NORTHLAND POWER

Long Lake Solar Project

Natural Heritage Site Investigation Report

October 18, 2012

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

Natural Heritage Site Investigation Report

Long Lake Solar Project

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Project Report

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

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

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

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

a) an area of natural and scientific interest (ANSI) (earth science)

b) an ANSI (life science)

c) a coastal wetland

d) a northern wetland

e) a southern wetland

f) a valleyland

g) a wildlife habitat, or

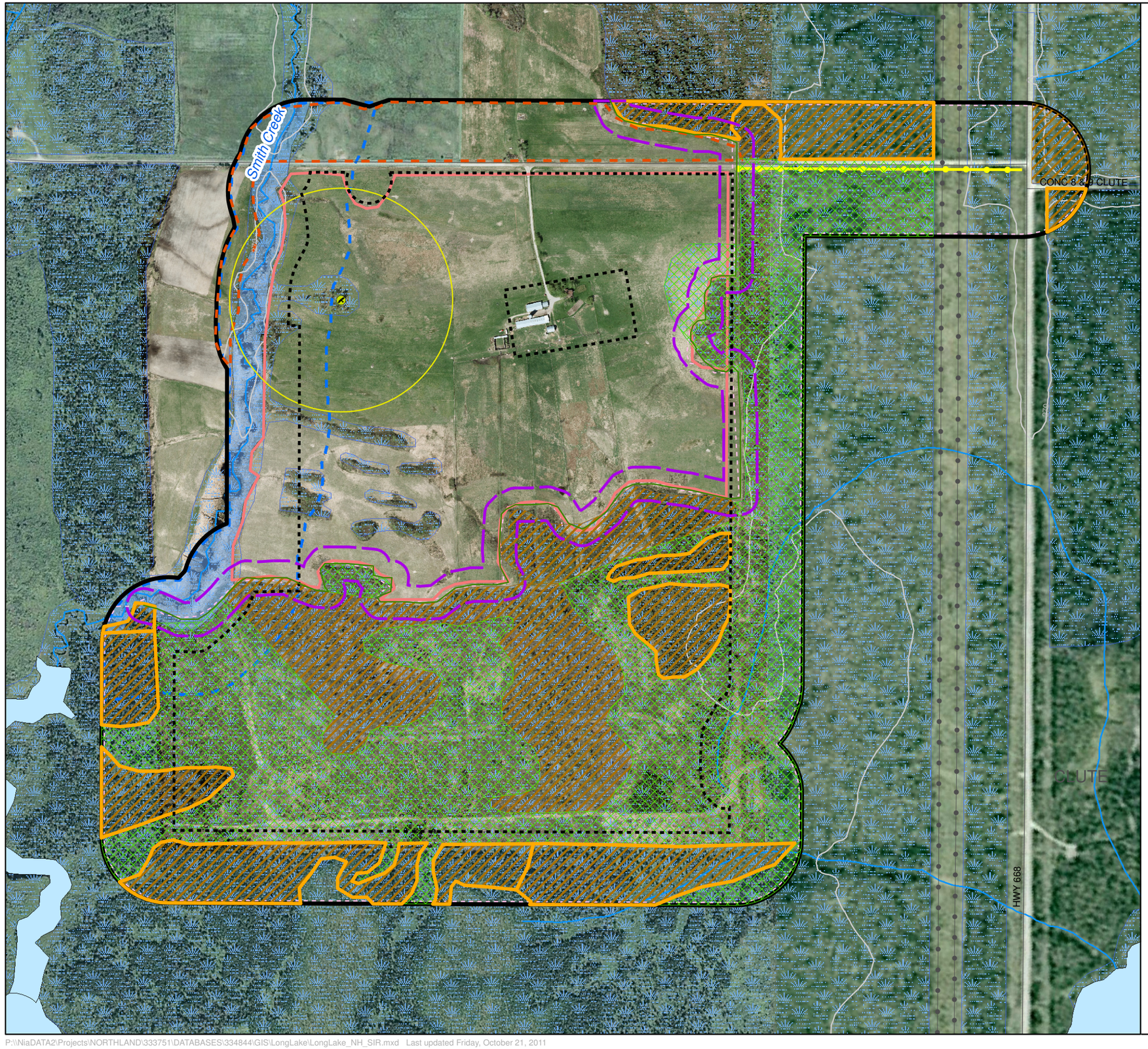
h) a woodland.

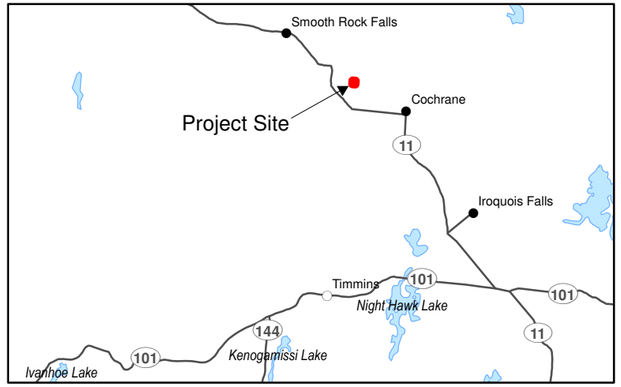
With respect to valleylands and woodlands, Section 1.1 of the REA Regulation identifies that these features are only found south and east of the Canadian Shield. As the Project location is north of the Canadian Shield, it is not possible for valleylands or woodlands to be located on or within 120 m of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

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

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

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





LEGEND

- Raptor Nest Location
- Roads
- Transmission Line
- Watercourse
- Waterbody
- Wetland Area
- Animal Movement Corridor \ *Carex haydenii* Habitat / *Scirpus heterochaetus* Habitat / Wetland Supporting Amphibian Breeding Habitat
- Area Sensitive Grasslands Short-Eared Owl Habitat
- Area Sensitive Shrubland Habitat / *Carex wiegandii* Habitat
- Area Sensitive Woodland Habitat
- *Carex loliacea* Habitat
- Common Nighthawk Habitat / Area Sensitive Grasslands
- Olive-sided Flycatcher Habitat
- Specialized Raptor Nesting Habitat
- Waterfowl Nesting 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. Wetland boundary delineation provided from Natural Resource Solutions Inc. (Oct. 2011).
4. Satellite imagery obtained from Google Earth Pro, captured 2004.
5. Airphoto obtained from Northland Power Inc., flown May 2011.

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NORTH

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

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2. Summary of Results of Records Review

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

Table 2.1 Summary of Records Review Determinations

Determination to be Made	Yes/No	Description
Is the Project in or within 120 m of a provincial park or conservation reserve?	No	The nearest such features are located more than 120 m away from the Project location.
Is the Project in a natural feature?	No	The nearest features are located more than 120 m away from the Project location
Is the Project within 50 m of an ANSI (earth science)?	No	The nearest earth science ANSI is located several kilometres from the Project location.
Is the Project within 120 m of a natural feature that is not an ANSI (earth science)?	Yes	There are wetlands within 120 m of the Project location.

Therefore, Project components will be located on or within 120 m of natural features.

3. Site Investigation Methodology

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

3.1 Wetland Communities

Wetland communities were classified according to the Ontario Wetland Evaluation System (OWES) – Northern Manual. Wetland boundaries were delineated in accordance with the protocols outlined within the OWES – Northern Manual. Wetland site investigations were completed in 2011 by certified wetland evaluators from Natural Resources Solutions Inc. (NRSI). The Project location and lands within 120 m were surveyed in accordance with OWES Protocols. Dates, start time, end times, duration, and weather conditions are provided below.

Additional details on the methodology, field notes from this site investigation, as well as names and qualifications of persons conducting the site investigations, are included within Appendix B.

