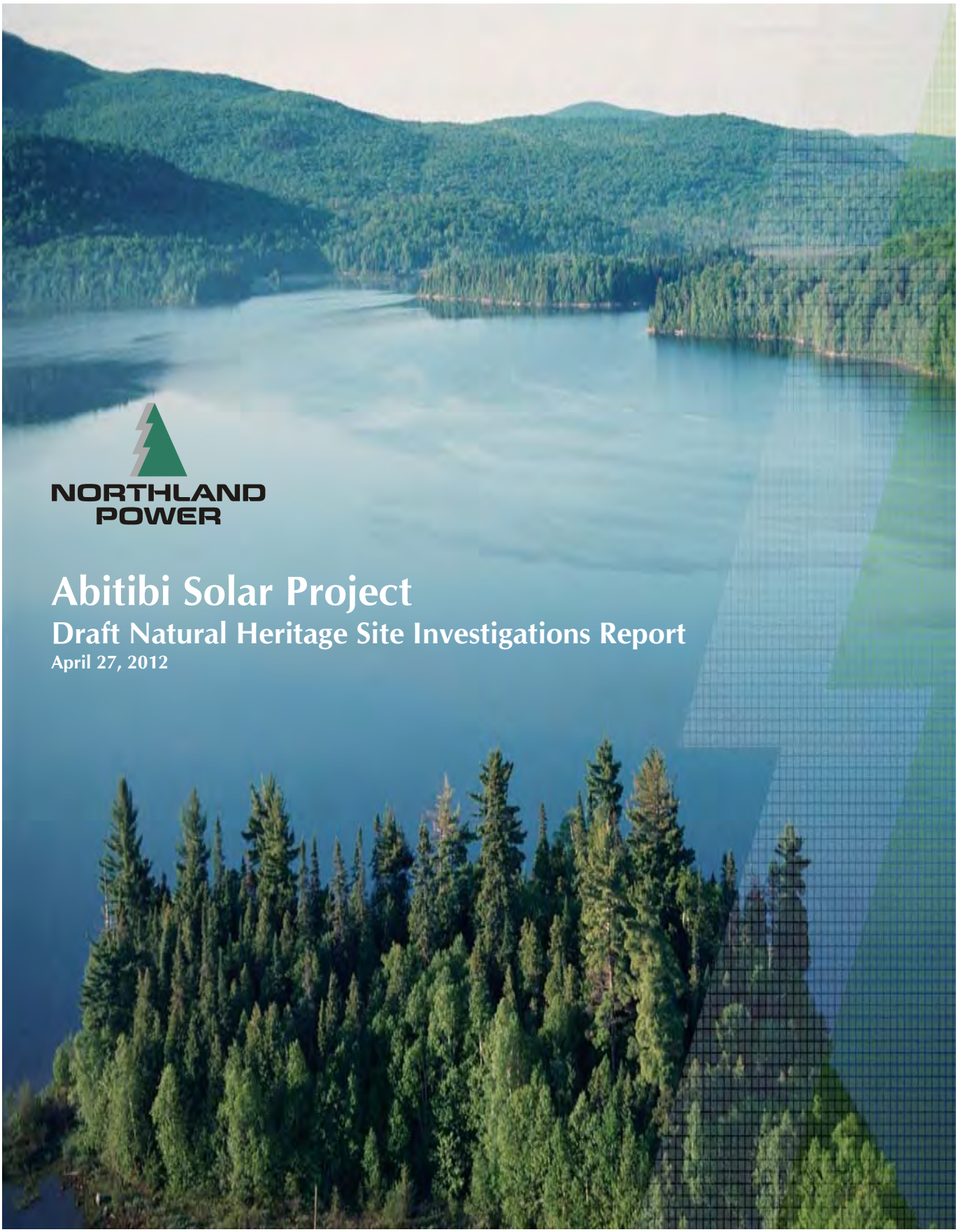

NORTHLAND POWER

Abitibi Solar Project

Draft Natural Heritage Site Investigations Report

April 27, 2012

Northland Power Inc.
on behalf of
Northland Power Solar
Abitibi L.P.
Toronto, Ontario

DRAFT Natural Heritage Site Investigation Report

Abitibi Solar Project

H334844-0000-07-124-0243
Rev. 0
April 27, 2012

Project Report

April 27, 2012

Northland Power Inc.
Abitibi Solar Project

DRAFT Natural Heritage Site Investigation Report

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1. Introduction

1.1 Project Description

Northland Power Solar Abitibi 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 District of Cochrane. This Project, known as the Abitibi Solar Project, is hereafter referred to as "Abitibi" 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 98 hectares (ha) in size and located on Lots 14 and 15, 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 distribution line from the solar panel Project location to the connection point west of the Project location near Hunta, Ontario. This portion of the project is referred to as the distribution 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

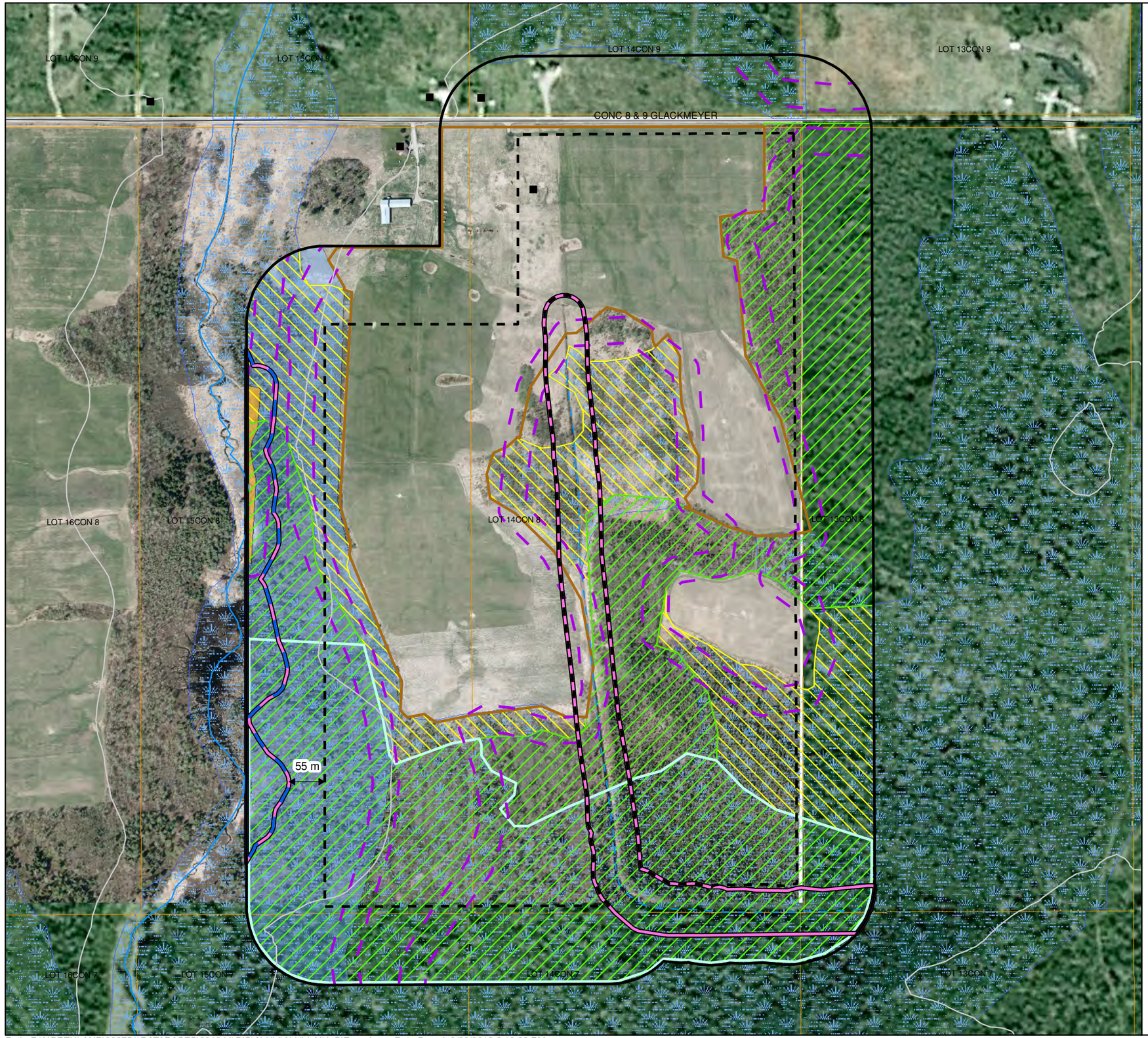
h) a woodland.

