HATCH™

Canadian Solar Solutions Inc.
and
UC Solar Ltd.

Draft Natural Heritage Assessment Evaluation of Significance Report

For

2176047
Solar Energy Project

H335467
Rev. G
May 20, 2011

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Project Report

May 20, 2011

Canadian Solar Solutions Inc. & UC Solar Ltd.
2176047 - Solar Energy Project

Draft Natural Heritage Assessment Evaluation of Significance

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1. Introduction

1.1 Project Description

UC Solar Ltd. ("UC Solar") in partnership with Canadian Solar Solutions Inc. ("Canadian Solar") is proposing to develop a 10 megawatt (MW) solar photovoltaic project titled 2176047 Solar Energy Project (herein referred to as the ''Project''). The Project Location[1] is situated on approximately 36 hectares (ha) of land on Lots 7 & 8, Concession 3, Elizabethtown-Kitley Township (lower tier municipality), United Counties of Leeds and Grenville (upper tier Municipality). A portion of the Project Location along the north side of Centennial Road is within the boundary of the City of Brockville. The Project is located within the Smith Falls Ecodistrict 6E-11.

1.2 Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals 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 nameplate 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.

Subsection 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 natural heritage records review and site investigation.

Natural features are defined in subsection 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] "Project Location means, when used in relation to a renewable energy project, a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposed to engage in the project" (O. Reg. 359/09, s. 1 (1)).

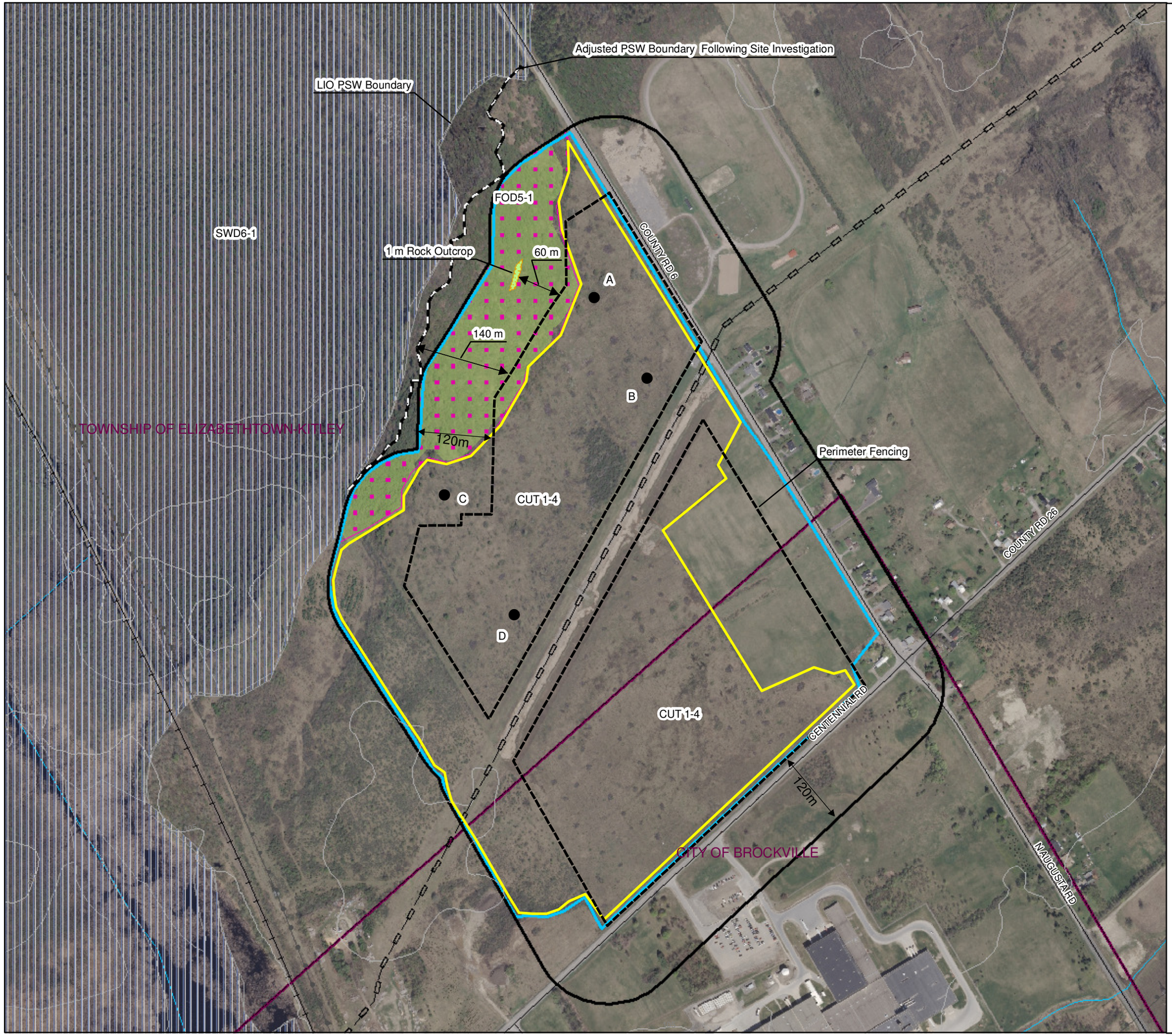
The *Natural Heritage Assessment Records Review Report* (Hatch Ltd., 2011a) did not identify any ANSI's, wetlands or valleylands on or within 120 m of the Project Location. However, there were confirmed significant woodlands and candidate significant wildlife habitat on and within 120 m of the Project Location that will need to be evaluated to determine significance.

