NORTHLAND POWER

Long Lake Solar Project

Draft Natural Heritage Evaluation of Significance Report

April 20, 2012

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

DRAFT Natural Heritage Evaluation of Significance Report

Long Lake Solar Project

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April 20, 2012

Project Report

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Northland Power Inc.
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DRAFT Natural Heritage Evaluation of Significance

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1. Introduction

1.1 Project Description

Northland Power Inc. (hereinafter referred to as "Northland") is proposing to develop a Class 3 10-megawatt (MW) ground mounted solar photovoltaic (Solar PV) facility in the unorganized township of Calder. This Project, known as the Long Lake Solar Project, is hereafter referred to as "Long Lake" or the "Project."

The Project location is approximately 123 hectares (ha) in size and located on Lots 2 and 3, in the unorganized Township of Calder, with a transmission line associated with the Project that traverses across the northern portion of Lot 1. The Project location is situated on Clute Concession Road 7\9 (shown in Figure 1.1).

1.2 Legislative Requirements

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

Section 24(1) of O. Reg. 359/09 requires proponents of Class 3 solar projects to undertake a natural heritage assessment consisting of a records review report, site investigation report and an evaluation of significance report for each natural feature identified during the records review and site investigation.

Natural Features are defined in Section 1(1) of O. Reg. 359/09 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.

With respect to woodlands and valleylands, Section 1(1) of O. Reg. 359/09 requires that these features be located south and east of the Canadian Shield as shown in Figure 1 in the Provincial Policy Statement issued under Section 3 of the *Planning Act*. This figure shows that the proposed Project location is located on the Canadian Shield, and therefore valleylands and woodlands as defined by O. Reg. 359/09 cannot be located on the Project location.

1.2.1 Records Review Report

Section 25 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage records review to identify "whether the project is

(a) in a natural feature

(b) within 50 m of an area of natural and scientific interest (earth science)

(c) within 120 m of a natural feature that is not an area of natural or scientific interest (earth science)." (O. Reg. 359/09, s. 25, Table).

Subsection 2 of Section 30 of the REA Regulation requires the proponent to prepare a report "setting out a summary of the records searched and the results of the analysis" (O. Reg. 359/09). The Natural Heritage Records Review Report (Hatch Ltd., 2012a) was prepared to meet these requirements.

1.2.2 Site Investigation Report

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

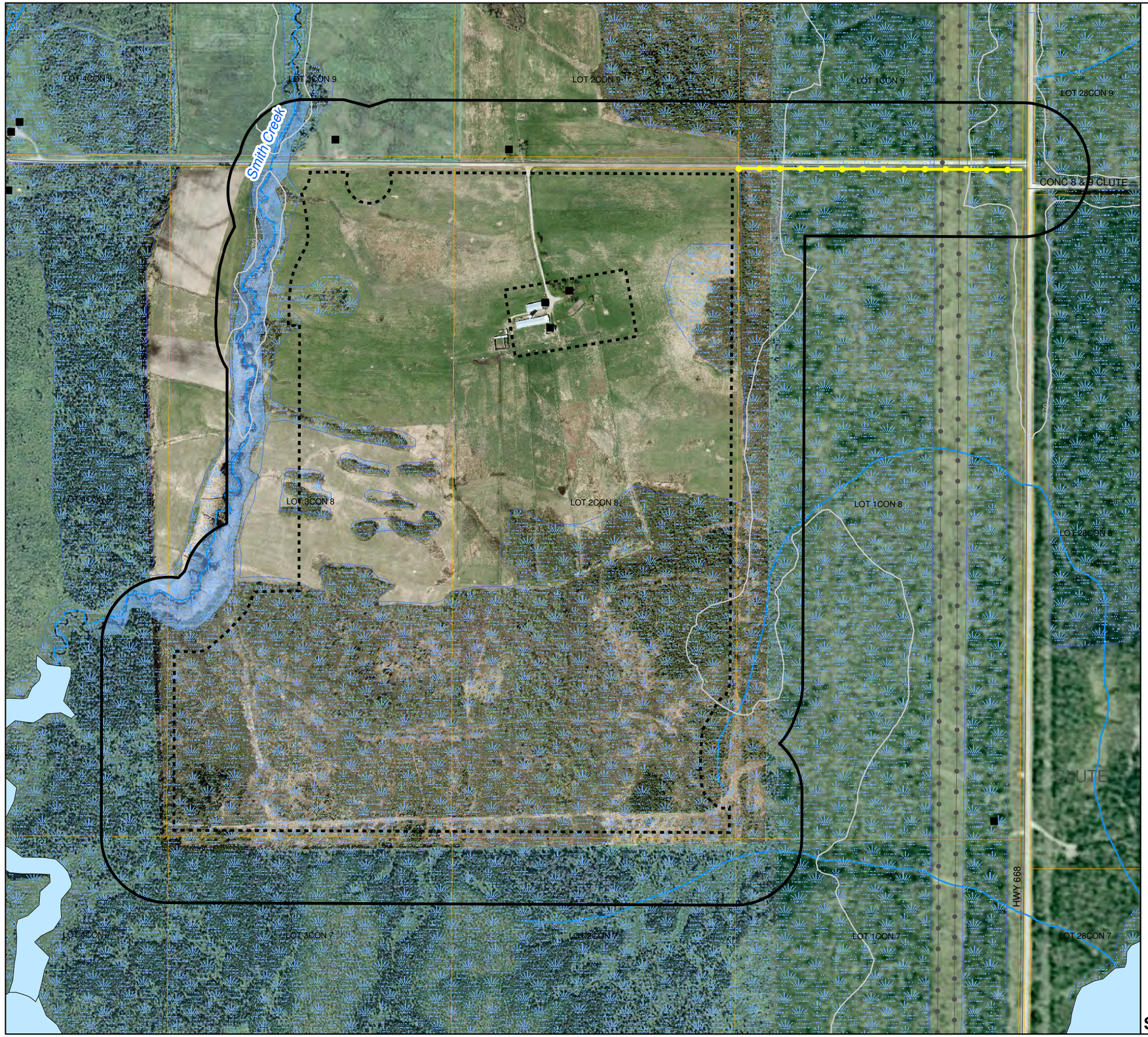
- whether the results of the analysis summarized in the (natural heritage records review) report prepared under Subsection 25(3) are correct or require correction, and identifying any required corrections
- whether any additional natural features exist, other than those that were identified in the (natural heritage records review) report prepared under Subsection 30(2)
- 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).

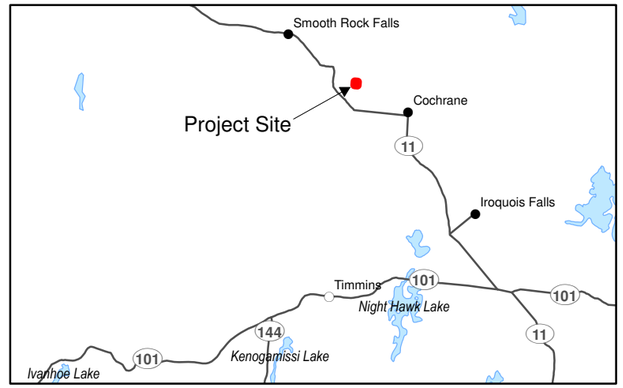
The Natural Heritage Site Investigation Report (Hatch Ltd., 2012b) was prepared to meet these requirements.

1.2.3 Evaluation of Significance Report

Section 27 of the REA Regulation requires proponents of Class 3 solar projects to undertake an evaluation of significance (EOS) for natural heritage features identified during the records review and site investigation and prepare a report that sets out

- a determination of whether the natural feature is
  - provincially significant
  - significant
  - not significant
  - not provincially significant
- a summary of the evaluation criteria or procedures used to make the determinations
- the name and qualifications of any person who applied to evaluation criteria or procedures.





LEGEND

- Building
- Roads
- Transmission Line
- Watercourse
- Parcel
- Waterbody

Significant Natural Heritage Features

- Animal Movement Corridor
  Wetland Supporting Amphibian Breeding Habitat
- Provincially Significant Wetland

Project Components

- Proposed Transmission Line
- 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 2004.
4. Airphoto obtained from Northland Power Inc., flown May 2011.

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Figure 1.1
Northland Power Inc.
Long Lake Solar Project
Project Location and Significant Natural Heritage Features

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This EOS Report for the natural features identified within 120 m of the Project has been prepared to meet these requirements.

1.3 Evaluation of Significance Report Format

Section 1 of this EOS has identified the legislative requirements for an EOS under the REA Regulation and identified the reasons why an EOS is required for the Project. Section 2 provides a summary of the results of the records review and site investigation. Section 3 provides the EOS for wildlife habitat, and Section 4 provides the EOS for the wetland. Section 5 identifies the conclusions of the EOS, and the references are provided in Section 6.

1.4 Input to Evaluation of Significance from Consultation Activities

As required by Section 27 of O. Reg. 359/09, the evaluation of significance must consider information obtained through consultation with the public, aboriginal communities and municipalities and local authorities. Results of these consultation activities in relation to the evaluation of significance are discussed below.

1.5 Public Consultation

A public meeting was held on July 27, 2011 in association with this Project; notices for these meetings were published in the Cochrane Times Post. In addition, landowners within 120 m of the Project location have been mailed a notice of the proposed Project and meeting date.

To date, no information relating to natural features relevant to the evaluation of significance has been obtained through these consultation activities.

1.6 Aboriginal Consultation

Aboriginal communities identified by the Ministry of the Environment as communities to be consulted through the Renewable Energy Approval process have been mailed letters requesting information relating to the Project, along with a meeting notice and a copy of the Project Description Report.

To date, no information relating to natural features relevant to the evaluation of significance has been obtained through these consultation activities.

1.7 Municipal/Local Authority Consultation

Meetings have been held with the Hunta Local Roads Board. In addition, the Hunta Local Roads Board has received the notice of the public meeting, a copy of the Project Description Report, and a municipal consultation form.

To date, no information relating to natural features relevant to the evaluation of significance has been obtained through these consultation activities.

2. Summary of Results of Records Review and Site Investigation

As stated above, natural features requiring an evaluation of significance are identified through the records review (Hatch Ltd., 2012a) and site investigation (Hatch Ltd., 2012b) required under Sections 25 and 26 of the REA Regulation, respectively. These studies have already been completed, and the results are summarized in Table 2.1. This Report provides the evaluations for the features identified in Table 2.1.

Table 2.1 Natural Features on and within 120 m of the Project Location

Natural Feature	Project Location	Adjacent Lands (within 120 m)
ANSI – Earth Science	No	No
ANSI – Life Science	No	No
Wetland	Yes	Yes
Wildlife Habitat	Yes	Yes

3. Wildlife Habitat

Several types of candidate significant wildlife habitats were identified during the site investigation:

- waterfowl nesting habitat
- habitat for area-sensitive species
- wetland supporting amphibian breeding habitat
- specialized raptor nesting habitat
- habitat for species of conservation concern
- watercourses on and within 120 m of the Project location as an animal movement corridors
- wetlands.

3.1 Evaluation Criteria and Guidelines for Wildlife Habitat, and Determination of Significance

The criteria processes outlined in the Ministry of Natural Resources (MNR) Natural Heritage Assessment Guide (NHAG) (MNR, 2011) and Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) are used to evaluate the significance of wildlife habitat. The specific criteria used in the evaluation from these sources are discussed by habitat type below.

3.1.1 Seasonal Concentration Habitats

Criteria for evaluation of seasonal concentration habitats are identified within Table Q-1 of Appendix Q of the SWTHG. The criteria that were considered during the evaluation of these features are discussed in respect of the individual features below.

3.1.1.1 Waterfowl Nesting Habitat

In order to evaluate the significance of waterfowl nesting habitat found along the creek, area searches were completed along the riparian habitat to search for evidence of nesting waterfowl (i.e., flushing

from nest, waterfowl within creek, etc). Surveys were completed twice during the waterfowl breeding season, the first occurring during the pair establishment/nest initiation phase in mid May, and the second during the nesting phase in late June. Surveys were completed within the boundaries of the habitat as depicted in Figure 1.1. Details of the surveys are provided below:

- Site Investigation 1
  - Date, Times and Duration of Site Investigation
    - Date: May 18, 2011
    - Start Time: 0830
    - End Time: 1430
    - Duration: 6 hours.
  - Weather Conditions During Site Investigation
    - Temperature: 13 to 20°C
    - Beaufort Wind: 3
    - Cloud Cover: 50 to 70%.
  - Name and Qualifications of Person Conducting Site Investigation
    - This site investigation was completed by Caleb Coughlin and Shelley Potter. Their qualifications are provided below
      - Caleb is an environmental technologist with experience in fisheries and fish habitat assessments. Recent projects have included spawning surveys (Muskoka and Trout Lake rivers), Riverine Index Netting (White Lake and Mattagami River), Fall Walleye Index Netting (Mattagami River), forage fish collection, Brook Trout mark and recapture studies and Ontario Broad-scale Monitoring (OBM). A recent study required a complete fish community inventory involving electrofishing, trap netting and seine netting (Shickluna Hydro Development). He has participated in a number of other resource management studies focusing on aquatic and terrestrial ecosystems including assessments of natural heritage features, aquatic invasive species, avian populations, amphibian and reptile populations, large mammals, furbearers and sustainable forestry practises.
      - Shelley Potter is an environmental professional with a marine and freshwater biology honours graduate from the University of Guelph. Previous work and internships have provided experience in the fields of environmental science, sustainable development, water conservation and analysis, fresh water biology, marine mammal biology, Ichthyology and Oceanography. Shelley recently completed an internship with the University of Queensland working with Dr. Mike Noad at the Humpback Whale Acoustic Research Collaboration. Marine Mammal Observing experience, acoustic recording experience and ability to geographically track migration patterns of humpback whales using a theodolite and Cyclops

computer program was acquired. Shelley has also recently participated in terrestrial and aquatic field surveys for various renewable energy projects in Ontario.

