Natural Heritage Assessment

Site Investigation Report

Newboro 1

Solar Energy Project

FIT Contract Number: FIT-FGJ9196

prepared for

Genivar and SunEdison

FINAL

ECOLOGICAL SERVICES

Report Author Signature Date

March 20 2012

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1.0 INTRODUCTION

SunEdison, LLC (Sun Edision) is proposing to develop a 10 megawatt solar photovoltaic project titled Newboro 1 Solar Power Project. The proposed project has received a 20 year Feed-in-Tariff contract from the Ontario Power Authority (FIT Contract Number: FIT-FGJ9196). The Project Location is a 142 hectare (ha) parcel situated 5 km east of the Village of Newboro, and approximately 40 km north of the Town of Gananoque. It is bounded by Narrows Lock Road (County Road 14) to the west, McCann Road to the north, and is landlocked to the south and east by agricultural lands and woodlands. The Project Location is currently undeveloped and is designated as 'Rural' in the Township of Rideau Lakes Official Plan. It is also Part of Lots 25, 26 and 27, Concession 1, South Crosby Ward, Township of Rideau Lakes, Leeds and Grenville County, Ontario. The longitude and latitude are 44o 40' 24.31" and 76o 16' 22.28".

1.1 Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – Renewable Energy Approvals under Part V.0.1 of the Act, (herein referred to as the REA Regulation) identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. As per the REA Regulation (Part II, Section 4), ground mounted solar facilities with a name plate capacity greater than (>) 12 kilowatts (kW) are classified as Class 3 solar facilities and require an REA.

Part IV, subsection 26 (1) of the REA Regulation requires proponents of Class 3 solar projects to conduct a site investigation (SI) of the air, land and water within 120 meters (m) of the Project Location for the purpose of determining:

> a) Whether the results of the analysis summarized in the Natural Heritage Assessment Records Review Report (NHARR - Genivar 2011) are correct and identifying any required corrections;
> b) Whether any additional natural features exist, other than those that were identified in the NHARR (Genivar 2011);
> c) The boundaries, located within 120 m of the Project Location, of any natural feature that was identified in the NHARR (Genivar 2011) or the site investigation; and
> d) The distance from the Project Location to the boundaries determined under clause (c).

Note: Project Location for a renewable energy project means 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).

Part IV, subsection 26 (3) of the REA Regulation requires the proponent to prepare a report setting out the following:

> 1. A summary of any corrections to the NHARR (Genivar 2011) and the determinations made as a result of conducting the site investigation under subsection 26 (1).
> 2. Information relating to each natural feature identified in the NHARR (Genivar 2011) and in the site investigation, including the type, attributes, composition and function of the feature.
> 3. A map showing, the boundaries of any natural feature that was identified in the NHARR (Genivar 2011) and site investigation that is located within 120 m of the Project Location; the location and type of each natural feature identified in relation to the Project Location; the distance from the Project Location to the boundaries of any natural feature identified within 120 m of the Project Location.

4. The dates and times of the beginning and completion of the site investigations.
5. The duration of the site investigations.
6. The weather conditions during the site investigations.
7. A summary of methods used to make observations for the purposes of the site investigations.
8. The name and qualifications of any person conducting the site investigations.
9. Field notes kept by the person conducting the site investigations.

This SI report has been prepared to meet these requirements.

Natural features are defined in Part I, subsection 1 (1) of the REA Regulation to be all or part of the following:

ANSI (earth science) – An area that has earth science values related to protection, scientific study or education.

ANSI (life science) – An area that has life science values related to protection, scientific study or education.

Coastal wetland – A wetland that is located on Lake Ontario, Lake Erie, Lake Huron, Lake Superior, Lake St. Clair, St. Mary's River, St. Clair River, Detroit River, Niagara River or St. Lawrence River; or on a tributary to any of these waterbodies and, wither in whole or in part, downstream of a line located 2 km upstream of the 1:100 year floodline (includes wave run-up) of the water body.

Southern wetland – A wetland located south of the northern limit of Ecoregions 5E, 6E and 7E as shown in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005.

Valleyland – A natural area that is south and east of the Canadian Shield as shown in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005; and that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year.

Wildlife habitat – An area where plants, animals and other organisms live or have the potential to live and find adequate amounts of food, water, shelter and space to sustain their population, including an area where a species concentrates at a vulnerable point in its annual or life cycle and an area that is important to a migratory or non-migratory species.

Woodland – Land that is south and east of the Canadian Shield as shown in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005; and that has per hectare (ha) at least 1,000 trees of any size or 750 trees that are > 5 centimetres (cm) in diameter, 500 trees that are > 12 cm in diameter, 250 trees that are > 20 cm in diameter that have been measured from 1.37 m from the ground.

2.0 REPORT PREPARATION AND QUALIFICATIONS

Genivar has retained Ecological Services to assist in meeting the REA requirements by conducting the investigations in support of the preparation of the Natural Heritage Site Investigation Report as identified under O.Reg. 359/09. Contact information for this report is as follows:

Rob Snetsinger: Consultant, Ecological Services
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Ecological Services is a locally owned firm, specializing in the provision of services relating to ecological management and research. We have been in operation in eastern Ontario since 1985. Our core personnel combine education and experience to give us a strong focus on land use planning and management as they relate to natural resources. Our experience includes environmental impact assessments, management plans, wetland evaluations, and municipal land use planning. We have research experience in aquatic ecology and chemistry, forest fragmentation, avian ecology, and fisheries ecology.

We have worked with government at the federal, provincial, local and international levels. Other clients have included Crown corporations, planning and engineering firms, developers, and local groups. Our association with Queen's University provides us immediate access to current and broad-based research, and also provides us with a pool of expert associates. A work prospectus is available at our website at http://ecologicalservices.webs.com.

Natural feature surveys of lands within 120 m of the Project location, and the subsequent preparation of the SI was done by Rob Snetsinger. Dale Kristensen assisted in initial natural feature survey, and Chris Grooms conducted breeding bird surveys. CV information for each is provided below:

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Employment

1985 - present: Environmental Consultant.

Specializing in floral and faunal resource inventories, wetland evaluations, woodland/forest assessments, environmental impact assessments, and habitat restoration.

1985 - present: Adjunct Academic. Department of Biology at Queen's University.

Development and instruction of various courses at Queen's University, including:

- Ecological Assessment (ENSC 401)
- Introduction to the Biology of the Cell and the Organism (BIOL 102, Biol 103)
- Diversity of Life I (BIOL 201)
- Ecology and the Environment (BIOL 111)
- Human Genetics (BIOL 110)
- Field Botany (BIOL 320)
- Field ecology modules at Lake Opinicon (BIOL 307)

Education

M.Sc., Biology, Queen's University. Kingston, Ontario.
B. Sc., Biology, Queen's University. Kingston, Ontario.
Forestry Diploma. Lakehead University. Thunder Bay, Ontario

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Employment

1988 - present: Environmental Consultant with Ecological Services

Specializing in floral and faunal resource inventories, wetland evaluations, environmental impact assessments, habitat analyses, and habitat restoration.

1996 - present. Phytotron Manager (Plant Research Facility). Dept. of Biology, Queen's University.

Manager of a controlled environment facility for plant and other research

2008 – present: Curator Queen`s University Fowler Herbarium

1987- 2009: Adjunct Academic. Department of Biology at Queen's University.

Development and instruction of various courses at Queen's University, including:

- Wildlife Issues in a Changing World (ENSC 320)
- Restoration Ecology (BIOL 522)
- Biology of Sex (BIOL 210)
- Field Botany (BIOL 320)
- Field ecology module at Lake Opinicon (BIOL 344)
- International graduate-level course on biodiversity

Education

M.Sc., 1996 (Ecology) Queen's University. Kingston, Ontario.

B.Sc., 1981 (Wildlife Biology), University of Guelph. Guelph, Ontario.

Affiliations

Ecological Restoration Society, North American Wildflower Society, Land Conservancy for Kingston, Frontenac, Lennox & Addington, Kingston Field Naturalists, COSEWIC Species Recovery Team – Deerberry (*Vaccinium stamineum*) and Cerulean Warbler (*Dendroica caerulea*) habitat modelling. Certified Butternut Health Assessor

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Employment

2006 - present: Research Assistant. Paleoecological Environmental Assessment and Research Laboratory, Queen's University.

- high arctic fieldwork, maintenance and supply, data management, figure design for publication, website design, computer and analytical machine operation and maintenance.

2003- 2005: Coordinator, Eastern Region. Ontario Nature – Federation of Ontario Naturalists.

- liaison with member groups and other conservation organizations to promote conservation, land stewardship and nature education

1992- 2003. Habitat Stewardship and Ornithological Experience. Contracts with the Canadian Wildlife Service, Ontario Ministry of Natural Resources (MNR), Wildlife Preservation Trust Canada, and Bird Studies Canada.

- endangered loggerhead shrike recovery - population surveys, landowner contact; monitored nests, oversaw colour banding, mapped habitat, selected future reintroduction sites; supervised first experimental reintroduction of captive-bred shrikes to the wild.

Ontario Power Generation: inventory of the fauna of the Lennox Generation Station property.

Nature Conservancy Canada: inventory of breeding birds and amphibians at Burnley Carmel Nature Reserve near Rice Lake, Ontario.

Acres & Associated Environmental Limited: bird usage inventory of proposed wind farm sites on Wolfe Island, Ontario, and a bird inventory for a proposed wind site on Amherst Island, Ontario.

Lower Trent Region Conservation Authority: documented nesting sites of Red-Shouldered Hawks in five townships in eastern Ontario for the MNR over three years.

