to avoid turtles by conducting a visual inspection of the work site prior to the commencement of the daily activities. The crew would be made aware that they need to avoid harming turtles. Workers will be provided with an ID manual of turtles and protocol of what to do if s are present (i.e. wait for turtles to pass, avoid turtles). The contact information of a SAR biologist who will be responsible for safely transporting turtles will be provided. Construction crew will record the number and species of any turtles observed.
- The access road use and vehicular speeds will be minimized during mid-October to November (when turtles are moving towards the wintering area) and early spring (i.e. after ice melt till mid-end of June, when turtles leave the wintering area for nesting sites). During these same periods a thorough sweep of the work areas within 100m of the wintering area will be performed daily prior to any work commencing within this area.

Post-construction Monitoring:
If a turtle overwinter area is identified it will be monitored using the same protocol as outline above in order to determine impacts to use of the habitat by turtles. Monitoring will be completed beginning the first spring following the completion of the construction works and will continue for an additional 2 years (total of 3 years of post-monitoring). A report outlining the findings will be provided to MNR by the end of that year.

Contingency:
If the post-monitoring results find that a negative impact occurred, then the proponent will contact MNR to discuss additional measures.

Operation Phase – Potential Impacts and Mitigation Measures

No direct impacts would occur during operation.

The indirect impacts during the operational phase include those discussed under the wetland section above. That is, a change in the quality of surface water runoff from the project location as a result of herbicide application or from an accidental spill. Furthermore, there would be the potential that the perimeter fence could re-direct migrating turtles away from their desired location or force them to turn around and attempt to cross the road. This could result in an increase of road mortality. If significant turtle overwintering or nesting areas are present, then this impact would be local, negative, long-term (operation) and minor to in magnitude (assuming that proper application of herbicides is applied).

Mitigation Measures:
As noted previously, Community 15/Wetland 2 is being treated as significant pending the findings of the pre-construction surveys and Community 16/Wetland 3 is being assumed as significant. As such, mitigation measures are required and the Construction Plan Report and

EEMP will indicate that the mitigation measures listed in Table 12 under wetlands will be implemented as well as those listed under construction/decommissioning above will be followed.

5.3.3 Amphibian Breeding Habitat (woodland) (within 120 m of the project location)

The amphibian breeding habitat (woodland) was assumed to be significant for all habitat located on the north side of Snug Harbour Road or the east side of Kennedy Bay Road associated with communities 1, 3, 4, 13, 14 and 16. As such mitigation measures are required. No post-construction monitoring is required for these communities.

The communities associated with amphibian breeding habitat on the south side of Snug Harbour Road (Communities 13-15) was not visited during the appropriate time of year to conduct egg mass surveys for breeding amphibians, particularly salamanders, and only one amphibian breeding visit (as per the marsh monitoring protocol) was completed. Therefore their significance was not determined but assumed. As such additional field work is required to determine if these sites are significant for woodland amphibian breeding areas.

Pre-Construction Surveys

The additional field work will be scheduled for spring of 2013 and will be conducted based on approved MNR protocols provided below. If a feature is determined to be not significant, then post-construction monitoring will not be required for that particular feature. If a feature is determined to be significant, then the mitigation and monitoring programs described in Table 12 for wetland features will be required.

Amphibian Breeding Habitat (woodland) Survey Protocol

Monitoring Frequency and Timing:

- Conduct 2 amphibian egg mass searches for each candidate amphibian breeding habitat during daylight hours in early spring with the first visit in March after the first warm rain and the second visit in early April

Survey Methods:

Egg Mass Surveys

- Surveys will be focused on egg mass searches
- Egg mass surveys will need to target non-vocalizing amphibians (i.e. Salamanders) that are laying eggs in this habitat
- Area searches will include walking within or along the perimeter of each wetland/vernal pool looking for egg masses; however, visual surveys may be required in some instances because of water depth.

- A minimum search effort of 30 minutes will be applied for each site, in each candidate habitat.

Amphibian Breeding Surveys (Marsh Monitoring Protocol)

- The same protocol as that described under the Site Investigations section will be followed.
- Two additional visits will be completed during the spring (April-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland.
- Evaluation methods to follow the Marsh Monitoring Protocol
- Monitoring station 5 is be used as this station is located within 500m of Communities 13 and 14 (candidate habitat on the south side of Snug Harbour Road)

Data Collection:

- Level of effort (date, start and end time, duration, etc.)
- Weather conditions (wind speed, temperature, cloud cover, precipitation, etc)
- Name of observer(s) conducting field work
- Complete list of all amphibian species observed using standard 4 letter species ID codes
- Complete list of all egg masses observed with identification made to the species level where possible, using amphibian scientific field guides and/or field keys
- Description of habitats or areas scanned during the survey
- A GPS point and photographs of any egg masses found

A pre-construction report will be prepared outlining the data collected (as listed above) and a summary of findings (i.e. is significant amphibian breeding habitat present) and provided to MNR prior to any work within 50 m of the candidate feature. Furthermore the construction mitigation measures listed below will be implemented until the EOS confirms the significance or non-significance of the features. The determination of the significance of the breeding habitat will follow the SWHEC. Candidate amphibian breeding habitat is confirmed if any of the communities meet the following criteria:

- Presence of breeding population of 1 or more of the listed species with at least 20 individuals (adults, juvenile, larval masses)

  Wildlife species:
  - Eastern Newt
  - Blue-spotted Salamander
  - Spotter Salamander
  - Gray Tree frog
  - Spring Peeper
  - Western Chorus Frog
  - Wood Frog

Construction/Decommissioning – Potential Impacts and Mitigation Measures

No direct impacts to either amphibian breeding (woodland) community will occur as a result of this project all communities are located outside of the project location.

The indirect impacts during construction/decommissioning include those discussed under the wetland section above. That is, a change in the quantity or quality of surface water runoff from the project location during construction/decommissioning. If amphibian breeding habitat (woodland) is present, then this impact would be local, negative, short term and minor in magnitude.

Mitigation Measures:

As such, mitigation measures are required and the Construction Plan Report and EEMP will indicate that the mitigation measures listed in Table 12 above for the wetland feature will be implemented as well as the following:

- Construction crew would be educated about the location and significance of this feature and will be made aware that they need to avoid harming frogs.
- The access road use and vehicular speeds will be minimized between April and June (when frogs are moving towards the breeding area).

Post-construction Monitoring:

If an amphibian breeding habitat is identified it will be monitored using the same protocol as outline above in order to determine impacts to use of the habitat by amphibians. Monitoring will be completed beginning the first spring following the completion of the construction works and will continue for an additional 2 years (total of 3 years of post-monitoring). A report outlining the findings will be provided to MNR by the end of that year.

Contingency:

If the post-monitoring results find that a negative impact occurred, then the proponent will contact MNR to discuss additional measures.

Operational Phase – Potential Impacts and Mitigation Measures

No direct impacts would occur during operation.

The indirect impacts during the operational phase include those discussed under the wetland section above. That is, a change in the quality of surface water runoff from the project location as a result of herbicide application. If significant amphibian breeding habitat (woodland) is present, then this impact would be local, negative, long-term (operation) and minor to in magnitude (assuming that proper application of herbicides is applied).

Mitigation Measures:
As such, mitigation measures are required and the Construction Plan Report and EEMP will indicate that the mitigation measures listed in Table 12 above for the wetland feature will be implemented as well as those listed under construction/decommissioning.

5.4 Generalized Significant Wildlife Habitat

The identification of significant wildlife habitat (SWH) followed Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (NHAG) (July 2011) and as such Generalized Candidate SWH was brought forward to the EIS. To mitigate against potential impacts, sediment and erosion control measures (silt fence) will be installed and maintained regularly during the construction phase to prevent any deleterious substances from entering into the surrounding lands. Further general mitigation measures are described in Table 12 above.

The construction and operation of the proposed facility will not result in the removal of any natural vegetation outside of the fencerows or any alterations of the overall drainage pattern of the surface water. Furthermore, no activities will take place within the drip line of Woodland 1. This eliminates the potential to directly impact any of the generalized SWH. No monitoring plan is recommended for this item.

Any Construction Plan Report and EEMP will indicate that the following will be implemented:

- No natural vegetation other than the fencerows will be removed as part of this proposed facility.
- No work will occur within the drip line of Woodland 1.
- Sediment fence will be installed around the perimeter of the project location.

6.0 NEGATIVE ENVIRONMENTAL EFFECTS, DESIGN AND OPERATIONS AND CONSTRUCTION PLAN

When negative environmental effects of a project on the significant natural features are identified, the EIS report needs to describe how the Environmental Effects Monitoring Plan (EEMP) addresses them. A description of the potential impacts, mitigation measures and residual impacts are provided in the sections above. These details will be further discussed in the EEMP report.

The construction plan report will address any negative environmental effects by including the mitigation measures identified within this report.

The mitigation measures may be updated following the completion of the pre-construction and post-construction surveys and reporting.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed solar facility is located on agricultural lands with some deciduous treed fencerows.

The only significant feature within the project location was the snake hibernacula. This was treated as significant.

Within the surrounding lands there were several significant features (determined, treated or assumed). Woodland 1 was brought forward as Significant (Figure 9). Wetlands 1 and 3 was brought forward and assumed significant. Wetland 2 was brought forward and treated as significant pending the results of the pre-construction surveys. (The difference between Wetlands 2 and 3, is that Wetland 2 is accessible and located on the same side of the public road as the project location whereas Wetland 3 is on private land on the opposite side of a public road).

All snake hibernacula were treated as significant and are being brought forward along with pre-construction survey commitments.

The amphibian breeding habitat (woodland) and turtle overwintering area associated with Wetland 2, Community 13 and part of Community 14 on the south side of Snug Harbour Road were treated as significant and brought forward along with pre-construction survey commitments.

Turtle overwintering, turtle nesting areas and amphibian breeding habitat (woodland) associated with Wetland 3 and Communities 1, 3, 4 and 13 and part of Community 14 were located within the surrounding 120 m and assumed significant.

Several other candidate SWH located outside of the project location were grouped together and assumed significant.

All features treated as significant will be confirmed through pre-construction surveys. Those confirmed to be significant (as per SWHEC) will require post-construction surveys.

The direct impacts have all been eliminated through avoidance. Indirect impacts have also been eliminated or minimized through project redesign, avoidance, timing windows and general mitigation measures described above.

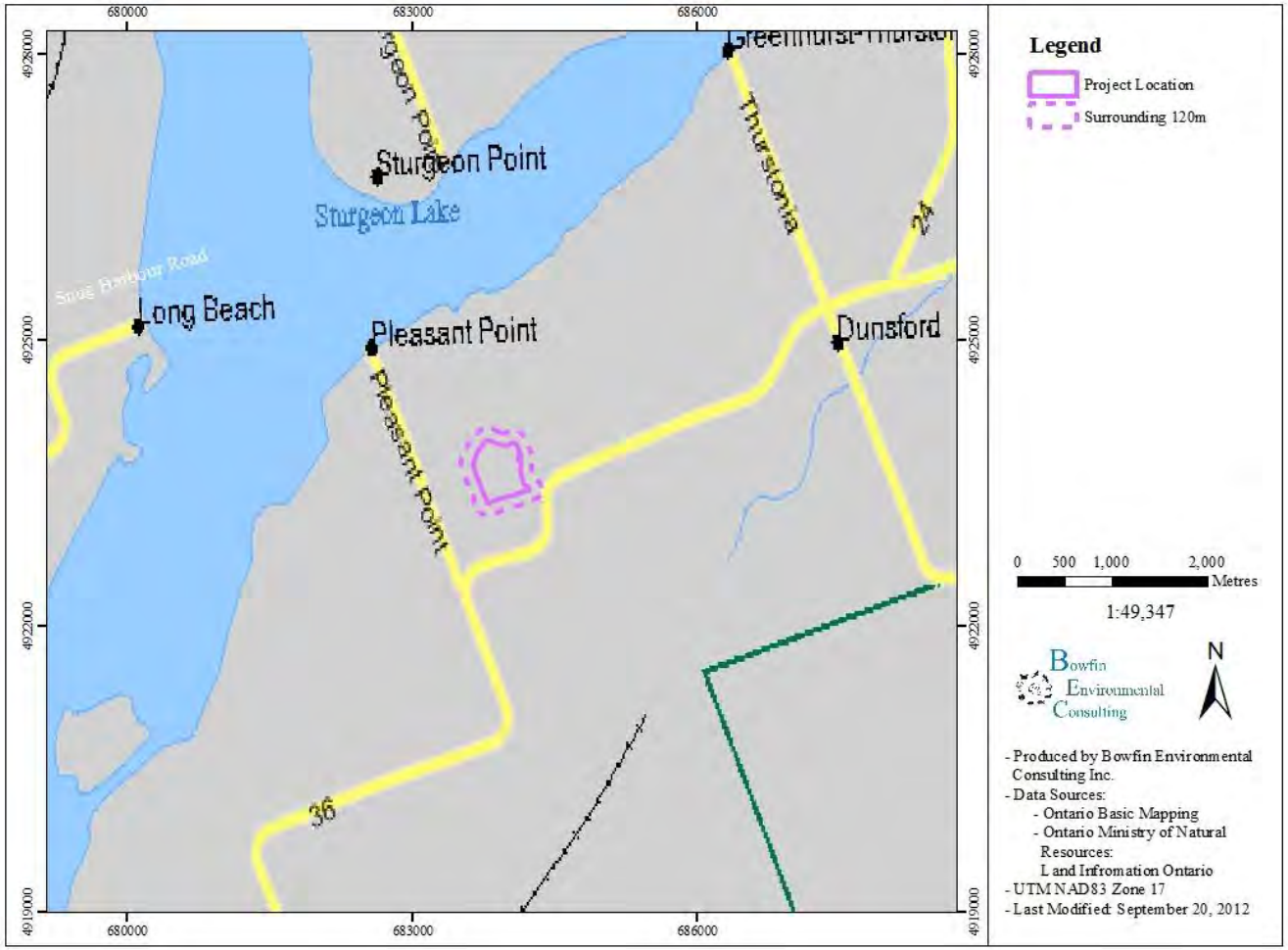
The generalized candidate SWH will be protected from potential impacts through the installation of a silt fence (sediment fence) along the outer edge of the project location and other general mitigation measures described above.

The study area is also located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment. The study area is not located within the jurisdiction of any planning boards, municipal planning authority, local roads boards or local services boards.

