



**BROOKE-ALVINSTON WIND FARM  
NATURAL HERITAGE ASSESSMENT**

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Prepared for:

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## **Executive Summary**

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Zephyr Farms Limited (Zephyr Farms) is a wholly-owned subsidiary of Green Breeze Energy Inc. Zephyr Farms has been awarded a Power Purchase Agreement with the Ontario Power Authority (RESOP11836) for the Brooke-Alvinston Wind Farm. The Project will be located in the Township of Brooke-Alvinston, Lambton County, Ontario.

The Project Location for this report includes all parts of the land in, on or over which the Brooke-Alvinston Wind Farm project is proposed. The basic components of the Project include four Samsung Heavy Industries 2.5 MW wind turbine generators for a total installed nameplate capacity of 10 MW, transformers at each turbine, electrical collector lines and fibre optic data lines, a switchyard with associated control room, a meteorological tower (met tower) and associated power and data cabling, and turbine access roads. The electrical transmission system would transport the electricity generated from each turbine to Hydro One Networks Inc.'s (HONI's) distribution network. The Project also includes interconnection equipment and installations specified by HONI.

Zephyr Farms retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) Application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). This Natural Heritage Assessment is intended to satisfy the requirements outlined within O. Reg. 359/09 (Sections 24 through 28 and 37, 38) and is to be submitted as a component of the REA under the *Green Energy and Green Economy Act* (GEA).

This report identifies the existence and boundaries of all natural features within 120 metres (m) of the Project Location based on a review of background records and on-site field investigations. As the Project Location is within 120 m of natural features, this report provides an evaluation of significance for each identified feature based on either an existing Ministry of Natural Resources (MNR) designation of the feature, or by using evaluation criteria or procedures established or accepted by the MNR.

A review of available background information indicated the presence of woodland within 120 m of the Project Location. A site investigation occurred in July 2010, and involved reviews of the vegetation communities and wildlife habitat assessment and surveys. The investigation was conducted with the purpose of confirming the status and boundaries of natural features identified through the records review and identifying any additional features. The site investigation confirmed the presence of woodland within 120 m of the Project Location. An evaluation of significance was undertaken to determine the significance and sensitivity of the woodland, using procedures established by MNR. The woodland did not meet the criteria to be considered significant. No significant features were located within 120 m of the Project Location and no EIS was required.

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## **1.0 Introduction**

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### **1.1 BACKGROUND**

Zephyr Farms Limited (Zephyr Farms) is a wholly-owned subsidiary of Green Breeze Energy Inc. Zephyr Farms has been awarded a Power Purchase Agreement with the Ontario Power Authority (RESOP11836) for the Brooke-Alvinston Wind Farm. The Project will be located in the Township of Brooke-Alvinston, Lambton County, Ontario.

The Study Area for this assessment is shown on Figure 1, Appendix A. For the purposes of this report the Study Area refers to the general geographic location of the project. It is generally bounded by i) Churchill Line to the North; ii) Ebenezer Road to the West; and iii) Old Walnut Road to the East.

The Project Location for this report includes all parts of the land in, on or over which the Brooke-Alvinston Wind Farm project is proposed. The basic components of the Project include four Samsung Heavy Industries 2.5 MW wind turbine generators for a total installed nameplate capacity of 10 MW, transformers at each turbine, electrical collector lines and fibre optic data lines, a switchyard with associated control room, a meteorological tower (met tower) and associated power and data cabling, and turbine access roads. The electrical transmission system would transport the electricity generated from each turbine to Hydro One Networks Inc.'s (HONI's) distribution network. The Project also includes interconnection equipment and installations specified by HONI.

Zephyr Farms retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) Application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). This report has been prepared in accordance with O. Reg. 359/09 (Sections 24 through 28, Natural Heritage and Section 37 and 38, Specified Natural Features).

### **1.2 APPLICABLE LEGISLATION**

This Natural Heritage Assessment is intended to satisfy the requirements outlined within Ontario Regulation 359/09 (Sections 24 through 28 and 37 and 38) and is to be submitted as a component of the REA under the *Green Energy and Green Economy Act* (GEA). The Study Area is not located within the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan Area or the Protected Countryside of the Greenbelt Plan.