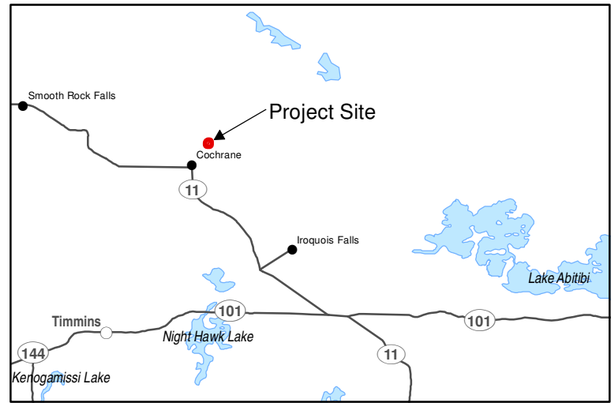
In respect of valleylands and woodlands, Section 1.1 of the REA Regulation identifies that these features are only found south and east of the Canadian Shield. As the Project location is north of the Canadian Shield, it is not possible for valleylands or woodlands to be located on or within 120 m of 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
- Road
- Intermittent Watercourse
- Permanent Watercourse
- Topographic Contour (5m interval)
- Animal Movement Corridor
- Area-sensitive Shrubland Habitat / *Carex wiegandii* Habitat
- Area-sensitive Woodland Habitat / *Vaccinium Ovalifolium* Habitat
- Canada Warbler Habitat
- *Carex haydenii* Habitat
- Common Nighthawk Habitat
- Olive-sided Flycatcher Habitat
- Parcel
- Waterfowl Nesting Habitat
- Wetland
- Wetland Supporting Amphibian Breeding Habitat

Project Components

- Project Location
- 120 m from Project Location

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 August, 2003.
4. Wetland information provided by NRSI (2011).

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Figure 1.1
Northland Power Inc.
Abitibi Solar Project
Solar Panel Project Location and Natural Heritage Features

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CONC 10 & 11 GLACKMEYER

GLACKMEYER

CONC 6 & 7 CLUTE

CONC 6 & 7 GLACKMEYER

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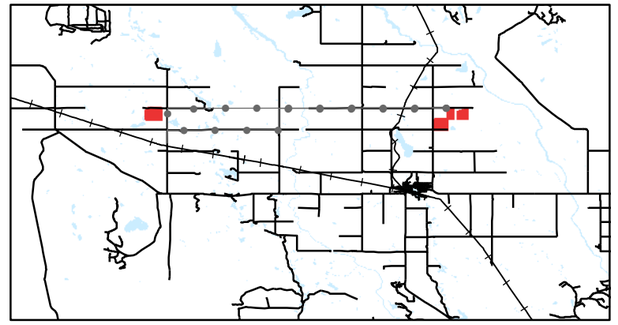

Legend

- 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

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.

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

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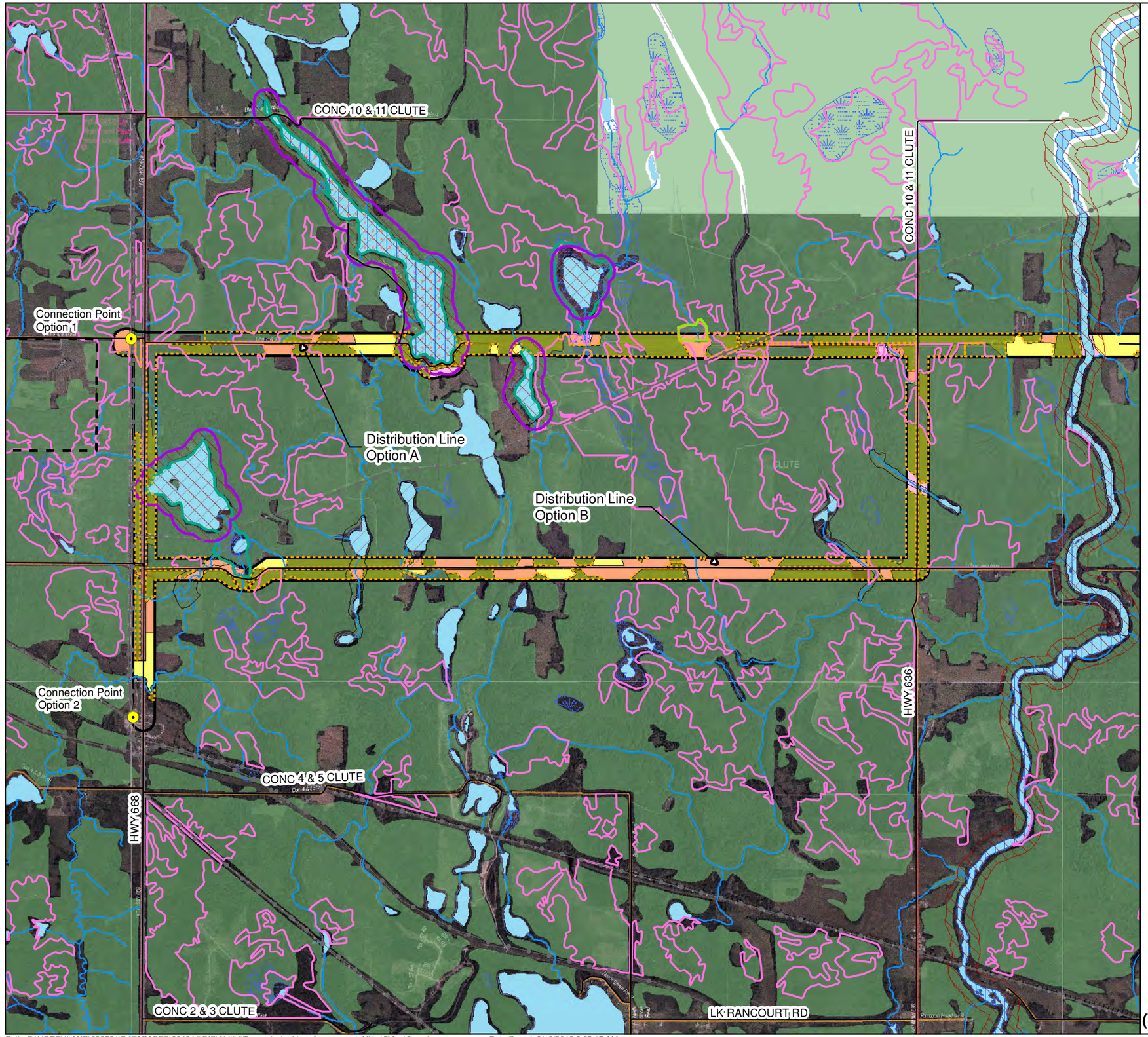

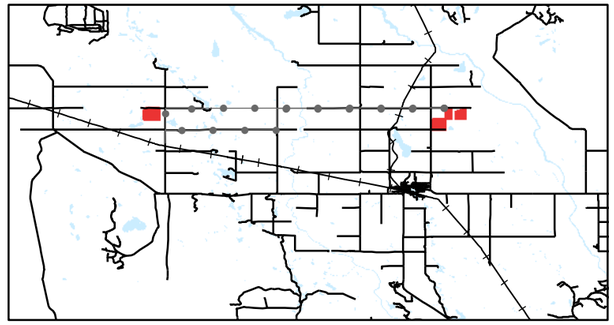

Legend

- Road
- Utility Line
- Watercourse
- Area Sensitive Grassland Habitat / Short-eared Owl Habitat
- Area Sensitive Shrubland Habitat / *Carex Wiegandii* Habitat
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- 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

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.