Education

B.Sc., 1998 (Biology), Queen's University. Kingston, Ontario.

Affiliations

Former President, Kingston Field Naturalists

3.0 STUDY APPROACH

3.1 Summary of Natural Features from the NHARR

Natural features were identified following the definitions provided in subsection 1 (1) of the REA Regulation and described in Section 1.2 of this report. The Ontario Ministry of Natural Resources (MNR) Ontario Base Maps and Land Information Ontario (LIO) mapping were used to locate natural features and other features on and within 120 m of the Project Location. A desktop exercise using satellite imagery to delineate habitat polygons was completed and ground-truthed during the SI.

The presence and/or absence of natural features on and within 120 m of the Project Location that were identified in the NHARR (Genivar 2011) is provided in Table 3.1.

Table 3.1. Summary for Newboro 1 from the NHARR (Genivar 2011).

Determination to be Made	Yes/No	Description
Located in or within 120 m of a provincial park or conservation	No	The Project Location is not within 120 m of a provincial park or conservation reserve.
Within the Protected Countryside	No	The Project Location is not within the designated Greenbelt Area Protected Countryside.
Within the Oak Ridges Moraine Conservation Plan Area	No	The Project Location is not within the Oak Ridges Moraine Conservation Plan Area
In a natural feature as described by Section 25 of O'Reg 359/09	Yes	The Project Location is located in a natural feature as described by O.Reg. 359/09. Potentially significant woodlands with small wetland
Within 50 m of an Area of Natural or Scientific Interest	No	The Project Location is not located within 50 m of an Area of Natural or Scientific Interest.
Within 120 m of a natural feature other than an ANSI	Yes	Wetland and potentially significant woodlands exist on or within 120 m of the Project Location.

The NHARR (Genivar 2011) identified 18 S1-S3-ranked species of conservation concern (excluding species that are designated as Endangered or Threatened on the SARO list) that based on their habitat preferences have the potential to occur on and/or within 120 m of the Project Location (Table 3.2).

Species of conservation concern include:

globally rare species – These species are assessed by NatureServe and assigned a global conservation status rank (G-rank) of G1 to G3.

nationally rare species – These species are designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered or Threatened and not protected in regulation under the Ontario Endangered Species at Risk Act (ESA).

provincially rare species – These species are designated by the MNR and assessed under two categories: species listed as Special Concern on the Species at Risk in Ontario (SARO) list; and species that are assigned a provincial (i.e. sub-national) conservation status rank of S1 to S3 and are not on the SARO list. There are species that can be found in both categories.

regionally rare species – These species are not assigned a formal designation, however, have been recognized as declining within a planning jurisdiction by government and/or nongovernment authorities.

conservation priority species – These include priority species that are recognized in government and/or non-government conservation plans and assigned a conservation objective.

As discussed in the NHARR (Genivar 2011), species that are designated as Endangered and Threatened under the ESA on the SARO list will be discussed in further detail in the Approval and Permitting Requirements Document for Renewable Energy Projects and will not be discussed herein.

Table 3.2 Species of Conservation Concern identified in the NHARR and their preferred habitat type

Species Of Conservation Concern	Habitat Guild				
	Woodland	Grassland	Shrub-early	Wetland	Other
Insects					
Early Hairstreak (*Erora laeta*)					
Reptiles					
Five-lined skink (*Plestiodon fasciatus*) – Great Lakes Population	✓				
Map turtle (*Graptemys geographica*)				✓	
Snapping turtle (*Chelydra serpentina*)				✓	
Milksnake (*Lampropeltis triangulum*)	✓	✓	✓		
Eastern ribbonsnake (*Thamnophis sauritus*) Great Lakes Population			✓	✓	
Birds					
Black Tern (*Chilidonias niger*)				✓	
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	✓				
Common Nighthawk (*Chordeiles minor*)	✓		✓		
Bald Eagle (*Haliaeetus leucocephalus*)	✓				
Canada Warbler (*Wilsonia canadensis*)	✓				
Golden Winged Warbler (*Vermivora chrysoptera*)			✓		
Olive Sided Flycatcher (*Contopus cooperi*)	✓			✓	
Short Eared Owl (*Asio flammeus*)		✓	✓		
Prairie Warbler (*Dendroica discolour*)		✓	✓		
Mammals					
Eastern small-footed bat (*Myotis leibii*)	✓				✓
Northern Long-eared Bat (*Myotis septentrionalis)*	✓				
Eastern Pipistrelle (*Pipistellus subflavus*)	✓				✓

3.2 Site Investigation Methodology

The natural features and species of conservation concern identified in Table 3.1 and Table 3.2 respectively were considered during the site investigation as well as all other plant and wildlife species encountered. A complete list of wildlife species observed during the SI is provided in Appendix 1.

Species discussed in the following sections are identified by common name only. Common names are written according to the standard rule of lower-case letters for all species excluding birds and proper nouns, in which case it is capitalized (e.g. woodland vole, Blanding's turtle, Black Tern and Red-headed Woodpecker). The binomial nomenclature system is a standard method used to formulate the scientific name of an organism (e.g. genus name + species name). The scientific and common names used in this report follow those used by the MNR.

As per subsection 26 (1) of the REA Regulation, the report must include: dates, times (beginning and completion of the site inventory), duration and weather conditions; qualifications, name and field notes kept by the person conducting the site investigation; and methodology used to make observations during the site investigation. The following information is intended to meet these requirements. Location, potential environmental constraints and identified natural features relevant to the field survey were obtained from the NHARR (Genivar 2011).

Survey visits to the Project Location by Ecological Services are presented in Table 3.3. The SI was developed from the features derived from the field surveys and satellite imagery. Information pertinent to revisions of the NHARR was submitted to Genivar.

Table 3.3 Visit summary for Newboro 1.

Date of Survey	Time	Weather Conditions	Surveyor	Purpose of Visit
June 17, 2011	02:00 – 07:00	Overcast, minimal winds, 20°C	Rob Snetsinger Dale Kristensen	Vegetation mapping, habitat assessment including wetlands.
June 18 2011	8:15-9:12	Clear, warming to 20°C by early morning	Chris Grooms	Breeding bird point count assessment
June 19 2011	5:22-8:13	Clear, warming to 20°C by early morning	Chris Grooms	Breeding bird point count assessment
July 8, 2011	8:00-12:00	Partially cloudy, 22°C	Rob Snetsinger	Habitat assessment
July 9, 2011	7:00-11:00	Mostly clear, 22°C	Dale Kristensen	Breeding bird point count assessment.
Dec 6, 2011	8:00-10:00	Mostly Clear 8°C	Rob Snetsinger	Continuing habitat assessment, winter raptor survey.
Dec 8, 2011	8:00-10:00	Mostly Clear 6°C	Rob Snetsinger	Continuing habitat assessment, winter raptor survey.
Jan 22, 2012	8:15 – 11:00	Sunny -11°C	Chris Grooms	Winter raptor survey
Feb 4, 2012	8:15 – 11:00	Sunny -6°C	Chris Grooms	Winter raptor survey

The SI was completed in part to: verify the presence and/or absence of natural features and species of conservation concern identified in Table 3.1 and Table 3.2, respectively; identify any corrections required in the NHARR (Genivar 2011) and determinations made as a result of conducting the site investigation; and document existing conditions including information on the type, attributes, composition and function for each natural feature identified on and within 120 m of the Project Location.

The methodology used during the SI involved walking the entire site by foot and documenting the natural features (e.g., wildlife habitat), plant and wildlife species. A search for species of conservation concern that were identified in the NHARR (Genivar 2011) was also completed. Habitat communities are generally described following the methodology outlined in the ELC for Southern Ontario (Lee et al., 1998) and if applicable, the Ontario Wetland Evaluation System Southern Manual (OMNR 2002). Photographs of the site were also taken to document the existing environment and natural features observed during the site investigation. A transcription of the field notes is provided in Appendix 2.

Candidate significant natural features were identified following the criteria outlined in the Natural Heritage Reference Guide (OMNR 2011), Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (OMNR 2009) and Significant Wildlife Habitat Technical Guide (OMNR 2000) and are discussed further in Section 4.

A breeding bird point count survey of the Project Location was conducted using standardized survey methods as described in the Ontario Breeding Bird Atlas Guide for Participants (Cadman and Kopysh 2001) for field and open land habitats and the Canadian Wildlife Service Forest Bird Monitoring Program for woodlands. Surveying began after dawn under appropriate weather conditions and stations were established across the Project Location (Appendix 3) in accordance with minimum spacing requirements to reduce incidences of observational overlap. Surveys were conducted within the breeding season for most bird species expected to be using the habitats found within 120 m of the Project location.

The presence of herpetofauna (reptiles and amphibians) was assessed by examining areas of appropriate habitat as indicated in OMNR (2000). For reptiles, this can include features associated with different parts of their life cycles (hibernacula and egg laying sites) such as rock piles, waste piles, under boards, exposed and fissured rock faces, building foundations, rotting logs, animal burrows, and barren rock. For amphibians, supportive habitat includes water bodies, riparian areas, wetlands and vernal pools as well as beneath fallen logs and other woody debris. Incidental signs of herpetofauna were to be recorded as encountered during all site visits. Incidental signs included shed skins, road kill, depredated nests and eggshells. Amphibian breeding calls were noted if heard during the various survey periods.

Other wildlife species of interest (e.g., butterflies, mammals) would be noted as encountered from direct observation, or from other signs of their presence (tracks, scat, den sites, etc.).

Vascular plant species encountered were used to characterize ELC community types. Species of conservation concern would be GPS referenced and the habitat would be surveyed in order to determine the extent of the population. Specimens that could not be readily identified in the field would be assessed later using appropriate references (e.g., Gleason and Cronquist 1991; Queen`s University Fowler Herbarium records).