A Natural Heritage Assessment is required to determine whether any of the following features exist in and/or within 120 metres (m) of the Project Location:

- Wetlands;
- Coastal wetlands;
- Life Science Areas of Natural and Scientific Interest (ANSIs);
- Earth Science ANSIs;
- Valleylands;
- Woodlands;
- Wildlife habitat; and
- Provincial parks and conservation reserves.

This report identifies the existence and boundaries of all natural features within 120 m of the Project Location based on a review of background records and on-site field investigations. As the project location is within 120 m of natural features, this report provides an evaluation of significance for each identified feature based on either an existing Ministry of Natural Resources (MNR) designation of the feature, or by using evaluation criteria or procedures established or accepted by the MNR.

If the Project extends into the zone of influence for any of the identified significant features (50 m of a provincially significant Earth Science ANSI, 120 m for all other specified natural features) an Environmental Impact Study is required that identifies and assesses any negative environmental effects and identifies mitigation measures (O.Reg. 359/09, s.38).

## 2.0 Records Review

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### 2.1 METHODS

This records review was prepared in accordance with O. Reg 359/09, s. 25 (3).

Background data were collected and reviewed to identify natural features located in or within 120 m of the Project Location. A Natural Environment Report (including vegetation, breeding bird and migrating bird field surveys) was completed for a broader study area that includes the project location by Neil Morris Environmental in 2009 (separate cover); all information relevant to the Brooke-Alvinston Study Area have been summarized here.

Documents reviewed and agencies contacted as part of the records review included but were not limited to:

- Ministry of Natural Resources. Correspondence to Heather Riddell, A/Planning Ecologist, MNR Aylmer District (July, 2010);
- Natural Heritage Information Centre (NHIC) database. February 2007. Natural Areas and Species records search. <http://www.mnr.gov.on.ca/MNR/nhic/nhic.html>. OMNR, Peterborough. Accessed September 2008 and July 2010;
- Ontario Ministry of Natural Resources. 2007. Land Information Ontario (LIO) digital mapping;
- Environment Canada/Canadian Wildlife Service. Correspondence to Rob Dobos, Manager, Environmental Assessment Branch, Environment Canada (July, 2010);
- SARA Schedule Species at Risk web mapping application (Environment Canada, 2006);
- Important Bird Areas database (IBA Canada, undated);
- Official Plan of Lambton County (1997);
- Lambton County. Correspondence with Frank Garardo, Planner, Ezio Nadalin, Planner, and Peter Corbett, Planning Technician (February-March, 2010);
- Township of Brooke-Alvinston Official Plan (2000);
- Various wildlife atlases (birds, mammals, herpetofauna, butterflies);
- Renewable Energy Atlas (2010) Bat hibernacula mapping;
- St. Clair Region Conservation Authority (SCRCA) communications with Chris Durand, GIS Specialist (July, 2010);
- *Bats and Bat Habitats. Guidelines for Wind Power Projects*. Draft. Ontario Ministry of Natural Resources. March, 2010;
- Long Point Bird Observatory (LPBO);
- Bird Studies Canada (BSC);

- Local naturalists groups (Lambton Wildlife Inc., 2009);
- Lambton County Preliminary Environmentally Sensitive Areas Study (University of Waterloo, 1980);
- Critical Unprotected Natural Areas in the Carolinian Life Zone of Canada (Eagles and Beechey, 1985);
- Audubon Society. Christmas Bird Count Data; and
- “Zephyr Farms Inc. Wind Power Project- Natural Environment Study”, Neil Morris Environmental, February, 2009.

Information received from each source and the manner in which it was considered is indicated within the identification of natural features (Section 2.2).

## **2.2 RESULTS**

A review of available background information has indicated the presence of known natural features occurring within the Study Area. The results of the records review search were used to determine whether the Project Location is in a natural feature, within 50 m of an earth science area of natural and scientific interest, or within 120 m of other natural features.

### **2.2.1 Wetlands**

There were no wetlands, or coastal wetlands, identified within 120 m of the Project Location through the records review (LIO, 2007; NHIC, 2007; Lambton County OP 1997).

The closest provincially significant wetland (PSW) to the Study Area is the Brown Creek Woods PSW. It is a 8.7 ha PSW, located approximately 3 km at its closest point from the south-eastern boundary of the Study Area.

