



**NORTHLAND
POWER**

Martin's Meadows Solar Project Natural Heritage Site Investigations Report

October 18, 2012



Northland Power Inc.
on behalf of
Northland Power Solar
Martin's Meadows L.P.
Toronto, Ontario

Natural Heritage
Site Investigation Report

Martin's Meadows Solar Project

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October 18, 2012

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Project Report

October 18, 2012

**Northland Power Inc.
Martin's Meadows Solar Project**

Natural Heritage Site Investigation Report

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1. Introduction

1.1 Project Description

Northland Power Solar Martin's Meadows L.P. (hereinafter referred to as "Northland") is proposing to develop a Class 3 10-megawatt (MW) ground mounted solar photovoltaic (Solar PV) facility in the Town of Cochrane. This Project, known as the Martin's Meadows Solar Project, is hereafter referred to as "Martin's Meadows" or the "Project."

The Project location is comprised of two primary components. The first part of the Project is the location of the solar panels, including access roads, inverters, transformers, fencing, etc, and is hereafter referred to as the "solar panel Project location" The solar panel Project location is approximately 82 hectares (ha) in size and located on Lot 16, Concession 8 of the Town of Cochrane. The solar panel Project location is situated on Glackmeyer Concession Road 9 (shown in Figure 1.1).

The second part of the Project is the approximately 20 km transmission line from the solar panel Project location to the connection point west of the Project location near Hunta, ON, as well as associated transition structure and switching station. This portion of the project is referred to as the transmission line Project location, with locations shown in Figures 1.2 and 1.3.

1.2 Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. Per Section 4 of the REA Regulation, ground-mounted solar facilities with a nameplate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require a REA.

Section 26 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage site investigation for the purpose of determining

- whether the results of the analysis summarized in the (Natural Heritage Records Review) report prepared under Subsection 25(3) are correct or require correction, and identifying any required corrections
- whether any additional natural features exist, other than those that were identified in the [natural heritage records review] report prepared under Subsection 25(3)
- the boundaries, located within 120 m of the Project location, of any natural feature that was identified in the records review or the site investigation
- the distance from the project location to the boundaries determined under clause (c).

Natural features are defined in Section 1.1 of the REA Regulation to be all or part of

- a) an area of natural and scientific interest (ANSI) (earth science)
- b) an ANSI (life science)
- c) a coastal wetland

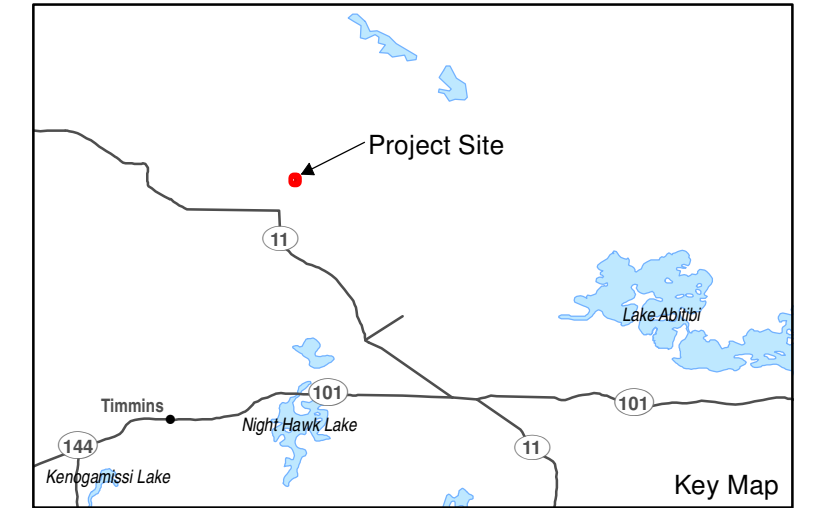
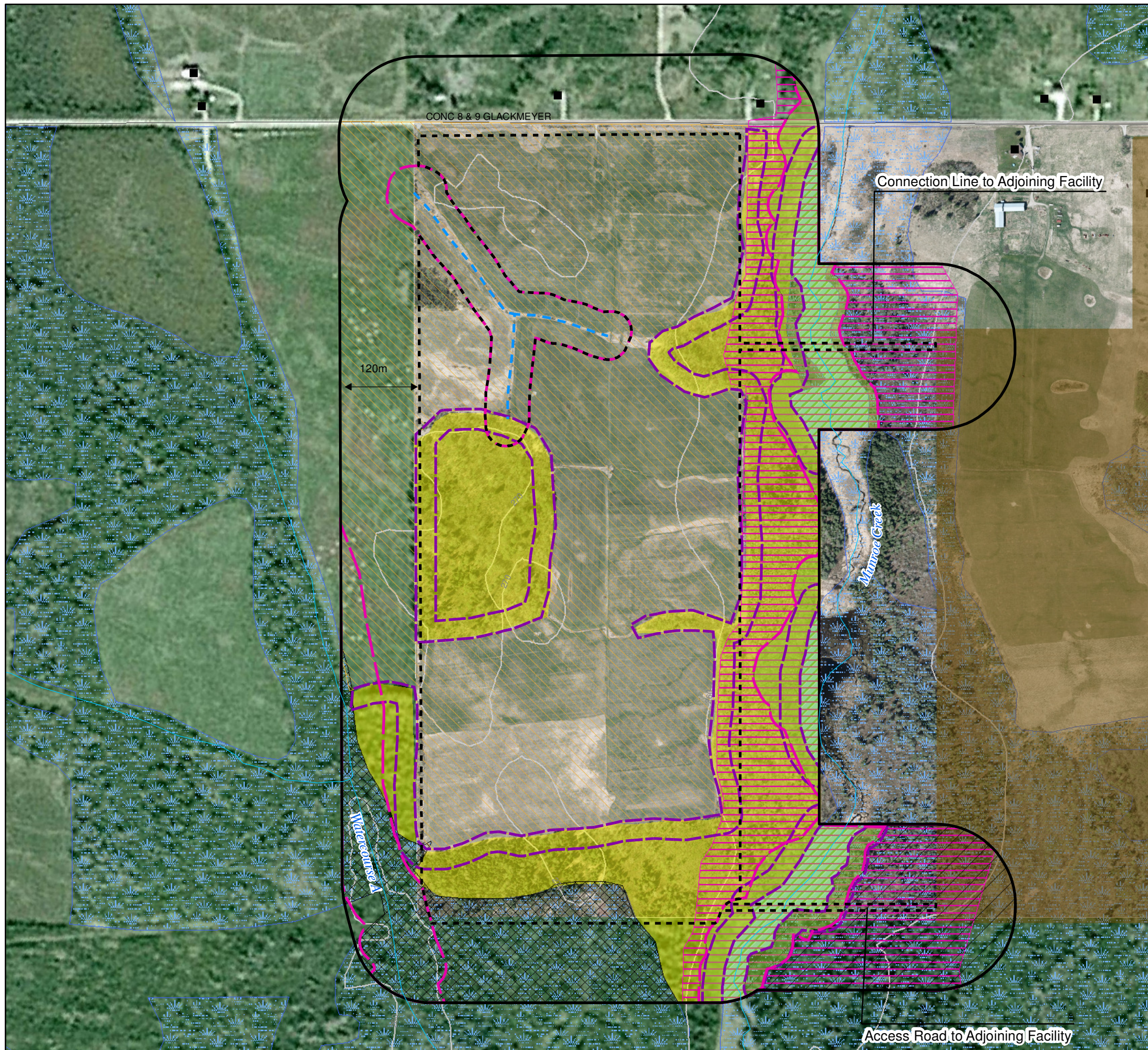
- d) a northern wetland
- e) a southern wetland
- f) a valleyland
- g) a wildlife habitat, or
- h) a woodland.

In respect of valleylands and woodlands, Section 1.1 of the REA Regulation identifies that these features are only found south and east of the Canadian Shield. As the Project location is north of the Canadian Shield, it is not possible for valleylands or woodlands to be located on or within 120 m of the Project location.

Subsection 3 of Section 26 of the REA Regulation requires the proponent to prepare a report setting out the following:

1. A summary of any corrections to the (Natural Heritage Records Review) report prepared under Subsection 25(3) and the determinations made as a result of conducting the site investigations under Subsection (1).
2. Information relating to each natural feature identified in the records review and in the site investigations, including the type, attributes, composition and function of the feature.
3. A map showing
 - the boundaries mentioned in clause (1)(c)
 - the location and type of each natural feature identified in relation to the project location
 - the distance mentioned in clause (1)(d).
4. The dates and times of the beginning and completion of the site investigation.
5. The duration of the site investigation.
6. The weather conditions during the site investigation.
7. A summary of methods used to make observations for the purposes of the site investigation.
8. The name and qualifications of any person conducting the site investigation.
9. Field notes kept by the person conducting the site investigation.

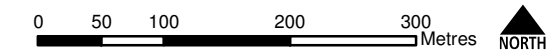
This Natural Heritage Site Investigations Report has been prepared to meet these requirements.



LEGEND

- Building
- - - Intermittent Watercourse
- Watercourse
- ⋯ Project Location
- ▭ 120m from Project Location
- ▭ Animal Movement Corridor
- ▨ Area Sensitive Shrubland / *Carex wiegandii* Habitat
- ▨ Area Sensitive Woodland
- ▭ *Carex haydenii* Habitat
- ▨ Common Nighthawk Habitat
- ▭ Olive-sided Flycatcher Habitat
- ▭ *Vaccinium ovalifolium* Habitat
- ▭ Waterfowl Nesting Habitat
- ▭ Wetland
- ▨ Wetland Supporting Amphibian Breeding / *Scirpus heterochaetus* Habitat
- ▭ Adjoining Solar Facility

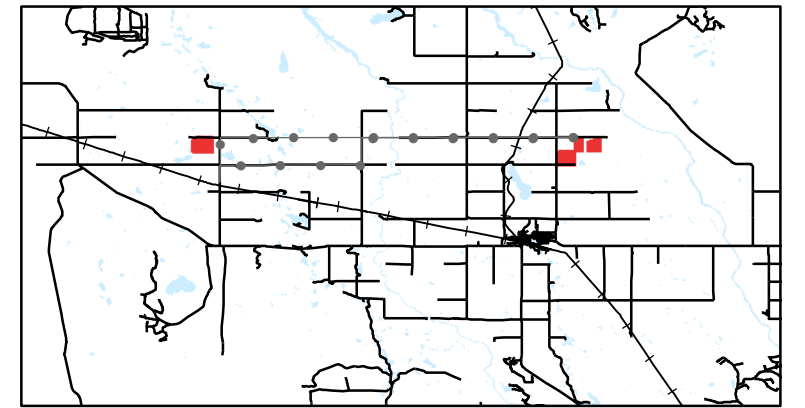
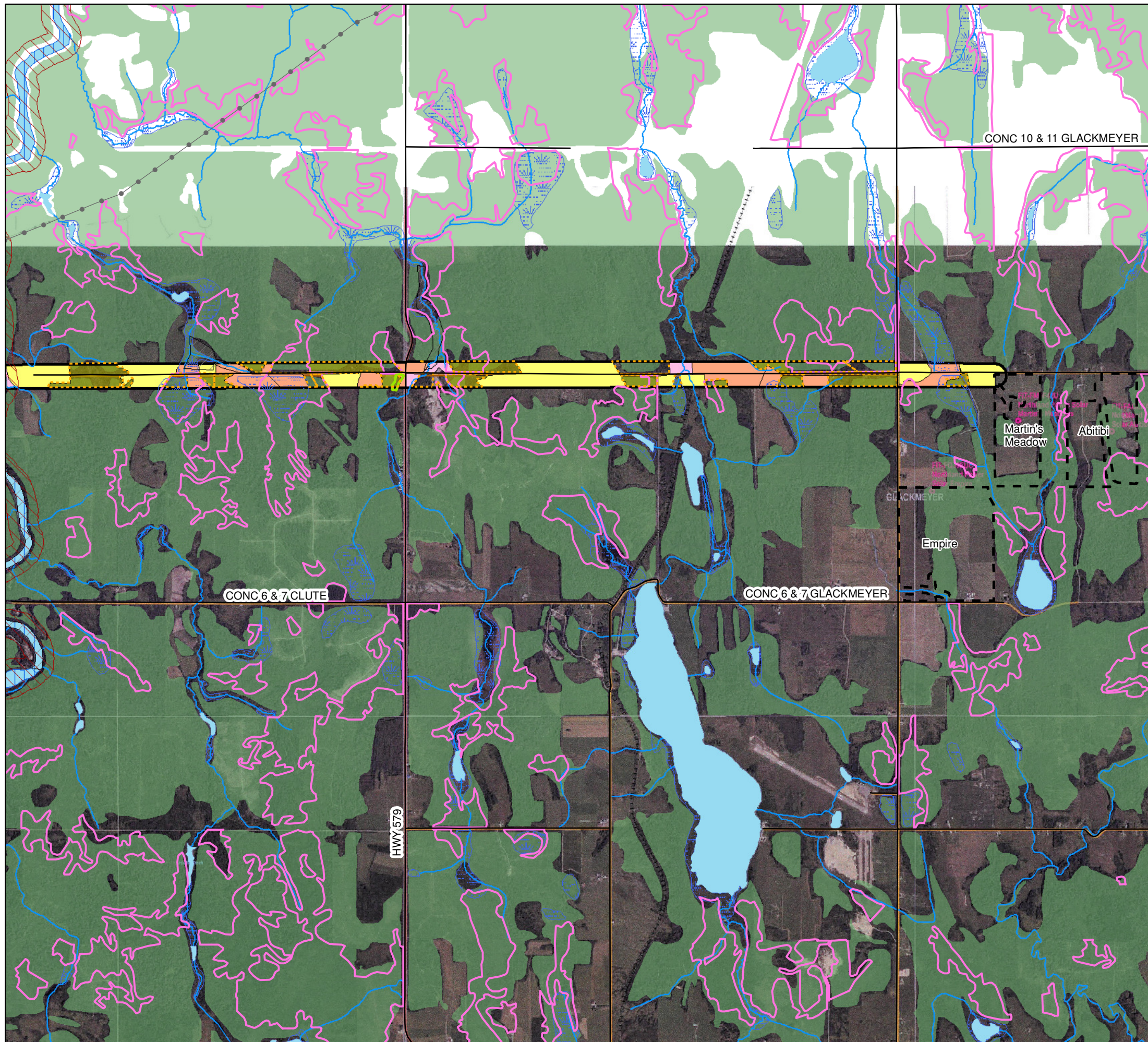
Notes:
 1. Produced by Hatch under licence from Ontario Ministry of Natural Resources. Copyright (c) Queens Printer 2011.
 2. Spatial referencing UTM NAD 83.
 3. Satellite imagery obtained from Google Earth Pro, captured 2003.
 4. Wetland information provided by NSRI (2011).



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Figure 1.1
 Northland Power Inc.
Martin's Meadows Solar Project
 Natural Heritage
 Site Investigation Report **HATCH™**

Back of figure 1.1



Legend

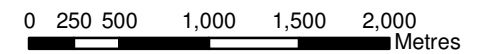
- Road
- Utility Line
- Watercourse
- Area Sensitive Grassland Habitat / Short-eared Owl Habitat
- Area Sensitive Shrubland Habitat / *Carex Wiegandii* Habitat
- Area Sensitive Woodland / Canada Warbler / Olive-sided Flycatcher / *Vaccinium ovalifolium* Habitat
- Bald Eagle Habitat
- *Carex haydenii* Habitat
- *Carex loliacea* Habitat
- Common Nighthawk Habitat
- Old Growth or Mature Forest / Northern Long-eared Bat and Specialized Raptor Nesting Habitat
- Mink, Otter, Marten, and Fisher Denning Site
- Moose Aquatic Feeding Area
- Moose Late Winter Habitat / Winter Deer Yard
- *Scirpus heterochaetus* Habitat
- Seeps and Springs / *Carex tetanica* Habitat
- Red-necked Grebe Habitat
- Waterbody
- Waterfowl Stopover and Staging Area
- Waterfowl Nesting Habitat
- Wetland Area
- Wetlands Supporting Amphibian Breeding Ponds

Project Infrastructure

- Connection Point
- Northland Power Project Location
- 120 m from Distribution Line
- Switchyard
- Transition Structure

Notes:

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2. Spatial referencing UTM NAD 83.
3. Satellite Imagery from Ministry of Natural Resources.

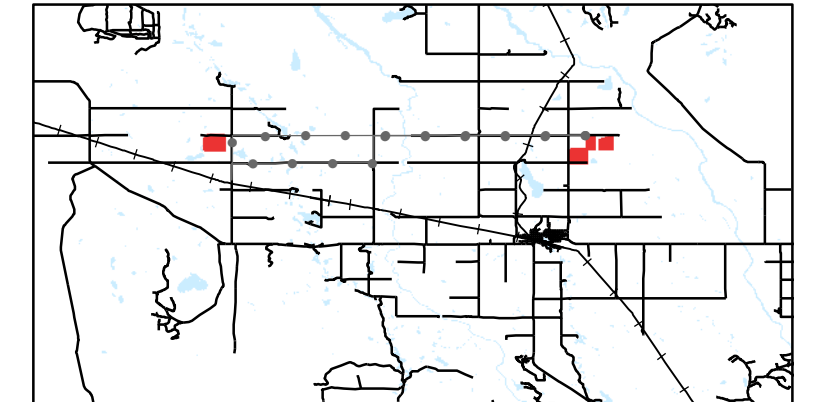
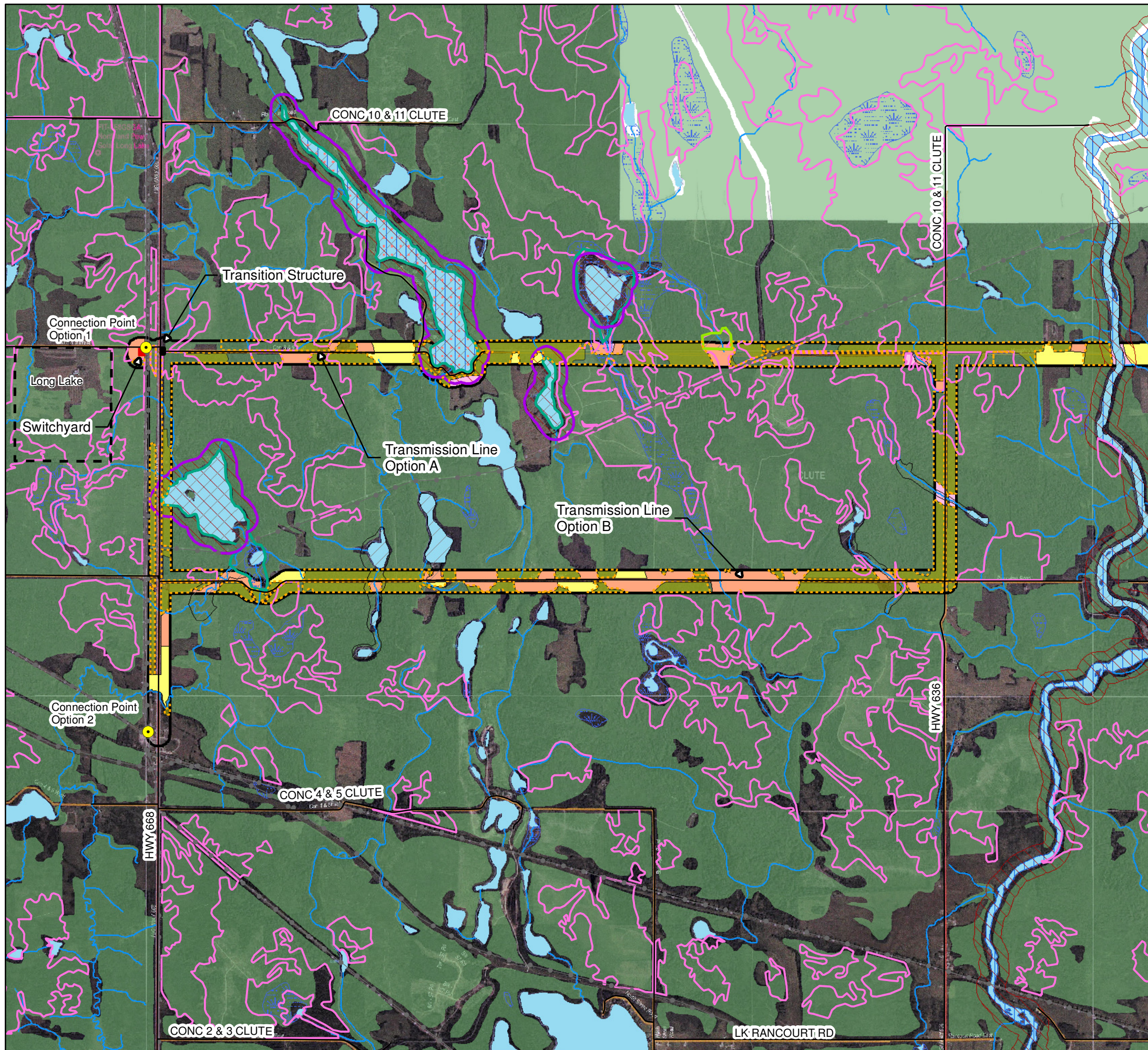


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Figure 1.2
Northland Power Inc.
Transmission Line Project Location (Eastern Half) - Natural Heritage Features

Back Figure 1.2



Legend

- Road
 - Utility Line
 - Watercourse
 - Area Sensitive Grassland Habitat / Short-eared Owl Habitat
 - Area Sensitive Shrubland Habitat / *Carex Wiegandii* Habitat
 - Area Sensitive Woodland / Canada Warbler / Olive-sided Flycatcher / *Vaccinium ovalifolium* Habitat
 - Bald Eagle Habitat
 - *Carex haydenii* Habitat
 - *Carex loliacea* Habitat
 - Common Nighthawk Habitat
 - Old Growth or Mature Forest / Northern Long-eared Bat and Specialized Raptor Nesting Habitat
 - Mink, Otter, Marten, and Fisher Denning Site
 - Moose Aquatic Feeding Area
 - Moose Late Winter Habitat / Winter Deer Yard
 - *Scirpus heterochaetus* Habitat
 - Seeps and Springs / *Carex tetanica* Habitat
 - Red-necked Grebe Habitat
 - Waterbody
 - Waterfowl Stopover and Staging Area
 - Waterfowl Nesting Habitat
 - Wetland Area
 - Wetlands Supporting Amphibian Breeding Ponds
- Project Infrastructure**
- Connection Point
 - Northland Power Project Location
 - 120 m from Distribution Line
 - Switchyard
 - Transition Structure

Notes:

1. Produced by Hatch under licence from Ontario Ministry of Natural Resources, Copyright (c) Queens Printer 2011.
2. Spatial referencing UTM NAD 83.
3. Satellite Imagery from Ministry of Natural Resources.



Figure 1.3
Northland Power Inc.
Transmission Line Project Location (Western Half) - Natural Heritage Features

Back of Figure 1.3

2. Summary of Results of Records Review

Table 2.1 summarizes the results of the records review (Hatch Ltd., 2011).

Table 2.1 Summary of Records Review Determinations

Determination to be Made	Yes/No	Description
Is the Project in or within 120 m of a provincial park or conservation reserve?	No	The nearest such features are located more than 120 m away from the Project location (both solar panel and transmission line).
Is the Project in a natural feature?	Yes	There are wetland communities identified along the transmission line Project location. Though no confirmed wildlife habitats exist on the Project location (both solar panel and transmission line) within the records, there exists potential for habitat of species of conservation concern on the Project location (both solar panel and transmission line).
Is the Project within 50 m of an ANSI (earth science)?	No	The nearest earth science ANSI is located several kilometres from the Project location (both solar panel and transmission line).
Is the Project within 120 m of a natural feature that is not an ANSI (earth science)?	Yes	There are wetlands located within 120 m of the transmission line Project location. Though no confirmed wildlife habitats exist within 120 m of the Project location (both solar panel and transmission line) within the records, there exists potential for habitat of species of conservation concern on the Project location (both solar panel and transmission line).