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

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2. Summary of Results of Records Review

Table 2.1 summarizes the results of the records review (Hatch Ltd., 2012).

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 distribution line).
Is the Project in a natural feature?	Yes	There are wetland communities identified along the distribution line Project location. Though no confirmed wildlife habitats exist on the Project location (both solar panel and distribution line) within the records, there exists potential for habitat of species of conservation concern on the Project location (both solar panel and distribution 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 distribution 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 distribution line Project location. Though no confirmed wildlife habitats exist within 120 m of the Project location (both solar panel and distribution line) within the records, there exists potential for habitat of species of conservation concern on the Project location (both solar panel and distribution line).

3. Site Investigation Methodology

There are two natural features that were considered during the site investigation, wetlands and wildlife habitats. Methodologies re 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 distribution line project location) and Hatch (on

and within 120 m of the distribution 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 A.

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 Investigation 7

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 Date, Time and Duration of Site Investigation

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

3.2.1.2 Weather Conditions During Site Investigation

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

3.2.1.3 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 8

The purpose of this site investigation was to continue 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. Photographs of the site were taken. Any observations of wildlife, vegetation, or natural features were noted. Field notes from the Site Investigation are included within Appendix A.

3.2.2.1 Date, Time and Duration of Site Investigation

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

3.2.2.2 Weather Conditions During Site Investigation

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

3.2.2.3 Name and Qualifications of Person Conducting Site Investigation

The site investigation was completed by Martine Esraelian. Her qualifications are provided in Section 3.2.1.3

3.2.3 Site Investigation 9

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 GPS'd, 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.

3.2.3.1 Date, Times and Duration of Site Investigation

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

3.2.3.2 Weather Conditions During Site Investigation

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

3.2.3.3 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 multi disciplinary contracts with the Bancroft District Ministry of Natural Resources 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.

3.2.4 Site Investigation 10

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.

3.2.4.1 Date, Times and Duration of Site Investigation

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

- Duration: 2.5 hours

3.2.4.2 Weather Conditions During Site Investigation

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

3.2.5 Site Investigations 11 through 16

The purpose of these site investigations was to confirm vegetation community classifications on and within 120 m of the distribution 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 Ministry of Natural Resources, 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 11 through 16 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 11 through 16

	Site Investigation 11	Site Investigation 12	Site Investigation 13	Site Investigation 14	Site Investigation 15	Site Investigation 16
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 were several wetland communities identified during the site investigations on and within 120 m of the Project location, many of which were previously unidentified during the records review stage. These communities are 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-001	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-002	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-003	See Figure 1 in Appendix B 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.
WET-004	See Figure 1 in Appendix B 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.
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.
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	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
WET-007	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-008	See Figure 1 in Appendix B for wetland vegetation communities within wetland.	No	This wetland community is located more than 120 m from the Project location and was therefore not

Wetland ID	Description of Community	Identified During Records Review?	Corrections to Records Review and Rationale for Correction
	Table 4.2 provides further description of the vegetation communities.		identified through the Records Review.
WET-009	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-010	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-011	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
Distribution Line Project Location			
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 identified in the Records Review.

Wetland ID	Description of Community	Identified During Records Review?	Corrections to Records Review and Rationale for Correction
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	Identified During Records Review?	Corrections to Records Review and Rationale for Correction
Solar Panel Project Location			
$cS_{1,2}$	Coniferous swamp dominated by balsam fir, black spruce and balsam fir	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review
tsS_{3-7}	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
$hS_{8,9}$	Trembling aspen/white birch deciduous swamp	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review

Wetland ID	Description of Community	Identified During Records Review?	Corrections to Records Review and Rationale for Correction
cS_{13}	Tamarack/Black spruce coniferous swamp	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
Distribution Line Project Location			
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:

- Agricultural lands consisting of pasturelands/hayfields, or recently ploughed lands (for archaeological surveys)
- 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 distribution 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.

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. Woodlands on and within 120 m of the southern portion of the Project location consist of coniferous swamps that may provide suitable habitat for over-wintering areas. However, no significant evidence of moose or deer use of these areas that would indicate the presence of a candidate significant wintering habitat. As a result, this habitat type is not found 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 areas adjacent to open waters were identified within 120 m of the Project location during the site investigation. Swamplands were identified within 120 m of the Project location, however suitable cavity trees to support waterfowl nesting were not recorded within these areas, and no cavity-nesting waterfowl were observed during the site investigations. Therefore,

CONC 10 & 11 GLACKMEYER

CONC 6 & 7 CLUTE

CONC 6 & 7 GLACKMEYER

HWY 579

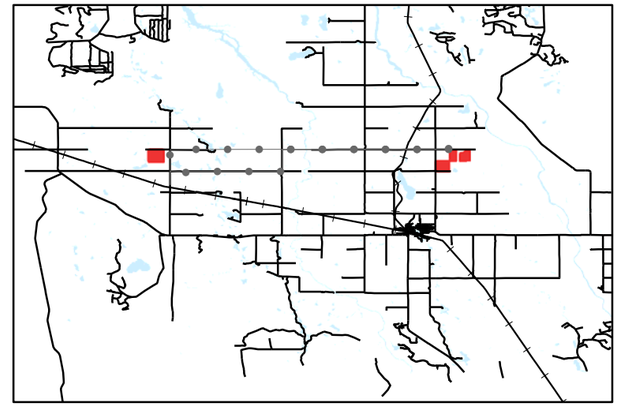
1

2

3

4

5



Legend

- 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

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

0 250 500 1,000 1,500 2,000 Metres

NORTH

1:42,000

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

HATCH

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Back of Fig 4.1

Figure 4.2 Distribution Line Project Location (Western Half) – Vegetation Communities

CONC 10 & 11 CLUTE

CONC 10 & 11 CLUTE

9

Connection Point
Option 1

8

6

4

5

7

Distribution Line
Option A

Distribution Line
Option B

Connection Point
Option 2

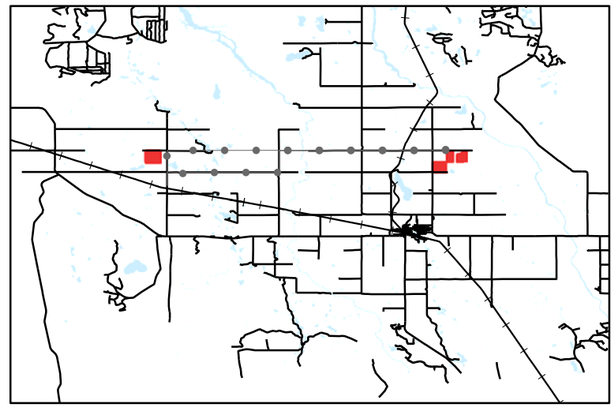
HWY 636

HWY 668

CONC 4 & 5 CLUTE

CONC 2 & 3 CLUTE

LK RANCOURT RD



Legend

- Connection Point
- 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

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 google Earth Pro, captured 2003 through 2004.