- Site Investigation 2
  - Date, Times and Duration of Site Investigation
    - Date: June 23, 2011
    - Start Time: 0530
    - End Time: 09:00
    - Duration: 3.5 hours.
  - Weather Conditions During Site Investigation
    - Temperature: 16°C
    - Beaufort Wind: 1 to 2.
    - Cloud Cover: 100%.
  - Name and Qualifications of Person Conducting Site Investigation
    - Names and qualifications of NRSI staff conducting the site investigations are provided in Appendix A.

During the site investigations, Mallard and Canada Goose were the only two species of waterfowl recorded. Of these species, 6 mallards were observed during the first site investigation, while 3 individuals and 1 pair were recorded during the site investigation. A single Canada Goose was noted during the second site investigation.

The results of these site investigations were then used to assess the criteria for significant waterfowl nesting habitat:

- Relative importance of the site to local waterfowl populations – Wetland communities are very common within this portion of the province, and therefore this site of relatively low importance and this criteria is not met.
- Presence of species of conservation concern – No waterfowl species of conservation concern were identified during the site investigation in the candidate significant waterfowl nesting area and therefore this criteria is not met.
- Species diversity – Mallard and Canada Goose were the only two species were recorded, therefore species diversity is low and this criteria is not met.
- Abundance – There were fewer than 10 or more nesting pairs of these species observed, therefore abundance is low and this criteria is not met.
- Size of area – This site provides a fairly large area of wetland and adjacent upland habitat, therefore this criteria is met.
- Quality of habitat – This site is of good quality and therefore this criteria is met.

- Location of site – The nesting habitat is located immediately adjacent to the wetland/water body, and therefore this criteria is met.
- Nest predation – Rates of nest predation are unknown.
- Level of disturbance – The site is fairly disturbed as a result of livestock and haying activity, therefore this criteria is not met.

Though the waterfowl nesting area met criteria for size, quality and location, it did not meet the criteria for species diversity or abundance, which are of greater import in determining significance. Therefore, this is not a significant waterfowl nesting area.

3.1.2 Specialized Wildlife Habitat

Criteria for evaluation of specialized habitat for wildlife are identified within Table Q-2 of Appendix Q of the SWTHG. The criteria that were considered during the evaluation of these features are discussed in respect of the individual features below.

3.1.2.1 Specialized Raptor Nesting Habitat

Nests of Red-tailed Hawks are not a species that contributes to identification specialized raptor nesting habitats within other EcoRegions (MNR, 2009), and therefore it is determined that they would not contribute to identification of candidate significant raptor-nesting in this EcoRegion. Therefore, the identified nest is not a significant wildlife habitat.

3.1.2.2 Habitat for Area-Sensitive Grassland Birds

Area-sensitive grassland birds were assessed through a random area search of suitable habitats during the breeding season. The search area is shown in Figure 3.1. Details of this survey are provided below (note: duration includes area searches of all habitat types).

- Date, Times and Duration of Site Investigation
  - Date: June 23, 2011
  - Start Time: 0530
  - End Time: 1048
  - Duration: 3.5 hours on and within 120 m of the Project location.
- Weather Conditions During Site Investigation
  - Temperature: 16°C
  - Beaufort Wind: 1 to 2.
  - Cloud Cover: 100%.
- Name and Qualifications of Person Conducting Site Investigation
  - Names and qualifications of NRSI staff conducting the site investigations are provided in Appendix A.

Of the birds recorded, two are considered to be area-sensitive grassland birds; Northern Harrier and Sandhill Crane. Northern Harrier were observed cruising over the site during the breeding bird survey, no evidence of breeding was recorded. A pair of Sandhill Cranes was observed foraging within the agricultural fields. The results of the survey were compared against the criteria for area-sensitive species:

- Presence of rare, uncommon or declining species – Neither species are a rare, uncommon or declining species, and therefore this criteria is not met.
- Overall area of site – There are more than 60 ha of grassland and wetland community providing suitable habitat for these species, therefore this criteria is met.
- Amount of vertical stratification of site – There is little vertical stratification within the wetland/grassland community, therefore this criteria is not met.
- Degree of disturbance on site – There is active livestock foraging within the grassland, therefore this criteria is not met.
- Amount of adjacent residential development – There are occasional residences, but no true residential development, therefore this criteria is met.
- Current representation of habitat in planning area – This habitat is relatively common within the local area as a result of other farm operations in the community of Hunta, therefore this criteria is not met.
- Provision of significant wildlife habitat – There are no other candidate significant habitats associated with the grassland community, and therefore this criteria is not met.

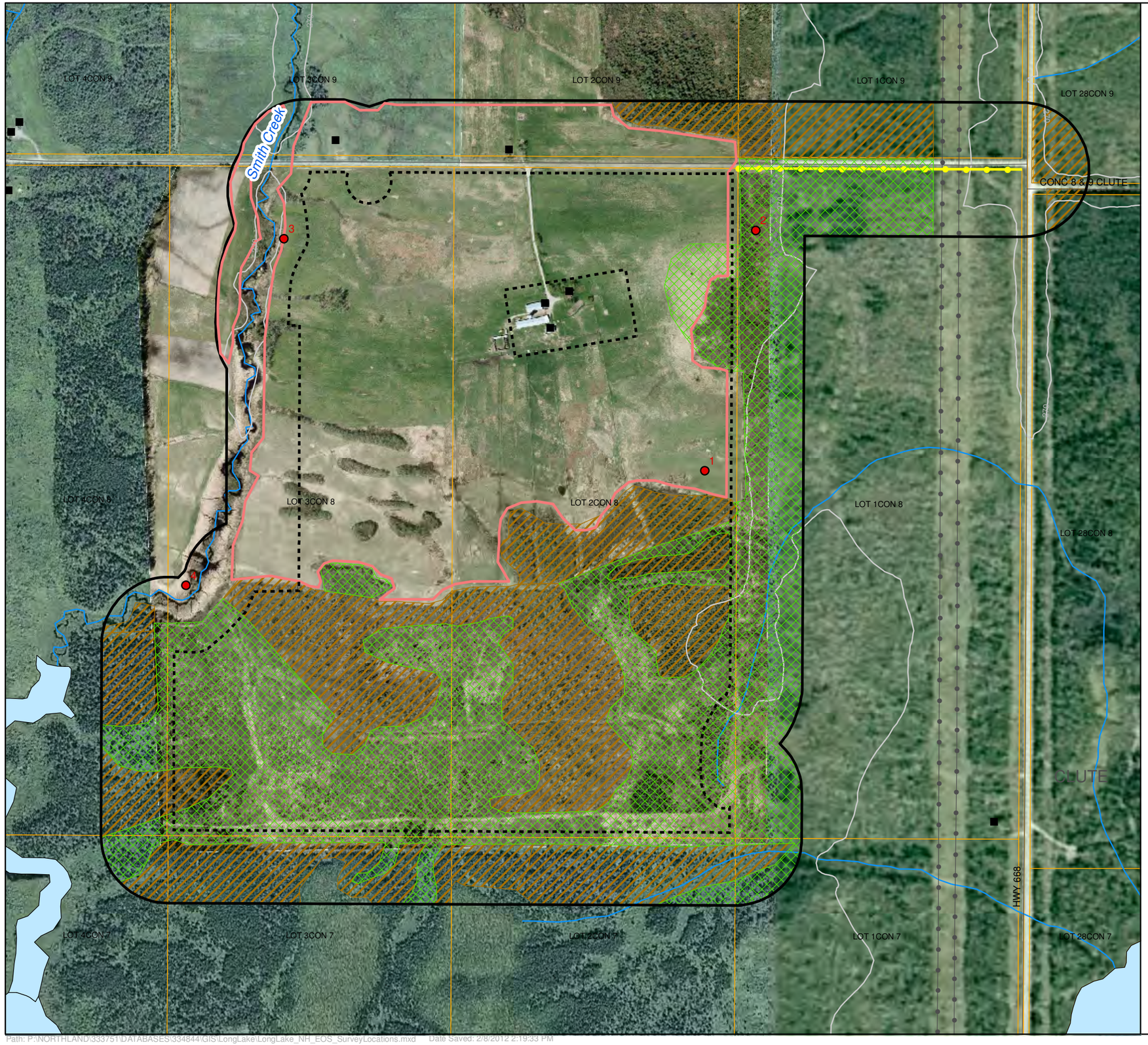
Therefore, though the criteria for area and adjacent residential development are met, the availability of suitable habitat and degree of disturbance on site indicate that this is not a significant wildlife habitat.

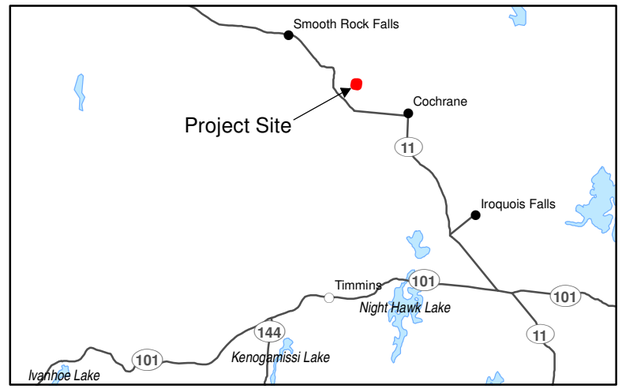
3.1.2.3 Habitat for Area-Sensitive Shrubland Species

Area-sensitive shrubland birds were assessed through a random area search of suitable habitats during the breeding season. The search area is shown in Figure 3.1. Details of this survey are provided in Section 3.1.2.2.

Of the birds detected, two were considered to be area-sensitive shrubland species; Blue-headed Vireo and Hermit Thrush. A singing male Blue-headed Vireo and seven singing male Hermit Thrush were recorded within a shrub thicket within 120 m east of the Project location, which three singing male veery were recorded within the tall shrub swamp on the southern portion of the Project location. These results were then compared against the criteria for area-sensitive species:

- Presence of rare, uncommon or declining species – These species are not rare, uncommon or declining species, and therefore this criteria is not met.
- Overall area of site – Neither thicket community is 30 ha or larger in size, and therefore does not meet the criteria for size.





LEGEND

- Building
- Road
- Transmission Line
- Watercourse
- Parcel
- Waterbody

Survey Locations

- Amphibian Call Monitoring / Evening Bird Survey Locations
- Area Sensitive Grassland Habitat Survey Area
- Area Sensitive Shrubland Habitat Survey Area
- Area Sensitive Woodland Habitat Survey Area

Project Components

- Proposed Transmission Line
- 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 2004.
4. Airphoto obtained from Northland Power Inc., flown May 2011.

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NORTH

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Figure 3.1
Northland Power Inc.
Long Lake Solar Project
Natural Heritage Evaluation of Significance Survey Locations

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Path: P:\NORTHLAND\333751\DATABASES\334844\GIS\LongLake\LongLake_NH_EOS_SurveyLocations.mxd Date Saved: 2/8/2012 2:19:33 PM

back of Fig 3.1

- Amount of vertical stratification of site – There is limited vertical stratification within the thicket communities.
- Degree of disturbance on site – There was no evidence of disturbance within the thicket community east of the Project location, however the tall shrub swamp on the Project location showed evidence of recent forestry activities.
- Amount of adjacent residential development – There are occasional residences, but no true residential development, therefore this criteria is met.
- Current representation of habitat in planning area – This habitat is abundantly available within the planning area, therefore this criteria is not met.
- Provision of significant wildlife habitat – There are no other candidate significant habitats associated with the thicket community, and therefore this criteria is not met

Therefore, the majority of the criteria were not met, including that of habitat size which is of primary importance, and therefore this is determined to not be a significant wildlife habitat type.

3.1.2.4 Habitat for Area-Sensitive Woodland Species

Area-sensitive woodland birds were assessed through a random area search of suitable habitats during the breeding season. The search area is shown in Figure 3.1. Details of this survey are provided in Section 3.1.2.2.