3. Site Investigation Methodology

There are two natural features that were considered during the site investigation, wetlands and wildlife habitats. Methodologies regarding detection of these candidate significant features are identified below.

3.1 Wetland Communities

Wetland communities were classified according to the Ontario Wetland Evaluation System (OWES) – Northern Manual. Wetland boundaries were delineated in accordance with the protocols outlined within the OWES – Northern Manual. Wetland site investigations were completed in 2011 by certified wetland evaluators from Natural Resources Solutions Inc. (NRSI) (on and within 120 m of

the solar panel project location and portions of the transmission line project location) and Hatch (on and within 120 m of the transmission line Project location). The Project location and lands within 120 m were surveyed in accordance with OWES Protocols. Surveys in November focused on identifying distinguishable boundaries between wooded wetlands, and shrub thicket or meadow marsh communities. Dates, start time, end times, duration, and weather conditions are provided below.

Field notes from this site investigations, as well as names and qualifications of persons conducting the site investigations, are included within Appendix B.

3.1.1 NRSI Site Investigation

3.1.1.1 Date, Times and Duration of Site Investigation

- Date: June 22, 2011
- Start Time: 0900
- End Time: 1600
- Duration: 9 hours

3.1.1.2 Weather Conditions During Site Investigation

- Temperature: 15°C
- Beaufort Wind: 1
- Cloud Cover: 0%

3.1.2 Hatch Site Investigation

All Hatch site investigations were completed by Martine Esraelian and Joe Viscek. Martine is a certified wetland evaluator, while Joe Viscek is an environmental technologist with experience in terrestrial and aquatic field studies in support of renewable energy projects throughout the province.

	Site Investigation 1	Site Investigation 2	Site Investigation 3	Site Investigation 4	Site Investigation 5	Site Investigation 6
Date	29-09-2011	30-09-2011	01-10-2011	02-10-2011	10-11-2011	11-11-2011
Start Time	1300h	0900h	0900h	0900h	0800h	0800h
End Time	1700h	1900h	1900h	1930h	1630h	1600h
Duration	4hrs	10hrs	10hr	10.5hrs	8.5hrs	8hrs
Temperature	19°C	15°C	5°C	16°C	1°C	-1°C
Beaufort Wind	1	1	1	1	3	2
Cloud Cover	100%	10%	40%	10%	100%	95%

3.2 Wildlife Habitats

Wildlife Habitats were searched for during several site investigations, discussed separately below.

3.2.1 *Site Investigations 7 to 9*

The purpose of this site investigation was to complete general characterization of the types of wildlife habitats available on and within 120 m of the solar panel Project location, including documentation of any wildlife species observed and vegetation communities.

All habitats on and within 120 m of the solar panel Project location were searched by the observers on foot as part of the survey. Areas beyond 120 m from the Project location were also considered for potential occurrences of wildlife habitats. Photographs of the site were taken. Any observations of wildlife, vegetation, or natural features were noted. Field notes from the Site Investigation are included in Appendix A.

3.2.1.1 *Site Investigation 7*

3.2.1.1.1 Date, Time and Duration of Site Investigation

- Date: August 22, 2010
- Start Time: 1300
- End Time: 1900
- Duration: 6 hours

3.2.1.1.2 Weather Conditions During Site Investigation

- Temperature: 15°C
- Beaufort Wind: 1 to 2
- Cloud Cover: 100%

3.2.1.2 *Site Investigation 8*

3.2.1.2.1 Date, Time and Duration of Site Investigation

- Date: August 23, 2010
- Start Time: 1600
- End Time: 1930
- Duration: 3.5 hours

3.2.1.2.2 Weather Conditions During Site Investigation

- Temperature: 15°C
- Beaufort Wind: 1 to 2
- Cloud Cover: 100%

3.2.1.3 *Site Investigation 9*

3.2.1.3.1 Date, Time and Duration of Site Investigation

- Date: August 24, 2010
- Start Time: 1400
- End Time: 1700
- Duration: 3 hours

3.2.1.3.2 Weather Conditions During Site Investigation

- Temperature: 24°C
- Beaufort Wind: 3
- Cloud Cover: 90%

3.2.1.4 Name and Qualifications of Person Conducting Site Investigation

The site investigation was completed by Martine Esraelian.

Martine Esraelian, B.Sc. is an Environmental Scientist specializing in species at risk and terrestrial ecosystems. She has a B.Sc. from Trent University where she specialized in Conservation Biology and Ecological Management and an Ecosystem Management Technician diploma from Sir Sandford Fleming College. During her time at Trent University, she completed a 1-yr internship with the Ministry of Natural Resources (MNR) which involved developing a genetic-based protocol for the extraction of DNA from unknown turtle eggshells to assist with species identification. The project entailed extensive molecular genetics research and intensive lab work to develop a protocol able to supplement existing conservation management practices.

She offers expertise across the full breadth of the field from environmental assessments and technical analysis of environmental data to conservation management, corporate and government consulting, and community outreach. Martine has liaised with all levels of government, the community, and a portfolio of clients that includes consulting firms, planners, and high-profile developers. She has both technical and hands-on experience conducting site investigations (terrestrial and aquatic), evaluations of significance, environmental and agricultural impact studies, constraint analyses, water quality and soil assessments, species at risk, wildlife management and fisheries studies to meet regulatory requirements.

Martine has a wide range of field experience related to terrestrial and aquatic ecosystems and species at risk. She has conducted reptile and amphibian surveys, small-mammal trapping, benthic invertebrate monitoring and fisheries inventories (seine netting and electrofishing). She has conducted detailed natural areas inventories which involve species identification of flora and fauna, vegetation community mapping, identifying rare vegetation communities and significant wildlife habitats.

Martine has project management and fieldwork experience for a number of species at risk monitoring projects. Some of the species she has been involved with include: fowler's toad, eastern massasauga rattlesnake, eastern ratsnake, queensnake, eastern ribbonsnake, milksnake, blanding's turtle, map turtle, spotted turtle, snapping turtle, Jefferson salamander, northern dusky and mountain alleghany dusky salamander, butternut, flowering dogwood, swamp rose mallow and spoon-leaved moss.

Martine is a certified Butternut Health Assessor and also holds a certificate in the Ecological Land Classification (ELC) system.

3.2.2 Site Investigation 10

The purpose of this site investigation was to complete a survey for reptile hibernacula during the peak of reptile emergence, and to search for evidence of raptor nesting occurring on or within 120 m of the solar panel Project location.

Reptile hibernacula were searched for by completing transect surveys across the Project location and lands within 120 m. Transects were spaced 50 m apart within the agricultural lands, and 20 m apart within woodland communities. Non-swamp wetland habitats were not searched for hibernacula given the low probability of occurrence.

Raptor nesting locations were searched for by traversing through the woodland communities, searching for stick nests prior to leaf out. Where stick nests were observed, the locations were GPSed, and the nest observed for activity in order to determine if the nesting location was active.

Copies of the field notes from this site investigation are provided within Appendix A.

3.2.2.1 *Date, Times and Duration of Site Investigation*

- Date: May 18, 2011
- Start Time: 1330
- End Time: 1730
- Duration: 4 hours

3.2.2.2 *Weather Conditions During Site Investigation*

- Temperature: 18°C
- Cloud Cover: Partly cloudy

3.2.2.3 *Name and Qualifications of Person Conducting Site Investigation*

This site investigation was completed by Levi Snook and Norm Bolton. Their qualifications are provided below.

Levi Snook is an Environmental Scientist with experience conducting environmental assessments on proposed hydroelectric, wind, and solar energy sites. He has diplomas in environmental science from Sir Sandford Fleming College and a degree in biology from Trent University. He has expertise in terrestrial assessments in support of Natural Heritage studies that include conducting Ecological Land Classifications, as well as wildlife inventories, including amphibian and reptile surveys.

Norm Bolton is a Fish and Wildlife Technologist with 5 years experience of multidisciplinary contracts with the Bancroft District MNR and as a Hatch contract staff specializing in a variety of fish and wildlife technical studies. Norm has extensive knowledge of aquatic systems with lead roles in the Ontario broadscale monitoring programs, spawning assessments, aquatic inventory and wetland evaluations. He is also well versed in wildlife and terrestrial studies acting as forestry compliance technician, wildlife technician, marsh monitoring program participant and an assistant instructor to the Ontario Fur Harvester Management Course.

3.2.3 **Site Investigation 11**

The purpose of this site investigation was to complete vegetation community classification and mapping using the Forest Ecosystem Classification for Northeastern Ontario (FEC) on and within 120 m of the solar panel Project location where appropriate.

This site investigation was completed by Natural Resource Solutions Inc. (NRSI). Field notes from the Site Investigation, and name and qualifications of the observer is provided in Appendix B.

3.2.3.1 *Date, Times and Duration of Site Investigation*

- Date: June 21, 2011
- Start Time: 0530
- End Time: 0800
- Duration: 2.5 hours

3.2.3.2 *Weather Conditions During Site Investigation*

- Temperature: 13°C
- Beaufort Wind: 0 to 2
- Cloud Cover: 90%

3.2.4 *Site Investigations 12 through 17*

The purpose of these site investigations was to confirm vegetation community classifications on and within 120 m of the transmission line Project location, including documentation of any wildlife species observed and vegetation communities. Prior to these surveys, a map of the vegetation communities was prepared through interpretation of satellite imagery as well as background records obtained from the MNR, Cochrane District. Boundaries of the communities along the roadside associated with the Project location were then confirmed through visual observation. Site investigations in November 2011 focused on boundaries of woodland communities and associated overstorey tree composition.

Site Investigations 12 through 17 were completed by Martine Esraelian and Joe Viscek. Martine is trained in the use of Ecological Land Classification, and has participated in several vegetation community surveys within northeastern Ontario. Joe Viscek is an environmental technologist with experience in terrestrial and aquatic field studies in support of renewable energy projects throughout the province.

Table 3.1 Dates, Times, Duration and Weather Conditions During Site Investigations 12 through 17

	Site Investigation 12	Site Investigation 13	Site Investigation 14	Site Investigation 15	Site Investigation 16	Site Investigation 17
Date	29-09-2011	30-09-2011	01-10-2011	02-10-2011	10-11-2011	11-11-2011
Start Time	1300h	0900h	0900h	0900h	0800h	0800h
End Time	1700h	1900h	1900h	1930h	1630h	1600h
Duration	4hrs	10hrs	10hr	10.5hrs	8.5hrs	8hrs
Temperature	19°C	15°C	5°C	16°C	1°C	-1°C
Beaufort Wind	1	1	1	1	3	2
Cloud Cover	100%	10%	40%	10%	100%	95%

4. Results of Site Investigation

4.1 Wetland Communities

There is one wetland community identified during the site investigations on and within 120 m of the Project location, portions of which were previously unidentified during the records review stage.

This community is identified within Table 4.1. Wetland vegetation type descriptions are identified within Table 4.2.

Table 4.1 Wetland Communities on and within 120 m of the Project Location

Wetland ID	Description of Community	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
Solar Panel Project Location			
WET-005	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.
Transmission line Project Location			
WET-006	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	The identification of this wetland represents a change to the records review
Wetland Catch Basin 2	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.
Wetland Catch Basin 3	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.
Wetland Catch Basin 4	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not

Wetland ID	Description of Community	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
			identified in the Records Review.
Wetland Catch Basin 5	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
Wetland Catch Basin 6	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.
Wetland Catch Basin 7	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.
Wetland Catch Basin 8	See Figure 1.2 for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.

Table 4.2 Wetland Vegetation Types on and within 120 m of the Project Location

Wetland ID	Description of Community <i>(see Appendix II of Appendix B for further community description)</i>	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
<i>Solar Panel Project Location</i>			
tsS _{5, 7, 18}	Tall shrub swamp dominated by speckled alder and red osier dogwood	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review
reM ₁₄	Common cattail robust emergents marsh	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review
neM ₁₅	Aquatic sedge narrow-leaved emergents marsh	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review
tsS ₄₆	Speckled Alder/Bebb's willow tall shrub swamp	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review
<i>Transmission line Project Location</i>			
tsS	Tall shrub swamps, typically containing speckled alder, red osier dogwood, and willow species	Yes (portions of these wetland)	Portions of these wetland communities were identified during the Records Review, however several other pockets of this wetland community that are part of this wetland were not identified in the Records Review.
cS	Coniferous swamp, predominantly dominated by black spruce and larch.	Yes (portions of these wetlands)	Portions of these wetland communities were identified during the Records Review, however several other pockets of this wetland community that are part of this wetland were not identified in the Records Review.
gcM	Graminoid marshlands, typically dominated by a variety of grasses and sedges	Yes (portions of these wetland)	Portions of these wetland communities were identified during the Records Review, however several other pockets of this wetland community that are part of this wetland were not identified in the Records Review.

4.2 Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) identifies four main types of wildlife habitat that can be classified as significant:

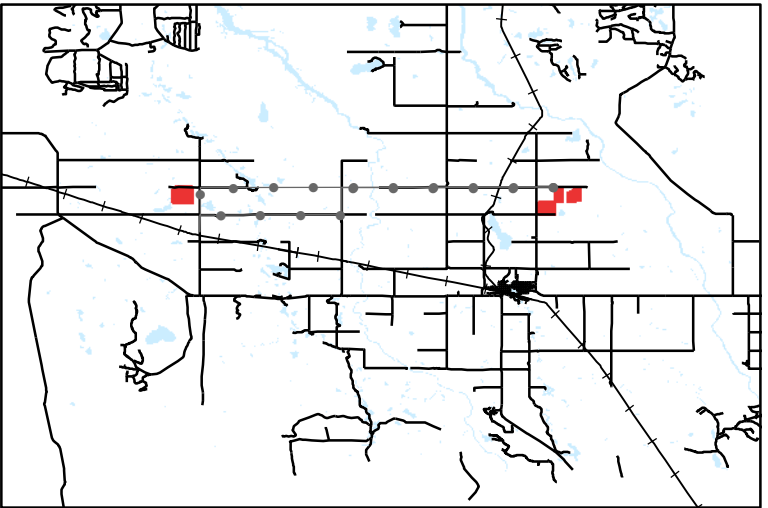
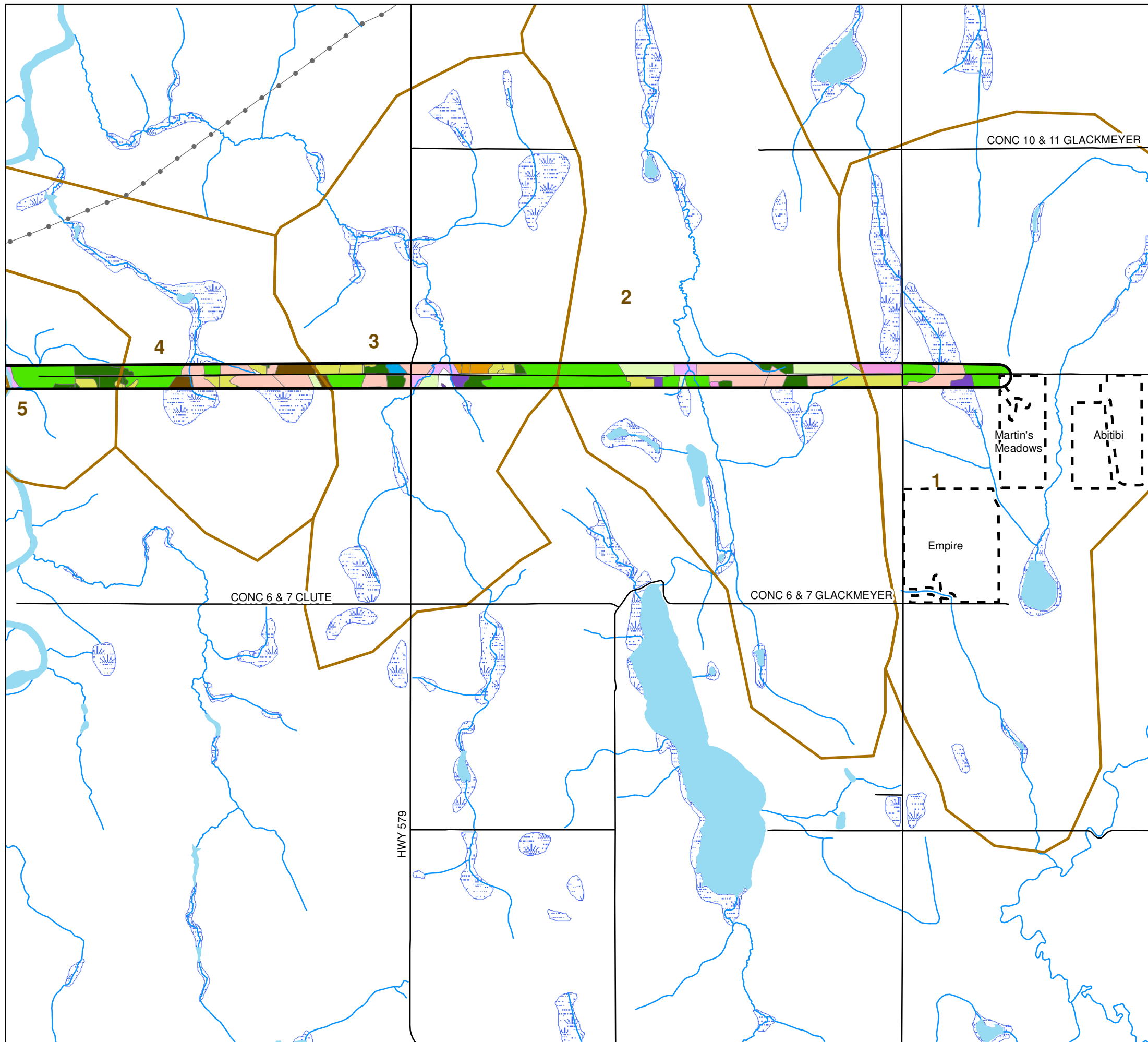
- habitat for seasonal concentrations of animals
- rare or specialized habitats for wildlife
- habitat for species of conservation concern
- wildlife movement corridors.

Many of these wildlife habitats relate to the vegetation communities found in the area. Wetland vegetation communities have been previously described within Section 4.1. Upland vegetation community identified on or within 120 m of the Project location included the following:

- Solar Panel Project Location
 - ◆ Agricultural lands consisting of pasturelands/hayfields, or recently ploughed lands.
 - ◆ ES6m – Trembling Aspen-Black Spruce-Balsam Fir – Medium Soil
 - ◆ MEGM3-8 – Reed Canary Grass Graminoid Meadow Type
- Transmission line Project Location
 - ◆ Agricultural lands consisting of pasturelands/hayfields
 - ◆ ES1 – Coniferous stands dominated by black spruce and jack pine
 - ◆ ES6 – Mixedwood stands of trembling aspen and black or white spruce
 - ◆ ES7 – Hardwood stands of trembling aspen and white birch
 - ◆ ES9 – Coniferous stands dominated by black or white spruce
 - ◆ ES10 – Hardwood dominated mixedwood stands of trembling aspen, black spruce and balsam poplar
 - ◆ ES11 – Black spruce stands on organic soil
 - ◆ ES12 – Black spruce and larch stands on organic soil
 - ◆ ES13 – Black spruce and larch or white cedar stands on organic soil.

Appendix B provides methodology and results of upland vegetation community assessments on and within 120 m of the solar panel Project location, while Figures 4.1 and 4.2 show the results of the upland vegetation community assessments on and within 120 m of the transmission line Project location.

Each of these types of wildlife habitat is considered further below and how they were considered during the site investigation is described.



Legend

- Connection Point
- Switchyard
- Transition Structure
- Road
- Utility Line
- Watercourse
- - - Northland Power Project Location
- ▭ 120 m from Distribution Line
- Waterbody
- Wetland Area
- Wetland Drainage Basin
- Upland Vegetation Community (Within 120m)
- ES1
- ES6
- ES9
- ES10
- ES11
- ES12
- ES13
- Agriculture
- Wetland Community (Within 120m)
- Coniferous Swamp
- Graminoid Marsh
- Hardwood Swamp
- Shrub Thicket Swamp

1. Produced by Hatch under licence from Ontario Ministry of Natural Resources, Copyright (c) Queens Printer 2011.
 2. Spatial referencing UTM NAD 83.
 3. Satellite Imagery from google Earth Pro, captured 2003 through 2004.

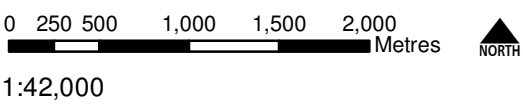
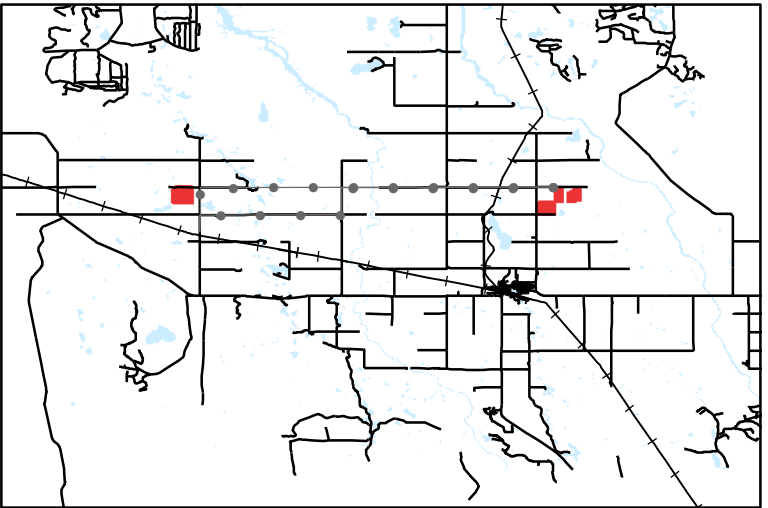
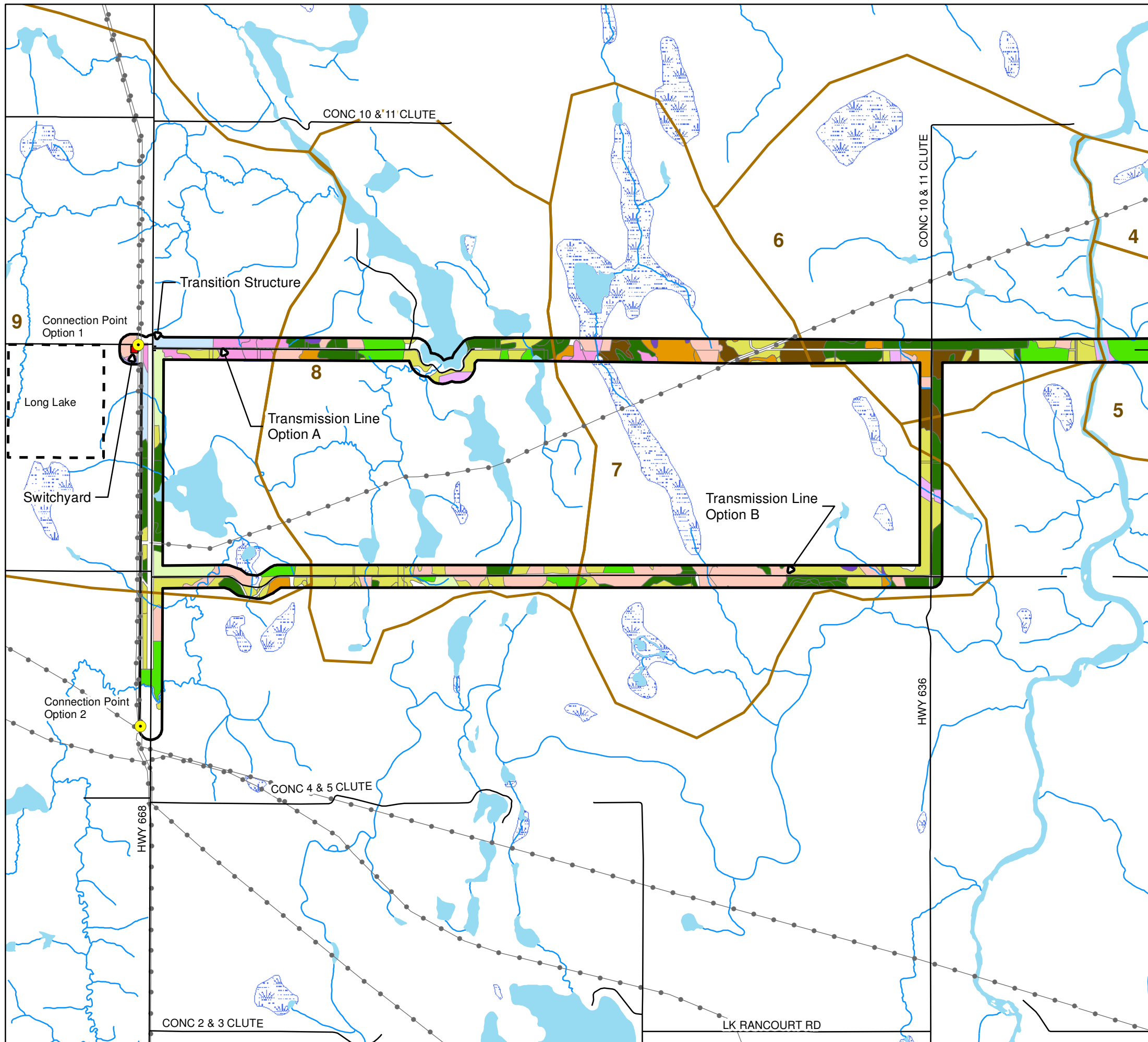


Figure 4.1
 Northland Power Inc.
Transmission Line Project Location (Eastern Half) - Vegetation Communities

Back of figure 4.1



- Legend**
- Connection Point
 - Switchyard
 - Transition Structure
 - Road
 - Utility Line
 - Watercourse
 - ▭ Northland Power Project Location
 - ▭ 120 m from Distribution Line
 - Waterbody
 - Wetland Area
 - Wetland Drainage Basin
 - Upland Vegetation Community (Within 120m)
 - ES1
 - ES6
 - ES9
 - ES10
 - ES11
 - ES12
 - ES13
 - Agriculture
 - Wetland Community (Within 120m)
 - Coniferous Swamp
 - Graminoid Marsh
 - Hardwood Swamp
 - Shrub Thicket Swamp

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 2. Spatial referencing UTM NAD 83.
 3. Satellite Imagery from google Earth Pro, captured 2003 through 2004.