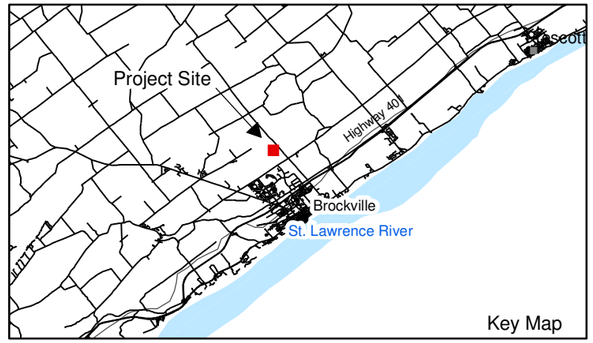
1.2.1 Natural Heritage Assessment Evaluation of Significance Report

Section 27 of the REA Regulation requires proponents of Class 3 solar projects to prepare a *Natural Heritage Assessment Evaluation of Significance Report* for natural features identified in the *Natural Heritage Assessment Records Review Report* and *Natural Heritage Assessment Site Investigation Report* that sets out:

- a determination of whether the natural feature is:
  - provincially significant or not provincially significant (i.e. wetlands and ANSI's)
  - significant or not significant (i.e. woodland, valleyland or wildlife habitat)
- 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 report has been prepared to meet these requirements. Although not a requirement under Section 27 of the REA Regulation, a map showing the boundaries of the significant natural features identified in this report (Figure 1.1) has also been prepared. As mentioned in Section 1.2, there are no wetlands or ANSI's on or within 120 m of the Project Location. Therefore, an evaluation to determine if these features are provincially or non-provincially significant is not required. However, there are confirmed significant woodlands and candidate significant wildlife identified on and within 120 m of the Project Location that will be evaluated to determine significance. Although the municipality has confirmed the presence of significant woodlands on and within 120 m of the Project Location, these woodlands will be evaluated to reflect the information obtained during the site investigation.





LEGEND

- ABCD = Breeding Bird Survey Points
- Electrical Transmission Line
- Pipeline
- Railway
- Road
- Topographic Contour (5 m Interval)
- Watercourse
- Municipality
- Project Location
- 120 m from Project Location
- Rock Outcrop

Natural Features

- Buells Creek Reservoir Provincially Significant Wetland (PSW)
- Significant Woodland

Significant Habitat of Seasonal Concentrations of Animals

- -- Raptor Winter Feeding and Roosting Areas
- -- Reptile Hibernacula

Significant Specialized Habitats for Wildlife

- -- Forest Providing a High Diversity of Habitats
  - -- Highly Diverse Areas
  - -- Specialized Raptor Nesting Habitat
  - -- Habitat for Area-sensitive Forest Breeding Bird Species
- -- Habitat for Area-sensitive Shrub/Early Successional Breeding Bird Species

Significant Habitat of Species of Conservation Concern

- -- Milksnake Hibernacula
- -- Western Chorus Frog

ELC Codes

CUT1- 4 - Gray Dogwood Cultural Thicket Type
FOD5 -1 - Fresh Sugar Maple Deciduous Forest Type
SWD6-1 - Red Maple Organic Deciduous Swamp Type

Notes:
1. OBM and NRVIS data downloaded from LIO,with permission.
2. Spatial referencing UTM NAD 83, August 2010.
3. Ortho photos obtained from Cataraqui Region Conservation Authority, Scale 1:2000, flown 2008.

0 80 160 320 Meters

NORTH

Scale 1:6,000

Figure 1.1

UC Solar Ltd.

2176047

Significant Natural Heritage Features

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2. Evaluation of Confirmed and Candidate Significant Natural Features

2.1 Confirmed and Candidate Significant Woodlands

The *Natural Heritage Assessment Records Review Report* (Hatch Ltd., 2011a) confirmed the presence of significant woodlands on and within 120 m of the Project Location. These significant woodlands were evaluated by the municipality. Although there are confirmed significant woodlands, the following discussion is provided to determine which criteria were met.

Woodlands are defined in subsection 1 (1) of the REA Regulation as:

(a) land that is south and east of the Canadian Shield

(b) land that has per hectare, at least

1000 trees of any size

750 trees measuring over 5 cm in diameter

500 trees measuring over 12 cm in diameter

250 trees measuring over 20 cm in diameter

(c) land that does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.

The site investigation confirmed that there are woodlands on and within 120 m of the Project Location that meet the criteria for tree stocking density.

The criteria for establishing woodland significance are identified in Section 7 of the *Natural Heritage Reference Manual* (NHRM) (Ontario Ministry of Natural Resources (MNR), 2010). The criteria for establishing significance and how the woodlands were evaluated against the criteria are discussed below. Woodlands that meet a suggested minimum standard set out in the NHRM (MNR, 2010) for any one of the criterion are considered significant.

Criteria for Establishing Significant Woodlands

- **Woodland size** – Where woodland cover is between 30–60% of the land cover, woodlands 50 ha in size or larger should be considered significant.
- **Ecological function** – woodlands providing any of the following ecological functions should be considered significant
  - **Woodland interior** – Where woodlands cover about 30–60% of the land cover, 8 ha or more of interior habitat is considered significant. Woodland interior habitat, is usually defined as habitat more than 100 m from the edge of the woodland
  - **Proximity to other woodlands or other habitats** – Woodlands within 30 m of a significant natural feature receiving ecological benefit from the woodland.
  - **Linkages** – Woodlands providing a connecting link between two other significant features.

  - **Water protection** – Woodlands located within a sensitive or threatened watershed or a specified distance (e.g., 50 m or top of valley bank if greater) of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat.
  - **Woodland diversity** – Woodlands with a high native diversity through a combination of composition and terrain.
- **Uncommon characteristics** – Woodlands exhibiting uncommon characteristics such as old-growth or rare vegetation communities.
- **Economic and social functional values** – Woodlands with high economic or special services value.

2.1.1 Woodland at the Northern Portion of the Project Location

One woodland feature was identified during the site investigation as occurring on the Project Location. It is classified as a *fresh sugar maple deciduous forest type (FOD5-1) according to the Ecological Land Classification (ELC) System for Southern Ontario (*Lee *et al.*, 1998*)*. Characteristics of this woodland in relation to the criteria identified in Section 4.1 are discussed below.

- **Woodland size** – The contiguous woodland is estimated to be 734 ha, calculated using the MNR Land Information Ontario wooded area layer in ArcGIS 9.3. Accordingly the woodland is considered significant for the region, and this criterion is met.
- **Woodland interior** – The contiguous woodland interior is estimated to be 392 ha of which 99 ha falls within the Project site assuming a 100 m buffer around the woodland perimeter. Therefore this criterion is met.
- **Proximity to other woodlands or other habitats** – The woodland is adjacent to other significant woodlands and therefore this criterion is met.
- **Linkages** – The woodland is adjacent to other significant woodlands and therefore provides linkages. This criterion is met.
- **Water protection** – The woodland provides hydrological benefits to the Buells Creek Reservoir provincially significant wetland and therefore this criterion is met. The wetland is located greater than 120 m from the Project Location.
- **Woodland diversity** – The woodland provides a variation in composition as it is a transitional area between upland and wetland areas and therefore this criterion is met.
- **Uncommon characteristics** – There are no local, regional or provincially (S-Rank of S1, S2 or S3) rare vegetation communities found within the boundary of this woodland and therefore this criterion is not met.