0 250 500 1,000 1,500 2,000 Metres

NORTH

1:42,000

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

HATCH

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candidate significant waterfowl nesting habitat is not 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.

- Distribution 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 distribution 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 4.1 and 4.2.
  - 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 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 distribution 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 – Suitable habitat for area-sensitive species was identified in respect of woodland habitats and shrubland habitats. 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 and 4.2.

- 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 nor 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. Areas of upland forest are considered to be candidate old-growth or mature forest stands.
- Forest providing a high diversity of habitats – As the woodland communities on and within 120 m of the Project location essentially consist of two vegetation types (coniferous swamp and upland mixedwood), of which there are few upland areas, this habitat does 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 Wye Creek 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 2. 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.

- Distribution 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 water body/ 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. Based on FRI data relating to stand origin, all areas of upland forest within 120 m of the Project location that are greater than 70 years old 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 distribution 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 distribution 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 species. In addition, the following candidate significant specialized wildlife habitats were identified on or within 120 m of the distribution 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 limited availability of suitable habitat on or within 120 m of the Project location, as the Project location consisted primarily of ploughed fields at the time of Site Investigation 10. A small area of pasture land was recorded on the Project location, however at less than 2 ha, the size of the habitat patch was not sufficient to provided habitat for Short-eared Owls.
- 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 present in the coniferous swamplands on and 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 of Conservation Concern

Scientific Name	Common Name	Habitat	Habitat Occurrence on or within 120 m of	
			Solar Panel Project Location	Distribution Line Project Location
Moehringia macrophylla	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
Carex haydenii	Long-scaled Tussock Sedge	open and shaded wet habitats	Suitable habitat may be found in association with the waterbodies 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
Carex loliacea	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
Carex tetanica	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
Carex wiegandii	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.
Scirpus clintonii	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
Scirpus heterochaetus	Slender Bulrush	marshes and shores	Suitable habitat is not found on or within 120 m of the Project location	Suitable habitat may be found within the marshlands or shoreline within 120 m of the Project location
Gymnocarpium robertianum	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
Woodsia alpina	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
Woodsia glabella	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

Scientific Name	Common Name	Habitat	Habitat Occurrence on or within 120 m of	
			Solar Panel Project Location	Distribution Line Project Location
Vaccinium membranaceum	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
Vaccinium ovalifolium	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
Oxytropis viscida var. hudsonica	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
Diphasiastrum sabinifolium	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
Listera auriculata	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
Malaxis paludosa	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
Panicum leibergii var. baldwinii	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 Distribution 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 distribution 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 distribution line Project location. Therefore suitable habitat may be found within 120 m of the distribution 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 distribution 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 distribution 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 distribution line Project location.
- Bald Eagle (*Haliaeetus leucocephalus*) – Suitable habitat may be found in association with the larger waterbodies located wihtin 120 m of the distribution 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 4.1.

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 more than 120 m west 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 water bodies, 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.

Distribution 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.

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
    - Canada Warbler habitat
    - *Vaccinium ovalifoliuym* habitat
    - *Carex wiegandii* habitat
    - *Carex haydenii* habitat
  - Animal movement corridor
- Distribution 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.

6. References

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Appendix A

Site Investigation Field Notes

Chachrane 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 woodlot

813 - TRANSECT 2 END

814 - START TRANSECT 3

815 - Beginning of woodlot in Transect 3

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 - Rock 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 - Exit the woodlot
829 - Point along woodlot
830 - END TRANSECT 2

Alaska - 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

Abithbi - Frog Pond 1 - GPS 837

Time: 9:45pm May 18th

10°C, Clear Sky

Meadows / Abithbi Frog 1 - GPS 837

Time: 9:45pm

8°C, Clear SKY

"Rite in the Rain"

Abithbi - Frog Pond 1 - GPS 837 Note: GPS 838 = SPEE2

Time: 9:15pm May 18th

10°C, Clear Sky

Meadows / Abithbi Frog 1 - GPS 838

Time: 9:15pm

10°C, Clear Sky

Abitibi / Martin Meadows - FRoc #3 - GPS 840
10:25pm
7°C, Clear SKY

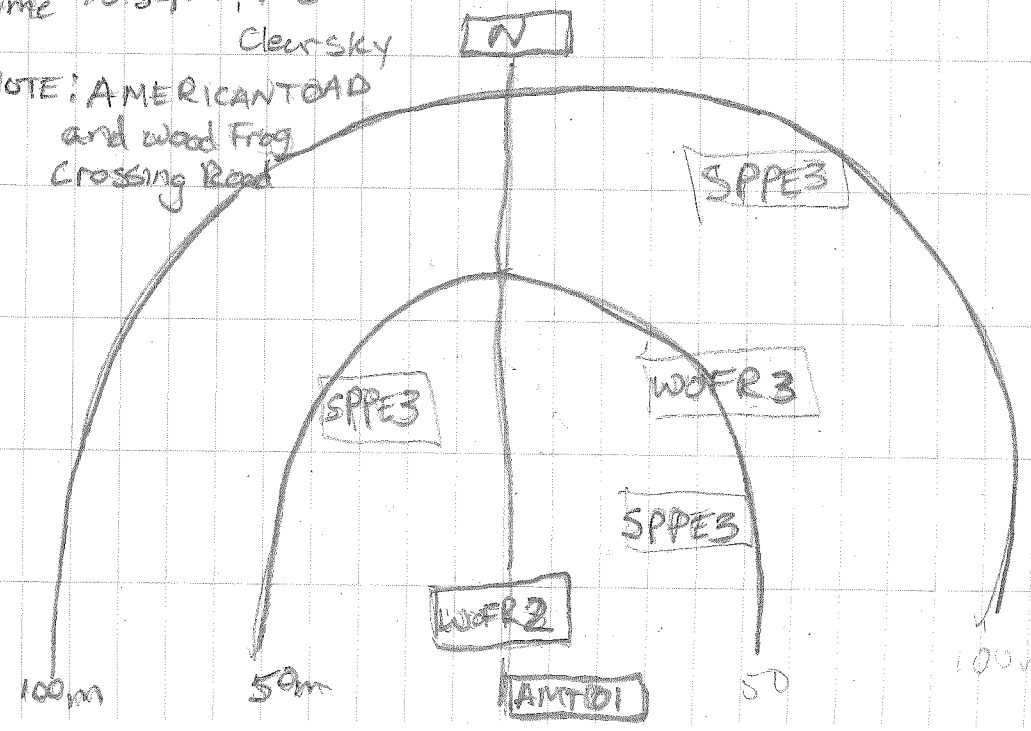
"Rite in the Rain"

MARTINS MEADOWS FROC #2 - GPS 824
Time - 10:05pm
8°C, Clear SKY.

