

## **Appendix L**

# **Ostrander Wind Energy Park Environmental Effects Monitoring Plan**

Ostrander Point Wind Energy Park  
Environmental Effects Monitoring Plan for Wildlife and Wildlife  
Habitat

**FINAL DRAFT**

**May 2011**

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## 1.0 Introduction

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### 1.1 BACKGROUND

Gilead Power Corporation (“Gilead”) is an Ontario-based, renewable energy development company dedicated to providing renewable energy for Ontario. In response to the Government of Ontario's initiative to promote the development of renewable, pollution-free electricity in the province, Gilead is proposing to develop the Ostrander Point Wind Energy Park (the Project) in Prince Edward County, Ontario. The Project includes nine (9) GE xl 2.5 MW wind turbine generators with a total installed nameplate capacity of 22.5 MW and supporting infrastructure (substation, electrical collector lines and access roads).

Gilead 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 Post-Construction Monitoring Plan is one component of the Mitigation and Environmental Effects Monitoring Plan (EEMP) of the REA Application for the Project, and has been prepared in accordance with O. Reg. 359/09, the Ontario Ministry of Natural Resources' (MNR's) *Approval and Permitting Requirements Document for Renewable Energy Projects* (September 2009) and the *MOE's draft Technical Bulletin Two: Guidance for preparing the Design and Operations Report* (March 2010).

BirdLife International, in cooperation with Bird Studies Canada and Nature Canada has identified an “Important Bird Area” (IBA) in Prince Edward County, of which the Project Location is a part, due to the presence of what it believes are globally significant concentrations of waterfowl and nationally significant concentrations of waterbirds and seabirds (IBA Canada, undated, Wilson and Cheskey, 2001).

As discussed in **Appendix E (the Bird Report)** of the Project's **Natural Heritage Assessment and Environmental Impact Study (NHA/EIS)**, primary data was collected through multiple-year bird and bat baseline studies in the Project area pre-construction. This data was augmented with secondary data from published and unpublished sources to generate a dataset from which to assess the potential effects of the Project.

The potential environmental effects to wildlife and wildlife habitat and recommended mitigation measures, based upon this dataset, ornithological advice, and professional opinion, are set out in **NHA/EIS Section 5**. Additionally, wildlife and wildlife habitat post-construction monitoring commitments are summarized in **Table 5.3, Appendix B** of the **NHA/EIS** and are elaborated on in this document.

The purpose of this EEMP is to assess the effectiveness of the proposed mitigation measures in consideration of applicable provincial and federal legislation and guidelines. The EEMP also provides a response and contingency plan if these criteria and standards are not met. The monitoring plan summarized in the provides details on the post-construction wildlife monitoring program for

1. mortality of breeding birds, migratory landbirds, migratory raptors (fall) and bats
2. effects of disturbance on breeding birds, migratory landbirds, and amphibians; and
3. the effectiveness of mitigation in the form of alvar restoration and management.

Monitoring will confirm the accuracy of the impact assessments summarized in the NHA/EIS and will provide a factual foundation and basis for the implementation of the response and contingency plan described in this EEMP.

## 2.0 Post-Construction Monitoring Program

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### 2.1 PURPOSE AND TIMING

The purpose of the wildlife post-construction monitoring program in this EEMP is to identify performance objectives, assess the effectiveness of the proposed mitigation measures and to identify a response and contingency plan that will be implemented if performance objectives cannot be met. Furthermore, any unanticipated potentially significant adverse environmental effects discovered during the post-construction monitoring program will be mitigated as described in Section 3.0. A further detailed below, post-construction monitoring for wildlife and wildlife habitat recommended in the **NHA/EIS** includes the following:

- *mortality monitoring*: twice weekly (3-4 day intervals) mortality monitoring at all turbines from May 1 to October 31, and weekly monitoring for raptors during November, for a period of at least three years. Searcher efficiency and scavenger trials will be conducted each year in accordance with MNR guidance documents.
- *potential disturbance effects to shrubland/successional breeding birds survey*: Fourteen pre-construction point count stations (7 within 120 m of Project Location, 7 located more than 120 m from Project Location - "control stations") will be surveyed in shrubland habitat within the area considered to be significant habitat for declining shrub/successional breeding bird species. Point counts will be carried out using the same methods as the pre-construction surveys and will be conducted twice in June, annually for at least three years. Breeding pair density is a standard measure that can be compared among years or between control/impact sites.
- *potential disturbance effects to migrating birds*: Surveys will be conducted to assess use of the Project area by spring and fall migrating landbirds. The number of species and the number of individual migratory landbirds will be monitored across a transect through variety of habitats and compared to pre-construction conditions, four days per week in May and in mid-August through October, for at least three years.
- *potential disturbance effects to breeding amphibians*: Surveys will be conducted to assess changes in the use of significant amphibian breeding habitat within 120 m of the project. A point count-based study will be based on the methods outlined in Environment Canada's Road Call Counts program, modified for off-road use. One new point count will be established in 2011 and will be monitored for at least two years post-construction.
- *effectiveness of alvar restoration and management*: Alvar restoration (seeding and/or transplantation of alvar species) areas will be visually inspected to determine germination and transplantation success rates. Alvar management (buckthorn control) areas will be visually inspected to quantify invasive species removal rates.