Evaluation – The woodland has been identified by the Cataraqui Region Conservation Authority (CRCA) as a potentially significant woodland. Our evaluation of the woodland is that it is a significant woodland as it meets the size and interior forest criteria for this region and provides some economic and social values. Since the Project Location falls on and within 120 m of this feature it will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2 Candidate Significant Wildlife Habitat

The *Significant Wildlife Habitat Technical Guide* (SWHTG) (MNR, 2000) identifies four main types of wildlife habitat that can be classified as significant: habitat for seasonal concentrations of animals, rare vegetation communities or specialized habitats for wildlife, habitats of species of conservation concern and animal movement corridors. Within each of these four types of wildlife habitat are specific habitat types to reflect the life history requirements of an individual or group of species.

The criteria and processes outlined in the NHRM (MNR, 2010), SWHTG (MNR, 2000) and *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* (MNR, 2009) were used to evaluate the significance of wildlife habitat. The criteria that were considered during this evaluation and how they were assessed is discussed in the following sections for each of the candidate significant *specialized habitats for wildlife* and *habitat of species of conservation concern* that were identified in the *Natural Heritage Assessment Site Investigation Report* (Hatch Ltd., 2011b).

2.2.1 Habitat of Seasonal Concentrations of Animals

Criteria for evaluation of habitat of seasonal concentrations of animals are identified within the Table Q-1 (Habitat for seasonal concentration of animals potential) of Appendix Q of the SWHTG (MNR, 2000).

2.2.1.1 Waterfowl Nesting Areas

The woodland and associated shrub habitat were considered as candidate waterfowl nesting areas during the site investigation.

- **Relative importance of the site to local waterfowl populations** – Sites that support higher levels of nesting are more significant. Waterfowl were not observed on or within 120 m of the Project Location during the bird survey, although the survey was late for evaluating the site for use by waterfowl. Important waterfowl nesting areas in Southern Ontario are usually associated with marshes, newly flooded beaver ponds, riparian areas, and sheet water. None of these features are found on or within 120 m of the Project Location and therefore this criterion is not met.
- **Presence of species of conservation concern** – Sites with nesting and brood habitat for American Black Duck, Gadwall, Green-winged Teal, Northern Pintail, Northern Shoveler, and American Wigeon should be considered significant. Of the species listed, the site provides potential marginal nesting habitat for Green-winged Teal, but is not considered significant.
- **Species diversity and abundance** – The most significant sites support several species of conservation concern; significant sites support one species. Sites with the greatest number of species are more significant. As indicated, the site may provide marginal nesting habitat for common species such as Green-winged Teal, Wood Duck, Mallard and Canada Goose and therefore this criterion is partially met.
- **Size of area** – Larger sites are more significant. The habitat on the Project Location is part of a large contiguous natural area of forest swamp and marsh forms. It is a large regional feature on the landscape, but the size on the Project Location is small and therefore this criterion is not met.
- **Quality of habitat** – Sites supporting preferred habitat requirements of nesting waterfowl are more significant. The Project Location does not provide good nesting habitat for ground nesting

waterfowl as it is too overgrown for most ground-nesting species and the site has limited habitat for cavity nesting species as the trees in the woodland (mostly sugar maple) are generally small (DBH 20 cm) with few large tree that would have cavities for nesting waterfowl. Therefore this criterion is not met.

- **Location of site** – Nesting sites located near or adjacent to brood rearing sites are more significant. There are nesting and brood rearing sites within the vicinity of the Project and therefore this criterion is met.
- **Nest predation** – Sites with lower predation are more significant. Nest predation rates are unknown and this criterion is not evaluated.
- **Level of disturbance** – Sites with less disturbance and fragmentation are more significant. The wetland is fairly undisturbed and unfragmented for this region of Ontario. It is bounded by roads with agricultural activity along its borders. Therefore this criterion of low disturbance is met.

Evaluation – The Project Location contains potential marginal waterfowl nesting habitat, primarily for Mallard and Canada Goose, although it is too overgrown for even these ubiquitous species. Wood Duck could potentially be found in the swamp area, but the swamp is greater than 120 m from the Project Location. Green-winged Teal prefer open, grassy uplands near water such as beaver ponds and probably do not nest at the Project Location but even if present, the site undoubtedly is a non significant waterfowl nesting area and therefore this habitat type will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.1.2 Raptor Winter Feeding and Roosting Areas

The woodland and cultural habitats on and within 120 m of the Project Location were considered a candidate raptor winter feeding and roosting area during the site investigation.

- **Relative importance of the site** – Significant sites are generally the only known sites in the planning area; significant sites may be one of only a few in the area. The Project Location was not identified in the *Natural Heritage Assessment Records Review* Report as a significant site for raptors (Hatch Ltd., 2011a) and therefore this criterion is not met.
- **Species diversity and abundance** – Sites with the greatest number of species and the highest number of individuals are more significant. The *Ontario Breeding Bird Atlas* (OBBA) identifies twelve species of raptors within the vicinity of the Project Location, although surveys were conducted throughout the year, not just the winter (Bird Studies Canada *et al.*, 2006). Therefore this criterion is unevaluated.
- **Presence of species of conservation concern** – The most significant sites support several species of conservation concern; significant sites support one species. Red-shouldered Hawk (*Buteo lineatus)* (down listed from Special Concern) was commonly observed in the 10 x 10 km OBBA square that overlaps the Project Location during the first and second survey periods (1981 to 1985 and 2001 to 2005) (Bird Studies Canada *et al.*, 2006). Use of the area during the winter is not known and therefore this criterion remains unevaluated.
- **Size of site** – Raptor wintering sites need to be > 20 ha (MNR, 2009) and the SWHTG (MNR, 2000) indicates that the best raptor winter feeding and roosting sites should be at least 25 to

30 ha in size. The woodland and associated swamp exceeds this size criterion and therefore this criterion is met.