ABITIBI / MARTIN MEADOWS - FROG #4 - GPS 840

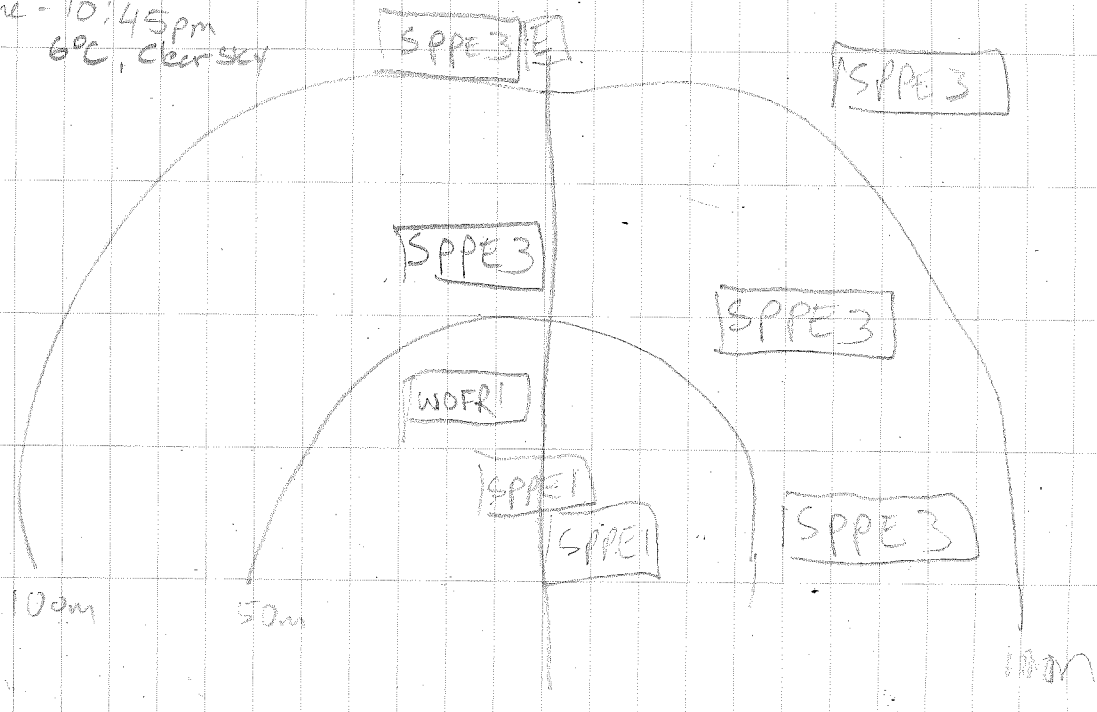
Time - 10:30pm, 7°C
Clear sky

NOTE! AMERICAN TOAD and wood Frog Crossing Road



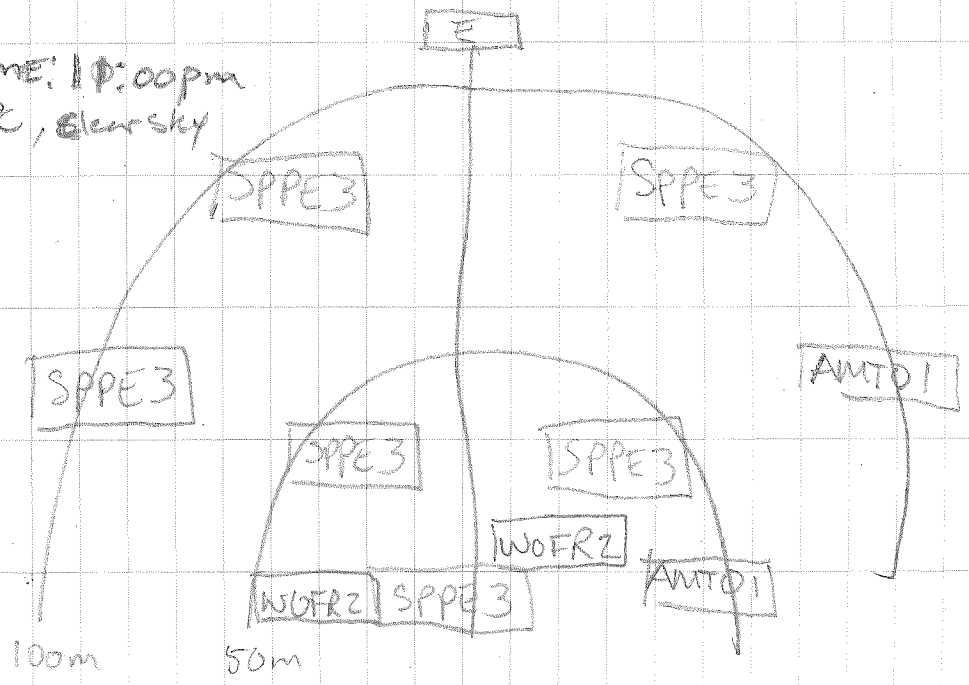
EMPIRE - FROG 1 - GPS 821

Time - 10:45pm
6°C, clear sky



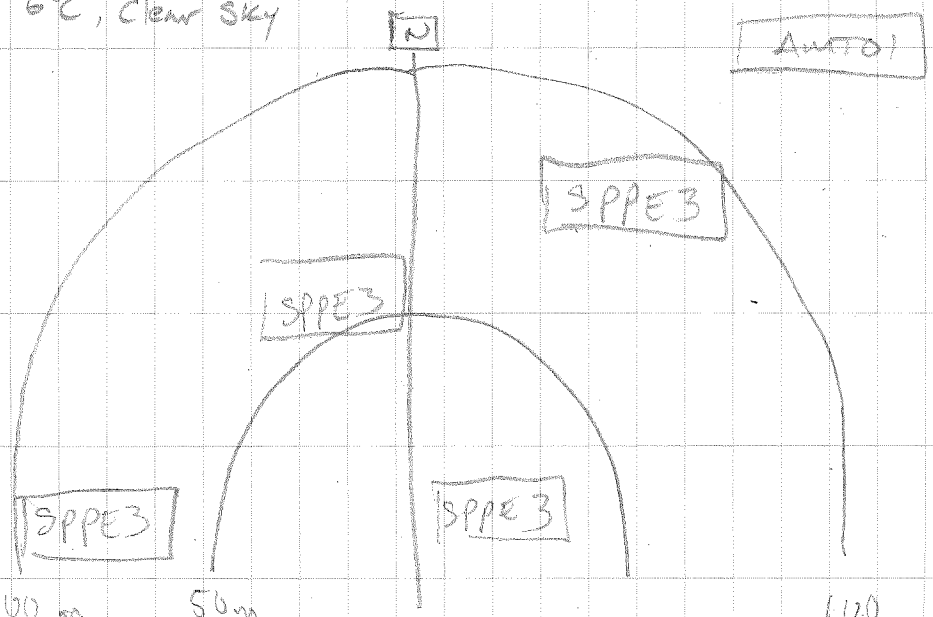
Empire FROG 2 - GPS 841

Time: 10:00pm
6°C, Clear sky

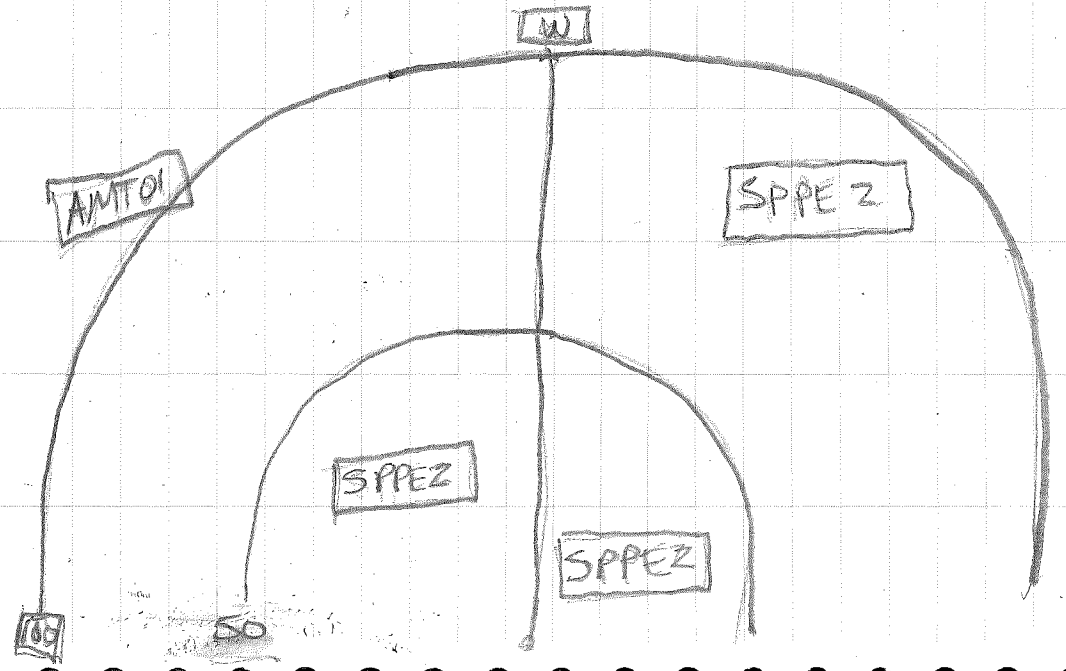


EMPIRE FROG 3 - GPS 843

11:20pm, 6°C, Clear sky



Empire Frg 4 - 11:40pm, 6°C, clear sky
GPS- 844



No.
Date. Page 37

Project : Martin's Meadow / Abitibi Site
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 & surrounding the Project site.
- There is a water course that traverses north [illegible] through Lot 15, Conc. 8
- This watercourse is shown on the LIO mapping
- This watercourse is surrounded by wetland vegetation characteristic of a meadow marsh (e.g. [illegible], cattail, grasses, sedges). Surrounding the meadow marsh community is a thicket swamp dominated by

No.
Date. Page 38

willow, [illegible] red-osier dogwood.
- These wetland communities (meadow marsh & willow thicket swamp) are not shown on the LIO mapping.
- There is also a municipal drain that flows east along Conc 8 & 9 road north of the Project site.
This municipal drain is approximately 5' wide & at least 5' deep in some areas.
- Water was [illegible] 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 canola, hay, grain.
- Pasture was also observed
- A large [illegible] operation & small equestrian hobby farm was

No. ....

Date. .... Page 39

observed on the properties north of the Project site

The areas that are not in agricultural production (within 1km) include scrublands & young immature woodlands

- The Project site was formerly used as a livestock operation 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..... Page 49

Project: Martin's Meadows

Date: Aug 23, 2010

Time: 1600 - 1930 (3.5)

% O.C: 85%

Temp: 24°C

Wind: 2

black bear in NE wooded

No.....

Date..... Page 50

- drainage feature along the western boundary. Galvanize culvert observed
- drain not connected to the main creek stream
- [illegible] drainage feature
- small - flooded area
- broad leaved cattail
- alder (R)
- [illegible]
- [illegible]
- drainage feature ends at [illegible] wooded - where it reaches wooded channel is not defined - marsh

wooded

- alder (D)
- willow
- pondweed
- [illegible] sp
- balsam poplar
- trembling aspen

No.
Date. Page 51

Small woodlot

willows raspberry sp
trembling aspen
alder.

Abitibi Site
North east Woodlot
wet/moist woodland - 30% canopy cover / (understory / groundcover) vegetation dense
alder, willow (edge)
Balsam Poplar (D) along edge
Trembling aspen (D) within woodland
red raspberry sp
spruce sapling
red-osier dogwood (edge)
fragrant bedstraw
ferns
horsetail sp.
alder (understory D)
balsam fir (immature) (R)
gooseberry
Strawberry sp.
grasses
highbush cranberry?

No.
Date. Page 52

agrimony
Sensitive fern
aster sp
rose sp
- venous pooling with water along edge (GPS point taken)
- sedges, fireweed
- alder

- balsam poplar / trembling aspen vary in dominance within woodland

- patch of willow & alder that extend from the woodland east - west onto agricultural field (GPS point taken)

↳ tamarack, white spruce saplings
near seat?

No.....

Date..... Page 53

South-central (Atchafalaya side)
alder, willow, trembling aspen
white birch (AC)
small-fruited bulrush
spotted joe pye weed

southern portion of Atchafalaya has more coniferous trees
tamarack
spruce
black bear in woodland

No.....

Date..... Page.....

Date: Aug 24, 2010 %cc: 90%
No. Temp: 24°C
Time: 1400 - 1900 (30) Wind: 3
Date Page 57
Project Site between Martins

Meadow & Alder

- Rolling topography - water drains west
Southeast towards centre
wetland