## 2.2 PRIMARY DATA COLLECTION

Data collection will be conducted by field personnel skilled at identifying birds by song and sight, bats by sight, and amphibians by call. To the extent possible, the same field personnel who carried out the pre-construction baseline studies will carry out the post-construction monitoring works to assist in standardizing the datasets.

The detailed monitoring methods, including duration, frequency and survey locations are discussed below.

### 2.2.1 Bird Mortality Monitoring

#### ***Background***

The Project is a Category 4 Level of Concern project from the perspective of bird use, based on criteria provided in EC's Guidance (Environment Canada 2007). As noted in this guidance document, projects in this category present a relatively high level of potential risk to birds and require the highest level of effort with respect to environmental assessment, including follow-up monitoring.

Draft *Bird and Bird Habitats: Guidelines for Wind Power Projects* were released by the MNR in October, 2010, and have been considered during the preparation of this monitoring plan (MNR, 2010b).

#### ***Monitoring***

Mortality monitoring within minimally-vegetated portions (i.e., Visibility Classes 1 and 2 [MNR, 2010b]) of a 50 m search area radius from the base of all wind turbines will be conducted twice-weekly (3-4 day intervals) between May 1 and October 31. A weekly mortality survey will also be conducted at all turbines in November to assess raptor mortality.

Although all reasonable efforts will be made to conduct surveys as scheduled, surveys will not be conducted if weather (e.g. lightning, severe fog) presents safety concerns. Weather conditions will be noted when surveys were not conducted as scheduled, and every attempt will be made to complete the missed survey(s) as soon as possible.

Searcher efficiency and scavenger trials will be conducted in accordance with EC and MNR guidelines. Searcher efficiency trials will typically be conducted once in each of spring, summer and fall, but will be repeated if searchers change during the year. Searcher efficiency trials are designed to correct for carcasses that may be overlooked by surveyors during the survey periods. Searcher efficiency trials involve a "tester" that places bird and bat carcasses under turbines prior to the standard carcass searches to test the searcher's detection rate. Trial carcasses will be discreetly marked so they can be identified as study carcasses. Each trial will consist of a minimum of 10 carcasses per searcher per visibility class. Searcher efficiency (Se) is calculated for each searcher as follows:

$$Se = \frac{\text{number of test carcasses found}}{\text{number of test carcasses placed} - \text{number of test carcasses scavenged}}$$

Scavenger trials will be conducted once a month (May-Oct) and will involve 10 carcasses of bird and bat turbine fatalities, if available, or dark-coloured poultry chicks. If available, at least one raptor carcass will be used for some trials. Carcasses will be discreetly marked so they can be identified as study carcasses. Scavenger trials are designed to correct for carcasses that are removed by predators before the search period. These trials involve the distribution of carcasses in habitat types being searched, at known locations at each wind turbine generator, followed by periodic checking to determine the rate of removal. Proportions of carcasses remaining after each search interval are pooled to calculate the overall scavenger correction factors:

$$Sc = \frac{n_{visit1} + n_{visit2} + n_{visit3} + n_{visit4}}{n_{visit0} + n_{visit1} + n_{visit2} + n_{visit3}}, \text{ where}$$

**Sc** is the proportion of carcasses not removed by scavengers over the search period

**n<sub>visit0</sub>** is the total number of carcasses placed

**n<sub>visit1</sub> – n<sub>visit4</sub>** are the numbers of carcasses remaining on visits 1 through 4

There are numerous published and unpublished approaches to incorporating these corrective factors into an overall assessment of total bird and bat mortality. The estimated mortality will be calculated as follows:

$$C = c / (Se \times Sc \times Ps), \text{ where}$$

**C** is the corrected number of bird or bat fatalities

**c** is the number of carcasses found

**Se** is the proportion of carcasses expected to be found by searchers (searcher efficiency)

**Sc** is the proportion of carcasses not removed by scavengers over the search period

**Ps** is the percent of the area searched.

Most birds and bats will fall within 50 m of the turbine base (MNR, 2010a). This value will be used to determine the percent of area searched (Ps). When the entire 50 m radius search area is searched, Ps will equal 100%. If portions of the 50 m radius search area are impossible or futile to search due to site conditions such as standing water or dense vegetation, Ps will be adjusted accordingly based on the searchers' ongoing estimates of the proportion of the search area that was physically searched. An alternative option is to use a GPS to delineate the search area and calculate the Ps.