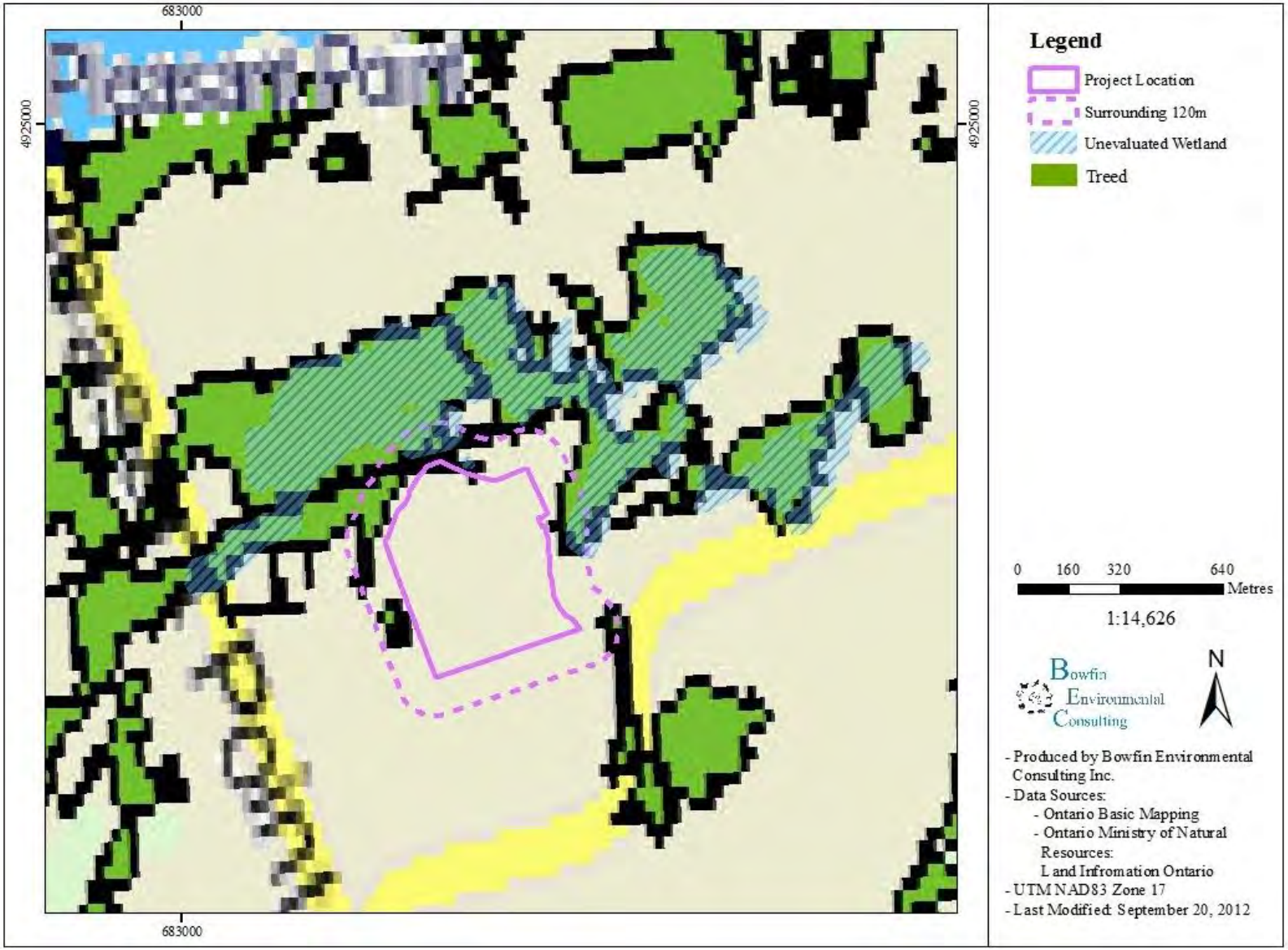
The EEMP and the CPR will address any negative environmental effects through the inclusion of the mitigation measures as described within this report.

