



# McCann Solar Project

## Natural Heritage Evaluation of Significance Report

July 8, 2011



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

Natural Heritage  
Evaluation of Significance Report

McCann Solar Project

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Project Report

July 8, 2011

**Northland Power Inc.  
McCann Solar Project**

**Natural Heritage Evaluation of Significance  
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## 1. Introduction

### 1.1 Project Description

Northland Power Solar McCann L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatt (MW) solar photovoltaic Project, titled the McCann Solar Project (hereinafter referred to as the “Project”). The Project will be located on approximately 40 hectares (ha) of land, located just south of Big Rideau Lake in the Township of Rideau Lakes, within the United Counties of Leeds and Grenville (Figure 1.1).

### 1.2 Legislative Requirements

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

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

Natural Features are defined in Section 1(1) of O. Reg. 359/09 to be all or part of

- a) an area of natural and scientific interest (ANSI) (earth science)
- b) an ANSI (life science)
- c) a coastal wetland
- d) a northern wetland
- e) a southern wetland
- f) a valleyland
- g) a wildlife habitat, or
- h) a woodland.

#### 1.2.1 Records Review Report

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

- (a) in a natural feature
- (b) within 50 m of an area of natural and scientific interest (earth science)
- (c) within 120 m of a natural feature that is not an area of natural or scientific interest (earth science).” (O. Reg. 359/09, s. 25, Table).

Subsection 2 of Section 30 of the REA Regulation requires the proponent to prepare a report “setting out a summary of the records searched and the results of the analysis” (O. Reg. 359/09). The Natural Heritage Records Review Report (Hatch Ltd., 2010a) was prepared to meet these requirements.

### **1.2.2 Site Investigation Report**

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

- whether the results of the analysis summarized in the (natural heritage records review) report prepared under Subsection 25(3) are correct or require correction, and identifying any required corrections
- whether any additional natural features exist, other than those that were identified in the (natural heritage records review) report prepared under Subsection 30(2)
- the boundaries, located within 120 m of the Project location, of any natural feature that was identified in the records review or the site investigation
- the distance from the Project location to the boundaries determined under clause (c).

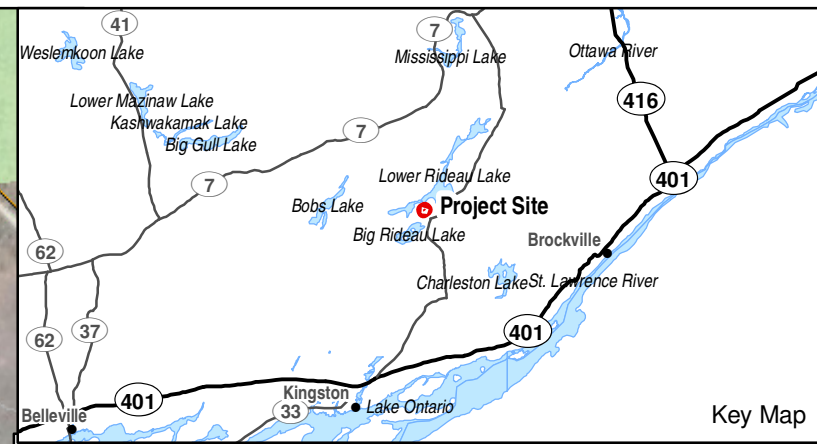
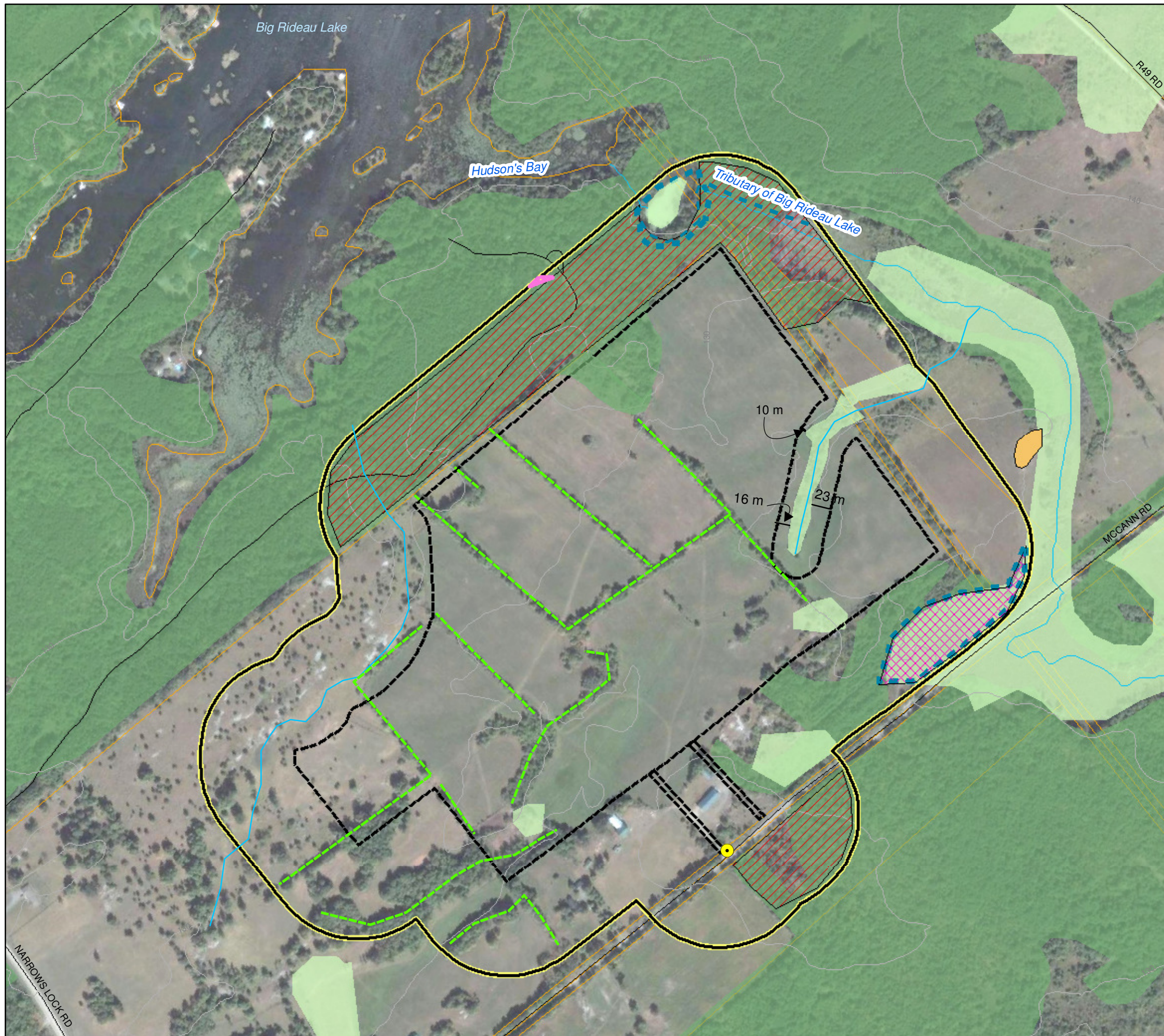
The Natural Heritage Site Investigation Report (Hatch Ltd., 2010b) was prepared to meet these requirements.

### **1.2.3 Evaluation of Significance Report**

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

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

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



**Legend**

- Road
- +— Railway
- Transmission Line
- Topographic Contour (5 m interval)
- Watercourse
- ▭ Parcel

**Candidate Significant Natural Heritage Features**

- Hedgerow / Animal Movement Corridor
- ▭ Wetland
- ▭ Woodland / Animal Movement Corridor
- ▭ Turtle Nesting Habitat
- ▭ Cerulean Warbler Habitat
- ▭ Western Chorus Frog Habitat
- ▭ Milksnake Habitat / Raptor Winter Feeding and Roosting
- ▭ Eastern Ribbonsnake Habitat / Northern Map Turtle Habitat / Snapping Turtle Habitat / Animal Movement Corridor
- ▭ Habitat for Area Sensitive Species (Red-breasted Nuthatch, Black-and-white Warbler/ Forest providing a high diversity of habitats)

**Project Components**

- Connection Point With Existing Distribution Line
- ▭ 120 m from Project Location
- ▭ Project Location

0 50 100 200 Metres  
1:5,000

Notes:  
1. OBM and NRVIS data downloaded from LIO, with permission.  
2. Spatial referencing UTM NAD 83.  
3. Satellite imagery from Google Earth Pro.

▲ NORTH

Figure 1.1  
Northland Power Inc.  
**McCann Solar Energy Project**  
**Project Location and**  
**Natural Heritage Features**

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### 1.3 Evaluation of Significance Report Format

Section 1 of this EOS has identified the legislative requirements for an EOS under the REA Regulation and identified the reasons why an EOS is required for the Project. Section 2 provides a summary of the results of the records review and site investigation. Section 3 provides the EOS for the woodland, Section 4 for wildlife habitat, and Section 5 provides the EOS for the wetland. Section 6 identifies the conclusions of the EOS, and the references are provided in Section 7.

## 2. Summary of Results of Records Review and Site Investigation

As stated above, natural features requiring an evaluation of significance are identified through the records review (Hatch Ltd., 2010a) and site investigation (Hatch Ltd., 2010b) required under Sections 25 and 26 of the REA Regulation, respectively. These studies have already been completed, and the results are summarized in Table 2.1. This Report provides the evaluations for the features identified in Table 2.1.

