



**NORTHLAND
POWER**

Glendale Solar Project

Natural Heritage Evaluation of Significance Report

October 5, 2011



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

Natural Heritage
Evaluation of Significance

Glendale Solar Project

H334844-0000-07-124-0206

Rev. 1

October 5, 2011

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Project Report

October 5, 2011

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Glendale Solar Project

Natural Heritage Evaluation of Significance

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 Wetlands Site Investigation**

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1. Introduction

1.1 Project Description

Northland Power Inc. on behalf of Northland Power Solar Glendale L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatt (MW) solar photovoltaic (PV) Project titled Glendale Solar Project (hereinafter referred to as the “Project”). The Project will be located on approximately 45 hectares (ha) of land, in the Township of South Glengarry, within the United Counties of Stormont, Dundas and Glengarry.

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 3 of Section 25 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 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).

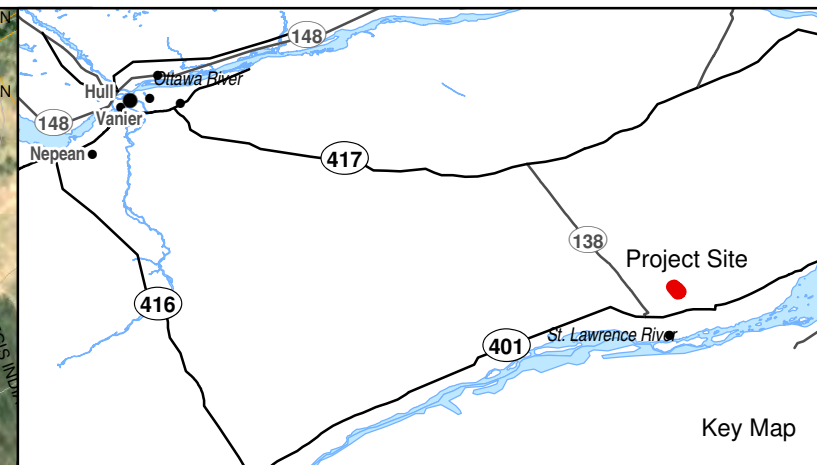
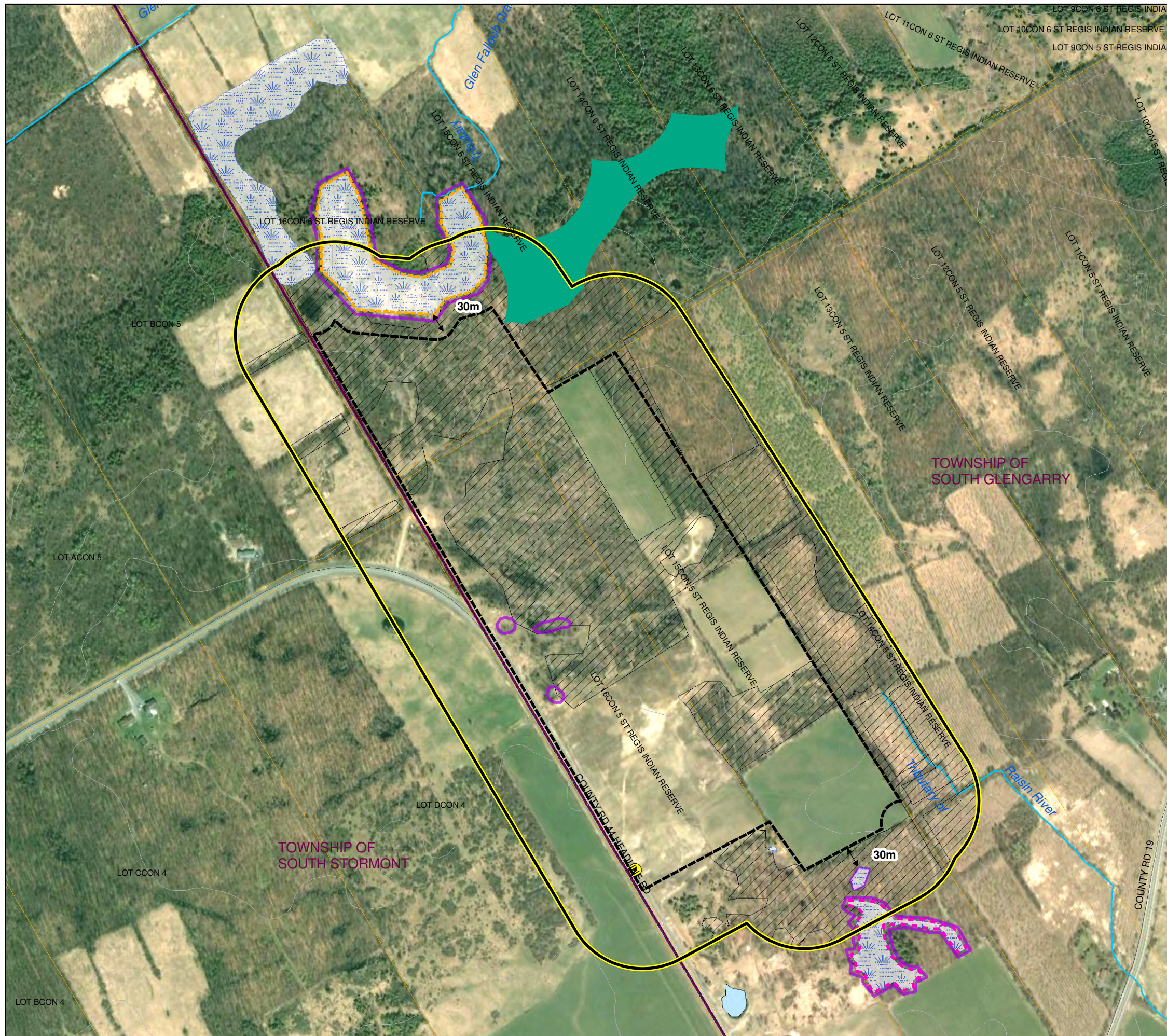
The Natural Heritage Site Investigations Report (Hatch Ltd., 2010b) was prepared to meet these requirements.

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 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 Evaluation of Significance (EOS) Report for the natural features identified on and within 120 m of the Project has been prepared to meet these requirements.



- Legend**
- Roads
 - Watercourse
 - ▭ Parcels
 - ▭ Municipal Boundary
 - ▭ Waterbody
- Candidate Significant Natural Features**
- ▭ Amphibian Breeding Habitat
 - ▨ Forest Providing a High Diversity of Habitats/ Ovenbird Habitat / American Redstart Habitat / Eastern Wood-Pewee Habitat / Northern Flicker Habitat
 - ▭ Interior Forest
 - ▭ Milksnake Habitat / Highly Diverse Areas / Raptor Winter Feeding and Roosting Habitat
 - ▭ Waterfowl Nesting Area
 - ▭ Western Chorus Frog Habitat
 - ▭ Wetland
 - ▭ Woodland
- Project Components**
- ▭ 120 m from Project Location
 - ▭ Project Location
 - Connection Point With Existing Distribution Line



Notes:
 1. OBM and NRVIS data downloaded from LIO, with permission.
 2. Spatial referencing UTM NAD 83, August 2010.
 3. Satellite imagery from Google Earth Pro.