### **2.2.2 Areas of Natural and Scientific Interest (ANSIs)**

The Walnut Woodlot Regionally Significant Life Science ANSI and the Brown Creek Regionally Significant Life Science ANSI are found within the vicinity of the Study Area, but do not extend into the Study Area.

There were no life science ANSIs identified within 120m of the Project Location through the records review (LIO, 2007; NHIC, 2007; Lambton County OP 1997).

There were no earth science ANSIs identified within 120m of the Project Location through the records review (LIO, 2007; NHIC, 2007; Lambton County OP 1997).

### **2.2.3 Valleylands**

There were no valleylands identified in the Study Area through the records review (LIO, 2007; NHIC, 2007; Lambton County OP 1997). Regulation mapping of hazard lands by Conservation Authorities can be used to help identify the presence of valleylands (NHRM 2010). The St. Clair Region Conservation Authority has mapped regulated areas extending to within 120 m of the Project Location (SCRCA, 2010). These are shown on Figure 1, Appendix A.

### **2.2.4 Woodlands**

According to Riley and Mohr (1994), Lambton County contains approximately 10.4% woodland cover.

MNR's LIO mapping (2009) indicates the Study Area contains three small, isolated woodlands that are 3.2, 5.4 and 9.7 ha. Woodlands as mapped by LIO are shown on Figure 1, Appendix A. Woodland C is within 120 m of the Project Location.

The Study Area is located in the Niagara section of the Deciduous Forest Region (Rowe, 1972). This area is also known as the Carolinian Forest. The extreme southern tip of Ontario represents the maximum northern limit of Carolinian Forest. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak, and bur oak, butternut, bitternut hickory, rock elm, silver maple and blue beech. Species such as black cherry, black walnut, sycamore, swamp white oak, and shagbark hickory are also occasionally present. Species considered rare to the province, such as pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present. Needle-leaved trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar and black spruce may be found in isolated patches where soil conditions are favourable.

### **2.2.5 Wildlife Habitat**

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle and that are important to migratory and non-migratory species (O.Reg359/09; NHRM, 2010). Wildlife habitat are grouped into four categories (i.e. seasonal concentration areas, rare vegetation communities or specialized habitats, movement corridors and habitats of species of conservation concern).

A compilation of background information on known wildlife use of the Study Area was undertaken. Using this information, a preliminary assessment was conducted to identify wildlife habitat features that may be present in or within 120 m of the Project Location to determine whether the area contains any confirmed significant wildlife habitat (SWH) or involves a trigger for SWH.

The Study Area consists primarily of active agricultural fields (soybean). Natural habitat, that may support wildlife, is limited to hedgerows and three small woodlots (Figure 1, Appendix A).

### **2.2.5.1 Seasonal Concentration Areas**

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The Significant Wildlife Habitat Technical Guide (MNR, 2000) identifies 14 potential types of seasonal concentration areas.

The 14 types of seasonal concentrations are:

1. winter deer yards;
2. moose late winter habitat;
3. colonial bird nesting sites;
4. waterfowl stopover and staging areas;
5. waterfowl nesting sites;
6. shorebird migratory stopover areas;
7. landbird migratory stopover areas;
8. raptor winter feeding and roosting areas;
9. Wild Turkey winter range;
10. Turkey Vulture summer roosting areas;
11. reptile hibernacula;
12. bat hibernacula;
13. bullfrog concentration areas; and
14. migratory butterfly stopover areas.

Deeryards are areas of key winter habitat for white-tailed deer. They usually consist of a coniferous forest, which provides shelter from snow and wind, adjacent to an area of deciduous forest or other foraging habitat. White-tailed deer are known to occur in the vicinity of the Study Area (Dobbyn, 1994) but there are no identified deer yards located in the Study Area (LIO 2007).

A review of LIO mapping showed that in the Study Area, there are no identified avian breeding, roosting, staging or wintering (LIO, 2007). In addition, a background review of the Study Area did not identify any known seasonal concentration areas associated with birds (i.e. known migration stopover or staging areas, colonies, roosting areas or wintering areas) (BSC; IBA undated; LIO, 2007; Cadman et al. 2007). The Study Area is located more than 30 km from the nearest IBA (IBA, undated). The Study Area is not located in close proximity to a lake shore

(i.e. approximately 30 km from Lake Huron) and does not contain features that would concentrate migrating birds (i.e. shorelines, large lakes, peninsulas). Passerine migration studies that were conducted in and around the Brooke-Alvinston Study Area confirm the area does not support this function (NME, 2009).