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

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

## 3. Woodlands

Section 1 of O. Reg. 359/09 defines “woodland” as land

- (a) that is south and east of the Canadian Shield
- (b) that has per hectare, at least
  - (i) 1000 trees of any size
  - (ii) 750 trees measuring over 5 cm in diameter
  - (iii) 500 trees measuring over 12 cm in diameter
  - (iv) 250 trees measuring over 20 cm in diameter
- (c) that does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.

### 3.1 Evaluation Criteria and Guidelines for Woodlands

The EOS was completed in consideration of the Evaluation Approach outlined in Section 7 of the NHRM (MNR, 2010a). The evaluation criteria recommended in the NHRM to assess significance of a woodland are as follows:

- Woodlots greater than 50 ha in size in this region are considered significant. This size recommendation is for this area where woodlots represent approximately 30 to 60% of the land cover.
- Ecological Functions
  - ◆ Woodland Interior – Woodlands with 8 ha or more of interior habitat.
  - ◆ Proximity to Other Woodlands or Other Habitats – Woodlands within 30 m of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland.
  - ◆ Linkages – Woodlands providing a connecting link between two other significant features within 120 m of the woodland.
  - ◆ Water Protection – Woodlands located within a sensitive or threatened watershed or within 50 m of various water features (such as watercourses or sensitive recharge areas).
  - ◆ Woodland Diversity – Woodlands with i) a naturally occurring composition of forest species that have declined or ii) with a high native diversity through a combination of composition and terrain.
- Uncommon Characteristics – Woodlands with i) a unique species composition or site; ii) a vegetation community with a provincial ranking of S1, S2, or S3; iii) important habitat or a rare, uncommon, or restricted woodland plant species or iv) characteristics of older woodlands or woodlands with larger tree size structure in native species.
- Economic and Social Functional Values – Woodlands with i) a high productivity in terms of economic value products together with continuous native natural attributes; ii) a high value in special services, such as air quality improvement or recreation at a sustainable level that is compatible with long-term retention, or iii) important identified appreciation, education, cultural or historical value.

### 3.2 Date of Beginning and Completion of Evaluation

The evaluation of woodlands commenced with records reviews in May 2010 and is finalized with the completion of this report in December 2010. A site visit was completed in association with this evaluation on May 17, 2010, August 10, 2010 and October 14, 2010.

### 3.3 Determination of Significance

There are several woodlands identified in the vicinity of the Project location. These woodlands, shown in Figure 1.1, are evaluated individually below. Woodland sizes were calculated using the MNR Land Information Ontario wooded area layer, supplemented with boundaries confirmed during site investigations, in ArcMap 9.3.

#### 3.3.1 Northern Woodland

This woodland is located on and within 120 m of the northern boundary of the Project location. Woodland size is estimated to be 122.1 ha with approximately 9 ha of interior forest habitat. This woodland is also adjacent to Big Rideau Lake and various tributaries. Portions of the woodland beyond 120 m from the Project location have been identified as containing old growth forest

characteristics, while portions within 120 m of the Project location have been identified as woodland supporting old growth forest (MNR, 2011).

The woodland was not composed of species that have declined or with a high native diversity of composition and terrain. The woodland was not comprised of an uncommon vegetation community, and is not known to contain economic or social functional values.

The MNR (2010b) identifies this woodland as significant for linkage and riparian features. It is considered significant as it meets the requirements for linkage, woodland size, interior habitat, old growth forest, and proximity to water features.

### **3.3.2 Red Pine Plantation**

This woodland is located on and within 120 m of the southern portion of the Project location, north of McCann Road. Woodland size is estimated to be 2.9 ha with no interior forest habitat. This woodland is adjacent to the unevaluated wetland.

The woodland was not composed of species that have declined or with a high native diversity of composition and terrain. The vegetation community was not considered to be uncommon, was not considered to be linkage habitat, and is not known to contain economic or social functional values.

MNR (2010b) does not identify this woodland as significant, and this was confirmed during this evaluation.

### **3.3.3 Southern Woodland**

This woodland is located within 120 m of the southern boundary of the Project location opposite McCann Rd. Woodland size is estimated to be 135.8 ha with 15.0 ha of interior forest habitat. This woodland is adjacent to the unevaluated wetland and watercourse which flows into Lower Rideau Lake. This woodland is considered to provide linkage habitat.

The woodland was not composed of species that have declined or with a high native diversity of composition and terrain. The vegetation community was not considered to be uncommon, and is not known to contain economic or social functional values.

This woodland was identified as significant by MNR (2010b), and it is considered significant as it meets the requirements for proximity to watercourse, woodland size, linkage, and interior forest habitat.

## **3.4 Name and Qualifications of Evaluator**

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

Sean K. Male, M.Sc. is a Terrestrial Ecologist specializing in assessments of terrestrial habitat, flora and fauna. Sean received his Bachelors of Science (Honours) in Biology from Queen's University, where he completed his Honour's thesis under Dr. Raleigh J. Robertson, studying the impacts of nestbox density in Tree Swallows (*Tachycineta bicolor*) on nest-building behaviour. He then completed a Master's of Science degree in the Watershed Ecosystem Graduate Program at Trent University under Dr. Erica Nol. Sean's thesis focussed on examining the impacts of a Canadian diamond mine on a population of breeding passerines. For his thesis, Sean spent two summers in the Canadian arctic studying populations of Lapland Longspurs (*Calcarius lapponicus*) around the

Ekati Diamond Mine, located 300 km northeast of Yellowknife. While at Trent, Sean participated in the Northern Saw-whet Owl (*Aegolius acadicus*) Migration Banding Project at the Oliver Centre. Following his time at Trent, Sean participated in the Landscape Monitoring Program, participating in a study of the impacts of woodlot size on breeding birds.

Sean joined Hatch as a Terrestrial Ecologist in 2006. Since joining Hatch, Sean has participated in several environmental assessments, REAs and other regulatory approvals for hydro, wind and solar power developments as the terrestrial biologist specializing in field investigations identifying flora and fauna species, including species of significance. He has developed and implemented baseline monitoring and impact assessment programs for both terrestrial wildlife and plant communities, including detailed bird and bat studies for several wind power developments, including the proposed 100-MW Coldwell wind power development near Marathon, Ontario, a proposed 20-MW facility near Port Dover, Ontario, and a proposed 110-MW wind facility in southwestern Ontario. Sean has also conducted terrestrial and wetland vegetation surveys for several proposed hydropower projects totalling over 40 MW in southern and northern Ontario and has participated in fisheries surveys for several of these projects.

## 4. Wildlife Habitat

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

- raptor winter roosting and feeding areas
- habitat for area-sensitive species (Red-breasted Nuthatch, Black-and-white Warbler)
- forest providing a high diversity of habitats
- habitat for species of conservation concern (including Milksnake, Eastern Ribbonsnake, Five-lined Skink, Northern Map Turtle, Snapping Turtle, Western Chorus Frog)
- woodlands, hedgerows, and the Tributary of Big Rideau Lake on and within 120 m of the Project location as animal movement corridors

### 4.1 Evaluation Criteria and Guidelines for Wildlife Habitat, and Determination of Significance

The criteria processes outlined in the Ministry of Natural Resources (MNR) Natural Heritage Reference Manual (NHRM) (MNR, 2010a) and Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) are used to evaluate the significance of wildlife habitat. The specific criteria used in the evaluation from these sources are discussed by habitat type below.

#### 4.1.1 Seasonal Concentration Habitats

Criteria for evaluation of specialized habitat for wildlife are identified within Table Q-1 of Appendix Q of the SWHTG. The criteria that were considered during the evaluation of these features are discussed in respect of the individual features below.

#### 4.1.1.1 *Forest Providing a High Diversity of Habitats*

The criteria that were considered during the evaluation of the forests providing a high diversity of habitats, as identified associated with the large woodlands within 120 m north and south of the Project location, include the following:

- Provision of significant wildlife habitat – The woodland within 120 m north of the Project location is also identified as significant Cerulean Warbler habitat, while both woodlands are considered to be significant animal movement corridors. Therefore, this criteria is met.
- Size of site – Both woodlands are greater than 100 ha in size, therefore this criteria is met.
- Age, condition of trees on site – The age of trees within the woodland within 120 m north of the Project location was determined to be mature, while the woodland within 120 m south of the Project location was identified as mid-aged. Presence of diseased and damaged trees within the woodland was described as light. Therefore, this criteria is not met.
- Vegetation composition and diversity of site – Woodland communities were identified as consisting of a single community type. Therefore this criteria is not met.
- Cavity size, abundance and location – Large snags capable of providing cavity support trees were not recorded during the site investigation; therefore this criteria is not met.
- Location of site – The woodlands encompass a watercourse and a wetland; therefore this criteria is met.
- History of forest management – There is no recent history of forest management within the woodland within 120 m north or south of the Project location. As there is no history of forest management associated with this woodland, this criteria is met.

Therefore, as several of the criteria have been met, this habitat type within both woodland communities is considered to be significant.