3.1.1 Date, Times and Duration of Site Investigation

- Date: June 23, 201
- Start Time: 0530
- End Time: 1048
- Duration: (3.5 hours on and within 120 m of the Project location; 1.5 hours at Syndicate and Kennedy Lakes).

3.1.2 Weather Conditions During Site Investigation

- Temperature: 16°C
- Beaufort Wind: 1 to 2

3.2 Wildlife Habitats

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

3.2.1 Site Investigation 1

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

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

3.2.1.1 Date, Times and Duration of Site Investigation

- Date: August 24, 2010
- Start Time: 0900
- End Time: 1330
- Duration: approximately 4.5 hours.

3.2.1.2 Weather Conditions During Site Investigation

- Temperature: 16°C
- Beaufort Wind: 4 to 6
- Cloud Cover: 100%.

3.2.1.3 Name and Qualifications of Person Conducting Site Investigation

The site investigation was completed by Martine Esraelian.

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

She offers expertise across the full breadth of the field from environmental assessments and technical analysis of environmental data to conservation management, corporate and government consulting,

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

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

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

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

3.2.2 Site Investigation 2

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

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

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

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

3.2.2.1 Date, Times and Duration of Site Investigation

- Date: May 18, 2011
- Start Time: 0830
- End Time: 1430
- Duration: 6 hours.

3.2.2.2 Weather Conditions During Site Investigation

- Temperature: 13 to 20°C
- Beaufort Wind: 3
- Cloud Cover: 50 to 70%.

3.2.2.3 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.

3.2.3 Site Investigation 3

The purpose of this site investigation was to (i) complete a Bald Eagle nesting survey at Kennedy and Syndicate lakes near the Project location, and (ii) complete vegetation community classification and mapping using the Forest Ecosystem Classification (FEC) for northeastern Ontario and the Ontario Wetland Evaluation System (OWES) – Northern Manual where appropriate. Wetland boundaries were delineated in accordance with the protocols outlined within the OWES – Northern Manual.

This site investigation was completed by NRSI.

3.2.3.1 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; 1.5 hours at Syndicate and Kennedy lakes).

3.2.3.2 Weather Conditions During Site Investigation

- Temperature: 16°C
- Beaufort Wind: 1 to 2.
- Cloud Cover: 100%

3.2.3.3 Name and Qualifications of Person Conducting Site Investigation

Names and qualifications of NRSI staff conducting the site investigations are provided in Appendix B.

4. Results of Site Investigation

4.1 Wetland Communities

There were eleven wetland communities identified during the site investigations on and within 120 m of the Project location, many of which were previously unidentified during the records review stage. These communities are identified within Table 4.1. Wetland vegetation type, attributes and composition descriptions are identified within Table 4.2.

Wildlife habitat functions of the various wetland communities are addressed in Section 4.2, where applicable. Other functions that the wetland may provide include the following:

- Primary production – Primary productions describes the relationship whereby plants absorb sunlight to create energy; this is often the starting point of energy flow through a food chain. Wetland communities, particularly those near flowing water sources which constantly provide new nutrients to the system, are regarded as having high primary production when compared to other ecosystems. As such, the wetland communities around Smith Creek within 120 m of the Project location provide primary production functions.
- Watershed protection – Wetland communities provide protection of watersheds through (i) filtration of surface water inflow thereby improving water quality, (ii) flood control by trapping water flowing into a watercourse, and slowly releasing it, and (iii) protecting the shoreline of the watercourse from erosion by slowing the flow of water along the banks.
- Preservation of biodiversity – Wetland communities help preserve biodiversity by providing habitat for wetland obligate species of flora and fauna.
- Fish habitat – open water communities within the wetland provide habitat for fish communities.
- Support of natural cycles – wetland communities provide an important component of support for carbon, nitrogen and water.

Table 4.1 Wetland Communities

Wetland ID	Description of Community	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
WET-001	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-002	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	Yes (portions of the wetland)	Portions of this wetland community were identified during the Records Review, however several other wetland communities that are part of this wetland were not identified in the Records Review.
WET-003	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community is located more than 120 m from the Project location and was therefore not identified through the Records Review.
WET-004	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
WET-005	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
WET-006	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
WET-007	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
WET-008	See Figure 1 in Appendix B for wetland vegetation communities within wetland. Table 4.2 provides further description of the vegetation communities.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.

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

Table 4.2 Wetland Vegetation Type Descriptions

Wetland ID	Description of Community *(see Appendix II of Appendix B for further community description)*	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
tsS1,2	Tall shrub swamp, dominated by speckled alder.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
cS3,4,5,26, 27,31	Coniferous swamp, dominated by black spruce and tamarack.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review
hS6-17, 34,36,38,39, 45,50,53,54	Deciduous swamp, dominated by trembling aspen and balsam poplar.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
cS18-20	Black spruce coniferous swamp	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
gcM21,29,42	Graminoid marsh, featuring field horsetail, marsh marigold, bird's foot trefoil, tufted vetch, red clover, spotted forget-me-not and meadowrue.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.

Wetland ID	Description of Community *(see Appendix II of Appendix B for further community description)*	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
tsM22, 23	Tall shrub march, with speckled alder and willow the predominant tall shrub species.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
hS24,25,29,30,32, 35,37,43,44,46,47-49,52,55	Deciduous swamp, predominated by trembling aspen, balsam poplar and tamarack.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
tsS30,41	Tall shrub swamp, dominated by speckled alder and willow.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.
lsB28	Low shrub bog, with Labrador tea, sheep sorrel, bog laurel and low sweet blueberry identified in the low shrub layer.	No	This wetland community was not previously identified, and therefore this represents a correction to the Records Review.

4.2 Wildlife Habitat

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

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

Many of these wildlife habitats relate to the vegetation communities found in the area. Wetland vegetation communities have been previously described within Section 4.1. The only upland vegetation community identified on or within 120 m of the Project location was agricultural lands consisting of pasturelands/hayfields, or recently ploughed lands (for archaeological surveys (see Appendix B for methodology and results of upland vegetation community assessments).

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

4.2.1 Habitats of Seasonal Concentrations of Animals

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

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

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

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

Review, it was noted that waterfowl may also use the watercourses and wetlands which feed these waterbodies. This was considered during the site investigation, however characteristics of these features were determined to not support candidate significant stopover and staging areas (i.e., watercourses were generally considered too narrow to support an abundance of waterfowl during the migration period with larger watercourse/wetland complexes in the immediate vicinity.

- Waterfowl nesting – Waterfowl nesting sites can consist of relatively large, undisturbed upland areas with abundant ponds and wetlands, while other species nest within tree cavities in swamps or on the shorelines of waterbodies. Suitable candidate habitat was identified in association with the areas of upland agricultural habitat (i.e. hayfields) in proximity to the watercourses. The boundary of the waterfowl nesting habitat includes the wetlands along Smith Creek (previously described within Section 4.1), and the hayfields within 120 m of the wetland boundaries. The function of this habitat is to provide nesting and foraging for waterfowl. Therefore candidate significant waterfowl nesting habitat is found on and within 120 m of the Project location.
- Turkey Vulture summer roosting areas – The Project location is at the extreme northern end of the Turkey Vulture breeding range. No rocky cliff ledges or large dead snags with white-washing indicative of Turkey Vulture summer roosting areas were identified during the site investigations. Further, no Turkey Vultures were recorded during the site visits. Therefore, suitable habitat was not identified on the Project location.
- Reptile hibernacula – Reptile hibernacula are commonly found in animal burrows and rock crevices. No candidate reptile hibernacula features, or snakes, were identified during transects of the Project location during the spring emergence period, which indicates that these features are not found on or within 120 m of the Project location.
- Bat hibernacula – Bat hibernacula are found in caves, abandoned mines, areas with karst topography and deep rock crevices. These features were not identified during the site investigation. Further, there are no records of abandoned mines from on or within 120 m of the Project location.