4.0 CONFIRMATION AND ASSESSMENT OF NATURAL FEATURES

The presence / absence of natural features identified in the NHARR (Genivar 2011) were verified during the site investigation and are discussed in the following sections. The Project Location, ELC, and 120 m buffer boundaries is shown in Figure 4.0.

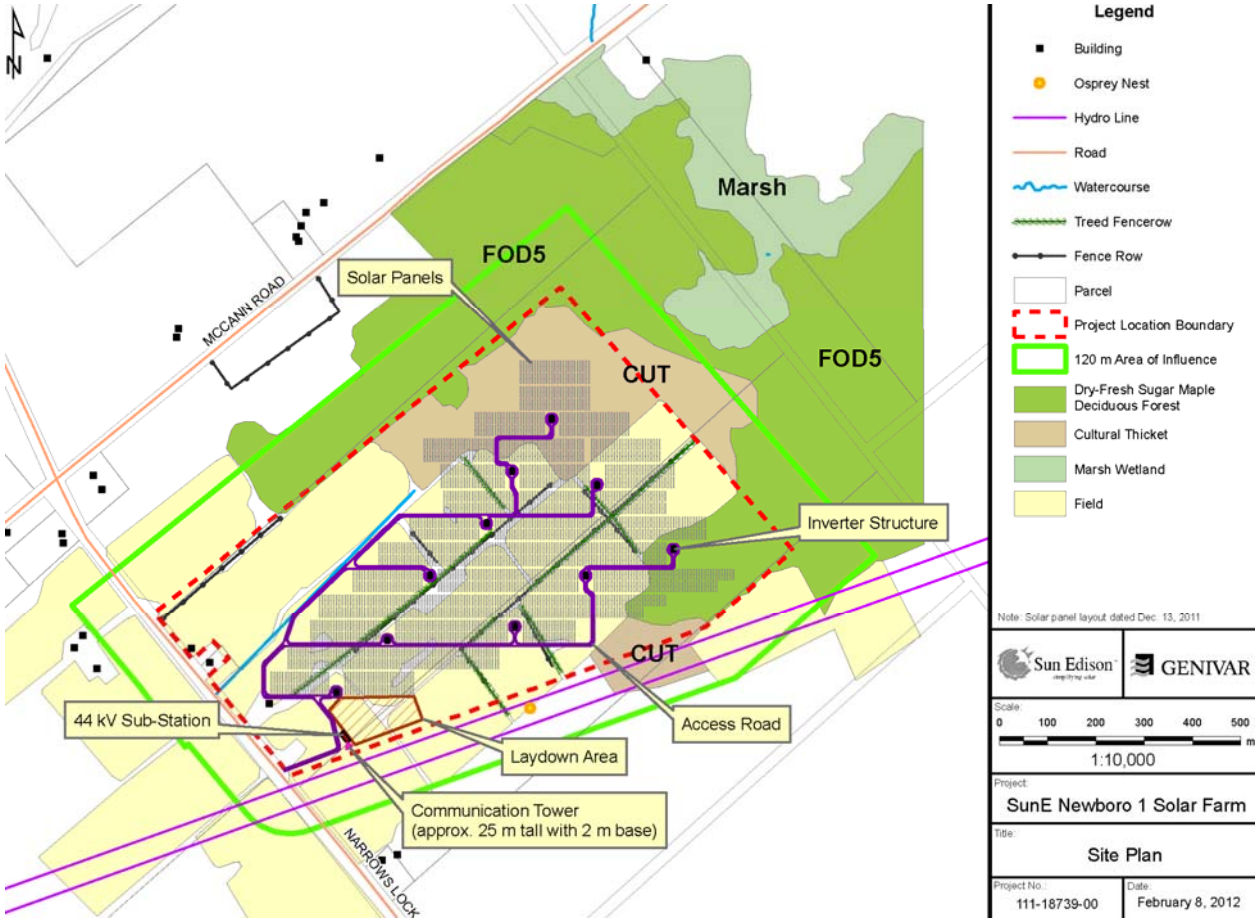


Figure 4.0 *Project location, 120 M buffer, and ELC lands*.

4.1 Wetland

The information sources reviewed in the NHARR (Genivar 2011) identified a wetland to the northeast of the Project Location. In Figure 4.0 it can be seen that this wetland is more than 120 m away from the Project Location. Rob Snetsinger, an accredited OWES surveyor, confirmed the location of this wetland relative to the Project Location. Because the wetland is beyond the 120 m zone, no field effort is required to assess its features and functions.

Genivar (2011) also identified potential wetlands on and within 120 m of the Project Location; however during the site investigation it was determined that these were not wetland. Instead they were patches of wetland vegetation occurring within the upland forests, and none of the patches were > 2 ha., (OWES minimum size for wetland mapping), or >0.5 ha., (ELC minimum size for habitat type mapping) and therefore do not constitute as wetland. Many of the patches have complex edges interspersed with upland species mixed throughout, and no standing water was observed during the site visits. The patches occur in upland forest that has been heavily logged in recent years, resulting in many saplings and young trees as can be seen in Fig. 4.1. Several of the wetland like patches have been created, or enhanced, by logging skidder activity (e.g., Fig. 4.2).

Conclusion: There are no wetlands on or within 120 m of the Project Location and therefore they will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Figure 4.1. *Upland woodland identified as potential wetland in the records review (Nov. 2011 photo).*

***Figure 4.2**. Wet skidder trail through logged forest (taken Nov. 2011).*

4.2 Area of Natural and Scientific Interest

The information sources reviewed in the NHARR (Genivar 2011) did not identify any provincially or regionally significant earth science Area of Natural and Scientific Interest (ANSI) within 50 m, or a life science ANSI within 120 m of the Project Location. OMNR (2011) does not require identifying additional ANSIs during the site investigation.

Conclusion: There is no provincially significant earth science ANSI's within 50 m or life science ANSI's within 120 m of the Project Location and therefore they will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

4.3 Valleylands

The information sources reviewed in the NHARR (Genivar 2011) did not identify significant valleylands on or within 120 m of the Project Location. The Project Location is mostly open field oriented towards the northeast. Lands at the top end of the property (i.e., NE) are thicket, logged forest and wetland. Lands to the SW across County Rd. 14 are active farmland, lands to the NW across McCann Rd. are in active agricultural use, and lands to the SE east are a mix of active agricultural lands and mixed

woodlands. Local topography is mostly flat, sloping slightly upwards towards the NE. A photograph of part of the Project Location is provided in Figure 4.3.

Conclusion: The site investigation determined that there are no valleylands on or within 120 m of the Project Location and this natural feature will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

***Figure 4.3**. Newboro 1. View towards County Rd. 14. (taken Nov. 2011).*

4.4 Woodlands

The presence of woodlands on and within 120 m of the Project Location was confirmed using the definition in the ELC system for Southern Ontario (Lee et al., 1998) and the REA Regulation. The ELC system describes woodlands as forested areas with greater than or equal to (≥) 35 % tree cover. The REA Regulation defines "woodland" as land that is south and east of the Canadian Shield. There are patches of granite bedrock coming up through the ground throughout the woodland suggesting the woodlands are on the Canadian Shield and therefore not applicable to REA Regulations for woodland. However the adjacent farmland suggests that this area is within a Canadian Shield/Limestone Plain transition zone, and so we are feel it would be prudent to include the woodlands as an applicable natural feature.

A site is considered woodland if it has a per hectare stocking of 1000 trees of any size; or 750 trees measuring over 5 cm in diameter; or 500 trees measuring over 12 cm in diameter; or 250 trees measuring

over 20 cm in diameter. We didn't do a formal stocking assessment, but did estimate that these numbers are met by the identified woodland and therefore woodland presence is confirmed.

Woodland boundaries were verified from 2011 aerial imagery and from field observations made during the SI. As per subsection 26 (3) of the REA Regulation, any corrections to the records review (Genivar 2011) made to the woodland information from observations made during the SI are to be provided. These are summarized in Section 5.1 of this report.

Some woodland (about 1 ha.) occurs within the Project Location, as well as Treed Fencerows <10 m wide separating individual fields that include tree and shrub cover. Treed Fencerow is not an ELC vegetation community category as it falls below the minimum size criterion for stand characterization; nevertheless, this feature may have potential value in terms of watercourse protection and provision of wildlife habitat and so was evaluated as woodland. The main woodland has been heavily logged resulting in a patchy species assemblage that is mostly dominated by young sugar maple. As such, it has been designated Dry-Fresh Sugar Maple Deciduous Forest Ecosite (FOD5) (see Fig 4.4).

***Figure 4.4**. Logged FOD5 woodland north of the Project Location (Dec 2011 photo).*

4.4.1 ELC Forest Stand Types on and within 120 m of the Project Location

Dry-Fresh Sugar Maple Deciduous Forest Ecosite (FOD5): This forest wraps around the north border of the Project Location, and about 3.3 hectares of the woodland is within the Project Location (see Figure 4.0). The woodland has been heavily logged, which has influenced stand structure and composition. The dominant tree present is sugar maple (mostly saplings), but other common species present include white ash, ironwood, elm, aspens, and white pine. Sporadic larger older trees are also present. The shrub layer is sparse, but tree saplings and shrubs such as European buckthorn, Eastern red cedar, and juniper are common. The ground cover is denser than it would be in an older forest due to the open canopy.