Figure 1.1
 Northland Power Inc.
Glendale Solar Project
Project Components 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 investigations. Section 3 provides the evaluation of significance for wildlife habitat, while Section 4 provides the evaluation of significance for the woodland, and Section 5 provides the evaluation of significance for the wetlands. Section 6 identifies the conclusions of the evaluation of significance, 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 investigations (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. Wildlife Habitat

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

- woodlands supporting amphibian breeding ponds on the Project location
- American Redstart habitat
- Forest providing a high diversity of habitats
- Highly diverse areas
- Raptor winter feeding and roosting areas.
- habitat for species of conservation concern (Milksnake, Northern Flicker, Eastern Wood-pewee, and Western Chorus Frog) on and within 120 m of the Project location
- woodlands on and within 120 m of the Project location as animal movement corridors

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

The criteria processes outlined in the Ministry of Natural Resources (MNR) Natural Heritage 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.

3.1.1 Seasonal Concentration Areas

Criteria for evaluation of seasonal concentration habitats 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.

3.1.1.1 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 forest communities are common within Ecodistrict 6E-12, representing the majority of the landscape (i.e., more than a 100,000 ha), and therefore this site (at 45 ha), is not of relative importance, and this criteria is not met.
- Presence of species of conservation concern/Species diversity/abundance – Red-tailed Hawk and Northern Harrier were noted during the site investigations, and may use the site during the over-wintering period. Neither species are a species of conservation concern. Other raptor species that may use the area are currently unknown. Therefore, this criteria is not met.
- Size of site – The size of the both the grassland and woodland areas are greater than 20 ha, which exceeds the criteria, and this criteria is met
- Level of disturbance – There is an adjacent arterial roadway, residential properties, and agricultural operations within close proximity of the area, therefore disturbance is high. Further, disturbance (logging, trails, hunting) was common within portions of the woodland. As a result, this criteria is not met.
- Location of site – There are other open grasslands and mixed wood forest communities present in the area, therefore this criteria is met as the suitable habitat is located within a network of suitable habitats
- Quality of habitat – Though abundance of prey is unknown, habitat is believed to be reflective of the quality of habitat available within the region. Therefore, habitat quality is moderate (i.e., likely consistent within region and not providing an over or under abundance or prey). Therefore, this criteria is not met.
- Historical Use – There are no records of historical use of this feature by wintering raptors, therefore this criteria is not met.

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

3.1.1.2 *Waterfowl Nesting*

The criteria for waterfowl nesting habitats include the following:

- Relative importance of the site to local waterfowl populations – The wetland community is part of a large complex of wetland communities within the region. The 2 ha of suitable Wood Duck nesting habitat identified within 120 m of the Project location represents a negligible portion of the suitable habitat found within this larger wetland complex. The total size of the larger wetland complex has not been determined, however the wetland appears to be several hundred hectares in size.
- Presence of species of conservation concern – Wood Duck are not a species of conservation concern.
- Species diversity – Only one species of waterfowl would use the nesting area.
- Abundance – Only one individual Wood Duck was recorded during the site investigation.
- Size of area – The size of the suitable habitat is 2 ha.
- Quality of habitat – The quality of the habitat for wood duck nesting appears to be good.
- Location of habitat - The nesting habitat provides safe movement from nesting habitat to the wetland
- Nest predation – Levels of nest predation are unknown.
- Level of disturbance – There appears to be limited disturbance within the woodland.

Based on the small size and low relative importance of the suitable habitat, absence of species of conservation concern or a diversity of waterfowl, the waterfowl nesting area is determined to not be significant.

3.1.2 *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.

3.1.2.1 *Habitat for American Redstart, an Area Sensitive Species*

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

- Presence of rare, uncommon, or declining species – American Redstart are not considered to be declining 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, this woodlands on the site is part of a much larger woodland, and one of several large woodlands within the regional area. Further, within the planning area (Ecodistrict 6E-12), there are more than 50,000 ha of interior forest within woodlands with more than 8 ha of interior forest. Therefore, the portions of the woodland in the vicinity of the Project location, with 8 ha of interior forest does 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 within the portions of the woodland near the Project location is 8 ha. Therefore, this criteria is not 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 – Some vertical stratification was noted within the community, therefore this criteria is met.
- Amount of contiguous closed-canopy/open areas in forest stand – Canopy coverage within the woodland is variable and therefore this criteria is not met.
- Degree of disturbance – Degree of disturbance within the woodland communities is high, with further disturbance present within the surround areas (roadways, agricultural operations).
- Amount of adjacent residential development – There is no significant residential development adjacent to the woodland. Therefore, this criteria is met.
- Provision of significant wildlife habitat – The woodland also provides several candidate significant wildlife habitats. 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, given the relatively low importance of this site, and the absence of more than 8 ha of interior forest, this feature is not considered to be significant.

3.1.2.2 *Habitat for Ovenbird, an Area Sensitive Species*

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

- Presence of rare, uncommon, or declining species – Ovenbird are not considered to be declining 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, this woodlands on the site is part of a much larger woodland, and one of several large woodlands within the regional area. Further, within the planning area (Ecodistrict 6E-12), there are more than 50,000 ha of interior forest within woodlands with more than 8 ha of interior forest. Therefore, the portions of the woodland in the vicinity of the Project location, with 8 ha of interior forest does 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 within the portions of the woodland near the Project location is 8 ha. Therefore, this criteria is not 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 – Some vertical stratification was noted within the community, therefore this criteria is met.

- Amount of contiguous closed-canopy/open areas in forest stand – Canopy coverage within the woodland is variable and therefore this criteria is not met.
- Degree of disturbance – Degree of disturbance within the woodland communities is high, with further disturbance present within the surround areas (roadways, agricultural operations).
- Amount of adjacent residential development – There is no significant residential development adjacent to the woodland. Therefore, this criteria is met.
- Provision of significant wildlife habitat – The woodland also provides several candidate significant wildlife habitats. 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, given the relatively low importance of this site, and the absence of more than 8 ha of interior forest, this feature is not considered to be significant.

3.1.2.3 *Forest Providing a High Diversity of Habitats*

The criteria that were considered during the evaluation of the forests providing a high diversity of habitats include the following:

- Provision of significant wildlife habitat – Several candidate significant wildlife habitats have been identified associated with the woodland. Therefore, this criteria is met.
- Size of site – The woodland is more than 50 ha in size, therefore this criteria is met.
- Age, condition of trees on site – The age of trees within the woodland community within 120 m of the Project location was determined to be young to mid-aged. Presence of diseased and damaged trees within the woodland was described as common. Therefore, this criteria is met.
- Vegetation composition and diversity of site – Woodland communities were identified as consisting of diverse community of deciduous trees. Therefore this criteria is 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 recent history of forest management within the woodland; therefore this criteria is not met.