#### 4.1.1.2 *Raptor Winter Feeding and Roosting Areas*

The criteria for raptor winter feeding and roosting areas include the following:

- Relative importance of the site – Grassland areas and mixedwood forest communities are common within Ecodistrict 6E-11, representing the majority of the landscape (i.e., more than a 100,000 ha), and therefore this site (at 40 ha), is not of relative importance.
- Presence of species of conservation concern/Species diversity/abundance – A Red-tailed Hawk was noted during the site investigation in October 2010, and may use the site during the overwintering period. Red-tailed Hawks are not a species of conservation concern. Other raptor species that may use the area are currently unknown.
- Size of site – The size of the both the grassland and woodland areas are greater than 20 ha, which exceeds the criteria
- Level of disturbance – There are nearby roadways, residential properties, and agricultural operations within close proximity of the area, therefore disturbance is high

- Location of site – There are other open grasslands and mixed wood forest communities present in the area.
- Quality of habitat – Though abundance of prey is unknown, habitat is believed to be reflective of the quality of habitat available within the region.
- Historical Use – Historical use of the feature is unknown

Based on the low relative importance of this site, the abundance of this habitat type within the region, these areas are not considered to be a significant raptor winter feeding and roosting area.

#### 4.1.2 *Specialized Habitat for Wildlife*

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

##### 4.1.2.1 *Habitat for Red-Breasted Nuthatch/Black-and-White Warbler, Area-Sensitive Species*

The criteria for area-sensitive coniferous forest species include the following:

- Presence of rare, uncommon, or declining species – Both Red-breasted Nuthatch and Black-and-white Warbler populations are stable within the province (NHIC, 2011). Therefore, this criteria is not met.
- Overall area of the site/current representation of the specialized habitat – Based on satellite imagery there are several large woodlands within the regional area. Further, within the planning area (Ecodistrict 6E-11), there are more than 40,000 ha of interior forest within woodlands with more than 8 ha of interior forest. Therefore, these woodlands, with 9 ha and 15 ha of interior forest do not represent a large portion of these lands within the planning area. As a result, this criteria is not met.
- Area of forest interior contained within the forest stand – Forest interior is 9 ha and 15 ha for the northern and southern woodlands, respectively. Therefore, this criteria is met.
- Age and tree composition of the forest stand – The wooded area is not considered to be a mature forest community; therefore, this criteria is not met.
- Amount of vertical stratification of site – Forest communities are even-aged in this area, and therefore, this criteria is not met.
- Amount of contiguous closed-canopy/open areas in forest stand – Canopy coverage within the woodland is high and therefore this criteria is met.
- Degree of disturbance – Degree of disturbance within the woodland communities is low, though disturbance in surrounding areas (roadways, agricultural operations) is moderate.
- Amount of adjacent residential development – There is no residential development within the woodland, though several cottages are located along the lakeshore. Therefore, this criteria is met.

- Provision of significant wildlife habitat – The woodland also provides a significant animal movement corridor. Therefore, this criteria is met.
- Potential for long-term protection of the site – The site is located on private land and therefore long-term protection of the feature cannot be assured.

Therefore, as several of the criteria are met, this feature is considered significant.

#### **4.1.3 Habitat for Species of Conservation Concern**

Criteria for evaluation habitat of conservation concern are identified within Table Q-3 of Appendix Q of the SWHTG. The criteria that were considered during this evaluation include

- degree of rarity of species found at site (i.e., habitat of rare species is significant)
- documented significant decline in a species and/or its critical habitat
- species whose range is solely or primarily found in Ontario
- condition of existing habitat at site (i.e., sites with minimal disturbances, non-invasive sp., etc)
- size of species population at site
- size and location of habitat
- potential for long-term protection of habitat
- evidence of use of the habitat.

The species of conservation with potential habitat on the Project location are discussed further in relation to these criteria below:

- Milksnake – Given that Milksnake are habitat generalists, the entire Project location and lands within 120 m were considered to be suitable habitat for Milksnake. As Milksnake are difficult to detect, use of the area was unconfirmed, and the size of the population is uncertain. The site is located on private land and therefore long-term protection cannot be assured, though lands located on the Project location will be protected by Northland Power during the life of the Project. Milksnake are identified as a species of Special Concern on the ESA, and therefore though use is unconfirmed, the area is treated as significant wildlife habitat and carried forward in the EIS.
- Eastern Ribbonsnake/Northern Map Turtle/Snapping Turtle/Western Chorus Frog – Potential habitat for these species was identified within the Tributary of Big Rideau (except Western Chorus Frog) and online wetland communities within 120 m east of the Project location. Use of the area was unconfirmed and the size of the population is uncertain. As these features are associated with watercourse, some protection is provided through existing legislation. These species are identified as a species of Special Concern on the ESA (Eastern Ribbonsnake/Northern Map Turtle/Snapping Turtle) or Threatened by the Committee on the Status of Endangered Wildlife in Canada (Western Chorus Frog), and therefore though use is unconfirmed, the area is treated as significant wildlife habitat and carried forward in the EIS.

- Cerulean Warbler – Suitable habitat for Cerulean Warblers was identified within the woodland community within 120 m north of the Project location. Use of the area was unconfirmed and the size of the population is uncertain. The woodland is located on private land and therefore there is no assurance of long-term protection. Cerulean Warbler are identified as a species of Special Concern on the ESA, and therefore though use is unconfirmed, the area is treated as significant wildlife habitat and carried forward in the EIS.

#### **4.1.4 Animal Movement Corridors**

Potential animal movement corridors were identified in the woodlands adjacent to the Project location, and the watercourse which crosses the Project location.

Evaluation of animal movement corridors is identified within Section 8.7 of the SWHTG. The criteria for significance are outlined in Table Q-4 of Appendix Q in the SWHTG, and include the following:

- Importance of areas to be linked by corridor – Areas linking critical habitats/significant areas
- Importance of corridor to survival of target species – Corridors linking significant or critical habitat for a target species.
- Dimensions of corridor – Most significant corridors should be at least 200 m wide
- Continuity of corridor – Corridor should be unbroken
- Habitat and habitat structure of corridor – Corridor with several layers of vegetation and other structures, such as watercourses
- Species found in corridor or presumed to be using corridor – Corridors with high species diversity are significant
- Risk of mortality for species using corridor – Corridors with low risk of road kills or adjacent to residential areas
- Opportunity for protection – Corridors within areas that may be protected, such as undeveloped shorelines or borders of conservation areas
- Provision of other related values (such as erosion protection).

The hedgerows and woodland are discussed separately below.

- Hedgerows – Section 8.7 of the SWHTG states that “fence and hedgerows should not be considered significant unless they provide the only animal movement corridors in the planning areas”. Given that there is a large animal movement corridor present in the local area (represented by the woodland surrounding the Project location), these features are not considered to be significant wildlife habitat.
- Woodland within 120m north of the Project location – This corridor connects significant woodlands and wildlife habitat features with Big Rideau Lake and other wildlife habitat features. There are no target species identified for this corridor, though likely deer, coyotes, other mammals, birds, and species of amphibians and reptiles use the corridor. The corridor is mostly continuous (excepting some small roadways), wide, and the risk of mortality is low. The corridor is located on private land, and therefore long-term protection cannot be assured. The corridor



provides resistance to soil erosion and assists in maintaining water quality within Big Rideau Lake and the associated tributaries. As several criteria appear to be met, this feature is considered to be a significant animal movement corridor.

- Woodland within 120m south of the Project location – This corridor connects significant woodlands and wildlife habitat features. There are no target species identified for this corridor, though likely deer, coyotes, other mammals, birds, and species of amphibians and reptiles use the corridor. The corridor is continuous, wide, and the risk of mortality is low. The corridor is located on private land, and therefore long-term protection cannot be assured. The corridor provides resistance to soil erosion and assists in maintaining water quality the tributary of Big Rideau Lake. As several criteria appear to be met, this feature is considered to be a significant animal movement corridor.
- Tributary of Big Rideau Lake – This corridor links several upland amphibian (i.e., Northern Leopard Frog) and reptile (Northern Map Turtle) breeding wetland communities with the over-wintering habitat that may be found within Big Rideau Lake. There is a low risk of mortality for species using this corridor, and the corridor provides resistance to soil erosion. The corridor is generally narrow to wide and does contain a diversity of habitats (wetland/woodland). As the corridor is associated with a watercourse, there is some protection assured through existing legislation. Given that several of the criteria are met, this corridor is considered to be significant.

#### 4.2 Date of Beginning and Completion of Evaluation

The evaluation of wildlife habitat commenced with records review in May 2010 and is finalized with the completion of this Report in December 2010. Site investigations were completed in association with this evaluation on May 17, 2010, August 10, 2010 and October 14, 2010.

#### 4.3 Overall Conclusion

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

- habitat for species of Conservation Concern (Milksnake, Eastern Ribbonsnake, Northern Map Turtle, Snapping Turtle, Cerulean Warbler)
- forest providing a high diversity of habitats
- habitat for Red-breasted Nuthatch and Black-and-white Warbler
- woodlands and Tributary of Big Rideau Lake within 120 m of the Project location as significant animal movement corridors.

#### 4.4 Name and Qualifications of Evaluator

Evaluations of wildlife habitat were completed by Sean K. Male of Hatch. His qualifications are provided within Section 3.4

## 5. Wetlands

In accordance with the Natural Heritage Assessment Guide (NHAG) for Renewable Energy Projects (MNR, 2010c), the majority of wetland communities within 120 m of the Project location are treated as a Provincially Significant Wetland, and an Environmental Impact Study will be required.

As part of this process, a specific assessment of the wetland community according to specified processes within the NHAG is required, which is provided in Appendix A.