Grasses, herbaceous perennials (e.g., goldenrod), and thorny shrubs such as black raspberry are present. The woodlots itself is part of a patchy fragmented mosaic, and as such its precise size is difficult to determine. We estimate its continuous size to be about 50 ha., but it is in close association with a 28 ha. patch, a 42 ha., patch, and a 90 ha. patch.

Conclusion: The site investigation identified candidate significant woodland on and within 120 m of the Project Location. These features will be evaluated in the Natural Heritage Assessment Evaluation of Significance Report.

Treed Fencerows: The majority of the Project Location is made up of several field areas, some of which are divided by sparse fencerows of 3-8 m in width. Tree species within the fencerows are mostly American elm, but also include maples, ash, and oak. Examples of shrub and understory species include European buckthorn, gray dogwood, tartarian honeysuckle and Rubus species. The total area of tree cover represented by these fencerows is about 1 ha (see Figure 4.5). As expected, none of the OMNR (2011) criteria for establishing woodland significance were even closely met by treed hedgerows.

Conclusion: The treed fencerows were not identified as candidate significant woodland and therefore will not be evaluated in the *Natural Heritage Assessment Evaluation of Significance Report.*

Figure 4.5 Treed Fencerows, Newboro 1. (marked in yellow).

4.5 Wildlife Habitat

Each wildlife habitat type considered during the site investigation is described below in the context of the significant wildlife habitat guidelines of OMNR (2009) for site Region 6E.

4.5.1 Seasonal Concentration Areas:

Habitats of seasonal concentrations of animals are areas where animals occur in relatively high densities for specific periods in their life cycles and/or in particular seasons. These areas are generally localized and relatively small in relation to the area of habitat used at other times of the year. Areas that support species at risk, or provide important habitat for a large proportion of a population are also examples of seasonal concentration areas that are considered significant wildlife habitat. OMNR (2009) includes 11 types of seasonal concentration areas, and these are described below.

Waterfowl stopover and staging areas (terrestrial): Waterfowl traditionally congregate in larger wetlands and relatively undisturbed shorelines with vegetation during spring and fall migration. Habitat requirements for staging areas differ in the spring and fall depending on the nesting habits and wintering areas for some waterfowl species. In the fall, some waterfowl species may use staging areas as night-time roosts and disperse to other areas to feed during the day. During the spring migration, waterfowl may congregate on flooded agricultural fields.

OMNR (2009) describe habitat characteristics that are important for migrating waterfowl (i.e., terrestrial habitat) and for local and migrant waterfowl populations during the spring and fall migrations (i.e., aquatic habitat). Suitable stopover and staging habitat for migrating waterfowl include cultural meadow and thicket communities that are seasonally flooded (i.e., annual spring flooding from meltwater or surface water runoff), especially during spring migration (i.e., mid-March to May). Suitable aquatic habitat includes wetland communities such as ponds, marshes, swamps, lakes, bays, coastal inlets and watercourses. These habitat types have an abundant food supply (i.e., aquatic invertebrates and vegetation in shallow water).

There are no water areas (e.g., flooded fields) that would provide terrestrial habitat for waterfowl stopover and staging within 120 m of the Project Location. No waterfowl were observed within 120 m of the Project location during surveys in 2011, and a review of existing planning documents and available information from the MNR determined that there are no confirmed significant waterfowl stopover and staging areas (terrestrial) on or within 120 m of the Project Location (Genivar 2011).

Conclusion: Waterfowl stopover and staging area habitat (terrestrial) will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Waterfowl stopover and staging areas (aquatic): Areas with standing water such as ponds, marshes, and lakes that supply migrating waterfowl with a good food supply to support their migration efforts. There are no open water areas within 120 m of the Project Location.

Conclusion: Candidate significant waterfowl stopover and staging area habitat (aquatic) will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Colonial-nesting bird breeding habitat: Colonial birds can include herons, gulls, terns and swallows. Nesting sites for these species includes eroding banks/cliffs, sandy hills, pits, steep slopes, rock faces or piles (e.g. swallows), trees/shrubs (e.g. herons) and ground (e.g. gulls and terns). Bank Swallow and Cliff Swallow prefer exposed soil banks that are undisturbed or naturally eroding for more than 10 years. Areas that are not considered important habitat include man-made structures or recently (i.e. two years) disturbed soils, such as berms, embankments or aggregate stock piles.

There are no suitable wetland habitats or other colonial bird supportive habitat features within 120 m of the Project Locations, and no colonial nesting birds were observed. A review of existing planning documents and available information from the MNR determined that there are no confirmed significant colonial birds nesting sites on or within 120 m of the Project Location (Genivar 2011).

Conclusion: Colonial-nesting bird breeding habitat is not present and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Shorebird migratory stopover area: This habitat type includes shorelines of lakes, rivers, and wetlands, including beach areas, bars, and seasonally flooded shoreline, usually muddy and un-vegetated. All shorebird species known for Site Region 6E, including Killdeer, are to be considered as indicators of appropriate habitat.

There is no appropriate aquatic associated habitat within 120 m of the Project Location. A review of information from the MNR determined that there are no confirmed significant shorebird migratory stopover areas on or within 120 m of the Project Location (Genivar 2011).

Conclusion: Shorebird migratory stopover area habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Songbird migratory stopover areas: Songbird migratory stopover areas are found within 5 km of the Lake Ontario shoreline and include traditionally-used sites to feed, rest and wait in poor weather conditions. The Project Location is not within 5 km of the Lake Ontario shoreline.

Conclusion: Songbird migratory stopover area habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Raptor wintering area: This habitat type includes a combination of fields and thickets (CUM, CUT) and woodlands (FOD, FOM, FOC) that provide roosting, foraging and resting habitat for wintering raptors. These areas should have productive small mammal populations such as open fields, agricultural lands (i.e., hayfields, pasture) and meadows. Roosting sites for most raptor species include mature mixed or coniferous woodlands, although some species prefer grassy fields.

The Project Location and 120 m buffer areas have fields, thickets and woodlands throughout as seen in Figure 4.6.

Conclusion: Raptor wintering area will be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

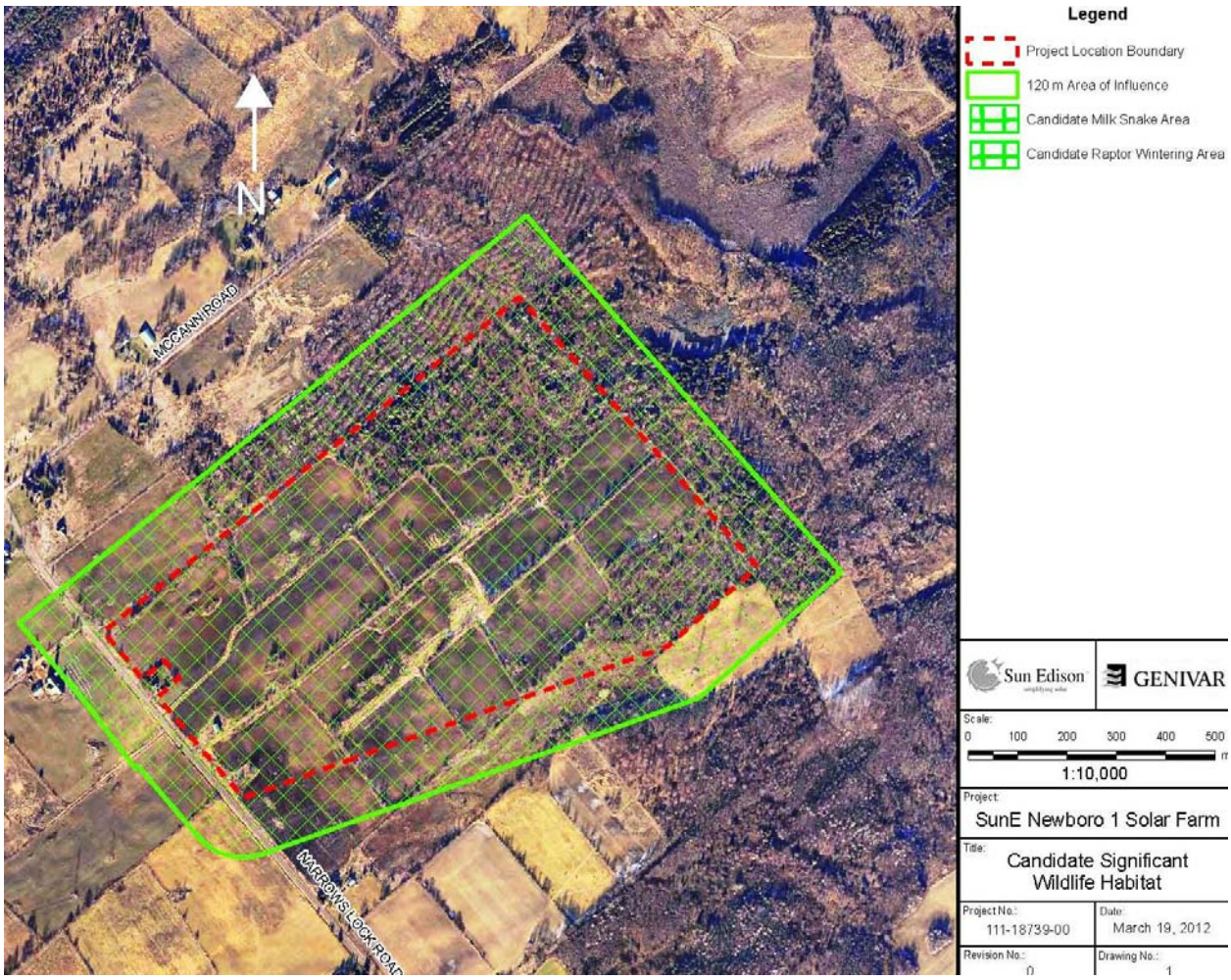


Figure 4.6 Candidate Significant Wildlife Habitat (Winter Raptor and Milksnake)

Bat hibernacula: Bat hibernacula are found in caves, abandoned mines and underground foundations. Winter roosts and maternal colonies are often found in trees with loose bark, tree cavities/hollow trees and buildings (buildings are not considered significant wildlife habitat).