Of the birds species recorded, two were considered to be area-sensitive woodland species; Black-and White Warbler and Ovenbird. Eight singing male Black-and-White Warblers were recorded within the regenerating woodland communities along the eastern portion of the Project location. A singing male Ovenbird was recorded within an area of coniferous swamp within 120 m southwest of the Project location. These results were then compared against the criteria for area-sensitive species:

- Presence of rare, uncommon or declining species – Neither species is a rare, uncommon or declining species, and therefore this criteria is not met.
- Overall area of site – The forest community on and within 120 m of the Project location are part of a large network of forests, and therefore this criteria is met.
- Area of forest interior contained within the forest stand – With respect to the woodland in which the Black-and-White Warbler was observed, as a result of forestry operations, there is presently no forest interior present within the forest stand on or within 120 m of the Project location. With respect to the woodland in which the Ovenbird was observed, there are several gaps within the forest community, and therefore there is no forest interior present within this patch. Therefore, this criteria is not met.
- Age and tree composition of forest stand – With respect to the woodland in which the Black-and-White Warbler was observed, as a result of recent clear-cutting activities there is not an abundance of mature trees within the forest stand on the Project location. With respect to the woodland in which the Ovenbird was observed, tree composition is trembling aspen/black spruce. Age is mid-aged. Therefore this criteria is not met.

- Amount of vertical stratification of site – Given recent clear-cutting within the forest stand, vertical stratification was not present within the forests on the Project location.
- Amount of contiguous closed-canopy/open areas in forest stand – With respect to the woodland in which the Black-and-White Warbler was observed, as a result of recent forestry operations, there is limited availability of closed canopy forest within the stand, therefore this criteria is not met. With respect to the woodland in which the Ovenbird was observed, the forest has a fairly contiguous closed canopy.
- Degree of disturbance on site – Recent forestry activity was noted within the forest community on the Project location, and therefore this criteria is not met.
- Amount of adjacent residential development – There are occasional residences, but no true residential development, therefore this criteria is met.
- Current representation of habitat in planning area – This habitat is abundantly available within the planning area, therefore this criteria is not met.
- Provision of significant wildlife habitat – This woodland community is also candidate significant moose habitat, and therefore this criteria is not met as only one other candidate significant wildlife habitat was identified.

Therefore, as a result of the recent forestry operations, the absence of a rare, uncommon or declining species, and availability of suitable habitat, the woodland community is not providing significant area-sensitive habitat for woodland birds.

3.1.2.5 Wetlands Supporting Amphibian Breeding Habitat

Wetlands supporting amphibian breeding habitat were identified within the wetland communities around Smith Creek within 120 m west of the Project location. In order to evaluate the significance of wetlands supporting amphibian breeding habitat, amphibian calling surveys were completed at various points within the wetland community on two separate occasions. Surveys were completed in accordance with the protocols outlined in the Marsh Monitoring Program, which consists of 180 deg, 3-minute point counts, completed either after sunset or after 2200 hours. Survey locations are shown in Figure 3.1. Details of the surveys are provided below:

- Site Investigation 1
  - Date, Times and Duration of Site Investigation
    - Date: May 18, 2011
    - Start Time: 2014
    - End Time: 2045
    - Duration: 30 minutes.
  - Weather Conditions During Site Investigation
    - Temperature: 18 to 19°C
    - Beaufort Wind: 0

- Cloud Cover: 0%.

- Name and Qualifications of Person Conducting Site Investigation
  - This site investigation was completed by Caleb Coughlin and Norm Bolton. Caleb's qualifications were provided previously in Section 3.1.1.1. Qualifications for Norm Bolton are provided below.
    - Norm Bolton is a Fish and Wildlife Technologist with 5 years experience of multidisciplinary 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 broad scale 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.

- Site Investigation 2
  - Date, Times and Duration of Site Investigation
    - Date: June 24, 2011
    - Start Time: 2200
    - End Time: 2400
    - Duration: 2 hours.
  - Weather Conditions During Site Investigation
    - Temperature: 15°C
    - Beaufort Wind: 5 (light rain).
  - Name and Qualifications of Person Conducting Site Investigation
    - Names and qualifications of NRSI staff conducting the site investigations are provided in Appendix A.

During the site investigations, Mallard and Canada Goose were the only two species of waterfowl recorded. Of these species, 6 mallards were observed during the first site investigation, while 3 individuals and 1 pair were recorded during the site investigation. A single Canada Goose was noted during the second site investigation.

The results of these site investigations were then used to assess the criteria for significant wetlands supporting amphibian breeding habitat:

- Provision of significant wildlife habitat – The wetland community is also considered to be candidate significant animal movement corridor, and therefore this criteria is not met as only one other candidate significant wildlife habitat was identified.

- Degree of permanence – It is expected that water is permanently found within Smith Creek, therefore this criteria is met.
- Species diversity of pond – Five species of frog (Mink Frog, Green Frog, Spring Peeper, American Toad, Wood Frog) were recorded during amphibian surveys. Therefore, species diversity of the ponds is considered to be high.
- Presence of rare species – No rare species were identified during the baseline surveys.
- Size and number of ponds – The wetland community is a relatively large and therefore this criteria is met.
- Diversity of submergent and emergent vegetation – A diversity of submergent and emergent vegetation was not recorded from the wetland community.
- Presence of shrubs, logs at edge of pond – Both tall and low shrubs were recorded within the wetland community, therefore this criteria is met.
- Adjacent forest habitat – Portions of the wetland community occur adjacent to forest communities, therefore this criteria is met.
- Water quality – Water quality is unknown.
- Level of disturbance – There is evidence of forestry activities within the forest community adjacent to the wetland, and livestock use of the wetland area would occur; therefore this criteria is not met.

Therefore, as the criteria for degree of permanence, species diversity, size, presence of shrubs and adjacent forest habitat have been met, this feature is determined to be a significant wetland supporting amphibian breeding habitat.

3.1.3 Habitat for Species of Conservation Concern

3.1.3.1 Short-eared Owl

Area-searches of grassland habitats as previously described in Section 3.1.2.2 did not result in any observations of Short-eared Owl nesting occurrences. Further, Short-eared Owls were not recorded during any of the evening surveys completed in association with amphibian monitoring (see Section 3.1.2.6). As a result, it is determined that they are not present on or within 120 m of the Project location.

3.1.3.2 Canada Warbler

Area searches of woodland habitats, as previously described in Section 3.1.2.5 did not result in any observations of Canada Warbler. As a result, it is determined that they are not present on or within 120 m of the Project location.

3.1.3.3 Olive-sided Flycatcher

Area searches of woodland and wetland habitats, as previously described in Sections 3.1.2.5 and 3.1.2.3, respectively, did not result in any observations of Olive-sided Flycatcher. As a result, it is determined that they are not present on or within 120 m of the Project location.

3.1.3.4 Common Nighthawk

Evening bird surveys were completed in conjunction with the second site investigation for wetlands supporting amphibian breeding habitat (see Section 3.1.2.6 for details of timing and weather conditions). Survey locations are shown in Figure 3.1. No Common Nighthawk were recorded during the surveys on or within 120 m of the Project location.

3.1.3.5 Carex haydenii

This species was not detected during vegetation surveys of suitable habitats on and within 120 m of the Project location. Details of vegetation surveys have been previously identified in the Natural Heritage Site Investigations Report (Hatch, 2012b).

3.1.3.6 Carex loliacea

This species was not detected during vegetation surveys of suitable habitats on and within 120 m of the Project location. Details of vegetation surveys have been previously identified in the Natural Heritage Site Investigations Report (Hatch, 2012b).

3.1.3.7 Carex wiegandii

This species was not detected during vegetation surveys of suitable habitats on and within 120 m of the Project location. Details of vegetation surveys have been previously identified in the Natural Heritage Site Investigations Report (Hatch, 2012b).

3.1.3.8 Scirpus heterochaetus

This species was not detected during vegetation surveys of suitable habitats on and within 120 m of the Project location. Details of vegetation surveys have been previously identified in the Natural Heritage Site Investigations Report (Hatch, 2012b).

3.1.4 Animal Movement Corridors

A candidate significant animal movement was identified in association with Smith Creek and the associated riparian habitat. Evaluation of animal movement corridors is identified within Section 8.7 of the SWHTG. The criteria for significance are outlined in Table Q-4 of Appendix Q in the SWHTG, and are provided below along with the evaluation for these features:

- Importance of areas to be linked by corridor – The corridor links Syndicate Lake with waterbodies farther north, likely providing linkage between breeding and foraging areas for a variety of wildlife species, therefore this criteria is met.
- Dimensions of corridor – The corridor near the Project location varies in width from 50 to 100 m, which is of moderate width, and therefore this criteria is not met.
- Continuity of corridor – The corridor is broken by a road, and therefore this criteria is not met.
- Habitat and habitat structure of corridor – As the corridor is adjacent to agricultural land in much of the Project location, and consists of a single habitat type, this criteria is not met.
- Species found in corridor or presumed to be using corridor – The corridor is assumed to be used by a wide array of species, and therefore this criteria is met.

- Risk of mortality for species using corridor – There is a moderate risk of mortality for species using the corridor given the presence of a road crossing, though not well travelled, and open agricultural lands adjacent to the corridor providing for ease of predator movement. Therefore, this criteria is not met.
- Opportunity for protection – As this feature is associated with a watercourse, opportunity for protection is good.
- Provision of other related values (such as erosion protection) – As this corridor includes riparian habitats, it provides protection for soil erosion and water quality, as well as for foraging opportunities for other wildlife species. Therefore, this criteria is met.

3.2 Date of Beginning and Completion of Evaluation

The evaluation of wildlife habitat commenced with records review in May 2010 and is finalized with the completion of this Report in January 2012. Site investigations were completed in association with this evaluation on August 24, 2010, and May 18, June 23, and June 24, 2011.

3.3 Overall Conclusion

Based on the evaluation above, the following significant wildlife habitat features were identified:

- wetlands supporting amphibian breeding habitats
- animal movement corridor associated with Smith Creek and associated riparian habitat.

3.4 Name and Qualifications of Evaluator

Evaluations of wildlife habitat were completed by Sean K. Male of Hatch.

Sean K. Male, M.Sc. is a Terrestrial Ecologist specializing in assessments of terrestrial habitat, flora and fauna. Sean received his Bachelors of Science (Honours) in Biology from Queen's University, where he completed his Honour's thesis under Dr. Raleigh J. Robertson, studying the impacts of nestbox density in Tree Swallows (*Tachycineta bicolor*) on nest-building behaviour. He then completed a Master's of Science degree in the Watershed Ecosystem Graduate Program at Trent University under Dr. Erica Nol. Sean's thesis focussed on examining the impacts of a Canadian diamond mine on a population of breeding passerines. For his thesis, Sean spent two summers in the Canadian arctic studying populations of Lapland Longspurs (*Calcarius lapponicus*) around the Ekati Diamond Mine, located 300 km northeast of Yellowknife. While at Trent, Sean participated in the Northern Saw-whet Owl (*Aegoius acadicus*) Migration Banding Project at the Oliver Centre. Following his time at Trent, Sean participated in the Landscape Monitoring Program, participating in a study of the impacts of woodlot size on breeding birds.

Sean joined Hatch as a Terrestrial Ecologist in 2006. Since joining Hatch, Sean has participated in several environmental assessments, REAs and other regulatory approvals for hydro, wind and solar power developments as the terrestrial biologist specializing in field investigations identifying flora and fauna species, including species of significance. He has developed and implemented baseline monitoring and impact assessment programs for both terrestrial wildlife and plant communities, including detailed bird and bat studies for several wind power developments, including the proposed 100-MW Coldwell wind power development near Marathon, Ontario, a proposed 20-MW facility

near Port Dover, Ontario, and a proposed 110-MW wind facility in southwestern Ontario. Sean has also conducted terrestrial and wetland vegetation surveys for several proposed hydropower projects totalling over 40 MW in southern and northern Ontario and has participated in fisheries surveys for several of these projects.

4. Wetlands

The evaluation of the wetland communities was completed separately and can be found in Appendix A. The conclusion of the wetland evaluation was that these communities are part of a provincially significant wetland complex.

5. Conclusions

Results of the EOS are summarized in Table 5.1. Based on the EOS outlined above, there is significant wildlife habitat and significant woodlands present on and within 120 m of the Project location. The locations of these features are shown in Figure 1.1.

An environmental impact study conducted according to the requirements of Section 38(2) of O. Reg. 359/09 will be required in order to construct the Project within 120 m of these significant natural features.

Table 5.1 Significant Natural Features on and within 120 m of the Project Location

Natural Feature		Project Location	Adjacent Lands (within 120 m)
SIGNIFICANT	Wildlife Habitat	No	Yes
PROVINCIALLY SIGNIFICANT	Wetland	Yes	Yes
	Earth Science ANSI	No	No
	Life Science ANSI	No	No

6. References

Hatch Ltd. 2012a. Long Lake Solar Project – Natural Heritage Records Review Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Long Lake L.P.