APPENDIX A RECORDS REVIEW

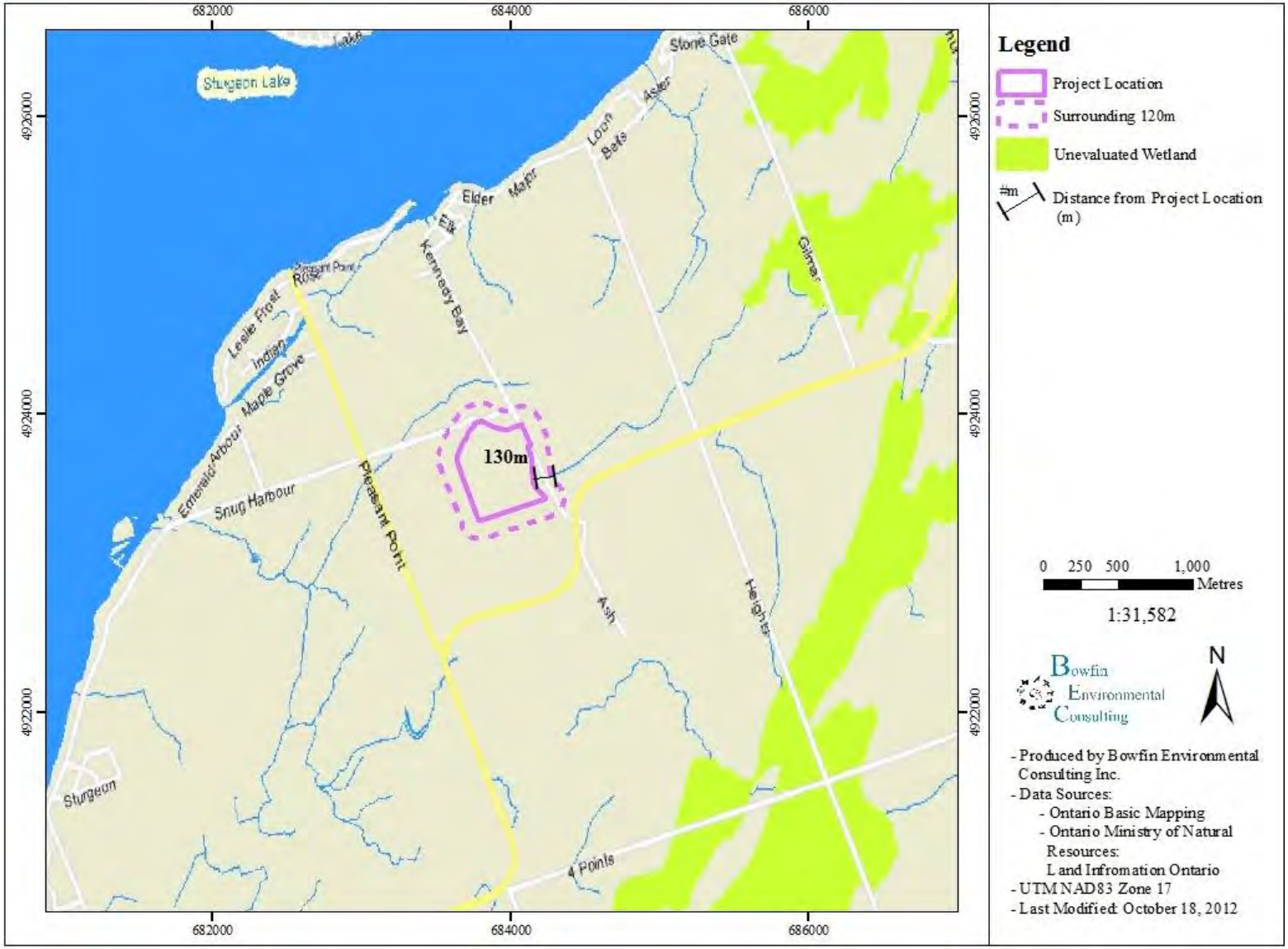
Crown Land Use Policy Atlas Mapping



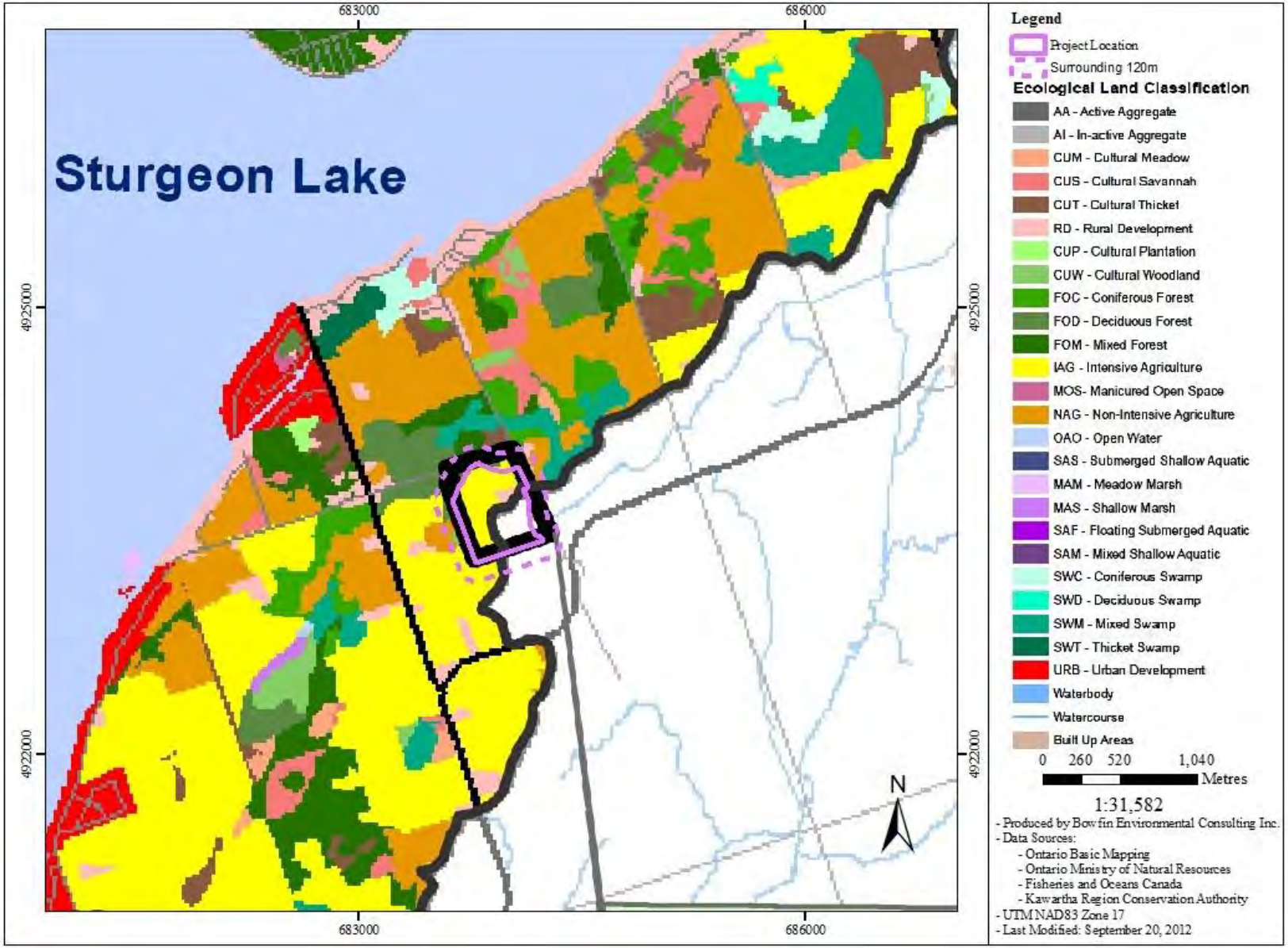
Make-A-Map Mapping

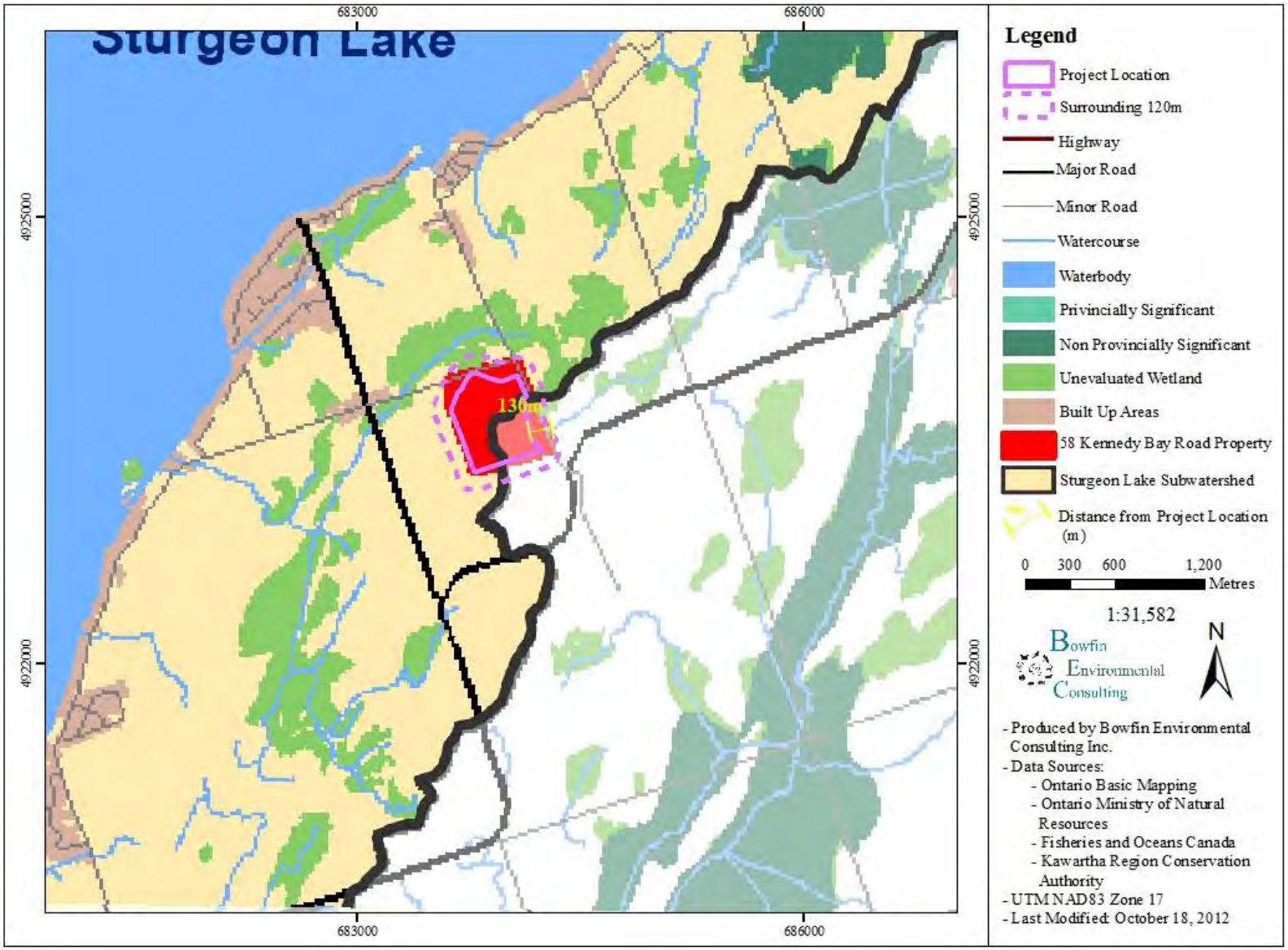


Renewable Energy Atlas Mapping

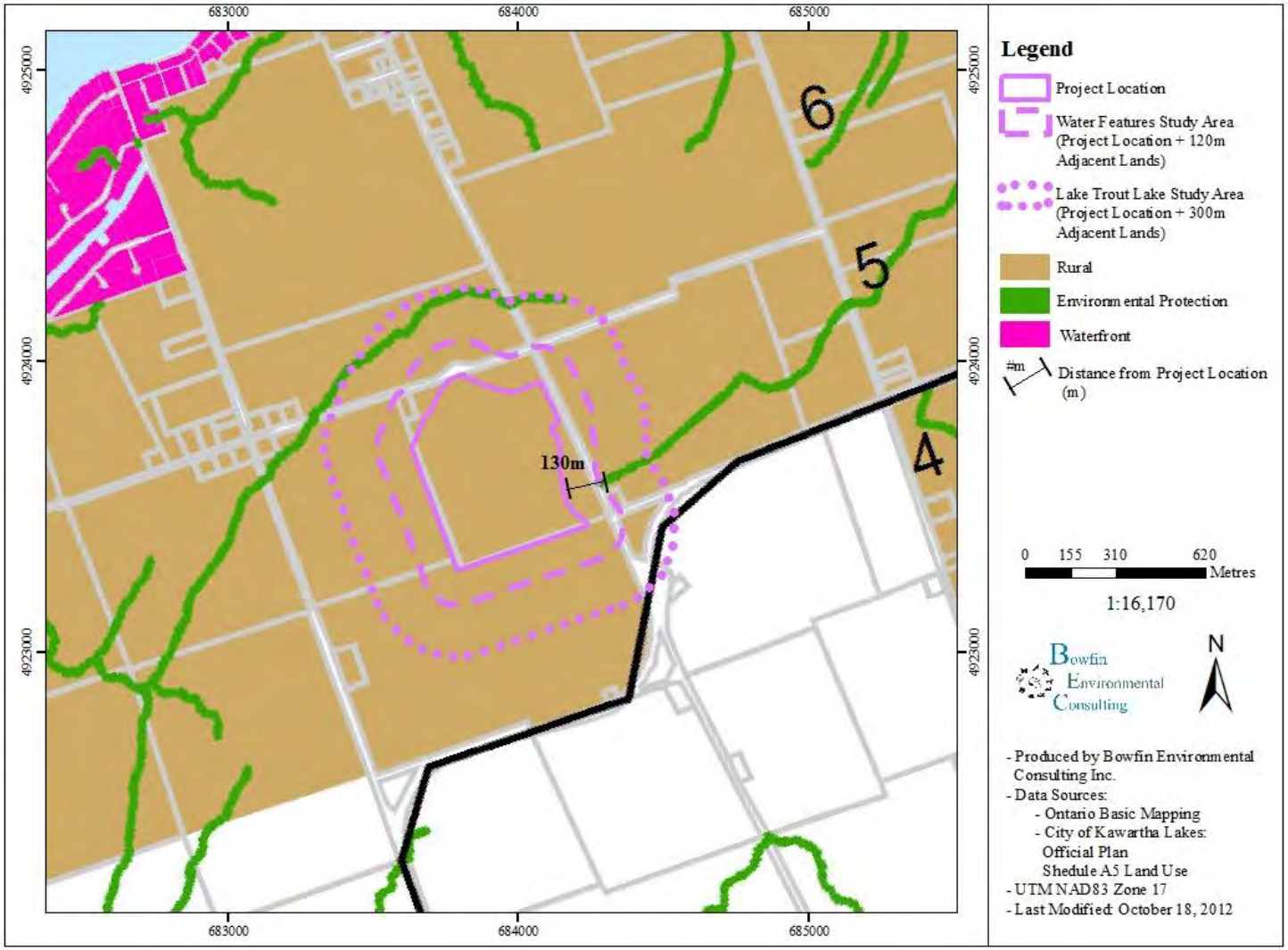


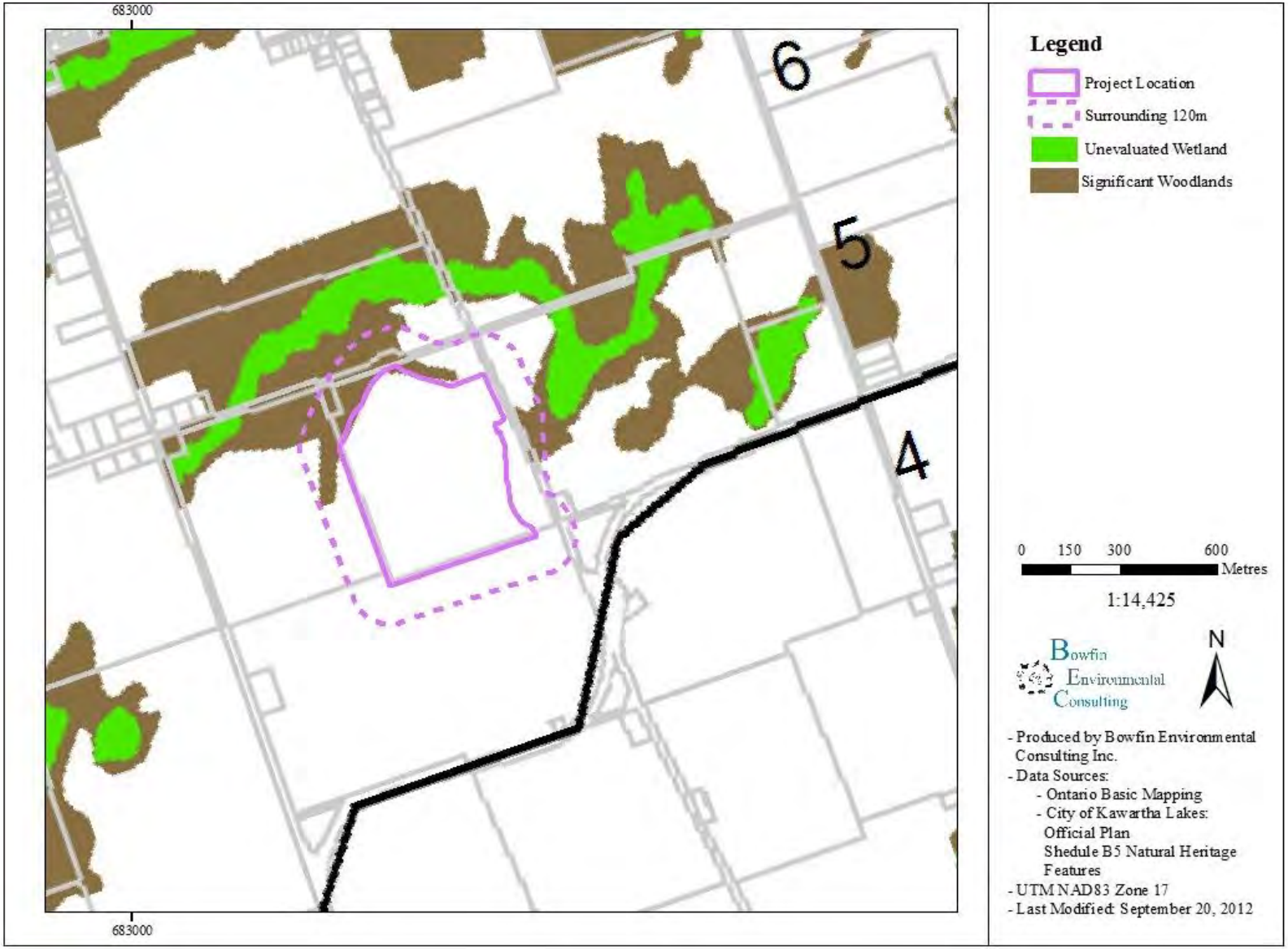
Kawartha Conservation Mapping




Sturgeon Lake
683000
686000
4925000
4922000
120m
Legend
Project Location
Surrounding 120m
Highway
Major Road
Minor Road
Watercourse
Waterbody
Privincially Significant
Non Provincially Significant
Unevaluated Wetland
Built Up Areas
58 Kennedy Bay Road Property
Sturgeon Lake Subwatershed
Distance from Project Location (m)
0 300 600 1,200
Metres
1:31,582
N
Bowfin Environmental Consulting
- Produced by Bowfin Environmental Consulting Inc.
- Data Sources:
- Ontario Basic Mapping
- Ontario Ministry of Natural Resources
- Fisheries and Oceans Canada
- Kawartha Region Conservation Authority
- UTM NAD83 Zone 17
- Last Modified: October 18, 2012

City of Kawartha Lands OP Mapping




683000
6
5
4
683000
Legend
Project Location
Surrounding 120m
Unevaluated Wetland
Significant Woodlands
0 150 300 600
Metres
1:14,425
N
Bowfin Environmental Consulting
- Produced by Bowfin Environmental Consulting Inc.
- Data Sources:
- Ontario Basic Mapping
- City of Kawartha Lakes:
Official Plan
Shedule B5 Natural Heritage Features
- UTM NAD83 Zone 17
- Last Modified: September 20, 2012

ABBO TABLE Square 17PK82 (note that Endangered and Threatened Species have been removed as they are dealt with under a separate process).

Common Name	Scientific Name	OBBA Category	Federal Status	Provincial Status	SRank
Common Loon	*Gavia immer*	possible			S5B, S5N
Great Blue Heron	*Ardea herodias*	possible			S4
Green Heron	*Butorides virescens*	possible			S4B
American Bittern	*Botaurus lentiginosus*	possible			S4B
Canada Goose	*Branta canadensis*	confirmed			S5
Mallard	*Anas platyrhynchos*	probable			S5
Wood Duck	*Aix sponsa*	probable			S5
Turkey Vulture	*Cathartes aura*	possible			S5B
Red-tailed Hawk	*Buteo jamaicensis*	possible			S5
Osprey	*Pandion haliaetus*	confirmed			S5B
American Kestrel	*Falco sparverius*	possible			S4
Ruffed Grouse	*Bonasa umbellus*	possible			S4
Virginia Rail	*Rallus limicola*	probable			S5B
Killdeer	*Charadrius vociferus*	possible			S5B, S5N
Upland Sandpiper	*Bartramia longicauda*	probable			S4B
Spotted Sandpiper	*Actitis macularia*	probable			S5
Common Snipe	*Gallinago delicata*	possible			S5B
Herring Gull	*Larus argentatus*	possible			S5B, S5N
Black Tern	*Chlidonias niger*	confirmed		SC	S3B
Rock Pigeon	*Columba livia*	possible			SNA
Mourning Dove	*Zenaida macroura*	probable			S5
Black/Yellow-billed Cuckoo	*Coccyzus erythropthalmus/americanus*	possible			S5B / S4B
Eastern Screech-Owl	*Megascops asio*	possible			S4
Belted Kingfisher	*Ceryle alcyon*	confirmed			S4B
Northern Flicker	*Colaptes auratus*	possible			S4B
Yellow-bellied Sapsucker	*Sphyrapicus varius*	possible			S5B
Hairy Woodpecker	*Picoides villosus*	possible			S5
Downy Woodpecker	*Picoides pubescens*	possible			S5
Pileated Woodpecker	*Dryocopus pileatus*	possible			S5
Eastern Kingbird	*Tyrannus tyrannus*	probable			S4B
Great Crested Flycatcher	*Myiarchus crinitus*	possible			S4B
Eastern Phoebe	*Sayornis phoebe*	possible			S5B
Willow Flycatcher	*Empidonax traillii*	possible			S5B
Alder Flycatcher	*Empidonax alnorum*	possible			S5B
Least Flycatcher	*Empidonax minimus*	possible			S4B

Common Name	Scientific Name	OBBA Category	Federal Status	Provincial Status	SRank
Eastern Wood-Pewee	*Contopus virens*	possible			S4B
Horned Lark	*Eremophila alpestris*	possible			S5B
Tree Swallow	*Tachycineta bicolor*	probable			S4B
Bank Swallow	*Riparia riparia*	possible			S4B
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	possible			S4B
Cliff Swallow	*Petrochelidon pyrrhonota*	possible			S4B
Blue Jay	*Cyanocitta cristata*	confirmed			S5
American Crow	*Corvus brachyrhynchos*	confirmed			S5B
Black-capped Chickadee	*Poecile atricapilla*	confirmed			S5
White-breasted Nuthatch	*Sitta carolinensis*	possible			S5
Red-breasted Nuthatch	*Sitta canadensis*	possible			S5
Brown Creeper	*Certhia familiaris*	possible			S5B
House Wren	*Troglodytes aedon*	possible			S5B
Winter Wren	*Troglodytes troglodytes*	possible			S5B
Gray Catbird	*Dumetella carolinensis*	probable			S4B
Brown Thrasher	*Toxostoma rufum*	possible			S4B
American Robin	*Turdus migratorius*	confirmed			S5B
Wood Thrush	*Hylocichla mustelina*	possible			S4B
Veery	*Catharus fuscescens*	probable			S4B
Eastern Bluebird	*Sialia sialis*	confirmed			S5B
Cedar Waxwing	*Bombycilla cedrorum*	probable			S5B
European Starling	*Sturnus vulgaris*	confirmed			SNA
Red-eyed Vireo	*Vireo olivaceus*	confirmed			S5B
Warbling Vireo	*Vireo gilvus*	confirmed			S5B
Black-and-white Warbler	*Mniotilta varia*	confirmed			S5B
Nashville Warbler	*Vermivora ruficapilla*	possible			S5B
Yellow Warbler	*Dendroica petechia*	confirmed			S5B
Blackburnian Warbler	*Dendroica fusca*	confirmed			S5B
Chestnut-sided Warbler	*Dendroica pensylvanica*	possible			S5B
Pine Warbler	*Dendroica pinus*	possible			S5B
Ovenbird	*Seiurus aurocapillus*	probable			S4B
Northern Waterthrush	*Seiurus noveboracensis*	probable			S5B
Mourning Warbler	*Oporornis philadelphia*	possible			S4B
Common Yellowthroat	*Geothlypis trichas*	confirmed			S5B
American Redstart	*Setophaga ruticilla*	probable			S5B
House Sparrow	*Passer domesticus*	confirmed			SNA
Red-winged Blackbird	*Agelaius phoeniceus*	confirmed			S4
Baltimore Oriole	*Icterus galbula*	possible			S4B
Common Grackle	*Quiscalus quiscula*	confirmed			S5B
Brown-headed Cowbird	*Molothrus ater*	confirmed			S4B
Northern Cardinal	*Cardinalis cardinalis*	confirmed			S5
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	possible			S4B

Common Name	Scientific Name	OBBA Category	Federal Status	Provincial Status	SRank
Indigo Bunting	*Passerina cyanea*	confirmed			S4B
House Finch	*Carpodacus mexicanus*	possible			SNA
American Goldfinch	*Carduelis tristis*	probable			S5B
Savannah Sparrow	*Passerculus sandwichensis*	confirmed			S4B
Vesper Sparrow	*Pooecetes gramineus*	possible			S4B
Chipping Sparrow	*Spizella passerina*	possible			S5B
Field Sparrow	*Spizella pusilla*	possible			S4B
White-throated Sparrow	*Zonotrichia albicollis*	confirmed			S5B
Swamp Sparrow	*Melospiza georgiana*	confirmed			S5B
Song Sparrow	*Melospiza melodia*	confirmed			S5B

Ranking Updated: August 23, 2012

SRANK DEFINITIONS

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

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

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

SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

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

SARO STATUS DEFINITIONS

SC Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

APPENDIX B – SITE INVESTIGATIONS

Bowfin's Qualifications

MICHELLE L. (NUNAS) LAVICTOIRE, M. Sc.

EDUCATION

M. Sc. Natural Resources, Macdonald Campus, McGill University – Supervisor Dr. Curtis, 2011
B. Sc. Wildlife Biology, Macdonald Campus, McGill University, 1997

LANGUAGES

Fluent in English, French, advanced in Spanish.

PROFESSIONAL AFFILIATIONS

American Fisheries Society (AFS), Association Québécoise pour l'évaluation d'impacts (AQEI), International Association for Impact Assessment (AIAI), Ontario Waterpower Association.