Therefore, of the seasonal concentration areas considered during the site investigation, only waterfowl nesting habitat will be carried forward to the evaluation of significance.

4.2.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

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

Specialized wildlife habitats include

- areas that support species that have highly specific habitat requirements
- areas with high species and community diversity
- areas that provide habitat that greatly enhances species survival.

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

- Habitat for area-sensitive species – Suitable habitat for area-sensitive species was identified in respect of woodland habitats, grassland habitats, and shrubland habitats. Woodland and shrubland habitats found on and within 120 m of the Project location are associated with swamp and thicket swamp communities, respectively. These communities have been previously described within Section 4.1, and their boundaries are shown on Figure 1.1. Grassland habitats are restricted to the locations of hayfields found on and within 120 m of the Project location. Both of these habitat types extend more than 120 m from the Project location. Functions of these habitats are to provide interior breeding habitat for species sensitive to habitat edges, or to provide breeding habitat for species requiring large areas to support breeding activities. Therefore, habitats for these species will be considered during the evaluation of significance.
- Moose calving areas/Mineral Licks – These sites are identified by the MNR or may be known to local landowners. Neither moose calving areas nor mineral licks were identified by the MNR during the Records Review, and consultation with the public on the Project has not identified any such features on or within 120 m of the Project location.
- Moose aquatic feeding areas – Moose aquatic feeding areas consist of areas with abundant coverage of aquatic plants and adjacent woodland stands. Such habitat is found within the area around Syndicate Lake, however these habitats are located more than 120 m from the Project location.
- Old-growth or mature forest stands – These communities are associated with upland forest areas. No upland forests were noted on or within 120 m of the Project location.
- Forest providing a high diversity of habitats – A the woodland communities on and within 120 m of the Project location essentially consist of two vegetation types (coniferous and deciduous), of which there are no upland areas, this habitat does not meet the definition of a candidate forest providing a high diversity of habitats.
- Foraging areas with abundant mast – Though active bear presence (scat) was observed within 120 m of the Project location this is likely due to a bear baiting station located on the adjacent property. Bear activity within this region is common and no mast producing trees were observed on the Project location. In addition, no large patches of berry-producing shrubs, or Mountain Ash, Apple or Black Cherry trees were recorded. As a result, this specialized habitat is not found on or within 120 m of the Project location.
- Woodlands supporting amphibian-breeding ponds – Amphibian-breeding ponds were not found within the woodlands located on or within 120 m of the Project location during the site investigation.
- Wetlands supporting amphibian breeding habitat – Wetland communities containing open water were identified during the site investigations. Therefore, this meets the habitat requirement for wetlands supporting amphibian breeding habitat. The attributes of the habitat are marshland surrounding Smith Creek. Boundaries were determined to be the boundaries of the riparian

wetland communities along Smith Creek found within 120 m of the Project location. This feature would extend more than 120 m from the Project location. This habitat type would provide amphibian breeding functions (i.e., habitat for breeding, egg-deposition, and larval growth). Composition of the wetland community in this area is described as tall shrub and graminoid marshland.

- Turtle nesting habitat – The Project is located north of the range of turtle occurrence within the Province, and therefore there is no potential for this habitat type to occur.
- Mink, Otter, Marten, and Fisher denning sites – Denning sites for these members of the weasel family were not recorded on or within 120 m of the Project location during site investigations. Further, MNR has not identified feeding and denning sites for these species during the records review stage. Similarly, there are no undisturbed shorelines or wetlands, given the active pasture in the area, or closed-canopy forests with larger older trees, on or within 120 m of the Project location. Therefore, this habitat type is not found on or within 120 m of the Project location.
- Specialized raptor-nesting habitat – A stick nest was observed during the site investigation (see Figure 1.1), though no raptor activity was noted at the nest. There was evidence of animal hair on the nest during Site Investigation 2, which had disappeared by the time of Site Investigation 3 (later that day), which suggests the nest is an active nest location. Based on the characteristics of the nest, it was determined to be a nest of a Red-tailed Hawk. Areas within 200 m of the nest are also considered to be part of this habitat type as these areas provide important foraging habitat. The function of this feature is to provide nesting and foraging opportunities for raptors. This feature is therefore considered to be candidate significant wildlife habitat, and lands on and within 200 m of the nest are carried forward to the evaluation of significance.
- Highly diverse areas – Highly diverse areas are commonly associated with the deciduous forest region of Ontario, the Frontenac Axis, and portions of the Canadian Shield underlain by carbonate bedrock (MNR 2000). These features are not found on or within 120 m of the Project location, and therefore this habitat type does not occur in this area.
- Cliffs and caves – These features were not identified on or within 120 m of the Project location during the site investigations.
- Seeps and springs – These features were not identified on or within 120 m of the Project location during the site investigations.

As a result, habitat for area-sensitive species, wetlands supporting amphibian breeding habitat and specialized raptor nesting habitat, is found on and within 120 m of the Project location.

4.2.3 Habitat of Species of Conservation Concern

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

- Mammals
  - Northern Long-eared Bat – There were no mines or caves identified during the site investigation. Further, there were no hollow trees identified, or trees with loose bark that

may serve as maternity colonies. Therefore, suitable habitat was not identified on or within 120 m of the Project location.

- Rock Vole – Suitable rocky areas capable of providing habitat were not identified on or within 120 m of the Project location.

- Birds
  - Bald Eagle – Neither Bald Eagles, nor stick nests were observed during 30-minute surveys at Kennedy and Syndicate lakes more than 120 m from the Project location. Therefore, there does not appear to be active Bald Eagle nesting occurring near either of these waterbodies, and thus there is no candidate significant Bald Eagle habitat present on or within 120 m of the Project location.
  - Short-eared Owl – At the time of the site investigations in 2011, all fields on the Project location were ploughed and therefore there was no suitable habitat on the Project location. However, suitable habitat may found within the agricultural hayfields within 120 m of the Project location. The function of this habitat would be to provide nesting and foraging opportunities.
  - Canada Warbler - Suitable habitat for Canada Warbler is found within the swamp communities on and within 120 m of the southern portion of the Project location. Attributes and composition of these communities have been previously described within Section 4.1. The function of this habitat would be to provide nesting and foraging opportunities for Canada Warbler.
  - Olive-Sided Flycatchers – Suitable habitat for Olive-sided Flycatchers is found within the edge habitats associated with the treed areas on and within 120 m of the southern extent of the Project location, as well as along the riparian habitats west of the Project location. Edges typically represent transitional habitats form the agricultural fields or riparian corridors to the woodlands, and are often dominated by shrubs and immature trees. Functions of these habitats would be to provide breeding opportunities within the woodlands while permitting exposed perches from which the flycatchers would sally forth to forage for insects.
  - Common Nighthawk — Suitable habitat for Common Nighthawk is found within the agricultural lands on and within 120 m of the Project location. In 2011, these habitats existed as ploughed fields, which would provide suitable habitat for Common Nighthawk. Functions of this habitat would be to provide nesting opportunities. Common Nighthawk are an aerial forager and they would be expected to forage over the wetlands and agricultural fields in the vicinity of the nest sites.
- Vegetation
  - Vegetation species are addressed within Table 4.3 below. Functions of these habitats, were present, would be to provide suitable growing conditions for the respective vegetation species of conservation concern. Attributes and compositions of the various habitats discussed below have been previously addressed within Section 4.1.