The Study Area falls within the range of various common species of snake (Oldham and Weller, 2000). Potential hibernacula include features that would provide a route underground, including buried concrete or rock (e.g. building foundations, culverts), rock crevices or animal burrows. There is the potential for reptile hibernacula to be found within the Study Area.

No known bat hibernacula have been identified within the Study Area (Renewable Energy Atlas, 2010). No bat hibernacula features were identified through the record review (i.e. karst topography, abandoned mines, forested ridges). Depending on the species, maternity roosts for bats can include tree foliage, tree cavities and crevices under loose bark, under shutters or shingles, in buildings or between rocks. There are no known maternity roosts in the Study Area.

The Study Area does not contain suitable habitat for bullfrog and is not considered to be in an area that would serve as a butterfly stopover.

#### **2.2.5.2 Animal Movement Corridors**

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (SWHTG, 2000). No animal movement corridors were identified in the Study Area (LIO, 2007). Hedgerows can serve as small linkages (SWHTG, 2000). A review of aerial photography indicates the presence of small linear hedgerows in the Study Area. One, extending north from woodland A, is found within 120 m of the Project Location.

#### **2.2.5.3 Rare Vegetation Communities or Specialized Habitats**

Rare or specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the “state”, or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (i.e., extremely rare to rare – uncommon in Ontario), as defined by the Natural Heritage Information Centre (NHIC), could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant.

#### **Rare Vegetation Communities**

A search of the NHIC database did not identify any records of rare vegetation communities in the Study Area. Aerial photo interpretation and a review of available background information indicates that there are no rare vegetation communities in the Study Area (LIO, 2007; NHIC, 2007; Lambton County OP 1997).

### **Specialized Habitats**

Specialized habitats are microhabitats that are critical to some wildlife species. The SWHTG identifies the following potential specialized habitats:

- habitat for area-sensitive species;
- forests providing a high diversity of habitats;
- old-growth or mature forest stands;
- foraging areas with abundant mast;
- amphibian woodland breeding ponds;
- turtle nesting habitat;
- specialized raptor nesting habitat;
- moose calving areas;
- moose aquatic feeding areas;
- mineral licks;
- mink, otter, marten, and fisher denning sites;
- highly diverse sites;
- cliffs; and
- seeps and springs.

A review of background information and aerial photography of vegetation communities suggests the majority of these features are not expected to occur within the Study Area.

Ontario Breeding Bird Atlas information indicates that the 10x10 km squares that encompass the Study Area contain records of woodland area sensitive breeding birds. Woodlands larger than 10 ha are considered to have the potential to host populations of area-sensitive species (SWHTG, 2000). The only woodland habitat found within 120 m of the project location is woodlot C, which is considerably smaller than 10 ha (Figure 1, Appendix A); it is not considered to have the potential to host sustainable populations of area sensitive species.

#### **2.2.5.4 Species of Conservation Concern**

Species of conservation concern include four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk from certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe.

Rare species are considered at five levels: globally rare, nationally rare (with designations by COSEWIC), provincially rare, regionally rare (at the Site Region level), and locally rare (in the municipality or Site District). This is also the order of priority that should be assigned to the

importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to habitat loss and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

Within the context of O.Reg 359/09, endangered and threatened species are addressed as part of MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (APRD) requirements (September 2009). Information required as part of these requirements is being submitted as part of the Brooke-Alvinston Wind Farm APRD Report (separate cover). Where this information indicates that approvals or permits are required these will be addressed separately through the applicable statute and its permitting process.

Primary and secondary source data were used to determine potential wildlife use of the Study Area. NHIC was used to identify historic records of species of conservation concern that occur from the Study Area. Inventories of wildlife were compiled from available literature and resources including the Atlas of the Mammals of Ontario (Dobbyn, 1994), the Ontario Herpetofaunal Summary (Oldham and Weller, 2000), Ontario Odonata Atlas (NHIC, 2005) and the Ontario Breeding Bird Atlas (Cadman et al., 2007). It is important to note that the exact location of species occurrences are not available from these atlases and, instead, are recorded within 10 x 10 km squares. Therefore the identified species recorded from these databases may not occur within the Study Area.