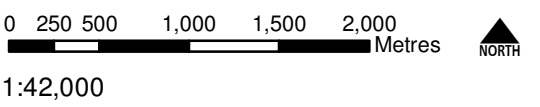


Figure 4.2
 Northland Power Inc.
Transmission Line Project Location (Western Half) - Vegetation Communities

Back of Figure 4.2

4.2.1 *Habitats of Seasonal Concentrations of Animals*

There are many different kinds of seasonal concentration areas identified within the SWHTG. Of these several were not considered during the site investigation, and are provided below:

- Shorebird/Landbird migratory stopover areas – Shorebird migratory stopover areas are found along the shorelines of the Great Lakes and James Bay, while landbird stopover areas are found along the shorelines of the Great Lakes and contain a variety of habitat types from open fields to large woodlands. As the Project location is located more than 120 m away from these areas, this habitat type cannot occur on the Project location.
- Wild Turkey winter range – The Project is located more than 120 m from the range of Wild Turkey within the province.
- Migratory butterfly stopover areas – These habitats are found within 5 km of the Great Lakes; as the Project area is located outside of this zone, such habitat features are not found.
- Bullfrog concentration areas – The Project is located more than 120 m from the range of Bullfrogs within the province.
- Raptor wintering areas – As the majority of raptor species that forage in open country winter in areas well south of the Project location, this habitat type is determined to have no potential for occurrence on or within 120 m of the Project location.

Those that were considered during the site investigations, and the discussion of their potential occurrence on the Project location, are discussed below by type of Project location:

- Solar Panel Project Location
 - ◆ Winter deer yards/Moose late winter habitat – Winter deer yards/moose late winter habitat are sheltered areas where these species congregate during the winter months. As these species are not adept at moving through deep snow, a key component of these habitats is a core area predominantly composed of coniferous trees with a 60% canopy cover. Habitat of this type was considered during the site investigation in relation to the wooded areas present on and within 120 m of the Project location. No such woodlands were identified on or within 120 m of the Project location.
 - ◆ Colonial bird nesting sites – Colonial bird nesting sites are locations where colonial species, such as herons, gulls, terns, and swallows traditionally nest in colonies of varying size. No heronries were observed during area searches of lands on and within 120 m of the Project location. No colonial nesting species, such as terns or herons, were observed during surveys of the wetland communities in suitable times of year for detection. No suitable gull or tern colony locations (islands or peninsulas) were noted on or within 120 m during area searches along the waterbodies. Potential swallow colonial breeding locations such as eroding banks, sandy hills, pits, steep slopes, rock faces or piles were not recorded during area searches on or within 120 m of the Project location.
 - ◆ Waterfowl stopover and staging areas – Waterfowl traditionally congregate in larger wetlands and clusters of small wetlands located close to one another during spring and fall migration. Though there are wetland communities present within 120 m of the Project

location, none of these wetland communities contain open water areas capable of supporting waterfowl stopover and staging areas. Therefore, this habitat type is not found on or within 120 m of the Project location.

- ◆ Waterfowl nesting – Waterfowl nesting sites can consist of relatively large, undisturbed upland areas with abundant ponds and wetlands, while other species nest within tree cavities in swamps or on the shorelines of water bodies. Suitable upland/treed areas adjacent to open waters/wetlands were identified on and within 120 m of the Project location during the site investigation. No swamplands were identified on or within 120 m of the Project location. Therefore, candidate significant waterfowl nesting habitat is found on or within 120 m of the Project location.
- ◆ Turkey Vulture summer roosting areas – The Project location is at the extreme northern end of the Turkey Vulture breeding range. No rocky cliff ledges or large dead snags with white-washing indicative of Turkey Vulture summer roosting areas were identified during the site investigations. Further, no Turkey Vultures were recorded during the site visits. Therefore, suitable habitat was not identified on the Project location.
- ◆ Reptile hibernacula – Reptile hibernacula are commonly found in animal burrows and rock crevices. No candidate reptile hibernacula features, or snakes, were identified during transects of the Project location during the spring emergence period, which indicates that these features are not found on or within 120 m of the Project location.
- ◆ Bat hibernacula – Bat hibernacula are found in caves, abandoned mines, areas with karst topography and deep rock crevices. These features were not identified during the site investigation. Further, there are no records of abandoned mines from on or within 120 m of the Project location.
- Transmission line Project Location
 - ◆ Winter deer yards/Moose late winter habitat – Suitable habitat for winter deer yards/moose late winter habitat may be found within the conifer dominated woodland communities located within 120 m of the transmission line Project location (i.e., corresponding with Ecosites 1, 9, 11, 12, and 13)
 - ◆ Colonial bird nesting sites – Colonial bird nesting sites are locations where colonial species, such as herons, gulls, terns, and swallows traditionally nest in colonies of varying size. No heronries are known to occur, or were observed during area searches of lands on and within 120 m of the Project location. No colonial nesting species, such as terns or herons, were observed during surveys of the wetland communities, and none of the marshlands was determined to provide suitable habitat for colonial nesting terns. No suitable gull or tern colony locations (islands or peninsulas) were noted on or within 120 m of the Project location at the major waterbodies (such as the Frederickhouse River and Kennedy Lake). Similarly, there were no potential swallow colonial breeding locations (such as eroding banks or steep rock faces) identified on or within 120 m of the Project location.
 - ◆ Waterfowl stopover and staging areas – Waterfowl traditionally congregate in larger wetlands and clusters of small wetlands located close to one another during spring and fall

migration. As was noted during the Records Review, waterfowl staging areas are identified in association with Kennedy Lakes located within 120 m of the Project location. Further, there are several wetland complexes and waterbodies within 120 m of the Project location that may also provide waterfowl stopover and staging areas. These locations are shown in Figures 1.2 to 1.3.

- ◆ Waterfowl nesting – Waterfowl nesting sites can consist of relatively large, undisturbed upland areas with abundant ponds and wetlands, while other species nest within tree cavities in swamps or on the shorelines of waterbodies. Suitable candidate habitat was identified in association with areas of upland agricultural habitat in proximity to watercourses or wetlands, as well as around the shorelines of various waterbodies present within 120 m of the Project location.
- ◆ Turkey Vulture summer roosting areas – The Project location is at the extreme northern end of the Turkey Vulture breeding range. No rocky cliff ledges or groups of large dead snags with white-washing indicative of Turkey Vulture summer roosting areas were identified during the site investigations. Further, no Turkey Vultures were recorded during the site visits. Therefore, suitable habitat was not identified on the Project location.
- ◆ Reptile hibernacula – Reptile hibernacula are commonly found in animal burrows and rock crevices. No candidate reptile hibernacula feature are known to occur or were identified during the site investigations. Based on the regional landscape, i.e., relatively uncommon bedrock exposures at the surface, it is expected that these features are highly uncommon and are not expected to be found on or within 120 m of the Project location.
- ◆ Bat hibernacula – Bat hibernacula are found in caves, abandoned mines, areas with karst topography and deep rock crevices. These features were not identified during the site investigation and are not expected to be found on or within 120 m of the Project location.

Therefore, of the seasonal concentration areas considered during the site investigation, the following, which were identified on or within 120 m of the solar panel or transmission line project location, will be carried forward to the evaluation of significance:

- winter deer yards/moose late winter habitat
- waterfowl stopover and staging areas
- waterfowl nesting sites.

4.2.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare vegetation communities include alvars, tall-grass prairies, savannahs, rare forest types, talus slopes, rock barrens, sand barrens and Great Lakes dunes. Vegetation communities observed during the site investigations are shown in Figure 1.1; none of these communities are considered to be rare vegetation communities.

Specialized wildlife habitats include

- areas that support species that have highly specific habitat requirements
- areas with high species and community diversity

- areas that provide habitat that greatly enhances species survival.

There are many habitat types that may meet these definitions; those that were considered during the site investigations as they had the potential to be present in the area, and the discussion of their potential occurrence on the Project location, are addressed below:

- Solar Panel Project Location
 - ◆ Habitat for area-sensitive species – Though woodland communities have been identified on and within 120 m of the Project location, the majority of these communities are either too narrow (i.e. less than 200 m wide), or too small (< 10 ha) to provide area-sensitive breeding bird habitat. Suitable habitat for area-sensitive species was identified in respect of (i) shrubland habitats on the Project location, and extending south and west of the Project location more than 120 m from the Project location, and (ii) woodland habitats on and within 120 m east of the Project location. Therefore, habitats for these species will be considered during the evaluation of significance. Attributes and boundaries of these habitats have been previously described within Section 4.1.
 - ◆ Moose calving areas/mineral licks – These sites are identified by the MNR or may be known to local landowners. Neither moose calving areas nor mineral licks were identified by the MNR during the Records Review, and consultation with the public on the Project has not identified any such features on or within 120 m of the Project location.
 - ◆ Moose aquatic feeding areas – Moose aquatic feeding areas consist of areas with abundant coverage of aquatic plants and adjacent woodland stands. Such habitat is not found on or within 120 m of the solar panel Project location.
 - ◆ Old-growth or mature forest stands – These communities are associated with upland forest areas. Upland forest communities identified on and within 120 m of the Project location did not meet the characteristics of old-growth or mature forest stands (i.e., older, undisturbed forests). Therefore, this habitat type is not found on or within 120 m of the Project location.
 - ◆ Forest providing a high diversity of habitats – As the woodland communities on and within 120 m of the Project location consist of one vegetation type (see Section 4.2), these isolated habitats do not meet the definition of a candidate forest providing a high diversity of habitats.
 - ◆ Foraging areas with abundant mast – Though active bear presence was observed on and within 120 m of the Project location, bear activity within this region is common. Berry-producing shrubs and mountain ash trees were recorded during the site investigation, however, no large patches of these species were recorded. As a result, this specialized habitat is not found on or within 120 m of the Project location.
 - ◆ Woodlands supporting amphibian-breeding ponds – Amphibian-breeding ponds were not found within the woodlands located on or within 120 m of the Project location during the site investigation.
 - ◆ Wetlands supporting amphibian breeding habitat – Suitable riparian wetlands may be found in association with the marshlands around Munroe Creek on and within 120 m of the solar

panel Project location. Therefore, this candidate significant habitat type is found within 120 m of the Project location.

- ◆ Turtle-nesting habitat – The Project is located north of the range of turtle occurrence within the Province, and therefore there is no potential for this habitat type to occur.
- ◆ Mink, Otter, Marten, and Fisher denning sites – Denning sites for these members of the weasel family were not recorded on or within 120 m of the Project location during site investigations. Further, MNR has not identified feeding and denning sites for these species during the records review stage. Therefore, this habitat type is not found on or within 120 m of the Project location.
- ◆ Specialized raptor-nesting habitat – No stick nests were observed during area transects of lands on and within 120 m of the Project location completed in association with Site Investigation 10. Further, no raptors were recorded on or within 120 m of the Project location during any of the site investigations. Therefore, this habitat type is not found on or within 120 m of the Project location.
- ◆ Highly diverse areas – Highly diverse areas are commonly associated with the deciduous forest region of Ontario, the Frontenac Axis, and portions of the Canadian Shield underlain by carbonate bedrock (MNR 2000). These features are not found on or within 120 m of the Project location, and therefore this habitat type does not occur in this area.
- ◆ Cliffs and caves – These features were not identified on or within 120 m of the Project location during the site investigations.
- ◆ Seeps and springs – These features were not identified on or within 120 m of the Project location during the site investigations.
- Transmission line Project Location
 - ◆ Moose calving areas/mineral licks – These sites are identified by the MNR or may be known to local landowners. Neither moose calving areas nor mineral licks were identified by the MNR during the Records Review, and consultation with the public on the Project has not identified any such features on or within 120 m of the Project location.
 - ◆ Moose aquatic feeding areas – Moose aquatic feeding areas consist of areas with abundant coverage of aquatic plants and adjacent woodland stands. Based on these habitat characteristics, such habitat is found within associated with the following waterbody/wetland complexes, and associated woodlands within 120 m: Kennedy Lake, Little Cannon Lake, Lower Deception Lake and Prior Lake.
 - ◆ Old-growth or mature forest stands – These communities are associated with upland forest areas. Areas of upland forest are considered to be candidate old-growth or mature forest stands.
 - ◆ Foraging areas with abundant mast – No candidate significant mast producing areas were identified during the site investigation (i.e., shrublands of berry-producing shrubs or areas dominated by mountain-ash trees).

- ◆ Woodlands supporting amphibian-breeding ponds – Amphibian-breeding ponds may be found within the woodlands located within 120 m of the transmission line Project location. As a result, these areas within 120 m of the Project location are considered to be candidate significant woodlands supporting amphibian breeding ponds.
- ◆ Wetlands supporting amphibian breeding habitat – Wetland communities containing open water were identified during the site investigations within 120 m of the transmission line Project location. Therefore, this meets the habitat requirement for wetlands supporting amphibian breeding habitat.
- ◆ Turtle-nesting habitat – The Project is located north of the range of turtle occurrence within the Province, and therefore there is no potential for this habitat type to occur.
- ◆ Mink, Otter, Marten, and Fisher denning sites – MNR has not identified feeding and denning sites for these species during the records review stage, and none were identified during consultation with the public. Based on habitat characteristics of relatively undisturbed shorelines and wetlands with closed canopy forest, candidate habitat may be found around the Frederickhouse River, Kennedy Lake, Little Cannon Lake, Lower Deception Lake, and Prior Lake.
- ◆ Specialized raptor-nesting habitat – Suitable raptor nesting habitat may be found within the woodland communities on and within 120 m of the Project location. Given the need for mature trees to provide nesting structure, candidate significant raptor nesting habitat has been determined to be present within those areas previously identified and candidate significant old growth or mature forest.
- ◆ Highly diverse areas – Highly diverse areas are commonly associated with the deciduous forest region of Ontario, the Frontenac Axis, and portions of the Canadian Shield underlain by carbonate bedrock (MNR 2000). These features are not found on or within 120 m of the Project location, and therefore this habitat type does not occur in this area.
- ◆ Cliffs and caves – These features were not identified on or within 120 m of the Project location.
- ◆ Seeps and springs – Candidate locations of seeps and springs were identified through use of topographical mapping and aerial photographs to identify small streams and headwater areas within 120 m of the Project location. The locations are identified as having a high potential for seeps and springs, and are therefore considered to be candidate significant seeps and springs..

As a result, the only candidate significant specialized wildlife habitats on or within 120 m of the solar panel Project location is habitat for area-sensitive shrubland species. In addition, the following candidate significant specialized wildlife habitats were identified on or within 120 m of the transmission line Project location:

- habitat for area-sensitive species
- moose aquatic feeding areas
- old growth or mature forest stands

- woodlands supporting amphibian breeding habitat
- wetlands supporting amphibian breeding habitat
- mink, otter, marten and fisher denning sites
- specialized raptor nesting habitat
- seeps and springs.

4.2.3 **Habitat of Species of Conservation Concern**

Species of conservation concern that were considered during the site investigation include the following:

4.2.3.1 *Solar Panel Project Location*

4.2.3.1.1 Mammals

- Northern Long-eared Bat – There were no mines or caves identified during the site investigation. Further, there were no hollow trees identified, or trees with loose bark that may serve as maternity colonies. Therefore, suitable habitat was not identified on or within 120 m of the Project location.
- Rock Vole – Suitable rocky areas capable of providing habitat were not identified on or within 120 m of the Project location.

4.2.3.1.2 Birds

- Red-necked Grebe (*Podiceps grisegena*) – Suitable habitat, permanent freshwater lakes with a fringe of aquatic emergent vegetation, protected marshy areas or bays in larger lakes, or marshes impoundments or sewage lagoons with more than 4 ha of open water, were not recorded on or within 120 m of the Project location.
- Black Tern (*Chlidonias niger*) – Suitable habitat for Black Tern, large cattail marshes, marshy edges of waterbodies, wet open fens or meadows, were not recorded on or within 120 m of the Project location.
- Short-eared Owl (*Asio flammeus*) – There was no suitable habitat on the Project location, as the Project location consisted primarily of ploughed fields at the time of Site Investigation 11. Pasture land is located north of the Project location, however portions within 120 m of the Project location would not provide suitable habitat given proximity to the roadway. Similarly, the small portion of meadow within 120 m southwest of the Project location is too small to provide suitable habitat.
- Common Nighthawk (*Chordeiles minor*) – Suitable habitat for Common Nighthawk was found on the ploughed fields on and within 120 m of the Project location. Therefore, candidate significant habitat for Common Nighthawk is found on and within 120 m of the Project location.
- Canada Warbler (*Wilsonia canadensis*) – Suitable habitat for Canada Warbler is not found as they are an interior forest specialist, and such habitat is not found on or within 120 m of the Project location.
- Bald Eagle (*Haliaeetus leucocephalus*) – Suitable habitat (i.e., large waterbodies) are not found on or within 120 m of the Project location.

- Olive-sided Flycatcher (*Contopus cooperi*) – Suitable habitat for Olive-sided Flycatcher may be found on or within 120 m of the Project location associated with the forest edges.

4.2.3.1.3 Vegetation

Vegetation species are addressed within Table 4.3 below.

Table 4.3 Vegetation Species

Scientific Name	Common Name	Habitat	Habitat Occurrence on or within 120 m of	
			Solar Panel Project Location	Transmission line Project Location
<i>Moehringia macrophylla</i>	Large-leaved Sandwort	rocky ledges, open rocky woodlands and talus slopes	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Carex haydenii</i>	Long-scaled Tussock Sedge	open and shaded wet habitats	Suitable habitat may be found in association with the waterbodies on and within 120 m of the Project location	Suitable habitat may be found in association with the waterbodies and wetlands within 120 m of the Project location
<i>Carex loliacea</i>	Sedge	bogs, muskegs and black spruce forests	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat may be found within the black spruce forests within 120 m of the Project location
<i>Carex tetanica</i>	Common Stiff Sedge	moist grassland, sandy shores and ditches, prairies, seepages	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat may be found in association with the seepage areas
<i>Carex wiegandii</i>	Wiegand's Sedge	black spruce bogs and alder swamps	Suitable habitat is found within the alder swamps present on and within 120 m of the Project location.	Suitable habitat is found within the alder swamps within 120 m of the Project location.
<i>Scirpus clintonii</i>	Clinton's Bulrush	shorelines, rock crevices in north	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Scirpus heterochaetus</i>	Slender Bulrush	marshes and shores	Suitable habitat may be found in association with the marshlands around Munroe Creek on and within 120 m of the Project location	Suitable habitat may be found within the marshlands or shoreline within 120 m of the Project location
<i>Gymnocarpium robertianum</i>	Limestone Oak Fern	ledges and slopes in calcareous rock; occasionally in sphagnum mats in cedar swamps	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location

Scientific Name	Common Name	Habitat	Habitat Occurrence on or within 120 m of	
			Solar Panel Project Location	Transmission line Project Location
<i>Woodsia alpina</i>	Northern Woodsia	moist, cool, often shaded crevices in calcareous cliffs	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Woodsia glabella</i>	Smooth Woodsia	shaded, calcareous rock crevices	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Vaccinium membranaceum</i>	Mountain Bilberry	moist, mature white birch, balsam fir, white cedar forests on shallow, acid soils	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Vaccinium ovalifolium</i>	Blue Bilberry	mixed woods	Suitable habitat may be found within the woodlands on and within 120 m of the Project location	Suitable habitat may be found within the woodlands within 120 m of the Project location
<i>Oxytropis viscida</i> var. <i>hudsonica</i>	Locoweed	beach ridges and floodplains	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Diphysastrum sabinifolium</i>	Ground-fir	sandy woods and meadows	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Listera auriculata</i>	Auricled Twayblade	moist, shaded sandy soil	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Malaxis paludosa</i>	Bog Adder's-mouth	sphagnum bogs and muskegs	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location
<i>Panicum leibergii</i> var. <i>baldwinii</i>	Baldwin's Panic Grass	dry to mesic prairies, sandy fields and sandy or rocky openings in oak forest; open, rocky riverbanks in northern Ontario	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat is not found on or within 120 m of the Project location

4.2.3.2 *Transmission line Project Location:*

4.2.3.2.1 Mammals

- Northern Long-eared Bat – There are no mines or caves known to occur on or within 120 m of the transmission line Project location. Suitable areas of hollow trees may be found within the woodland communities previously identified as candidate old growth or mature forest stands located within 120 m of the transmission line Project location. Therefore suitable habitat may be found within 120 m of the transmission line Project location.
- Rock Vole - Based on the regional landscape, i.e. relatively uncommon bedrock exposures at the surface, it is expected that suitable habitat for Rock Vole is highly uncommon and is not expected to be found on or within 120 m of the Project location.

4.2.3.2.2 Birds

- Red-necked Grebe (*Podiceps grisegena*) – Suitable habitat, permanent freshwater lakes with a fringe of aquatic emergent vegetation, protected marshy areas or bays in larger lakes, or marshes impoundments or sewage lagoons with more than 4 ha of open water, were identified in association with Lower Deception Lake and Syndicate Lake within 120 m of the Project location.
- Black Tern (*Chlidonias niger*) – Suitable habitat for Black Tern, large cattail marshes, marshy edges of waterbodies, wet open fens or meadows, were not recorded on or within 120 m of the Project location.
- Short-eared Owl (*Asio flammeus*) – Habitat for Short-eared Owl may be found within the agricultural grasslands within 120 m of the transmission line Project location.
- Common Nighthawk (*Chordeiles minor*) – Suitable habitat for Common Nighthawk may be found on the agricultural fields, pits, and recently harvested forests within 120 m of the transmission line Project location.
- Canada Warbler (*Wilsonia canadensis*) – Suitable habitat for Canada Warbler is in association with the woodland communities located within 120 m of the transmission line Project location.
- Bald Eagle (*Haliaeetus leucocephalus*) – Suitable habitat may be found in association with the larger waterbodies located within 120 m of the transmission line Project location, specifically the Frederickhouse River, Lower Deception Lake and Syndicate Lake.
- Olive-sided Flycatcher (*Contopus cooperi*) – Suitable habitat for Olive-sided Flycatcher may be found on or within 120 m of the Project location associated with the forest edges.