Hatch Ltd. 2012b. Long Lake Solar Project – Natural Heritage Site Investigations Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Long Lake L.P.

Ministry of Natural Resources (MNR). 2011. Natural Heritage Assessment Guide for Renewable Energy Projects. Toronto: Queen's Printer for Ontario. 248 pp.

MNR. 2000. Significant Wildlife Habitat Technical Guide. 151p.

Appendix A

Natural Resource Solutions Inc., Summary of Wetland and Upland Vegetation Mapping, Breeding/Evening Bird and Amphibian Call Surveys

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

1247A

February 1, 2012

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

Dear Mr. Male,

RE: Long Lake Solar Project
Summary of Wetland & Upland Vegetation Mapping,
Breeding/Evening Bird, Eagle 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 23, 2011 (0530 - 1230hrs, weather 16℃, 100% cloud cover, wind - Beaufort scale 1 to 2). 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.

Upland vegetation on the subject property and within 120m was described using the Forest Ecosystem Classification system (Taylor *et al.* 2000). Since this system focuses on woodland habitats, the standard Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.* 1998; Lee 2008) was used to classify meadow, thicket and other habitats not covered by the FEC.

In addition, a catchment basin boundary was identified that included the on-site wetlands and extended for several kilometers to the north, west and east. The limits of the proposed catchment basin were provided to the OMNR for review and comment. 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).

Please see Appendix II for a list of polygon labels. A map of the vegetation communities within the wetland complex is included with the wetland evaluation, Appendix III.

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 24, 2011 (2200 - 2400hrs, weather 15℃, light rain, 100% cloud cover, wind - Beaufort scale 5, water temperature 18℃). The standard Marsh Monitoring Protocol (Bird Studies Canada 2009) was used in which a team of two biologists conducted 3 minute point counts at predetermined stations (monitored previously by staff of Hatch). The locations of these stations are shown on the vegetation map in Appendix II.

No standing water was present at Station 1, and no amphibians were heard. No standing water was present at Station 2 either, but northern spring peepers (*Pseudacris crucifer crucifer*) were heard calling north of the station (approximately 150m). No amphibians were heard during surveys at Station 3, but mink frogs (*Rana septentrionalis*) were heard during vegetation surveys. Nothing was heard at Station 4.

The field data forms are included in Appendix IV.

Green Frog (*Rana clamitans melanota*) was also heard during the on-site breeding bird surveys.

Breeding Bird Surveys

On site breeding bird surveys were completed on June 23, 2011 (0530 - 0900hrs, weather 16℃, 100% cloud cover, wind - Beaufort scale 1 to 2) using the standard Ontario Breeding Bird methodology (Cadman *et al*. 2007). In this case an area search technique as described in OMNR (2010) was used to cover the entire property.

The field data forms are included in Appendix IV.

The following species were observed during that period:

Species Observed	Observed	Possible	Probable	Confirmed
Canada Goose (*Branta canadensis*)		S		
Mallard (*Anas platyrhynchos*)		P		
Common Loon (*Gavia immer*)		S		
Northern Harrier (*Circus cyaneus*)	X			
American Kestrel (*Falco sparverius*)		H		
Sandhill Crane (*Grus canadensis*)			P	
Wilson's Snipe (*Gallingo delicate*)			P	
Northern Flicker (*Colaptes auratus*)				DD
Alder Flycatcher (*Empidonax alnorum*)		S		
Blue-headed Vireo (*Vireo solitarius*)		S		

Species Observed	Observed	Possible	Probable	Confirmed
American Crow (*Corvus brachyrhynchos*)		S		
Barn Swallow (*Hirundo rustica*)		H		
Veery (*Catharus fuscescens*)		S		
Hermit Thrush (*Catharus guttatus*)		S		
American Robin (*Turdus migratorius*)			P	
European Starling (*Sturnus vulgaris*)		H		
Tennessee Warbler (*Vermivora peregrine*)		S		
Nashville Warbler (*Vermivora ruficapilla*)		S		
Yellow Warbler (*Dendroica petechia*)		S		
Yellow-rumped Warbler (*Dendroica coronata*)		S		
Black-and-white Warbler (*Mniotilta varia*)		S		
Ovenbird (*Seiurus aurocapillus*)		S		
Connecticut Warbler (*Oporornis agilis*)		S		
Mourning Warbler (*Oporornis philadelphia*)		S		
Common Yellowthroat (*Geothlypis trichas*)		S		
Chipping Sparrow (*Spizella passerine*)		S		
Vesper Sparrow (*Pooecetes gramineus*)		S		
Song Sparrow (*Melospiza melodia*)		S		
White-throated Sparrow (*Zonotrichia albicollis*)		S		
American Goldfinch (*Carduelis tristis*)		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:

Moose (tracks)	(*Alces alces*)
White-tailed Deer (scat)	(*Odocoileus virginianus*)
Snowshoe Hare	(*Lepus americanus*)
Red Fox	(*Vulpes vulpes*)

Evening Bird Surveys

Surveys for birds that are primarily active in the evening were conducted at the project site. The surveys followed standard monitoring protocols developed for species such as whip-poor-will and common nighthawk (the two focus species for this survey) (OMNR 2011).

In addition, neither of these bird species were detected at the 4 stations used for amphibian surveys on June 24, 2011 (2155 - 2232hrs). No evening birds were heard during amphibian call surveys on the same night.

Other species observed during evening bird surveys included:

White-throated Sparrow (*Zonotrichia albicollis*)

Bald Eagle Surveys

Bald eagle (*Haliaeetus leucocephalus*) surveys were conducted at Kennedy Lake and Syndicate Lake on June 23, 2011 (0920 -1048hrs, weather 16℃, overcast, 100% cloud cover, wind - Beaufort scale 1).

Two (2) point counts were conducted for 30 minute intervals at strategic locations on the shoreline (17U 480155 E 5442058 N for Kennedy Lake and 17U 477799 E 5441502 N for Syndicate Lake). As well, the shorelines were scanned with binoculars for large stick nests.

No bald eagles or stick nests were observed during this survey. No bald eagles were observed during vegetation or wildlife surveys on-site and in the catchment basin area.

Incidental wildlife species observed at Kennedy Lake on June 23, 2011, included:

Common Loon	(*Gavia immer*)
American Kestrel	(*Falco sparverius*)
Red-eyed Vireo	(*Corvus brachyrhynchosi*)
Tree Swallow	(*Tachycineta bicolor*)
American Robin	(*Turdus migratorius*)
White-throated Sparrow	(*Zonotrichia albicollis*)
Red-winged Blackbird	(*Agelaius phoeniceus*)
American Goldfinch	(*Carduelis tristis*)
Northern Spring Peeper	(*Pseudacris crucifer crucifer*)
Mink Frog	(*Rana septentrionalis*)
Beaver (lodge)	(*Castor canadensis*)

Wildlife observed at Syndicate Lake on June 23, 2011, included:

Red-eyed Vireo	(*Vireo olivaceus*)
American Robin	(*Turdus migratorius*)
American Redstart	(*Setophaga ruticilla)*

Common Yellowthroat	(*Geothlypis trichas*)
Chipping Sparrow	(*Spizella passerina*)
Song Sparrow	(*Melospiza melodia*)
White-throated Sparrow	(*Zonotrichia albicollis*)
American Goldfinch	(*Carduelis tristis*)
American Toad	(*Bufo americanus*)
Mink Frog	(*Rana septentrionalis*)
Moose (scat, tracks)	(*Alces alces*)

I trust that this information is adequate. Please contact me if you have any questions.

Yours sincerely,
Natural Resource Solutions Inc.

David Stephenson, M.Sc.,
Senior Biologist

References

Bird Studies Canada. 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. Published by Bird Studies Canada in Cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage and A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario. Available online at: http://www.birdsontario.org/atlas/index.jsp

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Lee, H. 2008. Southern Ontario Ecological Land Classification - Vegetation Type List. Ontario Ministry of Natural Resources: London, Ontario.

Ontario Ministry of Natural Resources. 1993. Ontario Wetland Evaluation System. Northern Manual. Revised 1994 & 2002)

Ontario Ministry of Natural Resources. 2010. Birds and bird Habitats - Guidelines for Wind Power projects.

Ontario Ministry of Natural Resources. 2011. Northeast Nightjar Survey Techniques (Draft). Sudbury District MNR

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

Appendix I
Team Members

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
Katharina Walton	Terrestrial and Wetland Biologist Certified ELC	Reporting
Megan Pope	Terrestrial and Wetland Biologist	Site Assessment, Data Analysis, Reporting
Gerry Schaus	GIS Technician	Mapping

Appendix II
Vegetation Codes

Within Project Site and 120m boundary

$tsS_{1,2,}$:

[OWES: Tall Shrub Swamp]
h: balsam poplar (*Populus balsamifera ssp. balsamifera*), trembling aspen (*Populus tremuloides*)
c: black spruce (*Picea mariana*), tamarack (*Larix laricina*)
dc,dh,ds: black spruce (*Picea mariana*), balsam poplar (*Populus balsamifera ssp. balsamifera*), tamarack (*Larix laricina*)
*ts: speckled alder (*Alnus incana spp. rugosa*), willows (*Salix sp.*), poplars (*Populus sp.*)
ls: speckled alder (*Alnus incana spp. rugosa*), red raspberry (*Rubus idaeus ssp. idaeus*), willow (Salix sp.), trembling aspen (*Populus tremuloides*), red osier dogwood (*Cornus stolonifera*), Labrador tea (*Ledum groenlandicum*), low sweet blueberry (*Vaccinium angustifolium*)
gc: tall buttercup (*Ranunculus acris*), marsh marigold (*Caltha palustris*), strawberry (*Fragaria virginiana*), yellow avens (*Geum aleppicum*), dandelion (*Taraxacum officinale*)
ne: blue joint grass (*Calamagrostis canadensis*), bristly sedge (*Carex comosa*), path rush (*Juncus tenuis*)
re: common cattails (*Typha latifolia*)
m: moss sp., clubmoss sp.

$cS_{3,4,5,26,27,31}$:

[OWES: Conifer Swamp]
*c: black spruce (*Picea mariana*), tamarack (*Larix laricina*)
ts: speckled alder (*Alnus incana spp. rugosa*)
ls: Labrador tea (*Ledum groenlandicum*), speckled alder (*Alnus incana spp. rugosa*), creeping snowberry (*Gaultheria hispidula*)
gc: blue-bead lily (*Clintonia borealis*), wood horsetail (*Equisetum sylvaticum*), bunchberry (*Cornus canadensis*)
m: peat moss, caribou lichen

$hS_{6\text{-}17,34,36,38,39,45,50,53,54}$:

[OWES: Deciduous Swamp]
*h: trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera ssp. balsamifera*)
c: black spruce (*Picea mariana*)
dc,dh,ds: poplars (Populus sp.)
ts: speckled alder (*Alnus incana spp. rugosa*), mountain ash
ls: red raspberry (*Rubus idaeus ssp. idaeus*), red osier dogwood (*Cornus stolonifera*), alder leaved buckthorn (*Rhamnus alnifolia*), sheep laurel (*Kalmia angustifolia*), Labrador tea (*Ledum groenlandicum*), red currant (*Ribes rubrum*)
gc: wild strawberry (Fragaria virginiana), blue-bead lily (*Clintonia borealis*), bunchberry (*Cornus canadensis*), purple stem aster (*Symphyotrichum puniceum*)
ne: blue joint grass (*Calamagrostis canadensis*), sedge sp., Awl-fruited sedge (*Carex stipata*)
re: dark-green bulrush (*Scirpus atrovirens*)
m: moss

$cS_{18\text{-}20}$:

[OWES: Coniferous Swamp]
h: trembling aspen (*Populus tremuloides*)
c: black spruce (*Picea mariana*)
ts: willow (Salix sp.), speckled alder (*Alnus incana spp. rugosa*)
ls: Labrador tea (*Ledum groenlandicum*), red currant (Ribes rubrum), low sweet blueberry (*Vaccinium angustifolium*)
gc: wood horsetail (*Equisetum sylvaticum*), bunchberry (*Cornus canadensis*)
m: peat moss

$gcM_{21,\ 29,42}$:

[OWES: Graminoid Marsh]
ts: speckled alder (*Alnus incana spp. rugosa*), balsam poplar (*Populus balsamifera ssp. balsamifera*), willow (Salix sp.)
ls: willow (Salix sp.), red raspberry (*Rubus idaeus ssp. idaeus*), meadowsweet (*Filipendula ulmaria ssp. ulmaria*)
*gc: field horsetail (*Equisetum arvense*), marsh marigold (*Caltha palustris*), bird's foot trefoil (*Lotus corniculatus*), tuffed vetch (*Vicia cracca*), red clover (*Trifolium pretense*), forget-me-not (Myosotis sp.), meadowrue (Thalictrum sp.)
ne: blue joint grass (*Calamagrostis canadensis*), dark-green bulrush (*Scirpus atrovirens*)
F: yellow pond lily (Nuphar sp.)