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

3.1.2.4 *Woodlands Supporting Amphibian Breeding Ponds*

The criteria for woodlands supporting amphibian breeding ponds include the following:

- Provision of significant wildlife habitats – Several candidate significant wildlife habitats have been identified associated with the woodland. Therefore, this criteria is met.

- Degree of permanence – During the wetland evaluation, wetland communities within 120 m of the Project location were determined to contain permanent water, therefore this criteria is met. Vernal pools within the woodland, southern portion of the Project location were not identified as containing open water, while the northern wetland was identified as having less than 10% open water. Therefore, the degree of permanence criteria is not considered to be met.
- Species diversity of pond – Three species of amphibians were recorded during the site investigations, therefore diversity is considered to be moderate and this criteria is met.
- Presence of rare species – No rare amphibian species were recorded during the site investigations.
- Size and number of ponds – The total amount of wetland habitat present on the Project location is approximately 8 ha, of which approximately 4 ha is identified as suitable amphibian breeding habitat. Wetland size is determined to meet the criteria for significance.
- Diversity of submergent and emergent vegetation – Portions of the wetland communities were identified as containing several species of submergent and emergent vegetation, and therefore this criteria is met.
- Presence of shrubs, logs at edge of pond – Though large numbers of logs were not noted along the edge of the breeding ponds, an abundance of shrub and immature tree species were noted and therefore this criteria is met.
- Adjacent forest habitat – Wetland communities border several forest areas, therefore this criteria is met.
- Water quality – Pollution within the watercourses on the Project location would be restricted to stormwater runoff from agricultural fields and roadways. Therefore, it is assumed that water quality is generally good.
- Level of disturbance – Level of disturbance between the wetland and woodlands is low, therefore this criteria is met.

As a result, woodlands supporting amphibian breeding ponds are considered to be significant wildlife habitat.

3.1.2.5 *Highly Diverse Areas*

The criteria for areas of high diversity include the following:

- Current representation of such areas in the planning area – Woodland/wetland complexes are relatively common within Ecodistrict 6E-12, with more than 100,000 ha of such habitat available. Therefore this habitat complex is readily available and this criteria is not met.
- Natural community diversity – The woodlands and wetlands were identified as containing a diversity of communities.
- Species diversity – Though a complete species inventory of the various communities was not completed, given that many of the communities extend several hundred meters beyond 120 m from the Project location, a relatively diverse list of species was noted within the communities

on and within 120 m of the Project location. In addition, several wildlife species were also documented during area searches of the Project location and lands within 120 m.

- Presence of rare species – Butternut, a species listed as Threatened on the Species at Risk in Ontario list, were recorded within the woodlands. In addition, two species of conservation concern were identified within the woodlands.
- Size of site – Woodland/wetland complex is greater than 50 ha; therefore this criteria is met

Based on the above evaluation, several criteria for significance were met and the woodlands and wetlands are identified as a highly diverse area.

3.1.3 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 was 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.
- Northern Flicker/Eastern Wood-Pewee – Northern Flicker/Eastern Wood-Pewee are not considered to be rare species, though declines have been recorded (Ontario Partners in Flight, 2009). Their range is not solely or primarily found in Ontario. Presence of disturbance and invasive species was noted from within the woodland. The size of the species populations at the site is unknown. The suitable habitat is contained within the large woodland present on and within 120 m of the Project location, however the habitat is located on private land and therefore long-term protection is not assured. Northern Flicker and Eastern Wood-pewee were recorded within suitable habitat during site investigations in 2010. Though declines have been

noted in these species, the abundance of these species within the province, as well as the abundance of suitable habitat in the local area indicates that the habitat found on and within 120 m of the Project location is not of significance for Northern Flicker and Eastern Wood-pewee.

- Western Chorus Frog – Populations of Western Chorus Frog are described as vulnerable within the province, though they are a commonly recorded species. Declines have been noted within Western Chorus Frog populations. Western Chorus Frogs are not solely or primarily found within Ontario. Invasive species, such as reed canary-grass, were noted within the wetland community. Western Chorus Frog were not recorded during the site investigations, and therefore there is no evidence of use of the habitat or size of the population. The wetland community is not considered to be a large community, nor is it connected to other wetland communities, and it has not been identified as supporting other species of conservation concern. Suitable habitat is located on private land, within a woodland that is already heavily disturbed as a result of existing uses, therefore potential for long-term protection is low. Therefore, based on the fact that several of the criteria have not been met, habitat for Western Chorus Frog is determined to not be of significance.

3.1.4 *Animal Movement Corridors*

Potential animal movement corridors were identified in the woodlands and hedgerows on and within 120 m of 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).

Consideration of woodlands and hedgerows in relation to the above criteria is addressed 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 woodlands discussed below), these features are not considered to be significant wildlife habitat.
- Woodlands – The woodland community present on the Project location provides habitat for wildlife movement across the landscape. No target species have been identified for the corridor, though likely deer, coyotes, other mammals, birds and species of amphibians and reptiles use the corridor. The corridor is very wide in many locations and primarily continuous, separated by a few roadways, and therefore the risk of mortality is low. The corridor is located on private land, therefore long-term protection cannot be assured. There is a watercourse present within the corridor, therefore some erosion protection would be provided. The corridor is not known to connect significant natural features or critical habitats for any wildlife species. Therefore, though the woodland communities likely represent a movement corridor through the regional area, the absence of linkage to significant features or critical habitat indicates that this feature is not a significant movement corridor.

3.1.5 Overall Determination of Significance

Based on the evaluation completed above, significant wildlife habitats identified on and within 120 m of the Project location include

- all lands on and within 120 m of the Projects site as habitat for Milksnake
- woodlands supporting amphibian breeding habitat..
- forest providing a high diversity of habitats
- highly diverse areas

3.2 Date of Beginning and Completion of Evaluation

The evaluation of wildlife habitat commenced with records reviews in June 2010 and was finalized with the completion of this Report in June 2011. Several site visits were completed in association with this evaluation on June 21 and 22, 2010, August 12, 2010 and September 24 through 27, 2010.

3.3 Name and Qualification of Individual Conducting the Evaluation

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

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. Woodlands

4.1 Description of Natural Feature

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.

4.2 Evaluation Criteria and Guidelines for Woodlands

The evaluation 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:

- Woodland Size – 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 for 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.

Many of the criteria for significance have a minimum woodland size associated with them. In this area, where relevant, the minimum size for a woodland to be considered significant is 5 ha.

4.3 Date of Beginning and Completion of Evaluation

The evaluation of woodlands commenced with records reviews in June 2010 and was finalized with the completion of this Report in June 2011. Several site visits were completed in association with this evaluation on June 21 and 22, 2010, August 12, 2010 and September 24 through 27, 2010.

4.4 Determination of Significance

The woodland is estimated to be more than 800 ha, with a forest interior of 8.0 ha in the area around the Project location, and many more hectares of forest interior in portions of the woodland further west of the Project location. The woodland overlaps several watercourses, including tributaries of Glen Falloch Drain and Raisin River, and contains Butternut (*Juglans cinerea*), which are listed on the Species at Risk in Ontario list. The woodland was determined to be a forest providing a high diversity of habitats. Linkage habitats were not identified associated with the woodland.