POSITIONS HELD

2002-:	Bowfin Environmental Consulting Inc., Principal/Biologist
2000-2002:	Self-employed, Biologist
1999-2000	Tera Environmental Consultants, Calgary, AB, Environmental Planner
1998-1999:	Enviroconsult Inc. Calgary, AB, Biologist
1998:	Golder Associates Ltd., Calgary, AB, Contract Technician
1997-1998:	Envirowest Consultants Ltd., Prince George, BC, Biologist
1996:	Heritage Laurentien, Montreal, PQ, Naturalist
1996:	Martineau-Walker, Montreal, PQ, Naturalist
1995:	Ottawa-Carleton Wildlife Centre, Ottawa, ON, Wildlife Intern

CERTIFICATIONS/COURSES

Participated in the:

- Aboriginal Awareness Training (Ripple Effects on-line course)
- First Nations Environmental Assessment Toolkit for Ontario workshop
- Ontario Fish Identification course offered by the Centre for Biodiversity and Conservation Biology at the Royal Ontario Museum
- Ontario Freshwater Mussel Identification Workshop
- Natural Heritage Assessment Training for Environmental Consultants (MNR)
- MTO/DFO/OMNR Fisheries Specialist Training Sessions

Certified in / Registered as:

- MNR certified for: Ontario Wetland Evaluation System, Ecological Land Classification and Butternut Health Assessor
- MTO R.A.Q.S. Fisheries Assessment, Environmental Inspection during Construction and Fisheries Compliance during Contracts and Natural Sciences.

- Class 1 WSC Electroshocking Certification
- First aid and CPR, PADI Instructor, Marine radio operator, Pleasure Craft Operator Card

EXPERIENCE

Experience in environmental assessments, peer/technical reviews, aboriginal consultation, public consultation, environmental protection plans, terrestrial habitat assessment, freshwater and marine habitat assessment, route selection, watershed studies and terrestrial and fisheries inventories including habitat mapping, stream classification, underwater surveys (marine and freshwater), electroshocking, Species at Risk inventories, development of mitigation and compensation measures, obtaining permits and approvals from DFO, MNR, MOE and Mohawk Council of Akwesasne.

SELECTED PROJECTS

Renewable Resources – Solar and Small Waterpower Facilities

- Bonnechere River Proposed Thomas Low Waterpower Project Environmental Impact Assessment and the Mississippi River Enerdu Proposed Expansion Waterpower Project. Roles included: agency and aboriginal consultation, terrestrial and aquatic habitat descriptions, reptile surveys, breeding birds inventories, benthic macroinvertebrate and fish community sampling, species at risk assessment, development of mitigation measures and assessment of impacts.
- MNR Natural Heritage Assessment, Environmental Impact Study, APRD and the Water Body reports for a 500kw solar facility near Rodney, Ontario (Aylmer District). Activities included: completion of Ecological Land Classification, wetland evaluation, evaluation of significance of natural features, wildlife observations, evaluation of the potential for and impact to species at risk, recommendation of mitigation measures, development of SAR monitoring program, identification of water bodies (as per Renewable Energy Approval definitions) and agency consultations. MNR confirmation and APRD letters were obtained.
- MNR Natural Heritage Assessment, Environmental Impact Study and Water Body reports for three anaerobic digesters in eastern Ontario (Kemptville District) and one on Wolfe Island, ON (Peterborough District). Activities included: completion of ecological land classification, evaluation of significance, evaluation of potential to impact natural features and Species at Risk and agency consultation. MNR confirmation and APRD letters were obtained.
- Monitoring plan and Species at Risk approval for a small hydroelectric facility producer on the South Nation River.
- MNR Natural Heritage Assessment, Environmental Impact Study, Water Body and Water Body Assessment reports for three 10 MW solar facilities in the Townships of Hamilton, Edwardsburgh and South Glengarry (Kemptville and Peterborough Districts). Roles included: Ecological Land Classification, Ontario Wetland Evaluation, Aquatic habitat description, fish community sampling, reptile survey, breeding bird and Loggerhead Shrike surveys, Species at Risk assessment and agency consultation. MNR confirmation and APRD letters were obtained.
- Terrestrial and aquatic evaluation of three proposed small waterpower options on behalf of a Cree community in northern Quebec. Activities include field visits, fish community and larvae sampling, breeding bird surveys, plant inventories, habitat descriptions, consultations with Cree community, compilation and mapping of aboriginal traditional knowledge, ranking of options and reporting. Work is completed in both English and French.
- Bonnechere River Douglas Hydroelectric Site Facility Re-Development Aquatic Habitat and Community Assessment, Mitigation measures and Impact Assessment and Species at Risk assessment. Roles include: agency consultation, study design, fish community and walleye spawning surveys, benthic invertebrate inventory, habitat descriptions and development of mitigation measures.

- Collection terrestrial and aquatic baseline data for the proposed First Chute small hydroelectric facility on the Bonnechere River (near Renfrew, ON). Work included: terrestrial and aquatic habitat descriptions using ecological land classification, and Ontario wetland evaluation system, inventories (plant, species at risk, breeding birds, reptile, fish, molluscs and benthic invertebrates), spawning surveys (Lake sturgeon and walleye).
- South River Hydroelectric Facility Existing Environmental Conditions and Impact Analysis and Fish Compensation and Monitoring Plan. Activities included: agency consultation, fish community inventories, terrestrial and aquatic habitat descriptions and development of mitigation measures.

Aggregate Resources – Sand Pits and Quarries

- Level 2 Fisheries Assessment for several sand pits and quarries including: Wendover II Quarry (Wendover, ON), Leduc Sand Pit (Moose Creek, ON), Yelle Pit Expansion (Greely, ON), Pommerleau Pit Expansion (Greely, ON), Brown Sand Pit (Finch, ON), Gagne Pit Expansion (Hammond, ON), Dillabough Sand Pit (Kemptville, ON). Activities included: completion of fish community inventories and habitat descriptions as well as the evaluation of potential impacts and recommendation of mitigation measures.
- Wetland Community Description and Impact Assessment and Intermittent Drain Fish Habitat Assessment for a proposed quarry near Moose Creek, ON. Activities included: agency consultation, Ontario Wetland Evaluation, Species at Risk inventories (Least Bittern and Blanding's), and fish community sampling and habitat description.
- Plantagenet Asphalt Plant Fish Habitat and Community Assessment. Activities included: fish habitat description, fish community sampling and evaluation of impacts.
- Sarrazin Pit Natural Environment Assessment Level 1 and 2 (near Plantagenet ON). Activities included: Ecological Land Classification and fish habitat descriptions, breeding bird survey, fish community sampling, Species at Risk evaluation, Butternut inventory and impact assessment and development of mitigation measures.
- Private client. Level 1 and Level 2 Natural Environment Assessment for a proposed quarry expansion (eastern Ontario). Activities included: ecological land classification and fish habitat descriptions, fish community sampling, breeding bird surveys and butternut inventory.
- Aquatic impact assessment in support of obtaining a PTTW for the Apple Hill Quarry.
- Level 2 Fisheries Assessment for Vermiculite Canada (Peterborough area, ON). Activities included: aquatic habitat description, project management of environmental team, agency consultation and reporting outlining potential impact assessment.
- Level 1 Natural Environmental Assessment for Vermiculite Canada several projects (Peterborough area, ON). Activities included: terrestrial and aquatic habitat descriptions.

Land Use Planning - Subdivisions, Lot Severances and Forestry Projects

- Municipal Campus Kingston Ecological Assessment. Activities included: habitat descriptions using ecological land classification, Ontario wetland evaluation and Ontario stream assessment protocol. Also completed breeding bird and fish community inventories. Field work was required to evaluate the significance of the natural features present within the study area, and to develop mitigation measures, enhancement measures and complete an impact assessment.
- Ontario Wetland Evaluation descriptions and boundary determinations for: Morrisburg Industrial Park (Morrisburg, ON) and Doran Creek Estates (Iroquois, ON). Activities included: consultation with agencies, habitat descriptions (OWES and ELC), mapping, impact assessment and recommendation of mitigation measures.
- Environmental Impact Assessments/ Statements and Ontario Wetland Evaluation surveys for several single lot severances in United Counties of South Glengarry, Dundas and Stormont as well as in the Casselman and Ottawa Areas.
- Fish Habitat and Community Assessments for: Trillium Proposed Subdivision (Rockland, ON), Shadow

Ridge Subdivision Phases 2 and 3 (Greely, ON), Single Lot Development (Casselman, ON), Laviolette Proposed Subdivision (Rockland, ON), Legault Proposed subdivision (St. Albert, ON), and Proposed Medical Office and Retail drugstore on Mitch Owens (Manotick, ON). Activities included: agency consultation, fish community and habitat description, evaluation of impacts and recommendation of mitigation measures and enhancement/compensation measures, as required.

- Natural Environmental Impact Statement for: Doran Creek Estates (Iroquois, ON) and Heron Bay Subdivision (South Lancaster, ON). Roles included: habitat descriptions using ecological land classification and Ontario wetland evaluation system, surveys (plant, breeding bird and butternut), determination of impact assessment, species at risk assessment and the recommendation of mitigation measures.
- Ecological Site Assessment for Morrisburg Industrial Park (Morrisburg, ON) and Ottawa Landfill Ditch Re-alignment. Roles included: review of known information, air photo interpretation, identification and obtaining of required permits and approvals.
- Aquatic habitat and community assessment in support of a MOE permit to take water for the Amberwood and Riverbend Golf Courses (Ottawa, ON) and Summersheights Golf Course (Cornwall ON).
- Natural Environment Level 1 for Ferguson Lake Development (Renfrew County). Roles included: terrestrial habitat description and screening.
- Aquatic Assessment and Environmental Screening Report for Loughborough Lake. Roles included: agency consultation, field surveys and report writing. (Kingston Area, ON).
- Assisted with terrestrial environmental impact assessments, in identification of environmental features to identify constraints and opportunities in support of a proposed Official Plan amendment in Tatlock, Ontario.
- Wrote Environmental Overview for Tanglewood and Creekside Mills residential developments in Calgary.
- Wrote Environmental Overview for Elbow Valley Environmental Protection Plan in Calgary.
- Fish habitat assessment on various waterbodies throughout Ontario and in Quebec, Alberta and British-Columbia. Waterbodies assessed include: Lafontaine Drain (Rockland, ON), Clarence Creek (Rockland, ON), Brook Creek (Port Hope, ON), Young Creek (Norfolk, ON), Hay Creek (Norfolk, ON), Spring Creek (Norfolk, ON), Lynn River (Norfolk, ON), Poole Creek (Ottawa, ON), Grey's Creek (Cornwall, ON), Shirley's Brook (Ottawa, ON), Adam's Pond (Ottawa, ON), Foster Drain (Ottawa, ON), Carp River (Ottawa, ON), Jock River (Ottawa, ON), Feedmill Creek (Ottawa, ON), Little Cataraqui River (Kingston, ON), Tay River (Perth, ON), Ottawa River (L'Orignal, ON), Athabasca River (Fort McMurray, AB), Fraser River (Prince George, BC) as well as numerous unnamed watercourses throughout Ontario and near Prince George and MacKenzie in British Columbia.
- Conducted Forest Resources stream inventories for Lakeland Mills in Prince George, BC and north of MacKenzie BC. Work included backpack electrofishing, minnow trapping and snorkel surveys. Work was completed by helicopter, ATV or by foot and required accurate orienteering and mapping skills.

Route Section Studies – WTTP, WPCP, Pipelines

- Natural Heritage Assessment for the proposed water intake pipe in Picton, ON. Roles includes: agency consultation, terrestrial and aquatic habitat assessment, ranking of proposed routes.
- Natural Heritage Existing Conditions Report for the Petewawa River Crossing Route Selection for Muncaster Environmental Planning. Activities included: terrestrial and aquatic habitat descriptions using ecological land classification and Ontario wetland evaluation system.

- Environmental Impact Statement for the route selections for the Caron Street Expansion in Rockland, ON. Activities included: description of the terrestrial and aquatic habitats.
- Aquatic assessment of alternative routes for the proposed Cataraqui Bridge Crossing (Kingston, ON). Activities included: agency consultation, habitat description and ranking of alternatives and construction methods.
- Route Selection Assessment for the Simcoe WPCP. Activities included: completion of terrestrial and aquatic habitat assessments, plant inventories and fish community inventories as well as the ranking of the route alternatives.

- Terrestrial and Aquatic Environmental Screening Reports for sewer and water mains projects: Westley's Point (Township of South Glengarry) and Cataraqui River Crossing (Kingston, ON). Roles included: agency consultation, terrestrial and aquatic habitat descriptions, ranking of routes and identification of potential impacts.
- Assisted with environmental impact assessments, environmental field reports and fieldwork for various pipeline projects (Calgary area and Fort McMurray, AB and Strait of Georgia, BC).

Linear Development – Bridges, Roads, and WPCP, WTTP, Natural Gas and Oil Pipelines

- Aquatic component of environmental assessment for: the proposed Cataraqui Bridge Crossing (Kingston, ON), Morrisburg Waste Water Tunnel (Morrisburg, ON), Clarkson WWTP Outfall (Lake Ontario), Town of Saugeen Shores WPP Upgrade (Lake Huron), Burloak Water Purification Tunnel Project (Lake Ontario), L'Orignal Wastewater Treatment Plant (L'Orignal, ON), Alexandria Wastewater Treatment Plant Expansion (Alexandria, ON).
- Environmental Impact Assessment for: Caron Street Expansion (Rockland, ON), Cataraqui Utilities Crossing (Kingston, ON), Proposed WPCP Expansion in the Town of Greater Napanee (ON), Proposed WTTP Expansion (Iroquois, ON), Morrisburg Wastewater Treatment Plant (Morrisburg to Iroquois ON), Harbour Front Trunk Sewer Overflow Control (Kingston, ON). Roles included: agency consultation, terrestrial and aquatic habitat descriptions (including wetland evaluations), surveys (breeding bird, fish community and plants), evaluation of the potential for Species at Risk, identification of potential impacts and recommendations of mitigation measures, compensation and/or enhancement measures as required.
- Assisted with environmental impact assessments, environmental field reports and fieldwork for various pipeline projects in Alberta (southern AB and Fort McMurray, AB) and the proposed marine pipeline in the Strait of Georgia.
- Wrote Environmental Overview and Environmental Protection Plan for Beddington Trail (Calgary, AB).

Aquatic Inventories

- Spawning and fall community surveys for: lake trout and lake whitefish on Lakes Barlow and Opémisca (Oujé-Bougoumou, Quebec). Sampling methods included: neuston nets, egg traps, seine nets, backpack electrofishing, gill nets and hoop nets.
- Designed and conducted fish kill monitoring of the recently upgraded water treatment facility in Southampton, ON.
- Completed boat elecrofishing and habitat mapping for Port of Prescott proposed expansion (Prescott, ON).
- Collected and analyzed fish and benthic macroinvertebrates from Pattingale and Hoople Creeks for a comparison study of impacted and non-impacted sites for the Raisin Region Conservation Authority (Cornwall, ON).
- Developed and conducted sampling for a benthic macroinvertebrate monitoring program for PTTW, Riverbend Golf Course (near Ottawa, ON).
- Completed R.I.N. (OMNR) gill netting protocol on the Bonnechere River (Renfrew, ON).
- Conducted young-of-the-year walleye monitoring on the Raisin River and Lake St. Francis using boat electrofishing (Cornwall ON).
- Provided fish removal services for Poole Creek at Huntmar (Kanata, ON).
- Conducted young-of-the-year muskie seining for Muskies Canada and OMNR (Gananoque, ON) and on Lake St. Francis (Cornwall, ON) for the Raisin Region Conservation Authority. Sampling method consisted of seine netting.
- Conducted shoreline boat and beach seining along Lake St. Francis for the Lake St. Francis Fish Habitat Plan (Cornwall, ON)
- Walleye spawning surveys on Lakes Barlow and Opémisca (Oujé-Bougoumou, Quebec), Hoople Creek (Ingleside, ON), Raisin River (Martintown, ON), Bonnechere River (Renfrew and Douglas ON), Mississippi River (Almonte, ON), Tay River (Perth, ON). Rideau River (Ottawa, ON). Surveys were completed using night visual surveys methods, modified neuston nets and/or egg traps.