- Tamarack (D) mixed with alder &
willow and some spruce
Balsam poplar > 10cm
also observed throughout

Southern portion
some tamarack
Balsam poplar (D)
trembling aspen
alder
willow
very buck
SP
- trembling aspen
- balsam P.
willow
alder

No.
Date Page 58

wetland area
- whorled milkweed ?
meadow rue
alder (A)
Tamarack (A)
willow (A)
cattail sp.

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℃, 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℃, 5% cloud cover, wind – Beaufort scale 3 to 4, water temperature 19℃). 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℃, 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 (*Empidonax alnorum*)		S		
American Crow (*Corvus brachyrhynchos*)	X			
American Goldfinch (*Carduelis tristis*)		H		
American Redstart (*Setophaga ruticilla*)		S		
American Robin (*Turdus migratorius*)		S		
Black-and-white Warbler (*Mniotilta varia*)		S		
Black-throated Green Warbler (*Dendroica virens*)		S		
Blue Jay (*Cyanocitta cristata*)		S		
Common Loon (*Gavia immer*)	X			
Hermit Thrush (*Catharus guttatus*)		S		
Ovenbird (*Seiurus aurocapillus*)		S		
Red-eyed Vireo (*Vireo olivaceus*)		S		
Sandhill Crane (*Grus canadensis*)				FY
Song Sparrow (*Melospiza melodia*)		S		
Tennessee Warbler (*Vermivora peregrine*)		S		
White-throated Sparrow (*Zonotrichia albicollis*)		S		
Yellow Warbler (*Dendroica petechia*)		S		
Yellow-rumped Warbler (*Dendroica cronoata*)	X			

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

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

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Appendix I
Team Members

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
Vegetation Codes

Appendix II

Within Project Site and 120m boundary

OWES CLASSIFICATIONS

cS_1:

[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 spp. rugosa*), showy mountain-ash (*Sorbus decora*)
gc: blue-bead lily (*Clintonia borealis*), star-flower (T*rientalis borealis ssp. borealis*), bunchberry (*Cornus canadensis*), wood horsetail (*Equisetum sylvaticum*), ostrich fern (*Matteuccia struthiopteris var. pensylvanica*)
m: clubmoss

cS_{13}:

[OWES: Coniferous Swamp]
*c: tamarack (*Larix laricina*), black spruce (*Picea mariana*)
ts: speckled alder (*Alnus incana spp. 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. pensylvanica*), woodland strawberry (*Fragaria vesca ssp. americana*), bunchberry (*Cornus canadensis*), Canada mayflower (*Maianthemum canadense*)
m: moss sp.

hS_8:

[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. pensylvanica*), blue-bead lily (*Clintonia borealis*)

$tsS_{3\text{-}5,7,18}$:

[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*)

tsS_{46}:

[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 (*Symphyotrichum novae-angliae*), rough goldenrod (*Solidago rugosa ssp. rugosa*), Common hairgrass (*Deschampia flexuosa*)
ne: reed canary grass (*Phalaris arundinacea*)

neM_{15}:

[OWES: Narrow-leaved Emergents Marsh]
*ne: aquatic sedge (*Carex aquatilis*)

reM_{14}:

[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]

<u>Outside of Project Site and 120m boundary</u>

OWES CLASSIFICATIONS

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

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

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

reM_{29}:
[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]

APPENDIX III
Wetland Evaluation

Abitibi-Martin's Meadow-Empire Wetland Complex	
Wetland Evaluation Edition	2012
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

Northern Ontario Wetland Evaluation, Data and Scoring Record **February 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)

viii) WETLAND SIZE AND BOUNDARIES

a) Single contiguous wetland area: - hectares

b) Wetland complex comprised of 11 individual wetlands:

Wetland Unit Number (for reference)		Isolated	Palustrine	Riverine	Size of each wetland unit Lacustrine	
Wetland Unit No.	WET-001		33.71			ha
Wetland Unit No.	WET-002		119.89	21.09		ha
Wetland Unit No.	WET-003		9.66			ha
Wetland Unit No.	WET-004		6.09			ha
Wetland Unit No.	WET-005		277.49	81.35	10.84	ha
Wetland Unit No.	WET-006		10.97			ha
Wetland Unit No.	WET-007		5.19			ha
Wetland Unit No.	WET-008		2.03			ha
Wetland Unit No.	WET-009		1.53			ha
Wetland Unit No.	WET-010		14.93			ha
Wetland Unit No.	WET-011		98.15	3.60		ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit No.						ha
Wetland Unit Totals:		0.00	579.64	106.04	10.84	

(Attach additional sheets if necessary)

TOTAL WETLAND SIZE 696.52 ha

c) Brief documentation of reasons for including any areas less than 0.5 ha in size:

(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)		one	9 points
2)	X	two	13
3)		three	20
4)		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

Code	Forms		Dominant Species				
M6	re,	ff	re,	*Typha latifolia;*	ff,	*Lemna minor*,	*Wolffia*
S1	ts,	gc	ts,	*Salix discolor;*	gc,	*lmpatiens capensis*,	*Thelypteris palustris*

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	Total # of communities with 4 -5 forms = 23	Total # of communities with 6 or more forms = 1
1 = 1.5 points	1 = 2 points	1 = 3 points
2 = 2.5	2 = 3.5	2 = 5
3 = 3.5	3 = 5	3 = 7
4 = 4.5	4 = 6.5	4 = 9
5 = 5	5 = 7.5	5 = 10.5
6 = 5.5	6 = 8.5	6 = 12
7 = 6	7 = 9.5	7 = 13.5
8 = 6.5	8 = 10.5	8 = 15
9 = 7	9 = 11.5	9 = 16.5
10 = 7.5	10 = 12.5	10 = 18
11 = 8	11 = 13	11 = 19
+.5 each additional community = 5.0	+.5 each additional community = 5.0	+ 1 each additional community = 3.0

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

Northern Ontario Wetland Evaluation Data and Scoring Record February 2012

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

Wetland Size (ha): 696.52

Vegetation Form	% area in which form is dominant
h	0.20
c	30.20
dh	0.00
dc	0.00
ts	56.46
ls	0.00
ds	0.00
gc	0.00
m	0.00
ne	8.82
be	0.00
re	4.37
ff	0.00
f	0.00
su	0.00
u (unvegetated)	0.00
Total = 100%	100.00

1.2.3 DIVERSITY OF SURROUNDING HABITAT

(Check all appropriate items(1))

	recent burn (< 5 yr)
	abandoned agricultural land
	utility corridor
x	deciduous forest
	recent cutover or clearcut (<5 yr)
x	coniferous forest
x	mixed forest (at least 25% conifer and 75% deciduous or vice versa)
x	crops
	abandoned pits and quarries
x	pasture
	ravine
x	fence rows
x	open lake or deep river
x	creek flood plain
	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)	x	Hydrologically connected by surface water to other wetlands (different dominant wetland type) or open lake or river within 1.5 km	8 points
2)		Hydrologically connected by surface water to other wetlands (same dominant wetland type) within 0.5 km	8
3)		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)		Hydrologically connected by surface water to other wetlands (same dominant wetland type) from 0.5 to 1.5 km away	5
5)		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)		Within 1 km of other wetlands,but not hydrologically connected by surface water	2
7)		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 l00		15
6)	101 to 125		18
7)	126 to 150		21
8)	151 to 175	x	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)	x	type 1	8
2)		type 2	8
3)		type 3	14
4)		type 4	20
5)		type 5	30
6)		type 6	8
7)		type 7	14
8)		type 8	3
9)		no open water	0

Open Water Type Score (Choose one only maximum 30 points) 8

1.3 SIZE

696.52 hectares 73 Subtotal for Biodiversity

Size Score (Biological Component) (maximum 5O 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)		<5 ha	0
2)		5 -25 ha	4
3)		26 -50 ha	6
4)		51- l00 ha	8
5)		101 -200 ha	11
6)	X	>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)			Score (Choose one)
Present	1)		2 points
Absent	2)	0	0

Source of information:

Lowbush Cranberry Score (maximum 2 points) 0

2.1.3 Wild Rice

(Check one)			Score (Choose one)
Present (at least 0.5 ha)	1)	X	10 points
Absent	2)		0

Source of infolmation: Cochrane MNR office

Wild Rice Score (maximum 10 points) 10

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

(Check one)			Score (Choose one)
Present	1)	X	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	field work
2)	red fox 3	field work
3)	red squirrel 3	field work
4)	marten 3	Cochrane MNR office
5)		

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)		3 points
Indistinct	2)	X	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)		7 points
One or several localized disturbances	2)	X	4
Moderate disturbance; localized water pollution	3)		2
Wetland intact but impairment of ecosystem quality intense in some areas	4)		1
Extreme ecological degradation, or water pollution severe and widespread	5)		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)		20 points
Infrequent	2)		12
No visits	3)	X	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)		8 points
No interpretation centre or staff but a system of self-guiding trails or brochures available	2)		4
Facilities such as maintained paths (e.g., woodchips) boardwalks, boat launches or observation towers but no brochures or other interpretation	3)		2
No facilities or programs	4)	X	0

Source of information: Cochrane MNR office

Facilities and Programs Score (maximum 8 points) 0

2.4.3 RESEARCH AND STUDIES

(check appropriate spaces)		Score
Long term research has been done		12 points
Research papers published in refereed scientific journal or as a thesis		10
One or more (non-research) reports have been written on some aspect of the wetland ' s flora fauna hydrology etc.		5
No research or reports	X	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	
1) Within or adjoining settlement	40 points		26		16	
2) 0.5 to 10 km from settlement	26		16	X	10	
3) 10 to 60 km from settlement	12		8		4	
4) >60 km from settlement	5		2		0	
5) >100 km from settlement	0		0		0	
		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		x	10	=	0.00
FA of wetland area in public ownership,not as above		x	8	=	0.00
FA of wetland area in private ownership,not as above	1.00	x	4	=	4.00

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 l00 points according to area. For example if 10 ha of a l00 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)		696.52
(b)	Total area (ha) of upstream detention areas (include the wetland itself)		710.96
(c)	Ratio of (a):(b)		0.98
(d)	Upstream detention factor: (c) x 2 = (maximum allowable factor = 1)	1.96	1.00

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

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

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

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

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

(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] x 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.