MNR (2010b) identifies the woodland as significant for interior forest (on portions of the woodland located within 120 m east of the Project location), proximity to watercourse (around the Glen Falloch Drain within 120 m northeast of the Project location), and proximity to other natural features (such as other significant woodlands). In addition, the woodland appears to meet criteria for woodland size.

Therefore, the woodland on and within 120 m of the Project location are determined to be significant for:

- Size

- Forest interior
- Water protection
- Uncommon characteristics
- Proximity to other natural features
- Woodland diversity

4.5 Name and Qualifications of Evaluator

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

5. Wetlands

Wetland communities identified within 120 m of the Project location are assumed to be provincially significant wetlands in accordance with the requirements of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2010c). The requirements of the Natural Heritage Assessment Guide for the wetland communities within 120 m of the Project location are completed within Appendix A.

6. Conclusions

Results of the evaluation of significance are summarized in Table 6.1. Based on the evaluation of significance outlined above, there is significant wildlife habitat, a significant woodland, and wetlands treated as provincially significant wetlands located on and within 120 m of the Project location. The locations of these features are shown in Figure 1.1.

An environmental impact study conducted according to the requirements of Section 38 (2) of O.Reg. 359/09 will be required in order to construct Project components within 120 m of these 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	Woodland	Yes	Yes
	Wildlife Habitat	Yes	Yes
	Valleyland	No	No
PROVINCIALY SIGNIFICANT	Wetland	No	Yes (assumed)
	Earth Science ANSI	No	No
	Life Science ANSI	No	No

7. References

Eastern Ontario Natural Heritage Working Group (EONHWG). 2003. Woodland Valuation System. Version 2.0. Available on-line at <http://woodlandvaluation.eomf.on.ca/index.htm>.

Hatch Ltd. 2010a. Glendale Solar Project – Natural Heritage Records Review. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010b. Glendale Solar Project – Natural Heritage Site Investigations. Prepared for Northland Power Inc. August 2010.

Ministry of Natural Resources (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)

MNR. 2010c. Natural Heritage Assessment Guide for Renewable Energy Projects. Draft – December 2010.

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

United Counties of Stormont, Dundas and Glengarry (UCSDG). 2010. Map provided to Hatch Ltd. showing significant woodlands in the vicinity of the Project location.

Appendix A
Natural Resource Solutions Inc.
Wetlands Site Investigation

Memo

Project No. 1145

To: Sean Male

From: David Stephenson

Date: July 7, 2011

Re: Glendale Solar Project Wetland Evaluation

The wetlands in the vicinity of the proposed Glendale Solar Project lands are unevaluated at this time. The new Natural Heritage Assessment Guide (NHAG) for Renewable Energy Projects (OMNR 2010) allows for the evaluation of these wetlands using Appendix C.

Our assessment of the unevaluated wetland complex, within the catchment area provided on the attached Catchment Area map in accordance with the appropriate sections of the Ontario Wetland Evaluation System for Southern Ontario (MNR 2002), 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 required for preparation of an EIS as per the NHAG.

The field study approach taken by NRSI during the August 12, 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).
- Conducted 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) Northern Manual as well as Ecological Land Classification (ELC), and recording all species of flora and fauna within the wetlands.

The field work focused on the wetlands within the project area. Most of the scores within Table 1 are drawn from the field work completed from the communities within the project area.

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.

It is assumed that this wetland complex would be provincially significant if a formal wetland evaluation was completed. The complex contains many individual wetlands that are part of a larger habitat network and corridor of natural communities. It is highly likely that significant species are found in this area because of its size and diversity of habitats.

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 line extending to the right.

David Stephenson, M.Sc.,
Senior Biologist

Work Cited:

Ontario Ministry of Natural Resources. 2010. Natural Heritage Assessment Guide for Renewable Energy Projects. Ontario Ministry of Natural Resources.

Ontario Ministry of Natural Resources. 2002. Ontario Wetland Evaluation System: Southern Manual. Third Edition, revised December 2002.

Table 1. Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects

Characteristic/ Ecological Function	Evaluation Results	Scoring
<p>Actual Wetland Size (ha)</p>	<p>Wetland 1: = 8.48ha Marsh, tall shrub swamp (M1, tsS1)</p> <p>Wetland 2: = 9.98ha Coniferous swamp (cS11)</p> <p>Wetland 3: = 1.77ha Marsh (M2)</p> <p>Wetland 4: = 13.75ha Coniferous swamp (cS12)</p> <p>Wetland 5: = 80.79ha Marsh, tall shrub swamp, coniferous swamp (M3, M26, M4, M5, M6, M9, M10, tsS2, tsS3, tsS4, tsS5, cS13)</p> <p>Wetland 6: = 3.28ha Deciduous swamp (hS26)</p> <p>Wetland 7: = 1.12ha Tall shrub swamp (tsS6)</p> <p>Wetland 8: = 0.37ha Marsh (M26)</p> <p>Wetland 9: = 23.91ha Marsh, deciduous swamp (M7, hS27)</p> <p>Wetland 10: = 1.47ha Marsh (M8)</p> <p>Wetland 11: = 4.26ha Coniferous swamp (cS14)</p> <p>Wetland 12: = 0.1ha Deciduous swamp (hS28)</p> <p>Wetland 13: = 1.26ha Deciduous swamp (hS29)</p> <p>Wetland 14: = 0.23ha Deciduous swamp (hS30)</p>	

<p>Wetland 15: = 1.8ha Deciduous swamp (hS31)</p> <p>Wetland 16: = 0.64ha Deciduous swamp (hS32)</p> <p>Wetland 17: = 1.01ha Deciduous swamp (hS33)</p> <p>Wetland 18: = 3.04ha Coniferous swamp (cS15)</p> <p>Wetland 19: = 3.0ha Deciduous swamp (hS34)</p> <p>Wetland 20: = 0.83ha Marsh (M13)</p> <p>Wetland 21: = 0.34ha Marsh (M11)</p> <p>Wetland 22: = 0.3ha Marsh (M12)</p> <p>Wetland 23: = 42.85ha Marsh, coniferous swamp, deciduous swamp (M14, cS16, cS17, hS35, hS36, hS37)</p> <p>Wetland 24: = 22.85ha Marsh, coniferous swamp, deciduous swamp (M15, M16, cS18, hS38)</p> <p>Wetland 25: = 61.12ha Marsh, tall shrub swamp, coniferous swamp, deciduous swamp (M17, M19, M20, tsS8, cS19, cS20, cS21, cS22, cS23, hS39, hS40, hS42)</p> <p>Wetland 26: = 2.21ha Marsh (M18)</p> <p>Wetland 27: = 3.49ha Tall shrub swamp (tsS7)</p> <p>Wetland 28: = 14.67ha Tall shrub swamp, deciduous swamp (tsS9, hS41)</p> <p>Wetland 29: = 10.31ha Marsh, coniferous swamp, deciduous swamp (M21, M23, cS25, hS43)</p>	
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	<p>Wetland 30: = 3.63 Deciduous swamp (hS44)</p> <p>Wetland 31: = 0.92ha Deciduous swamp (hS45)</p> <p>Wetland 32: = 2.28ha Deciduous swamp (hS46)</p> <p>Wetland 33: = 0.73ha Marsh (M22)</p> <p>Wetland 34: = 1.51ha Deciduous swamp (hS47)</p> <p>Wetland 35: = 8ha Marsh, deciduous swamp (M24, hS48, hS49)</p> <p>Wetland 36: = 6.9ha Marsh, tall shrub swamp, coniferous swamp (M25, tsS10, cS24, cS25)</p> <p>Wetland 37: = 7.05ha Deciduous swamp (hS50)</p> <p>Wetland 38: =3.1ha Deciduous swamp (hS51)</p> <p>Total : 353.35ha</p>	
Wetland Type	<p>Calculations are provided below.</p> <p>Fractional Area of Wetland Types:</p> <p>Swamp: <i>Swamp (ha)</i> Total ha = 286.81</p> <p>FA=286.81/353.35 =0.81</p> <p>Marsh: <i>Marsh (ha)</i> Total ha = 66.53</p> <p>FA =66.53/353.35 =0.19</p>	9.33
Site Type	Palustrine: 1.0*2 =2	2
Vegetation Communities	Number of communities with 1-3 forms: 38 = 21.5 pts	22