- Conducted and analyzed data from a stream assessment project of Hoople, Hoasic and Sutherland Creeks (OSAP protocol) (eastern ON).
- Benthic macroinvertebrate community sampling on several watercourses including: Clarence and Lafontaine Creeks (Rockland, ON), Bonnechere River (Douglas and Renfew, ON), South River (Village of South River, ON), tributary to the Beaudette River (Alexandria, ON), Hosaic and Hoople Creeks (Morrisburgh, ON), Sutherland Creek and Raisin River (Cornwall, ON), Jock River (Ottawa, ON), and a tributary to Feedmill Creek (Ottawa, ON).
- Conducted boat electrofishing along the shoreline of Lake St. Francis and Raisin River with the RRCA (Cornwall, ON).
- Completed fish community sampling for various projects on the Cataraqui River (Kingston, ON). Sampling methods included boat electrofishing and seine netting.
- Developed and conducted a fish survey on West Nose Creek (Calgary, AB).
- Assisted in a fry monitoring project at the NOVA pump house on Red Deer River (Red Deer, AB). Responsibilities included setting and monitoring fry traps, and data collection.
- Northern pike spawning and spring/ summer/fall fish community sampling for the assessment of potential impacts and as part of monitoring programs. Waterbodies sampled include: Lafontaine Drain (Rockland, ON), Clarence Creek (Rockland, ON), Brook Creek (Port Hope, ON), Young Creek (Norfolk, ON), Hay Creek (Norfolk, ON), Lynn River (Norfolk, ON), Poole Creek (Ottawa, ON), Grey's Creek (Cornwall, ON), Beaudette River (Cornwall, ON), Raisin River (Lancaster, ON), Hosaic Creek (Morrisburg, ON), Shirley's Brook (Ottawa, ON), Foster Drain (Ottawa, ON), Carp River (Ottawa, ON), Jock River (Ottawa, ON), Feedmill Creek (Ottawa, ON), Little Cataraqui River (Kingston, ON), Tay River (Perth, ON), Athabasca River (Fort McMurray, AB), Fraser River (Prince George, BC), West Nose Creek (Calgary, AB) as well as numerous unnamed watercourses throughout Ontario and near Prince George and MacKenzie British Columbia. Sampling methods included: backpack electrofishing, dip netting and minnow and Windermere traps.

Environmental and Fisheries Inspections

- Currently providing the lead support for environmental permitting and approvals for all levels of government (Federal, Provincial and First Nations) and the fisheries inspections for the construction of the Three Nations Bridge Phase 2 (Cornwall, ON).
- Provided the lead environmental support and fisheries inspections for the construction of the three in-water pier of the Three Nations Bridge Phase 1 (Cornwall, ON).
- Designed and managed Clarkson's wastewater tunnel monitoring program for suspended sediments during in-water drilling (Lake Ontario).
- Burloak Water Purification Tunnel Monitoring. Roles included: agency consultation, development and completion of monitoring of fish kill and suspended sediment levels during in-water blasting (Lake Ontario, ON)
- Environmental Inspections during Construction and Fisheries Compliance During Contracts for: the Poole Creek Re-alignment/Huntmar Drive Crossing (Ottawa, ON), Three Nations Bridge Phases 1 & 2 and Cataraqui Utilities Crossing (Kingston, ON) and several MTO projects (Napanee, Vankleek Hill, Lancaster, Ottawa, Peterborough, Iroquois, Kingston).
- Fish removals for:
  - MTO projects: HWY 125, HWY 7, Green's Creek,
  - Trans-Northern Pipeline in eastern Ontario
  - Bonnechere River (waterpower project)

Roles included: design and completion of fish salvage methods.

- Conducted Environmental inspection of the dewatering process for the Elbow Valley Residential sanitary sewer system, Calgary Alberta.

Species at Risk Inventories (note that in addition to the studies listed below, most terrestrial and aquatic projects described above included assessment on the potential to impact SAR)

- Design and monitoring of Golden-winged Warbler breeding and habitat over a 20 year period for a solar facility.
- Completed SAR surveys for the Three Nations Bridge Phases 1 & 2, Cornwall ON
- Obtained SAR clearances for three 10 MW solar facilities, 1 500 kW facility and 5 anaerobic digesters located between London, Ottawa and Cornwall.
- Obtained SAR clearance for new channel to be constructed near Carp, ON.
- Completed search for Bobolinks, whip-poor-will, chimney swifts at various locations in eastern Ontario.
- Completed searches for s nests along road shoulders in Eastern Ontario.
- Completed search for Least Bittern near Moose Creek, Ontario.
- Lake Sturgeon surveys on South Nation River for South Nation Conservation Authority.
- American Eel boat electrofishing surveys on the South Nation River and the St. Lawrence River near the Port of Prescott for South Nation Conservation.
- Completed Protection of SAR assessment for MTO Contract 2010-4028 near Perth, ON.
- Completed SAR surveys for three ditch re-alignments in SD&G
- Larvae Lake Sturgeon surveys on the Bonnechere River.
- Completed Butternut Health Assessments in Port Hope, Colborne, Prescott, Bourget, Moose Creek, Lancaster, Cornwall, Ottawa, Stittsville, Renfrew, Douglas and along several drains in United Counties of Stormont, Dundas and Glengarry.
- Completed searches for Blanding's , Eastern Musk , Spotted for various projects including those in: Picton, Kemptville, Renfrew, Douglas and Moose Creek.
- Worked with Dr. David Bird on Peregrine falcons in Montreal, Quebec.

Marine Environment – Route Section, Environmental Impact Assessments, Inventories, Habitat Assessments

- Environmental Impact Assessment for the Proposed Strait of Georgia Pipeline (BC). Roles included: route selection, marine habitat description, development of sampling methodologies, completion of marine fish and invertebrate surveys, project management of sub-consultants during marine survey period, literature search and potential impact assessment for all marine life and habitats.
- Population Study on Host Sea Anemones and Anemonefishes in Sulawesi, Indonesia. Roles: Realized, completed and presented a population study on the host sea anemones and anemonefishes in Sulawesi, Indonesia in cooperation with McGill University, Ecosurveys Ltd (UK) and Newman Biomarine Pte Ltd (Singapore). The study involved coral habitat mapping and fish surveys.
- Participated in Operation Wallacea on Pulau Hoga Indonesia. Roles included: participation in scuba diving inventories of marine fish communities and mapping of marine habitats.

Environmental Protection Plans

- Environmental Protection Plan for the Three Nations Bridge Phases 1 & 2 (Cornwall, ON).
- Wrote Environmental Protection Plans for Tanglewood, Creekside Mills and Elbow Valley residential developments (Calgary, AB).

Aboriginal Consultation

- Currently acting as liaison with the Mohawk Council of Akwesasne for natural environment matters on behalf of the contractor during Phase 2 of the Three Nations Bridge Phase 2, Cornwall, ON.
- Environmental Lead for the Construction of Phase 1 of the Three Nations Bridge (Cornwall, ON). Roles included: coordination of meetings, obtaining permits and communications with Mohawk Council of Akwesasne for environmental matters for the contractor.
- Natural Environment Consultant for a proposed small hydroelectric facility in Northern Quebec for the Eenou Companee (Oujé-Bougoumou, Quebec). Roles included: conducting interviews and community consultation regarding the traditional and cultural uses of the natural environment.

Other

- Co-authored the Walleye Management Plan for Lake St. Francis with the Raisin Region Conservation Authority and OMNR.
- Peer review of the Talston Hydroelectric project, NWT Canada.
- Presented a talk on monitoring walleye larvae and BMPs at the IAGLR Conference, May 2006.
- Presented *How to Develop a Monitoring Program for BMPs* at the Great Lakes Sustainability Non Point Source Symposium, March 2006
- Co-authored Lake St. Francis Fish Habitat Plan for Raisin Region Conservation Authority.
- Coordinated the 2003 Strategic Habitat Restoration Working Group workshop for the Raisin Region Conservation Authority.
- Contributing author for the Raisin Region Natural Heritage Strategy
- Co-authored a paper on the Effects of Marine Pipelines on the Benthic Environment, presented at the 7th International Symposium on Environmental Concerns in Right-of-Way Management.
- Created and conducted environmental education programs in French for children and the general public.

Niblett's Qualifications

Chris Ellingwood, President and Sr. Terrestrial and wetland biologist

Bird survey and Amphibian survey qualifications

Mr. Ellingwood has conducted breeding bird surveys for numerous projects including wind power and hydroelectric facilities and for over 1000 EIS reports. The surveys are conducted using standard surveys techniques. He also participates annually in various volunteer projects, several for over 15 years including the Ontario Breeding Bird Survey, Forest Bird Monitoring Survey, and the Ontario Marsh Monitoring Program (amphibian and bird surveys).

He also has participated in the Breeding Bird Census, Ontario Breeding Bird Atlas (1st and 2nd), Maritime Breeding Bird Atlas, , Spring Red-shouldered Hawk and Woodpecker Survey, Nocturnal Owl Survey, Ontario Nest Record Scheme, Christmas Bird Counts, Ontario Rare Breeding Bird Program, Project Feederwatch, Canadian Lakes Loon Survey, Loggerhead Shrike Survey (1987), Couchiching Conservancy volunteer monitoring Shrike Survey, Ontario Grassland Bird Survey, Central Ontario Whip-poor-will survey and the Peregrine Falcon Reintroduction Program.

Mr. Ellingwood acted as Regional Coordinator (Region 14) for the second Ontario Breeding Bird Atlas project (2001-2005) and is currently the volunteer regional coordinator for Bird Studies Canada's Marsh Monitoring Program in the Kawartha Lakes area. He is also the coordinator for the Lindsay Christmas Bird Count.

He regularly conducts workshops for birdwatching, birding by ear, leads nature tours and participates in the Carden Challenge (a 24 hr birding event) in the Carden Plain. He has over 35 years experience as an expert bird watcher.

Mr. Ellingwood has conducted amphibian surveys using the MMP protocols for over 15 years. He has two routes in the Kawarthas utilizing the MMP protocol. He is also the volunteer regional coordinator for Bird Studies Canada in the Kawartha Lakes area for the Marsh Monitoring Program amphibian and bird surveys. He has over 20 years experience with amphibian surveys and habitat assessments including designing compensation works for frog breeding ponds, Species At Risk work and habitat enhancement measures for snakes, frogs and s.

Butternut health assessments

Mr. Ellingwood is a MNR certified Butternut Health Assessor (#110) and has conducted numerous assessments under the MNR protocols across southern and eastern Ontario.

Kelly Cordick, Terrestrial and wetland biologist

Vegetation surveys

Ms. Cordick has over 10 years experience as a biologist and has worked as a terrestrial and wetland biologist for NEA for 5 years. She has training in the ELC southern Ontario system, the Ontario Wetland Evaluation System and plant biology. As a biologist with NEA, Ganaraska and Toronto Region Conservation Authorities, she has conducted numerous surveys across Ontario

in grasslands, woodlands, wetlands and valleylands. She has a strong background in plant identification of Ontario trees, shrubs, groundcover and aquatic/wetland species. She is also a qualified MFTIP evaluator for woodlands on private lands.

Ali Giroux, **Terrestrial and wetland biologist**

Amphibian survey

Ms. Giroux has four years of experience as a biologist and has worked as a terrestrial and wetland biologist for NEA for less than a year. She has experience identifying amphibians in the field by both sight and sound. Ali was a terrestrial monitoring volunteer with the Toronto and Region Conservation Authority (TRCA) in 2006 which involved amphibian surveys on TRCA land. She has also been involved with the Marsh Monitoring Program performing marsh bird and amphibian surveys in the Aylmer area. She has completed many amphibian surveys this past spring with NEA for projects across Southern Ontario and currently, Ali monitors a route for the marsh monitoring program in Peterborough for both amphibian and marsh birds.

Katherine Ryan, **Terrestrial and wetland biologist**

Amphibian survey

Ms. Ryan has two years of experience as a biologist and has worked as a terrestrial and wetland biologist for NEA for almost a year. She began with technical training for the identification of frogs through sight and sound at Fleming College. Katherine worked with Otonabee Region Conservation Authority (ORCA) and completed amphibian surveys on ORCA lands. She has completed many amphibian surveys this past spring with NEA for projects across Southern Ontario and is currently a Marsh Monitoring Volunteer for a route in the Lindsay area monitoring amphibians.

Gerry Sullivan**, Terrestrial and wetland biologist**

Wetland delineation

Mr. Sullivan is a certified MNR OWES wetland assessor and has conducted numerous wetland boundary delineations for projects across Central Ontario. He has worked for Otonabee Conservation in this capacity and in his work at NEA.

List of Observed Species (Bowfin and Niblett)

(Note that any Endangered or Threatened species has been removed from the list as they are dealt with under a separate process).

Common Name	Scientific Name	Srank	Provincial Status (SARO)	Federal Status (SARA)
BUTTERFLIES				
Monarch	*Danaus plexippus*	S2N, S4B	SC	SC
AMPHIBIANS				
Western Chorus Frog	*Pseudacris triseriata*	S4		
Spring Peeper	*Pseudacris crucifer*	S5		
Bullfrog	*Rana catesbeiana*	S4		
Green Frog	*Rana clamitans*	S5		
Wood Frog	*Rana sylvatica*	S5		
Mink Frog	*Rana septentrionalis*	S5		
REPTILES				
Northern Water Snake	*Nerodia sipedon sipedon*	S5		
BIRDS				
Ring-billed Gull	*Larus delawarensis*	S5B, S4N		
Rock Dove	*Columba livia*	SNA		
Mourning Dove	*Zenaida macroura*	S5		
Downy Woodpecker	*Picoides pubescens*	S5		
Eastern Wood-Pewee	*Contopus virens*	S4B		
Eastern Kingbird	*Tyrannus tyrannus*	S4B		
Warbling Vireo	*Vireo gilvus*	S5B		
Red-eyed Vireo	*Vireo olivaceus*	S5B		
Blue Jay	*Cyanocitta cristata*	S5		
American Crow	*Corvus brachyrhynchos*	S5B		
Black-capped Chickadee	*Poecile atricapilla*	S5		
White-breasted Nuthatch	*Sitta carolinensis*	S5		
House Wren	*Troglodytes aedon*	S5B		
American Robin	*Turdus migratorius*	S5B		
Gray Catbird	*Dumetella carolinensis*	S4B		
European Starling	*Sturnus vulgaris*	SNA		
Cedar Waxwing	*Bombycilla cedrorum*	S5B		
Yellow Warbler	*Dendroica petechia*	S5B		
Black-and-white Warbler	*Mniotilta varia*	S5B		
American Redstart	*Setophaga ruticilla*	S5B		
Ovenbird	*Seiurus aurocapillus*	S4B		
Common Yellowthroat	*Geothlypis trichas*	S5B		
Chipping Sparrow	*Spizella passerina*	S5B		
Field Sparrow	*Spizella pusilla*	S4B		
Savannah Sparrow	*Passerculus sandwichensis*	S4B		
Song Sparrow	*Melospiza melodia*	S5B		