$tsM_{22,23}$:

[OWES: Tall Shrub Marsh]
h: trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera ssp. balsamifera*)
ts: speckled alder (*Alnus incana spp. rugosa*), willow (Salix sp.)
ls: red raspberry (*Rubus idaeus ssp. idaeus*), meadow-sweet (*Spiraea chamaedryfolia*), willow (Salix sp.)
gc: meadowrue (Thalictrum sp.), yellow avens (*Geum aleppicum*), pale touch-me-not (*Impatiens palidia*), field horsetail (*Equisetum arvense*)
ne: blue joint grass (*Calamagrostis canadensis*), fox sedge (*Carex vulpinoidea*)

$hS_{24,25,29,30,32,35,37,43,44,46,47\text{-}49,52,55}$:

[OWES: Deciduous Swamp]
*h: trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera ssp. balsamifera*), tamarack (*Larix laricina*)
c: black spruce (*Picea mariana*), balsam fir (*Abies balsamea*)
dc,dh,ds: poplars (Populus sp.), spruce (Picea sp.)
ts: speckled alder (*Alnus incana spp. rugosa*), trembling aspen (*Populus tremuloides*)
ls: alder-leaved buckthorn (*Rhamnus alnifolia*), red currant (*Ribes rubrum*)
gc: meadow rue (Thalictrum sp.), bracken fern (*Pteridium aquilinum var. latiusculum*), strawberry (*Fragaria virginiana*), bunchberry (*Cornus canadensis*), lady fern (*Athyrium filix-femina var. angustum*)
ne: sedge sp.
m: moss sp.

$tsS_{30,41}$:

[OWES: Tall Shrub Swamp]
h: white birch (*Betula papyrifera*)
c: tamarack (*Larix laricina*), black spruce (*Picea mariana*)
dc,dh,ds: birch (Betula sp.)
ts: speckled alder (*Alnus incana spp. rugosa*), willow (Salix sp.)
ls: speckled alder (*Alnus incana spp. rugosa*), willow (Salix sp.), red osier dogwood (*Cornus stolonifera*), Labrador tea (*Ledum groenlandicum*)
ne: aquatic sedge (*Carex aquatilis*), blue joint grass (*Calamagrostis canadensis*)
re: dark-green bulrush (*Scirpus atrovirens*)

lsB_{28}:

[OWES: Low Shrub Bog]
c: tamarack (*Larix laricina*), black spruce (*Picea mariana*)
dc,dh,ds: spruce (Picea sp.)
ts: tamarack (*Larix laricina*), black spruce (*Picea mariana*)
ls: Labrador tea (*Ledum groenlandicum*), sheep sorrel (*Rumex acetosella*), bog laurel (*Kalmia polifolia*), low sweet blueberry (*Vaccinium angustifolium*)
gc: Canada mayflower (*Maianthemum canadense*) m:
peat moss

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

$tsS_{33,40}$:

[OWES: Tall Shrub Swamp]

$cS_{26,27,31}$:

[OWES: Conifer Swamp]

$hS_{34,36,38,39,45,50,53,54}$:

[OWES: Deciduous Swamp]

gcM_{42}:

[OWES: Graminoid Marsh]

$hS_{24,\ 29,30,32,35,37,43,44,46,47\text{-}49,52,55}$:

[OWES: Deciduous Swamp]

$tsS_{30,41}$:

[OWES: Tall Shrub Swamp]

lsB_{28}:

[OWES: Low Shrub Bog]

APPENDIX III
Wetland Evaluation

Long Lake Wetland Complex	
Wetland Evaluation Edition	2012
February 1, 2012	

Comments
Attached Documents include:
1) Map of Long Lake Wetland Complex
2) Reasons for including wetlands less than 0.5 ha
3) List of vegetation communities
4) Summary of Wetland types, site types and dominant form areas
5) Map of Interspersion
6) List of Research and Studies
7) Map of Long Lake Wetland Complex Catchment Basin
8) List of Significant Species
9) List of fish species in and around Long Lake Wetland Complex
10) Vascular Plant List
11) Fauna list

Additional Information

Official Name:	Long Lake Wetland Complex				
Evaluation Edition:	2012	Class:		Wetland ID.:	
Wetland Significance	Year/Month Last Evaluated			February 1, 2012	
Provincially Significat	Year/Month Last Updated				
Special Planning Considerations:					

Scores	
Biological:	158
Social:	95
Hydrological:	215
Special Features:	250
Overall:	717

Submitted by:	Natural Resources Solutions Inc.
Date:	February 1, 2012

General Directions

1 Blue shaded boxes require a numerical response except for those boxes with a zero value.
Those boxes have been linked to corresponding values and formulas and should not need any input.
Change these boxes only where necessary.
Blue boxes with no zero value require a numerical input according to directions.

2 Orange shaded boxes are section totals and have been linked to corresponding fields and formulas.
Change these boxes only where necessary
Orange boxes with no zero value require a numerical value according to directions.

3 Underlined fields without blue or orange shading require either an alpha capital letter "X" or a written explaination as per directions.

4 An exception to the above rules is page #2 "Size and Boundaries", the underlined fields require numeric values.

5 Start with the Identification Page as all other pages are linked to information inputted into it's fields. The Title page is to be completed last.

Long Lake Wetland Complex	
Wetland Evaluation Edition	2012
February 1, 2012	

Comments
Attached Documents include:
1) Map of Long Lake Wetland Complex
2) Reasons for including wetlands less than 0.5 ha
3) List of vegetation communities
4) Summary of Wetland types, site types and dominant form areas
5) Map of Interspersion
6) List of Research and Studies
7) Map of Long Lake Wetland Complex Catchment Basin
8) List of Significant Species
9) List of fish species in and around Long Lake Wetland Complex
10) Vascular Plant List
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Additional Information

Official Name:	Long Lake Wetland Complex				
Evaluation Edition:	2012	Class:		Wetland ID.:	
Wetland Significance	Year/Month Last Evaluated			February 1, 2012	
Provincially Significat	Year/Month Last Updated				
Special Planning Considerations:					

Scores	
Biological:	158
Social:	95
Hydrological:	215
Special Features:	250
Overall:	717

Submitted by:	Natural Resources Solutions Inc.
Date:	February 1, 2012

Northern Ontario Wetland Evaluation, Data and Scoring Record **(DATE)**

WETLAND DATA AND SCORING RECORD

i) **WETLAND NAME:** **Long Lake 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:** **Calder Con. 7 Lots 1-6, Con. 8 Lots 1-7, Con. 9 Lots 1-9,**
(attach separate sheet if necessary) **Con. 10 Lots 1-9, Con. 11 Lots 3-9; Clute Con. 6 Lots 26-28,**
Con. 7 Lots 26-28, Con. 8 Lots 26-28, Con. 9 Lots 25-28, Con. 10 Lots 25-28

vii) **MAP AND AIR PHOTO REFERENCES**

a) Latitude: _____ Longitude: _____

b) UTM grid reference: Zone: **17** Block: _____
Grid:E 470000 N 5445000

c) National Topographic Series:

map name(s) _____

map number(s) _____ edition _____

scale **1:22,000**

d) Aerial photographs: Date photo taken: _____ Scale: _____
Google Earth image: July 16, 2004

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)		Size of each wetland unit				
		Isolated	Palustrine	Riverine	Lacustrine	
Wetland Unit No.	WET-001		94.20			ha
Wetland Unit No.	WET-002		1116.71	203.35	21.60	ha
Wetland Unit No.	WET-003		2.25			ha
Wetland Unit No.	WET-004		0.60			ha
Wetland Unit No.	WET-005	0.17				ha
Wetland Unit No.	WET-006	0.16				ha
Wetland Unit No.	WET-007	0.18				ha
Wetland Unit No.	WET-008	0.42				ha
Wetland Unit No.	WET-009		41.16		20.16	ha
Wetland Unit No.	WET-010		67.62			ha
Wetland Unit No.	WET-011		0.63			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:		0.93	1323.17	203.35	41.76	

(Attach additional sheets if necessary)

TOTAL WETLAND SIZE 1569.21 ha

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

Small wetlands fall within the project area boundary of the solar park. They would have been connected to each other at one time, but now have been disturbed by agriculture. This has also disturbed their natural flow patterns and has isolated wetlands 5-8.

The wetland complex was defined by including all wetlands within 750m of each other within the catchment boundary. The catchment boundary was reviewed and approved by the MNR prior to the wetland evaluation being completed. The catchment boundary was drawn to include all contiguous wetlands.

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	
0.500	clay/loam
	silt/marl
	limestone
	sand
0.500	humic/mesic
	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	9.00
	silt/marl	0.00
	limestone	0.00
	sand	0.00
9	humic/mesic	4.50
	fibric	0.00
	granite	0.00

Final Score Growing Degree-Days/Soils (maximum 30 points) 14

Northern Ontario Wetland Evaluation, Data and Scoring Record (DATE)

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

	Fractional Area			Score
Bog	0.06	x	3	0.18
Fen		x	6	0.00
Swamp	0.89	x	8	7.12
Marsh	0.05	x	15	0.75

Wetland type score (maximum 15 points) 8.1

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

	Fractional Area				Score
Isolated	0.001	x	1	=	0.001
Palustrine (permanent or intermittent flow)	0.843	x	2	=	1.686
Riverine	0.147	x	4	=	0.587
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)	0.027	x	2	=	0.053
			Sub Total:		2.327

Site Type Score (maximum 5 points) 2.3

1.2 BIODIVERSITY

1.2.1 NUMBER OF WETLAND TYPES

(Check only one)			Score
1)		one	9 points
2)		two	13
3)	X	three	20
4)		four	30

Number of Wetland Types Score (maximum 30 points) 20

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 = 6.0	+.5 each additional community = 5.0	+ 1 each additional community =

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) 11.0

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Wetland Name: Long Lake Wetland Complex

Wetland Size (ha): 1569.21

Vegetation Form	% area in which form is dominant
h	7.56
c	52.64
dh	0.00
dc	0.00
ts	29.05
ls	5.49
ds	0.00
gc	3.19
m	0.00
ne	2.07
be	0.00
re	0.00
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
X	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
	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		24
9)	176 to 200		27
10)	>200	X	30

Interspersion Score (Choose one only maximum 30 points) 30

1.2.6 OPEN WATER TYPES

	Permanently flooded: (Check one)		Score
1)		type 1	8
2)	X	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

Northern Ontario wetland Evaluation Data and Scoring Record (DATE)

1.3 SIZE

1569.21 hectares 84 Subtotal for Biodiversity

Size Score (Biological Component) (maximum 5O points) 50

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)	X	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: Cochrane MNR office

Commercial Fish Score (maximum 12 points) 12

2.1.5 FURBEARERS

(Consult Appendix 9)

Name of furbearer		Source of information
1) beaver	3	Cochrane MNR office, field work
2) marten	3	Cochrane MNR office
3) red fox	3	field work
4)		
5)		

Scoring: 3 points for each species. maximum 12

Furbearer Score (maximum 12 points) 9

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		10	
3) 10 to 60 km from settlement	12		8	X	4	
4) >60 km from settlement	5		2		0	
5) >100 km from settlement	0		0		0	
		0		0		0

Name of settlement: Town of Cochrane

Proximity to Human Settlement Score (maximum 40 points) 8

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

Northern Ontario Wetland Evaluation, Data and Scoring Record (Date)

2.7 SIZE

1569.21 hectares 69 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) 18

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)		1569.21
(b)	Total area (ha) of upstream detention areas (include the wetland itself)		1635.00
(c)	Ratio of (a):(b)		0.96
(d)	Upstream detention factor: (c) x 2 = (maximum allowable factor = 1)	1.92	1.00

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

(a)	Wetland area (ha)		1569.21
(b)	Size of catchment basin (ha) upstream of wetland (include wetland itself in catchment area)		2649.52
(c)	Ratio of (a):(b)		0.59
(d)	Wetland attenuation factor: (c) x 10 = (maximum allowable factor = 1)	5.9	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) 90.0

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)

0.8438004	FA of isolated or palustrine wetland	x	20	=	16.88
0.1467936	FA of riverine wetland	x	5	=	0.73
0.0266121	FA of lacustrine wetland (wetland <50% lacustrine)	x	0	=	0.00

Site Type Score: (maximum 20 points) 18

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	0.0005927	x	0.5 =	0.0003	
Riverine	FA	0.1467936	x	1 =	0.15	
Palustrine with no inflow	FA		x	0.7 =	0.00	
Palustrine with inflows	FA	0.844	x	1 =	0.84	
Lacustrine on lake shoreline	FA	0.027	x	0.2 =	0.01	
Lacustrine at lake inflow or outflow	FA		x	1 =	0.00	
Watershed Improvement Score (IF x 30) (maximum = 30)						29.89

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*	X	15
Secondary corridor		11
Tertiary corridor		6
Temporary or abandoned		3
None		0
Score for LUU		15

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 19

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)	X	6
3)	Marshes and swamps with >50% organic soil		9
4)	Wetland with less than 10% of soils organic		0