Table 4.3 Vegetation Species of Conservation Concern

Scientific Name	Common Name	Habitat	Habitat Occurrence on Project Location
Moehringia macrophylla	Large-leaved Sandwort	rocky ledges, open rocky woodlands and talus slopes	Suitable habitat is not found on or within 120 m of the Project location
Carex haydenii	Long-scaled Tussock Sedge	open and shaded wet habitats	Suitable habitat is found within the riparian corridor associated with Smith Creek.
Carex loliacea	Sedge	bogs, muskegs and black spruce forests	Suitable habitat is found within the black spruce swamps on and within 120 m of the Project location.
Carex tetanica	Common Stiff Sedge	moist grassland, sandy shores and ditches, prairies, seepages	Suitable habitat is not found on or within 120 m of the Project location
Carex wiegandii	Wiegand's Sedge	black spruce bogs and alder swamps	Suitable habitat is found within the alder swamps present on and within 120 m of the Project location.
Scirpus clintonii	Clinton's Bulrush	prairie and open woods in south; shorelines, rock crevices in north	Suitable habitat is not found on or within 120 m of the Project location
Scirpus heterochaetus	Slender Bulrush	marshes and shores	Suitable habitat is found within the riparian corridor associated with Smith Creek.
Gymnocarpium robertianum	Limestone Oak Fern	ledges and slopes in calcareous rock; occasionally in sphagnum mats in cedar swamps	Suitable habitat is not found on or within 120 m of the Project location
Woodsia alpina	Northern Woodsia	moist, cool, often shaded crevices in calcareous cliffs	Suitable habitat is not found on or within 120 m of the Project location
Woodsia glabella	Smooth Woodsia	shaded, calcareous rock crevices	Suitable habitat is not found on or within 120 m of the Project location
Vaccinium membranaceum	Mountain Bilberry	moist, mature white birch, balsam fir, white cedar forests on shallow, acid soils	Suitable habitat is not found on or within 120 m of the Project location
Vaccinium ovalifolium	Blue Bilberry	mixed woods	Suitable habitat is not found on or within 120 m of the Project location
Oxytropis viscida var. hudsonica	Locoweed	beach ridges and floodplains	Suitable habitat is not found on or within 120 m of the Project location
Diphasiastrum sabinifolium	Ground-fir	sandy woods and meadows	Suitable habitat is not found on or within 120 m of the Project location
Listera auriculata	Auricled Twayblade	moist, shaded sandy soil	Suitable habitat is not found on or within 120 m of the Project location
Malaxis paludosa	Bog Adder's-mouth	sphagnum bogs and muskegs	Suitable habitat is not found on or within 120 m of the Project location

Scientific Name	Common Name	Habitat	Habitat Occurrence on Project Location
Panicum leibergii var. baldwinii	Baldwin's Panic Grass	dry to mesic prairies, sandy fields and sandy or rocky openings in oak forest; open, rocky riverbanks in northern Ontario	Suitable habitat is not found on or within 120 m of the Project location

Based on the results of the site investigation, there is candidate habitat for Short-eared Owl, Canada Warbler, Olive-sided Flycatcher, Common Nighthawk, *Carex haydenii*, *Carex loliacea*, *Carex wiegandii*, and *Scirpus heterochaetus* found on and within 120 m of the Project location.

4.2.4 *Animal Movement Corridors*

The SWHTG (MNR, 2000) defines animal movement corridors as "elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another". Animal movement corridors were considered during the site investigation. Candidate animal movement corridors were only identified in association with Smith Creek, and associated riparian habitat, connecting Syndicate Lake to other waterbodies north of the Project location. Given the disturbed nature of much of the landscape surrounding Smith Creek in association with the agricultural activities, the movement corridor is restricted to the boundaries of the naturally vegetated areas. Attributes and composition of these naturally vegetated areas have been previously described within Section 4.1. This habitat would provide corridor functions for species of waterfowl, amphibians, and mammals as they move between the larger waterbodies, but likely also provides breeding/foraging habitat for several of these species.

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

4.2.5 *Summary*

Table 4.2 summarizes the candidate significant wildlife habitats identified during the site investigations.

Table 4.4 Candidate Significant Wildlife Habitats

Feature Type	Description of Community	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
Habitat for Area-Sensitive Species	Associated with various vegetation communities on and within 120 m of the Project location	No	As this feature was not identified during the records review, the identification of this candidate significant habitat type is considered to be a correction to the Records Review.
Waterfowl Nesting Habitat	Associated with the creek and associated wetlands and nearby upland areas in the western	No	As this feature was not identified during the records review, the identification of

Feature Type	Description of Community	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
	portion of the Property		this candidate significant habitat type is considered to be a correction to the Records Review.
Wetland supporting amphibian breeding habitat	Associated with the wetland communities on and within 120 m of the Project location, specifically gCM21	No	As this feature was not identified during the records review, the identification of this candidate significant habitat type is considered to be a correction to the Records Review.
Specialized Raptor Nesting Habitat	A red-tailed hawk nest was identified during the site investigations	No	As this feature was not identified during the records review, the identification of this candidate significant habitat type is considered to be a correction to the Records Review.
Habitat for Short-eared Owl, a Species of Conservation Concern	Associated with the agricultural lands within 120 m of the Project location.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Habitat for Canada Warbler, a Species of Conservation Concern	Associated with the swamp communities on and within 120 m of the southern portion of the Project location.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Habitat for Olive-sided Flycatcher, a Species of Conservation Concern	Associated with the edge habitats on and within 120 m of the Project location.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Habitat for Common Nighhawk, a Species of Conservation Concern	Associated with the agricultural lands on and within 120 m of the Project location.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Habitat for *Carex wiegandii*, a Species of Conservation	Suitable habitat is found within the alder swamps present on and within 120 m of the Project location.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.

Feature Type	Description of Community	Identified During Records Review?	Corrections to Records Review, and Rationale for Correction
Concern			
Habitat for *Carex haydenii*, a Species of Conservation Concern	Suitable habitat is found within the riparian corridor associated with Smith Creek.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Habitat for *Carex loliacea*, a Species of Conservation Concern	Suitable habitat is found within the black spruce swamps on and within 120 m of the Project location.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Habitat for *Scirpus heterochaetus*, a Species of Conservation Concern	Suitable habitat is found within the riparian corridor associated with Smith Creek.	Yes (potential for occurrence)	The locations of the habitat represent a correction to the Records Review.
Animal Movement Corridor	Associated with Smith Creek and associated riparian habitat which crosses the western edge of the Property between Syndicate Lake and waterbodies farther north.	No.	As this feature was not identified during the records review, the identification of this candidate significant habitat type is considered to be a correction to the Records Review.

5. Conclusions

Based on the results of the site investigation identified above, several corrections to the records review were identified, as described in Tables 4.1 and 4.2. There are several features present on and within 120 m of the Project location that will require an Evaluation of Significance:

- habitat for area-sensitive species
- waterfowl nesting habitat
- animal movement corridor
- wetlands supporting amphibian breeding habitat
- specialized raptor nesting habitat
- habitat for species of conservation concern
- wetlands located within 120 m of the Project location.

6. References

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Appendix A

Site Investigation Field Notes

No.....

Date..... Page 54

Project: Long Lake

Date: Aug. 24, 2010

Time: 0900 - 1330

% C.C.: 100%

Temp: 16°C

Wind: 4-6 strong [illegible]

Black bear scat

Black bear bait area north of Project site

No.....

Date..... Page 55

North Upland

Trembling aspen (D)

Alder

Balsam Poplar

willow sp.

tamarack (R.O) > black spruce (R.O)

white birch (R)

(small isolated wetlands dominated by cattail and some tamarack

Standing water present)

blueberry

fern sp.

strawberry

balsam fir (R)

No.

Date. Page 56

red-osier dogwood

Balsam Poplar may be d[illegible]

along North edge of property.