A review of existing planning documents and available information from the MNR determined that there are no confirmed bat hibernacula, winter roosts and maternal colonies on or within 120 m of the Project Location (Genivar 2011). The bat species whose ranges overlap the Project Location and that were considered during the site investigation include: big brown bat, little brown bat and northern long-eared bat (Genivar 2011). All of these bat species are known to overwinter in Ontario.

There are no caverns, crevices or appropriate building structures present within 120 m of the Project Location. Woodland communities within 120 m of the Project Location have been heavily logged and are mostly young trees with an absence of large cavity trees.

Conclusion: Bat hibernacula are not present and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Butterfly migratory route/stopover areas: Migratory butterfly stopover areas are found within uplands (CUT, CUM) and woodlands (e.g., FOC, FOM, CUP) located within 5 km of Lake Ontario.

The Project Location is more than 5 km from Lake Ontario. Furthermore, a review of existing planning documents and available information from the MNR determined that there are no confirmed significant migratory butterfly stopover areas on or within 120 m of the Project Location (Genivar 2011).

Conclusion: Butterfly migratory route/stopover habitat is not present and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Snake hibernaculum: Some species of snakes migrate to wooded areas in the fall where they find areas to hibernate such as animal burrows, log piles, and rock crevices. Woodlands ≥ 30 ha are favourable as they may 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. No features present within 120 m of the Project Location suitable as snake hibernacula were observed (e.g., building foundations, south-facing ridges, crevices, large boulder piles, etc.) in the fields or recently logged woodlot. No snakes were encountered within 120 m of the Project Location. The Project Location currently exists as ploughed field.

Conclusion: No snake hibernaculum habitat features were observed and this feature will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Deer wintering areas: To function as a deer wintering area it needs to have a history of use by deer; an absence of barriers to migration to and from the yard itself; suitable areas of cover, food and adjacent natural lands. Deer wintering area have three basic habitat components: core areas; core feeding areas; and staging areas. Deer spend the majority of the winter in core areas and core feeding areas. These areas are associated with coniferous and mixed forests which provide shelter (i.e. > 60 % canopy cover) and an adequate supply of food (i.e. woody browse, fruits and nuts). Staging areas are located adjacent to winter deer yards and provide temporary habitat as deer move in and out of winter yards. Suitable staging areas include agricultural land and mast-producing woodlands where food is abundant.

A review of existing planning documents on deer wintering areas from the MNR determined that there are no confirmed significant winter deer yards within 120 m of the Project Location (Genivar 2011). This was confirmed during winter field work, although deer (and subsequently coyotes) have been attracted to the recently logged areas due to the prevalence of recently accessible woody browse and the lack of snow.

Conclusion: Deer wintering areas will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Amphibian breeding habitat (woodland): The presence of woodland next to a wetland is considered to have potential amphibian breeding habitat. The FOD5 woodland within and north of the Project Location is also next to a wetland and therefore the woodland meets the criteria of potential woodland amphibian breeding habitat. Potential spring breeding areas were identified in the woodland, as well as the adjoining cultural thicket, and these are shown with a W in Figure 4.6. Approximate distances to the Project Location boundary (red dashed line) are also shown in Figure 4.6, where it can be seen that four

of the potential amphibian breeding areas are within 120 m of the Project Location boundary, and one is within the Project Location itself.

Conclusion*:* Candidate significant woodland amphibian breeding habitat will be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

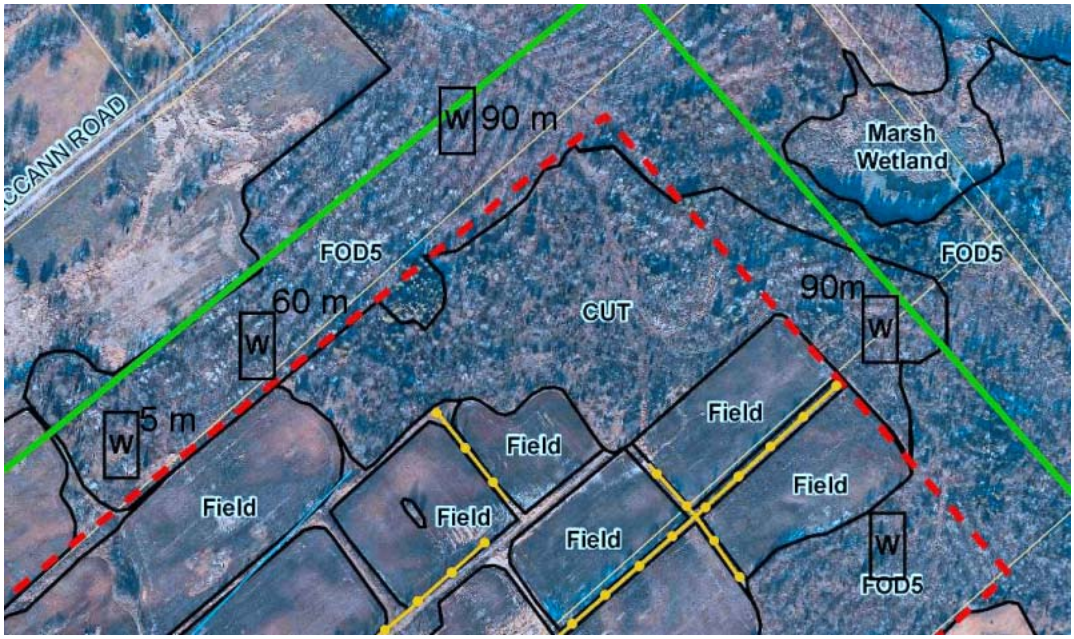


Fig 4.7 Potential woodland breeding areas (W).

Amphibian breeding habitat (wetland): Wetlands supporting high species diversity are considered significant. There is no wetland within 120 m of the Project Location. As a result, the potential breeding areas do not meet the criteria for candidate amphibian breeding habitat.

Conclusion*:* Candidate significant amphibian wetland breeding habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Summary of Candidate Significant Habitats of Seasonal Concentration Areas

One candidate significant habitat of seasonal concentration was identified on and within 120 m of the Project Location and will be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

4.5.2 Rare Vegetation Communities

All vascular plant species encountered during the site investigation were recorded and used in characterizing individual vegetation community types. Any plant identified as a species of conservation concern would be GPS referenced and the habitat would be surveyed in order to determine the extent of the population. Specimens that could not be readily identified in the field would be collected and assessed

later using appropriate references (e.g., Gleason and Cronquist 1991; Queen`s University Fowler Herbarium records).

Rare vegetation communities are those that are considered rare in Site Region 6E under the Ecoregion Criteria Schedules (see also NHIC S-Ranks designations). Rare community types are typically those with SRANKS of S1 to S3 (i.e., extremely rare to rare – uncommon in Ontario). In addition to being rare themselves, it is also assumed that these communities support wildlife species that are also considered significant. There are 6 identified communities for Site Region 6E, including: Alvar, Cliff and talus slopes, Savannah, Tallgrass Prairie, Sand Barren, Old Growth Forest

OMNR (2010) describes rare vegetation communities as areas that contain a provincially rare vegetation community or are rare within the planning area. The vegetation community types that are identified as provincially rare or rare within the Smiths Falls Ecodistrict 6E-11 planning area during the NHARR (Genivar 2011) are listed below and were considered during the site investigations.

Provincially Rare Vegetation Communities – The Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2: Ecodistrict Summaries (Henson and Brodribb, 2005) identifies the following provincially rare vegetation community within the Smiths Falls Ecodistrict 6E-11.

Common Juniper - Fragrant Sumac - Hairy Beardtongue Alvar Shrubland Type G2? S2
Philadelphia Panic Grass - False Pennyroyal Alvar Pavement Type G1Q S1
Pitch Pine Treed Granite Barren Type G3G5 S1
Tufted Hairgrass - Canada Bluegrass - Philadelphia Panic Grass Alvar Grassland Type G2G3?S3
White Cedar - White Spruce - Philadelphia Panic Grass Treed Alvar G3?S3

No rare vegetation communities or specialized habitats were identified in the NHARR (Genivar 2011) matching these criteria, nor were any found during the site investigations of lands on or within 120 m of the Project Location. The Project Location is mostly field with vegetated fencerows and shrub thicket. The associated woodland community type has a rank of S5. All of the plant species encountered are common native species with an S-rank of S5, or are non-native (SU).

Summary of Candidate Significant Rare Vegetation Community Habitat

Candidate significant rare vegetation communities are not present and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

4.5.3 Specialized Habitats for Wildlife

OMNR (2010) describes specialized habitats for wildlife as areas that: support wildlife species that have highly specific habitat requirements, have high species and community diversity, and provide habitat that greatly enhances species' survival.

The Ecoregion Criteria Schedules (MNR 2009) identifies 5 categories of specialized habitat for wildlife for Site Region 6E, the area in which the Project Location occurs. Each of these is discussed below in context with what was observed during the site investigations of the areas within 120 m of the Project Location:

Waterfowl nesting area: Waterfowl nesting areas can extend 120 m from a wetland where waterfowl nesting is known to occur. No nesting was observed in the lands between the wetland and the Project Location, a distance of approximately 130 m. The nesting habitat quality of this intervening land is limited as it is predominately composed of scrub habitat with limited grass cover, and it is also bisected with a logging road that is used by ATV users. Nesting waterfowl also require a post-hatch water source for the hatchlings to move to and it must have enough breadth and diversity to supply good quality growth habitat. These parameters are not met by the wetland northeast of the Project Location.