Carbon Sink Score (maximum 15 points) 6

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	
Weland area: Upslope catchment area	Large (>50%) = 0		Moderate (6-50%) = 2		Small (<5%) = 5	5
Lagg Development	None found = 0	0	Minor = 2	0	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		4		20

(Scores are cumulative maximum score 30 points)

Groundwater Discharge Score (maximum 30 points) 29

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)

X	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 OR THREATENED 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 OR THREATENED SPECIES

	Name of species		Source of information
1)	Barn swallow	150	field work (breeding bird survey)
2)			
3)			
4)			
5)			
	Total:	150	

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) 150

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)	Connecticut warbler	*Oporornis agilis*	breeding bird survey
2)	Sandhill crane	*Grus canadensis*	breeding bird survey
3)	Vesper sparrow	*Pooecetes gramineus*	breeding bird survey
4)			
5)			
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) 40

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	X	10	X	10
5)	Not possible		0		0
6)	Not known		0		0
	Total:			0	

Source of information: MNR information (observation by district staff)

Waterfowl Moulting and Staging Score (maximum 150 points) 20

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

4.2.7 FISH HABITAT

4.2.7.1 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)

Northern Ontario Wetland Evaluation (DATE)

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)

_____ Low marsh not present (Continue to Step 5)
X 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	X	6.05	0.4	5	2.0
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)						2.0

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				11	0.0
3	Cattail-Bulrush-Burreed				5	0.0
4	Arrowhead-Pickerelweed	X	82.52	1	5	5.0
Total Score (maximum 25 points)						5.0

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)	=	2.0
Score for Spawning and Nursery Habitat (High Marsh) (maximum 25)	=	5.0
Score for Swamp Containing Fish Habitat (maximum 20)	=	0.0

Sum (maximum score 100 points) = 7

4.2.7.2 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	0.06	x	25	=	1.5
Fen, treed to open on deep soils floating mats or marl		x	20	=	0.0
Fen, on limestone rock		x	5	=	0.0
Swamp	0.89	x	3	=	2.7
Marsh	0.05	x	0	=	0.0
		Sub Total:			4.2

Ecosystem Age Score (maximum 25 points) 4

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	

Northern Ontario Wetland Evaluation, Data and Scoring Record (DATE)

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 23 and 24, 2011

DATE THIS EVALUATION COMPLETED: **October 18, 2011**

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

18 hours

WEATHER CONDITIONS

i) at time of field work weather 16°C, 100% cloud cover, wind – Beaufort scale 1 to 2
weather 15°C, light rain, 100% cloud cover, wind – Beaufort scale 5, water temperature 18°C
weather 16°C, overcast, 100% cloud cover, wind – Beaufort scale 1

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, bald eagle survey

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 (DATE)

WETLAND EVALUATION SCORING RECORD

WETLAND NAME Long Lake Wetland Complex

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

1.1.1	Growing Degree-Days/Soils	14	
1.1.2	Wetland Type	8	
1.1.3	Site Type	2	
	Total for Productivity		24

1.2 BIODIVERSITY

1.2.1	Number of Wetland Types	20	
1.2.2	Vegetation Communities (maxixmum 45)	11	
1.2.3	Diversity of Surrounding Habitat (maximum 7)	7	
1.2.4	Proximinty to Other Wetlands	8	
1.2.5	Interspersion	30	
1.2.6	Open Water Type	8	
	Total for Biodiversity		84
	Sub Total for Biodiversity	84	

1.3 SIZE (Biological Component) 50

TOTAL FOR BIOLOGICAL COMPONENT (not to exceed 250) 158

Northern Ontario Welland Evaluation (DATE)

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	9	
Total for Economically Valuable Products		45

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 8

2.6 OWNERSH1P 4

Subtotal for Social Component 69

2.7 SIZE (Social Component) 18

2.8 ABORIGINAL AND CULTURAL VALUES (maximum 30) 0

TOTAL FOR SOCIAL COMPONENT (not to exceed 250) 95

Northern Ontario Wetland Evaluation, Score Summary (DATE)

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION		90
3.2 GROUNDWATER RECHARGE		
3.2.1 Site Type	18	
3.2.2 Soils	7	
Total for Groundwater Recharge		25
3.3 WATER QUALITY IMPROVEMENT		
3.3.1 Watershed Improvement Factor	30	
3.3.2 Adjacent and Watershed Land Use	19	
3.3.3 Vegetation Form	8	
Total for Water Quality Improvement		57
3.4 CARBON SINK		6
3.5 SHORELINE EROSION CONTROL		8
3.6 GROUNDWATER DISCHARGE		29
TOTAL FOR HYDROLOGICAL COMPONENT (not to exceed 250)		215

Northern Ontario Wetland Evaluation, Score Summary (DATE)

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	150	
4.1.2.3	Provincially Significant Animals	0	
4.1.2.4	Provincially Significant Plants	0	
4.1.2.5	Regionally Significant Species	40	
4.1.2.6	Locally Significant Species	0	
4.1.2.7	Species of Special Status	0	
	Total for Species Rarity		190

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	20	
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		87

4.3	ECOSYSTEM AGE	4
4.4	GREAT LAKES COASTAL WETLANDS	0
	Subtotal:	321
	TOTAL FOR SPECIAL FEATURES (maximum 250)	250

Northern Ontario Wetland Evaluation, Score Summary (DATE)

SUMMARY OF EVALUATION RESULT

Wetland	Long Lake Wetland Complex
TOTAL FOR 1.0 BIOLOGICAL COMPONENT	158
TOTAL FOR 2.0 SOCIAL COMPONENT	95
TOTAL FOR 3.0 HYDROLOGICAL COMPONENT	215
TOTAL FOR 4.0 SPECIAL FEATURES COMPONENT	250
WETLAND TOTAL	717

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.

DATE February 1, 2012

Species Observed		Vegetation Survey	Amphibian Survey	Breeding Bird Survey	Nocturnal Bird Survey	Eagle Survey
Amphibians & Reptiles						
American toad	*Bufo americanus*					x
Green frog	*Rana clamitans melanota*			x		
Mink frog	*Rana septentrionalis*			x		x
Spring peeper	*Pseudacris crucifer crucifer*		x		x	x
Wood frog	*Rana sylvatica*	(Reported by Hatch)				
Birds						
Alder flycatcher	*Empidonax alnorum*			x		
American bittern	*Botaurus lentiginosus*	x				
American crow	*Corvus brachyrhynchos*			x		x
American goldfinch	*Carduelis tristis*			x		x
American kestrel	*Falco sparverius*			x		x
American redstart	*Setophaga ruticilla*					x
American robin	*Turdus migratorius*	x		x		x
Barn swallow	*Hirundo rustica*			x		
Black and white warbler	*Mniotilta varia*	x		x		
Blue-headed vireo	*Vireo solitarius*			x		
Canada Goose	*Branta canadensis*			x		
Chipping sparrow	*Spizella passerina*	x		x		x
Common loon	*Gavia immer*			x		x
Common yellowthroat	*Geothlypis trichas*			x		x
Conneticut warbler	*Oporornis agilis*			x		
European starling	*Sturnus vulgaris*			x		
Hermit thrush	*Catharus guttatus*			x		
Mallard	*Anas platyrhynchos*			x		
Mourning warbler	*Oporornis philadelphia*			x		
Nashville warbler	*Vermivora ruficapilla*			x		
Northern flicker	*Colaptes auratus*			x		
Nothern harrier	*Circus cyaneus*			x		
Ovenbird	*Seiurus aurocapillus*			x		
Red-eyed vireo	*Vireo olivaceus*					x
Red-winged blackbird	*Agelaius phoeniceus*					x
Ruffed grouse	*Bonasa umbellus*			x		
Sandhill crane	*Grus canadensis*			x		
Song sparrow	*Melospiza melodia*	x		x		
Tennesee warbler	*Vermivora peregrina*			x		
Tree swallow	*Tachycineta bicolor*					x
Veery	*Catharus fuscescens*			x		
Vesper sparrow	*Pooecetes gramineus*			x		
White-throated sparrow	*Zonotrichia albicollis*			x	x	x
Wilson's snipe	*Gallingo delicata*			x		
Woodpecker sp.				x		
Yellow-rumped warbler	*Dendroica coronata*			x		
Yellow warbler	*Dendroica petechia*			x		

Species Observed		Vegetation Survey	Amphibian Survey	Breeding Bird Survey	Nocturnal Bird Survey	Eagle Survey
Butterflies						
Canadian tiger swallowtail	*Papilio canadensis*	x				
Dragonflies and Damselflies						
Bluet sp.						x
Darner sp.						x
Mammals						
Beaver	*Castor canadensis*					x
Black bear	*Ursus americanus*	x				
Deer	*Odocoileus virginianus*			x		
Moose	*Alces alces*			x		x
Red fox	*Vulpes vulpes*			x		
Snowshoe hare	*Lepus americanus*			x		
Vegetation						
Alder-leaved buckthorn	*Rhamnus alnifolia*	x				
Aquatic sedge	*Carex aquatilsis*	x				
Awl-fruited sedge	*Carex stipata*	x				
Balsam poplar	*Populus balsamifera ssp. balsamifera*	x				
Bird's-foot trefoil	*Lotus corniculatus*	x				
Black spruce	*Picea mariana*	x				
Bluebead-lily	*Clintonia borealis*	x				
Bog laurel	*Kalmia polifolia*	x				
Bottlebrush sedge	*Carex hystericina*	x				
Bunchberry	*Cornus canadensis*	x				
Canada blue-joint	*Calamagrostis canadensis*	x				
Northern reindeer lichen	*Cladina stellaris*	x				
Club moss sp.	*Lycopodiaceae sp.*	x				
Common cattail	*Typha latifolia*	x				
Common dandelion	*Taraxacum officinale*	x				
Creeping snowberry	*Gaultheria hispidula*	x				
Dark-green bulrush	*Scirpus atrovirens*	x				
Early meadowrue	*Thalictrum dioicum*	x				
European moutain-ash	*Sorbus aucuparia*	x				
Forget-me-not	*Myosotis sp.*	x				
Fox sedge	*Carex vulpinoidea*	x				
Labrador-tea	*Ledum groenlandicum*	x				
Lady fern	*Athyrium filix-femina*	x				
Low bush blueberry	*Vaccinium angustifolium*	x				
Marsh-marigold	*Caltha palustris*	x				
Meadowsweet	*Filipendula ulmaria ssp. ulmaria*	x				
Moss sp.		x				
Pale jewelweed	*Impatiens pallida*	x				
Path rush	*Juncus tenuis*	x				
Peat moss	*Sphagnum sp.*	x				
Purple-stemmed aster	*Symphyotrichum puniceum*	x				

Species Observed		Vegetation Survey	Amphibian Survey	Breeding Bird Survey	Nocturnal Bird Survey	Eagle Survey
Raspberry	*Rubus sp.*	x				
Red clover	*Trifolium pratense*	x				
Red currant	*Ribes rubrum*	x				
Red osier dogwood	*Cornus stolonifera*	x				
Red raspberry	*Rubus idaeus ssp. idaeus*	x				
Sheep laurel	*Kalmia angustifolia*	x				
Sheep sorrel	*Rumex acetosella*	x				
Speckled alder	*Alnus incana spp. rugosa*	x				
Tall buttercup	*Ranunculus acris*	x				
Tamarack	*Larix laricina*	x				
Trembling aspen	*Populus tremuloides*	x				
Tufted vetch	*Vicia cracca*	x				
Willow species	*Salix species*	x				
Wood horsetail	*Equisetum sylvaticum*	x				
Woodland strawberry	*Fragaria vesca ssp. americana*	x				
Yellow avens	*Geum aleppicum*	x				
Yellow pond-lily	*Nuphar advena*	x				
Yellow sedge	*Carex flava*	x				

Figure 1

Northland Cochrane Area Solar Projects

Interspersion Map / Catchment Boundary

Legend

- Long Lake Project Site
- Catchment Area
- Wetland
- Ecological Land Classification
- Interspersion Grid (636.43m x 636.43m)
- Hydro Line
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Highway
- Primary Road
- Secondary Road
- Waterbody

Project: 1247A
Date: October 19, 2011

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

0 250 500 750 1,000 1,250 Metres

N

Path: X:\1247_NorthlandCochrane_SolarFarms\NRSI_1247_Fig1_NorthlandCochrane_LongLake_12K_2011_08_04_GC.mxd

Figure 2

Northland Cochrane Area Solar Projects

Study Area

Legend

- Long Lake Project Site
- Wetland
- Ecological Land Classification
- Watercourse Flow Direction
- Waterbody
- Watercourse (Intermittent)
- Watercourse (Permanent)

478500 478750 479000 479250 479500 479750

5443500 5443250 5443000 5442750 5442500

HS17 HS16 TSM23 HS15 HS14 HS25 CS35 HS53 CS52 WET-004 WET-005 WET-006 HS13 HS11 HS12 HS8 WET-007 HS10 WET-008 GCM21 HS9 HS6 CS20 TSM22 TSS2 TSS1 CS3 CS24 CS18 HS7 GCM29 CS4 CS19 CS19 CS19 CS5 TSS87

Path: X:\1247_NorthlandCochraneAreaSolarFarms\NRSI_1247E_Fig2_StudyArea_2012_02_01_ELF.mxd

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Project: 1247A
Date: Wednesday, February 01, 2012

NAD83 - UTM Zone 17
Size: 11x17"
1:5,000

N

0 50 100 150 200 250 Metres

APPENDIX IV
Amphibian Call Survey, Breeding Bird & Evening Bird Field Data Sheets

Long Lake site #1247
Cochrane Solar Farm June 23, 11
16°C, overcast, wind=1 obs. JEG, MP

OWES / BREEDING BIRDS

- Conducted OWES mapping & breed birds throughout property (0530-0915hrs) (see data forms)
- General site photos - 270, 271, 285, 286, 292, 293 (JEG's camera)
- Generally the site is very wet - all habitats that are not plough field are wetland - pockets of poplar regen where soils are wetter - heavy disturbance.