Additional wetland communities were identified on and within 120 m of the Project location. These communities were determined to not be part of the PSW complex, and to be too small to warrant completion of an evaluation of significance.

## 6. Conclusions

Results of the EOS are summarized in Table 6.1. Based on the EOS outlined above, there is significant wildlife habitat and significant woodlands present on and within 120 m of the Project location, as well as a wetland community treated as provincially significant within 120 m of the Project location. The locations of these features are shown in Figure 1.1.

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

**Table 6.1 Significant Natural Features on and within 120 m of the Project Location**

Natural Feature		Project Location	Adjacent Lands (within 120 m)
SIGNIFICANT	Valleylands	No	No
	Woodlands	Yes	Yes
	Wildlife Habitat	Yes	Yes
PROVINCIALY SIGNIFICANT	Wetland	No	Treated as Provincially Significant
	Earth Science ANSI	No	No
	Life Science ANSI	No	No

## 7. References

- Hatch Ltd. 2010a. McCann Solar Project – Natural Heritage Records Review Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar McCann L.P. July 2010.
- Hatch Ltd. 2010b. McCann Solar Project – Natural Heritage Site Investigations Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar McCann L.P. July 2010.
- Ministry of Natural Resources (MNR). 2011a. Personal communication from H. Zurbrigg (MNR Kemptville) to S. Male (Hatch).MNR . 2010a. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen’s Printer for Ontario. 248 pp.
- MNR. 2010b. Personal communication from H. Zurbrigg (MNR Kemptville) to S. Male (Hatch) during a meeting on September 17, 2010.
- MNR. 2010c. Natural Heritage Assessment Guide for Renewable Energy Projects. 86pp.
- MNR. 2000. Significant Wildlife Habitat Technical Guide. 151p.
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**Appendix A**  
**Natural Resource Solutions Inc.**  
**Wetland Evaluations**



## Memo

Project No. 1144

**To: Sean Male**

**From: David Stephenson; Kevin Dance**

**Date: March 22, 2011**

**Re: McCann Solar Project Wetland Evaluation  
Response to MNR Comments**

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The wetlands in the vicinity of the proposed McCann Solar Project lands are unevaluated at this time. The new Natural Heritage Assessment Guide (NHAG) for Renewable Energy Projects (MNR 2010) allows for the evaluation of these wetlands using Appendix C. By completing the wetland evaluation sections outlined in the NHAG's Appendix C the wetlands on site are assumed to be Provincially Significant wetland. An EIS is therefore also required to be completed if Appendix C of the NHAG is used. Based on comments NRSI received from yourself, MNR has identified that the on-site wetlands identified as hS4 (SWDM4-2), neM4 (MASM1-10) and nearby hS5 (SWDM2-2), are not to be included as part of the PSW complex, see *Wetland Vegetation Map*. We agree with this determination, as the three wetlands mentioned above were isolated wetlands and were all <0.5ha in size, which according to the Ontario Wetland Evaluation System for Southern Ontario (OWES) is too small to map and to require a wetland evaluation (OWES 2002). These wetlands were therefore not included in the NHAG Appendix C evaluation for the wetland complex.

The catchment area used in this evaluation is based on that identified by Shaun Thompson of MNR, from February 17, 2011 (Pers. Comm. 2011), see attached *Catchment Area Map*. The location and the vegetation community types of the unevaluated wetlands within the catchment area are shown on the attached *Wetland Vegetation Map*. The size of the wetlands within the catchment area are provided in hectares (ha) on the *Area (ha) of Wetland Vegetation Communities Map*. Completion of Appendix C of the NHAG was completed in accordance with the appropriate sections of the Ontario Wetland Evaluation System for Southern Ontario (MNR 2002), and is attached as Table 1. It is our understanding that this table will be used by Hatch to identify potential negative environmental effects and mitigations as is required for preparation of an EIS.

The field study approach taken by NRSI during the August 10<sup>th</sup>, 2010 site visit included:

- Collection and review of background information on wetland-related natural features in the vicinity of the project location.

- Identification of all wetlands, evaluated and non-evaluated, within approximately 750m of the subject wetlands to assess the extent of wetland mapping that would be required to address whether wetlands in the vicinity of the project location would be complexed with other wetlands (i.e. to identify whether a 'string' of unevaluated wetlands occur between the subject wetlands and the nearest evaluated wetland)
- Conduct field surveys of subject wetlands on the project location as well as on neighbouring lands. This included mapping of wetland vegetation communities based on Ontario Wetland Evaluation System (OWES) Southern Manual as well as Ecological Land Classification (ELC), and recording all species of flora and fauna within the wetlands.

Some of the wetlands in the catchment area were not able to be visited in the field on August 10<sup>th</sup>, 2010 by NRSI staff, as they were on private property and not visible from public roads. For wetlands which were not accessible during the site visits or were identified later by MNR, information on those wetlands was based on air photo interpretation. Air photo interpretation took into account MNR NRVIS wetland mapping and the mapping provided by Shaun Thompson (MNR) to determine wetland boundaries for those wetlands that were inaccessible in the field. This allowed for the size of the wetlands to be determined for use in completing the Appendix C evaluation (see the attached Catchment Area and Wetland Size map).

As part of Appendix C of the NHAG, we have completed an interspersion map covering the wetlands in the catchment area, and have attached the interspersion map with this memo.

I trust that this information is adequate. If any further information or clarification is needed please contact me.

Yours Sincerely,  
Natural Resource Solutions Inc.

A handwritten signature in black ink, appearing to read "D. Stephenson", with a long horizontal flourish extending to the right.

David Stephenson, M.Sc.,  
Senior Biologist

**Work Cited**

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**Work Cited:**

Ontario Ministry of Natural Resources (MNR). 2010. Natural Heritage Assessment Guide For Renewable Energy Projects. Ontario Ministry of Natural Resources. Pp86.

Ontario Ministry of Natural Resources (MNR). 2002. Ontario Wetland Evaluation System: Southern Manual. Ontario Ministry of Natural Resources. 252p.

Thompson, Shaun. 2011. Personal Communication from February 17<sup>th</sup>, 2011. Ontario Ministry of Natural Resources.





**Table 1 Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects, Wetland Complex**

Characteristic/ Ecological Function	Evaluation Results	Scoring																				
<b>Actual Wetland Size (ha)</b>	<p><b>Wetland 1:</b> Tall shrub, swamp #1 (tsS1) = 6.12ha Deciduous, swamp #2 (hS2) = 0.62ha</p> <p><b>Wetland 2:</b> Herbs, marsh #1 (gcM1) = 0.27ha</p> <p><b>Wetland 3:</b> Robust emergent, marsh #1 (reM1) = 32.87ha Herbs, marsh #3 (gcM2) = 2.4ha Deciduous, swamp #3 (hS3) = 0.6ha</p> <p><b>Wetland 4:</b> Herbs, marsh #3 (gcM3) = 0.61ha</p> <p><b>Wetland 5:</b> Deciduous, swamp #6 (hS6) = 0.66ha</p> <p><b>Wetland 6:</b> Herbs, marsh #3 (gcM4) = 3.49ha</p> <p><b>Wetland 7:</b> Robust emergent, marsh #2 (reM2) = 1.2ha</p> <p><b>Wetland 8:</b> Robust emergent, marsh #3 (reM3) = 0.54ha</p> <p><b>Wetland 9:</b> Tall shrub, swamp #2 (tsS2) = 0.86ha Narrow-leaved emergent, marsh #2 (neM2) = 2.02</p> <p><b>Wetland 10:</b> Robust emergent, marsh #4 (reM4) = 0.88ha Submergent, marsh #1 (suM1) = 0.41ha Floating, marsh #1 (fM1) = 8.82ha</p> <p><b>Total : 62.37 ha (excluding Non PSW wetlands ID'd by MNR)</b></p>																					
<b>Wetland Type</b>	<p>WETLAND (Fractional Area = area of wetland 1.1.2 TYPE type/total wetland area)</p> <table border="1" data-bbox="548 1402 1203 1633"> <thead> <tr> <th></th> <th>Fractional Area</th> <th></th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Bog</td> <td></td> <td>x 3</td> <td>0.00</td> </tr> <tr> <td>Fen</td> <td></td> <td>x 6</td> <td>0.00</td> </tr> <tr> <td>Swamp</td> <td>0.14</td> <td>x 8</td> <td>1.12</td> </tr> <tr> <td>Marsh</td> <td>0.86</td> <td>x 15</td> <td>12.9</td> </tr> </tbody> </table> <p style="text-align: right;"><b>Wetland type score (maximum 15 points) 14.02</b></p> <p><b>Fractional Area of Wetland Types:</b>  <b>Swamp: Swamp (ha)</b>  Total ha = 8.86  FA=8.86/62.37  =0.14</p>		Fractional Area		Score	Bog		x 3	0.00	Fen		x 6	0.00	Swamp	0.14	x 8	1.12	Marsh	0.86	x 15	12.9	9
	Fractional Area		Score																			
Bog		x 3	0.00																			
Fen		x 6	0.00																			
Swamp	0.14	x 8	1.12																			
Marsh	0.86	x 15	12.9																			