4.2.3.2.3 Vegetation

Vegetation species are addressed within Table 4.3.

4.2.4 **Animal Movement Corridors**

The SWHTG (MNR, 2000) defines animal movement corridors as “elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another”. Animal movement corridors were considered during the site investigation.

Solar Panel Project Location

The riparian habitats associated with the creek on and within 120 m east of the Project location may provide a movement corridor. This movement corridor may be used by species of waterfowl, amphibians, and mammals as they move between Lauzon Lake and other waterbodies, but likely also provides breeding/foraging habitat for several of these species.

Given that the woodland communities on and within 120 m of the Project location are part of a very large forest community that would provide for diffuse wildlife movement, there are no candidate animal movement corridors identified in association with this features.

Transmission line Project Location

Given that the majority of woodland communities within 120 m of the Project location are part of larger woodland networks, these areas are not considered to provide candidate animal movement corridors. Therefore, candidate animal movement corridors are restricted to those associated with watercourses within 120 m of the Project location.

4.2.5 Summary

Several wildlife habitats have been identified on and within 120 m of both the solar panel and transmission line Project locations. None of these features were identified during the records review, and thus, their identification represents a correction to the records review.

5. Conclusions

Based on the results of the site investigation identified above, several corrections to the records review were identified, as described in Tables 4.1 and 4.2. There are several features that will require an Evaluation of Significance:

- Solar Panel Project Location
 - ◆ Wetlands
 - ◆ Waterfowl Nesting habitat
 - ◆ Habitat for area-sensitive species
 - ◆ Wetlands supporting amphibian breeding habitat
 - ◆ Habitat for species of conservation concern, including
 - Common Nighthawk Habitat
 - Olive-sided Flycatcher Habitat
 - *Vaccinium ovalifolium* habitat
 - *Scirpus heterochaetus* habitat
 - *Carex wiegandii* habitat
 - *Carex haydenii* habitat
 - ◆ Animal movement corridor

- Transmission line Project Location
 - ◆ Wetlands
 - ◆ Generalized Characterized Candidate Significant Wildlife Habitat
 - Seasonal Concentration Areas
 - Winter deer yards/moose late winter habitat
 - Waterfowl stopover and staging areas
 - Waterfowl nesting sites
 - Specialized Wildlife Habitats
 - Area-sensitive woodland/shrubland/grassland habitats
 - Moose aquatic feeding areas
 - Old growth or mature forest stands
 - Woodlands supporting amphibian breeding habitat
 - Wetlands supporting amphibian breeding habitat
 - Mink, otter, marten and fisher denning sites
 - Specialized raptor nesting habitat
 - Seeps and springs
 - Habitat for Species of Conservation Concern
 - Northern Long-eared Bat
 - Red-necked Grebe
 - Short-eared Owl
 - Common Nighthawk
 - Canada Warbler
 - Bald Eagle
 - Olive-Sided Flycatcher
 - *Vaccinium ovalifolium*
 - *Scirpus heterochaetus*
 - *Carex wiegandii*
 - *Carex tetanica*
 - *Carex loliacea*
 - *Carex haydenii*

- Animal Movement Corridors associated with several waterbodies within 120 m of the Project location

None of the features identified above were identified through the Records Review stage, and therefore their identification herein represents a change to the Records Review.

6. References

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Appendix A

Site Investigation

Field Notes

Project: Martins Meadow

Abitibi S. Co.

Date: Aug 22 2010

Time: 1300-1900

% C.C.: 100%

Wind: 1-2

Land Use Only

- The agricultural fields on the project site are used for the production of hay. There are woodlands on it surrounding the project site.
- There is a watercourse that traverses north-south through Lot 15, conc. 8.
- This watercourse is shown on the L10 mapping.
- This watercourse is surrounded by wetland vegetation characteristic of a meadow marsh (e.g. broad leaved cattail, grasses, sedges). Surrounding the meadow marsh community is a thicket swamp dominated by

- willow sp. & red-osier dogwood.
- These wetland communities (meadow marsh & willow thicket swamp) are not shown on the L10 mapping.
- There is also a municipal drain that flows east along Line 8 & 9 road, north of the project site.
- This municipal drain is approximately 5' wide & at least 5' deep in some areas.
- Water was present within the drain during the site visit.
- Evidence of erosion was observed particularly along the road where gravel/pavement appear to be eroding.
- The surrounding land use is agricultural, primarily cash crops such as carrots, hay, grain.
- Pasture was also observed.
- A large equipment operation & small aqueduct hole, farm was

document on the properties north
of the Project site.
The area has not been
agricultural production (within 100m)
include scrublands & young
immature woodlands.
- The Project site was formerly used
as a livestock spread or with
>100 cattle. It is now used
for the production of hay. The
barn is currently being used
as a shop for rebuilding engines
& farm equipment.

No.
Date
Project
Date
Time
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Date. Page 49

Project: Martin's Meadows

Date: Aug 23, 2010

Time: 1600-1930 (3.5)

% a.c.: 0%

Temp: 24°C

Wind: 2

black bear in NE woodlot

No.

Date. Page 50

drainage feature along the western boundary. Galvanize culvert buried

- drain not connected to the municipal drain

— willow along drainage feature

- small-fruited h. o.

- broad leaved cattail

- alder (R)

- Mt. ash dogwood (R)

- tree

- drainage feature ends at woodlot - where it reaches woodlot channel is not defined.

alder (D) mosses

woodlot

willow

yellowweed

water sp.

balsam poplar

franklinia cyprip

No.....

Date.....

Page 53

No.....

Date.....

Page.....

South-central (Alibi site)

alder, willow, trembling aspen

white birch (R)

small-fruited balsam

spotted Joe pyweed

Southern portion of Alibi site

had more coniferous trees

Yamaguchi

Spruce

black bear in woodland

Date: Aug 24, 2010 %CC: 90%

No. Temp: 24°C

Time: 1400-1700 (30) Wind: 3 Page: 57

Project - Site between Martine
Meadow & Abitibi

- Rollin drainage - water drains west
Southward towards southern
woodlot

- Tamarack (D) mixed with alder &
willow and some spruce.

Balsam poplar & trembling aspen
also observed throughout

Southern pines: aspen,
some tamarack, strawberries,
Balsam poplar (D), alder sp,
trembling aspen, some yellowed

alder
willow

white birch
S

- trembling aspen

- Balsam poplar

willow
alder

No.

Date Page: 58

Wetland area

Whorled milkweed ?

meadow rue

alder (A)

Tamarack (A)

Willow (A)

alder sp.

Chochmaie SNAKE SURVEYS
EMPIRE

Concession 6+7 Site -

- Start May 18 11:00 am
- Partly Cloudy
- 15°C

GPS 808 - Start TRANSECT 1

809 - Photo# 8912 8913

- Rock Pile along E Property Boundary

810 - END TRANSECT 1

811 - Middle of West TRANSECT

* - Missed Point at Start of
transect 2

812 - Middle of transect 2

- Where came out of weed lot

813 - TRANSECT 2 END

814 - START TRANSECT 3

815 - Beginning of weed lot in Transect 3

Not in the log

818 - END TRANSECT 3

819 - Walked to point Along Back Property line

821 - SMALL vernal pool
- Photo # 8914

Martin Meadow - Northland

START 1:30pm, 18°C, Partly Cloudy

822 - START TRANSECT 1

823 - Back Pile Along Property Boundary
- Photo # 8915

824 - Stream
- Small wetland area
- 1 wood frog heard
- Possible Amphibian Location
- END TRANSECT 1

825 - Point in woodlot

826 - Start TRANSECT 2

827 - Point in woodlot

828 - EXT the woodlot

829 - Point along woodlot

830 - END TRANSECT 2

Alibi - SNAKE SURVEY - 3:30pm

831 - START TRANSECT 1

832 - Ditch with Standing Water
- Possible Amphibian Location

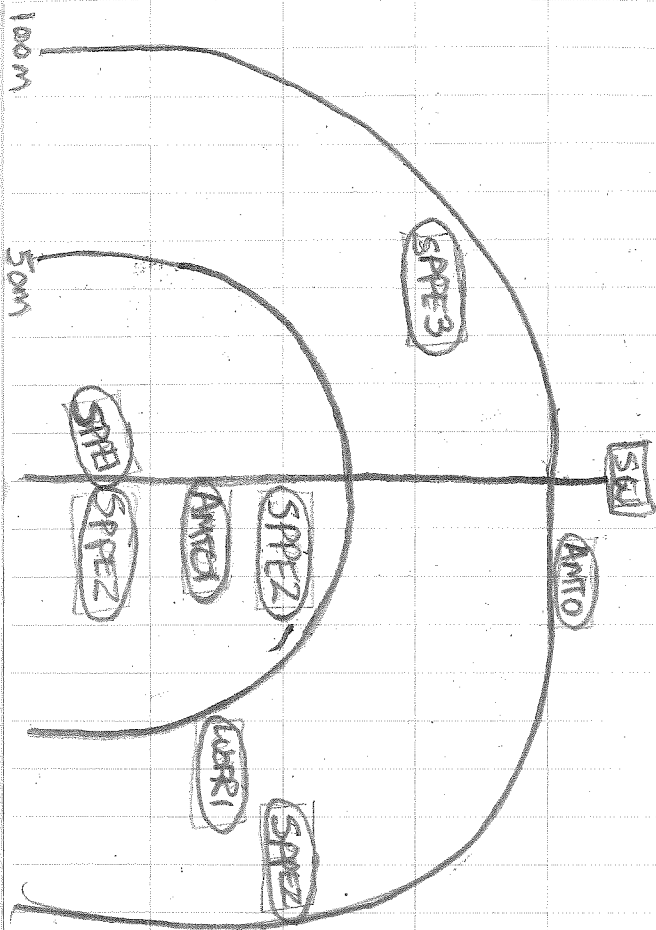
833 - Point in woodlot

834 - Start Transect 2

835 - Spring Peeper heard Class-2
- 1 wood frog heard

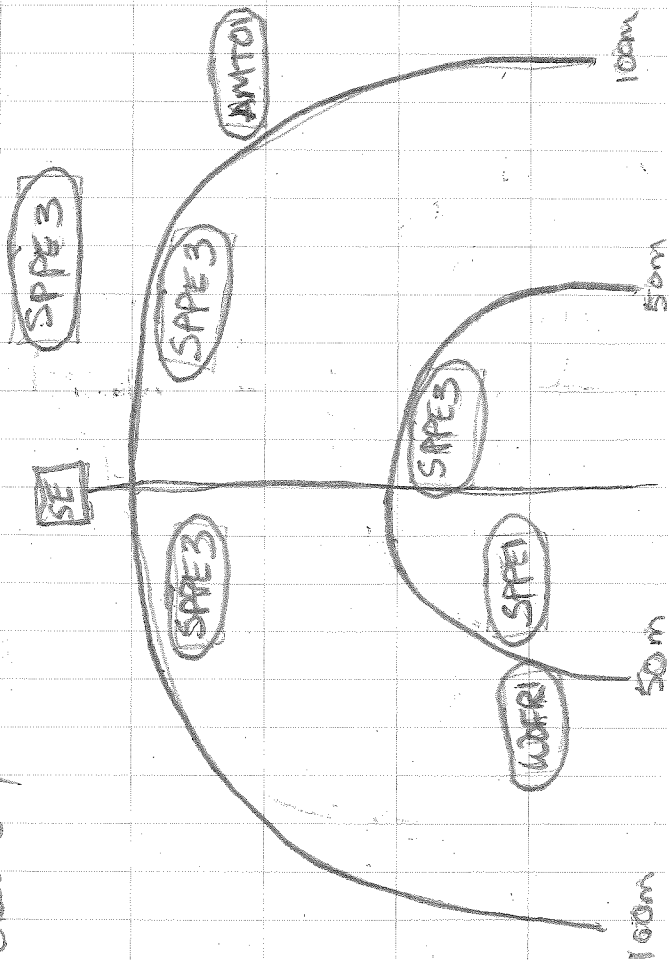
836 - END TRANSECT 2

Abidi - Frog Pant 1 - CFS 837
 Time: 9:15pm May 18th
 10°C, Clear sky

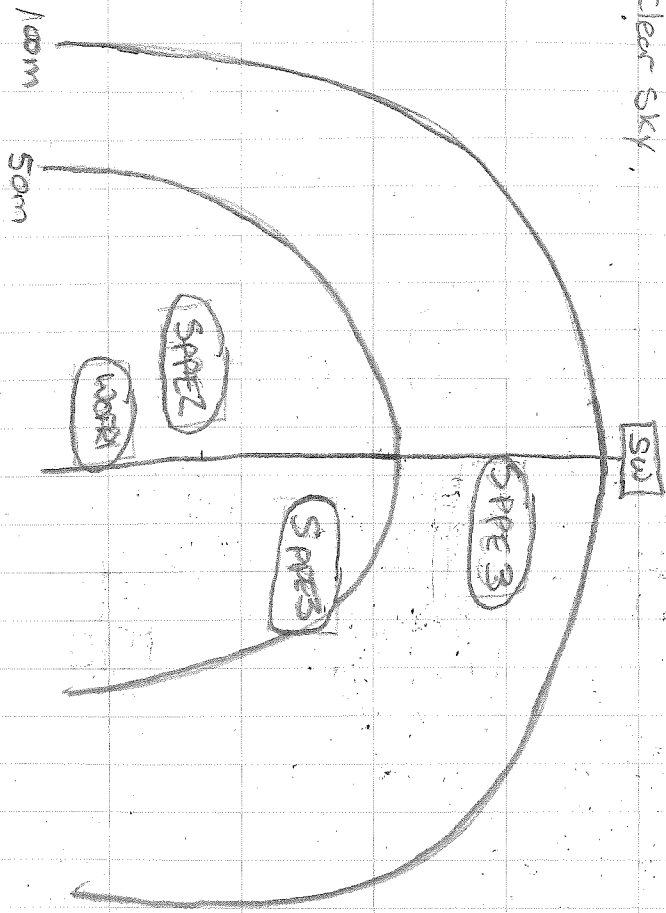


Note: CFS 838 = SPEZ
 in small grassy wet spot
 1 WAFRI

Martins Meadows / Abidi Frog - CFS 838
 Time: 9:45pm
 8°C, Clear Sky

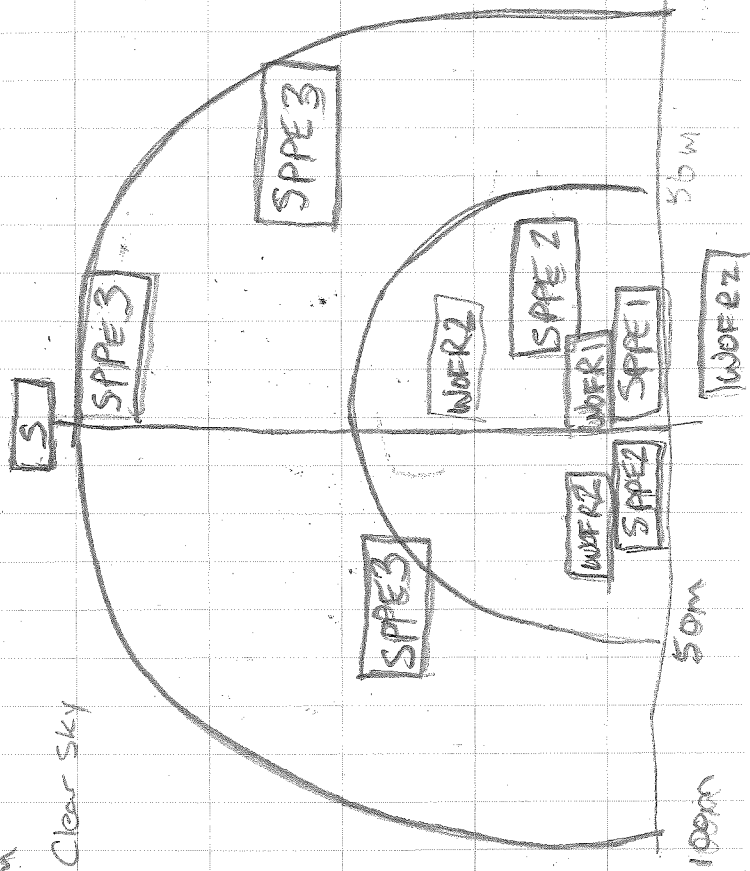


"Alive in the Rain"



MARTIN'S MEADOWS FROG #2 - GPS 824
 TIME - 10:05pm
 8°C, Clear Sky.

"Abitibi" / Martin Meadows - Frog #3 - GPS 840
 10:25pm
 7°C, Clear Sky



"Rita in the Rain"

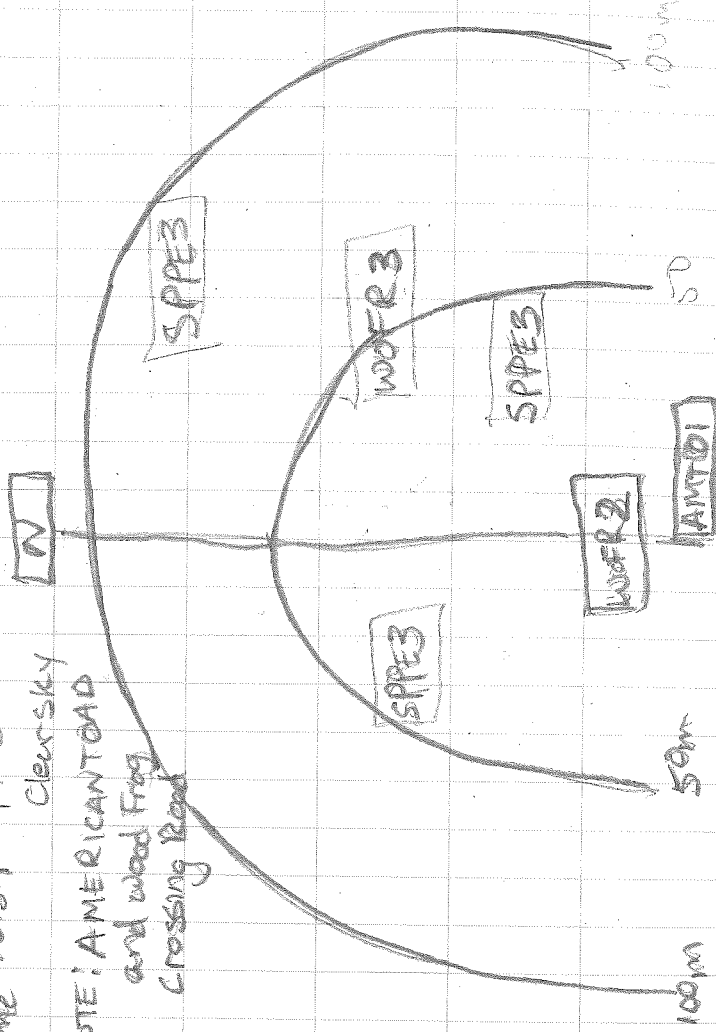
Apitibi / MARTIN MEADOWS - FROG #4 - GPS 840

Time - 10:30pm, 7°C

Clearsky

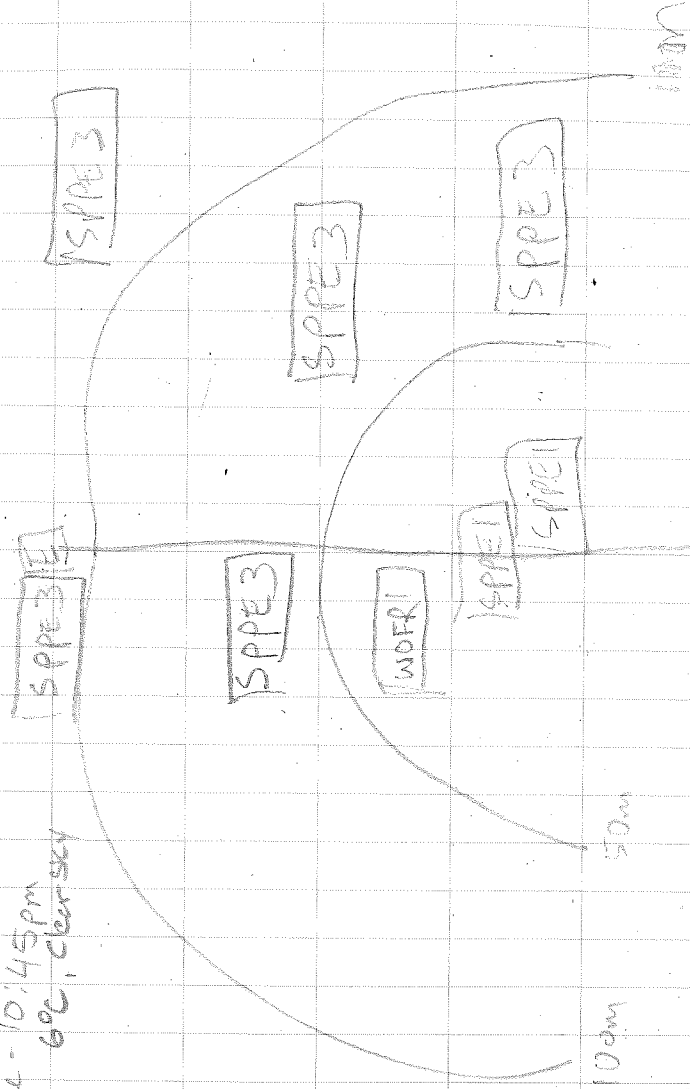
NOTE: AMERICAN TOAD

and wood frog
crossing Road



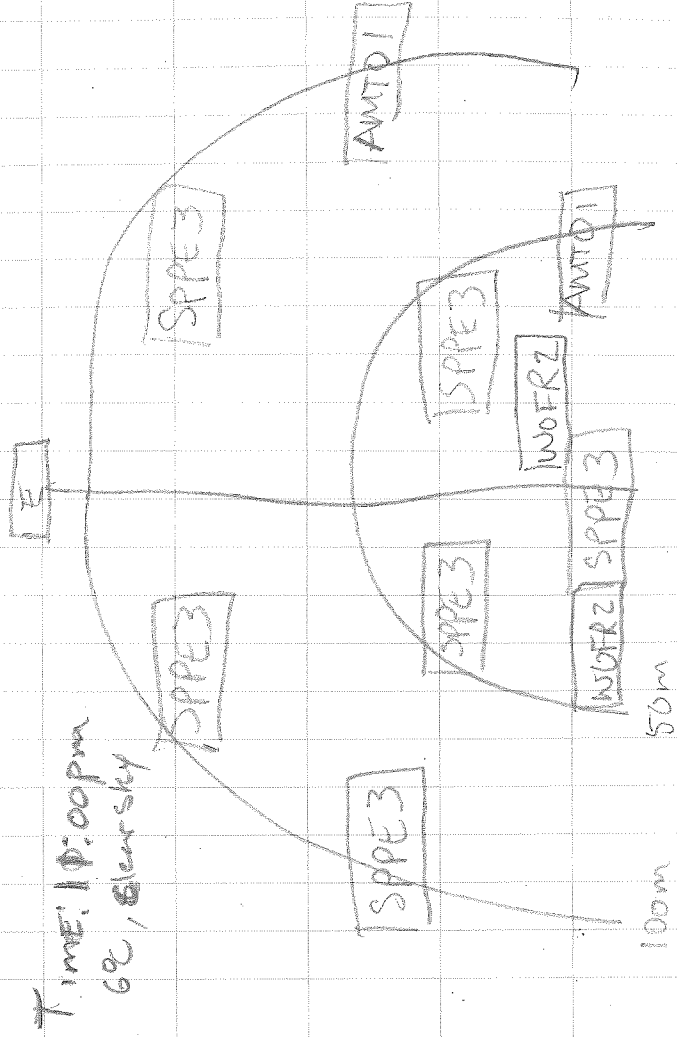
EMPIRE - FROG #1 - GPS 821

Time - 10:45pm
6°C, Clearsky

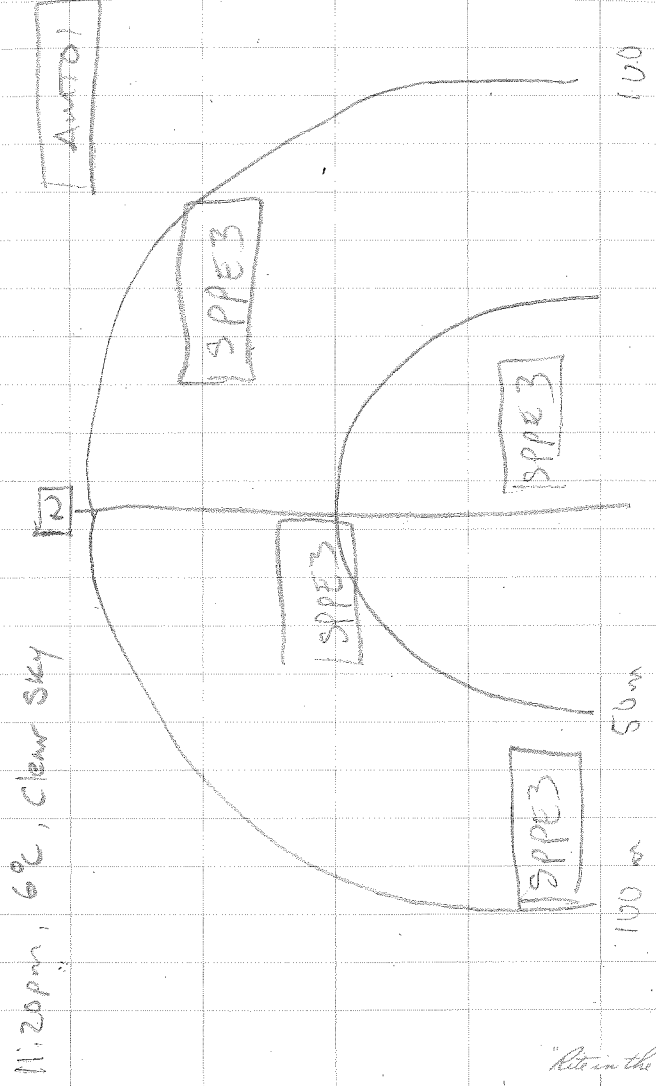


"Return the favor"