Proximity to other Wetlands	Hydrologically connected by surface water to other wetlands (same dominant wetland type), within 0.5 km	8
Interspersion	See Appended Interspersion Map. Total vertical: 36 Total horizontal: 46 Total = 82	15
Open Water Types	Open water occupies 5-25% of the wetland area, occurring in ponds of various sizes; vegetation occurs in dense patches or diffuse open stands. (Type 3).	14
Flood Attenuation (total)	Details of Flood Attenuation calculations are provided below.	100
Water Quality Improvement (Total)	Details of water quality improvement calculations are provided below.	2.37
Shoreline Erosion Control	Wetland is entirely palustrine.	0
Groundwater Recharge (Total)	Details of Groundwater Recharge calculations are provided below.	2
Species Rarity(Total)	No rare species noted during 2010 surveys within the wetland. Section 4.1.2.1 Breeding Habitat for Endangered or Threatened Species = none 4.1.2.2 Traditional Migration or Feeding Areas for an Endangered or Threatened Species = none 4.1.2.3 and 4.1.2.4 Provincially Significant Plant and Animal Species = none 4.1.2.5 Regionally Significant Species = none 4.1.2.6 Locally Significant Species = none 4.1.2.7 Species of Special Status = none	0
Significant Features and Habitats (Total)	Section: 4.2.1 Colonial Waterbirds = none 4.2.2 Winter Cover for Wildlife = none 4.2.3 Waterfowl Staging and/or Molting Area = none 4.2.4 Waterfowl Breeding = none	0
Fish Habitat (Total)	An unnamed tributary of the Glen Falloch Drain runs from the wetland at the northern end of the Project location. The Glen Falloch Drain itself also runs through a portion of the wetland complex, west of the Project location. The tributary of the Glen Falloch Drain is identified by the Raisin Region Conservation Authority (RRCA) as a Class C Drain under the Fisheries and Oceans Drain Classification System. Class C drains are permanent, warm water drains with no sensitive species or communities present. RRCA noted that this drain may provide baitfish habitat.	

	<p>A visual aquatic habitat survey of the tributaries was conducted on June 22, 2010. The portion of the tributary running from the wetland does not appear capable of providing direct fish habitat since there was no defined channel, although there was evidence of annual surface flow due to the presence of meadow marsh vegetation within a shallow swale-like area leading from the wetland. Based on aerial photograph review, further downstream portions of the tributary channel do appear more well-defined and, therefore, may support baitfish communities. The portion of the tributary leading directly from the wetland would indirectly support downstream fish communities by buffering surface runoff, regulating hydrology and water quality and providing allochthonous inputs (organic matter).</p>	
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Wetland Type Calculations:

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

	Fractional Area			Score
Bog		x	3	0.00
Fen		x	6	0.00
Swamp	0.81	x	8	6.48
Marsh	0.19	x	15	2.85

Wetland type score (maximum 15 points)

9.33

Flood Attenuation Calculations:

FLOOD 3.1 ATTENUATION

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

Step 1: Determination of Maximum Score

_____	Wetland is located on one of the defined 5 large lakes or 5 major rivers (Go to Step 4)
_____	Wetland is entirely isolated (i.e. not part of a complex) (Go to Step 4)
_____ x _____	All other wetland types (Go through Steps 2,3 and 4B)

Step 2: Determination of Upstream Detention Factor (DF)

(a)	Wetland area (ha)	353.35
(b)	Total area (ha) of upstream detention areas (include the wetland itself)	353.35
(c)	Ratio of (a):(b)	1.00
(d)	Upstream detention factor: (c) x 2 =	2.00
	(maximum allowable factor = 1)	1.00

Step 3:

Determination of Wetland Attenuation Factor (AF)

(a)	Wetland area (ha)		353.35
(b)	Size of catchment basin (ha) upstream of wetland (include wetland itself in catchment area)		2898.54
(c)	Ratio of (a):(b)		0.12
(d)	Wetland attenuation factor: (c) x 10 =	1.2	1.00
	(maximum allowable factor = 1)		

Step 4:

Calculation of final score

(a)	Wetlands on large lakes or major rivers		0
(b)	Wetland entirely isolated		0
(b)	All other wetlands --calculate as follows:		
(c)	* Complex Formula - Isolated portion	0.0	1
	Initial Score		100 *
	Upstream detention factor (DF) (Step 2)		1.00
	Wetland attenuation factor (AF) (Step 3)		1.00
	Final score: [(DF + AF)/2] x Initial score =		100.00
(c)	* Final score:=	100.0	
	*Unless wetland is a complex with isolated portions (see above).		

Flood Attenuation Score (maximum 100 points)

100

Water Quality Improvement Calculations:

3.2 WATER QUALITY IMPROVEMENT

3.2.1 SHORT TERM WATER QUALITY IMPROVEMENT

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

Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5a)

_____ x _____

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		x	0.5	=	0.000
FA of riverine wetland		x	1	=	0.000
FA of palustrine wetland with no inflow	1.000	x	0.7	=	0.700
FA of palustrine wetland with inflows		x	1	=	0.000
FA of lacustrine on lake shoreline		x	0.2	=	0.000
FA of lacustrine at lake inflow or outflow		x	1	=	0.000
			Sub Total:		0.700
			Sum (WIF cannot exceed 1.0)		0.70

Step 3: **Determination of catchment land use factor (LUF)**
 (Choose the first category that fits upstream landuse in the catchment.)