	<p><b>Marsh: Marsh (ha)</b>  Total ha = 53.65  FA =53.51/62.37  =0.86</p>	
<b>Site Type</b>	<p>Lacustrine (at river mouth):  FA= 9.7/62.37= 0.15  0.15*5 = 0.75  Palustrine:  FA= 10.98/62.37= 0.18  0.0.18*2 = 0.35  Riverine:  FA= 41.69/62.37=0.67  0.67*4 = 2.68</p>	3.73
<b>Vegetation Communities</b>	<p>Ten wetland areas have information on vegetation communities. Seven of the wetlands have no detailed vegetation information as only available information is from air photos as there was no property access to these private property areas.</p> <p>Areas with known vegetation communities:  =19  Assuming all areas have only 1-3 forms  19= 12</p>	12
<b>Proximity to other Wetlands</b>	Hydrologically connected by surface water to other wetlands (different dominant wetland type), or open lake or deep river within 1.5 km	8
<b>Interspersion</b>	<p>See Appended Interspersion Map</p> <p>Total vertical: <b>53</b>  Total horizontal: <b>46</b></p> <p><b>Total = 99</b></p>	15
<b>Open Water Types</b>	Type 2: Open water occupies 5-25% of the wetland area, occurring in a central area	8
<b>Flood Attenuation (total)</b>	Details of Flood Attenuation calculations are provided below Table 1	89
<b>Water Quality Improvement (Total)</b>	Details of water quality improvement calculations are provided below Table 1	60 +0
<b>Shoreline Erosion Control</b>	Details of shoreline erosion control calculations are provided below Table 1	8
<b>Groundwater Recharge (Total)</b>	Details of Groundwater Recharge calculations are provided below Table 1	22.4
<b>Species Rarity(Total)</b>	No rare species were noted by NRSI staff during 2010 surveys within the wetlands that were able to be examined. Shaun Thompson of MNR has identified that there is a high potential for	

	the following rare species within the wetland communities; Musk Turtle, Snapping Turtle, Blanding's Turtle, Pugnose Shiner, Least Bittern, and Black Tern	
<b>Significant Features and Habitats (Total)</b>	<p><b>Section:</b></p> <p><b>4.2.1 Colonial Waterbirds</b> = black tern (Shaun Thompson, MNR) = 25</p> <p><b>4.2.2 Winter Cover for Wildlife</b> = none =0</p> <p><b>4.2.3 Waterfowl Staging and/or Molting Area</b> = none =0</p> <p><b>4.2.4 Waterfowl Breeding</b> = habitat suitable =10</p>	35
<b>Fish Habitat (Total)</b>	<p>No fisheries information for the unnamed tributary on the Project property was found during the records review. Hatch conducted a visual aquatic habitat survey of the watercourse on May 17, 2010. No specific fish community assessment work was completed.</p> <p>The watercourse consists of a drainage tributary originating on the Project property, flowing for approximately 500 m before draining into the tributary of Big Rideau Lake off the Project location. The tributary runs on the Project property for approximately 200 m. It flows through a narrow, naturally vegetated corridor, surrounded by grassed fields used as cow pastures. The channel bottom is comprised of a mix of organic and mineral soils and the channel is approximately 1.5 to 2 m wide. Water depth during the site investigation was &lt;0.30 m and no flow was evident. It appears as though this watercourse primarily flows during precipitation and snow melt events, and is likely intermittent during the drier parts of the year. Algae was abundant throughout the channel on the Project property. There were some bulrushes (<i>Scirpus sp.</i>) and cattails (<i>Typha sp.</i>) and some inundated willow shrubs (<i>Salix sp.</i>) within the main channel. The riparian areas of the channel are dominated by a variety of shrubs and trees including trembling aspen (<i>Populus tremuloides</i>) and raspberries (<i>Rubus sp.</i>) in the upland areas near the border of the Project property.</p> <p>This watercourse may provide seasonal aquatic habitat for fish residing within the tributary of Big Rideau Lake, although it appears to be intermittent and would not provide direct habitat on a year-round basis. It also likely provides habitat for benthic invertebrates, which may act as a food source for the downstream fish community, and seasonal habitat for frogs, which were observed during the site investigation. The watercourse also provides some hydrology and water quality regulation for the downstream watercourse.</p>	

**Flood Attenuation Calculations:**

<p><b>HYDROLOGICAL</b></p> <p><b>3.0 COMPONENT</b></p> <hr/> <p><b>FLOOD</b></p> <p><b>3.1 ATTENUATION</b></p> <hr/> <p>If the wetland is a complex including isolated wetlands, apportion the 100 points according to area. For example if 10 ha of a 100 ha complex is isolated, the isolated portion receives the maximum</p>
--

proportional score of 10. The remainder of the wetland is then evaluated out of 90.

$$\text{Initial score} = 0.27 + 1.2 + 0.54 + 3.49 + 0.61 + 0.66 = 6.77 / 62.37 = 0.11$$

**Initial Score = 88**

**Step 1:** Wetland is located one of the defined 5 large lakes or 5 major rivers (Go to Step 4)

wetland is entirely isolated (ie. not part of a complex) (Go to Step 4)

All other wetlands, go through steps 2, 3, 4b

**Step 2: Determination of Upstream Detention Factor (DF)**

(a)	Wetland area (ha)		62.37
(b)	Total area (ha) of <u>upstream</u> detention areas (include the wetland itself)		62.37
(c)	Ratio of (a):(b)		1.00
(d)	Upstream detention factor: (c) x 2 = (maximum allowable factor = 1)	2.00	1.00

**Step 3: Determination of Wetland Attenuation Factor (AF)**

(a)	Wetland area (ha)		62.37
(b)	Size of catchment basin (ha) <u>upstream</u> of wetland (include wetland itself in catchment area)		595
(c)	Ratio of (a):(b)		1:9
(d)	Wetland attenuation factor: (c) x 10 = (maximum allowable factor = 1)	0.1	1

**Step 4: Calculation of final score**

- (a) Wetlands on large lakes or major rivers
- (b) Wetland entirely isolated
- (c) All other wetlands –calculate as follows:

Upstream Detention Factor (DF) (Step 2)	1.00
Wetland Attenuation Factor (AF) (Step 3)	1.00
Final Score: [(DF + AF)/2] x initial score (88) =	89

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

**Total Flood Attenuation Score (maximum 100 points)**

**89**

### Water Quality Improvement Calculations:

Southern Ontario Wetland Evaluation, Data and Scoring Record

(March 1993)

### 3.2 WATER QUALITY IMPROVEMENT

3.2.1 SHORT TERM WATER QUALITY IMPROVEMENT

**Step 1: Determination of maximum initial score**

X Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5a)  
 All other wetlands (Go through Steps 2, 3, 4, and 5b)

**Step 2: Determination of watershed improvement factor (WIF)**

Calculation of WIF is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA= area of site type/total area of wetland)	Fractional Area				
FA of isolated wetland	0.000	x	0.5	=	0.000
FA of riverine wetland	0.67	x	1	=	0.670
FA of palustrine wetland with no inflow	0.18	x	0.7	=	0.126
FA of palustrine wetland with inflows		x	1	=	0.0
FA of lacustrine on lake shoreline	0.15	x	0.2	=	0.03
FA of lacustrine at lake inflow or outflow		x	1	=	0.000
			Sub Total:		0.826
			<b>Sum (WIF cannot exceed 1.0)</b>		<b>0.826</b>

**Step 3: Determination of catchment land use factor (LUF)**

(Choose the first category that fits upstream landuse in the catchment.)

1)	1.0	Over 50% agricultural and/or urban	1.0
2)		Between 30 and 50% agricultural and/or urban	0.8
3)		Over 50% forested or other natural vegetation	0.6
		<b>LUF (maximum 1.0)</b>	<b>1.00</b>

**Step 4: Determination of pollutant uptake factor (PUT)**

Calculation of PUT is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. Base assessment on the dominant vegetation form for each community except where dead trees or shrubs dominate. In that case base assessment on the dominant live vegetation. (FA = area of vegetation type/total area of wetland)

FA of wetland with live trees, shrubs, herbs or mosses (c,h,ts,ls,gc,m)	Fractional Area				
	0.25	x	0.75	=	0.1875
FA of wetland with emergent, submergent or floating vegetation (re,be,ne,su,f,ff)	0.75	x	1	=	.75
FA of wetland with little or no vegetation (u)	0.0	x	0.5	=	0.0
fM1+suM1					
			<b>Sum (PUT cannot exceed 1.0)</b>		<b>0.9375</b>

**Step 5: Calculation of final score**

- (a) Wetland on large lakes or major rivers 0

(b)	All other wetlands -calculate as follows		
	Initial score		88
	Water quality improvement factor (WIF)		0.826
	Land use factor (LUF)		1.00
	Pollutant uptake factor (PUT)		0.9375
	<b>Final score: 88 x WIF x LUF x PUT =</b>		<b>68.145</b>
<b>Short Term Water Quality Improvement Score (maximum 60 points)</b>			<b>60</b>
3.2.2	<b>LONG TERM NUTRIENT TRAP</b>		
<b>Step 1:</b>	Wetland on defined 5 large lakes or 5 major rivers		0 points
	X	All other wetlands (proceed to Step 2)	
<b>Step 2:</b>	Choose only one of the following settings that best describes the wetland being evaluated		
	1)	Wetland located in a river mouth	10 points
	2)	Wetland is a bog, fen or swamp with more than 50% of the wetland being covered with organic soil	10
	3)	Wetland is a bog, fen or swamp with less than 50% of the wetland being covered with organic soil	3
	4)	Wetland is a marsh with more than 50% of the wetland covered with organic soil	3
	5)	X None of the above	0
<b>Long Term Nutrient Trap Score (maximum 10 points)</b>			<b>0</b>