Empire Frog 2 - GPS 841



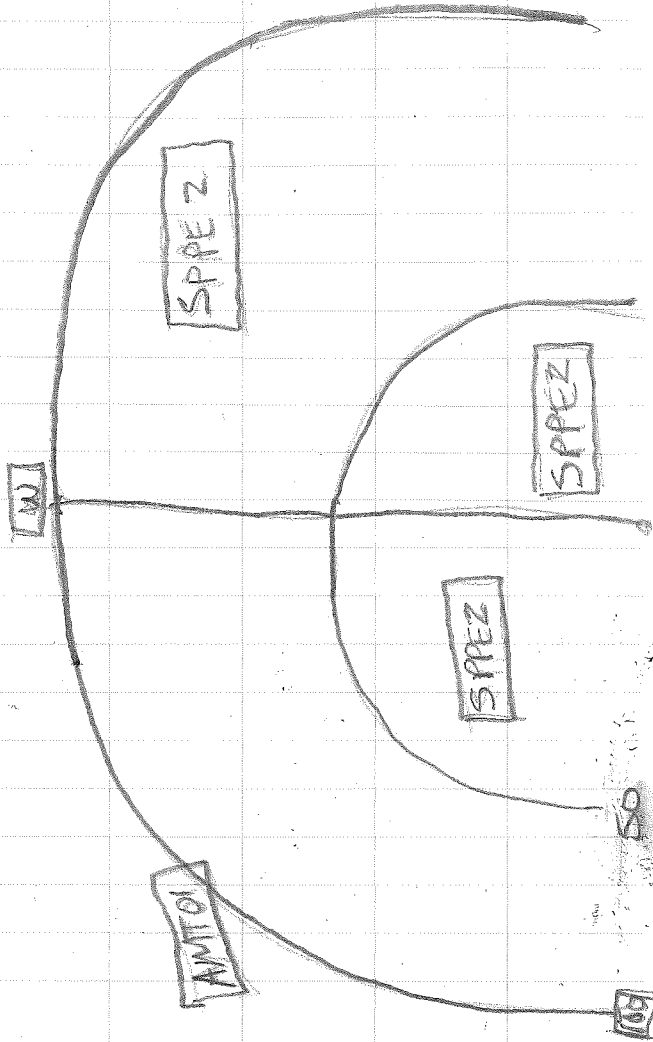
EMPIRE FROG 3 - GPS 843



"Return the Rain"

Empire Frog 4 = 11:40pm, 6°C, clear sky

GPS-844



Appendix B
Natural Resource Solutions Inc.
Wetland Evaluations



NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

1247B

February 22, 2012

Mr. Sean Male
Hatch Energy
4342 Queen Street, Suite 500
Niagara Falls, ON L2E 7J7

Dear Mr. Male,

**RE: Abitibi and Martin's Meadow Solar Project
Summary of Wetland & Upland Vegetation Mapping,
Breeding Bird and Amphibian Call Surveys**

Summary of Surveys

On behalf of Natural Resource Solutions Inc., I am pleased to provide the following which documents the work completed at the above noted solar project being proposed by Northland Power.

The objectives of this assignment were to complete vegetation mapping, amphibian surveys, breeding bird, and evening bird surveys.

Appendix I includes a list of study team members and their roles.

Vegetation

On site vegetation mapping occurred on June 22, 2011 (0900 – 1600hrs, weather 15°C, sunny, 0% cloud cover, wind – Beaufort scale 1). The standard Ontario Wetland Evaluation System (OWES) (OMNR 1993) was used by a Certified Wetland Evaluator to map and describe on-site wetlands, as well as wetlands within 120m of the project site.

In addition, a catchment basin boundary was identified that included the on-site wetlands. All wetlands in the catchment basin were also mapped and described using OWES June 21 to June 24, 2011. In this case, land access and the extent of the lands required that the mapping be completed using aerial photography supplemented with field checks of wetland polygons at strategic locations (primarily roadside).

The standard Ecological Land Classification (ELC) (Lee et al. 1998; Lee 2008) was also used by a Certified ELC staff to describe polygons outside of OWES and Forest Ecosystem Classification (FEC) (Taylor et al. 2000).

Please see Appendix II for a list of polygon labels.

The wetlands within the catchment basin were evaluated using the standard OWES system for northern Ontario. A copy of the completed evaluation, including mapping, is included in Appendix III.

Amphibian Call Monitoring

On site amphibian call surveys were completed on June 21, 2011 (2000-2200hrs, weather 15°C, 5% cloud cover, wind – Beaufort scale 3 to 4, water temperature 19°C). The standard Marsh Monitoring Protocol (Bird Studies Canada 2009) was used in which 3 minute point counts at predetermined stations.

At the Abitibi site nothing was heard at Station 1, which was determined to be marginal amphibian habitat since no water or frog habitat was present. Three spring peepers (*Pseudacris crucifer crucifer*) were heard northeast of Station 1B (approximately 100m distance). Two spring peepers were heard north of Station 2 (approximately 100m distance). At the Martin's Meadow site, nothing was heard at Station 2. No standing water or frog habitat is present. A second station was chosen, Station 3, to replace monitoring at Station 2 which was at a sedge marsh with pockets of standing water. No amphibians were heard.

The field data forms are included in Appendix IV.

Breeding Bird Surveys

On site breeding bird surveys were completed June 21, 2011 (0530 – 0800hrs, weather 13°C, 90% cloud cover, wind – Beaufort scale 0 to 2) using the standard Ontario Breeding Bird methodology (Cadman et al. 2007).

The following species were observed during that period:

Species Observed	Observed	Possible	Probable	Confirmed
Alder Flycatcher (<i>Empidonax alnorum</i>)		S		
American Crow (<i>Corvus brachyrhynchos</i>)	X			
American Goldfinch (<i>Carduelis tristis</i>)		H		
American Redstart (<i>Setophaga ruticilla</i>)		S		
American Robin (<i>Turdus migratorius</i>)		S		
Black-and-white Warbler (<i>Mniotilta varia</i>)		S		
Black-throated Green Warbler (<i>Dendroica virens</i>)		S		
Blue Jay (<i>Cyanocitta cristata</i>)		S		
Common Loon (<i>Gavia immer</i>)	X			
Hermit Thrush (<i>Catharus guttatus</i>)		S		
Ovenbird (<i>Seiurus aurocapillus</i>)		S		
Red-eyed Vireo (<i>Vireo olivaceus</i>)		S		
Sandhill Crane (<i>Grus canadensis</i>)				FY
Song Sparrow (<i>Melospiza melodia</i>)		S		
Tennessee Warbler (<i>Vermivora peregrine</i>)		S		
White-throated Sparrow (<i>Zonotrichia albicollis</i>)		S		
Yellow Warbler (<i>Dendroica petechia</i>)		S		
Yellow-rumped Warbler (<i>Dendroica cronoata</i>)	X			

The following species were observed within the Martin's Meadow area:

Species Observed	Observed	Possible	Probable	Confirmed
American Crow (<i>Corvus brachyrhynchos</i>)	X			
American Goldfinch (<i>Carduelis tristis</i>)		S		
American Redstart (<i>Setophaga ruticilla</i>)		S		
American Robin (<i>Turdus migratorius</i>)		S		
Black-throated Green Warbler (<i>Dendroica virens</i>)	X			
Northern Cardinal (<i>Cardinalis cardinalis</i>)		S		
Ovenbird (<i>Seiurus aurocapillus</i>)		S		
Red-eyed Vireo (<i>Vireo olivaceus</i>)		S		
Sandhill Crane (<i>Grus canadensis</i>)		S		
Savannah Sparrow (<i>Passerculus sandwichensis</i>)		S		
Veery (<i>Catharus fuscescens</i>)		S		
White-throated Sparrow (<i>Zonotrichia albicollis</i>)		S		

Observed

X Species observed in its breeding season with no evidence of breeding

Possible

H Species observed in its breeding season in suitable nesting habitat

S Singing male present or breeding calls heard in breeding season in suitable nesting habitat

Probable

P Pair observed in their breeding season in suitable nesting habitat

T Permanent territory presumed through registration of territorial song on at least 2 days, one week or more apart at the same place

D Courtship or display between a male and female or 2 males including courtship feeding and copulation

V Visiting probable nest site

A Agitated behaviour or anxiety calls of an adult

B Brood patch on adult female or cloacal protuberance on adult male

N Nest building or excavation of nest site

Confirmed

DD Distraction display or injury feigning

NU Used nest or egg shell found (occupied/laid this season)

FY Recently fledged young or downy young

AE Adults leaving or entering nest site in circumstances indicating occupied nest

FS Adult carrying faecal sac

CF Adult carrying food for young

NE Nest containing eggs

NY Nest with young seen or heard

Other species observed on site included:

Red Fox (*Vulpes vulpes*)

Evening Bird Surveys

Surveys for birds that are primarily active in the evening were conducted on June 21, 2011 (2000 – 2200hrs, weather 15°C, 5% cloud cover, wind – Beaufort scale 3 to 4).

The survey followed standard monitoring protocols developed for species such as whip-poor-will and common nighthawk (the two focus species for this survey) (OMNR 2011).

No nighthawks (*Chordeiles* sp.) or whip-poor-wills (*Caprimulgus vociferous*) were observed during evening surveys.

Other species observed during evening surveys included:

American Robin (*Turdus migratorius*)

Hermit Thrush (*Catharus guttatus*)

Sandhill Crane (*Grus canadensis*)

Veery (*Catharus fuscescens*)

White-throated Sparrow (*Zonotrichia albicollis*)

Red Fox (*Vulpes vulpes*)

References

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- Taylor, K.C. et al. 2000. A Field Guide to Forest Ecosystems of Northeastern Ontario. 2nd Edition. NEST Field Guide FG-001.

Appendix I

Team Member	Qualification	Role
David Stephenson	Certified Wetland Evaluator Certified ELC Certified OWES Certified Arborist	Project Management, Reporting
Jessica Grealey	Terrestrial and Wetland Biologist Certified ELC	Site Assessment
Tara Brenton	Terrestrial and Wetland Biologist Certified ELC Certified OWES Certified Arborist	Site Assessment
Charlotte Moore	Terrestrial Biologist	Site Assessment
Megan Pope	Terrestrial Biologist	Site Assessment, Data Analysis, Reporting
Gerry Schaus	GIS Technician	Mapping

Appendix II

Within Project Site and 120m boundary

OWES CLASSIFICATIONS

cS₁:

[OWES: Coniferous Swamp]

h: white birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*),
trembling aspen (*Populus tremuloides*), balsam poplar (*Populus
balsamifera ssp. balsamifera*)

*c: balsam fir (*Abies balsamea*), black spruce (*Picea mariana*)

dc: balsam fir (*Abies balsamea*)

ts: speckled alder (*Alnus incana ssp. rugosa*), showy mountain-ash
(*Sorbus decora*)

gc: blue-bead lily (*Clintonia borealis*), star-flower (*Trientalis borealis ssp.
borealis*), bunchberry (*Cornus canadensis*), wood horsetail (*Equisetum
sylvaticum*), ostrich fern (*Matteuccia struthiopteris var. pennsylvanica*)

m: clubmoss

cS₁₃:

[OWES: Coniferous Swamp]

*c: tamarack (*Larix laricina*), black spruce (*Picea mariana*)

ts: speckled alder (*Alnus incana ssp. rugosa*), showy mountain-ash
(*Sorbus decora*), red-berried elderberry (*Sambucus racemosa ssp.
pubens*), balsam fir (*Abies balsamea*)

ls: Labrador tea (*Ledum groenlandicum*), red raspberry (*Rubus idaeus
ssp. idaeus*), red currant (*Ribes rubrum*)

gc: bracken fern (*Pteridium aquilinum var. latiusculum*), ostrich fern
(*Matteuccia struthiopteris var. pennsylvanica*), woodland strawberry
(*Fragaria vesca ssp. americana*), bunchberry (*Cornus canadensis*),
Canada mayflower (*Maianthemum canadense*)

m: moss sp.

hS₈:

[OWES: Deciduous Swamp]

*h: trembling aspen (*Populus tremuloides*), white birch (*Betula papyrifera*)

ls: red raspberry (*Rubus idaeus ssp. idaeus*), Canada soapberry
(*Shepherdia canadensis*), low sweet blueberry (*Vaccinium angustifolium*),
Labrador tea (*Ledum groenlandicum*)

gc: woodland strawberry (*Fragaria vesca ssp. americana*), bunchberry
(*Cornus canadensis*), ostrich fern (*Matteuccia struthiopteris var.
pennsylvanica*), blue-bead lily (*Clintonia borealis*)

tsS_{3-5,7,18}:

[OWES: Tall Shrub Swamp]

*ts: speckled alder (*Alnus incana* spp. *rugosa*), red osier dogwood (*Cornus stolonifera*)

gc: pale touch-me-not (*Impatiens palidia*), spinulose wood fern (*Dryopteris carthusiana*), fragrant bedstraw (*Galium triflorum*)

m: moss sp.

tsS_{11,12}:

[OWES: Tall Shrub Swamp]

*ts: speckled alder (*Alnus incana* spp. *rugosa*), Bebb's willow (*Salix bebbiana*)

ls: Labrador tea (*Ledum groenlandicum*), blueberry (*Vaccinium angustifolium*), Bebb's willow (*Salix bebbiana*), speckled alder (*Alnus incana* spp. *rugosa*)

gc: rough-leaved goldenrod (*Solidago patula*), Philadelphia fleabane (*Erigeron philadelphicus* ssp. *philadelphicus*), tall buttercup (*Ranunculus acris*)

ne: reed canary grass (*Phalaris arundinacea*), Bottlebrush sedge (*Carex comosa*), fox sedge (*Carex vulpinoidea*)

tsS₄₆:

[OWES: Tall Shrub Swamp]

*ts: speckled alder (*Alnus incana* spp. *rugosa*), bebb's willow (*Salix bebbiana*)

ls: red osier dogwood (*Cornus stolonifera*), red raspberry (*Rubus idaeus* ssp. *idaeus*)

gc: lady fern (*Athyrium filix-femina* var. *angustum*), tall meadowrue (*Thalictrum pubescens*), New England aster (*Symphotrichum novae-angliae*), rough goldenrod (*Solidago rugosa* ssp. *rugosa*), Common hairgrass (*Deschampia flexuosa*)

ne: reed canary grass (*Phalaris arundinacea*)

neM₁₅:

[OWES: Narrow-leaved Emergents Marsh]

*ne: aquatic sedge (*Carex aquatilis*)

reM₁₄:

[OWES: Robust Emergents Marsh]

ds: speckled alder (*Alnus incana* spp. *rugosa*)

*re: common cattail (*Typha latifolia*)

ff: greater duckweed (*Spirodela polyrhiza*)

FEC CLASSIFICATIONS

ES6m: [FEC: Trembling Aspen-Black Spruce-Balsam Fir-Medium Soil]

Mixedwood stands on fresh to moderately moist, medium loamy to silty soils. Medium number of shrubs, herb rich.

ELC CLASSIFICATIONS

MEGM3-8: [ELC: Reed Canary Grass Graminoid Meadow Type]

Outside of Project Site and 120m boundary

OWES CLASSIFICATIONS

cS_{2,27,32,33,34,37}:
[OWES: Coniferous Swamp]

tsS_{10,16,17,19-24,38,39,43-45,48,81}:
[OWES: Tall Shrub Swamp]

neM_{28,40-42,83}:
[OWES: Narrow-leaved Emergents Marsh]

reM₂₉:
[OWES: Robust Emergents Marsh]

FEC CLASSIFICATIONS

ES1r: [FEC: White Spruce-White Birch-Very Shallow Soil-Species Rich]
Mixedwood dominated by white spruce and white birch on dry to fresh, very shallow soils (0-30cm) over bedrock. Medium number of shrubs, herb poor.

ES6m: [FEC: Trembling Aspen-Black Spruce-Balsam Fir-Medium Soil]
Mixedwood stands on fresh to moderately moist, medium loamy to silty soils. Medium number of shrubs, herb rich.

ELC CLASSIFICATIONS

THDM2-8: [ELC: Raspberry Deciduous Shrub Thicket Type]

WODM5-1: [ELC: Moist Poplar Deciduous Woodland Type]

MEMM3: [ELC: Fresh Mixed Meadow Ecosite]

Abitibi-Martin's Meadow-Empire Wetland Complex

Wetland Evaluation Edition	2012
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February 22, 2012

Comments

Attached Documents include:

- Map of Interspersion
- Map of Long Lake Wetland Complex Catchment Basin
- Vascular Plant List
- Fauna list

Additional Information

Official Name:	Abitibi-Martin's Meadow-Empire Wetland Complex				
Evaluation Edition:	2012	Class:		Wetland ID.:	
Wetland Significance	Year/Month Last Evaluated		February 22, 2012		
Provincially Significat	Year/Month Last Updated				
Special Planning Considerations:			Scores		
			Biological:	132	
			Social:	107	
			Hydrological:	205	
			Special Features:	159	
			Overall:	603	
Submitted by:	Natural Resources Solutions Inc.				
Date:	February 22, 2012				

WETLAND DATA AND SCORING RECORD

- i) **WETLAND NAME:** Abitibi-Martin's Meadow-Empire Wetland Complex
- ii) **MNR ADMINISTRATIVE REGION:** Cochrane **DISTRICT:** Cochrane
AREA OFFICE (if different from District): _____
- iii) **CONSERVATION AUTHORITY JURISDICTION:**
 (If not within a designated CA, check here: X)
- iv) **COUNTY OR REGIONAL MUNICIPALITY:** Cochrane
- v) **TOWNSHIP:** Cochrane
- vi) **LOTS & CONCESSIONS:** Glackmeyer Conc. 11 Lot 17, Conc. 10 Lots 12-19,
 (attach separate sheet if necessary) Conc. 9 Lots 12-19, Conc. 8 Lots 12-18,
Conc. 7 Lots 13-18, Conc. 6 Lots 16-17, Conc. 5 Lots 15-18
- vii) **MAP AND AIR PHOTO REFERENCES**
- a) Latitude: _____ Longitude: _____
- b) UTM grid reference: Zone: 17 U Block: _____
 Grid:E 501243 N 5442382
- c) National Topographic Series:
 map name(s) _____
 map number(s) _____ edition _____
 scale 1:22,000
- d) Aerial photographs: Date photo taken: Spring 2005 Scale: Google Earth Imagery
 Flight & plate numbers: _____

 (attach separate sheet if necessary)
- e) Ontario Base Map numbers & scale _____

 (attach separate sheets if necessary)

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

1.1.1 GROWING DEGREE-DAYS/SOILS

GROWING DEGREE DAYS

(check one)

- 1) _____ <1600
- 2) _____ 1600-2000
- 3) X _____ 2000-2400
- 4) _____ 2400-2800
- 5) _____ 2800-3000
- 6) _____ >3000

SOILS

Estimated Fractional Area

0.300	clay/loam
_____	silt/marl
_____	limestone
_____	sand
0.200	humic/mesic
0.500	fibric
_____	granite

SCORING:

Growing Degree-Days	Clay-Loam	Silt-Marl	Lime-stone	Sand	Humic-Mesic	Fibric	Granite
<1600	12	11	9	7	7	6	4
1600-2000	15	13	11	9	8	7	5
2000-2400	18	15	13	11	9	8	7
2400-2800	22	18	15	13	11	9	7
2800-3000	26	21	18	15	13	10	8
>3000	30	25	20	18	15	12	9

(maximum score 30; if wetland contains more than one soil type, evaluate based on the fractional area)

Steps required for evaluation: _____ (maximum score 30 points)

1. Select GDD line in evaluation table applicable to your wetland;
2. Determine fractional area of the wetland for each soil type;
3. Multiply fractional area of each soil type by score;
4. Sum individual soil type scores (round to nearest whole number).

In wetland complexes the evaluator should aim at determining the percentage of area occupied by the categories for the complex as a whole.

Score		
18	clay/loam	5.40
_____	silt/marl	0.00
_____	limestone	0.00
_____	sand	0.00
9	humic/mesic	1.80
8	fibric	4.00
_____	granite	0.00

Final Score Growing Degree-Days/Soils (maximum 30 points)

11

1.1.2 WETLAND TYPE (Fractional Area = area of wetland type/total wetland area)

	Fractional Area		Score
Bog		x 3	0.00
Fen		x 6	0.00
Swamp	0.87	x 8	6.96
Marsh	0.13	x 15	1.95

Wetland type score (maximum 15 points) 9

1.1.3 SITE TYPE (Fractional Area = area of site type/total wetland area)

	Fractional Area		Score
Isolated		x 1 =	0.000
Palustrine (permanent or intermittent flow)	0.830	x 2 =	1.660
Riverine	0.150	x 4 =	0.600
Riverine (at rivermouth)		x 5 =	0.000
Lacustrine (at rivermouth)		x 5 =	0.000
Lacustrine (on enclosed bay, with barrier beach)		x 3 =	0.000
Lacustrine (exposed to lake)	0.020	x 2 =	0.040
		Sub Total:	2.300

Site Type Score (maximum 5 points) 2

1.2 BIODIVERSITY

1.2.1 NUMBER OF WETLAND TYPES

(Check only one)	Score
1) <input type="checkbox"/>	one 9 points
2) <input checked="" type="checkbox"/>	two 13
3) <input type="checkbox"/>	three 20
4) <input type="checkbox"/>	four 30

Number of Wetland Types Score (maximum 30 points) 13

1.2.2 VEGETATION COMMUNITIES

Attach a separate sheet listing community (map) codes, vegetation forms and dominant species. Use the form on the following page to record percent area by dominant vegetation form. This information will be used in other parts of the evaluation.