- open area north boundary is used for

the production of grain (oats)

NE of Project [illegible] (D)

Balsam Poplar / Tamarack (0) dominant

along NW of property with immature

trembling aspen

balsam fir saplings

spruce saplings

mature balsam poplar (Northern portion of project [illegible])

vegetation [illegible] small [illegible]

red baneberry	mountain maple saplings
rose sp.	trembling aspen (?)
raspberry sp.	Spruce [illegible]
strawberry	balsam fir
[illegible] sp.	
Bunchberry	
canada mayflower	
aster sp.	
ferns.	
agrimony	

No.

Date. Page.

Caleb + Shelby.

May 18th 8:30 a.m.

Temp: 13°C

Bob's Farm Long Lake

Birds

WTS - White throated Sparrows

Robins

Boreal chickadee

Loons - Distance.

Red eyed Vireo

Crow

Raven

Mallards - (6) Stream

Northern Flickers

Stock Nest - GPS - Nest Etc.

Animal - Possible - Hare in nest

Woodcock.

Sticknest Rechecked Animal hair gone - Nest Active.

Mammals

- Deer
- Fox Scat
Red Squirrel
Moose Tracks - Litter Browse
Landowner - Wolf, Bear, Coyote.

Beaver ladges + Dens in creek.

- Crossed Waterway Hedgerow
Backside - Photo's - Map

Forest inland old Clear Cut
Poplar Regen. approx age 15 years

Confirmed with Landowner
Cut 15 - 20 years ago

Amphibian Point Count Data Form

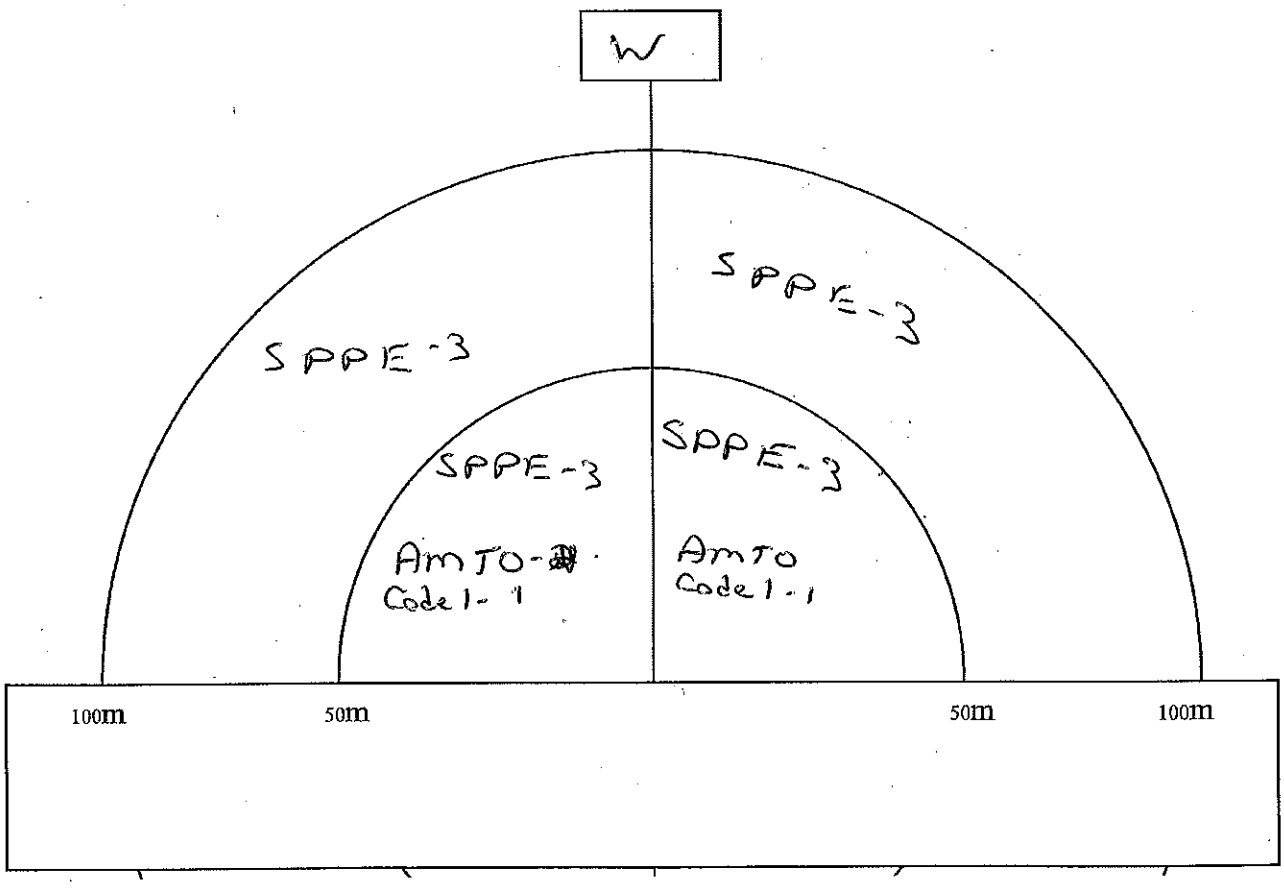
Observer: Caleb + Norm	Site: Long Lake.	Date: May 18th
Station ID: 1	Visit #: 1	Start Time (HH:MM): 8:14
Beaufort Wind Scale: 0	Cloud Cover (%): 0	Finish Time (HH:MM): 8:18
Precipitation: 0	Visibility: Ex	Temperature (°C): 19
Remarks:		

Aerial Foragers		
Species	**IN***	**OUT****
AMTO	✓	
BCFR		
BULL		
CHFR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE	✓	✓
WOFR		

Call Level Codes	
CODE 1	Calls not simultaneous, number of individuals can be accurately counted.
CODE 2	Some calls simultaneous, number of individuals can be reliably estimated.
CODE 3	Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