Species that would be considered of conservation concern (i.e. special concern, low s-ranks), and whose presence would be assessed within an evaluation of significant wildlife habitat in the Study Area are listed in Table 2.1, Appendix B.

The potential for the Project Location to support populations of grassland birds (identified as species of conservation concern) was considered. Ontario Partners in Flight indicate that this part of southern Ontario supports moderate relative densities of avian species associated with grassland habitats (Ontario PIF, 2006). The decline of grassland birds has been identified as a conservation concern (Cadman et al., 2007), and areas containing healthy populations of species belonging to these guilds would be considered for designation of significant wildlife habitat. The Ontario Breeding Bird Atlas results indicate that grassland species designated by PIF as conservation priorities (i.e. Bobolink, Eastern Meadowlark and Vesper Sparrow) were recorded in the 10x10 km squares that overlap with the Study Area.

Criteria as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG, 2000) were used to determine if potentially eligible grassland habitat is present. As indicated in the SWHTG large, contiguous undisturbed grasslands of at least 30 ha (and preferably 50 ha or more) should be protected. The Brooke-Alvinston Study Area is comprised solely of actively cultivated

cropland, with no grassland (pasture, hayfields or fallow land) present. The Study Area does not have the potential to support grassland breeding bird populations.

### **2.2.6 Provincial Parks and Conservation Reserves**

There were no provincial parks or conservation reserves identified in the Study Area through the records review.

## **2.3 SUMMARY**

The results of the records review determined that the only natural features that occur within 120m of the Brooke-Alvinston project location is woodland.

There is also the potential for the project location to contain:

- Wildlife habitat (reptile hibernacula, animal movement corridors and species of conservation concern as indicated in Table 2.1, Appendix B).

A site investigation is required to confirm the presence and boundaries of these features, as well as determine whether any additional natural features exist in, or within 120m of, the Brooke-Alvinston Wind Farm Project Location.

## **3.0 Site Investigation**

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The site investigations were conducted in accordance with O. Reg 359/09, s. 26 (1), Natural Heritage Site Investigation. This report is prepared in accordance with s. 26 (3).

The site investigations in support of this report were completed with the purpose of confirming the status and boundaries of natural features identified through the records review and identifying any additional features. Data collected during the records review concerning natural features and species occurrences were used to guide the scope and direction of site investigations.

The field surveys undertaken detail current conditions within the Project Location and the 120 m investigation zone. Dates, times, duration, field personnel and weather are presented in Table 3.1 (Appendix B). The following provides details of the survey methods.

A map showing the boundaries of any natural feature located within 120 m of the Project Location, the location and type of each natural feature and the distance from the Project location to the natural feature boundaries is provided in Figure 1 (Appendix A).

### **3.1 METHODS**

#### **3.1.1 Vegetation Community and Vascular Plants Assessment**

A botanical inventory and Ecological Land Classification (ELC) of the vegetation communities in the Study Area was conducted on July 26, 2010. Survey times, weather conditions and field personnel are summarized in Table 3.1, Appendix B.

Vegetation communities were delineated on aerial photographs and checked in the field. Vascular plant species lists were recorded separately for each community. Community characterizations were then based on the ELC system (Lee et al., 1998). English colloquial names and scientific binomials of plant species generally follow Newmaster et al. (1998).

Treed areas identified during vegetation surveys were compared to the definition of woodlands provided in O.Reg359/09 to delineate the limits of “woodlands”. Treed areas were also compared to the definition of woodland provided in the Natural Heritage Reference Manual (2010). Information regarding woodland size, ecological function and uncommon characteristics was collected during site investigation and through GIS analysis.

### **3.1.2 Wildlife and Wildlife Habitat**

A survey to determine the presence of habitat that would support seasonal concentrations of animals or specialized habitat for wildlife as outlined in the Significant Wildlife Habitat Technical Guide (2000) was conducted on July 26, 2010. Specific emphasis was placed on determining the presence of suitable amphibian breeding habitat, potential snake hibernacula, or significant bat habitat (i.e. hibernacula or maternity roosts), as well as assessing the presence of species of conservation concern identified through the record review. Survey times, weather conditions and field personnel are summarized in Table 3.1, Appendix B.