Common Name	Scientific Name	Srank	Provincial Status (SARO)	Federal Status (SARA)
White-throated Sparrow	*Zonotrichia albicollis*	S5B		
Indigo Bunting	*Passerina cyanea*	S4B		
Red-winged Blackbird	*Agelaius phoeniceus*	S4		
Common Grackle	*Quiscalus quiscula*	S5B		
Brown-headed Cowbird	*Molothrus ater*	S4B		
American Goldfinch	*Carduelis tristis*	S5B		
House Sparrow	*Passer domesticus*	SNA		
MAMMALS				
White-tailed Deer	*Odocoileus virginianus*	S5		
PLANTS				
Stonewort sp.	*Chara sp.*			
Northern Lady Fern	*Athyrium filix-femina var. angustum*	S5		
Spinulose Wood Fern	*Dryopteris carthusiana*	S5		
Oak Fern	*Gymnocarpium dryopteris*	S5		
Ostrich Fern	*Matteuccia struthiopteris*	S5		
Sensitive Fern	*Onoclea sensibilis*	S5		
Field Horsetail	*Equisetum arvense*	S5		
Meadow Horsetail	*Equisetum pratense*	S5		
Interrupted Fern	*Osmunda claytoniana*	S5		
Common Juniper	*Juniperus communis var. depressa*	S5		
Eastern Red Cedar	*Juniperus virginiana*	S5		
Eastern White Cedar	*Thuja occidentalis*	S5		
Scotch Pine	*Pinus sylvestris*	SNA		
Eastern Hemlock	*Tsuga canadensis*	S5		
Manitoba Maple	*Acer negundo*	S5		
Red Maple	*Acer rubrum*	S5		
Silver Maple	*Acer saccharinum*	S5		
Sugar Maple	*Acer saccharum*	S5		
Poison-ivy	*Rhus radicans ssp. negundo*	S5		
Staghorn Sumac	*Rhus typhina*	S5		
Wild Carrot	*Daucus carota*	SNA		
Spreading Dogbane	*Apocynum androsaemifolium*	S5		
Common Milkweed	*Asclepias syriaca*	S5		
Swallow-wort	*Cynanchum rossicum*	SNA		
Common Yarrow	*Achillea millefolium ssp. millefolium*	SNA		
Common Ragweed	*Ambrosia artemisiifolia*	S5		
Great Burdock	*Arctium lappa*	SNA		
Common Burdock	*Arctium minus ssp. minus*	SNA		
Aster sp.	*Aster sp.*			
Heart-leaved Aster	*Aster cordifolius*	S5		

Common Name	Scientific Name	Srank	Provincial Status (SARO)	Federal Status (SARA)
Panicled Aster	*Aster lanceolatus ssp. lanceolatus*	S5		
Small White Aster	*Aster lateriflorus var. lateriflorus*	S5		
Purple-stem Aster	*Aster puniceus var. puniceus*	S5		
Ox-eye Daisy	*Chrysanthemum leucanthemum*	SNA		
Chicory	*Cichorium intybus*	SNA		
Thistle sp.	*Cirsium sp.*			
Bull Thistle	*Cirsium vulgare*	SNA		
Daisy Fleabane	*Erigeron annuus*	S5		
Philadelphia Fleabane	*Erigeron philadelphicus ssp. philadelphicus*	S5		
Common Boneset	*Eupatorium perfoliatum*	S5		
Spotted Joe-pye-weed	*Eupatorium maculatum ssp. maculatum*	S5		
Grass-leaved Goldenrod	*Euthamia graminifolia*	S5		
Orange Hawkweed	*Hieracium aurantiacum*	SNA		
King Devil Hawkweed	*Hieracium X floribundum*	SNA		
Tall White Lettuce	*Prenanthes altissima*	S5		
Goldenrod sp.	*Solidago sp.*			
Blue-stem Goldenrod	*Solidago caesia*	S5		
Canada Goldenrod	*Solidago canadensis*	S5		
Zig-zag Goldenrod	*Solidago flexicaulis*	S5		
Spiny-leaved Sow-thistle	*Sonchus asper ssp. asper*	SNA		
Common Dandelion	*Taraxacum officinale*	SNA		
Doubtful Goat's-beard	*Tragopogon dubius*	SNA		
Coltsfoot	*Tussilago farfara*	SNA		
Spotted Jewel-weed	*Impatiens capensis*	S5		
Purple-flowered Blue Cohosh	*Caulophyllum giganteum*	S4?		
May-apple	*Podophyllum peltatum*	S5		
White Birch	*Betula papyrifera*	S5		
Ironwood	*Ostrya virginiana*	S5		
Viper's Bugloss	*Echium vulgare*	SNA		
Creeping Bellflower	*Campanula rapunculoides*	SNA		
Marijuana	*Cannabis sativa*	SNA		
Honeysuckle sp.	*Lonicera sp.*			
Tartarian Honeysuckle	*Lonicera tatarica*	SNA		
Common Elderberry	*Sambucus canadensis*	S5		
Sweet William	*Silene armeria*	SNA		
Bladder Campion	*Silene latifolia*	SNA		
Lamb's Quarters	*Chenopodium album var. album*	SNA		
Field Bindweed	*Convolvulus arvensis*	SNA		
Alternate-leaved Dogwood	*Cornus alternifolia*	S5		

Common Name	Scientific Name	Srank	Provincial Status (SARO)	Federal Status (SARA)
Round-leaved Dogwood	*Cornus rugosa*	S5		
Red-osier Dogwood	*Cornus stolonifera*	S5		
Bird's-foot Trefoil	*Lotus corniculatus*	SNA		
Alfalfa	*Medicago sativa*	SNA		
White Sweet-clover	*Melilotus alba*	SNA		
Red Clover	*Trifolium pratense*	SNA		
Cow Vetch	*Vicia cracca*	SNA		
American Beech	*Fagus grandifolia*	S4		
Herb-robert	*Geranium robertianum*	SNA		
Prickly Gooseberry	*Ribes cynosbati*	S5		
Smooth Gooseberry	*Ribes hirtellum*	S5		
Common St. John's-wort	*Hypericum perforatum*	SNA		
Bitternut hickory	*Carya cordiformis*	S5		
Black Walnut	*Juglans nigra*	S4		
Wild Basil	*Clinopodium vulgare*	S5		
Mint sp.	*Mentha sp.*			
American Wild Mint	*Mentha arvensis ssp. borealis*	S5		
Catnip	*Nepeta cataria*	SNA		
Purple Loosestrife	*Lythrum salicaria*	SNA		
White Mulberry	*Morus alba*	SNA		
White Ash	*Fraxinus americana*	S5		
Black Ash	*Fraxinus nigra*	S5		
Green Ash	*Fraxinus pennsylvanica*	S5		
Common Lilac	*Syringa vulgaris*	SNA		
Dwarf Enchanter's Nightshade	*Circaea alpina*	S5		
Canada Enchanter's Nightshade	*Circaea lutetiana ssp. canadensis*	S5		
Common Evening-primrose	*Oenothera biennis*	S5		
Bloodroot	*Sanguinaria canadensis*	S5		
Ribgrass	*Plantago lanceolata*	SNA		
Common Plantain	*Plantago major*	SNA		
Rugel's Plantain	*Plantago rugelii*	S5		
Fringed Polygala	*Polygala paucifolia*	S5		
Lady's-thumb	*Polygonum persicaria*	SNA		
Curly Dock	*Rumex crispus*	SNA		
White Baneberry	*Actaea pachypoda*	S5		
Sharp-lobed Hepatica	*Anemone acutiloba*	S5		
Wild Columbine	*Aquilegia canadensis*	S5		
Garden Columbine	*Aquilegia vulgaris*	SNA		
Tall Buttercup	*Ranunculus acris*	SNA		
Early Meadow-rue	*Thalictrum dioicum*	S5		

Common Name	Scientific Name	Srank	Provincial Status (SARO)	Federal Status (SARA)
Tall Meadow-rue	*Thalictrum pubescens*	S5		
Common Buckthorn	*Rhamnus cathartica*	SNA		
Black Chokeberry	*Aronia melanocarpa*	S5		
Hawthorn sp.	*Crataegus sp.*			
Common Strawberry	*Fragaria virginiana ssp. virginiana*	S5		
White Avens	*Geum canadense*	S5		
Apple sp.	*Malus sp.*			
Rough Cinquefoil	*Potentilla norvegica ssp. monspeliensis*	SU		
Rough-fruited Cinquefoil	*Potentilla recta*	SNA		
Black Cherry	*Prunus serotina*	S5		
Choke Cherry	*Prunus virginiana ssp. virginiana*	S5		
Wild Red Raspberry	*Rubus idaeus ssp. strigosus*	S5		
Purple Flowering Raspberry	*Rubus odoratus*	S5		
Smooth Bedstraw	*Galium mollugo*	SNA		
Balsam Poplar	*Populus balsamifera ssp. balsamifera*	S5		
Trembling Aspen	*Populus tremuloides*	S5		
Bebb's Willow	*Salix bebbiana*	S5		
Weeping Willow	*Salix babylonica*	SNA		
Crack Willow	*Salix fragilis*	SNA		
Slender Willow	*Salix petiolaris*	S5		
Early Saxifrage	*Saxifraga virginiensis*	S5		
Common Mullein	*Verbascum thapsus*	SNA		
Bittersweet Nightshade	*Solanum dulcamara*	SNA		
American Basswood	*Tilia americana*	S5		
American Elm	*Ulmus americana*	S5		
Wood Nettle	*Laportea canadensis*	S5		
Blue Vervain	*Verbena hastata*	S5		
Virginia Creeper	*Parthenocissus inserta*	S5		
Riverbank Grape	*Vitis riparia*	S5		
Jack-in-the-pulpit	*Arisaema triphyllum ssp. triphyllum*	S5		
Awl-fruited Sedge	*Carex stipata*	S5		
Black Bulrush	*Scirpus atrovirens*	S5		
Wool-grass	*Scirpus cyperinus*	S5		
Dudley's Rush	*Juncus dudleyi*	S5		
Wild Leek	*Allium burdickii*	S1?		
Asparagus	*Asparagus officinalis*	SNA		
Wild Lily-of-the-valley	*Maianthemum canadense*	S5		
False Solomon's Seal	*Maianthemum racemosum ssp. racemosum*	S5		
Hairy Solomon's Seal	*Polygonatum pubescens*	S5		

Common Name	Scientific Name	Srank	Provincial Status (SARO)	Federal Status (SARA)
Rose Twisted-stalk	*Streptopus roseus*	S5		
White Trillium	*Trillium grandiflorum*	S5		
Common Helleborine	*Epipactis helleborine*	SNA		
Grass Family	*Poaceae*			
Oat sp.	*Avena sp.*			
Orchard Grass	*Dactylis glomerata*	SNA		
Barnyard Grass	*Echinochloa crusgalli*	SNA		
Reed Canary Grass	*Phalaris arundinacea*	S5		
Timothy	*Phleum pratense*	SNA		
Large-leaved Pondweed	*Potamogeton amplifolius*	S5		
Sago Pondweed	*Potamogeton pectinatus*	S5		
Narrow-leaved Cattail	*Typha angustifolia*	SNA		
Broad-leaved Cattail	*Typha latifolia*	S5		

Ranking and Status Updated: September 21, 2012

SRANK DEFINITIONS

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

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

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

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

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

SU Unrankable, Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

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

? Inexact Numeric Rank—Denotes inexact numeric rank

SARO STATUS DEFINITIONS

SC Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

SARA STATUS DEFINITIONS

SC Special Concern, a wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Summary of Amphibian Breeding Visit (April 2011, Niblett)

Station #	Associated community #	date	Start time	result
1	4, 16	14/04/2011	2037	3 chorus frogs, 3 spring peepers, and 2 wood frogs heard in the cSWH (community 4)
2	8	14/04/2011	2042	none
3	3	14/04/2011	2052	3 spring peepers and 2 wood frogs (community 3)
4	1,3,13, 15	14/04/2011	2057	2 spring peepers (community 15) 2 wood frogs (community 1)
5	13, 14	14/04/2011	2105	2 wood frogs (community 14)
6	None: project layout has since changed and the habitat community associated with this area is no longer within 120 m	14/04/2011	2106	none
7	13, 14	14/04/2011	2111	2 spring peepers (community 13) 2 spring peepers (community 14)
Total # of listed species in each community	1			2
	3			5
	4			8
	8			None
	13			2
	14			4
	15			2
	16			none
Totals for contiguous candidate woodland amphibian breeding habitats	North of Snug Harbour Rd. (1, 3, and part of 14)			2+5+2=9
	South of Snug Harbour Rd. (community 13, part of 14 and 15)			2+2+2=6
	East of Kennedy Bay Rd. (communities 4 and 16)			8+0=8
	Community 8			none

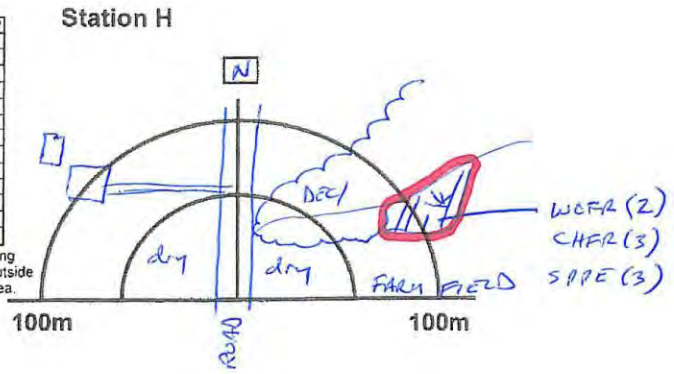
Field Notes

10-0606

STATION 1

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR	3	
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE	3	
WOFR		2

* Check if species calling from inside and/or outside 100-metre station area.



Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

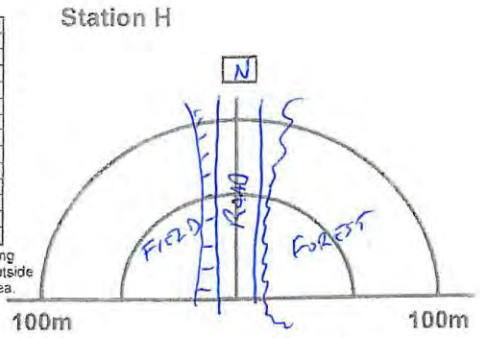
Observer: CHRIS ELLINGWOOD		
Route name: BARTA SOLAR SITE - 10-066 KENNEDY BAY ROAD - creek to east		
Date (dd-mm-yr): 14-04-11	Visit No.: 1	Start time (24 hr clock): 2037 - 2
Beaufort Wind Scale No.: 1	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓ Damp/Haze/Fog:____ Drizzle:____ Rain:____		
Has the habitat on your route changed from previous years: Yes:____ No:____ Not applicable:____		
Remarks: -calling activity high - daytime Temp 10°C.		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

STATION 2

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species calling from inside and/or outside 100-metre station area.



- no frogs
- no wetland or ponding.

Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

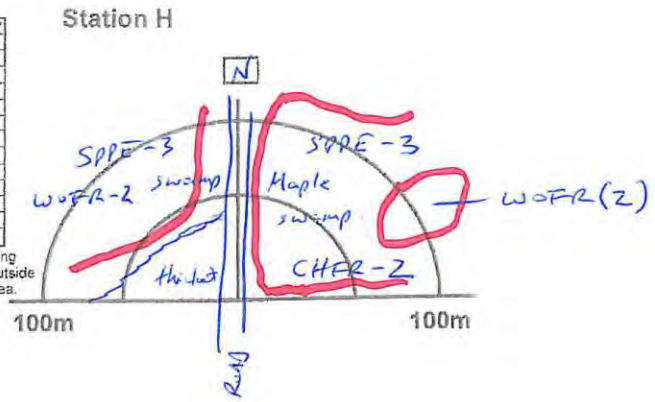
Observer:	CHRIS ELLINGWOOD	
Route name:	BARTA SOLAR SITE – 10-066 KENNEDY BAY ROAD – N. of Hwy 36.	
Date (dd-mm-yr): 14-04-11	Visit No.: 1	Start time (24 hr clock): 2042
Beaufort Wind Scale No.: 1	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓	Damp/Haze/Fog:____	Drizzle:____ Rain:____
Has the habitat on your route changed from previous years: Yes:____	No:____	Not applicable:____
Remarks: – ridge to west – south forest east – dry		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

STATION 3

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR	2	
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE	3	
WOFR	2	2

* Check if species calling from inside and/or outside 100-metre station area.



Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

Observer:	CHRIS ELLINGWOOD
Route name:	BARTA SOLAR SITE 10-066

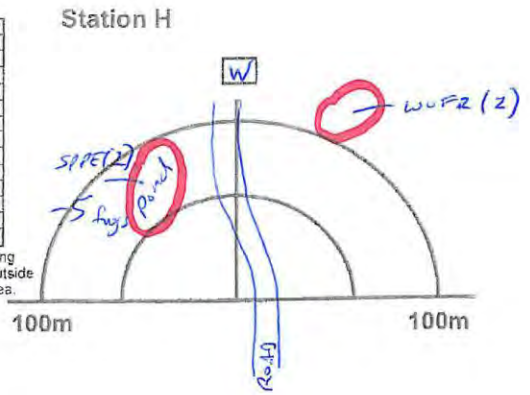
Date (dd-mm-yr): 14-04-11	Visit No.: 1	Start time (24 hr clock): 2052
Beaufort Wind Scale No.: 1	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓	Damp/Haze/Fog:____	Drizzle:____ Rain:____
Has the habitat on your route changed from previous years: Yes:____	No:____	Not applicable:____
Remarks: KENNEDY BAY ROAD - N. of property - maple swamp.		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

STATION 4

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE	2	
WOFR		2

* Check if species calling from inside and/or outside 100-metre station area.



Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

Observer:	CHRIS ELLINGWOOD
Route name:	BARTA SOLAR – 10-066

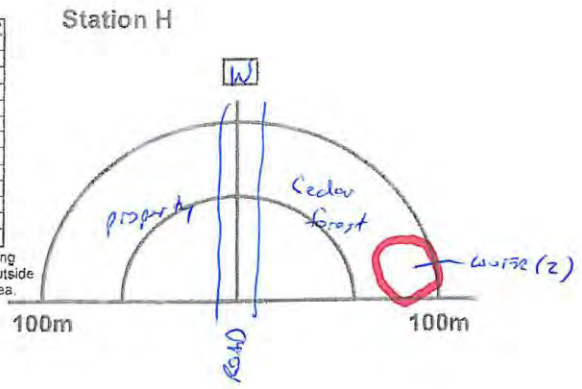
Date (dd-mm-yr): 14-JUL-11	Visit No.: 1	Start time (24 hr clock): 2057
Beaufort Wind Scale No.: 0	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓	Damp/Haze/Fog:_____	Drizzle:_____ Rain:_____
Has the habitat on your route changed from previous years: Yes:_____	No:_____	Not applicable:_____
Remarks: Snug Harbour Road – west of Kennedy Bay – pond on site.		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

STATION 5

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR	2	

* Check if species calling from inside and/or outside 100-metre station area.



Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

Observer:	CHRIS EDLINGWOOD
Route name:	BARTA SOLAR - 10-066

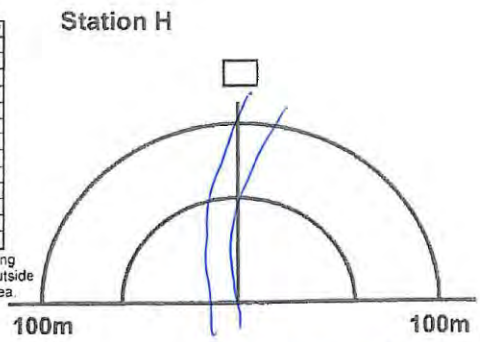
Date (dd-mm-yr): 14-06-11	Visit No.: 1	Start time (24 hr clock): 2105
Beaufort Wind Scale No.: 0	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓	Damp/Haze/Fog:____	Drizzle:____ Rain:____
Has the habitat on your route changed from previous years: Yes:____	No:____	Not applicable:____
Remarks: - SNUG HARBOUR ROAD - west edge of property		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

STATION 6

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species calling from inside and/or outside 100-metre station area.



— no frogs

Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

Observer:	CHRIS ELLINGWOOD
Route name:	BARRA SOLAR - 10-066

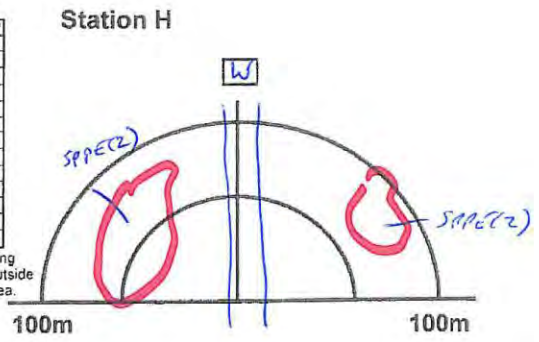
Date (dd-mm-yr): 14-04-11	Visit No.: 1	Start time (24 hr clock): 2106
Beaufort Wind Scale No.: 0	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓	Damp/Haze/Fog:____	Drizzle:____ Rain:____
Has the habitat on your route changed from previous years: Yes:____	No:____	Not applicable:____
Remarks: ASH ROAD - dry upland forest.		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

STATION 7

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE	2	
WOFR		

* Check if species calling from inside and/or outside 100-metre station area.



Amphibian Data Form

Return by 31 July to Aquatic Surveys Officer, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

Please write legibly (in pen).

Observer:	CHRIS ELLINGWOOD
Route name:	BARTA SOLAR -10-066

Date (dd-mm-yr): 14-06-11	Visit No.: 1	Start time (24 hr clock): 2111
Beaufort Wind Scale No.: 0	Cloud Cover (10ths): 0	Air Temp (°C or °F): 6
Precipitation (check one): None/dry: ✓	Damp/Haze/Fog:_____	Drizzle:_____ Rain:_____
Has the habitat on your route changed from previous years: Yes:_____	No:_____	Not applicable:_____
Remarks: SNOW ~~FROZEN~~ ROAD - dry upland forest - N / wetland swamp SOUTH		

CALL LEVEL CODES
Code 1: Calls not simultaneous, number of individuals can be accurately **counted**
Code 2: Some calls simultaneous, number of individuals can be reliably **estimated**
Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

BARTA MMP APRIL 14/11

Vegetation community form

Niblett Environmental Associates

Date: June 30/10

Project Name: Kennedy Bay site

Project Number: PENN ENERGY

Community No.

Soils/bedrock:
Sand, clay, silt, organic
gravel, rock, cobble.
shingles, limestone,
granitic

Type:

Community type:
deciduous forest
mixed forest
coniferous forest
plantation
old field meadow
swamp/marsh/bog/fen
alvar/ledge/talus slope
cliff/ rock barren/outcrop
sand dune/beach

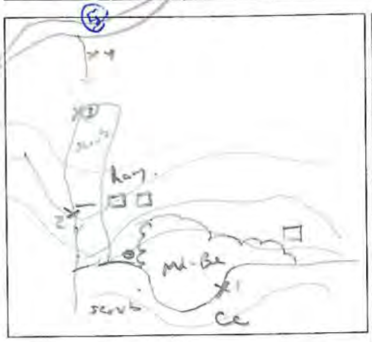
Community age:
1-Pioneer, 2-young
3-mid-aged, 4-mature
5-old growth 6-regen

Physiography:
Rolling, hummocky, hilly
valley, floodplain, slope,
bottomland, tableland,
alvar, riverine, shore

Disturbances:

ELC code: ELC veg. type:

Layer	dbh	% cover	Dominant species
Canopy			KENNEDY BAY
Understory			
Groundcover			0700 –



		(2) FIELD / Barn	(3) field
		SUSP	BLJY
		RECH	SOSP
		HOWR	MODO
		AMGO	REVI
		INBU	AMGO
		RWWA	BHCO
		AMRO	AMRO
		CHSP	EAME
		AMRE	EAKI
Trees	(1) FOREST – N	BHCO	COGR
	DOWO	GRCA	CEDW
	OVEN	SASP	SASP
	REVI	AMCR	
	BCCH	MODO	(4) FISP AMGO
	BWWA	RWBL	REVI AMRO
Shrubs	CEDW	COGR	EAME [illegible]
	BLJY	BNSW	SOSP
	AMGO		
	NAWA		
	AMCR	(5) corner – Hwy 36.	
	WBNU	BNSW COYE	
		[illegible] HOSP YEWA	

Birds: Wildlife:

hot, humid, breezy, sunny
cedar split rail, page wire & electric fencing

9:40 begin field work on SE portion. finish S/SE @ 10:57

NEA Niblett Environmental Associates Inc.
Biological Consultants

9:30 am arrival, recon entire site

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July 16, 2010 **Project #: 10-066**

Community #: 1
ELC Community type: CUM1-1 (1)
Location/boundary:

Dominant species (%, dbh range)

canopy-	11-12:30 n/ne portion + CC ✓wool grass
understory-	~~path rush~~
soil-	✓bl. camp
Herbaceous	**Herbaceous**
✓RCG	✓r. cinq
✓QAL	✓gr. burr
✓cow vetch	✓aspar
✓C. gold	✓catnip
✓n-l plantain	✓bull this
✓b-f tref	✓cl. ench n-S ★
✓C. st. john's	✓c. straw
✓viper's	✓tall wh. aster
✓DSV	✓c yarr
✓d. flea	✓bl camp
✓alfalfa	✓herb Rob ★
✓[illegible] aster	✓w. avens ★
✓C. milkwd	✓timothy
✓goat's	✓O. hawk
✓r clover	✓p-s aster
✓ox-eye	✓rugel's plant
✓PI	see pit 3 sample
✓C. dande	small [illegible]
✓W basil	✓w. swt clov
✓w. bedstraw	✓als clov
✓f. mint	✓hop clov

Tree Species(*=dominant)	Shrub Species
✓Ce (S end only)	✓Cc
✓Mh	✓W grape
✓Mm	✓Euro buck
✓Aw	✓creeper
✓Ew	✓hawth spp.
✓crabapple	✓lilac
..	✓C. junip
.	✓[illegible]
✓b-l plant	✓ALD
✓garden C[illegible]	✓honeys. spp.
~~path rush~~	✓wild r
✓bl. camp	✓ROD
✓wool grass	✓pr. [illegible]

Birds:
✓AMCR
✓RWBL

Wildlife:
✓WTDE (trails beds)
✓curled dock
sprdg. dgb

★= shady areas under mature trees

(2)

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Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July 16, 2010 **Project #: 10-066**

Community #: FOD ~~8-1~~ (4)
ELC Community type: Mh for
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	Herbaceous
✓ tall mead	✓ ostrich f.
✓ [illegible]	✓ CMF
✓ dw enchan-s	✓ w leek
✓ herb robt.	✓ wild g...
✓ w. tril (r?)	✓ gr. bwrd
✓ w. bN	
✓ . JITP	
✓ . sens f	
✓ tall lett	
✓ spin w-f	
✓ false sp	
✓ blue w	DITCH:
✓ helle	CLW4
✓ sharp hep	ABG
✓ fine fe	RCG
✓ w bane	b-l plant
	cotts
	c ancm
	f horsed
	sp flwel
	NSI

Tree Species(*=dominant)	Shrub Species
✓ Mh	✓ p-f rasp
✓ Aw	✓ w grape
✓ Ce	✓ c elder(?)
✓ butternut (see pix)	✓ ALD
✓ Hem	✓ L. R.K.
✓ Be	✓ r. go
✓ Bd	✓ rc
✓ Id	
✓ Ew	
✓ Cc	
✓ Cb	

Very high consistency, Low diversity

Birds:

Wildlife:

(2) 1LAL

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Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July ~~16~~ 20th 2010 **Project #: 10-066**

Community #:
ELC Community type:
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	Herbaceous
✓ bloodroot	
✓ W. bane	
✓ fringed poly	
✓ interrupted f.	
✓ oak f	
✓ mayapple	
✓ RTS	

Tree Species(*=dominant)	Shrub Species
✓ bitternut hick	

Birds:
✓ WBNI
~~[illegible]~~ (laughing call?)
✓ EWPE
✓ WTSP

Wildlife:

(3)

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Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July ~~16~~ 20, 2010 **Project #: 10-066**

Community #:
ELC Community type: dug pond
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	**Herbaceous**
✓ marimana (P)	✓ Chara
✓ b-l catt	
✓ n-l catt	
✓ RCG	
✓ SAS CUM H	I species
✓ slender pondwd	SAGO
✓ grass lvd gold	
✓	
✓ grn fr sedge	
✓ flat lvd pond	

Tree Species(*=dominant)	**Shrub Species**
✓ crack	✓ R O D
	✓ Bebb's wil

Birds: ✓ GRCA

Wildlife: ✓ GRFR
✓ BULL

(4)

NEA Niblett Environmental Associates Inc.
Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July 16, 2010 **Project #: 10-066**

Community #: 4
ELC Community type: hedge rows
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	Herbaceous
✓ . sils	
✓ . St. John's	
✓ . r clov	
✓ . tim	
✓ . KCG	
✓ . aly	
.	
.	
.	
.	
.	
.	

Tree Species(*=dominant)	Shrub Species
✓ Aw	✓ v. creeper
✓ Bd	✓ r. grape
✓ Fw	✓ t. hsn
✓ apple	✓ other hsn's
.	✓ Cc
.	✓ Gumblack
..	✓ Sm. grns
.	✓ PI
	✓ Wr
.	✓ ALD

Birds: Wildlife:

(5)

NEA Niblett Environmental Associates Inc.
Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July 16, 2010 **Project #: 10-066**

fin [illegible] 12:30

Community #: (5) n side
ELC Community type: snug harb rd
Location/boundary:

Dominant species (%, dbh range)
canopy-
understory-
soil-

Herbaceous	Herbaceous
✓ bitt ns	
✓ CLWH	
✓ W milk	
✓ n. bugleweed	
✓ tall [illegible]	
✓ Com gold	
✓ white grass	
* Smooth [illegible]	unscented
[illegible] purple	[illegible]
[illegible] (not?)	[illegible]
✓ self heal	

Tree Species(*=dominant)	Shrub Species
~~✓ MH~~	✓ ALD
✓ Ce	✓ euro b
✓ Ab	✓ RDD
✓ GW	✓ Creeper
✓ M Si	
✓ crack	
✓ [illegible]	
Ab swamp	
* moves into Ce swamp / Ce for	

Birds:

Wildlife:

(7)

NEA Niblett Environmental Associates Inc.
Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: July 16, 2010 **Project #: 10-066**

Community #: [illegible]
ELC Community type: sm. cedar
Location/boundary: regen comm

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	Herbaceous
✓ n-l plant	
✓ c dande	
✓ c. strawb	
✓ ? aster	
✓ L. bedst	
✓ r-s aster + other aster/Solidago spp.	
✓ [illegible] sax	
✓ all herbs stunted, small, immature	

Tree Species(*=dominant)	Shrub Species
Ce	✓ Cc

Birds: ✓ AMCR

Wildlife:

IIAC entered Aug 26

NEA Niblett Environmental Associates Inc.
Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: ~~July 16,~~ Aug 4 2010 Project #: 10-066

Community #: 1 UPLAND CE
ELC Community type:
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	Herbaceous
sp. lvd sunflws	
.	
.	
.	
.	
.	
.	
.	
.	
.	
.	

Tree Species(*=dominant)	Shrub Species
Cb, Ce, Mh,	Wn GRAPE
Aw, Ew, Ph,	BUCKTHORN
.	
.	
.	
.	
..	
.	
.	