Communities should be grouped by number of forms. For example, 2 form communities might appear as follows:

2 forms

<u>Code</u>	<u>Forms</u>	<u>Dominant Species</u>
M6	re, ff	re, <i>Typha latifolia</i> ; ff, <i>Lemna minor</i> , <i>Wolffia</i>
S1	ts, gc	ts, <i>Salix discolor</i> ; gc, <i>Impatiens capensis</i> , <i>Thelypteris palustris</i>

Note that the dominant species for each form are separated by a semicolon. The dominant species (maximum of 2) within a form are separated by commas.

Scoring:

Total # of communities with 1-3 forms = 40 1 = 1.5 points 2 = 2.5 3 = 3.5 4 = 4.5 5 = 5 6 = 5.5 7 = 6 8 = 6.5 9 = 7 10 = 7.5 11 = 8 +.5 each additional community = <u>5.0</u>	Total # of communities with 4 -5 forms = 23 1 = 2 points 2 = 3.5 3 = 5 4 = 6.5 5 = 7.5 6 = 8.5 7 = 9.5 8 = 10.5 9 = 11.5 10 = 12.5 11 = 13 +.5 each additional community = <u>5.0</u>	Total # of communities with 6 or more forms = 1 1 = 3 points 2 = 5 3 = 7 4 = 9 5 = 10.5 6 = 12 7 = 13.5 8 = 15 9 = 16.5 10 = 18 11 = 19 + 1 each additional community = <u>3.0</u>
e.g., a wetland with 3 one form communities 4 two form communities 12 four form communities and 8 six form communities would score:		

$6+13.5+15=34.5=35$ points

Vegetation Communities Score (maximum 45 points) **13**

Wetland Name: Abitibi-Martin's Meadow-Empire Wetland Complex

Wetland Size (ha): 696.52

<u>Vegetation Form</u>	<u>% area in which form is dominant</u>
------------------------	---

h	<u>0.20</u>
c	<u>30.20</u>
dh	<u>0.00</u>
dc	<u>0.00</u>
ts	<u>56.46</u>
ls	<u>0.00</u>
ds	<u>0.00</u>
gc	<u>0.00</u>
m	<u>0.00</u>
ne	<u>8.82</u>
be	<u>0.00</u>
re	<u>4.37</u>
ff	<u>0.00</u>
f	<u>0.00</u>
su	<u>0.00</u>
u (unvegetated)	<u>0.00</u>
Total = 100%	<u>100.00</u>

1.2.3 DIVERSITY OF SURROUNDING HABITAT

(Check all appropriate items(1))

<input type="checkbox"/>	recent burn (< 5 yr)
<input type="checkbox"/>	abandoned agricultural land
<input type="checkbox"/>	utility corridor
<input checked="" type="checkbox"/>	deciduous forest
<input type="checkbox"/>	recent cutover or clearcut (<5 yr)
<input checked="" type="checkbox"/>	coniferous forest
<input checked="" type="checkbox"/>	mixed forest (at least 25% conifer and 75% deciduous or vice versa)
<input checked="" type="checkbox"/>	crops
<input type="checkbox"/>	abandoned pits and quarries
<input checked="" type="checkbox"/>	pasture
<input type="checkbox"/>	ravine
<input checked="" type="checkbox"/>	fence rows
<input checked="" type="checkbox"/>	open lake or deep river
<input checked="" type="checkbox"/>	creek flood plain
<input type="checkbox"/>	rock outcrop

Diversity of Surrounding Habitat Score (1 for each, maximum 7 points)**7****1.2.4 PROXIMITY TO OTHER WETLANDS**

(Check first appropriate category only)

Scoring

1)	<input checked="" type="checkbox"/>	Hydrologically connected by surface water to other wetlands (different dominant wetland type) or open lake or river within 1.5 km	8 points
2)	<input type="checkbox"/>	Hydrologically connected by surface water to other wetlands (same dominant wetland type) within 0.5 km	8
3)	<input type="checkbox"/>	Hydrologically connected by surface water to other wetlands (different dominant wetland type), or open lake or river from 1.5 to 4 km away (Second Marsh Wetland)	5
4)	<input type="checkbox"/>	Hydrologically connected by surface water to other wetlands (same dominant wetland type) from 0.5 to 1.5 km away	5
5)	<input type="checkbox"/>	Within 0.75 km of other wetlands (different dominant wetland type) or open lake or river, but not hydrologically connected by surface water	5
6)	<input type="checkbox"/>	Within 1 km of other wetlands, but not hydrologically connected by surface water	2
7)	<input type="checkbox"/>	No wetland within 1 km	0

Proximity to other Wetlands Score (Choose one only, maximum 8 points)**8**

1.2.5 INTERSPERSION

Number of Intersections (Check one)		Score
1)	26 or less	3
2)	27 to 40	6
3)	41 to 60	9
4)	61 to 80	12
5)	81 to 100	15
6)	101 to 125	18
7)	126 to 150	21
8)	151 to 175	24
9)	176 to 200	27
10)	>200	30

Interspersion Score (Choose one only maximum 30 points)

24

1.2.6 OPEN WATER TYPES

Permanently flooded: (Check one)		Score
1)	<input checked="" type="checkbox"/> type 1	8
2)	<input type="checkbox"/> type 2	8
3)	<input type="checkbox"/> type 3	14
4)	<input type="checkbox"/> type 4	20
5)	<input type="checkbox"/> type 5	30
6)	<input type="checkbox"/> type 6	8
7)	<input type="checkbox"/> type 7	14
8)	<input type="checkbox"/> type 8	3
9)	<input type="checkbox"/> no open water	0

Open Water Type Score (Choose one only maximum 30 points)

8

1.3 SIZE696.52

hectares

73

Subtotal for Biodiversity

Size Score (Biological Component) (maximum 50 points)**37**

Evaluation Table Size Score (Biological component)

Wetland size (ha)	Total Score for Biodiversity Subcomponent									
	<37	37-47	48-60	61-72	73-84	85-96	97-108	109-120	121-132	>132
<20 ha	1	5	7	8	9	17	25	34	43	50
20-40	5	7	8	9	10	19	28	37	46	50
41-60	6	8	9	10	11	21	31	40	49	50
61-80	7	9	10	11	13	23	34	43	50	50
81-100	8	10	11	13	15	25	37	46	50	50
101-120	9	11	13	15	18	28	40	49	50	50
121-140	10	13	15	17	21	31	43	50	50	50
141-160	11	15	17	19	23	34	46	50	50	50
161-180	13	17	19	21	25	37	49	50	50	50
181-200	15	19	21	23	28	40	50	50	50	50
201-400	17	21	23	25	31	43	50	50	50	50
401-600	19	23	25	28	34	46	50	50	50	50
601-800	21	25	28	31	37	49	50	50	50	50
801-1000	23	28	31	34	40	50	50	50	50	50
1001-1200	25	31	34	37	43	50	50	50	50	50
1201-1400	28	34	37	40	46	50	50	50	50	50
1401-1600	31	37	40	43	49	50	50	50	50	50
1601-1800	34	40	43	46	50	50	50	50	50	50
1801-2000	37	43	47	49	50	50	50	50	50	50
>2000	40	46	50	50	50	50	50	50	50	50

2.0 SOCIAL COMPONENT**2.1 ECONOMICALLY VALUABLE PRODUCTS****2.1.1 WOOD PRODUCTS**

Area of wetland forested (ha), i.e. dominant form is h or c. Note that this is not wetland size. (Check one only)

		Score
1)	<input type="checkbox"/> <5 ha	0
2)	<input type="checkbox"/> 5 -25 ha	4
3)	<input type="checkbox"/> 26 -50 ha	6
4)	<input type="checkbox"/> 51- 100 ha	8
5)	<input type="checkbox"/> 101 -200 ha	11
6)	<input checked="" type="checkbox"/> >200 ha	14

Source of information: NRSI mapping

Wood Products Score (Score one only, maximum 14 points)

14

2.1.2 Lowbush Cranberry

(Check one)

Present

1)

Score (Choose one)

2 points

Absent

2)

0

0

Source of information: _____

Lowbush Cranberry Score (maximum 2 points)

0

2.1.3 Wild Rice

(Check one)

Present (at least 0.5 ha)

1)

X

Score (Choose one)

10 points

Absent

2)

0

Source of information: Cochrane MNR office

Wild Rice Score (maximum 10 points)

10

2.1.4 COMMERCIAL FISH (BAIT FISH AND/OR COARSE FISH)

(Check one)

Present

1)

X

Score (Choose one)

12 points

Absent

2)

0

Source of information:

NRSI

Commercial Fish Score (maximum 12 points)

12

2.1.5 FURBEARERS

(Consult Appendix 9)

Name of furbearer

Source of information

1)	beaver	3
2)	red fox	3
3)	red squirrel	3
4)	marten	3
5)		

field work
field work
field work
Cochrane MNR office

Scoring: 3 points for each species. maximum 12

Furbearer Score (maximum 12 points)

12

2.2 RECREATIONAL ACTIVITIES

Type of Wetland-Associated Use						
Intensity of Use	Hunting		Nature Enjoyment/ Ecosystem Study		Fishing	
High	40 points		40 points		40 points	
Moderate	20		20		20	
Low	8	X	8		8	X
Not possible/NotKnown	0		0	X	0	
Totals		8		0		8

(score one level for each of the three wetland uses; scores are cumulative; maximum score 80 points)

Sources of information:

Hunting: Cochrane MNR office

Nature: Cochrane MNR office

Fishing: Cochrane MNR office

Recreational Activities Score (maximum 80 points)

16

2.3 LANDSCAPE AESTHETICS**2.3.1 DISTINCTNESS**

(Check one)		Score (Choose one)
Clearly distinct	1) <input type="checkbox"/>	3 points
Indistinct	2) <input checked="" type="checkbox"/>	0

Landscape Distinctness Score (maximum 3 points)**0****2.3.2 ABSENCE OF HUMAN DISTURBANCE**

(Check one)		Score (Choose one)
Human disturbances absent or nearly so	1) <input type="checkbox"/>	7 points
One or several localized disturbances	2) <input checked="" type="checkbox"/>	4
Moderate disturbance; localized water pollution	3) <input type="checkbox"/>	2
Wetland intact but impairment of ecosystem quality intense in some areas	4) <input type="checkbox"/>	1
Extreme ecological degradation, or water pollution severe and widespread	5) <input type="checkbox"/>	0

Source of information: air photos, field work**Absence of Human Disturbance Score (maximum 7 points)****4****2.4 EDUCATION AND PUBLIC AWARENESS****2.4.1 EDUCATIONAL USES**

(Check one)		Score (Choose one)
Frequent	1) <input type="checkbox"/>	20 points
Infrequent	2) <input type="checkbox"/>	12
No visits	3) <input checked="" type="checkbox"/>	0

Source of information: Cochrane MNR office**Educational Uses Score (maximum 20 points)****0****2.4.2 FACILITIES AND PROGRAMS**

(check one)		Score (Choose one)
Staffed interpretation centre	1) <input type="checkbox"/>	8 points
No interpretation centre or staff but a system of self-guiding trails or brochures available	2) <input type="checkbox"/>	4
Facilities such as maintained paths (e.g., woodchips) boardwalks, boat launches or observation towers but no brochures or other interpretation	3) <input type="checkbox"/>	2
No facilities or programs	4) <input checked="" type="checkbox"/>	0

Source of information: Cochrane MNR office**Facilities and Programs Score (maximum 8 points)****0**

2.4.3 RESEARCH AND STUDIES

(check appropriate spaces)

Long term research has been done	<input type="checkbox"/>	Score	12 points
Research papers published in refereed scientific journal or as a thesis	<input type="checkbox"/>		10
One or more (non-research) reports have been written on some aspect of the wetland 's flora fauna hydrology etc.	<input type="checkbox"/>		5
No research or reports	<input checked="" type="checkbox"/>		0

Attach list of known reports by above categories

Research and Studies Score (Score is cumulative, maximum 12 points) 0

2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT

Circle the highest applicable score

Distance of wetland from settlement	1) population > 10,000		2) population 2,500 -10,000		3) population <2,500 or cottage community	
	40 points	<input type="checkbox"/>	26	<input type="checkbox"/>	16	<input type="checkbox"/>
1) Within or adjoining settlement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) 0.5 to 10 km from settlement	26	<input type="checkbox"/>	16	<input checked="" type="checkbox"/>	10	<input type="checkbox"/>
3) 10 to 60 km from settlement	12	<input type="checkbox"/>	8	<input type="checkbox"/>	4	<input type="checkbox"/>
4) >60 km from settlement	5	<input type="checkbox"/>	2	<input type="checkbox"/>	0	<input type="checkbox"/>
5) >100 km from settlement	0	<input type="checkbox"/>	0	<input type="checkbox"/>	0	<input type="checkbox"/>
		0		16		0

Name of settlement: Town of Cochrane

Proximity to Human Settlement Score (maximum 40 points) 16

2.6 OWNERSHIP (FA= fraction Area) Score

FA of wetland in public or private ownership held under contract or in trust for wetland protection	<input type="checkbox"/>	x	10	=	<input type="checkbox"/>
FA of wetland area in public ownership,not as above	<input type="checkbox"/>	x	8	=	<input type="checkbox"/>
FA of wetland area in private ownership,not as above	1.00	x	4	=	<input type="checkbox"/>

Source of information: Cochrane MNR office

Ownership Score (maximum 10 points) 4

2.7 SIZE**696.52** hectares**80** Subtotal for Social

Evaluation Table for Size Score (Social Component)

Wetland Size (ha)	Total for Size Dependent Score									
	<31	31-45	46-60	61-75	76-90	91-105	106-109	121-135	136-150	>150
<2 ha	1	2	4	8	10	12	14	14	14	15
2 - 4ha	1	2	4	8	12	13	14	14	15	16
5 - 8ha	2	2	5	9	13	14	15	15	16	16
9 - 12ha	3	3	6	10	14	15	15	16	17	17
13-17	3	4	7	10	14	15	16	16	17	17
18-28	4	5	8	11	15	16	16	17	17	18
29-37	5	7	10	13	16	17	18	18	19	19
38-49	5	7	10	13	16	17	18	18	19	20
50-62	5	8	11	14	17	17	18	19	20	20
63-81	5	8	11	15	17	18	19	20	20	20
82-105	6	9	11	15	18	18	19	20	20	20
106-137	6	9	12	16	18	19	20	20	20	20
138-178	6	9	13	16	18	19	20	20	20	20
179-233	6	9	13	16	18	20	20	20	20	20
234-302	7	9	13	16	18	20	20	20	20	20
303-393	7	9	14	17	18	20	20	20	20	20
394-511	7	10	14	17	18	20	20	20	20	20
512-665	7	10	14	17	18	20	20	20	20	20
666-863	7	10	14	17	19	20	20	20	20	20
864-1123	8	12	15	17	19	20	20	20	20	20
1124-1460	8	12	15	17	19	20	20	20	20	20
1461-1898	8	13	15	18	19	20	20	20	20	20
1899-2467	8	14	16	18	20	20	20	20	20	20
>2467	8	14	16	18	20	20	20	20	20	20

Total Size Score (Social Component)**19**

2.8 ABORIGINAL AND CULTURAL HERITAGE VALUES

Either or both Aboriginal or Cultural Values may be scored. However, the maximum score permitted for 2.8 is 30 points. Attach documentation.

2.8.1 ABORIGINAL VALUES

Full documentation of sources must be attached to the data record.

1) Significant		=	30 points
2) Not Significant		=	0
3) Unknown	X	=	0
Total:	0		

2.8.2 CULTURAL HERITAGE

1) Significant		=	30 points
2) Not Significant		=	0
3) Unknown	X	=	0
Total:	0		

Aboriginal Values/Cultural Heritage Score (maximum 30 points)

0

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION

If the wetland is a complex including isolated wetlands, apportion the 100 points according to area. For example if 10 ha of a 100 ha complex is isolated, the isolated portion receives the maximum proportional score of 10. The remainder of the wetland is then evaluated out of 90.

Step 1: If wetland is entirely Isolated, go directly to Step 5.

If wetland is lacustrine and the ratio of wetland area: lake area is <0.1, or wetland is riverine on the St. Mary's River, go to Step 5

All other wetlands, go through steps 2, 3, 4 and 5.

Step 2: Determination of Upstream Detention Factor (DF)

(a)	Wetland area (ha)	<u>696.52</u>
(b)	Total area (ha) of <u>upstream</u> detention areas (include the wetland itself)	<u>710.96</u>
(c)	Ratio of (a):(b)	<u>0.98</u>
(d)	Upstream detention factor: (c) x 2 = (maximum allowable factor = 1)	<u>1.96</u> <u>1.00</u>

Step 3: Determination of Peak Flow Attenuation Factor (AF)

(a)	Wetland area (ha)	<u>696.52</u>
(b)	Size of catchment basin (ha) <u>upstream</u> of wetland (include wetland itself in catchment area)	<u>2198.44</u>
(c)	Ratio of (a):(b)	<u>0.32</u>
(d)	Wetland attenuation factor: (c) x 10 = (maximum allowable factor = 1)	<u>3.2</u> <u>1.00</u>

Step 4: Determination of Wetland Surface Form Factor (FF)

From the list below, select the surface form which best describes the wetland.

Flooded with little or no aquatic vegetation	Factor <u>0</u>
Flooded but with submergent, emergent or floating vegetation	<u>0.2</u>
Flat (lawn) vegetation (typical of fens)	<u>0.5</u>
Hummock-depression microtopography	<u>X</u> 0.7
Patterned (e.g., string bog, ribbed fen)	<u>1</u>
Surface Form Factor (FF)	<u>0.7</u>

(Maximum allowable factor = 1)

Step 5:

- 1. Wetland is entirely Isolated 100 points
- 2. Wetland is lacustrine and the ratio of wetland area: lake area is <0.1 0 points
- 3. Wetland is riverine along the St. Mary's River 0 points
- 4. For all other wetlands*, calculate as follows:
 - a) Upstream Detention Factor (DF) (Step 2) 1.00
 - b) Wetland Attenuation Factor (AF) (Step 3) 1.00
 - c) Surface Form Factor (FF) (Step 4) 0.70

$[(DF + AF + FF)/3] \times 100^*$ 90

*Unless wetland is a complex including isolated portions -- see above

Total Flood Attenuation Score (maximum 100 points) 90

3.2 GROUND WATER RECHARGE

3.2.1 SITE TYPE

- (a) Wetland > 50% lacustrine (by area) or located on the St. Mary's River Score = 0
- (b) Wetland not as above. Calculate final score as follows:
(FA= area of site type/total area of wetland)

0.83	FA of isolated or palustrine wetland	x 20 =	16.60
0.15	FA of riverine wetland	x 5 =	0.75
0.02	FA of lacustrine wetland (wetland <50% lacustrine)	x 0 =	0.00

Site Type Score: (maximum 20 points) 17

3.2.2 SOILS

EVALUATION:

Dominant Wetland Type	Sand, loam, gravel, till		Clay or bedrock	
Lacustrine or on St. Mary's River	0		0	
Isolated	10		5	
Palustrine	7	X	4	
Riverine (not on St. Mary's River)	5		2	
Totals		7		0

Hydrological Soil Class Score (maximum 10 points) 7

3.3 DOWNSTREAM WATER QUALITY IMPROVEMENT**3.3.1 WATERSHED IMPROVEMENT FACTOR**

Calculation of Watershed Improvement Score is based upon the fractional area (FA) of each site type within the wetland. FA = area of site type/total area of the wetland.

<u>Site Type</u>	<u>Improvement Factor (IF)</u>				
Isolated	FA	<u>0</u>	x	0.5 =	<u>0.00</u>
Riverine	FA	<u>0.15</u>	x	1 =	<u>0.15</u>
Palustrine with no inflow	FA	<u>0</u>	x	0.7 =	<u>0.00</u>
Palustrine with inflows	FA	<u>0.83</u>	x	1 =	<u>0.83</u>
Lacustrine on lake shoreline	FA	<u>0.02</u>	x	0.2 =	<u>0.004</u>
Lacustrine at lake inflow or outflow	FA	<u>0</u>	x	1 =	<u>0.00</u>
Watershed Improvement Score (IF x 30) (maximum = 30)					29.52

3.3.2 ADJACENT AND WATERSHED LAND USE**EVALUATION****Step 1: Determination of Maximum Initial Score**

Wetland on the Great Lakes or St. Mary's River (Go to Step 5a)

All other wetlands (Go through steps 2, 3, 4 and 5b)

Step 2: Determination of Broad Upslope Land Use (BLU)

Assess broad upslope land uses within the previous 5 years, agriculture, or other activities which alter the natural vegetation cover in an extensive manner.

Choose one	Score
>50% of catchment basin	20
20-50% of catchment basin	14
<20% of catchment basin	X 4
Score for BLU	
4	

Step 3: Determination of Linear Upslope Land Uses (LUU)

Assess linear upslope uses (LUU) e.g., roads, railways, hydro corridors, pipelines, etc., crossing the upslope catchment within 200m of the wetland boundary.

Choose the highest only	Score
Major corridor*	15
Secondary corridor	11
Tertiary corridor	X 6
Temporary or abandoned	3
None	0
Score for LUU	
6	

Major, secondary and tertiary roads are those that are indicated as such on the provincial highways maps. Major hydro corridors are trunk lines coming directly from a generating station. Major pipelines are trans-continental lines. Secondary corridors are regional distribution lines (i.e. multi-cable hydro corridors not emanating directly from a generating station or regional gas distribution lines). Tertiary corridors are single hydro lines or local gas distribution lines (i.e. to domestic users).

Step 4: Determination of Point-source Land Use (PS)

Assess point source (PS) land uses producing industrial effluents such as heavy industry, pulp and paper plants, major aggregate operations (but not small pits use for local road construction), etc. Score as 'present' only if a point source land use is located less than 1km upstream from the wetland.

	Score
Present	15
Not present	X 0
Score for PS	
0	

Step 5: Calculation of total score for Adjacent and Watershed Land Use

- a) Wetland on the Great Lakes or St. Mary's River
b) All other wetlands, calculate as follows:

Final Score BLU+LUU+PS **10**

3.3.3 VEGETATION FORM

Choose the category that best describes the vegetation of the wetland

Trees, shrubs or herbs (h, c, ts, ls, gc)	X	Score
		8 points
Emergents, submergents (ne, re, be, f, ff, su)		10
Little or no vegetation (u)		0

Dominant Vegetation Form Score (maximum 10 points) **8**

3.4 CARBON SINK

Choose the category that best describes the wetland

- | | | |
|--|---|-----------|
| 1) Wetland a bog or fen with >50% organic soils | | 15 points |
| 2) Wetland has organic soils occupying 10 to 50% of the area (i.e. mainly mineral or undesignated soils, any wetland type) | | 6 |
| 3) Marshes and swamps with >50% organic soil | X | 9 |
| 4) Wetland with less than 10% of soils organic | | 0 |

Carbon Sink Score (maximum 15 points) **9**

3.5 SHORELINE EROSION CONTROL

From the wetland vegetation map determine the dominant vegetation type within the erosion zone for lacustrine and riverine site type areas only. Score according to the factors listed below.