Site Type	Improvement Factor (IF)						
Isolated	FA	0	x	0.5	=	0.00	
Riverine	FA	0.15	x	1	=	0.15	
Palustrine with no inflow	FA	0	x	0.7	=	0.00	
Palustrine with inflows	FA	0.83	x	1	=	0.83	
Lacustrine on lake shoreline	FA	0.02	x	0.2	=	0.004	
Lacustrine at lake inflow or outflow	FA	0	x	1	=	0.00	
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)
X	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

		Score
Trees, shrubs or herbs (h, c, ts, ls, gc)	X	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	10
Catchment soil coverage	Patchy = 0		Thin (<20cm) = 2		Thick = 5	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	X
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	

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 PROVINCIALLY 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 PROVINCIALLY 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		25 points
20-40 Indicated Pairs/100 km sq		20
10-20 Indicated Pairs/100 km sq	X	15
5-10 Indicated Pairs/100 km sq		10
1-5 Indicated Pairs/100 km sq		5
Habitat not suitable		0
Out of assessment range		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)		Provincially significant	l00
2)		Significant in Site Region	50
3)		Significant in Site District	25
3)		Locally significant	10
4)		Little or poor winter cover present	0

Source of information: _____

Winter Cover for Wildlife Score (maximum l00 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		150		150
2)	Provincially significant		100		l00
3)	Regionally significant		50		50
4)	Known to occur		10		10
5)	Not possible		0		0
6)	Not known	X	0	X	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	l00
2)		Regionally significant	50
3)	X	Habitat suitable	10
4)		Habitat not suitable	0

Source of information: field work

Waterfowl Breeding Score (maximum lOO points) 10

4.2.5 MIGRATOR PASSERINE, SHOREBIRD OR RAPTOR STOPOVER AREA

(check highest applicable category)

1)		Provincially significant	l00
2)		Significant in Site Region	50
3)		Significant in Site District	10
4)	X	Not significant	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)	X	Ungulate summer cover	15 points
(2)		Mineral licks	50
(3)		Moose aquatic feeding area Class 1	0
(4)	X	Moose aquatic feeding area Class 2	10
(5)		Moose aquatic feeding area Class 3	20
(6)		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)

X 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) X 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	l00 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)

X 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)
X 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 1Marsh 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.)

X 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)	=	0.0
Score for Spawning and Nursery Habitat (High Marsh) (maximum 25)	=	6.6
Score for Swamp Containing Fish Habitat (maximum 20)	=	0.0

Sum (maximum score 100 points) = 6.6

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) X 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)	Significant in Site Region	25 points
2)	Significant in Site District	15
3)	Locally Significant	10
4)	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) X	Wetland is riverine at rivermouth or lacustrine at rivermouth	25 points
2)	Wetland is riverine,within 0.75 km of rivermouth	15
3)	Wetland is lacustrine,within 0.75 km of rivermouth	10
4)	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 -lOO ha	=	50
	wetland > 100 ha	=	75

Great Lakes Coastal Wetlands Score (maximum 75 points) 0

5.0 EXTRA INFORMATION

5.1 PURPLE LOOSESTRIFE

X 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)	X
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	X
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	X
Not as above	____

INVESTIGATORS	AFFILIATION
David Stephenson	Natural Resource Solutions Inc.
Charlotte Moore	Natural Resource Solutions Inc.
Jessica Grealey	Natural Resource Solutions Inc.
Katharina Walton	Natural Resource Solutions Inc.
Megan Pope	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.

Northern Ontario Wetland Evaluation — February 2012

WETLAND EVALUATION SCORING RECORD

WETLAND NAME: Abitibi-Martin's Meadow-Empire Wetland Complex

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

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 BIODIVERSITY

1.2.1	Number of Wetland Types	13	
1.2.2	Vegetation Communities (maxixmum 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 SIZE (Biological Component) — 37

TOTAL FOR BIOLOGICAL COMPONENT (not to exceed 250): 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
2.2 RECREATIONAL ACTIVITIES (maximum 80)		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 PROXIMITY TO AREAS OF HUMAN SETTLEMENT		16
2.6 OWNERSH1P		4
Subtotal for Social Component	80	
2.7 SIZE (Social Component)		19
2.8 ABORIGINAL AND CULTURAL VALUES (maximum 30)		0
TOTAL FOR SOCIAL COMPONENT (not to exceed 250)		107

Northern Ontario Wetland Evaluation, Score Summary — February 2012

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION		90
3.2 GROUNDWATER RECHARGE		
3.2.1 Site Type	17	
3.2.2 Soils	7	
Total for Groundwater Recharge		24
3.3 WATER QUALITY IMPROVEMENT		
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 CARBON SINK		9
3.5 SHORELINE EROSION CONTROL		8
3.6 GROUNDWATER DISCHARGE		26
TOTAL FOR HYDROLOGICAL COMPONENT (not to exceed 250)		205

Northern Ontario Wetland Evaluation, Score Summary — February 2012

4.0 SPECIAL FEATURES

4.1 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

Northern Ontario Wetland Evaluation, Score Summary — February 2012

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
WETLAND TOTAL	603

INVESTIGATORS

David Stephenson
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AFFILIATION

Natural Resource Solutions Inc.

DATE: February 22, 2012

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

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

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

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

CONC 10 & 11 GLACKMEYER
CONC 8 & 9 GLACKMEYER
CONC 6 & 7 GLACKMEYER
CONC 4 & 5 GLACKMEYER
INGLIS LK RD
Chartrand Lake
Lauzon Lake
Lillabelle Lake
WET-001
WET-002
WET-003
WET-004
WET-005
WET-006
WET-007
WET-008
WET-009
WET-010
WET-011

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1247B
Date: February-22-12

NAD83 - UTM Zone 17
Scale: 1:17,000 (22x34")

0 250 500 750 1,000 Metres

N

Path: X:\1247_NorthlandCochraneAreaSolarFarms\NRSI_1247_Fig1_NorthlandCochrane_EastSide_Interspersion_17K_2012_02_21_ELF.mxd

APPENDIX IV
Amphibian Call Survey Field Data Sheets

NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Cochrane Project No. 1247

UTM:

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

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

225 Labrador Drive, Waterloo, Ontario, N2K 4M8 Tel: (519) 725-2227 Fax: (519) 725-2575
Web: www.nrsi.on.ca

NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

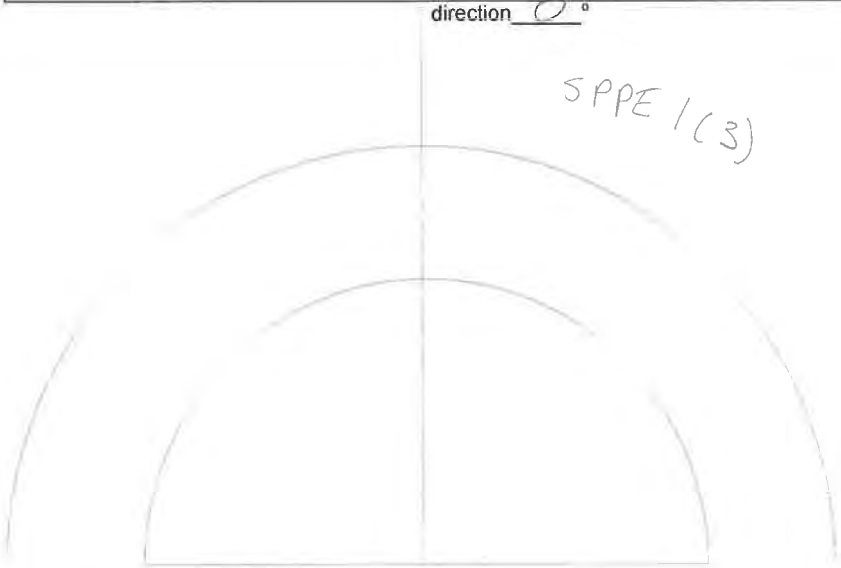
Amphibian Data Form

Project: Cochrane Project No. 1247

UTM:

Observer: JEG cm	Station Name: Avi Hill B Visit #: 1		Date: June 21/11 Start time: 20:21	
Wind speed: 4	% Cloud cover: 5	Air Temp: 15°c	Water Temp: /	Water pH: /
Precipitation Description: none				
Remarks:				

direction 0°



CALL LEVEL CODES		Beaufort Wind Scale		
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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Cochrane Project No. 1247

UTM:

Observer: JEG CM	Station Name: Abitibi 2 Visit #: 1		Date: June 21/11 Start time: 20.29	
Wind speed: 3	% Cloud cover: 1	Air Temp: 15°C	Water Temp: 19°C	Water pH: /
Precipitation Description: none				
Remarks:				

direction 0 °

SPPE 1 (2)

50m 100m

SPPE 1 (1)

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
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