- **Level of disturbance** – Sites that are part of a rural landscape are preferred by raptors to those surrounded by urban development (MNR, 2000). The woodland is fairly undisturbed and unfragmented. It is bounded by roads with agricultural activity along its borders and therefore this criterion is partially met.
- **Habitat quality** – Sites with better habitat (e.g., abundant prey and perches; a tendency toward less snow accumulation due to exposure to strong prevailing winds) are often more significant. The woodlands on and within 120 m of the Project Location are well protected from prevailing winds, provide perches for raptors and the adjacent agricultural fields and shrub habitat provide hunting areas. Therefore this criterion is met.

Evaluation – A review of the criteria indicates that the habitat must provide a combination of fields and woodlands that provide roosting, foraging, and resting habitats for wintering raptors. The Project Location meets this criterion and will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.1.3 Reptile Hibernacula

Some species of snakes hibernate in animal burrows, log piles, and rock crevices. Woodlands >30 ha are also favourable as they provide interior forest habitat with more moderate environmental conditions. Snake hibernacula are also found on man-made sites such as old stone fences, crumbling foundations and old wells. During the site investigation rock piles were found within 120 m the Project Location and considered candidate significant wildlife habitat. The criteria to evaluate them are described below.

- **Presence of species of conservation concern** – Species of conservation concern are known to be present in the area. Milksnake, a species of conservation concern was not seen during the site investigation but may occur at the Project Location and therefore this criterion is met.
- **Species diversity** – Most significant sites support two or more species of concern; significant sites may support one species. There is the potential for this site to support at least one species of conservation concern and other species of snakes and therefore this criterion is met.
- **Abundance** – Sites with the highest number of individuals are more significant. The abundance of snakes at the Project Location is unknown and therefore this criterion is unevaluated.
- **Habitat quality** – Sites with better habitat are probably more significant. The habitats found on the Project Location provide suitable habitat for milksnakes and other snakes commonly found in the region. Rock piles found within the 120 m setback may be used as hibernacula sites. Accordingly, this criterion is met.

  Location of site – Sites located within or adjacent to large areas of suitable habitat are more significant. For reptiles, sites found in areas with good movement corridors are more significant. The habitats are relatively large and bordered by a large woodland. Therefore this criterion is met.

- **Level of disturbance** – Least disturbed sites are more significant. The current level of disturbance is low and therefore this criterion is met.

Evaluation – The review of the criteria indicates that the lands on the Project Location may provide significant reptile hibernacula sites and accordingly this habitat feature will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.2 Specialized Habitats for Wildlife

2.2.2.1 Habitat for Area-sensitive Species

Habitat for Area-sensitive Forest Bird Species

Criteria used for the evaluation of significance for the habitat of area-sensitive forest breeding bird species on and within 120 m of the Project Location were taken from Appendix Q2 of the SWHTG (MNR 2000).

- **Presence of rare, uncommon, or declining species** – According to the SWHTG (MNR, 2000), sites supporting area-sensitive species of birds that are rare or uncommon, and/or species exhibiting population declines within the province are most significant. *The Natural Heritage Assessment Records Review Report* (Hatch 2011a) identified several potential forest breeding birds although none were observed during the site investigation**.** Therefore this criterion is not met.
- **Overall area of site** – Larger stands in an area are more significant, with those stands >30 ha being the most significant. The woodlands on the Project Location are part of a large contiguous woodland greater than 30 ha, and therefore this criterion is met.
- **Area of forest interior contained within the forest stand** – Significant forest stands typically provide at least 10 ha of forest interior excluding at least a 200 m buffer around the forest interior (MNR, 2000). The woodlands on and within 120 m of the Project Location have at least 10 ha of interior forest, and therefore this criterion is met.
- **Amount of vertical stratification of site** – Forests with a variety of different layers of vegetation at different heights usually provide more habitats and support more bird species and are consequently more significant. The site investigation confirmed that portions of the woodlands have a well developed understory of saplings and shrubs with an herbaceous component in the open and drier areas. Such diversity provides more habitats and supports more bird species than an even-aged forest. Therefore this criterion is met.
- **Amount of contiguous closed-canopy /open areas in forest stand** – Sites with an abundance of mature trees are more significant for certain nesting raptor species as well as for a number of songbird species (MNR, 2000). The woodlands on the Project Location have extensive closed canopy with open areas within, and therefore this criterion is met.
- **Amount of adjacent residential development** – Sites with less residential development are more significant. Rural and residential lots are found adjacent to the Project Location which increases the level of disturbance. The degree of disturbance to the site is light and consistent with rural, agricultural use, and therefore this criterion is met.

- **Current representation of specialized habitat in planning area** – Unknown
- **Provision of significant wildlife habitat** – The site provides other significant wildlife habitat as discussed in Section 2.2 and therefore this criterion is met.
- **Potential for long-term protection of the site** – The wetland component is identified as provincially significant which affords it protection through the PPS, 2005.

Evaluation – The review of the criteria indicates that the woodlands on the Project Location are part of significant habitat for area-sensitive woodland species and accordingly this feature will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

Habitat for Area-sensitive Shrub/Early Successional Bird Breeding Habitat

Criteria used for the evaluation of significance of area-sensitive shrub/early successional bird breeding habitat on and within 120 m of the Project Location were taken from Table 1.3 of the SWH Ecoregion Schedules (MNR 2009) and Appendix Q2 of the SWHTG (MNR 2000).

- **Presence of rare, uncommon, or declining species** – According to the SWHTG (MNR, 2000), sites supporting area-sensitive species of birds that are rare or uncommon, and/or species exhibiting population declines within the province are most significant. One species, identified as an indicator of significant shrub/early successional habitat, the Brown Thrasher, was observed in the shrub habitat during the site investigation. Therefore this criterion is met.
- **Overall area of site** – Larger shrub/thicket habitat are more significant, with those >30 ha being the most significant. The shrub/thicket habitat on the Project Location is approximately 35 ha and therefore this criterion is met.
- **Amount of adjacent residential development** – Sites with less residential development are more significant. Rural and residential lots are found adjacent to the Project Location. The degree of disturbance to the site is light and consistent with rural, agricultural use, and therefore this criterion is met.
- **Current representation of specialized habitat in planning area** – Unknown
- **Provision of significant wildlife habitat** – The site provides other significant wildlife habitat as discussed in Section 2.2 and therefore this criterion is met.
- **Potential for long-term protection of the site** – The shrub habitat is in private ownership and long-term protection cannot be assured. Therefore this criterion is not met.