Conclusion: Waterfowl nesting area habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Osprey Nesting, Foraging and Perching Habitat: Osprey nests are commonly associated with lakes, ponds, rivers, or open water wetlands where they can be found along forested shorelines and islands. None of these attributes apply to the Project Location.

An osprey nest was seen on a hydro tower within 120 m of the Project Location. Osprey nests in man-made structures do not count as significant under OMNR (2009).

Conclusion: Osprey nesting will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Woodland Raptor Nesting Habitat: Several species of raptors, and those nesting and hunting in forests and grasslands require somewhat specialised nesting habitat for their long-term survival. Nests typically occur in intermediate-age to mature conifer, deciduous, or mixed woodlands within tops or crotches of trees. In contrast, the woodlands associated with the Project Location have been heavily logged and are mostly young deciduous forest and would not provide suitable woodland raptor nesting habitat.

No remnant raptor nests were observed within the relatively open canopy of woodlands within 120 m of the Project Location during the SI. Of the nine woodland raptor species listed in OMNR (2009) only the Sharp-shinned Hawk was observed, but this was likely a flyby. Sharp-shinned Hawks typically nest in dense even-aged mid-aged conifers, usually near wet areas (Szuba and Naylor 1998), and this type of habitat is not present on and within 120 m of the Project Location.

Conclusion: No woodland raptor nesting habitat is considered to be present on or within the 120 m Project Location and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Turtle Nesting and Over-wintering Areas: Turtle nesting areas include exposed sites typically with a southern exposure and with sand or gravel substrates that allow turtles to dig. Turtle over-wintering areas consist of permanent waterbodies, large wetlands, and bog or fens with adequate dissolved oxygen. There are no such nesting areas or waterbodies within 120 m of the Project Location.

Conclusion: No turtle nesting and overwintering area habitat is considered to be present and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Seeps and Springs: No seeps or springs were identified within 120 m of the Project Location nor are any reported in the NHARR (Genivar 2011). The entire Project Location is active farm land.

Conclusion: Seeps and springs are not present and will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Summary of Candidate Specialized Habitats for Wildlife

No candidate specialized habitats for wildlife were found on or within 120 m of the Project Location and this habitat category will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

4.5.4 Habitat for Species of Conservation Concern

OMNR (2010) identifies species of conservation concern as: species that are designated at the national level as endangered or threatened by COSEWIC, which are not protected in regulation under Ontario's ESA, species listed as special concern under the ESA on the SARO List (formerly referred to as "Vulnerable" in the SWHTG), and species that are rare or substantially declining, or have a high percentage of their global population in Ontario.

OMNR (2000) defines rare or significant species at six levels: globally significant; nationally significant; provincially significant; regionally significant; locally significant (within a Site District); within a planning authority's jurisdiction.

Five categories of habitat that support species of conservation concern are listed in the Ecoregion Criteria Schedules (OMNR 2009) for Site Region 6E. Each of these is discussed below in context with species observed during the site investigations. Habitats supportive of identified species of conservation concern will be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Marsh bird breeding habitat: Marsh bird breeding habitat occurs in wetlands. All wetland habitats are to be considered as long as there is shallow water with emergent aquatic vegetation present. There is no marsh within 120 m of the Project Location

Conclusion: Marsh breeding bird habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Area –sensitive bird breeding habitat: All mature (>60 years old) natural forest (non-plantation) stands 30 ha or greater in size and with at least 10 ha interior habitat assuming 100 m buffer at edge of forest are to be considered for this criterion. The woodland does not meet the interior habitat or age criteria and is therefore not considered significant for area-sensitive bird breeding habitat.

Conclusion: Area-sensitive bird breeding habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Open country bird breeding habitat: This refers to grassland habitat 30 ha or larger in size that is not actively used for farming. The Project Location is farmland, although we saw little evidence of active farm use in 2012. Collectively, the Project Location and adjacent fields are greater than 30 ha. The fields were not grassland however, but instead were mostly dominated by legumes with a mix of perennial forbs (see Figure 4.6), although typical field grasses such as Poa, Phleum, and Bromus were present. The fields were ploughed after the field work was completed in 2012 and will not develop into useable field habitat for at least two years, at which point it will likely be dominated by legumes again.

Normally species use is discussed in the EOS, but it is worthwhile to mention that Cadman et al. (2005) shows that open country indicator and open country special concern species to be at the lowest potential levels (or not all) in this area. So even if good habitat was present, it is unlikely that these species would be present. Instead these species are more commonly seen in field areas nearer Lake Ontario to the west, or nearer Ottawa to the north. This suggests that there may be some regional factor, such as proximity to the Canadian Shield that makes this area undesirable to these species.

Conclusion: Due to habitat characteristics and background study, open country bird breeding habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Figure 4.8 Field of Newboro 1.

Shrub/early successional bird breeding habitat: Shrubland or successional fields 30 ha or larger in size and not being actively used for farming. The cultural thicket is between 5 and 6 hectares in size, which is below the threshold of 30 ha.

Conclusion: Due to its small size, the candidate shrub/early successional bird breeding habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Other Habitat Types: No other species of conservation concern requiring other forms of habitat (e.g., lakes, lakeshore) were noted in Table 3.2 and no other forms of habitat not already noted above occur within 120 m of the Project Location.

Conclusion: Candidate significant other habitat types will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Special concern and S1-S3 species and communities: Candidate habitat assessments for remaining species of conservation concern indicated in Table 3.2 that were not included in the habitat criteria evaluations are discussed in Table 4.3.

Conclusion: No habitats supportive of remaining S1-S3 species or other species of special concern were found within 120 m of the Project Location. This habitat category will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Table 4.3. Remaining species of conservation concern identified in the NHARR (Genivar 2011)

Species	Preferred Habitat	Assessment from SI	Potential
Insects			
Early Hairstreak (*Erora laeta)*	Mature maple-beech forest	Habitat not present	nil
Reptiles			
Eastern Ribbonsnake (*Thamnophis sauritus*)	sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams	No permanent water features or wetlands; no records for this Site Region	nil
Milksnake (*Lampropeltis triangulum*)	farmland, meadow, woodland; hides under logs, stones, boards or in outbuildings	A mix of habitats including fields. Fields were ploughed, forest is young and sparse. Logs and slash piles present.	possible
Five-lined skink (*Plestiodon fasciatus)*	In non Shield areas it needs to be near expansive open water.	Not near expansive open water.	nil
Map turtle (*Graptemys geographica*)	large waterbodies with soft bottoms, and aquatic vegetation;	Nearest large waterbody is about 1.5 km away.	nil
Snapping turtle (*Chelydra serpentina*)	Open water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; soft soil on south-	No suitable wetlands or waterbodies present within	nil

	facing slopes for nests; may nest at some distance from water;	120m of Project Location.	
Birds			
Bald Eagle	Forest near expansive open water.	Young logged forest not near open water.	nil
Prairie Warbler	Dry, early successional shrubland of 20 plus hectares.	Successional shrubland not large enough.	nil
Mammals			
Eastern pipistrelle (*Pipistrellus subflavus*)	open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices	No good water present, no caves or other hibernacula features	nil
Eastern small-footed bat (*Myotis leibii*)	roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings;	No suitable hibernacula features present	nil
Northern Long-eared Bat (*Myotis septentrionalis*)	hibernates in mines or caves; roosts in houses, manmade structures but prefers hollow trees or under loose bark;	No suitable hibernacula features present	nil

Summary of Habitats for Species of Conservation Concern

Candidate habitat (Figure 4.6) for one species of conservation concern (milksnake) is present and this will be carried forward to the Evaluation of Significance Report.

4.5.5 Animal Movement Corridors

Animal movement corridors are defined in the OMNR (2000) as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. Under the Ecoregion Criteria Schedules (OMNR 2009) for Site Region 6E, movement corridors that should be identified as candidate SWH include amphibian movement corridors, deer movement corridors, and bat movement corridors.

Amphibian movement corridors: Amphibian movement corridors provide a linkage between breeding habitat and summer habitat. There are no records of amphibian movement corridors reported in the NHARR (Genivar 2011) and no habitat or landscape features supportive of significant movements (e.g., valleylands, riparian routes) are found within 120 m of the Newboro 1 Project Location. The vegetation community types present are regionally common natural lands that extend broadly across the local landscape.

Conclusion: Amphibian movement corridors are not considered to be present within 120 m of the Project Location and will not carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Deer movement corridors: Deer movement corridors are typically found in (but are not limited to) riparian areas, ravines, steep river valleys and woodlands (OMNR 2000 and 2009), and provide a linkage between summer and winter range and deer yards. There are no confirmed winter deer yards or deer movement corridors reported in the NHARR (Genivar 2011) based upon a review of MNR records. The logged woodland exists within a patchy mosaic. No deer runs or trails were observed.

Conclusion: Deer movement corridors will not carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Bat movement corridors: Suitable bat migration corridors include areas directly along shorelines of large lakes or areas of high elevation (i.e. escarpment, cliff, high hills). There are no records of bat movement corridors reported in the NHARR (Genivar 2011) for this site and no habitat features supportive of significant movements. The vegetation community types present are common and extend broadly across the local landscape (i.e., there is no natural corridor occurring within an otherwise restrictive landscape matrix).