1)		Over 50% agricultural and/or urban	1.0
2)	x	Between 30 and 50% agricultural and/or urban	0.8
3)		Over 50% forested or other natural vegetation	0.6
		LUF (maximum 1.0)	0.80

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)

	Fractional Area				
FA of wetland with live trees, shrubs, herbs or mosses (c,h,ts,ls,gc,m)	0.52	x	0.75	=	0.39
FA of wetland with emergent, submergent or floating vegetation (re,be,ne,su,f,ff)	0.48	x	1	=	0.48
FA of wetland with little or no vegetation (u)		x	0.5	=	0.00

Sum (PUT cannot exceed 1.0)

0.87

Ground Water Discharge Calculations:

3.2.3 GROUNDWATER DISCHARGE

(Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points assign the maximum score of 30.)

Wetland Characteristics	Potential for Discharge						
	None to Little		Some		High		
Wetland type	1) Bog = 0	0	2) Swamp/Marsh = 2	2	3) Fen = 5		
Topography	1) Flat/rolling = 0		2) Hilly = 2	0	3) Steep = 5		
Wetland Area:	Large (>50%) = 0	0	Moderate (5-50%) = 2	0	Small "5%" = 5		
Upslope							0
Catchment Area							0
Lagg Development	1) None found = 0	0	2) Minor = 2	0	3) Extensive = 5		
Seeps	1) None = 0	0	2) = or < 3 seeps = 2	0	3) > 3 seeps = 5		
Surface marl deposits	1) None = 0	0	2) = or < 3 sites = 2		3) > 3 sites = 5		
Iron precipitates	1) None = 0	0	2) = or < 3 sites = 2	0	3) > 3 sites = 5		
Located within 1 km of a major aquifer	N/A = 0	0	N/A = 0	0	Yes = 10		
Totals		0		2		0	

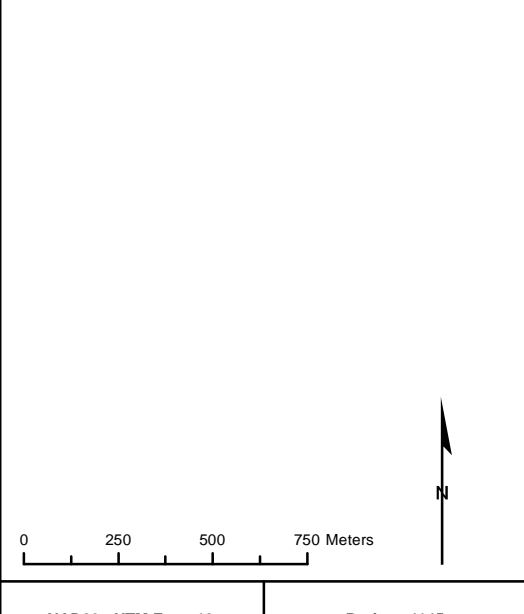
(Scores are cumulative maximum score 30 points)

Groundwater Discharge Score (maximum 30 points)

2

Glendale Solar Project Catchment Area

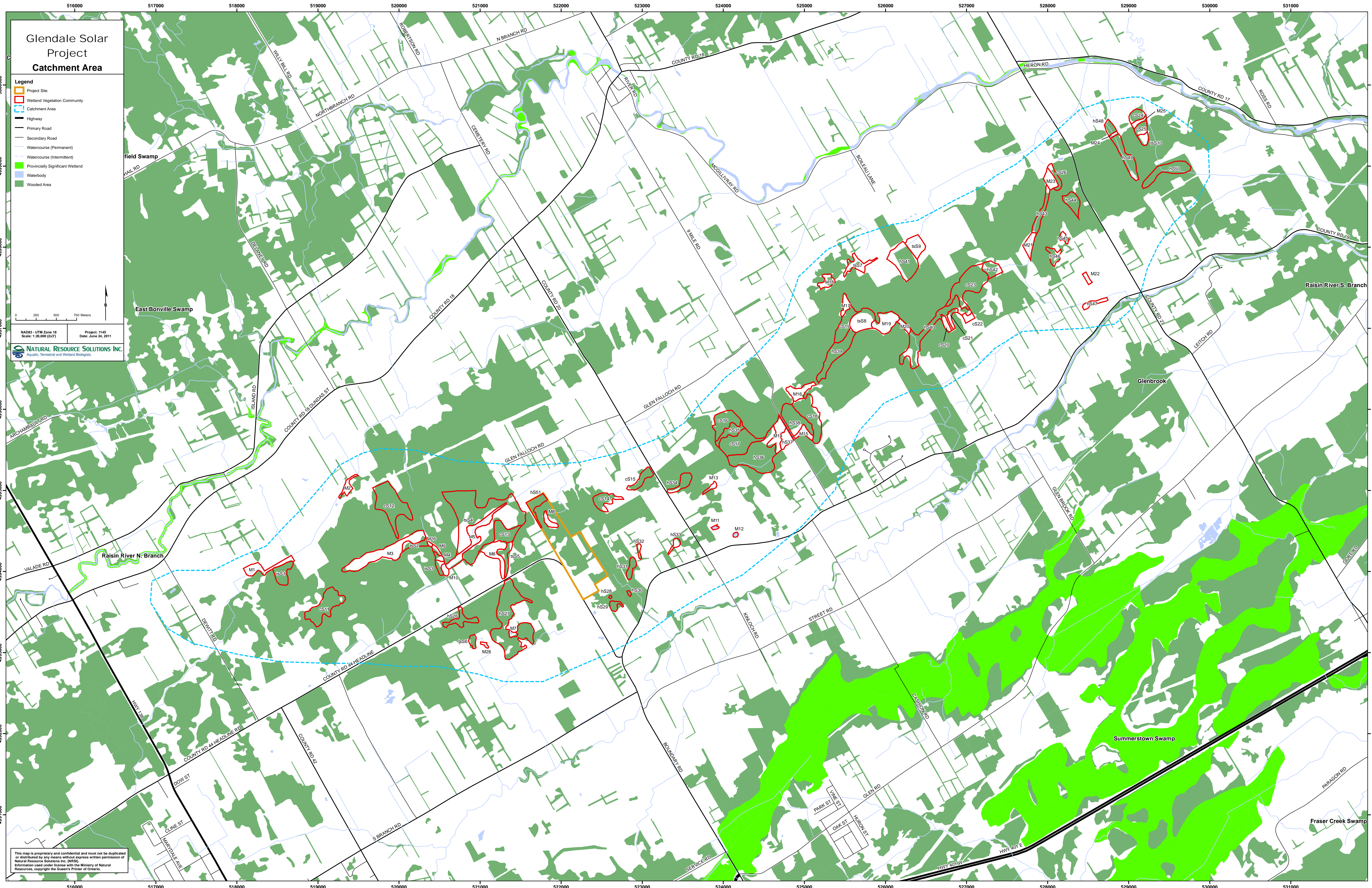
- Legend**
- Project Site
 - Wetland Vegetation Community
 - Catchment Area
 - Highway
 - Primary Road
 - Secondary Road
 - Watercourse (Permanent)
 - Watercourse (Intermittent)
 - Provincially Significant Wetland
 - Waterbody
 - Wooded Area