EAGLE SURVEYS

09:20 hrs - Kennedy Lake - 90% cloud, 20°C, wind=S (E)

- 30min point count done from road
- photo 295
- Shoreline scanned for large stick nests - none obs.
- Incidentals:
  - Common Loon
  - American Robin
  - Red-eyed Vireo
  - spring peeper
  - Am. Goldfinch
  - beaver hut - north end of lake
  - White-throated sparrow
  - Fish jumped in water
  - Mink Frog
  - Tree Swallow
  - Red-wing blackbird
  - American Crow
- No Eagles or other raptors obs.
- ~~Rest~~ obs when get in car.

pg 1 of 3

June 22, 2011 - JEO, MP #1247

Incidentals - Long Lake Road Side ows & Mapping

Can. Tiger Swallowtail
Black bear obs. (hydro corridor along 617)
Chipping Sparrow
Am. Robin
black & white warbler.
American bittern (Smith creek)
Stick nest N. of con 8/9 on hydro corridor - osprey?
Song Sparrow

Photos
- #299 - hydro corridor
  - looks drier than surrounding lands - grasses w scattered conifers, raspberry
- #300 - Smith creek facing East
- #301 - Smith creek facing west
- #302 - creek flowing through polygon 8 south of con. 10/11
  - drainage ditches on both sides of road - but creek does not cross road

Pg 3013

10:18 hrs - Syndicate Lake
- 30 min pt. count for Eagles
- photo - 296 - had to do point count from sedge marsh - best vantage pt.
- scanned for stick nests - none obs.

Incidentals
- white-throated Sparrow
- Am. Toad
- fresh moose scat & tracks
- Am. Redstart
- chipping Sparrow
- mink frog
- Common yellowthroat
- Red-eyed vireo
- Am. Robin
- bluet sp. (northern?)
- damer sp.
- song Sparrow
- Am. Goldfinch

- No Eagles or other raptors

Pg 2013

Roadside mapping
tsS79 tsS81 tsS83 tsS85 tsS86 tsS77 tsS69 tsS67 tsS65 tsS63
tsS59 tsS60 tsS58 tsS50-53

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Transline unit

tsS28 tsS29, tsS30 tsS32

Wetland Vegetation Communities

Project Name: Cochrane Solar Farm **Project #:** 1247

Observer(s): JT3, MP

Date: June 23/11 **Time (24h):** 0700

Field #: / **Weather:** Precipitation: None Temp (°C): 16

Map Code: 1 Wind Speed & Direction: NE Cloud %: 100

Wetland Type: Swamp **Site Type:** P **Dominant Form:** Tall shrub

% Open Water: 5% **ELC Code:** tsS1, tsS2, tsS33, tsS40

Photos: 272-273 (JD camera) 276 (south end) TRANSLINE: tsS1 – tsS40

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species) tsS8 – tsS10
h	Balsam Poplar; trembling Aspen (15%) tsS17, tsS18, tsS23/24
c	Black spruce; Tamarack (10%) FOR MOST 20-25% in some areas see map
dc,dh,ds	black spruce, balsam poplar, black spruce, tamarack (2%)
* ts	Speckled Alder; willows; poplars (90%)
ls	raspberry; willow; trembling Aspen; red osier dogwood; tea-leaved willow; speckled alder; labrador tea (20%)
gc	tall buttercup; marsh marigold; sedge; strawberry; yellow avens; dandelion (30%)
ne	Canada blue joint; sedge sp.; bottlebrush sedge; pearl rush (95%)
be	/ (AKA bristly sedge)
re	common cattails (5%)
ff	/ (AKA: broad leaved cattail)
f	/
su	/
m	moss sp; club moss sp. (50%)

Soil type:	silty clay	Organic ☐	Mineral ☒

Rare Species (Local, Regional, Provincial):	Wildlife Notes:
	Moose tracks

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants, **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock) **Mineral**= <60cm depth over mineral

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Wetland Vegetation Communities

Project Name: Cochrane Solar Farm **Project #:** 1247

Observer(s): JT3, MP

Date: June 23/11 **Time (24h):** 0600

Field #: / **Weather:** Precipitation: None Temp (°C): 16°C

Map Code: 2 Wind Speed & Direction: Cloud %:

Wetland Type: ~~Bog~~ Swamp **Site Type:** P **Dominant Form:** Coniferous Trees

% Open Water: 5% **ELC Code:** cS3 – cS8, cS26, cS27 cS41

Photos: 274-275, 277 (south end) cS51 TRANSLINE: cS16, cS19, cS22

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species) cS25 – cS27
h	1 cS33 – cS36
* c	Black spruce; Tamarack (90%)
dc,dh,ds	
ts	Speckled Alder; (15%)
ls	labrador tea; speckled alder; creeping snowberry (50%)
gc	bluebead lily; woodland horsetail; bunchberry (75%)
ne	
be	/
re	/
ff	/
f	/
su	/
m	feat moss (90%); caribou lichen (90%)

Roadside mapping: cS24, cS45, cS46, cS55

Soil type:	organic	Organic ☒	Mineral ☐

Rare Species (Local, Regional, Provincial):	Wildlife Notes:

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog, **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock) **Mineral**= <60cm depth over mineral

Note: Organic hummocks raised above water – layer of organic fibric soils overlaying sandy clay (see diagram on back)

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Wetland Vegetation Communities

Project Name: Cochrane Solar Farm **Project #:** 1247

Observer(s): JTO, MP

Date: June 23/11 **Time (24h):** 0645

Field #: — **Weather:** Precipitation: None Temp (°C): 17°c

Map Code: 3 Wind Speed & Direction: Cloud %: 100

Wetland Type: Swamp **Site Type:** P **Dominant Form:** deciduous trees

% Open Water: **ELC Code:** hS1 - hS, hS34, hS36, hS28, hS29, hS29 17 hS50, hS53, hS54

Photos: 278-280

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Trembling Aspen, balsam poplar (95%)
c	Black Spruce (5%)
dc,dh,ds	Poplars (7%)
ts	speckled alder, mountain ash - sharp leaved willow, labrador tea, red osier dogwood, alder-leaved buckthorn, red currant
ls	red raspberry, red osier dogwood, alder-leaved buckthorn, red currant (50%)
gc	strawberry, bluebead lily, bunchberry, purple stem aster (rolling 10%) (85%)
ne	Canada bluejoint (7%) sedge sp. (70%), rare stipula
be	—
re	Dark green fern bush
ff	—
f	—
su	—
m	moss s

Soil type: Organic ☐ Mineral ☒

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs, **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

Regenerating Poplar Community

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Wetland Vegetation Communities

Project Name: **Project #:** 1247

Observer(s): JTO, MP

Date: June 23, 2011 **Time (24h):** 0725

Field #: — **Weather:** Precipitation: None Temp (°C): 17°

Map Code: 4 Wind Speed & Direction: 3 S, ast Cloud %: 100

Wetland Type: Bog Swamp **Site Type:** P **Dominant Form:** coniferous trees

% Open Water: 0 **ELC Code:** cS18 cS19, cS20

Photos: 281-282

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Trembling Aspen (10%)
c	Black Spruce (90-95%)
dc,dh,ds	
ts	willow (red stem, rolled leaf), speckled alder (5%)
ls	labrador tea, red currant, low bushblue berry (15%)
gc	woodland horsetail, bunchberry (10%)
ne	
be	
re	
ff	
f	
su	
m	Feat moss (98%)

Soil type: - same as 2 Organic ☒ Mineral ☐

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

*Same as 2 but dominated entirely by black spruce - open areas have peat.

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Wetland Vegetation Communities

Project Name: Cochrane		**Project #:** 1247	
Observer(s): JEB, MP			
Date: June 23/11	**Time (24h):** 0815		
Field #: /	**Weather:** Precipitation:		Temp (°C): 17°C
Map Code: 5	Wind Speed & Direction: 3-4 East		Cloud %: 100
Wetland Type: Marsh	**Site Type:** R	**Dominant Form:** graminoids	
% Open Water:	**ELC Code:** gcM21, gcM42 291- culvert - facing South		
Photos: 283, 284, 287, 290 (from rd facing N.), 289 - culvert (N. end of road)			

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	
c	
dc,dh,ds	
ts	speckled alder; balsam poplar; willow
ls	willow; red raspberry; meadowsweet meadowsweet
* gc	Field horsetail; marsh marigold; birdsfoot trefoil, tufted vetch, red clover, [illegible]
ne	Canada bluejoint; Aquatic Sedge (dominant) (collected ✓); fox sedge
be	/
re	Common cattail; dark green bulrush
ff	/
f	yellow pond lily
su	/
m	/

Soil type:	organic mesic	Organic ☒	Mineral ☐

Rare Species (Local, Regional, Provincial):	Wildlife Notes:
	Sandhill crane Snapping turtle habitat present but not obs.

SAR observations must also include a specific UTM location.

Forms: h=deciduous trees; c=coniferous trees; dh, dc, ds=dead trees/shrubs; ts=tall shrubs; ls=low shrubs; gc=ground cover; ne=narrow emergents; be=broad emergents; f=floating plants; ff=free-floating plants; su=submerged plants; m=mosses

Wetland Type: S=swamp; M=marsh; B=bog; F=fen

Site Type: L=lacustrine; P=palustrine; R=riverine; IS=isolated

Soil type: cl=clay/loam; sl=silt/loam; l=limestone; s=sand; hm=humic/mesic; f=fibric; g=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

Note - same all around Syndicate lake - @ South end alder cover thicker

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Wetland Vegetation Communities

Project Name: JEB, MP		**Project #:** 1247	
Observer(s): JEB, MP			
Date: June 23/11	**Time (24h):** 0810		
Field #: /	**Weather:** Precipitation: None		Temp (°C): 17°C
Map Code: 6 Marsh	Wind Speed & Direction: 4 - east		Cloud %: 100
Wetland Type: ~~thicket~~	**Site Type:** R	**Dominant Form:** Tall Shrubs	
% Open Water: 0%	**ELC Code:** tsM22, tsM23		
Photos: 288			

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Trembling Aspen; balsam poplar (5%)
c	/
dc,dh,ds	
* ts	Speckled alder; willows (90%)
ls	Red raspberry; meadowsweet (50%); willows
gc	meadow rue, yellow avens, pale jewelweed, (40%), field horsetail
ne	Canada bluejoint; fox sedge (5%)
be	/
re	/
ff	/
f	/
su	/
m	/

Soil type:		Organic ☐	Mineral ☐

Rare Species (Local, Regional, Provincial):	Wildlife Notes:
	Deer tracks

SAR observations must also include a specific UTM location.

Forms: h=deciduous trees; c=coniferous trees; dh, dc, ds=dead trees/shrubs; ts=tall shrubs; ls=low shrubs; gc=ground cover, ne=narrow emergents; be=broad emergents; f=floating plants; ff=free-floating plants; su=submerged plants; m=mosses

Wetland Type: S=swamp; M=marsh; B=bog; F=fen

Site Type: L=lacustrine; P=palustrine; R=riverine; IS=isolated

Soil type: cl=clay/loam; sl=silt/loam; l=limestone; s=sand; hm=humic/mesic; f=fibric; g=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

Riparian edge.