Step 1:

Score

	Wetland entirely isolated or palustrine	0
X	Any part of the Wetland riverine or lacustrine (proceed to Step 2)	

Step 2:

Choose the one characteristic that best describes the shoreline vegetation (see text for a definition of shoreline)

Score

1)		Trees and shrubs	15
2)	X	Emergent vegetation	8
3)		Submergent vegetation	6
4)		Other shoreline vegetation	3
5)		No vegetation	0

Shoreline Erosion Control Score (maximum 15 points)

8

3.6 GROUNDWATER DISCHARGE

(Circle the characteristics that best describe the wetland being evaluated and then sum the scores)

Category	Catchment Interaction				
Wetland type	Bog = 0		Swamp/Marsh = 2	2	Fen = 5
Basin topography	Flat/Rolling = 5	5	Hilly = 2		Major relief break = 5
Wetland area: Upslope catchment area	Large (>50%) = 0		Moderate (6-50%) = 2	2	Small (<5%) = 5
Lagg Development	None found = 0	0	Minor = 2		Extensive = 5
Seeps at wetland edge	None found = 0	0	1-3 seeps = 5		4 or more seeps = 10
Iron precipitates evident at edge	None = 0	0	1-3 deposits = 2		4 or more deposits = 5
Surface marl deposits	None = 0	0	1-3 deposits = 2		>3 = 5
Wetland pH	Low < 4.2 = 0		Moderate 4.2-5.7 = 5		High >5.7 = 10
Catchment soil coverage	Patchy = 0		Thin (<20cm) = 2		Thick = 5
Catchment soil permeability	Low = 0		Moderate = 2	2	High = 5
Totals		5		6	15

(Scores are cumulative maximum score 30 points)

Groundwater Discharge Score (maximum 30 points)

26

4.0 SPECIAL FEATURES COMPONENT

4.1 RARITY

4.1.1 WETLANDS

Hills Site Region and Site District (5E only): _____

Wetland type (check one or more)

- _____ Bog
- _____ Fen
- X Swamp
- X Marsh

Evaluation Table for Scoring Rarity of Wetland Type.

Unit Number	Site Region & District	Marsh	Swamp	Fen	Bog
2E	James Bay	20	20	0	20
2W	Big Trout Lake	20	20	0	10
3E	Lake Abitibi	20	20	10	0
3W	Lake Nipigon	20	20	10	0
3S	Lake St. Joseph	20	20	10	0
4E	Lake Temagami	20	20	10	0
4W	Pigeon River	20	10	20	0
4S	Wabigoon Lake	20	10	20	0
5E-1	Thessalon	10	0	30	20
5E-2	Gore Bay	20	0	20	20
5E-3	La Cloche	20	0	30	20
5E-4	Sudbury	10	0	30	10
5E-5	North Bay	10	0	20	0
5E-6	Tomiko	10	0	20	0
5E-7	Parry Sound	20	0	30	20
5E-8	Huntsville	20	0	30	20
5E-9	Algonquin Park	10	0	30	0
5E-10	Brent	20	0	30	0
5E-11	Bancroft	0	10	30	10
5E-12	Renfrew	0	0	30	10
5E-13	Batchewana	10	0	10	30
5-S	Lake of the Woods	10	10	20	10

X

Rarity of Wetland Type Score (maximum 70 points)

40

4.1.2 SPECIES

4.1.2.1 BREEDING HABITAT FOR AN ENDANGERED SPECIES

	Name of species		Source of information
1)	_____		_____
2)	_____		_____
3)	_____		_____
4)	_____		_____
5)	_____		_____
Total:		0	

Attach documentation.

Scoring:

- For one species 250 points
- For each additional species 250 points

(score is cumulative, no maximum score)

Breeding Habitat for Endangered Species Score (no maximum)

0

4.1.2.2 TRADITIONAL MIGRATION OR FEEDING HABITAT FOR AN ENDANGERED SPECIES

	Name of species		Source of information
1)	_____		_____
2)	_____		_____
3)	_____		_____
4)	_____		_____
5)	_____		_____
Total:		0	

Attach documentation.

Scoring:

- For one species 150 points
- For each additional species 75

(score is cumulative, no maximum score)

Traditional Habitat for Endangered Species Score (no maximum)

0

4.1.2.3 PROVINCIALY SIGNIFICANT ANIMAL SPECIES

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____
7) _____	_____
8) _____	_____
9) _____	_____
10) _____	_____
11) _____	_____
12) _____	_____
13) _____	_____
14) _____	_____
15) _____	_____

Attach separate list if necessary; Attach documentation

Scoring:

Number of provincially significant animal species in the wetland:

1 species = 50 points	14 species = 154
2 species = 80	15 species = 156
3 species = 95	16 species = 158
4 species = 105	17 species = 160
5 species = 115	18 species = 162
6 species = 125	19 species = 164
7 species = 130	20 species = 166
8 species = 135	21 species = 168
9 species = 140	22 species = 170
10 species = 143	23 species = 172
11 species = 146	24 species = 174
12 species = 149	25 species = 176
13 species = 152	

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

(no maximum score)

Provincially Significant Animal Species Score (no maximum)

0

4.1.2.4 PROVINCIALY SIGNIFICANT PLANT SPECIES

(Scientific names must be recorded)

	Common Name	Scientific Name	Source of information
1)	_____	_____	_____
2)	_____	_____	_____
3)	_____	_____	_____
4)	_____	_____	_____
5)	_____	_____	_____
6)	_____	_____	_____
7)	_____	_____	_____
8)	_____	_____	_____
9)	_____	_____	_____
10)	_____	_____	_____
11)	_____	_____	_____
12)	_____	_____	_____
13)	_____	_____	_____
14)	_____	_____	_____
15)	_____	_____	_____

Attach separate list if necessary; Attach documentation

Scoring:

Number of provincially significant plant species in the wetland:

1 species	= 50 points	14 species	= 154
2 species	= 80	15 species	= 156
3 species	= 95	16 species	= 158
4 species	= 105	17 species	= 160
5 species	= 115	18 species	= 162
6 species	= 125	19 species	= 164
7 species	= 130	20 species	= 166
8 species	= 135	21 species	= 168
9 species	= 140	22 species	= 170
10 species	= 143	23 species	= 172
11 species	= 146	24 species	= 174
12 species	= 149	25 species	= 176
13 species	= 152		

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Plant Species Score (no maximum)

0

4.1.2.5 REGIONALLY SIGNIFICANT SPECIES (SITE REGION)

Scientific names must be recorded for plant species. **Lists of significant species must be approved by MNR.**

SIGNIFICANT IN SITE REGION:

	Common Name	Scientific Name	Source of information
1)	eastern phoebe	Sayornis phoebe	NRSI field work
2)	gray catbird	Dumetella carolinensis	NRSI field work
3)	northern cardinal	Cardinalis cardinalis	NRSI field work
4)	sandhill crane	Grus canadensis	NRSI field work
5)	scarlet tanager	Piranga olivacea	NRSI field work
6)			
7)			
8)			
9)			
10)			
11)			
12)			
13)			
14)			
15)			

Attach separate list if necessary. Attach documentation.

** Score only if there is an approved list

Scoring:

No. of species significant in Site Region

1 species	=	20	6 species	=	55
2 species	=	30	7 species	=	58
3 species	=	40	8 species	=	61
4 species	=	45	9 species	=	64
5 species	=	50	10 species	=	67

Add one point for every species past 10 (no maximum score).

Significant Species (Site Region) Score (no maximum)

50

4.2.1.6 LOCALLY SIGNIFICANT SPECIES (SITE DISTRICT)

Scientific names must be recorded for plant species. **Lists of significant species must be approved by MNR.**

	Common Name	Scientific Name	Source of information
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____
9	_____	_____	_____
10	_____	_____	_____
11	_____	_____	_____
12	_____	_____	_____
13	_____	_____	_____
14	_____	_____	_____
15	_____	_____	_____
16	_____	_____	_____
17	_____	_____	_____
18	_____	_____	_____

Attach separate list if necessary. Attach documentation.

Scoring:

No. of species significant in Site District

1 species	=	10	6 species	=	41
2 species	=	17	7 species	=	43
3 species	=	24	8 species	=	45
4 species	=	31	9 species	=	47
5 species	=	38	10 species	=	49

For each significant species over 10 in the wetland, add 1 point.

Locally Significant Species (Site District) Score (no maximum)

0

4.1.2.7 SPECIES OF SPECIAL STATUS

Black Duck

Suitable breeding habitat present and within assessment range (Figure 17)

Assessment Category	Check one	Score
40-80 Indicated Pairs/100 km sq	<input type="checkbox"/>	25 points
20-40 Indicated Pairs/100 km sq	<input type="checkbox"/>	20
10-20 Indicated Pairs/100 km sq	<input checked="" type="checkbox"/>	15
5-10 Indicated Pairs/100 km sq	<input type="checkbox"/>	10
1-5 Indicated Pairs/100 km sq	<input type="checkbox"/>	5
Habitat not suitable	<input type="checkbox"/>	0
Out of assessment range	<input type="checkbox"/>	0

Black Duck Score (maximum 25 points)

15

4.2 SIGNIFICANT FEATURES AND/OR FISH & WILDLIFE HABITAT

4.2.1 NESTING OF COLONIAL WATERBIRDS

Status	Name of species	Source of Information	Score
Currently nesting			50 points
Known to have nested within past 5 years			25
Active feeding area (great blue heron excluded)			15
None known			0
	X		

Attach documentation (nest locations etc., if known)

Colonial Waterbirds Score (maximum 50 points)

0

4.2.2. WINTER COVER FOR WILDLIFE

(Check only highest level of significance)	Score (one only)
1) <input type="checkbox"/> Provincially significant	100
2) <input type="checkbox"/> Significant in Site Region	50
3) <input type="checkbox"/> Significant in Site District	25
3) <input type="checkbox"/> Locally significant	10
4) <input type="checkbox"/> Little or poor winter cover present	0

Source of information: _____

Winter Cover for Wildlife Score (maximum 100 points)

0

4.2.3 WATERFOWL STAGING AND/OR MOULTING

(Check only highest level of significance for both staging and moulting; score is cumulative across columns, maximum score 150)

	Staging	Score (one only)	Moulting	Score (one only)
1) Nationally significant	<input type="checkbox"/>	150	<input type="checkbox"/>	150
2) Provincially significant	<input type="checkbox"/>	100	<input type="checkbox"/>	100
3) Regionally significant	<input type="checkbox"/>	50	<input type="checkbox"/>	50
4) Known to occur	<input type="checkbox"/>	10	<input type="checkbox"/>	10
5) Not possible	<input type="checkbox"/>	0	<input type="checkbox"/>	0
6) Not known	<input checked="" type="checkbox"/>	0	<input checked="" type="checkbox"/>	0
Total:			0	

Source of information:

Waterfowl Moulting and Staging Score (maximum 150 points)

0

4.2.4 WATERFOWL BREEDING

	(Check only highest level of significance)	Score
1) Provincially significant	<input type="checkbox"/>	100
2) Regionally significant	<input type="checkbox"/>	50
3) Habitat suitable	<input checked="" type="checkbox"/>	10
4) Habitat not suitable	<input type="checkbox"/>	0

Source of information:

field work

Waterfowl Breeding Score (maximum 100 points)

10

4.2.5 MIGRATOR PASSERINE, SHOREBIRD OR RAPTOR STOPOVER AREA

	(check highest applicable category)	Score
1) Provincially significant	<input type="checkbox"/>	100
2) Significant in Site Region	<input type="checkbox"/>	50
3) Significant in Site District	<input type="checkbox"/>	10
4) Not significant	<input checked="" type="checkbox"/>	0

Source of information:

Passerine, Shorebird or Raptor Stopover Score (maximum 100 points)

0

4.2.6 UNGULATE HABITAT

EVALUATION

Score (1) + (2) + one of (3) to (6)

		Score
(1)	<input checked="" type="checkbox"/> Ungulate summer cover	15 points
(2)	<input checked="" type="checkbox"/> Mineral licks	50
(3)	<input type="checkbox"/> Moose aquatic feeding area Class 1	0
(4)	<input checked="" type="checkbox"/> Moose aquatic feeding area Class 2	10
(5)	<input type="checkbox"/> Moose aquatic feeding area Class 3	20
(6)	<input type="checkbox"/> Moose aquatic feeding area Class 4	35

(Score is cumulative for a maximum possible score of 100)

Ungulate Habitat Score (maximum 100 points)

25

4.2.6 FISH HABITAT

4.2.6. Spawning and Nursery Habitat

Table 5. Area Factors for Low Marsh, High Marsh, and Swamp Communities.

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 1:

Fish habitat is not present within the wetland (Score = 0)

Fish habitat is present within the wetland (Go to Step 2)

Step 2:

Choose only one option

1) Significance of the spawning and nursery habitat within the wetland is known (Go to Step 3)

2) Significance of the spawning and nursery habitat within the wetland is not known (Go through Steps 4, 5, 6 and 7)

Step 3: Select the highest appropriate category below attach documentation:

- 1) Significant in Site Region 100 points
- 2) Significant in Site District 50
- 3) Locally Significant Habitat (5.0+ ha) 25
- 4) Locally Significant Habitat (<5.0 ha) 15

Score for Spawning and Nursery Habitat (maximum score 100 points)

0

Step 4: Proceed to Steps 4 to 7 only if Step 3 was not answered.

(**Low Marsh:** marsh area from the existing water line out to the outer boundary of the wetland)

Low marsh not present (Continue to Step 5)

Low marsh present (Score as follows)

Scoring for Presence of Key Vegetation Groups

Scoring is based on the one most clearly dominant plant species of the dominant form in each Low Marsh vegetation community. Check the appropriate Vegetation Group (see Appendix 16) for each Low Marsh community. Sum the areas of the communities assigned to each Vegetation Group and multiply by the appropriate size factor from Table 5.

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (see Table 5)	Score	Final Score (area factor x score)
1	Tallgrass				6 pts	0.0
2	Shortgrass-Sedge				11	0.0
3	Cattail-Bulrush-Burreed				5	0.0
4	Arrowhead-Pickerelweed				5	0.0
5	Duckweed				2	0.0
6	Smartweed-Waterwillow				6	0.0
7	Waterlily-Lotus				11	0.0
8	Waterweed-Watercress				9	0.0
9	Ribbongrass				10	0.0
10	Coontail-Naiad-Watermilfoil				13	0.0
11	Narrowleaf Pondweed				5	0.0
12	Broadleaf Pondweed				8	0.0
Total Score (maximum 75 points)						0.0

Step 5: (**High Marsh:** area from the water line to the inland boundary of marsh wetland type. This is essentially what is commonly referred to as a wet meadow, in that there is insufficient standing water to provide fisheries habitat except during flood or high water conditions.)

High marsh not present (Continue to Step 6)

High marsh present (Score as follows)

Scoring for Presence of Key Vegetation Groups

Scoring is based on the one most clearly dominant plant species of the dominant form in each High Marsh vegetation community. Check the appropriate Vegetation Group for each High Marsh community. Sum the areas of the communities assigned to each Vegetation Group and multiply by the appropriate size factor from Table 5.

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (see Table 5)	Score	Final Score (area factor x score)
1	Tallgrass				6 pts	0.0
2	Shortgrass-Sedge	X	10.84	0.6	11	6.6
3	Cattail-Bulrush-Burreed				5	0.0
4	Arrowhead-Pickerelweed				5	0.0
Total Score (maximum 25 points)						6.6

Step 6: (**Swamp:** Swamp communities containing fish habitat, either seasonally or permanently. Determine the total area of seasonally flooded swamps and permanently flooded swamps containing fish habitat.)

Swamp containing fish habitat not present (Continue to Step 7)

Swamp containing fish habitat present (Score as follows)

Swamp containing fish Habitat	Present (check)	Total area (ha)	Area Factor (see Table 5)	Score	TOTAL SCORE (factor x score)
Seasonally flooded				10	0.0
Permanently flooded				10	0.0
SCORE (maximum 20 points)					0.0

Step 7: Calculation of final score

Score for Spawning and Nursery Habitat (Low Marsh) (maximum 75)	=	<u>0.0</u>
Score for Spawning and Nursery Habitat (High Marsh) (maximum 25)	=	<u>6.6</u>
Score for Swamp Containing Fish Habitat (maximum 20)	=	<u>0.0</u>
Sum (maximum score 100 points) =		<u>6.6</u>

4.2.6.2 Migration and Staging Habitat**Step 1:**

- 1) Staging or Migration Habitat is not present in the wetland (Score = 0)
- 2) Staging or Migration Habitat is present in the wetland significance of the habitat is known (Go to Step 2)
- 3) Staging or Migration Habitat is present in the wetland significance of the habitat is not known (Go to Step 3)

NOTE: Only one of Step 2 or Step 3 is to be scored.

Step 2: Select the highest appropriate category below, attach documentation:

	Score
1) <input type="checkbox"/> Significant in Site Region	25 points
2) <input type="checkbox"/> Significant in Site District	15
3) <input type="checkbox"/> Locally Significant	10
4) <input type="checkbox"/> Fish staging and/or migration habitat present, but not as above	5

Score for Fish Migration and Staging Habitat (maximum score 25 points)

0

Step 3: Select the highest appropriate category below based on presence of the designated site type (does not have to be dominant). Note name of river for 2) and 3).

	Score
1) <input checked="" type="checkbox"/> Wetland is riverine at rivermouth or lacustrine at rivermouth	25 points
2) <input type="checkbox"/> Wetland is riverine, within 0.75 km of rivermouth	15
3) <input type="checkbox"/> Wetland is lacustrine, within 0.75 km of rivermouth	10
4) <input type="checkbox"/> Fish staging and/or migration habitat present, but not as above	5

Score for Staging and Migration Habitat (maximum score 25 points)

25

4.3 ECOSYSTEM AGE

(Fractional Area = area of wetland type/total area of wetland)

	Fractional Area			Scoring
Bog		x	25 =	0.0
Fen, treed to open on deep soils floating mats or marl		x	20 =	0.0
Fen, on limestone rock		x	5 =	0.0
Swamp	0.87	x	3 =	2.6
Marsh	0.13	x	0 =	0.0
		Sub Total:		2.6
Ecosystem Age Score (maximum 25 points)				2.6

4.4 GREAT LAKES COASTAL WETLANDS**Score for coastal (see text for definition) wetlands only**

Choose one only

wetland < 10 ha	=	0 points
wetland 10- 50 ha	=	25
wetland 51 -100 ha	=	50
wetland > 100 ha	=	75

Great Lakes Coastal Wetlands Score (maximum 75 points)**0**

5.0 EXTRA INFORMATION**5.1 PURPLE LOOSESTRIFE** Absent/Not seen Present(a) One location in wetland _____
Two to many locations _____

Abundance code

(b) (1 < 20 plants) _____
(2 20-99 plants) _____
(3 100-999 plants) _____
(4 >1000 plants) _____**5.2 SEASONALLY FLOODED AREAS**

Indicate length of seasonal flooding

Check one or more

Ephemeral (less than 2 weeks) _____
Temporal (2 weeks to 1 month) _____
Seasonal (1 to 3 months) _____
Semi-permanent (>3 months) _____
No seasonal flooding _____**5.3 SPECIES OF SPECIAL SIGNIFICANCE****5.3.1 Osprey**Present and nesting (attach map showing nest site) _____
Known to have nested in last 5 yr _____
Feeding area for osprey _____
Not as above _____**5.3.2 Common Loon**Nesting in wetland (attach map showing nest site) _____
Feeding at edge of wetland _____
Observed or heard on lake or
river adjoining the wetland _____
Not as above _____

INVESTIGATORS

AFFILIATION

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Natural Resource Solutions Inc.

Tara Brenton

Natural Resource Solutions Inc.

DATES WETLAND VISITED

June 21 and 22, 2011

DATE THIS EVALUATION COMPLETED:

February 22, 2012

ESTIMATED TIME DEVOTED TO COMPLETING THE FIELD SURVEY IN "PERSON HOURS"

50 hours

WEATHER CONDITIONS

- i) at time of field work June 21 morning: 13°C, 70-90% cloud cover, wind – Beaufort scale 0-2
 June 21 evening: 15°C, 5-15% cloud cover, wind – Beaufort scale 2-4
 June 22: 10-24°C, 10-100% cloud cover, wind – Beaufort scale 2-4

- ii) summer conditions in general spring: wet, cool; summer: hot, dry

OTHER POTENTIALLY USEFUL INFORMATION:

Surveys completed by Natural Resource Solutions Inc.:
 vegetation, breeding birds, nocturnal birds, anuran call surveys

CHECKLIST OF PLANT AND ANIMAL SPECIES RECORDED IN THE WETLAND:

Attach a list of all flora and fauna observed in the wetland.

*Indicate if voucher specimens or photos have been obtained, where located, etc.

WETLAND EVALUATION SCORING RECORD

WETLAND NAME	Abitibi-Martin's Meadow-Empire Wetland Complex		
<u>1.0 BIOLOGICAL COMPONENT</u>			
1.1	<u>PRODUCTIVITY</u>		
1.1.1	Growing Degree-Days/Soils	11	
1.1.2	Wetland Type	9	
1.1.3	Site Type	2	
	Total for Productivity		22
1.2	<u>BIODIVERSITY</u>		
1.2.1	Number of Wetland Types	13	
1.2.2	Vegetation Communities (maximum 45)	13	
1.2.3	Diversity of Surrounding Habitat (maximum 7)	7	
1.2.4	Proximinty to Other Wetlands	8	
1.2.5	Interspersion	24	
1.2.6	Open Water Type	8	
	Total for Biodiversity		73
	Sub Total for Biodiversity	73	
1.3	<u>SIZE</u> (Biological Component)		37
<u>TOTAL FOR BIOLOGICAL COMPONENT (not to exceed 250)</u>			132

2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

2.1.1 Wood Products	14
2.1.2 Lowbush Cranberry	0
2.1.3 Wild Rice	10
2.1.4 Commercial Fish	12
2.1.6 Furbearers	12

Total for Economically Valuable Products	48
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2.2 <u>RECREATIONAL ACTIVITIES (maximum 80)</u>	16
---	----

2.3 LANDSCAPE AESTHETICS

2.3.1 Distinctness	0
2.3.2 Absence of Human Disturbance	4

Total for Landscape Aesthetics	4
--------------------------------	---

2.4 EDUCATION AND PUBLIC AWARENESS

2.4.1 Educational Uses	0
2.4.2 Facilities and Programs	0
2.4.3 Research and Studies (maximum 12)	0

Total for Education and Public Awareness	0
--	---

2.5 <u>PROXIMITY TO AREAS OF HUMAN SETTLEMENT</u>	16
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2.6 <u>OWNERSHIP</u>	4
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Subtotal for Social Component	80
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2.7 <u>SIZE</u> (Social Component)	19
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2.8 <u>ABORIGINAL AND CULTURAL VALUES</u> (maximum 30)	0
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<u>TOTAL FOR SOCIAL COMPONENT (not to exceed 250)</u>	107
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3.0 HYDROLOGICAL COMPONENT

3.1 <u>FLOOD ATTENUATION</u>		90
3.2 <u>GROUNDWATER RECHARGE</u>		
3.2.1 Site Type	17	
3.2.2 Soils	7	
	Total for Groundwater Recharge	24
3.3 <u>WATER QUALITY IMPROVEMENT</u>		
3.3.1 Watershed Improvement Factor	30	
3.3.2 Adjacent and Watershed Land Use	10	
3.3.3 Vegetation Form	8	
	Total for Water Quality Improvement	48
3.4 <u>CARBON SINK</u>		9
3.5 <u>SHORELINE EROSION CONTROL</u>		8
3.6 <u>GROUNDWATER DISCHARGE</u>		26
	<u>TOTAL FOR HYDROLOGICAL COMPONENT (not to exceed 250)</u>	205

4.0 SPECIAL FEATURES4.1 RARITY

4.1.1 Wetlands		40
4.1.2 Species		
4.1.2.1 Endangered or Threatened Species Breeding	0	
4.1.2.2 Traditional Use by Endangered or Threatened Species	0	
4.1.2.3 Provincially Significant Animals	0	
4.1.2.4 Provincially Significant Plants	0	
4.1.2.5 Regionally Significant Species	50	
4.1.2.6 Locally Significant Species	0	
4.1.2.7 Species of Special Status	0	
Total for Species Rarity		50

4.2 SIGNIFICANT FEATURES OR HABITAT

4.2.1 Colonial Waterbirds	0	
4.2.2 Winter Cover for Wildlife	0	
4.2.3 Waterfowl Staging and Moulting	0	
4.2.4 Waterfowl Breeding	10	
4.2.5 Migratory Passerine, Shorebird or Raptor Stopover	0	
4.2.6 Ungulate Habitat	25	
4.2.7 Fish Habitat	32	
Total for Significant Features and Habitat		67

4.3 ECOSYSTEM AGE

3

4.4 GREAT LAKES COASTAL WETLANDS

0

TOTAL FOR SPECIAL FEATURES (maximum 250)159

SUMMARY OF EVALUATION RESULT

Wetland	Abitibi-Martin's Meadow-Empire Wetland Complex
TOTAL FOR 1.0 BIOLOGICAL COMPONENT	132
TOTAL FOR 2.0 SOCIAL COMPONENT	107
TOTAL FOR 3.0 HYDROLOGICAL COMPONENT	205
TOTAL FOR 4.0 SPECIAL FEATURES COMPONENT	159
	<u>WETLAND TOTAL</u>
	603

INVESTIGATORS

David Stephenson
Charlotte Moore
Jessica Grealey
Katharina Walton
Megan Pope
Tara Brenton

AFFILIATION

Natural Resource Solutions Inc.