Evaluation – The review of the criteria indicates that the Project Location provides significant habitat for area-sensitive species shrub and early successional bird species and accordingly this habitat will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.2.2 Forests Providing a High Diversity of Habitats / Highly Diverse Areas

The woodland located at the northern part of the Project Location (*fresh sugar maple-deciduous forest type – FOD5-1*) was considered in the *Natural Heritage Assessment Site Investigation Report* (Hatch 2011b) as a forest providing a high diversity of habitats. Included in this evaluation is the habitat type *highly diverse areas* which was also carried forward from the *Natural Heritage*

Assessment Site Investigation Report. Criteria for evaluation are identified in Table Q-2 (Rare vegetation communities or specialized habitats for wildlife) of Appendix Q of the SWHTG (MNR, 2000). The criteria that were considered during this evaluation include:

- **Provision of significant wildlife habitat** – Stands providing several significant wildlife habitats (e.g., forest interior habitat, raptor nesting, rare community) are most significant. The woodland does provide other significant wildlife habitat, and therefore this criterion of significance is met.
- **Size of site** – Larger sites are generally more diverse and consequently more significant than similar, but considerably smaller sites. The woodlands on the Project Location are part of a contiguous woodland greater than 30 ha and therefore it meets this criterion of significance.
- **Age, condition of trees on site** – Sites with a wide variety of age classes of trees are likely most significant for the provision of a variety of habitats. Those sites with a high proportion of old or mature trees, and/or diseased or damaged trees are likely more significant because they provide more organic ground structure. Uneven-aged forest stands are likely more significant as they are often less disturbed by management activities. The woodland is composed primarily of younger deciduous trees with pockets of coniferous species. Therefore this criterion is partially met.
- **Vegetation composition and diversity of site** – Sites with a diversity of tree and shrub species provide more understory structure and consequently are more significant. The woodland is primarily a mixed deciduous forest located in a transitional zone between wetland and upland communities and therefore provides a diversity of habitats, and therefore this criterion is met.
- **Cavity size, abundance, and location** – Sites with a high proportion of aspens, beech, basswood, conifers are likely most significant for tree cavity production. Sites with majority of cavities located in living trees are likely more significant because these trees last longer than dead cavity trees. Sites with cavities in living trees that also produce abundant mast (e.g., oak, beech, walnut, black cherry) are more significant. Sites with variety of tree species (e.g., hardwoods such as maple, oak, softwoods such as poplar, conifers) are more significant because some cavities can be created quickly (e.g., in softwoods) and some will last longer (e.g., in hardwoods). According to the SWHTG (MNR, 2000), sites that are likely most significant have a diversity of cavity sizes to meet the nesting, denning, foraging and resting habitat requirements of a variety of species. The woodland on and within 120 m of the Project Location is considered young to mid age with trees predominantly in the range of 20 cm DBH. There are few suitable trees for cavity nesting birds. Mast producing trees such as white oak, bitternut hickory, bur oak are common and provide a food source. Accordingly, the woodland partially meets this criterion for significance.

Evaluation – The woodland is evaluated as a significant forest providing a high diversity of habitat, primarily because of the inclusion of a transitional zone between the swamp and forest community. Since this feature falls within 120 m of the Project Location, it will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.2.3 Specialized Raptor Nesting Habitat

The woodland on the Project Location was considered during the site investigations as being potential nesting habitat for woodland raptors. Criteria for the evaluation of woodland raptor nesting habitat was taken from SWHTG (MNR, 2000) and are discussed below.

- **Forest type** – Most woodland raptors require mature trees that are large enough to support the nest, full canopy closure, and a minimum of trees and shrubs in the understory. The trees of the woodland are capable of supporting raptor nests and there is full canopy closure throughout much of the site. Therefore this criterion is met.
- **Forest size** – Larger tracts are more significant. The woodlands on the Project Location are part of a contiguous woodland greater than 30 ha, and therefore this criterion is met.
- **Forest fragmentation and disturbance** – Forests with few roads that tend to have less human disturbance are most significant. The woodland is fairly undisturbed and unfragmented. It is bounded by roads with agricultural activity along its borders. However, the contiguous tract of woodland is large and therefore this criterion is met.

Evaluation – A review of the criteria indicates that the woodland is significant habitat for woodland raptors. Since this feature falls within 120 m of the Project Location, it will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.3 Habitat for Species of Conservation Concern

Criteria for evaluation of species of conservation concern are identified in Table Q-3 (Evaluation Criteria for species/habitat of conservation concern) of Appendix Q of the SWHTG (MNR, 2000). The criteria that were considered during this evaluation include:

- degree of rarity of species found at site
- 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 disturbance, 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 candidate wildlife habitat for species of conservation concern identified during the *Natural Heritage Assessment Records Review Report* (Hatch Ltd., 2011a) and *Natural Heritage Assessment Site Investigation Report* (Hatch Ltd., 2011b) are discussed further below. As requested by the MNR, species at risk listed as Threatened or Endangered under ESA that may occur within the vicinity of the Project Location are not discussed herein and will be discussed in a separate document under the requirement of the ESA.

2.2.3.1 Amphibians

- **Western chorus frog** (*Pseudocharis triseriata*) Great Lakes / St. Lawrence Canadian Shield Population
  - **Degree of rarity of species found at site** – The western chorus frog is listed as Threatened under SARA but not at risk under ESA. Therefore this criterion is met.

- **Documented significant decline in a species and /or its critical habitat** – From 1995 to 2006, population numbers at Ontario sites decreased at an estimated rate of 3.5% per year, resulting in a total decrease of 30%. In many cases where populations have declined because of changes in land use, the populations have not recovered (Government of Canada, 2010a). Therefore this criterion is met.
- **Species whose range is solely or primarily found in Ontario** – In Canada, the western chorus frog is found in southern Ontario and southwestern Quebec. It is also present in the central and northeastern United States (Government of Canada, 2010a). Therefore this criterion is not met.
- **Condition of existing habitat at site** – The northern woodland can be considered a habitat for the western chorus frog (Hatch Ltd., 2011b). The woodland consists of a fresh sugar maple deciduous forest type (FOD5-1) and there is a well developed understory with a sparse herbaceous component (Hatch Ltd., 2011b). Significant wildlife habitat for this species possesses the following characteristics: the presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size; the wetland breeding pools may be permanent, seasonal, ephemeral, large or small in size, and could be located within or adjacent to the woodland) and, the presence of breeding population of with at least 20 individuals (adults, juveniles, eggs/larval masses). The northern woodland meets these criteria.
- **Size of species population at site** – Unknown.
- **Size and location of habitat** – Habitat for this species on and within 120 m of the Project Location is approximately 13 ha and is part of a 734 ha woodland (Figure 1.1). The habitat is connected to the provincially significant Buells Creek Reservoir wetland complex located immediately north of the 120 m Project setback. Therefore this criterion is met.
- **Potential for long-term protection of the habitat** – Part of the northern woodland on and within 120 m of the Project Location is private land and not within the provincially significant Buells Creek Reservoir wetland complex therefore long-term protection cannot be assured. Therefore this criterion is not met.
- **Representation of species/habitat within the municipality** – Unknown.
- **Evidence of use of the habitat** – The species was not seen on or within 120 m of the Project Location during the site investigations (Hatch Ltd., 2011b), but targeted surveys were not conducted. It is assumed that this criterion is met.
- **Species of particular interest to the planning authority** – The Project Location is not recognized significant western chorus frog habitat by the Cataraqui Region Conservation Authority or by the municipality. Therefore this criterion is not met.