**Shoreline Erosion Control and Groundwater Recharge (total):**

3.4	<b>SHORELINE EROSION CONTROL</b>		
<b>Step 1:</b>			Score
		Wetland entirely isolated or palustrine	0
	X	Any part of the Wetland riverine or lacustrine (proceed to Step 2)	
<b>Step 2:</b>	Choose the one characteristic that best describes the shoreline vegetation (see text for a definition of shoreline)		
			Score
	1)	Trees and shrubs	15
	2)	8 Emergent vegetation	8
	3)	Submergent vegetation	6
	4)	Other shoreline vegetation	3
	5)	No vegetation	0

**Shoreline Erosion Control Score (maximum 15 points)**

**8**

**3.5 GROUND WATER RECHARGE**

**3.5.1 WETLAND SITE TYPE**

Score

- (a) Wetland >50% lacustrine (by area) or located on one of the five major rivers
- (b) Wetland not as above. Calculate final score as follows:  
(FA= area of site type/total area of wetland)

0

Fractional Area

FA of isolated or palustrine wetland	0.18	x	50	=	9
FA of riverine wetland	0.67	x	20	=	13.4
FA of lacustrine wetland (wetland <50% lacustrine)	0.15	x	0	=	0.00

**Ground Water Recharge Wetland Site Type Component Score (maximum 50 points)**

**22.4**



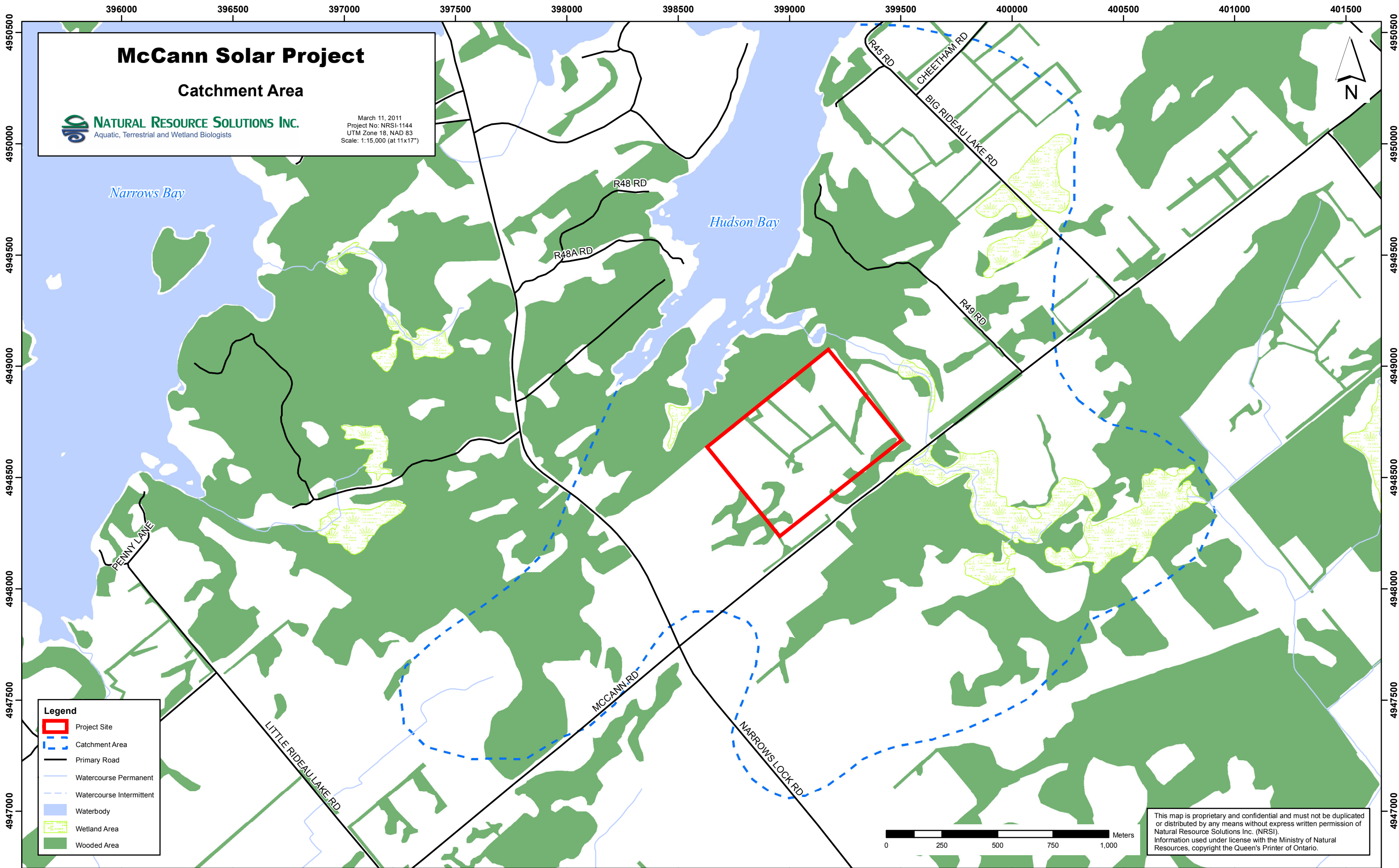


# McCann Solar Project









## Catchment Area

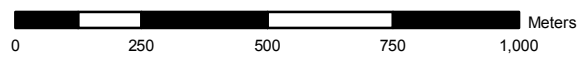
 **NATURAL RESOURCE SOLUTIONS INC.**  
Aquatic, Terrestrial and Wetland Biologists

March 11, 2011  
Project No: NRSI-1144  
UTM Zone 18, NAD 83  
Scale: 1:15,000 (at 11x17")



**Legend**

-  Project Site
-  Catchment Area
-  Primary Road
-  Watercourse Permanent
-  Watercourse Intermittent
-  Waterbody
-  Wetland Area
-  Wooded Area



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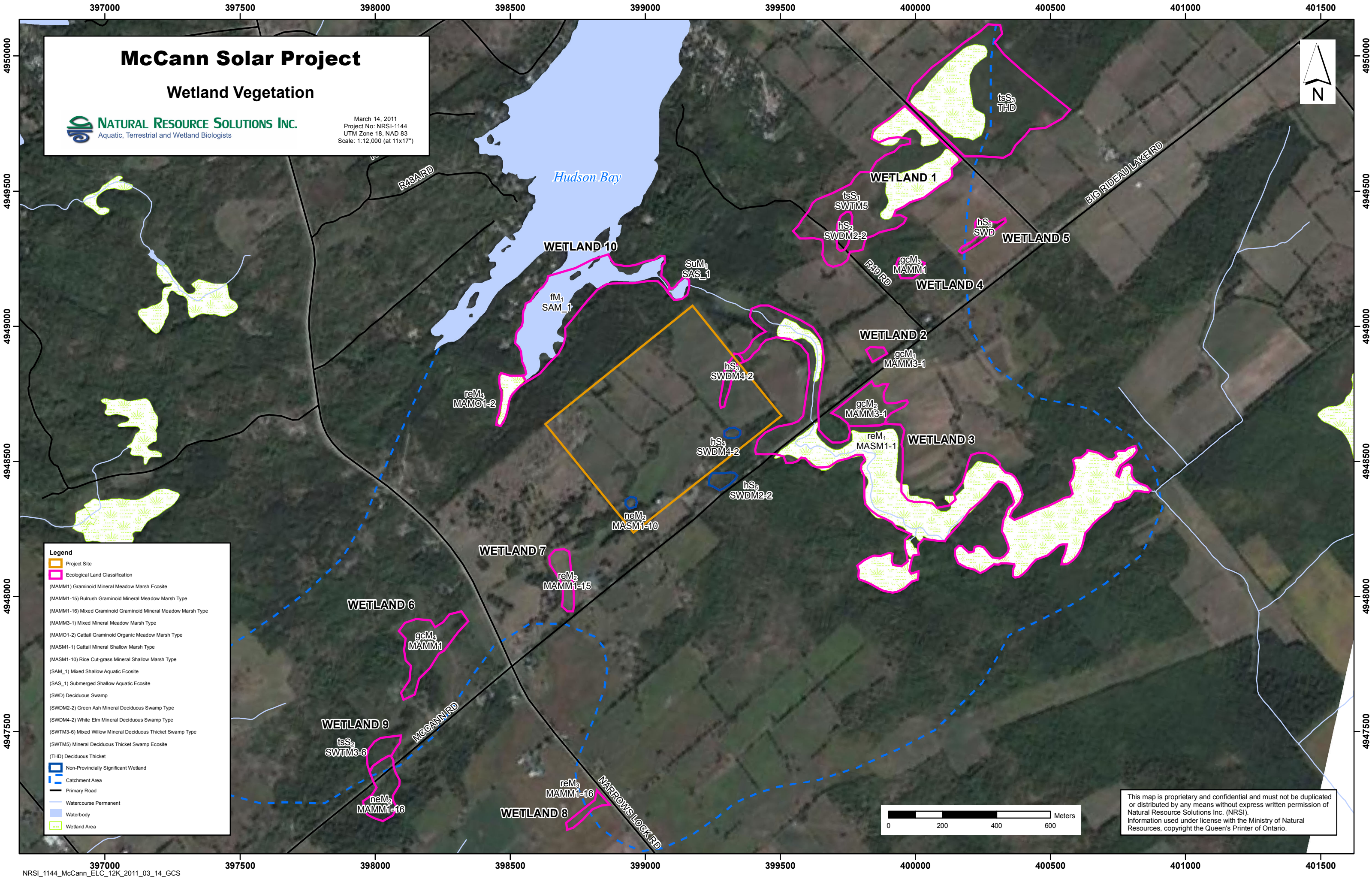