***Check if species is calling from inside 100-meter station area.**

****Check if species is calling from outside 100-meter station area.**



Amphibian Point Count Data Form

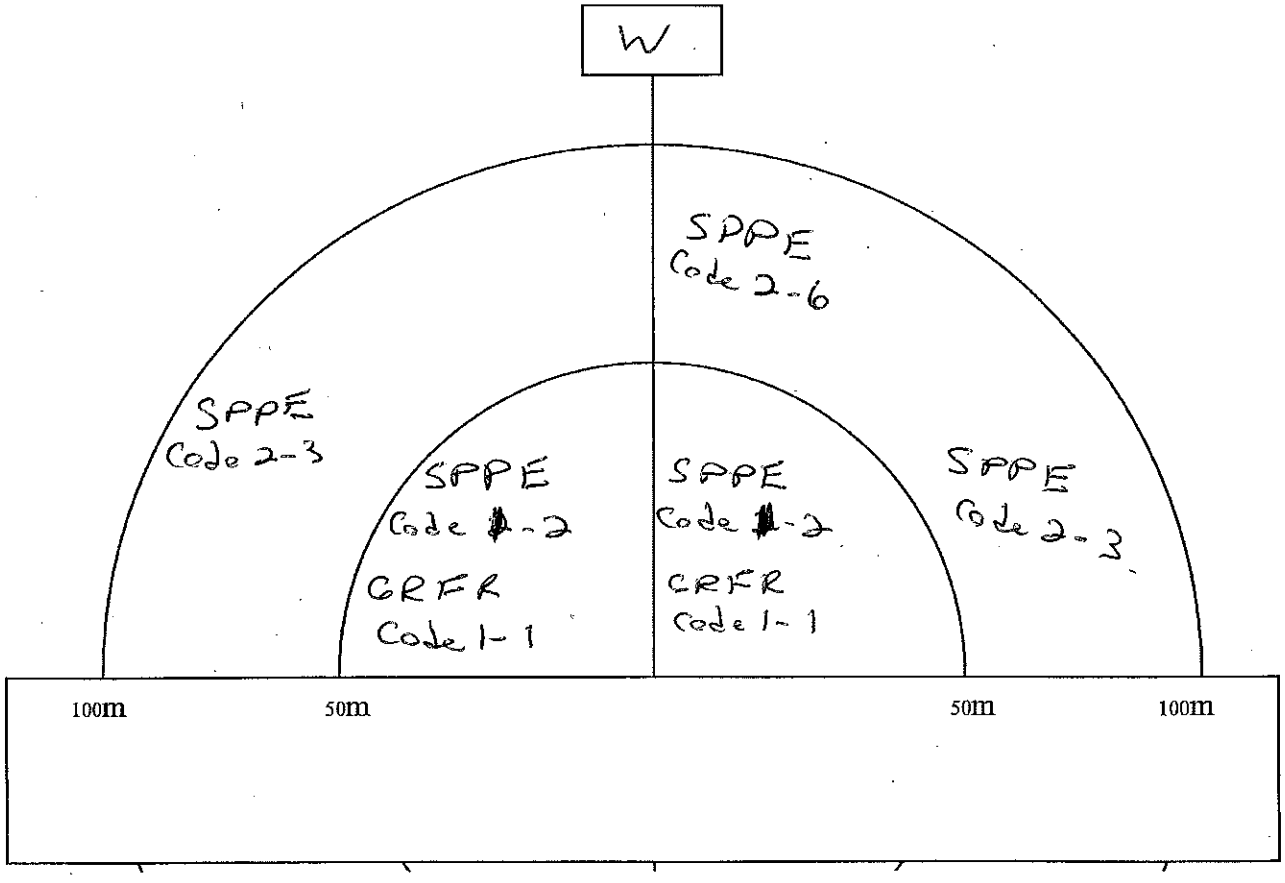
Observer: Caleb + Noam	Site: Ions Lake	Date: May 18th 2021
Station ID: 2	Visit #: 1	Start Time (HH:MM): 8:25
Beaufort Wind Scale: 0	Cloud Cover (%): 0	Finish Time (HH:MM): ~~8:28~~ 8:28
Precipitation: 0	Visibility: Ex	Temperature (°C): 19
Remarks:		

Aerial Foragers		
Species	**IN***	**OUT****
AMTO		
BCFR		
BULL		
CHFR		
FOTO		
GRTR		
GRFR	✓	✓
MIFR		
NLFR		
PIFR		
SPPE	✓	✓
WOFR		

Call Level Codes	
CODE 1	Calls not simultaneous, number of individuals can be accurately counted.
CODE 2	Some calls simultaneous, number of individuals can be reliably estimated.
CODE 3	Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

***Check if species is calling from inside 100-meter station area.**

****Check if species is calling from outside 100-meter station area.**



Amphibian Point Count Data Form

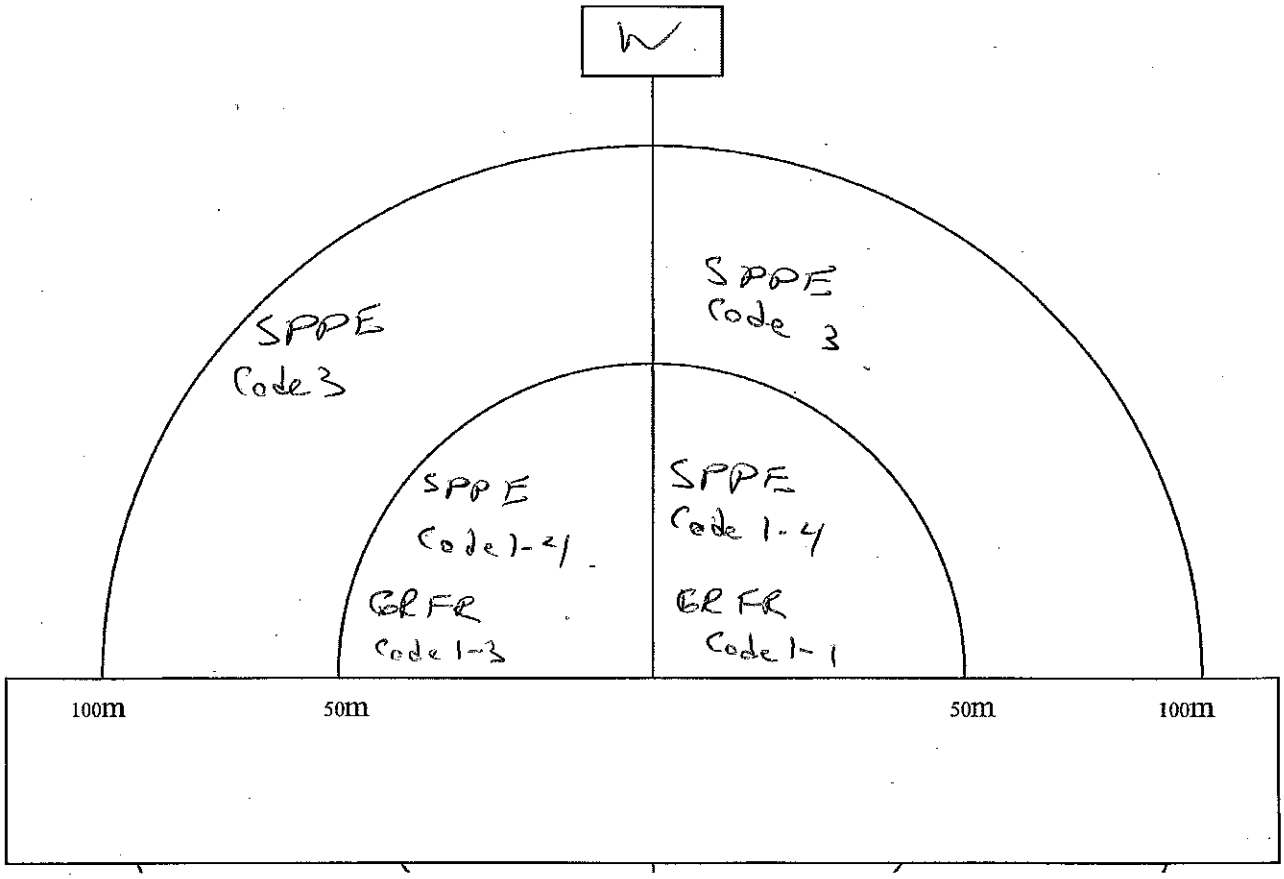
Observer: Caleb + Naim	Site: Long Lake	Date: May 18 2017
Station ID: 3	Visit #: 1	Start Time (HH:MM): 8:37
Beaufort Wind Scale: 0	Cloud Cover (%): 0	Finish Time (HH:MM): 8:34.
Precipitation: 0	Visibility: Ex	Temperature (°C): 18
Remarks:		

Aerial Foragers		
Species	**IN***	**OUT****
AMTO		
BCFR		
BULL		
CHFR		
FOTO		
GRTR		
GRFR	✓	✓
MIFR		
NLFR		
PIFR		
SPPE	✓	✓
WOFR		

Call Level Codes	
CODE 1	Calls not simultaneous, number of individuals can be accurately counted.
CODE 2	Some calls simultaneous, number of individuals can be reliably estimated.
CODE 3	Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