#### **3.1.2.1 Bat Maternity Roost Habitat Assessment**

Surveys for habitat features that would support potential bat maternity roosts focused on woodlots and buildings found within the Study Area. Woodlots were traversed and the presence and frequency of features that may support maternity colonies of bats were recorded (i.e. snags, hollow trees or trees with large slabs of loose bark).

#### **3.1.2.2 Amphibian Habitat Assessment**

The amphibian habitat assessment focused on the woodlots, the only portion of the Study Area that was not actively being farmed and provided potential habitat. Each woodlot was visited, and areas of standing water or areas which likely held water through the spring (based on topography and vegetation) were identified. Areas of standing water were investigated for tadpoles. Presence of standing water, potentially active hydroperiod, surrounding vegetation community, in-water vegetation and canopy cover were recorded.

#### **3.1.2.3 Reptile Survey Hibernacula Assessment**

As the Study Area consisted primarily of cultivated agricultural cropland at the time of the survey, the search for reptiles and associated hibernacula features focused on woodland edges, and hedgerows. A mid-late afternoon survey was conducted.

Evidence of reptiles, including direct observation of basking individuals, was searched for. Habitat features that could act as potential hibernacula were recorded, including buried concrete or rock (e.g. building foundations, culverts), rock crevices or animal burrows. All identified features were photographed and a GPS location recorded.

#### **3.1.2.4 Species of Conservation Concern**

Observations of all wildlife observed were recorded. Habitat within the Study Area was assessed for the potential to support historic species of conservation concern that are known to occur within the vicinity of the Study Area.

## **3.2 RESULTS**

A summary of the corrections to the features, or potentially occurring features, identified through the Records Review as a result of the Site Investigation program are outlined in Table 3.2, Appendix B. No new features or functions were identified as a result of the Site Investigation. Figure 1, Appendix A shows the boundaries located within 120 m of the project location of natural features, the location and type of each feature and the distance from the project location to the natural feature boundaries. Field notes for the site investigation are provided in Appendix C.

The Project Location, and associated 120 m is comprised primarily of actively cultivated cropland (soybean). Natural cover within 120 m of the Project Location was restricted to one small, isolated woodland and hedgerows.

### **3.2.1 Wetlands**

No wetlands were identified within 120 m of the Project Location through the site investigation. No corrections were required to the results of the record review as a result of the site investigation (Table 3.2, Appendix B).

### **3.2.2 Areas of Natural and Scientific Interest (ANSIs)**

ANSIs are defined as areas with life or earth science values related to protection, scientific study or education. The site investigation did not identify the presence of life science or earth science values. No corrections were required to the results of the record review as a result of the site investigation (Table 3.2, Appendix B).

### **3.2.3 Valleylands**

Valleylands are defined as a natural area that is south and east of the Canadian Shield and occurs in a valley or other landform depression that has water flowing through or standing for some period of the year (NHRM, 2010). Section 8.3 of the NHRM (2010) was used to guide the identification of valleylands within the Study Area. Site investigations confirmed that the topography of the site is flat, and landform depressions are absent. ELC and vegetation assessments did not indicate the presence of a linear vegetated system within the Study Area (Figure 2, Appendix A). The regulation limits that extend to within 120 m of the Project Location did not meet the criteria to be considered valleylands (NHRM 2010). The site investigation confirmed the absence of valleylands in the Subject Property and this correction was made to the results of the record review (Table 3.2, Appendix B).

### **3.2.4 Woodlands**

The vegetation communities found within the Study Area are described in Table 3.3, Appendix B and shown on Figure 2, Appendix B. A complete list of vascular plant species recorded in the Study Area is provided in Appendix D.

The Study Area was comprised of actively cultivated agricultural fields with three isolated woodlots (A, B and C on Figure 2, Appendix A). Woodland communities typically represented fresh to moist deciduous forest, with the southernmost woodlot containing pockets of deciduous swamp. All woodlots within the Study Area have been managed through selective logging. Only one woodland, woodland C, is found within 120 m of the Project Location. Woodland C is located 135 m north of the closest turbine (to turbine base) and 26 m north of the proposed access road and associated transmission line.