# McCann Solar Project

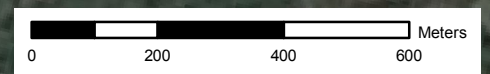
## Wetland Vegetation

**NATURAL RESOURCE SOLUTIONS INC.**  
Aquatic, Terrestrial and Wetland Biologists

March 14, 2011  
Project No: NRSI-1144  
UTM Zone 18, NAD 83  
Scale: 1:12,000 (at 11x17")



- Legend**
- Project Site
  - Ecological Land Classification
    - (MAMM1) Graminoid Mineral Meadow Marsh Ecosite
    - (MAMM1-15) Bulrush Graminoid Mineral Meadow Marsh Type
    - (MAMM1-16) Mixed Graminoid Graminoid Mineral Meadow Marsh Type
    - (MAMM3-1) Mixed Mineral Meadow Marsh Type
    - (MAMO1-2) Cattail Graminoid Organic Meadow Marsh Type
    - (MASM1-1) Cattail Mineral Shallow Marsh Type
    - (MASM1-10) Rice Cut-grass Mineral Shallow Marsh Type
    - (SAM\_1) Mixed Shallow Aquatic Ecosite
    - (SAS\_1) Submerged Shallow Aquatic Ecosite
    - (SWD) Deciduous Swamp
    - (SWDM2-2) Green Ash Mineral Deciduous Swamp Type
    - (SWDM4-2) White Elm Mineral Deciduous Swamp Type
    - (SWTM3-6) Mixed Willow Mineral Deciduous Thicket Swamp Type
    - (SWTM5) Mineral Deciduous Thicket Swamp Ecosite
    - (THD) Deciduous Thicket
  - Non-Provincially Significant Wetland
  - Catchment Area
  - Primary Road
  - Watercourse Permanent
  - Waterbody
  - Wetland Area



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**Area (ha) of Wetland Vegetation Communities Map**

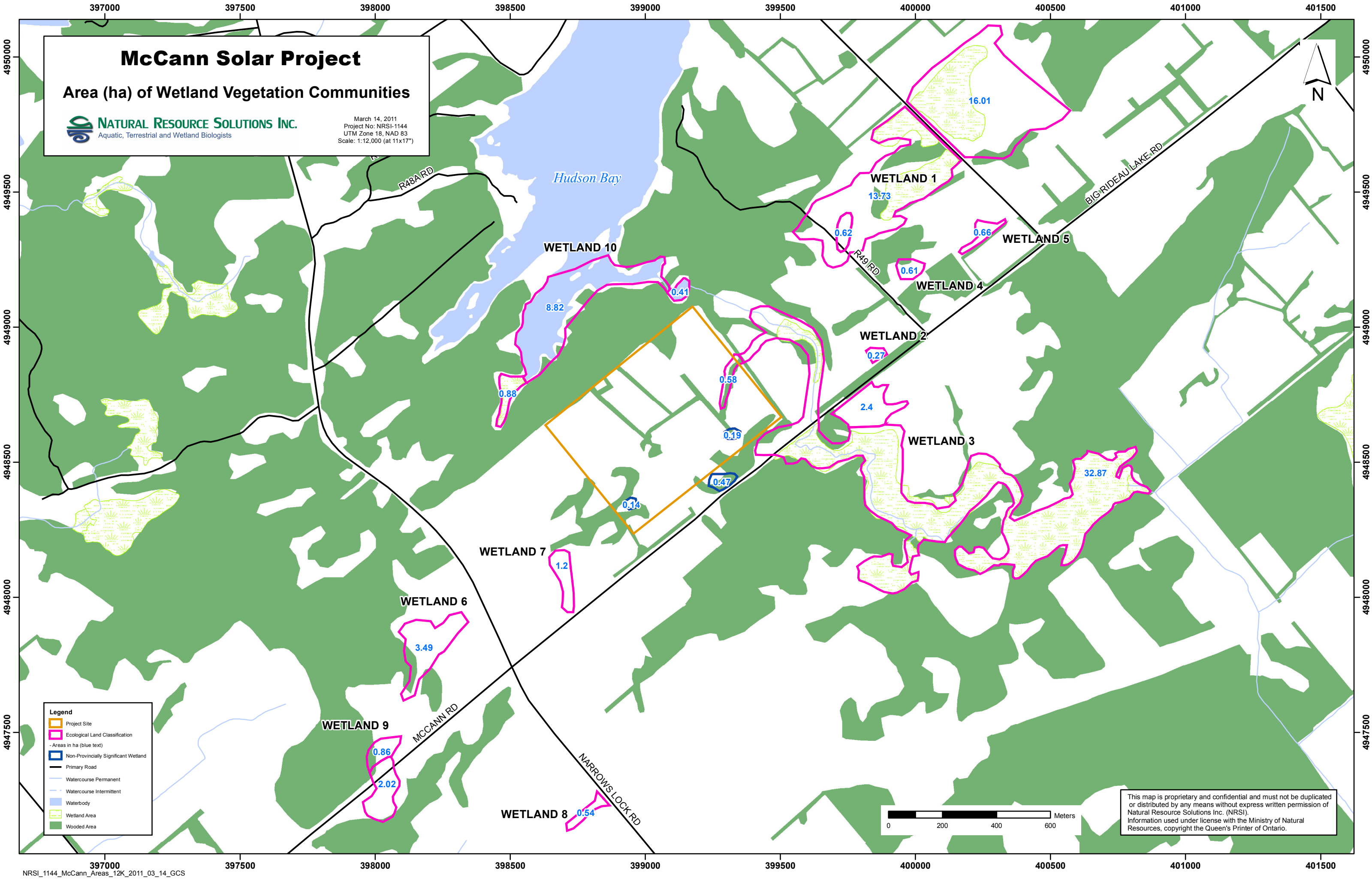
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# McCann Solar Project

## Area (ha) of Wetland Vegetation Communities

**NATURAL RESOURCE SOLUTIONS INC.**  
 Aquatic, Terrestrial and Wetland Biologists

March 14, 2011  
 Project No: NRSI-1144  
 UTM Zone 18, NAD 83  
 Scale: 1:12,000 (at 11x17")



**Legend**

- Project Site
- Ecological Land Classification
- Areas in ha (blue text)
- Non-Provincially Significant Wetland
- Primary Road
- Watercourse Permanent
- Watercourse Intermittent
- Waterbody
- Wetland Area
- Wooded Area



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# McCann Solar Project

## Interspersion Grid

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Aquatic, Terrestrial and Wetland Biologists

March 14, 2011  
Project No: NRSI-1144  
UTM Zone 18, NAD 83  
Scale: 1:20,000 (at 11x17")

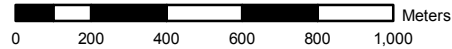


Narrows Bay

Hudson Bay

### Legend

- Project Site
- Ecological Land Classification
  - (MAMM1) Graminoid Mineral Meadow Marsh Ecosite
  - (MAMM1-15) Bulrush Graminoid Mineral Meadow Marsh Type
  - (MAMM1-16) Mixed Graminoid Graminoid Mineral Meadow Marsh Type
  - (MAMM3-1) Mixed Mineral Meadow Marsh Type
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  - (SWDM4-2) White Elm Mineral Deciduous Swamp Type
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  - (SWTM5) Mineral Deciduous Thicket Swamp Ecosite
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- Watercourse Permanent
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- Wetland Area
- Wooded Area



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**Project Team:**

<b>Member</b>	<b>Qualifications</b>	<b>Role</b>
David Stephenson, MSc	Certified Wetland Evaluator Certified ELC Certified Arborist	<ul style="list-style-type: none"><li>• Project Management</li><li>• Field Survey</li><li>• Data Analysis, Evaluation, Reporting</li><li>• Natural Heritage Assessment Guide Appendix C – for revised catchment area (air photo interpretation, interspersed mapping, and evaluation)</li></ul>
Kevin Dance, M.E.S.	Field Biologist Certified ELC	<ul style="list-style-type: none"><li>• Natural Heritage Assessment Guide Appendix C – for revised wetland evaluation</li></ul>
Megan Anevich, B.Sc. (candidate)	Field Biologist	<ul style="list-style-type: none"><li>• Field Survey</li></ul>
Barry Moss, B.E.S.	Field Biologist Certified ELC	<ul style="list-style-type: none"><li>• Field Survey</li></ul>
Matt Ross, B.Sc	Field Biologist	<ul style="list-style-type: none"><li>• Data Analysis, Evaluation</li></ul>
Shawn MacDonald, B.A.	GIS Mapping	<ul style="list-style-type: none"><li>• Mapping</li></ul>





# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: MCCANN

Project #: 1144

Observer(s): BAH, MA UTM:

Date: AUG 10/2010 Time (24h): 14:10

Field #: 22 Weather: Precipitation: NONE Temp (°C): 30

Map Code: +S1 Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: S Site Type: P Dominant Form: +S