NAD83 - UTM Zone 18
Scale: 1:20,000 (24:7)

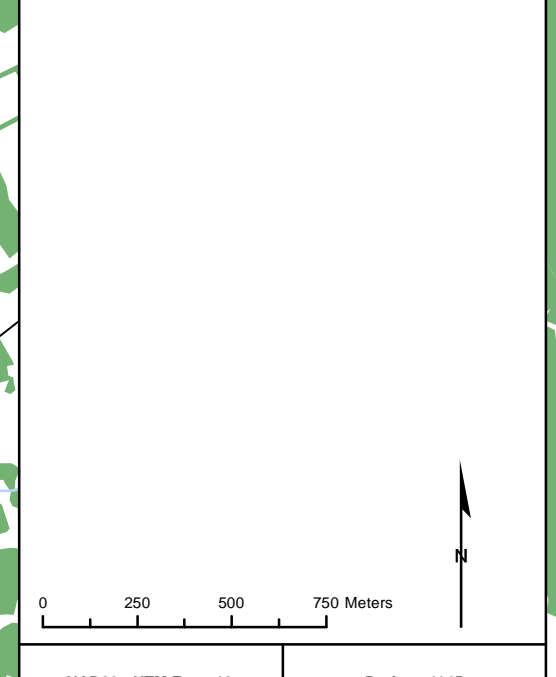
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Aquatic, Terrestrial and Wetland Biologists

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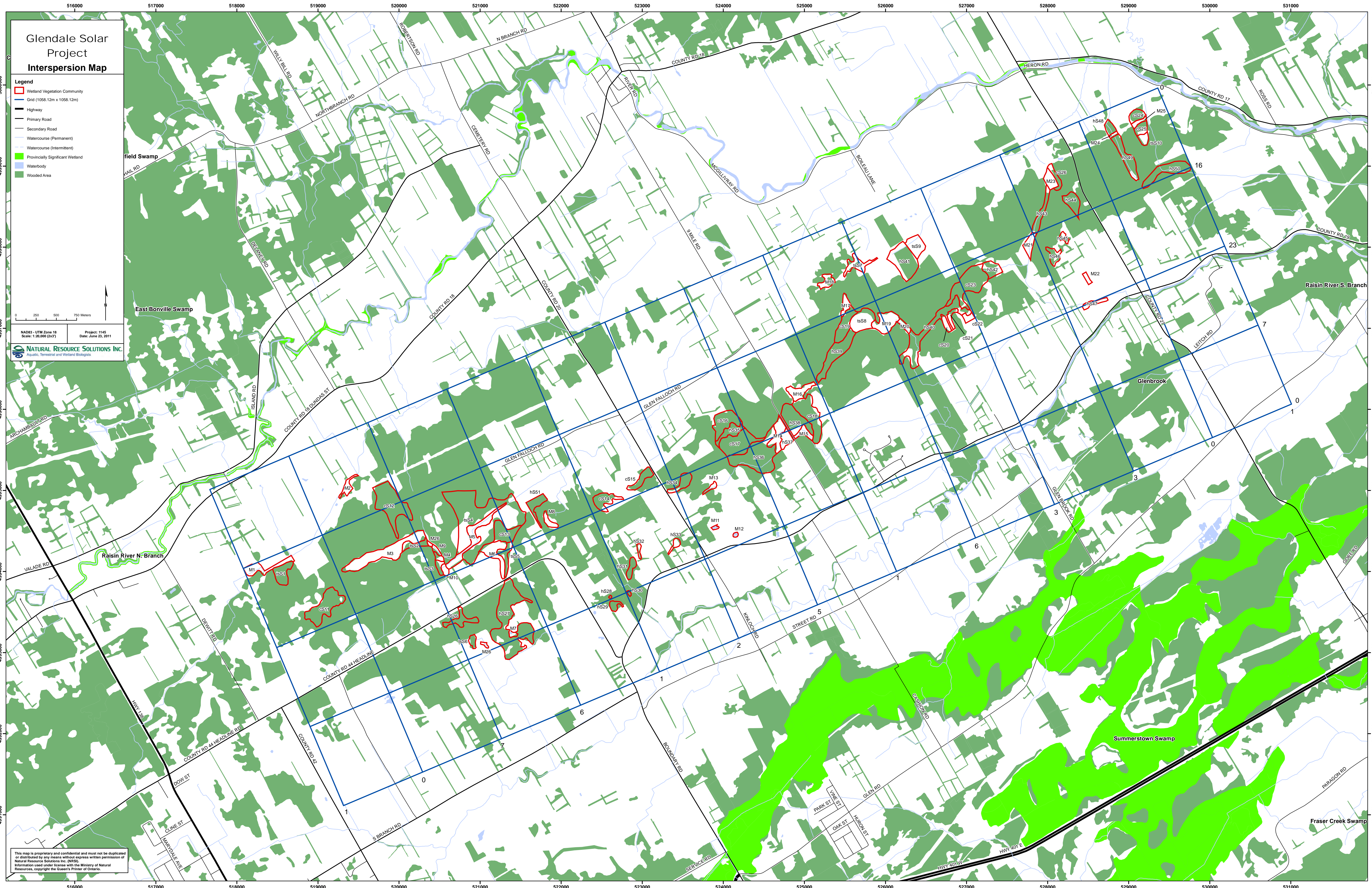
Glendale Solar Project Interspersion Map

- Legend**
- Wetland Vegetation Community
 - Grid (1058.12m x 1058.12m)
 - Highway
 - Primary Road
 - Secondary Road
 - Watercourse (Permanent)
 - Watercourse (Intermittent)
 - Provincially Significant Wetland
 - Waterbody
 - Wooded Area



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Project Team:

Member	Qualifications	Role
David Stephenson, MSc	Certified Wetland Evaluator Certified ELC Certified Arborist	<ul style="list-style-type: none">• Project Management• Field Survey• Data Analysis, Evaluation, Reporting• Natural Heritage Assessment Guide Appendix C – for revised catchment area (air photo interpretation, interspersed mapping, and evaluation)
Kevin Dance, M.Sc.	Certified ELC	<ul style="list-style-type: none">• Field Survey• Data Analysis• Evaluation
Matt Ross, B.Sc FWT	Field Biologist	<ul style="list-style-type: none">• Field Survey
Cheryl-Anne Payette, B.Sc FWT	Field Biologist	<ul style="list-style-type: none">• Data Analysis• Evaluation
Shawn MacDonald, BSc	GIS Mapping	<ul style="list-style-type: none">• Mapping



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale Project #: 1145

Observer(s): KSD,MR

Date: Aug 12, 2010 Time (24h): 8:38

Field #: 2c Weather: 0 Precipitation: 0 Temp (°C): 18

Map Code: 9CM3 Wind Speed & Direction: Cloud %:

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

% Open Water: 0 ELC Code: MAMM2

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
-----------------------------	--

h _____
c _____
dc, dh, ds _____
ts _____
ls _____
gc goldenrod sp, Queen anne's lace, gratingelia
ne _____
be _____
re broad leaved cat tail, broad stemmed bulrush
ff _____
f _____
su _____
m _____