Seventy-three species of vascular plants were recorded from the Study Area during the site investigation. Of that number, 56 species or 77% were native and 17 species or 23% were exotic. Most of the non-native species occurred around the woodland edges and hedgerows, although a few species such as garlic mustard, heal-all and European buckthorn occurred throughout the woodlots. The forest communities were generally in a disturbed state, due to management practices, with relatively low species diversity in the ground layer.

#### **Woodlot C**

This woodlot occurred in the northern portion of the Study Area. It consisted of a single vegetation community, the shagbark hickory dominated FOD9-4. Selective logging has resulted in an open canopy throughout the woodlot and as a result, the understory is comprised of dense thicket.

### **3.2.5 Wildlife Habitat**

Results of the site investigation program are provided below to identify natural features supported by the Project Location. The results are considered within the context of criteria for significant wildlife habitat as outlined within the Significant Wildlife Habitat Technical Guide (2000) in order to determine whether the project location supports candidate or confirmed significant wildlife habitat.

The Study Area is comprised predominately of cultivated agricultural fields. Natural wildlife habitat is limited to the three woodlots (see Section 3.2.4) and hedgerows.

Hedgerows within the Study Area were generally narrow (i.e. 1 to 2 m wide) and void of trees. Mature black walnut, bur oak and white elm trees occurred in one portion of hedgerow, located immediately south of woodlot B. Shrub cover in the hedgerows consisted of European buckthorn, grey dogwood and red raspberry; averaging approximately 5% cover, but reaching up to 40% shrub cover in places.

### **3.2.5.1 Seasonal Concentration Areas**

No bat hibernacula features were identified through the site investigations (i.e. karst topography, abandoned mines, forested ridges). Due to the logging practices that have occurred within the woodlot, standing snags and tree cavities were not common. No natural critical habitat features were identified within 120 m of the Project Location that may support significant bat maternity colonies. The Study Area is not considered to contain candidate Significant Wildlife Habitat for seasonal concentration areas for bats.

No snake hibernacula features were observed within the project location or 120 m zone of investigation.

The site investigation did not indicate the presence of additional features that would be considered candidate significant wildlife habitat.

### **3.2.5.2 Animal Movement Corridors**

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (MNR, 2000). One hedgerow extends to within 120 m of the Project Location. The hedgerow extends approximately 350 m north from woodlot A. It does not directly connect to other natural features. It is a narrow, sparsely vegetated hedgerow that divides two agricultural fields. The canopy cover is limited and is comprised primarily of buckthorn and ash with an understory of grasses and bare patches. The hedgerow is considered to have limited utility for wildlife, primarily due to its narrow width and limited tree cover. Site investigations did not reveal evidence of animal movement corridors as defined in the SWHTG (MNR, 2000).

### **3.2.5.3 Rare or Specialized Habitats**

Woodlot C did not provide amphibian habitat; the woodlot was a dry upland deciduous forest with no vernal pooling evident.

One rare vegetation community, a black walnut lowland deciduous forest is found in Woodlot B. The community has undergone extensive logging resulting in a very open canopy layer. The community is ranked S2S3 (vulnerable to imperiled) in Ontario (NHIC, 2008). The community is located in the Study Area, but is more than 120 m from the Project Location.

No additional specialized habitats were identified in the Project Location through the site investigation.

### **3.2.5.4 Species of Conservation Concern**

All of the native plant and animal species recorded within the Study Area are ranked S5 (Secure in Ontario) or S4 (Apparent secure in Ontario).

No plant or wildlife species of conservation concern were observed during the site investigation. Results of the site investigation and habitat assessment for species of conservation concern identified through the records review are provided in Table 3.4, Appendix B.

## **3.3 QUALIFICATIONS**

The following Stantec personnel were responsible for conducting the site investigation:

- Andrew Taylor, Field Surveyor

*Curricula vitae* are provided in Appendix E.

## **4.0 Evaluation of Significance**

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Natural heritage information collected from the records review, the site investigation and consultations were analyzed to determine the significance and sensitivity of existing ecological features and functions. For all natural features existing in, or within 120 m of, the Project Location, a determination was made of whether the natural feature is provincially significant, significant, not provincially significant or not significant.