***Check if species is calling from inside 100-meter station area.**

****Check if species is calling from outside 100-meter station area.**



Amphibian Point Count Data Form

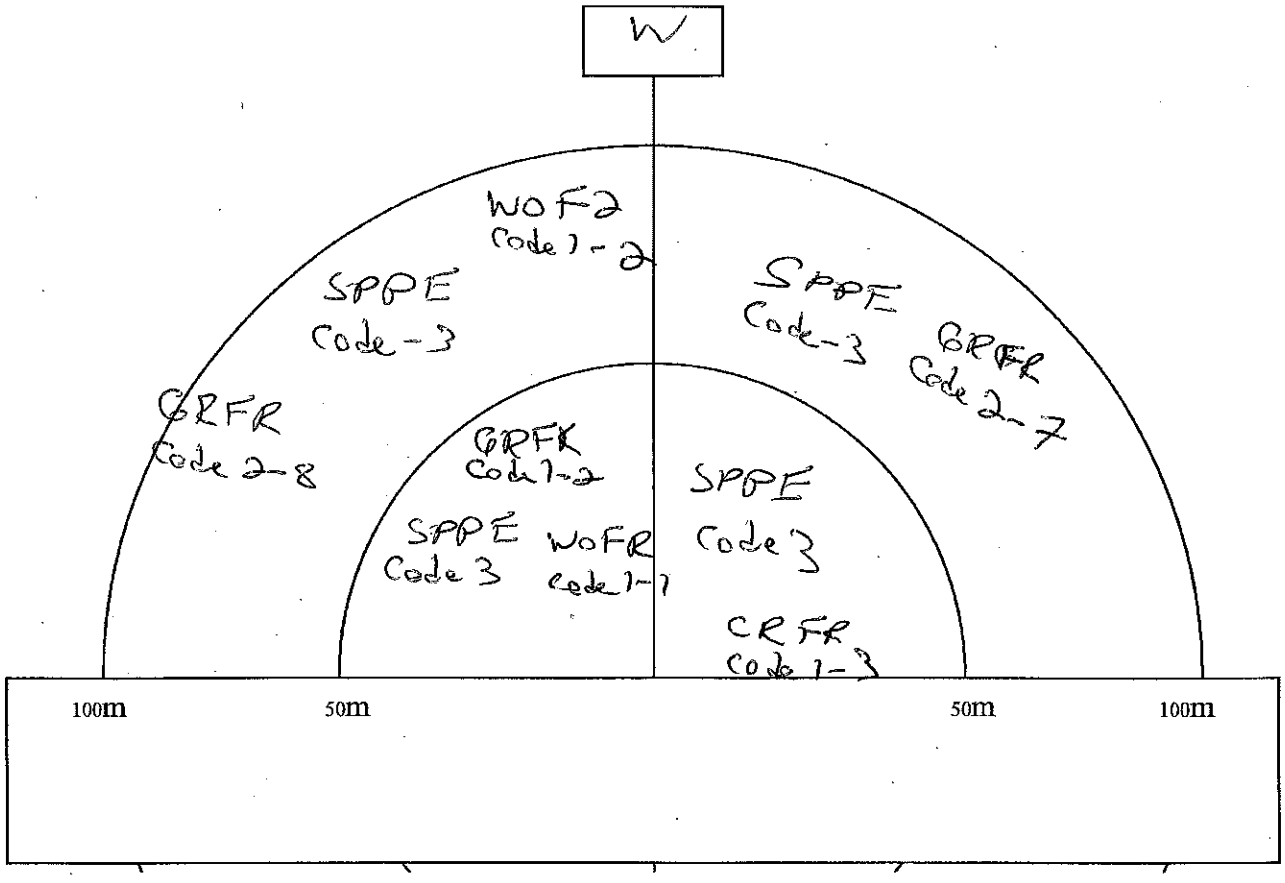
Observer: Caleb + Mom	Site: Long Lake	Date: May 16 2011
Station ID: 4	Visit #: 1	Start Time (HH:MM): 8:40
Beaufort Wind Scale: 0	Cloud Cover (%): 0	Finish Time (HH:MM): 8:43
Precipitation: 0	Visibility: Ex	Temperature (°C): 15
Remarks:		

Aerial Foragers		
Species	**IN***	**OUT****
AMTO		
BCFR		
BULL		
CHFR		
FOTO		
GRTR		
GRFR	2	✓
MIFR		
NLFR		
PIFR		
SPPE	✓	✓
WOFR	✓	✓

Call Level Codes	
CODE 1	Calls not simultaneous, number of individuals can be accurately counted.
CODE 2	Some calls simultaneous, number of individuals can be reliably estimated.
CODE 3	Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

***Check if species is calling from inside 100-meter station area.**

****Check if species is calling from outside 100-meter station area.**



① Toad & Spring peeper

Spring peeper Code 3
Toad Code 1 - 2 individual
within 50 m
Spring Peeper Code 3 within
100 m

② Spring Peeper Code 2
1/~~2~~ individual within 50m
2 Green Frogs
12 Spring Peepers
within 100 m

3 American Toads within
100 m
2 Green Frogs

③ Spring Peeper Code 2-8
Green Frog Code 1-3

Spring Peepers Code 3
Green Frog Code 1-4

Scale: 1 square = _____

① within 50

Spring Peeper Code 3
Green Frog Code 1-5
Wood Frog Code 1-

within 100
Spring Peepers Code 3
Green frog Code 2-15
Wood Frog Code 1-2

Scale: 1 square =

Appendix B

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

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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
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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)			SOILS Estimated Fractional Area	
1)		<1600	0.500	clay/loam
2)		1600-2000		silt/marl
3)	X	2000-2400		limestone
4)		2400-2800		sand
5)		2800-3000	0.500	humic/mesic
6)		>3000		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

Northern Ontario Wetland Evaluation Data and Scoring Record (DATE)

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

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

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)

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) (l < 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

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 HS9 GCM21 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

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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 / tsS59
tsS76, tsS77, tsS69 / tsS60
tsS67, tsS65, tsS63 / tsS58
tsS50-53

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Trans line con't
tsS25
tsS29, tsS30
tsS32

Wetland Vegetation Communities

Project Name: Cochrane Solar Farm		**Project #:** 1247	
Observer(s): JTB, MP			
Date: June 23/11	**Time (24h):** 0700		
Field #: /	**Weather:** Precipitation: None	Temp (°C): 16	
Map Code: 1	Wind Speed & Direction: 1 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 (JTB camera) 276 (south end) TRANS LINE: tsS1 – tsS4			

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

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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Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Cochrane Solar Farm		**Project #:** 1247	
Observer(s): JTB, 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:** cS2 – cS3, cS26, cS27, cS41		
Photos: 274-275, 277 (south end) ; 1st comm. along east side; cS51 TRANS LINE: cS16, cS19, cS22			

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species) cS25 – cS27, cS33 – cS36
h	/
* c	Black Spruce; Tamarack (90%) — Roadside mapping: cS24, cS45, cS46, cS55
dc,dh,ds	
ts	Speckled Alder; (15%)
ls	labrador tea; speckled alder; creeping snowberry (50%)
gc	bluebead lily; woodland horsetail; bunchberry (25%)
ne	
be	/
re	/
ff	/
f	/
su	/
m	Peat moss (90%); caribou lichen (90%)

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, hS38, hS39 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
ls	red raspberry; red osier dogwood, alder-leaved buckthorn; red currant (50%)
gc	strawberry; bluebead lily, bunchberry; purple stem aster (rare) (85%)
ne	Canada bluejoint (7%) sedge sp. (20%); rare stipata
be	—
re	Dark green tall brush
ff	—
f	—
su	—
m	moss s

- sheep laurel, labrador tea

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 E, ast Cloud %: 100

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

% Open Water: 0 **ELC Code:** cS18 cS19, cB20

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, reflexed) speckled alder (5%)
ls	labrador tea; red currant; low bush blueberry (15%)
gc	woodland horsetail; bunchberry (10%)
ne	
be	
re	
ff	
f	
su	
m	Peat 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 horsetail, bird foot trefoil (fruit trefoil), red clover, fowl manna (reed)
ne	Canada bluejoint; Aquatic sedge (awlfruit), fox sedge
be	/
re	Common cattail; dark green bulrush
ff	/
f	yellow pond lily
su	/
m	/

Soil type: organic mesic | Organic [X] Mineral [ ]

Rare Species (Local, Regional, Provincial):

Wildlife Notes:
Sandhill crane
Snapping turtle habitat present but not observed.