Birds:

Wildlife: NO UNDERSTORY

2-4pm * on-site

(2)

NEA — Niblett Environmental Associates Inc.
Biological Consultants

Community ~~Description Sheet~~
Project Name: Penn Energy (Barta Parcel)
Date: ~~July 16~~ Aug 4, 2010 **Project #: 10-066**

Community #:
ELC Community type: Mh,
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	**Herbaceous**
ZIG ZAG	
BLUE COHOSH	
COLTSFOOT	
EARLY MEADOW RUE	
PHIL FLEABANE	
TREFOIL	
Q A LACE	
~~[illegible]~~ CREEPING [illegible]	

Tree Species(*=dominant)	**Shrub Species**		
Mh, Bl, Bu, Ce,	CHOKE CHERRY	C. STRAWBERRY	
Hi*, Wd, Ew,	SH SUMAC	meadow Horsetail	
.	W GRAPE	ENCH NIGHTSHADE	
.	PRICK GOOSEBERRY	SENS FERN	
.			
.			
..			
.			
.			

Birds: Wildlife:

Niblett Environmental Associates Inc.
Biological Consultants

Community Description Sheet

Project Name: Penn Energy (Barta Parcel)
Date: ~~July 16,~~ Aug 4. 2010 **Project #: 10-066**

Community #:
ELC Community type: Ce Wet
Location/boundary:

Dominant species (%, dbh range)
canopy-

understory-

soil-

Herbaceous	Herbaceous
ENCH NIGHT	
R RASP	
BITTER NIGHTSHADE	
WETLAND GOLDENROD	
JEWELWEED	
P.I -	
WILD BASAL	
BURDOCK	
FIELD BINDWEED	
CANARY GRASS	
P LOOSESTRIFE	
Q A LACE	
J P WEED	

Tree Species(*=dominant)	Shrub Species
HB YG AB Pb	BUCKTHORN
EW T M BA	GRAPE
RW	ALT DOGWOOD
.	ROUND DOGWOOD
.	ROD
.	
..	
.	
.	

Birds:

Wildlife: 302 = RIC

CF birds done

*land owner needs notification

BARTA — LINDSAY

(6) dense FOC ✓ cedar in mixed
decid – Bd, Mm, Aw, Ew, Bt
✓ w grape

Aug 15/11 Barta
3:30 pm 24°C Cloudy

Kennedy Bay Rd - west side
- contour line - then field
- ash, buckthorn, hawthorn, cedar, m. maple
w. grape, reed canary grass
- open cedar meadow - regenerating

Thicket
- Green Ash, ash, trem. aspen, Man maple
Basswood, buckthorn*
w. grape, tar. honeysuckle, goldenrod sp
orchard grass

Silver maple Swamp
- standing H_2O, deadfall
Elm, Silver maple, weeping willow, cedars, b. ash
sensitive fern, wood nettle, jewelweed, bittersweet nightshade, ROD
buckthorn,
- same on both sides of Kennedy Bay Rd.

Snug Harbour
- S. along road - a.l. dogwood

N side of Snug
Mh* - g. ash, basswood - small dbh
zig-zag goldenrod, meadow rue

1 hybrid Bn

Penn Ridgefield (1)

aug 9 2012

@ 0830 100% overcast

18°C

no wind ML

AMGO

song sp G house along fence

crow sumac, M maple

blue jay ragweed

c mullein

MK1 4pic N W S E

field = LAMB'S QUARTERS

monarch

c dandelion ragweed

blue vesper thistle

along fence wild grape

↳ wild carrot

nonadj... grass

Bag 40 goldenrod

V creeper

c buckthorn

cherry

St John's wort

(2)

mk 2 4p N W S E

sugar maple 20, 29, 23, 38

(23-20)

Top slope white ash regen

herb rob

... dogwood

dec sugar maple forest

18m 90%

sub

Bottom slope E W cedar 12, 15

Pond - Silt on slope GRASS LEAVED GOLDENROD CANADA GOLDENROD

cattail, dogwood

regen cedar

mk3 pa-11

g frog deer tracks

grass, cattail

moss, DUDLEY'S RUSH

c. morning field horsetail

Penn Ridgefield (3)

White aster

flowering ... leaved ...

evening primrose,

RED clover ragweed

carrot

B.L. cottonwood

birdsfoot trefoil

milkweed

regen sugar maple

black walnut mk 4

mk5 Ploughed field

4p N W S E

ragweed, dandelion, switch...

LAMB'S QUARTERS

N fence row - tartarian honeysuckle

golden, wc, red dogwood

cedar

w grape

white ash (20)

c buckthorn

s maple

(4)

basswood

Pond = wetland nothing else around

mk 6 4p N W S E
cedar, dogwood, sugar (3 cm)
W. ash (17, 20, 17) (27, 23)
BLUE COHOSH
prickly gooseberry
T. Meadowrue

mk 7 - Rain
Ironwood (13)
A elm
black cherry (30)

Top = young S maples, 12 m tall, Ave 20 cm
85% canopy >> ironwood = W. ash
(20) >> ~~black cherry~~ elm > black cherry

mk 8
Sub 6m 5% ironwood > S maple
4pc no understory
ground 0.3 30% see photos
[illegible]
herb robert (2)
prickly gooseberry (2)

(5)

Penn Ridgefield
- garbage piles old farm equ
canopy also includes basswood

mk 8 4p N W S E

fencerow Beg 40
8-12m W. ash elm
basswood S. maple
+ honeysuckle buckthorn
S sumac
Ringbilled gull flying

mk 9 - some grass
barnyard grass
alfalfa, [illegible]
in field [illegible] daisy
[illegible] vetch
dandelion
LAMB'S QUARTER
FIELD BINDWEED

fencerow corn
Pileated [illegible]
M Maple

(6)

mk 10 4p N W S E

MK 11 lots dead / damaged trees in canopy

canopy 12-14m 85% Ave 30 [illegible] 70%
S maple = basswood [illegible] ash > [illegible]

Sub 8-10m 3.5 5 ironwood > elm = Sug maple
und 1-3m [illegible]
[illegible] = prickly gooseberry
4p 1c > W. ash = basswood

ground 0.3 30% jack-in-the-pulpit,
hickory, [illegible],
may apple, [illegible]
herb robert,
false solomon seal (?)

[illegible] (15-30)

(7)

Penn Ridgefield

mk 12 4pic bottom of slope
Sugar maple [illegible]

canopy 14-16 75%
Sug M >> White ash > [illegible]
logging

Sub 8m 15% ironwood (2) sugar (1)
5 basswood

underg 1m 0.5m 5%
W ash [illegible]
basswood

ground <0.3 Meadowrue >
zig zag >> [illegible]
ticks > [illegible]
blue cohosh
white baneberry

(8)

Back up top
W. cedar MK13 2pic

MK14 B walnut ✓ bark 1.8 DBH
to 35% 4m [illegible] 18
[illegible] but [illegible]
dead
[illegible] 4cm

this area very [illegible] wash [illegible]
12, A, 8

no canopy
Sub 5-8m 65% white ash >
basswood > sugar

Under 1-3 white ash >>
100%

MK15
4pic

ground 0-5m [illegible], W. grape
95% grasses, wild raspberry

(9)

MK16 b. walnut
w/ more open areas of
grass + goldenrod
[illegible] each 4M

woodland = 45%
[illegible] white ash + cedar

ground 95% grass, golden
V. creeper, [illegible]
W. grape

MK17 all b. walnut ✓

MK18 < 25% treed
Trees = white ash 2-6m tall

grass, goldenrod
bird [illegible], V. grape
VIPER'S BUGLOSS goldenrod,
[illegible], carrot
[illegible], red clover
[illegible]
cherry [illegible]

Beg
4P

(10)

~~MK19 [illegible]~~

~~MK 20~~ NW mark 2 pic
- cut field
Birdsfoot, yarrow
grass, carrot

Back in 'meadow'
red ~~[illegible]~~ cedar, scott pine

balsam fir

MK 20 ↑ treed
30-40% [illegible] pop > red [illegible]
1-4m basswood, scott pine
tall white ash, sugar
10m tall

ground - carrot, [illegible]
4pic mullein, birdsfoot

trails

(11)

Penn Ridge

MK21 △ greatly disturbed
Chiv[illegible] deciduous young
~~[illegible]~~
sugar, white ash, [illegible]

10-16m tall some are 20 [illegible]
MK22 ~~[illegible]~~
4pic
Sub can [illegible] [illegible]

N - still 'woodland'
ground w/ grape, w/ ash,
sugar

M 23
MK24 chickadee
[illegible] cedar, gr jn. [illegible]
[illegible] 2-5m tall Scott pine

ground birdsfoot, [illegible]
[illegible]

(12)

mk25 4pic

Cut field grass, bindweed, yarrow, alfalfa

Fencerow
ash, Basswood, white cedar
buckthorn
A. wild grape, elm

mk26 2pic
wild turkeys

Rock Pigeons
mk27 Rock fence 2pic

all this fence = rock pile till mk28

(13)

mk29 4pic
Plowed fields E side
LAMB'S QUARTER W side grass

Fencerow
grape, M Maple, hawthorne
Robin, bluejay, Timothy, honeysuckle
Buckthorn, W ash
A. elm, thorny
V creeper

Fencerow heading west
W. grape, milkweed, timothy
barnyard gr. C. buckthorn
A. elm S. sumac hawthorn
mk30 3pic W N E
field = LAMB'S QUARTER
fields S = hayfield
mk31 2pic

mk32 Rock pile 1p
more ... mk33
mk33 4pic N W S E

(14)

Heading E
By mk32 Rock piles at
... rocks
...

mk34 end rock fence ...
mk35 Rocks continue E
4pic

mk36 bedrock outcropping

mk37 walked around
C. buckthorn thicket
4pic

C. Buckthorn thicket
2-3m tall 40%
C. buckthorn & w. cedar

ground - juniper ... grasses ... strawberry ...
Rocky
wild grape
A. elm ...

(15)

Penn Ridge field

incl ... C. buckthorn small ...
T. vulture flying
N = cedar + b Poplar
↳ < 1m tall
↳ 25%

no canopy layer

shrub = C. buckthorn, w. ash,
w. cedar
35%

ground juniper, grass
20% C. YARROW, red clover
b. ... trefoil
... grap

mk38 4pic w elm
50-60% cedars 6m
w/ grasses / barberry
...
juniper
Robin w grape 3 bird ...
... Rose ...

(16)

SPREADING DOGBANE

(17)

Penn Ridgefield

(18)

(19)

Penn Ridgefield

(20)

Cutbank

mk52 mowed lawn w/cedar 2pc

mk53 dugdutch - mowed laugh

mk54 cedar plantation
w/ fewer ms + C. vacillans
trails + logging

mk55
Residential w/ some scrub natives
Vcg A. elm, sugar, w/cedar
dominant mulch litter
V. steeped VIPER'S BUGLOSS
w/ cliff boxwood
4p

mk56
mowed turf apron
shelter

(21)

Penn Ridge Field

mk57 no dutch

mk58 UPL w cedar
2-5m tall 70% cover
chickadee ground = goldenrod
bird dropping
whitedog
roger sugar
C. vacillans

mk59 2p no dutch
fully veg

mk60 4pk
UPL - trees dominate
bog Birch
Very near Bog, w/ shrubs
but ground = UPL

(22)

on edge of slope not all the way down
A. elm
5m birch → ~~elm~~ cedar, elm
A. C. buckthorn
A.
0.5-1m goldenrods → cedars
0.2m grass, moss, cornel, vanilla leaf
Purple loosestrife
ground solid
feels upland

mk61 dominated by A. elm
* tree UPL
A. elm willow
Ts ~~is~~ redcedar, white ash cedar
w/ goldenrod + vacillans
Vcanopy
Ts redcedar cedar
silver maple

(23)

Penn Ridge cont'd

mk62 dom. w/ each
plot → Tree

Dec Tree Swamp
ash, elm
pw
TS, LS, GC
no water
poison ivy / bittersweet
still on slope
still feels upland but flatter

mk63 little patch of pure cedar
C. buckthorn
bagged tick
clearing / sleeping bag

no pools
ATV trails mk62
4p

(24)

WEST of MK 64 more [illegible]

MK 65 cedar nothing else
11 pic

MK66 sugar maple ① >>
14-16 ironwood ③
75% ash ②
15-30 DBH

sub 11-6m sugar > ironwood
15% >> cedar

[illegible] ash > iron = [illegible]
1-2.5 prickly gooseberry
ground
-10% beggarticks + goldenrod
(fm)
yarrow [illegible]

[illegible]
alt leaved [illegible]

(25)

Penn Ridge

MK 67 no roads, [illegible] ditch
2 pic

MK68 3 pic 5m meadow
, grass, bergamot
redo[illegible]
carpet
birdsfoot

MK69 no ditch 2 pic
MK 70 no ditch 2 pic

sensitive fern T [illegible]
basswood.

MK71 ditch mowed +
fully veg
2 pic

bu[illegible] cat[illegible], reed[illegible]
[illegible]
c. bor[illegible]
ditch veg.
lady's thumb
bank - 10x [illegible] [illegible]
[illegible] [illegible]

(26)

ditch is fully veg
MK 72 2 pic
colt foot

MK 73 sugar maple [illegible]
lots of alt leaved
dogwood

70% canopy sugar
15% [illegible] canopy ② ah ① ash
3-5m (basswood)
[illegible] under [illegible]
25%
PURPLE FLOWERING RASPBERRY
[illegible]

[illegible] ground [illegible], zigzag GOLDENRODS
[illegible]
[illegible]
ironwood
false solomon

(27) Penn
Ridge

MK74 2 pic
ditch
veg
[illegible]

MK75 2 pic
herb rob
coltsfoot

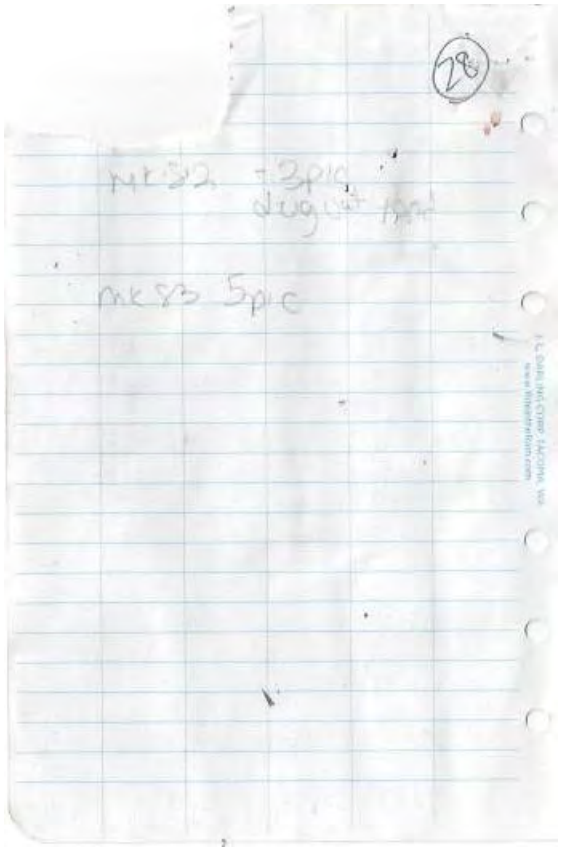
MK76 culvert 3p. veg [illegible]
S. jewelweed goldenrod
dandelion
[illegible] [illegible]
trees.

MK 77 2 pic eastern
kingbird

MK 79 2 pic

MK 80 Rock pile = 4m
1 pic

MK 81 Rock pile 2m veg
3 pic [illegible]


28
MK82 x3pcs
MK83 5pcs