Evaluation – Favourable habitat is found within 120 m of the Project Location. Although the species was not seen, targeted surveys were not conducted and it is assumed the species does occur on the Project Location. Since the Project Location falls within 120 m of the species habitat, the western chorus frog will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.3.2 Birds

- **Canada Warbler** (*Wilsonia Canadensis*)
  - **Degree of rarity of species found at site** – The Canada Warbler is listed as Threatened under SARA and Special Concern under ESA. Therefore this criterion is met.
  - **Documented significant decline in a species and /or its critical habitat** – The Canadian population is estimated at 2.7 million individuals. Long-term data from the Breeding Bird Survey suggests that the species has declined at a rate of 4.5% per year between 1968 and 2007; this amounts to a loss of approximately 85% of the population during that period. Between 1997 and 2007, the species declined by 5.4% per year, a decline of 43% over that decade. These declines are most evident in Ontario, Quebec and the Maritimes where the majority of the population breeds (Government of Canada, 2010b). Therefore this criterion is met.
  - **Species whose range is solely or primarily found in Ontario** – The Canada Warbler breeds primarily across much of southeastern Canada and the northeastern United States within the Great Lakes region (Government of Canada, 2010b). Therefore this criterion is not met.
  - **Condition of existing habitat at site** – The northern woodland was considered candidate habitat for the Canada Warbler (Hatch Ltd., 2011b). This woodland is a deciduous forest with distinct stands of coniferous trees therein. The understory is well shaded with a sparse herbaceous component. However, the preferred habitat for the species is "moist coniferous-deciduous forests with a well developed understory, especially in low-lying area such as cedar woods or alder swamps" (Bird Studies Canada 2006). Therefore this criterion is not met.
  - **Size of species population at site** – The population size at site is unknown but the Canada Warbler was seen during 45% and 17% of the first and second OBBA survey periods respectively (1981 to 1985 and 2001 to 2005) (Bird Studies *et al*., 2006). Therefore this criterion is met.
  - **Size and location of habitat** – The habitat on and within 120 m of the Project Location is marginal as it is not of the preferred ecotype. Marginal habitat is approximately 13 ha and part of a the larger 734 ha woodland (Figure 1.1). To be confirmed significant wildlife habitat for the Canada Warbler the mixed forest should be a mature (>60 years old) natural forest (non-plantation) 10 ha or greater in size assuming 100 m buffer at the edge of forest (MNR, 2009). The species is not abundant in the area and the OBBA surveys (2006) indicate a relative abundance point count for this species in the vicinity of the Project Location to be 0.0. Therefore this criterion is not met.
  - **Potential for long-term protection of the habitat** – The part of the northern woodland on and within 120 m of the Project Location is private land and not within the provincially significant Buells Creek Reservoir wetland complex. Therefore, long-term protection cannot be assured and this criterion is not met.
  - **Representation of species/habitat within the municipality** – This species has been observed in the 10 x 10 km OBBA survey square that overlaps the Project Location (Bird Studies

Canada *et al*., 2006). The provincially significant Buells Creek Reservoir wetland complex and the non-provincially significant (locally significant) Fairfield wetland complex could provide marginal habitat for the species within the municipality.

- **Evidence of use of the habitat** – The species was not seen on or within 120 m of the Project Location during the site investigations (Hatch Ltd., 2011b) and is not expected to breed in the area. Therefore this criterion is not met.
- **Species of particular interest to the planning authority** – The Project Location is not recognized significant Canada Warbler habitat by the Cataraqui Region Conservation Authority or by the municipality. Therefore this criterion is not met.

Evaluation – The habitat on and within 120 m of the Project location does not include ecotypes preferred by Canada Warbler and therefore the habitat for this species will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.3.3 Reptiles

- **Milksnake** (*Lampropeltis triangulum)*
  - **Degree of rarity of species found at site** – The milksnake is listed as Special Concern under SARA and ESA. Therefore this criterion is met.
  - **Documented significant decline in a species and /or its critical habitat** – This species lives in open woodlands, fields and farm buildings (McKenny *et al*., 2007). Observations in Ontario suggest that it has maintained much of its historical range, although the species has likely been extirpated from some large urban centres or areas of intensive agricultural use where habitat has been lost (Government of Canada, 2010f). Therefore this criterion is met.
  - **Species whose range is solely or primarily found in Ontario** – Milksnakes are found from southern Canada, throughout the United States and Mexico, and into northern South America (Government of Canada, 2010f). Therefore this criterion is not met.
  - **Condition of existing habitat at site** – Two features of favourable milksnake habitat found on the Project Location are proximity to water and suitable locations for basking and egg-laying. The site investigation identified rock piles within the 120 m Project setback which may be used as hibernacula sites and therefore this criterion is met.
  - **Size of species population at site** – The population size at the site is unknown. There are no population estimates of the milksnake available for Ontario (Government of Canada, 2010f). Therefore this criterion is not evaluated.
  - **Size and location of habitat** – Milksnake are habitat generalists and could potentially be found on the majority of the Project Location and its 120 m setback. The species' habitat on and within 120 m of the Project Location is approximately 60 ha (Figure 1.1). However, significant sites are restricted to the woodland and rock outcrop hibernacula sites. Therefore this criterion is met.