One natural feature, woodlot C, was identified within 120 m of the Project Location, requiring an evaluation of significance.

### **4.1 METHODS**

Global, national and provincial status of wildlife and plants was provided by the Natural Heritage Information Centre. Status rankings are primarily based on the number of occurrences within each respective jurisdiction.

Provincial designations for endangered, threatened and special concern species were obtained from the most recent Committee on the Status of Species at Risk in Ontario (COSSARO) assessments and consideration of species and habitat protection was determined according to the *Endangered Species Act* (ESA, 2007). Federally, designations for endangered, threatened and special concern species were obtained from the most recent Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessments and the schedules of the *Species At Risk Act* (SARA) were used to determine species protection.

Woodlands were considered to be significant if MNR has identified them as such, or when evaluated as significant using procedures established by MNR. The local planning authority is responsible for designating significant woodlands. In the absence of defined local criteria for the determination of significant woodlands the provincial guidelines of the Natural Heritage Reference Manual (NHRM) (MNR, 2010) were used to assess the significance of the woodland. Criteria suggested by the NHRM for designating significant woodlands include woodland size, ecological function, uncommon woodland characteristics and woodland economic and social value. In the case of woodland size, the suggested criteria changes depending on the amount of forest cover in the planning area. For instance, where there is less than 5% forest cover, it is suggested that woodlots 2 hectares in area or larger should be evaluated for significance compared to 4 hectare woodlots in areas with 5% to 15% forest cover, and 20 hectare woodlots for areas with 15 to 30% forest cover.

Lambton County has defined significant woodlands as those located in Primary Corridor or Significant Natural Area designations, or any contiguous forested area that is 4 hectares, or greater in size (Lambton County Official Plan, 1997). Significant woodlands have been mapped in the Official Plan for Brooke-Alvinston (2000).

Woodland C was not designated as significant by Lambton County or the Township of Brooke-Alvinston (Lambton County Official Plan, 1997; Official Plan for Brooke-Alvinston, 2000). An evaluation of whether it would be considered significant was conducted using criteria outlined in the NHRM (2010).

## **4.2 RESULTS**

Site investigation field sheets are provided in Appendix C. Information on vegetation communities is provided in Table 3.3, Appendix B and shown on Figure 2, Appendix A.

Size- Woodlot C is 3.2 ha. Forest cover in Lambton County is 10.4% (Riley and Mohr, 1994). For areas with 5%-15% forest cover, woodlots over 4 ha in size are considered significant (NHRM, 2010). Based on the size criteria outlined in NHRM, the woodland is not considered significant.

Ecological Function- the woodlot does not provide interior habitat (i.e., >100 m from the edge) or amphibian habitat. It is a small, isolated woodlot with little diversity, located within agricultural land. It does not provide linkages to other habitats and is not located within a sensitive hydrological feature. It did not contain specialized habitat features such as vernal pools, snags or cavities. No declining, rare, interior, or area-sensitive breeding birds occurred within the woodlot (NME, 2009). Given the extensive harvesting that had occurred the canopy was open and a dense thicket understory, including European buckthorn, had developed. The woodlot is not considered significant based on its ecological function.

Uncommon Characteristics- the woodlot is not considered uncommon in terms of species composition, cover type, age or structure. The woodlot contained one ELC community, considered very common in Ontario. No uncommon species were identified within the feature (see Appendix D).

Economic and Social Functional Values- the woodlot has undergone extensive harvesting. Given its small size and species composition, it is not considered to have significantly high economic value.

Using procedures established by MNR woodlot C is not significant. No significant woodland is located within 120 m of the Project Location.

## **4.3 SUMMARY**

This Natural Heritage Assessment was undertaken to identify natural features found within the Brooke-Alvinston Wind Farm and evaluate their significance. This report has been prepared in accordance with O. Reg. 359/09.

Based on an assessment of background information and the results of on-site field investigations no significant natural features were identified within 120 m of the Project Location.

#### **4.4 QUALIFICATIONS**

The following Stantec personnel were responsible for the application of evaluation criteria and procedures:

- Nicole Kopysh, Project Manager

*Curricula vitae* are provided in Appendix E.

#### **STANTEC CONSULTING LTD**



Nicole Kopysh  
Project Manager



Robert Rowland MSc, P.Geo.  
Senior Project Manager

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