Rare Species (Local, Regional, Provincial):

Wildlife Notes: none.

none

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: Glendale Project #: 1145

Observer(s): KSD,MR

Date: Aug 12/10 Time (24h): 8:38

Field #: 5 Weather: 0 Precipitation: 0 Temp (°C): 18

Map Code: FEM3 Wind Speed & Direction: 3 Cloud %: 60

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

% Open Water: 0 ELC Code: MASHM-2

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
-----------------------------	--

h trunking Aspen, Silver maple, elms sp.
c _____
dc, dh, ds _____
ts willow sp.
ls red aster, dogwood, narrow-leaved woodhusht
gc marsh bedstraw
ne Sedg sp, Purple loosestrife, toe pig-weed, horse t. spikegrass sp.
be narrow leaved water plantain, water plantain, water hemlock
re Soft-stem bulrush, br-leaved cat tail, black bullrush
ff _____
f _____
su _____
m _____

Rare Species (Local, Regional, Provincial):

Wildlife Notes: DEER - tk
Cherry faced meadowhawk
wh-faced meadowhawk
Cove
CEBW
EWPE

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



Wetland Vegetation Communities

Project Name: Glendale Project #: 1145

Observer(s): KSD, MR

Date: Aug 12/10 Time (24h): 838

Field #: 8 Weather: Precipitation: 0 Temp (°C): 18

Map Code: Wetland Type: N/A Site Type: P Dominant Form: h

% Open Water: N/A ELC Code: ELC Code:

Photos: Species (dominant species, secondary species, present species)

Forms % (Circle those >25%)

h Green NL > Sugar Maple > T. Aspen & Birch/Maple Hackery

c White Spruce, White Cedar, E. Hemlock

dc, dh, ds

ts Alternate Dogwood

ls Virginia Creeper, Red Cedar, False Solomon's Seal, Sens. Fern

gc ne be re ff f su m

Rare Species (Local, Regional, Provincial): Wood Frog

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



Wetland Vegetation Communities

Project Name: Glendale Project #: 1145

Observer(s): KSD, MR

Date: Aug 12/10 Time (24h): 838

Field #: 9 Weather: Precipitation: 0 Temp (°C): 18

Map Code: Wetland Type: N/A Site Type: P Dominant Form: h

% Open Water: N/A ELC Code: ELC Code:

Photos: Species (dominant species, secondary species, present species)

Forms % (Circle those >25%)

h Green NL > Am. Basswood > Am. Elm > Sugar Maple

c Choke Cherry, Spalding Sumac, Alternate Dogwood

dc, dh, ds

ts Wild Strawberry, Stinging Nettle, White Hawthorn, Pokki, Gasterol

ls ne be re ff f su m

Rare Species (Local, Regional, Provincial): Butterfly

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



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale Project #: 1145

Observer(s): KSD, MR

Date: Aug. 12/10 Time (24h): 838

Field #: 1 Weather: Precipitation: 0 Temp (°C): 18

Map Code: oCH Wind Speed & Direction: 3 Cloud %: 60

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

% Open Water: NAWR ELC Code: NAWM2-S

Photos:

Forms % (Circle those >25%) Species (dominant species, secondary species, present species)

- h Trembling Aspen, Green Ash
- c
- dc, dh, ds trembling aspen
- ts Willow sp.
- ls red-osier dogwood
- gc purple loosestrife, Canada goldenrod
- ne sedge sp.
- be
- re
- ff
- f
- su
- m

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

AM60

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: Glendale Project #: 1145

Observer(s): KSD, MR

Date: Aug. 12/10 Time (24h): 838

Field #: 2d Weather: Precipitation: 0 Temp (°C): 18

Map Code: h.S. Wind Speed & Direction: 3 Cloud %: 60

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

% Open Water: 0 ELC Code: SUDM4-S

Photos:

Forms % (Circle those >25%) Species (dominant species, secondary species, present species)

- h Trembling Aspen, green Ash, bitterroot, butternut
- c
- dc, dh, ds elm sp.
- ts
- ls rickety ash, red-osier dogwood, chokeberry
- gc grass sp., wild parsley, purple loosestrife, yarrow
- ne
- be
- re br.-leaved cattail, black bulrush
- ff
- f
- su
- m

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

Butternut - ? identified

EAPN
BECH
AMRE
Cuckoo sp.
RTHA
AM60

White faced woodchuck
Cabbage white
White Admiral
Common Garter snake
5/19/10 long

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: Glendale Project #: 1145

Observer(s): KSD, MR

Date: Aug. 12/10 Time (24h): 838

Field #: 26 Weather: Precipitation: 0 Temp (°C): 18

Map Code: 9042 Wind Speed & Direction: 3 Cloud %: 60

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

% Open Water: none ELC Code: MAMM2

Photos:

Forms % (Circle those ≥25%) Species (dominant species, secondary species, present species)

- h _____
- c _____
- dc, dh, ds _____
- ts _____
- ls willow sp.
- gc soldenrod sp. Queen-anemace, gratangulica, or city
- me purple loosestrife
- be _____
- re broad-leaved cattail, hard stemmed bulrush
- ff _____
- f _____
- su _____
- m _____

Rare Species (Local, Regional, Provincial):

BLSA Wildlife Notes:
EAKI Red admiral
LOYE Cabbage white
LOGR black & swa flowerail

none

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: Glendale Project #: 1145

Observer(s): KSD, MR

Date: Aug. 12/10 Time (24h): 838

Field #: 3 Weather: Precipitation: 0 Temp (°C): 18

Map Code: rehr Wind Speed & Direction: 3 Cloud %: 60

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

% Open Water: none ELC Code: MAMM1-2

Photos:

Forms % (Circle those ≥25%) Species (dominant species, secondary species, present species)

- h _____
- c _____
- dc, dh, ds _____
- ts _____
- ls _____
- gc spike rush sp.
- re narrow leaved plantain
- be broad-leaved cattail
- ff _____
- f _____
- su _____
- m _____

Rare Species (Local, Regional, Provincial):

Doer-tk Wildlife Notes:
Raccoon-tk
leopard frog

none

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: Glendale

Project #: 1145

Observer(s): PSD, MR

Date: Aug 12/0 Time (24h): 838

Field #: 7 Weather: Precipitation: 0 Temp (°C): 18

Map Code: NOU Wind Speed & Direction: 3 Cloud %: 60

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

% Open Water: 10% ELC Code: MAMM1-3

Photos:

Forms % (Circle those $\geq 25\%$)

Species (dominant species, secondary species, present species)

h green ash, black ash

c

dc, dh, ds

ts Alternate-leaved dogwood

ls hairy berry

gc yellow weed, spotted jewelweed, loosestrife

ne reed canopy, purple loosestrife

be broad-leaved cattail, giant burreed

ff lesser duckweed (Vernonia minor)

f

su

m

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

Wetroy Green frog eastern
Marsh Beaver old trees culm
White faced Woodpecker in open areas
Fragile for flight

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