% Open Water: 0 ELC Code: SWTH5

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h 10%	green ash, white elm
c 1%	red cedar
dc, dh, ds 2%	
ts 40%	green ash, white elm
ls 30%	narrow-leaved spirea, green ash, white elm
gc 50%	purple loosestrife, large-leaved goldenrod, orange goldenrod
ne 10%	reed, meadow grass, timothy
be 0	
re 10%	dark green bulrush
ff	
ff	
su	
m	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

BCCH

PHOTOS: 0128, 0129

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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: MCCANN

Project #: 1144

Observer(s): BAH, MA UTM:

Date: AUG 10/2010 Time (24h): 14:30

Field #: 23 Weather: Precipitation: NONE Temp (°C): 30

Map Code: HS2 Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: S Site Type: P Dominant Form: h

% Open Water: 0 ELC Code: SWDM2-2

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h 60%	green ash, white elm
c 0	
dc, dh, ds 5%	
ts 40%	green ash, white elm
ls 60%	narrow-leaved spirea, green ash, purple ivy
gc 50%	purple loosestrife, virginia creeper, acid dogwood
ne 20%	reed, meadow grass, timothy
be 0	
re 10%	cattail, dark green bulrush
ff 0	
ff 0	
su 0	
m 0	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

BCCH

PHOTOS: 0130, 0131

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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: NCCANN

Project #: 1144

Observer(s): BAH, MA UTM:

Date: AUG 10/2010 Time (24h): 15:00

Field #: 24 Weather: Precipitation: NONE Temp (°C): 30

Map Code: NCM4. Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: M Site Type: P Dominant Form: NC

% Open Water: 0 ELC Code: NASHI-10

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h 10%	
c 0	
dc, dh, ds 2%	
ts 2% white elm	
ls 0	
gc 40% yr pop wood, yellowed purple laureate	
ne 45% rice cut grass, bermudagrass, in ridge	
be 0	
re 5% soft-stemmed bulrush, dark green bulrush	
ff 0	
ff 0	
su 0	
m 0	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

DOWO, SOSP, NLER  
CABBAGE WHITE

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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: NCCANN

Project #: 1144

Observer(s): BAH, MA UTM:

Date: AUG 10/2010 Time (24h): 15:30

Field #: 25 Weather: Precipitation: NONE Temp (°C): 30

Map Code: HS3 Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: S Site Type: R Dominant Form: h

% Open Water: 0 ELC Code: SNDM4-2

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h 40% white elm, green ash	
c 0	
dc, dh, ds 5%	
ts 30% white elm, white birch, common buckthorn	
ls 10% white elm, white birch, common buckthorn	
gc 60% purple loosestrife, yr pop wood, coccoloba glandulosa	
ne 10% reed, narrow grass	
be 0	
re 20% cattail, dark green bulrush	
ff 0	
ff 0	
su 0	
m 0	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

WITU, WIFL  
GRFR, GRAY TREEFROG

PHOTOS: 0134, 0135

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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: MCCANN

Project #: 1144

Observer(s): BAN, MA

UTM:

Date: AUG 10 / 2010

Time (24h): 12:45

Field #: 18

Weather: Precipitation: NONE Temp (°C): 30

Map Code: h55

Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: S

Site Type: P Dominant Form: h

% Open Water: 0

ELC Code: SWDMZ-2

Forms % (Circle those >25%)	Species (dominant species, secondary species, present species)
h 40%	green ash, white elm
c 0	
dc, dh, ds 1%	
ts 30%	white cedar, dark pine, green ash
ls 10%	green ash, red osier dogwood, red cedar
gc 50%	purple loosestrife, jar pig weed, blue vervain
ne 40%	fox sedge, timothy
be 0	
re 10%	dark green bullrush
ff 0	
ff 0	
su 0	
m 0	

Forms % (Circle those >25%)	Species (dominant species, secondary species, present species)
h 1%	red maple
c 1%	white cedar
dc, dh, ds 2%	
ts 10%	slender willow, salix herbacea, green ash
ls 30%	salix discolor, salix herbacea, red osier dogwood
gc 30%	marsh fern, purple loosestrife, royal fern
ne 10%	carex lasiocarpa
be 25%	common hedgescreeb, bur reed
re 70%	moss, phragmites
ff 5%	duckweed
ff 15%	oxypholis cordata
su	
m 0	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

PHOTOS: 0123, 0124

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

# 3



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: MCCANN

Project #: 1144

Observer(s): BAN, MA

UTM:

Date: AUG 10 / 2010

Time (24h): 13:10

Field #: 19

Weather: Precipitation: NONE Temp (°C): 30

Map Code: r043

Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: M

Site Type: R Dominant Form: re

% Open Water: 20

ELC Code: MASH-1

Forms % (Circle those >25%)	Species (dominant species, secondary species, present species)
h 1%	red maple
c 1%	white cedar
dc, dh, ds 2%	
ts 10%	slender willow, salix herbacea, green ash
ls 30%	salix discolor, salix herbacea, red osier dogwood
gc 30%	marsh fern, purple loosestrife, royal fern
ne 10%	carex lasiocarpa
be 25%	common hedgescreeb, bur reed
re 70%	moss, phragmites
ff 5%	duckweed
ff 15%	oxypholis cordata
su	
m 0	

Forms % (Circle those >25%)	Species (dominant species, secondary species, present species)
h 1%	red maple
c 1%	white cedar
dc, dh, ds 2%	
ts 10%	slender willow, salix herbacea, green ash
ls 30%	salix discolor, salix herbacea, red osier dogwood
gc 30%	marsh fern, purple loosestrife, royal fern
ne 10%	carex lasiocarpa
be 25%	common hedgescreeb, bur reed
re 70%	moss, phragmites
ff 5%	duckweed
ff 15%	oxypholis cordata
su	
m 0	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

AMEO

PHOTOS: 0125, 0126

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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

H 3

## Wetland Vegetation Communities

Project Name: MCCANN Project #: 1144

Observer(s): BAN, MA UTM:

Date: AUG 10/2010 Time (24h): 13:30

Field #: 20 Weather: Precipitation: NONE Temp (°C): 30

Map Code: 3CH2 Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: M Site Type: P Dominant Form: gc

% Open Water: 0 ELC Code: HANN3-1

Forms % (Circle those >25%)	Species (dominant species, secondary species, present species)
h <input type="checkbox"/>	
c <input type="checkbox"/>	
dc,dh,ds <input type="checkbox"/>	
ts <input type="checkbox"/>	
ls <input type="checkbox"/>	2% green ash
<input checked="" type="checkbox"/> gc	60% purple loosestrife, Canada goldenrod, common milkweed
<input checked="" type="checkbox"/> ne	40% reed canopy grass
be	
re	
ff	
ff	
su	
m	

Rare Species (Local, Regional, Provincial):  NONE	Wildlife Notes:  AMGO  PHOTOS 0127
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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

H 2



# NATURAL RESOURCE SOLUTIONS INC.

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## Wetland Vegetation Communities

Project Name: MCCANN Project #: 1144

Observer(s): BAN, MA UTM:

Date: AUG 10/2010 Time (24h): 13:50

Field #: 21 Weather: Precipitation: Temp (°C):

Map Code: 3CH1 Wind Speed & Direction: Cloud %:

Wetland Type: M Site Type: P Dominant Form: gc

% Open Water: 0 ELC Code: HANN3-1

Forms % (Circle those >25%)	Species (dominant species, secondary species, present species)
h <input type="checkbox"/>	
c <input type="checkbox"/>	
dc,dh,ds <input type="checkbox"/>	
ts <input type="checkbox"/>	
ls <input type="checkbox"/>	
<input checked="" type="checkbox"/> gc	70% purple loosestrife, Canada goldenrod, common milkweed
<input checked="" type="checkbox"/> ne	30% reed canopy grass
be	
re	
ff	
ff	
su	
m	

Rare Species (Local, Regional, Provincial):  NONE	Wildlife Notes:  
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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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name: MCCANN

Project #: 1144

Observer(s): BAM, MA UTM:

Date: AVG 10/26/10 Time (24h): 16:00

Field #: 26 Weather: Precipitation: NONE Temp (°C): 30

Map Code: h54 Wind Speed & Direction: 2-W Cloud %: 20

Wetland Type: S Site Type: R Dominant Form: h

% Open Water: 0 ELC Code: SWDM4-2

Forms % (Circle those $\geq 25\%$ )	Species (dominant species, secondary species, present species)
(h) 40%	white elm, green ash, trembling aspen
c 0	
dc, dh, ds 10%	
(ts) 30%	salix, blackberry, white elm
ls 15%	salix, blackberry, white elm, green ash
(gc) 70%	purple inkberry, Joe pye weed, sensitive fern
ne 20%	reed, common grass, fox sedge
be 0	
re 10%	dark green bullrush
ff	
ff	
su	
m	

Rare Species (Local, Regional, Provincial):

NONE

Wildlife Notes:

BCCH

PHOTOS # 0136, 0137

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



# NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

## Wetland Vegetation Communities

Project Name:

Project #:

Observer(s): UTM:

Date: Time (24h):

Field #: Weather: Precipitation: Temp (°C):

Map Code: Wind Speed & Direction: Cloud %:

Wetland Type: Site Type: Dominant Form:

% Open Water: ELC Code:

Forms % (Circle those $\geq 25\%$ )	Species (dominant species, secondary species, present species)
h	
c	
dc, dh, ds	
ts	
ls	
gc	
ne	
be	
re	
ff	
ff	
su	
m	

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