Conclusion: Bat movement corridors are not considered to be present and will not carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Summary of Animal Movement Corridors

The results of the site investigation determined that there are no candidate significant animal movement corridors within 120 m of the Project Location. This candidate significant wildlife habitat will not be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

5.0 SUMMARY OF SITE INVESTIGATION RESULTS

5.1 Corrections Required in the Natural Heritage Assessment Records Review Report

Subsection 26 (3) of the REA Regulation requires that the Natural Heritage Assessment Site Investigation Report include a summary of any corrections to the NHARR (Genivar 2011) and the determinations made as a result of conducting the site investigation. Table 5.1 identifies determinations made for the natural features identified in the NHARR and documented during the site investigation.

Where needed, the corrections will be carried forward to the Natural Heritage Assessment Evaluation of Significance Report.

Table 5.1. Summary of corrections required to natural features identified by the Genivar 2011).

RECORDS REVIEW			SITE INVESTIGATION		
Feature	In PL	In 120 metre buffer	Type And Criteria Used	Location and Defining Criteria	Corrections to Records Review
Woodland Dry –Fresh Sugar Maple Deciduous Forest Ecoystem (FOD5)	No	Yes	Candidate Significant *NHRM* (MNR 2010) significant woodland evaluation criteria	Adjacent and within. Proximity to wetland and Woodland Diversity	Candidate Woodlands are within the Project Location.
Wetland Ephemeral Pond	Yes	Yes	Candidate Significant OWES, MNR (2002)	Adjacent and within. Too small and fragmented	No wetland on or within 120 m of the Project Location.
Wildlife Habitat Amphibian Breeding	Pending	Pending	Candidate Significant MNR (2009)	Adjacent and within (pending)	Possible, pending field work.

5.2 Candidate Significant Natural Features

The findings from this report identified the following candidate significant natural features.

Woodlands – candidate significant woodland was identified as occurring on and within 120 m of the Project Location.

Wildlife Habitat - candidate significant woodland amphibian breeding habitat, raptor wintering area, and candidate habitat for one species of conservation concern (milksnake).

A Natural Heritage Assessment Evaluation of Significance Report will be prepared for the confirmed candidate significant natural features identified in this report.

6.0 LIST OF REFERENCES

Cadman M. and N. Kopysh. 2001. Ontario Breeding Bird Atlas Guide. Bird Studies Canada, Environment Canada: Canadian Wildlife Service, Federation of Ontario Naturalists, OFO, Ontario Ministry of Natural Resources.

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists.

Gleason, Henry A. and Arthur Cronquist. 1991. Manual of the Vascular Plants of Northeastern United States and Adjacent Canada, Second Edition. D. Van Nostrand, N.Y

Genivar. 2011. Newboro 1 Solar Energy Project Natural Heritage Assessment Records Review. Prepared for SunEdison.

Henson, B.L. and K.E. Brodribb 2005. Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2: Ecodistrict Summaries. Nature Conservancy of Canada.

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario. Natural Heritage Information Centre, OMNR Peterborough.

Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. 151 pp. Fish and Wildlife Branch, Technical Section.

Ontario Ministry of Natural Resources. 2002. Ontario Wetland Evaluation System Southern Manual.

Ontario Ministry of Natural Resources. 2009. Significant Wildlife Habitat Ecoregion Criteria Schedules. Addendum to Significant Wildlife Habitat Technical Guide.

Ontario Ministry of Natural Resources. 2011. Natural Heritage Assessment Guide for Renewable Energy Projects.

Szuba, K., and B. Naylor. 1998. Forest Raptors and Their Nests in Central Ontario. Southcentral Sciences Section Field Guide FG-03. Ontario Ministry of Natural Resources.

Appendix 1. Wildlife species observed by calls, tracks, scats, and observatons at the Newboro 1.

Scientific Name	Common Name	SRANK	FAMILY
Accipiter striatus	Sharp shinned Hawk	S5	ACCIPITRIDAE
Agelaius phoeniceus	Red-winged Blackbird	S5B	ICTERIDAE
Bombycilla	Cedar Waxwing	S5B	BOMBYCILLIDAE
Buteo jamaicensis	Red-tailed Hawk	S5B	ACCIPITRIDAE
Carduelis tristis	American Goldfinch	S5B	FRINGILLIDAE
Cathartes aura	Turkey Vulture	S5B	CATHARTIDAE
Charadrius vociferus	Killdeer	S5B	CHARADRIIDAE
Cyanocitta cristata	Blue Jay	S5B	CORVIDAE
Circus cyanus	Northern Harrier	S4B	ACCIPITRIDAE
Coccyzus	Yellow bellied	S5B	TYRANNIDAE
Colaptes auratus	Northern Flicker	S5B	PICIDAE
Columba livia	Rock Pigeon	SNA	COLUMBIDAE
Corvus	American Crow	S5B	CORVIDAE
Dendroica petechia	Yellow Warbler	S5B	PARULIDAE
Dendroica	Chestnut sided Warbler	S5B	PARULIDAE
Dumetella	Gray Catbird	S5B	MIMIDAE
Dryocopus pileata	Pileated Woodpecker	S5S	PICIDAE
Empidonax trailii	Willow Flycatcher	S5B	TYRANNIDAE
Gallinago gallinago	Common Snipe	S5B	SCOLOPACIDAE
Falco sparverius	Kestrel	S5B	FALCONIDAE
Icterus galbula	Baltimore Oriole	S5B	ICTERIDAE
Geothlypis trichas	Common Yellowthroat	S5B	PARULIDAE
Molothrus ater	Brown-headed Cowbird	S5B	ICTERIDAE
Melospiza melodia	Song Sparrow	S5B	EMBERIZIDAE
Pandion haliaetus	Osprey	S5B	ACCIPITRIDAE
Passerculus	Savannah Sparrow	S5B	EMBERIZIDAE
Pheucticus	Rose-breasted Grosbeak	S5B	CARDINALIDAE
Picoides pubescens	Downy Woodpecker	S5	PICIDAE
Pipilo	Eastern Towhee	S4B	EMBERIZIDAE
Passerina cyanea	Indigo Bunting	S5B	CARDINALIDAE
Poecile atricapillus	Black-capped Chickadee	S5	PARIDAE
Quiscalus quiscala	Common Grackle	S5B	ICTERIDAE
Sphyrapicus varius	Yellow bellied Sapsucker	S5B	PICIDAE
Spizella pusilla	Field Sparrow	S5B	EMBERIZIDAE
Spizella passerina	Chipping Sparrow	S5B	EMBERIZIDAE
Spinus tristis	American Goldfinch	S5B	FRINGILLIDAE
Strix varia	Barred Owl	S4	STRIGIDAE
Sturnus vulgaris	European Starling	SNA	STURNIDAE
Tachycineta bicolor	Tree Swallow	S5B	HIRUNDINIDAE
Toxostoma rufum	Brown Thrasher	S4B	MIMIDAE
Turdus migratorius	American Robin	S5B	TURDIDAE
Tyrannus tyrannus	Eastern Kingbird	S5B	TYRANNIDAE
Vermivora	Golden Winged Warbler	S4B	PARULIDAE
Vireo olivaceous	Red eyed Vireo	S5B	VIREONIDAE
Zenaida marcoura	Mourning Dove	S5B	COLUMBIDAE
Canis latrans	Coyote	S5	CANIDAE
Microtus	Meadow Vole	S5	MURIDAE
Odocoileus	White-tailed Deer	S5	CERVIDAE
Peromyscus	Deer Mouse	S5	MURIDAE

Appendix 2. Field notes made during non bird-count visits.

ELC notes, transcribed from field annotated field maps for legibility.

Woodlot (FOD5)
Northwest and Northeast corners of PL
Recently logged, some branches and debris.
Mostly saplings and young trees
1. Ms>Aw, Iw, Elm (saplings, young trees)
2. mostly bare
3. juniper, buckthorn, raspberry, saplings
4. similar to adjacent fields, but sparse, grasses, forbs – goldenrod, common compositae
Uneven ground due to skidder trails and branch slash, almost no big logs
Mostly shallow soil over bedrock. Some exposed granite bedrock.
Coyote scats –rabbit or deer fur in scats
No small mammals seen – logging?
Small diffuse wetland patches within FOD5, carex, typha, phalaris, some common wetland forbs … especially in skidder trail depressions.
No game trails
No standing water, no amphibians.
No large raptor nests visible in open canopy.
No obvious reptile hibernacula, no big stumps.
Deer browse evident on saplings and shrubs.
Barred owls calling from wetland further north
Logging road north of PL, extends into 120 zone, with some log and earth piles near McCann Rd. (outside if 120 m).
Sub-plots less than 0.5 ha within FOD5 include Trembling Aspen/Birch/Aw stand and a
Pw stand
Wet patches – damp, no standing water, Phalaris, Carex sp., T.M.N, willow, red-o, Solidago,

CUT (north of PL)
Likely past apple orchard … overgrown apple trees.
Aw, Ms, Elm saplings and some trees … not enough to count as woodlot
Juniper, Red Cedar, Buckthorn, Rasp, Tartarian, Prickly Ash …
Weedy forbs similar to fields, Poa, Bromus, Orchard Grass, Solidago, Asters, Ranunculus, Vicia, Trifolium,
Dry shallow soil sloping down to wetland further north
Vehicle ruts