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 lane - a 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, (90%), 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 codes
~~hS~~ hS36, hS39, hS44

*should be hS (not hwS)

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Wetland Vegetation Communities

Project Name: Cochrane Solar Farm **Project #:** 1247
Observer(s): JEG, 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, hwS32
Photos: 294 (from edge) 298 hwS35, hwS37, hwS43, hwS41, hwS46, hwS47

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) silty clay after that **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): JEG, 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, tsS41
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

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Wetland Vegetation Communities

Project Name: Cochrane Solar Farm		**Project #:** 1247	
Observer(s): JEG, 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: 1sB30, 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 2, 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

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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	

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Breeding Bird Area Search Observation Form

Page 1 of 1

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								
Arrobird		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	Probable	Confirmed
X - No evidence of breeding	P - Pair	DD - Distraction display
	T - Permanent territory	NU - Used nest or egg shell
Possible	D - Courtship or display	FY - Fledged young
H - Suitable nesting habitat	V - Visiting prob. nest site	AE - Adults at occupied nest
S - Singing mate	A - Agitated behaviour or anxiety calls	FS - Faecal sac
	B - Brood patch/cloacal protuberance	CF - Carrying food
	N - Nest building or excavation	NE - Nest containing eggs
		NY - Nest with young

Beaufort Wind Scale

0 - Calm	9 - light structural damage
1 - smoke drifts	10 - trees uprooted
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	

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.

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 Site 3 & 4	See map	22:10	N	NONE			
on Rd.	Note - played barred owl calls - likely too windy to hear much						
HRP-4 Cedar Oak	See map - existing	22:25	N	White-throated Sparrow	O	50m	open meadow - played nighthawk calls
Between Lake	See map - roadside	22:32	N	Spring peeper	East	100m	

Stations refer to those picked by Hatch

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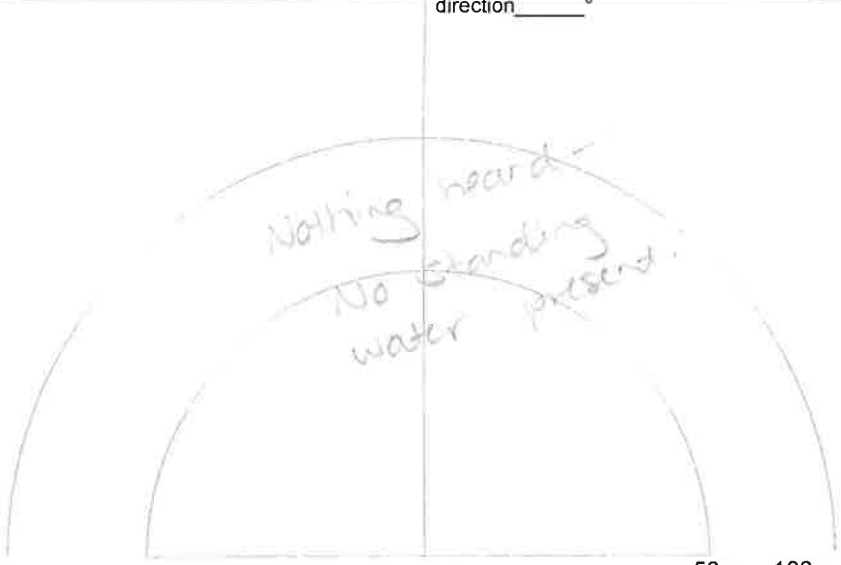
Amphibian Data Form

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

UTM:

Observer: MP, JEB	Station Name: 1 Visit #: 1		Date: June 24/11 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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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

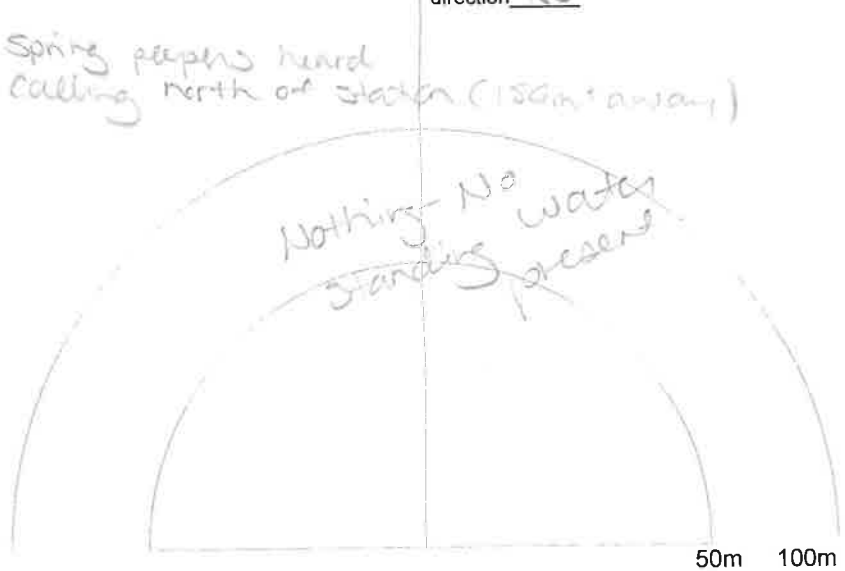
Amphibian Data Form

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

UTM:

Observer: JEB, MP	Station Name: 2 Visit #: 1		Date: June 24/11 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
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
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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Cochrane Solar Farm - Longlake Project No. 1247

UTM:

Observer: MJP, JEG	Station Name: 3 Visit #: 1		Date: 24/06/11 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°

50m 100m

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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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

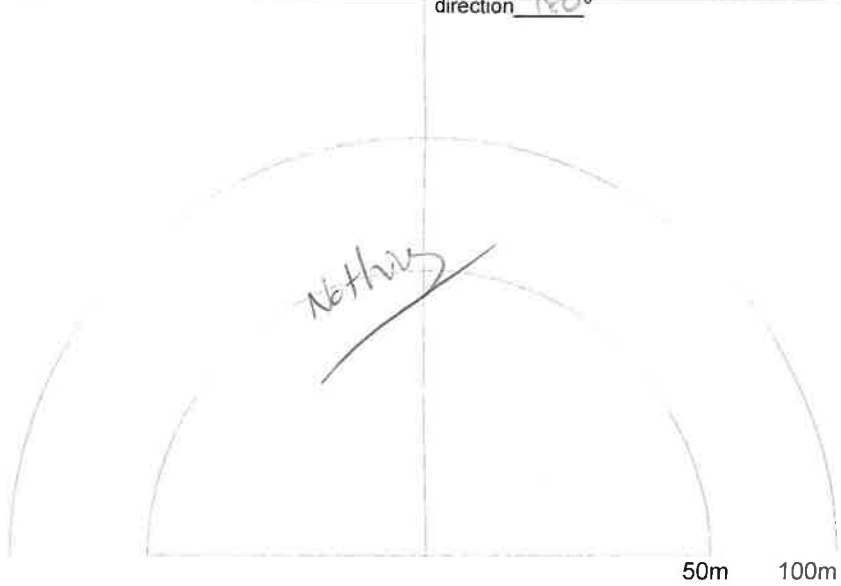
Amphibian Data Form

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

UTM:

Observer: JEG, MP	Station Name: 4 Visit #: 1		Date: June 24/11 Start time: 23:20	
Wind speed: 5	% Cloud cover: 100	Air Temp: 15	Water Temp: 15	Water pH: /
Precipitation Description: Light Rain				
Remarks:				

direction 180°



50m 100m

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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