Roadside mapping routes

~~hS~~ hS36, hS39, hS44

* should be hS (not hTS)

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Wetland Vegetation Communities

Project Name: Cochrane Solar Farm **Project #:** 1247

Observer(s): JEQ, MP

Date: June 23/11 **Time (24h):** 0900

Field #: ✓ **Weather:** Precipitation: None Temp (°C): 19°C

Map Code: 7 Wind Speed & Direction: 3 (E) Cloud %: 100

Wetland Type: Swamp **Site Type:** P **Dominant Form:** Mixed Trees

% Open Water: 0 **ELC Code:** hwS24, hwS25, hwS29, hwS30, hcS32

Photos: 294 (from edge) 298 hcS35, hwS37, hwSU3, hwSU11, hwSU5, hwS

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Trembling Aspen, Balsam Poplar (60%) - few tamarack
c	Black Spruce (50-60%) balsam fir
dc,dh,ds	Poplars spruce
ts	Speckled Alder; trembling Aspen (90%)
ls	alder-leaved buckthorn, red currant (50%)
gc	Meadow rue; bracken fern; strawberry, bunchberry, lady fern (90%)
ne	Sedge sp. (<1%)
be	✓
re	✓
ff	✓
f	✓
su	✓
m	moss sp (5%)

Soil type: Silty loam (15cm) over clay Organic ☐ Mineral ☒

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine, **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

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Wetland Vegetation Communities

Project Name: Cochrane Solar Farm **Project #:** 1247

Observer(s): JEQ, MP

Date: June 23, 2011 **Time (24h):** 1200

Field #: **Weather:** Precipitation: None Temp (°C): 20°C

Map Code: 8 Wind Speed & Direction: 4-E Cloud %: 100

Wetland Type: Swamp **Site Type:** R **Dominant Form:** Tall shrub

% Open Water: 10% **ELC Code:** tsS32, tsSU1

Photos: 303

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	white birch (2%)
c	Tamarack, black spruce (5%)
dc,dh,ds	birch (1%)
ts	Speckled Alder; willows (90%)
ls	Speckled Alder; willows; red osier dogwood; labrador tea (80%
gc	
ne	Aquatic Sedge; canada bluejoint (80%)
be	✓
re	dark green bulrush (2%)
ff	✓
f	✓
su	✓
m	✓

Soil type: silty clay Organic ☐ Mineral ☒

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees, **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine, **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

* Roadside

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Cochrane Solar Farm		**Project #:** 1247	
Observer(s): JG, MP			
Date: June 23/11	**Time (24h):** 1231		
Field #: /	**Weather:** Precipitation: None	Temp (°C): 20°	
Map Code: 9	Wind Speed & Direction: 4 East	Cloud %: 100	
Wetland Type: Bog	**Site Type:** P	**Dominant Form:** low shrub	
% Open Water: None	**ELC Code:** 1sB28		
Photos: 304, 305	Roadside mapping: 1sB80, 1sB40, 1sB41, 1sB45, 1sB47		

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h /	1sB78, 1sB76, 1sB68,
c Tamarack, black spruce (15%)	1sB70, 1sB57, 1sB48
dc,dh,ds Spruce (2%)	1sB49
ts Tamarack, black spruce (20%)	
* ls labrador tea; sheep sorrel; ~~bog Laurel~~ lowbush blueberry (80%)	
gc Canada mayflower	
ne /	
be /	
re /	
ff /	
f /	
su /	
m Peat moss (98%)	

Soil type:	organic	Organic ☒	Mineral ☐

Rare Species (Local, Regional, Provincial):	Wildlife Notes:
Same as 23.4	

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants, **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine, **R**=riverine; **IS**=isolated

Soil type: **cl**=clay/loam; **sl**=silt/loam; **l**=limestone; **s**=sand; **hm**=humic/mesic; **f**=fibric; **g**=granite **Organic**= >60cm depth over mineral (>10cm over bedrock)**Mineral**= <60cm depth over mineral

MAP #1 - 1241 Cochrane

Map 2-1247 - Cochrane Solar Farm
June 23, 2011 - JEG, MP - OWES, veg mapping

Photo 1

Map 3 - June 23, 2011 - JEG, MP
#1247 - Cochrane Solar Farm

Photo 2

Photo 3

MAP 4 – June 23, 2011 – JEG, MP
#1247 – Cochrane Solon Farm

↑ MAPS

Natural Resource Solutions Inc.	
Plant Specimen Voucher	
Project Name:	Cochrane S.F
Project #	1247
Species:	Carex aquatilis (Aquatic sedge)
Collector:	JEb
Date:	June 23, 2011
UTM:	Polygon 5
Habitat:	Sedge Marsh
Notes:	also collected June 22/11 by JEb in polygon I
Photo #	

Processing			
Sample ID	**Pressed**	**Discarded**	**Filed Herbarium**
Sedge sp. polygon 5		X	

Natural Resource Solutions Inc.	
Plant Specimen Voucher	
Project Name:	Cochrane S.F
Project #	1247
Species:	Carex flava
Collector:	JEb
Date:	June 24, 2011
UTM:	polygon F
Habitat:	Narrow leaved emergent marsh
Notes:	
Photo #	

Processing			
Sample ID	**Pressed**	**Discarded**	**Filed Herbarium**
Sedge sp. polygon F		X	

Natural Resource Solutions Inc.	
Plant Specimen Voucher	
Project Name:	cochrane S.F.
Project #	1247
Species:	carex hysericina c. aquatilis
Collector:	JEb
Date:	June 27, 2011
UTM:	polygon C
Habitat:	Tall shrub swamp
Notes:	
Photo #	

Processing			
Sample ID	**Pressed**	**Discarded**	**Filed Herbarium**
Sedge sp. polygon C		X	

NATURAL RESOURCE SOLUTIONS INC.

Breeding Bird Area Search Observation Form

Date: June 23, 11	Project: Cochrane # 1247	
Time: 0530 - 0900	Location: Long Lake	
Observers: MJP, JEG	UTM:	
Temperature (°C): 16°c	Cloud Cover (%): 100 %	Other Site Conditions/Survey Limitations:
Precipitation: none	Wind (Beaufort): 1-2	
Survey: Visit 1		

Species	POLYGON NUMBERS - Record # & evidence by polygon									
Hermit Thrush		7S								
Amr Robin		8P								
White throated Spar.		8S								
Blueheaded Vireo		1S								
Chipping Sparrow		1S								
Common Yellowthroat		4S								
Alder Flycatcher		5S								
Amr Crow		8S								
Veery		3S								
Yellow Warbler		2S								
Sandhill Crane		2S→P								
Woodpecker Sp		1 Drummery								
B; W Warbler		3S								
Connecticut Warbler		1S								
N. Flicker		4S+DD								
Nashville Warbler		3S								
Mourning Warbler		1S								
Vesper Sparrow		1S								
Wilson's Snipe		2P								
Tennessee Warbler		2S								
Common Loon		1S								
Ovenbird		1S								
Northern Harrier		1X								
Mallard		3S+P								
Song Sparrow		2S								
Amr. Goldfinch		1S								
Canada Goose		1S								
Ruffed Grouse		1 Drummery								
Amr Kestrel		1H								
Barn Swallow		3H								
E Starlings		20H								
Yellow rumped Warbler		1S								

Breeding Evidence Codes

Observed
X - No evidence of breeding

Possible
H - Suitable nesting habitat
S - Singing mate

Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation

Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Beaufort Wind Scale

0 - Calm
1 - smoke drifts
2 - wind felt on face
3 - leaves in motion
4 - small branches move
5 - small trees sway
6 - large branches move
7 - whole trees in motion
8 - twigs break off, hard to walk
9 - light structural damage
10 - trees uprooted

Photos:

Notes: Moose (tracks), snowshoe hare, Fox (tracks, scat)
Deer (scat), snag damage evidence (pileated?)
Green frog, Mink frog

Nocturnal Bird Survey Form

Project: Cochrane Solar Farm - Long Lake.

Project #: 1247

Date: June 24/11

Cloud Cover (%): 100

Observer(s): JCB, MP

Temperature (°C): 15°

Wind: 5

Precipitation: Light rain/drizzle

Spend ~~6~~ 10 minutes at each site listening for nocturnal birds. Record all wildlife you see/hear, but focus on nocturnal birds.

Stations refer to those picked by Hatch

Site	GPS Coordinates	Start Time	Moon Visible (Y/N)	Species Heard	Direction of Call (N, SW)	Approx. distance	Comments
HRP.3	See map - existing	21:55	N	None			
Between SW HRP	See map	22:10	N	None			
A-RB.	Note - [illegible] crickets - likely too windy to hear much						
HRP 4 [illegible]	See map - existing	22:20	N	White-throated Sparrow	O	50m	[illegible] - played [illegible] call
[illegible] Lake	See map - roadside	22:32	N	Spring peeper	East	100m	

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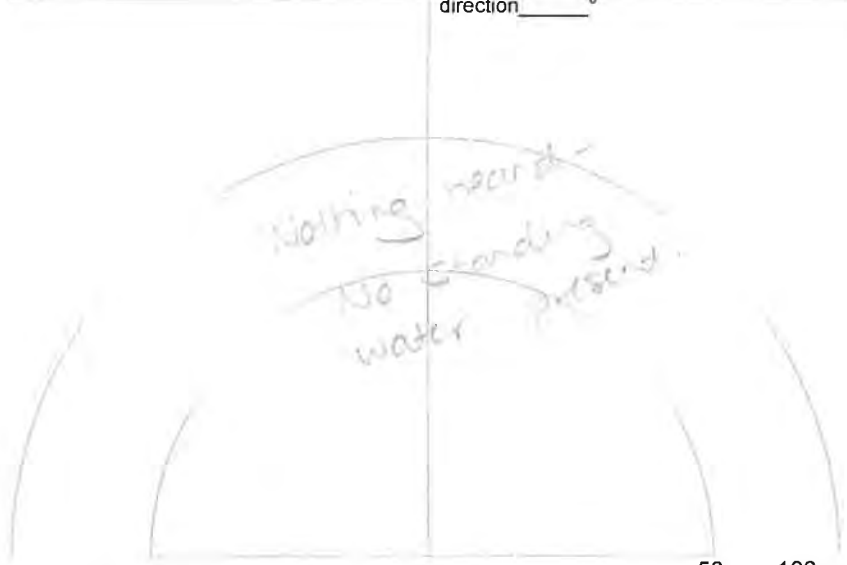
Amphibian Data Form

Project: Cochrane S.F. - Long Lake Site Project No. 1247

UTM:

Observer: MP, JCo	Station Name: 1 Visit #: 1		Date: June 24/17 Start time: 2130	
Wind speed: 5	% Cloud cover: 100	Air Temp: 15	Water Temp:	Water pH:
Precipitation Description: Light Rain				
Remarks:				

direction_____°



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

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Amphibian Data Form

Project: Cochrane S.F. - Long Lake Project No. 1247

UTM:

Observer: JCo, MP	Station Name: 2 Visit #: 1		Date: June 24/17 Start time: 2147	
Wind speed: 5	% Cloud cover: 100	Air Temp: 15°C	Water Temp: /	Water pH: /
Precipitation Description: Light Rain				
Remarks:				

direction 180°

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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Amphibian Data Form

Project: Cochrane Solar Farm - Longlaville Project No. 1242
UTM:

Observer: MJP, JEG	Station Name: 3 Visit #: 1		Date: 24/05/11 Start time: 22:00	
Wind speed: 5	% Cloud cover: 100	Air Temp: 15	Water Temp: 18	Water pH: /
Precipitation Description: light rain				
Remarks:				

direction 180°

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

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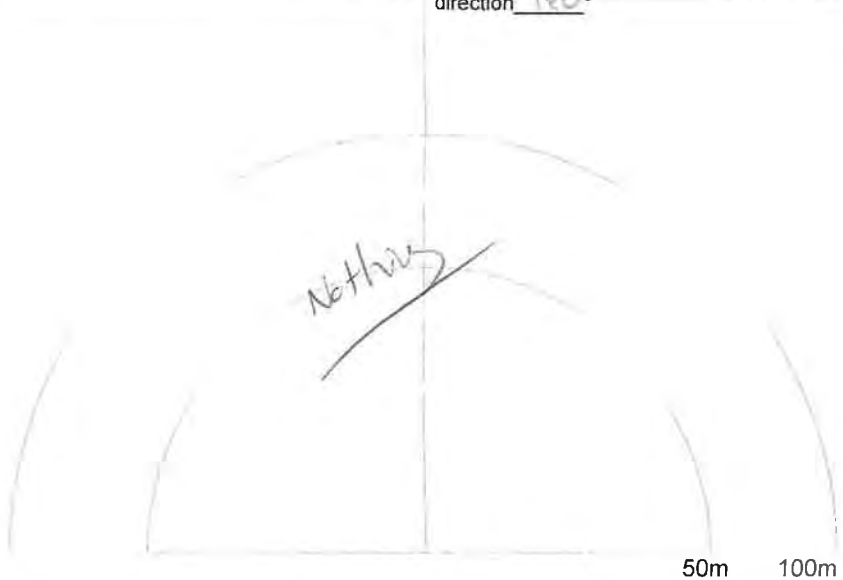
Amphibian Data Form

Project: Cochran Solar Farm - Long Lake Project No. 1247
UTM:

Observer: JEG, MP	Station Name: 4 Visit #: 1		Date: June 24/11 Start time: 2220	
Wind speed: 5	% Cloud cover: 100	Air Temp: 15	Water Temp: 18	Water pH: /
Precipitation Description: Light Rain				
Remarks:				

direction 180°



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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