- **Potential for long-term protection of the habitat** – The Project Location is located on private land and therefore long-term protection cannot be assured. Therefore this criterion is not met.
- **Representation of species/habitat within the municipality** – Aerial photographs suggest the presence of other suitable habitat for the milksnake in the United Counties of Leeds and Grenville. The habitat found at the Project Location is not rare in the municipality. Therefore this criterion is not met.
- **Evidence of use of the habitat** – As milksnake are difficult to detect, use of the area was unconfirmed. The species was not observed on or within 120 m of the Project Location during the site investigations (Hatch Ltd., 2011b). It is assumed that his criterion is met.
- **Species of particular interest to the planning authority** – The Project Location is not recognized significant milksnake habitat by the Cataraqui Region Conservation Authority or by the United Counties of Leeds and Grenville. Therefore this criterion is not met.

Evaluation – Although use is unconfirmed, the area is treated as significant wildlife habitat for the milksnake. Since the milksnake habitat falls on and within 120 m of the Project Location, the feature will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

3. Summary of Evaluation

Based on the evaluation of significance outlined above, there is a *significant woodland*, and *significant wildlife habitat* present on and within 120 m of the Project Location.

- **Significant Woodlands** – the woodlands (fresh sugar maple deciduous forest type – FOD5-1) found on and within 120 m of the Project Location have been evaluated as significant as they meet the minimum size requirement for significance and / or provide important ecological functions (i.e. interior forest habitat, water protection).
- **Significant Wildlife Habitat** – the following wildlife habitat types have been evaluated as significant:
  - **Habitat of seasonal concentration of animals** - raptor winter feeding and roosting areas and reptile hibernacula.
  - **Specialized habitats for wildlife** – habitat for area-sensitive forest bird breeding habitat and area-sensitive shrub/early successional bird breeding habitat, forest providing a high diversity of habitats, highly diverse areas and specialized raptor nesting habitat.
  - **Habitats of species of conservation concern** – habitat for *western chorus frog* and *milksnake*. The locations of these features and habitat types are shown in Figure 1.1.

Therefore, the significant natural features identified above will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess the potential negative environmental effects on these features. A map showing the locations of these habitat types is provided on Figure 1.1.

4. Next Steps

- A *Natural Heritage Assessment Environmental Impact Study* conducted according to the requirements of Subsection 38 (2) of O. Reg. 359/09 will be required in order to assess the potential effects, recommend mitigation and monitoring requirements for the construction, operating and decommissioning of Project components within 120 m of these significant natural features.
- The *Approval and Permitting Requirements Document for Renewable Energy Projects* will be prepared for MNR review for species that are designated as Endangered and Threatened under the *Ontario Endangered Species at Risk Act* and on the SARO list.

5. Evaluation Details

This evaluation of the natural features found on and within 120 m of the UC Solar 2176047 Project Location commenced with the records reviews in June 2010 and was finalized with the completion of this report in May 2011. Site investigations were completed in association with this evaluation on July 2 and September 21, 2010. Habitat evaluations using the criteria identified in this report were conducted by Paul Ashley and Martine Esraelian in November 2010 with re-evaluations and final revisions in May 2011.

6. Names and Qualifications of Site Investigators and Evaluators

The first site investigation was completed by Martine Esraelian, a terrestrial ecologist with diverse technical and consulting skills. She has conducted field inventories and assessments including wildlife and vegetation surveys, ELC mapping, soil surveys, land use surveys, and hydrological assessments. Martine has managed several environmental projects from initial design and planning through technical analysis, documentation, and delivery. She has played a major role in the completion of environmental and agricultural impact studies for major developments, including the proposed Canadian Motor Speedway proposed in Fort Erie, Ontario. This work has enabled Martine to liaise with all levels of government, the community, and a portfolio of clients that includes consulting firms, planners, and high-profile developers. She also has considerable experience working with species at risk, including Jefferson salamander, spotted turtle, spoon-leaved moss, Massasauga and gray ratsnake among others.

A second site visit was conducted by Paul Ashley, MSc. a senior ecologist with Hatch Ltd. Paul has wide-ranging experience working in terrestrial and wetland landscapes. He has led many management and rehabilitation projects related to forests, savannahs, wetlands and riparian corridors. He has also conducted wildlife surveys, especially for waterfowl throughout the province. While doing so he has worked with representatives from all tiers of government, non government organizations, universities and the private sector. He joined Hatch Ltd. in 2010 and is actively involved in the Renewable Energy Approval process.

His CV is provided in Appendix A.

7. References

Bird Studies Canada, Ontario Field Ornithologists, Environment Canada, Ontario Nature, and Ontario Ministry of Natural Resources. 2006. Ontario Breeding Bird Atlas Internet Site. Available on-line at www.birdsontario.org/atlas/atlasmain.html. Accessed August 19, 2010; Last Updated September 16, 2009.

Government of Canada. 2010a. Species Profile – Western chorus frog. Government of Canada, Species at Risk Public Registry. Available on-line at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1019. Accessed November 16, 2010; Last Updated January 11, 2010.

Government of Canada. 2010b. Species Profile – Canada Warbler. Government of Canada, Species at Risk Public Registry. Available on-line at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1008. Accessed November 16, 2010; Last Updated January 11, 2010.

Government of Canada. 2010c. Species Profile – Cerulean Warbler. Government of Canada, Species at Risk Public Registry. Available on-line at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=46. Accessed November 16, 2010; Last Updated January 11, 2010.

Government of Canada. 2010d. Species Profile – Common Nighthawk. Government of Canada, Species at Risk Public Registry, Available on-line at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=986. Accessed November 16, 2010; Last Updated January 11, 2010.

Government of Canada. 2010e. Species Profile – Red-shouldered Hawk. Government of Canada, Species at Risk Public Registry. Available on-line at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=58. Accessed November 16, 2010; Last Updated January 11, 2010.

Government of Canada. 2010f. Species Profile – Milksnake. Government of Canada, Species at Risk Public Registry. Available on-line at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=714. Accessed November 16, 2010; Last Updated January 11, 2010.

Government of Ontario. 2009. Ontario Regulation 359/09 made under the Environmental Protection Act 2007, Renewable Energy Approvals under Part V.0.1. of the Act. September 8, 2009 version. Printed in the Ontario Gazette: October 10, 2009. Available on-line at: Http://www.e-laws.gov.on.ca/html/source/regs/english/2009/elaws_src_regs_r09359)e.htm.