DATE

February 22, 2012

Species Observed		Vegetation survey	Amphibian survey	Breeding bird survey	Nocturnal bird survey
Amphibians					
Mink frog	<i>Rana septentrionalis</i>	X			
Spring peeper	<i>Pseudacris crucifer crucifer</i>		X		
Wood frog	<i>Rana sylvatica</i>	(Reported by Hatch)			
Birds					
Alder flycatcher	<i>Empidonax alnorum</i>	X		X	
American crow	<i>Corvus brachyrhynchos</i>	X		X	
American goldfinch	<i>Carduelis tristis</i>	X		X	
American kestrel	<i>Falco sparverius</i>	X			
American redstart	<i>Setophaga ruticilla</i>			X	
American robin	<i>Turdus migratorius</i>	X	X	X	X
Black and white warbler	<i>Mniotilta varia</i>	X		X	
Black-capped chickadee	<i>Poecile atricapillus</i>	X		X	
Black-throated green warbler	<i>Dendroica virens</i>	X		X	
Black-throated blue warbler	<i>Denrioca caerulenscens</i>	X		X	
Blue jay	<i>Cyanocitta cristata</i>			X	
Chestnut-sided warbler	<i>Dendrioca pensylvanica</i>			X	
Common loon	<i>Gavia immer</i>	X		X	
Common yellowthroat	<i>Geothlypis trichas</i>	X		X	
Eastern phoebe	<i>Sayornis phoebe</i>	X		X	
Gray catbird	<i>Dumetella carolinensis</i>			X	
Hermit thrush	<i>Catharus guttatus</i>		X	X	X
Mourning warbler	<i>Oporornis philadelphia</i>			X	
Northern cardinal	<i>Cardinalis cardinalis</i>			X	
Nothern harrier	<i>Circus cyaneus</i>	X			
Ovenbird	<i>Seiurus aurocapillus</i>			X	
Red-eyed vireo	<i>Vireo olivaceus</i>	X		X	
Red-winged blackbird	<i>Agelaius phoeniceus</i>	X		X	
Ring-billed gull	<i>Larus delawarensis</i>	X			
Sandhill crane	<i>Grus canadensis</i>	X	X	X	X
Savannah sparrow	<i>Passerculus sandwichensis</i>			X	
Scarlet tanager	<i>Piranga olivacea</i>			X	
Sharp-shinned hawk	<i>Accipiter striatus</i>	X			
Song sparrow	<i>Melospiza melodia</i>			X	
Tennessee warbler	<i>Vermivora peregrina</i>			X	
Tree swallow	<i>Tachycineta bicolor</i>	X			
Veery	<i>Catharus fuscescens</i>	X	X	X	X
White-breasted nuthatch	<i>Sitta carolinensis</i>	X			
White-throated sparrow	<i>Zonotrichia albicollis</i>	X	X	X	X
Yellow rumped warbler	<i>Dendroica coronata</i>			X	
Yellow warbler	<i>Dendroica petechia</i>	X		X	

Species Observed		Vegetation survey	Amphibian survey	Breeding bird survey	Nocturnal bird survey
Butterflies					
Canadian tiger swallowtail	<i>Papilio canadensis</i>	X			
Common ringlet	<i>Coenonympha tullia</i>	X			
Juvenal's duskywing	<i>Erynnis juvenalis</i>	X			
Northern crescent	<i>Phyciodes pascoensis</i>	X			
White admiral	<i>Limenitis arthemis arthemis</i>	X			
Wild indigo duskywing	<i>Erynnis Baptisiae</i>	X			
Dragonflies and Damers					
Ebony jewelwing	<i>Calopteryx maculata</i>	X			
Mammals					
Beaver	<i>Castor canadensis</i>	X			
Groundhog	<i>Marmota monax</i>	X			
Moose	<i>Alces alces</i>	X		X	
Red fox	<i>Vulpes vulpes</i>			X	X
Red squirrel	<i>Tamiasciurus hudsonicus</i>	X			
White-tailed deer	<i>Odocoileus virginianus</i>	X		X	
Vegetation					
Alder-leaved buckthorn	<i>Rhamnus alnifolia</i>	X			
Aquatic sedge	<i>Carex aquatilis</i>	X			
Awl-fruited sedge	<i>Carex stipata</i>	X			
Balsam fir	<i>Abies balsamea</i>	X			
Balsam poplar	<i>Populus balsamifera ssp. balsamifera</i>	X			
Bebb's willow	<i>Salix bebbiana</i>	X			
Bird's-foot trefoil	<i>Lotus corniculatus</i>	X			
Black spruce	<i>Picea mariana</i>	X			
Black willow	<i>Salix nigra</i>	X			
Blue bells	<i>Campanula rotundifolia</i>	X			
Blue flag iris	<i>Iris versicolor</i>	X			
Bluebead-lily	<i>Clintonia borealis</i>	X			
Bottlebrush sedge	<i>Carex hystericina</i>	X			
Bracken fern	<i>Pteridium aquilinum var. latiusculum</i>	X			
Bristly black currant	<i>Ribes lacustre</i>	X			
Bull thistle	<i>Cirsium vulgare</i>	X			
Bunchberry	<i>Cornus canadensis</i>	X			
Bush honeysuckle	<i>Diervilla lonicera</i>	X			
Canada blue-joint	<i>Calamagrostis canadensis</i>	X			
Canada mayflower	<i>Maianthemum canadense</i>	X			
Canada soapberry	<i>Shepherdia canadensis</i>	X			
Choke cherry	<i>Prunus virginiana ssp. virginiana</i>	X			
Club moss sp.	<i>Lycopodiaceae sp.</i>	X			
Common cattail	<i>Typha latifolia</i>	X			
Common dandelion	<i>Taraxacum officinale</i>	X			
Common hairgrass	<i>Deschampsia flexuosa</i>	X			
Cow parsnip	<i>Heracleum maximum</i>	X			
Cow vetch	<i>Vicia cracca</i>	X			
Curly dock	<i>Rumex crispus</i>	X			

Species Observed		Vegetation survey	Amphibian survey	Breeding bird survey	Nocturnal bird survey
Dark-green bulrush	<i>Scirpus atrovirens</i>	X			
Dwarf raspberry	<i>Rubus pubescens</i>	X			
Early meadowrue	<i>Thalictrum dioicum</i>	X			
European mountain-ash	<i>Sorbus aucuparia</i>	X			
Field horsetail	<i>Equisetum arvense</i>	X			
Fireweed	<i>Chamerion angustifolium</i> spp. <i>angustifolium</i>	X			
Fowl meadow grass	<i>Glyceria striata</i>	X			
Fox sedge	<i>Carex vulpinoidea</i>	X			
Fragrant bedstraw	<i>Galium triflorum</i>	X			
Grasses	<i>Poa</i> spp.	X			
Greater duckweed	<i>Spirodela polyrhiza</i>	X			
Hairy Solomon's seal	<i>Polygonatum biflorum</i>	X			
High bush cranberry	<i>Viburnum trilobum</i>	X			
Kentucky bluegrass	<i>Poa saltuensis</i> ssp. <i>languida</i>	X			
Labrador-tea	<i>Ledum groenlandicum</i>	X			
Lady fern	<i>Athyrium filix-femina</i>	X			
Lettuce sp.	<i>Lactuca</i> sp.	X			
Long-leaved aster	<i>Symphotrichum robynsonianum</i>	X			
Low bush blueberry	<i>Vaccinium angustifolium</i>	X			
Marsh cinquefoil	<i>Comarum palustre</i>	X			
Marsh St. John's-wort	<i>Triadenum virginicum</i>	X			
Marsh-marigold	<i>Caltha palustris</i>	X			
Moss sp.		X			
New England aster	<i>Symphotrichum novae-angliae</i>	X			
Nodding trillium	<i>Trillium cernuum</i>	X			
Northern beech fern	<i>Phegopteris connectilis</i>	X			
Ostrich fern	<i>Matteuccia struthiopteris</i> var. <i>pennsylvanica</i>	X			
Pale jewelweed	<i>Impatiens pallida</i>	X			
Prickly rose	<i>Rosa acicularis</i> ssp. <i>sayi</i>	X			
Red currant	<i>Ribes rubrum</i>	X			
Red maple	<i>Acer rubrum</i>	X			
Red raspberry	<i>Rubus idaeus</i> ssp. <i>idaeus</i>	X			
Red-berried elder	<i>Sambucus racemosa</i> ssp. <i>pubens</i>	X			
Red-osier dogwood	<i>Cornus stolonifera</i>	X			
Reed canary grass	<i>Phalaris arundinacea</i>	X			
Rough-leaved goldenrod	<i>Solidago patula</i>	X			
Sarsaparilla	<i>Aralia elata</i>	X			
Sedge sp.	<i>Carex</i> sp.	X			
Serviceberry	<i>Amelanchier humilis</i>	X			
Showy mountain ash	<i>Sorbus decora</i>	X			
Small-fruited Bulrush	<i>Scirpus microcarpus</i>	X			
Smooth scouring-rush	<i>Equisetum laevigatum</i>	X			
Speckled alder	<i>Alnus incana</i> spp. <i>rugosa</i>	X			
Spinulose wood fern	<i>Dryopteris carthusiana</i>	X			
Spotted touch-me-not	<i>Impatiens capensis</i>	X			
Star-flower	<i>Trientalis borealis</i> ssp. <i>borealis</i>	X			
Stinging nettle	<i>Urtica dioica</i>	X			
Swamp fly honeysuckle	<i>Lonicera oblongifolia</i>	X			
Tall buttercup	<i>Ranunculus acris</i>	X			














Species Observed		Vegetation survey	Amphibian survey	Breeding bird survey	Nocturnal bird survey
Tall meadow-rue	<i>Thalictrum pubescens</i>	X			
Tamarack	<i>Larix laricina</i>	X			
Trembling aspen	<i>Populus tremuloides</i>	X			
Tufted loosestrife	<i>Lysimachia thyrsiflora</i>	X			
Tufted vetch	<i>Vicia cracca</i>	X			
White birch	<i>Betula papyrifera</i>	X			
White spruce	<i>Picea glauca</i>	X			
Wild carrot	<i>Daucus carota</i>	X			
Wild mint	<i>Mentha arvensis ssp. borealis</i>	X			
Wild strawberry	<i>Fragaria virginiana</i>	X			
Willow species	<i>Salix species</i>	X			
Wood horsetail	<i>Equisetum sylvaticum</i>	X			
Woodland strawberry	<i>Fragaria vesca ssp. americana</i>	X			
Yellow lady's slipper	<i>Cypridedium calceolus</i>	X			

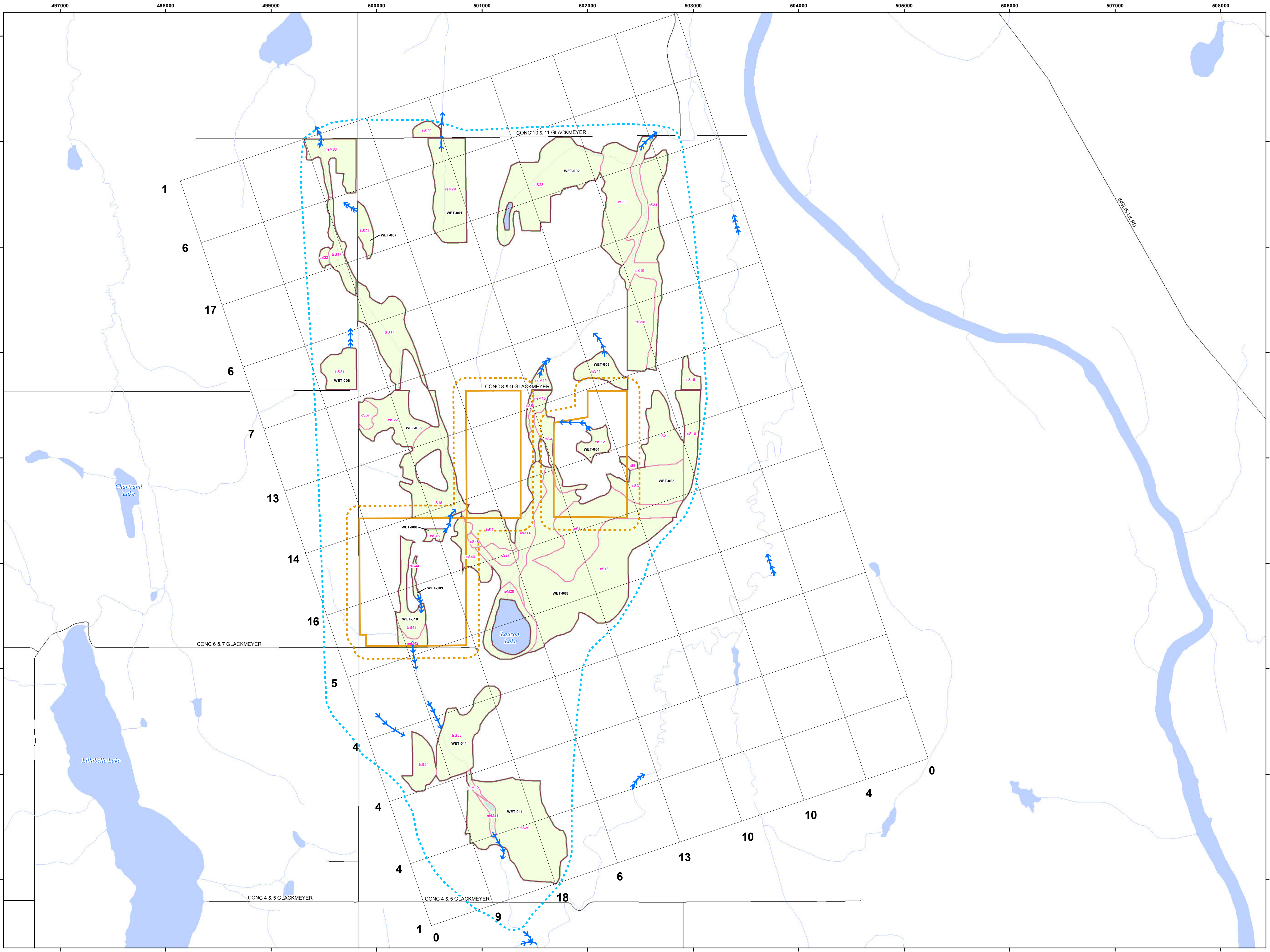
Figure 1

Northland Cochrane Area Solar Projects

Interspersion Map / Catchment Boundary

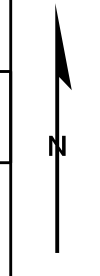
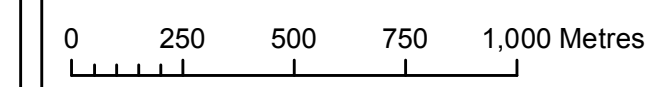
Legend

-  Project Site
-  Project Site 120m Buffer
-  Catchment
-  Wetland
-  Ecological Land Classification
-  Interspersion Grid
-  Highway
-  Primary Road
-  Secondary Road
-  Watercourse (Permanent)
-  Watercourse (Intermittent)
-  Waterbody
-  Watercourse Flow Direction



Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Source: Data provided by MNR© Copyright: Queen's Printer Ontario

Project: 1247B	NAD83 - UTM Zone 17
Date: February-22-12	Scale: 1:17,000 (22x34")



APPENDIX IV
Amphibian Call Survey Field Data Sheets



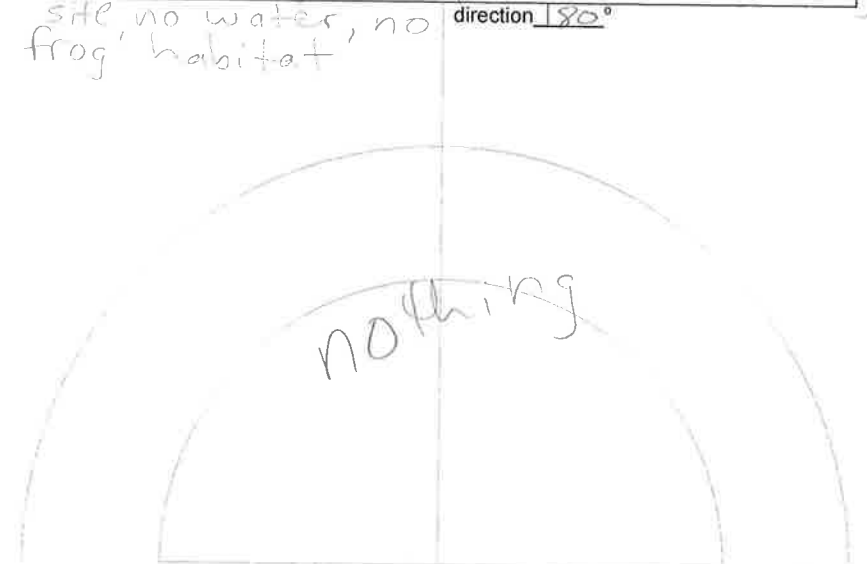
Amphibian Data Form

Project: Cochrane Project No. 1247

UTM:

Observer: <u>SEG, cm</u>	Station Name: <u>Abitibi 1</u> Visit #: <u>1</u>	Date: <u>June 21/11</u> Start time: <u>20:08</u>
Wind speed: <u>4</u>	% Cloud cover: <u>5</u>	Air Temp: <u>15°C</u>
Precipitation Description: <u>none</u>		Water Temp: <u>1</u>
Remarks: <u>Not a good amphibian monitoring site no water, no frog habitat</u>		Water pH: <u>1</u>

direction 80°



CALL LEVEL CODES		Beaufort Wind Scale		
1	Calls can be counted; not simultaneous	0 Calm	0-2	Smoke rises vertically
2	Some simultaneous calls; distinguishable	1 Light air	3-5	Smoke drifts, but wind vanes do not
3	Calls not distinguishable individually overlapping	2 Slight breeze	6-11	Wind felt on face, leaves rustle
Enter as: Call code (# of individuals) e.g. 1 (2)		3 Gentle breeze	12-19	Leaves & small twigs in constant motion; light flags extended
		4 Mod. breeze	20-30	Wind raises dust and loose paper; small branches move
		5 Fresh breeze	31-39	Small trees in leaf begin to sway
		6 Strong breeze	40-50	Large branches in motion; inconvenience felt when walking against wind



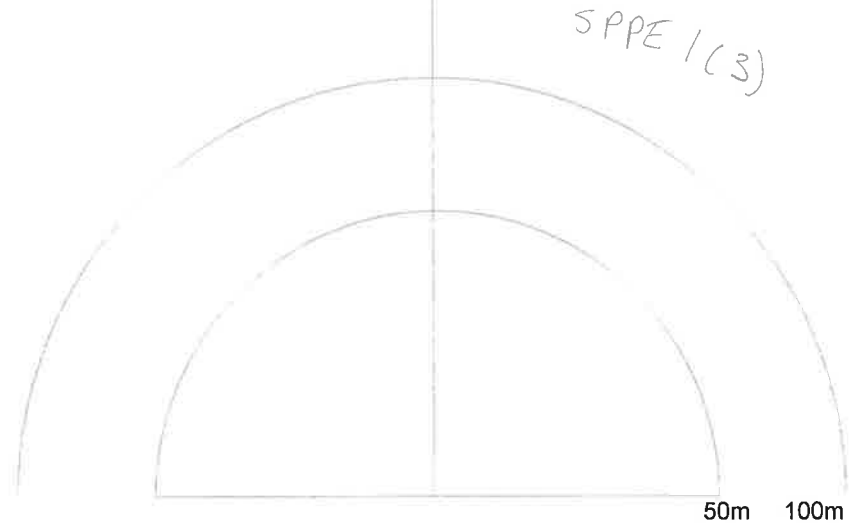
Amphibian Data Form

Project: Cochrane Project No. 1247

UTM:

Observer: <u>JEG cm</u>	Station Name: <u>Abitibi 1B</u>	Date: <u>June 21/11</u>
Wind speed: <u>4</u>	% Cloud cover: <u>5</u>	Start time: <u>20:21</u>
	Air Temp: <u>15°C</u>	Water Temp: <u>/</u>
		Water pH: <u>/</u>
Precipitation Description: <u>none</u>		
Remarks:		

direction 0°



CALL LEVEL CODES		Beaufort Wind Scale		
1	Calls can be counted; not simultaneous	0 Calm	0-2	Smoke rises vertically
2	Some simultaneous calls; distinguishable	1 Light air	3-5	Smoke drifts, but wind vanes do not
3	Calls not distinguishable individually overlapping	2 Slight breeze	6-11	Wind felt on face, leaves rustle
Enter as: Call code (# of individuals) e.g. 1 (2)		3 Gentle breeze	12-19	Leaves & small twigs in constant motion; light flags extended
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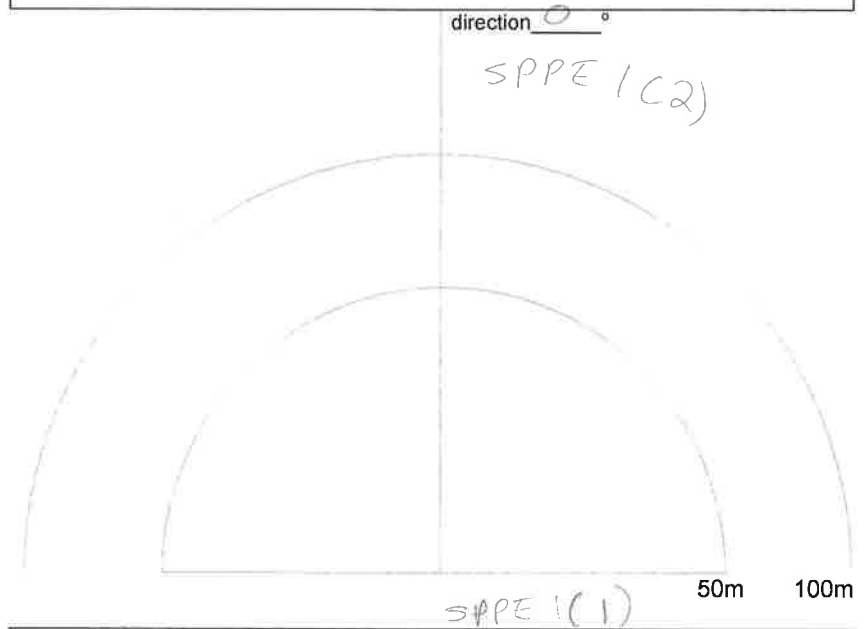


Amphibian Data Form

Project: Cochrane Project No. 1247

UTM:

Observer: <u>JEG cm</u>	Station Name: <u>Abitibi 2</u> Visit #: <u>4</u>	Date: <u>June 21/11</u> Start time: <u>20:29</u>
Wind speed: <u>3</u>	% Cloud cover: <u>1</u>	Air Temp: <u>15°C</u>
Precipitation Description: <u>none</u>		Water Temp: <u>19°C</u>
Remarks:		Water pH: <u>/</u>



CALL LEVEL CODES		Beaufort Wind Scale		
1	Calls can be counted; not simultaneous	0 Calm	0-2	Smoke rises vertically
2	Some simultaneous calls; distinguishable	1 Light air	3-5	Smoke drifts, but wind vanes do not
3	Calls not distinguishable individually overlapping	2 Slight breeze	6-11	Wind felt on face; leaves rustle
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		5 Fresh breeze	31-39	Small trees in leaf begin to sway
		6 Strong breeze	40-50	Large branches in motion; inconvenience felt when walking against wind