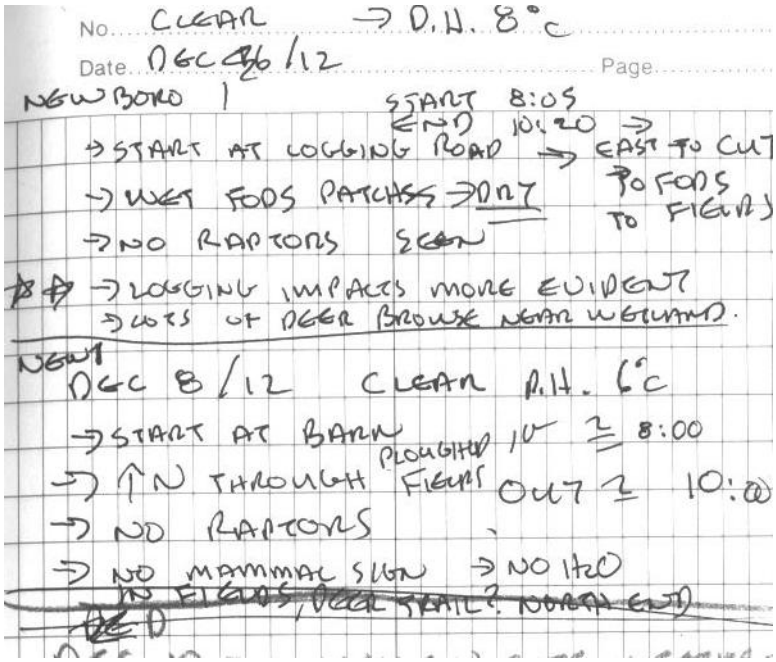
Ms = sugar maple
Pw = white pine
Iw=ironwood
Aw = white ash

Fields (before ploughing in Fall 2011)
Weedy open fields, dominated by dicots, difficult to walk in … shallow soil, granite outcrops in fields, tangled perennials and ruts,
field generalists … clovers, bugloss, oxyeye daisy, chicory, milkweed, rumex, mullein, buttercup, campion, vetch, goldenrods, sheep sorrel, carrot, toadflax, dock, field grasses (Poa, Phleum, Bromus, Festuca, Dactylus, Agrostis) Phalaris in damp patches
No small mammal burrows or trails observed, small mammal (vole, mice) sign around barn
Old ruts and remnant plow furrows
Open granite outcrops, mosses, lichens, prickly ash, Rubus, chickweed, buckthorn, juniper, grass … no fissures or rock piles, variable tree cover, elm, maple, ash
Rock piles between some fields, small over shallow soil … poor hibernacula potential

Wetland (beyond 120 m buffer)
Southward Extension - Open water good for waterfowl, no ducks or turtles seen, pond is about 30 x 70, Beaver lodge – current beaver sign, edges not logged
Main Body further north - no channel or open water at McCann Rd., very dense growth of emergents (farm runoff?), adjacent woodland heavily logged

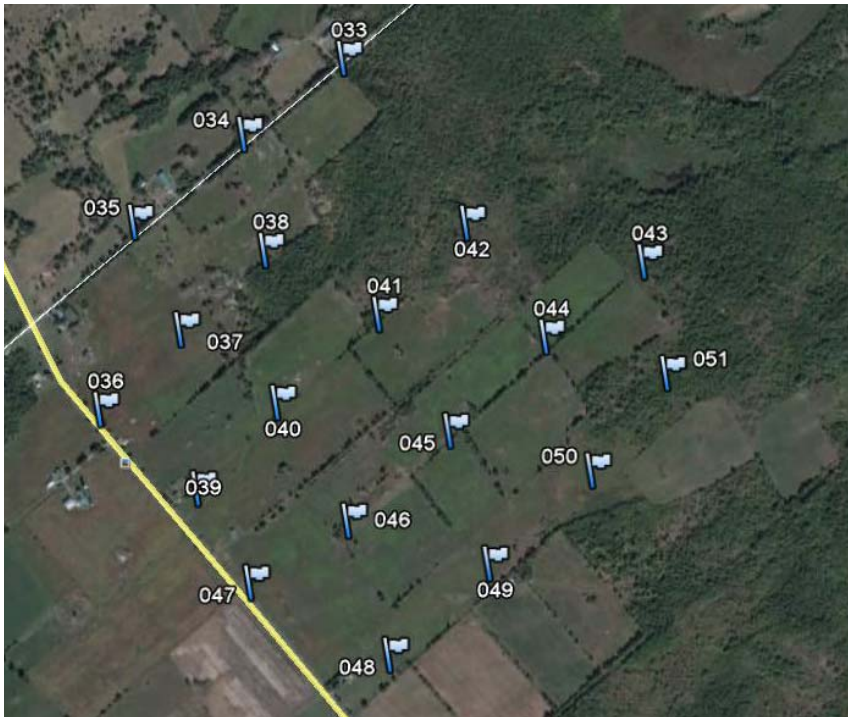
Fence Rows
Variable and sporadic tree coverage
1. Elm, maples, ash,
2. similar
3. Buckthorn, grey dogwood, rubus sp., prunus sp., prickly ash, cornus, tartarian, some tree regen
4. mostly forage grasses and weedy species, similar to adjacent fields
Small rock piles. Not deep enough and soil too shallow for hibernacula. No reptile signs.

June 17 and July 8 Notes.



Dec 6 and 8 field notes.

Appendix 3. Breeding Bird survey locations and counts.



Note: Stations 33 to 38 were surveyed on June 18 and 38 to 51 were surveyed on June 19. Subsequent visits to stations on July 9 are marked with a (II). Missing columns had no bird sightings.

Station	**33**	**34**	**35**	**35 (II)**	**36**

Common Name	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**
Turkey Vulture										2
Common Snipe			1							
Mourning Dove	1									
Willow Flycatcher						1				
Red-eyed Vireo	1		1			1				
Blue Jay	1									
American Crow		1								
Tree swallow								1		
American Robin		1	4			1			2	1
European Starling			4		2				1	
Cedar Waxwing			1		3					
Yellow Warbler			1	1	2					
Common Yellowthroat			1			1	1			
Eastern Towhee						1				
Chipping Sparrow			3		1				1	
Song Sparrow	3	1	1	2	2	2	6	5	2	3
Red-winged Blackbird			3						5	2
Common Grackle									1	
American Goldfinch					1	1	2	1		
Indigo Bunting							2			

		37		**37 (II)**		**38**		**39**	
Common Name	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**
Turkey Vulture	2		1						
Sharp-shinned Hawk					1 (fb)				
Red-tailed Hawk						1			
Mourning Dove									2
Pileated Woodpecker									1
Eastern Kingbird			1						
American Crow									2
American Robin	1					1	2		4
European Starling		2						1	
Cedar Waxwing						2			
Yellow Warbler								1	
Common Yellowthroat						2	1	2	1
Eastern Towhee						1			
Chipping Sparrow									1
Savannah Sparrow		2		1					
Song Sparrow	3	1	2			3	2	4	
Red-winged Blackbird	2	2						6	4
American Goldfinch		1							

	39 (II)		**40**		**41 (II)**		**42**		**43**	
Common Name	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**
Wild Turkey				**2**		**2**		**2**		
Northern Harrier		1 (fb)								
American Kestrel						1				
Mourning Dove				1		2		1		
Barred Owl									1	1
Pileated Woodpecker				1		1				
Willow Flycatcher					1	1	1		1	
Eastern Kingbird										1
Blue Jay							1			
American Crow				2		3		1	1	1
Tree swallow										
American Robin			1	3		3				5
Brown Thrasher							1			1
Golden-winged Warbler							1			
Yellow Warbler				1		1			1	
Common Yellowthroat			1	1	1				1	1

Eastern Towhee							2		1	
Field Sparrow				1	2	2		1		2
Song Sparrow			3	4	2	3	3	2	2	1
Red-winged Blackbird				2						
Baltimore Oriole					1					
	44		**44 (II)**		**45**		**45 (II)**		**46**	
Common Name	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**
Red-tailed Hawk						1				
Northern Flicker										1
Pileated Woodpecker						1				
Willow Flycatcher										1
Eastern Kingbird			2							
Yellow-billed Cuckoo								1		
American Crow										3
Tree swallow								5 (fb)		
American Robin	1	2					1		1	4
Gray Catbird					2					
Brown Thrasher	1	1				1				
European Starling										1
Yellow Warbler	1				2				3	
Chestnut-sided Warbler							1			
Common Yellowthroat				1					2	
Field Sparrow		4								2
Savannah Sparrow					3					
Song Sparrow	4	1	5	4	3	1	5	5	2	2
Red-winged Blackbird	6					2				1
Common Grackle						1				
American Goldfinch									1	
	46 (II)		**47**		**47 (II)**		**St. 48**		**48 (II)**	
Common Name	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**
Osprey			1							
Rock Pigeon				4						
Mourning Dove				2						
Killdeer		1								
American Crow				1				1		
American Robin			1	5	1		1	1		
European Starling			5							
Cedar Waxwing							1			
Common Yellowthroat			1	1						
Savannah Sparrow	1								1	
Song Sparrow	3	2	4	2	3		2	2	1	1
Red-winged Blackbird	2		4	6		6	7	5		
Common Grackle			1							
Baltimore Oriole							1			
American Goldfinch							1			
	49		**49 (II)**		**50**		**50 (II)**		**51**	
Common Name	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**	**<100m**	**>100m**
Red-tailed Hawk	1									
Yellow-bellied Sapsucker										1
Willow Flycatcher					1	1				
American Robin		2				1			1	2
Gray Catbird	1									
Yellow Warbler	1	2								
Chestnut-sided Warbler									1	
Common Yellowthroat		1		2					2	1
Eastern Towhee						1				
Field Sparrow			1					2		
Savannah Sparrow	1		2							
Song Sparrow	2	2	2	2	2	4	2		3	1

Rose-Brested Grosbeak	2									
Red-winged Blackbird	1	1	1							2
Common Grackle							3			