Hatch Ltd. 2011a. 2176047 Solar Energy Project Natural Heritage Assessment Records Review Report. Canadian Solar Solutions Inc. and UC Solar Ltd. Niagara Falls, Ontario.

Hatch Ltd. 2011b. 2176047 Solar Energy Project Natural Heritage Assessment Site Investigation Report. Canadian Solar Solutions Inc. and UC Solar Ltd. Niagara Falls, Ontario.

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

McKenney, D., M. Oldham, J. Bogart, and B. Mackey. 2007. Amphibians and Reptiles of Ontario. Natural Resources Canada. Available on-line at http://cfs.nrcan.gc.ca/subsite/glfc-amphibians. Accessed August 19, 2010; Last Updated November 30, 2007.

Oldham, M.J. and W.F. Weller. 2000. Ontario Herpetofaunal Atlas. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Available on-line at http://nhic.mnr.gov.on.ca/MNR/nhic/herps/ohs.html. Accessed October 19, 2010, Last Updated January 15, 2010.

Ontario Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. Toronto: Queen's Printer for Ontario. 151 p.

Ontario Ministry of Natural Resources (MNR). 2009. Draft Significant Wildlife Habitat Ecoregion Criteria Schedules: addendum to Significant Wildlife Habitat Technical Guide. Available on-line at http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=15513&Attachment_ID=32528.

Ontario Ministry of Natural Resources (MNR). March 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 p.

Appendix A

Curriculum Vitae

Paul Ashley

SENIOR ECOLOGIST

EDUCATION

MSc, Biology, University Western Ontario, London, Ontario, Canada, 2005

BSc, Environmental Science, Trent University, Peterborough, Ontario, Canada, 1990

Diploma, Biology, Fleming College, Lindsay, Ontario, Canada, 1986

SUMMARY OF EXPERIENCE

Paul is a Senior Ecologist with over 20 years of experience working terrestrial, wetland and aquatic ecosystems. He has led many management and rehabilitation projects related to forests, savannahs, wetlands and riparian corridors. He also has extensive experience working with wildlife, and is a recognized expert on waterfowl and other wildlife, having written several peer-reviewed articles on waterfowl, white-tailed deer, amphibians and reptiles. He has represented various government agencies on national and international committees and working groups. Before joing Hatch, Paul designed and implemented long-term ecosystem monitoring programs for Arctic National Parks, particularly to monitor their responses to climate change. Much of this work involved collaboration with all tiers of government, universities across Canada, non-governmental organizations and private clients. Several monitoring projects he developed involved working with Inuit and using traditional knowledge. He has also managed two National Wildlife Areas, and was responsible for the delivery of the biological program.

Paul joined Hatch in 2010 and is actively involved in the environmental aspects of Canadian Solar Projects and the Renewable Energy Approval Process. He draws upon all his experience to teach a course each spring on Environmental Monitoring at the Central European University in Budapest.

RELEVANT EXPERIENCE

Biologist. Paul managed the Long Point and Big creek National Wildlife Area; two of southern Ontario's largest wetland complexes and natural areas.

Paul was responsible for leading the biological program at the National Wildlife Areas, which included:

- leading a multi-agency infrastructure project to mitigate the effects of a roadway on wildlife and impacted wetlands
- representing the agency on the international tri-lateral Monarch Butterfly Reserve Network
- managing and restoring forest and savannah habitats
- managing and inventorying white-tailed deer and other wildlife populations

- conducting restoration work with species at risk, including: bald eagle, prothonotary warbler, king rail, spiny soft-shell, spotted turtle, American chestnut, common hop-tree and cucumber tree
- leading the waterfowl banding program
- managing wetlands in diked impoundments
- working with community and groups, special interest groups, non-government organizations and universities

Ecosystem Scientist. As the ecosystem scientist for the Nunavut National Parks, Paul lead the development of the ecosystem monitoring program.

Paul worked with colleagues from Parks Canada, universities and other government agencies to monitor:

- glaciers, sea ice, and permafrost through remote sensing
- wildlife populations, including polar bears, colonial seabirds, snow geese, and lemmings
- water quality and active layer
- tundra vegetation change and phenology
- sea ice conditions using Traditional Knowledge.

Canadian Solar Projects, Niagara Falls, Ontario, Canada, Senior Ecologist. Paul has worked as Hatch's Senior Ecologist for Canadian Solar Projects in Ontario. He has conducted site investigations which include ecological land classification, wetland evaluations, bird surveys, amphibian surveys, and other wildlife inventories. He has also conducted water body site investigations. Paul has prepared natural heritage records review reports, site investigation reports, evaluation of significance reports and environmental impact study reports as required under the Renewable Energy Approval process. He has also worked closely with clients and government representatives to advance Canadian Solar projects.

CAREER HISTORY

2010 - 2010	Hatch, Niagara Falls, Ontario, Canada. Senior Ecologist
2008 - 2010	Parks Canada, Iqaluit, Nunavut, Canada. Ecosystem Scientist
1990 - 2007	Environment Canada, Port Rowan, Ontario, Canada. Site Manager Big Creek/Long Point National Wildlife Areas

TECHNICAL PAPERS

Ashley, P. (coauthor), Linking natal and Canadian harvest areas of American Black Ducks using stable isotopes methods., Avian Conservation and Ecology 5(2) Online: http://www.ace-eco.org/vol5/iss2/art7, Ontario, Canada, 2010

Ashley, P. (coauthor) , Tertial and upper wing covert molt in young American Black Ducks , Waterbirds. 30: 433-440, Ontario, Canada, 2007

Ashley, P. (coauthor), Incidence of intentional vehicle-reptile collisions , Human Dimensions of Wildlife 12: 137-143, Ontario, 2007

Ashley, P. (coauthor), Age determination of American Black Ducks in winter and spring , Wildlife Society Bulletin. 34: 1401-1410. , Ontario, 2006

Ashley, P. (coauthor), Automated doors for waterfowl banding traps , Wildlife Society Bulletin. 32: 273-275., Ontario, Canada, 2004

Ashley, P. (coauthor) , Morphological responses of white-tailed deer to a severe population reduction, Canadian Journal of Zoology. 76: 1-5, Ontario, Canada, 1997

Ashley, P. (coauthor) , Road mortality of amphibians, reptiles and other wildlife on the Long Point causeway, Lake Erie, Ontario, Canadian Field Naturalist. 110: 403-412, Ontario, Canada, 1996

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