The area searched will be determined for each turbine by mapping searchable areas on a grid (by visibility class) and counting the number of searched grid cells within 50 m. Maps of the varying search areas will be made available to review agencies. The summed area of those

cells will be divided by the total area within a 50 m radius circle to determine the percent area searched for that turbine ( $Ps_x$ , where x is the turbine number).

$$Ps_x = \frac{\text{area searched within 50 m radius circle}}{7854 \text{ m}^2}$$

The overall  $Ps$  for the facility will be calculated as the average of  $Ps_1$  through  $Ps_9$ .

Observed fatalities will be photographed, and the species, GPS coordinates, substrate, carcass conditions, and distance and direction to the nearest turbine will be recorded along with the date, time and searcher. This approach to mortality monitoring will facilitate any potential correlation between mortality occurrences, turbine location, habitat/land use features, and season.

Bird carcasses in good condition may be collected and stored in a freezer for future use in searcher efficiency and/or scavenger removal trials. Persons handling bird carcasses will take reasonable precautions (e.g. gloves, tools etc.) to protect their personal health. Bird carcasses will be placed in heavy-duty plastic bags and transported that day to a freezer, where they will be stored until required for the trials. Carcasses of any species covered under the *Endangered Species Act, 2007* ("ESA") or the federal *Species at Risk Act* ("SARA") will be collected in a manner consistent with the conditions of applicable permits (see below). All other bird carcasses will be left in place and noted to avoid double-counting during future searches.

As of 30 June 2008, species that are extirpated, endangered, or threatened are protected under the *ESA*. Consequently, unless otherwise authorized, possession and transport of species at risk is prohibited under the *ESA*. Therefore, in order to carry out the various activities contemplated in this Plan, a permit under clause 17(2)b of the *ESA* is necessary to allow Gilead and its agents to collect, possess, and transport species at risk as obtained from the study area. Any conditions attached to the permit relating to handling of injured birds, including raptors and species at risk, will of course be adhered to.

Additionally, in support of the activities contemplated in this Plan, Gilead or its agents will apply for a scientific collector's permit under the *Fish and Wildlife Conservation Act* ("FWCA") from the MNR that would allow the Gilead and its agents to possess and transport a species protected by this legislation.

Finally, Gilead or its agents will apply to EC (Canadian Wildlife Service) for a scientific collector's permit under the *Migratory Bird Convention Act, 1994* ("MBCA") that would allow Gilead and its agents to collect, possess, and to utilize for scientific research purposes, deceased specimens of migratory birds obtained from the study area.

Other permits, approvals, authorizations, etc., are not likely to be required from the MNR or EC to permit the monitoring activities contemplated in this Plan.

## 2.2.2 Bat Mortality Monitoring

### *Background*

Bat mortality has been documented at wind power facilities in a variety of habitats across North America. Nearly every monitored wind power facility in the United States and Canada has reported bat mortality with minimum annual mortality varying from < 1 to 50 bat fatalities/turbine/year (MNR 2006). The majority of bat fatalities at wind power facilities occur in the late summer and fall, and the long-distance migratory bats (i.e., hoary bat, eastern red bat, silver-haired bat) appear to be most vulnerable to collisions with moving turbine blades. Specific factors causing bat mortality and affecting species vulnerability to wind turbine mortality remain unclear, although recent evidence from Alberta suggests that air pressure differences in the blade vortices may contribute to bat mortality. Ontario specific data is relatively sparse at this time.

### **Monitoring**

Bat mortality monitoring will be conducted according to MNR's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (2010b). In general, the mortality monitoring for bats will be undertaken in conjunction with bird mortality monitoring (described above).

- Bat mortality monitoring will be conducted twice-weekly (3-4 day intervals) within minimally-vegetated portions (i.e., Visibility Classes 1 and 2 [MNR, 2010b]) of a 50 m search area radius from the base of all turbines between May 1 and September 30 for a three-year period in accordance with MNR guidelines. This time period includes the core season when resident and migratory bats are active. Bat mortality monitoring will be conducted in conjunction with other monitoring activities (birds) for efficiency.
- Searcher efficiency trials will be conducted seasonally and carcass removal trials will be conducted monthly between May 1 and September 30. Searcher efficiency and carcass removal rates are known to be more variable for bats than for birds throughout the year and depending on habitat (in part due to the relative size of the species).

As with birds, trial carcasses will be discreetly marked so they can be identified as study carcasses. Each trial will consist of a minimum of 10 carcasses per searcher per visibility class (for searcher efficiency trials) or per trial (for scavenger removal trials). At least one-third of the trial carcasses should be bats.

Bat carcasses in good condition may be collected and stored in a freezer for future use in searcher efficiency and/or scavenger removal trials. Persons handling bat carcasses will take reasonable precautions (e.g., gloves, tools etc.) to protect their personal health. All searchers will ensure they have updated rabies pre-exposure vaccinations. Biological material will be disposed of in a way to ensure that it does not pose a public or environmental health risk and in accordance with any applicable federal, provincial, and municipal laws.

### **2.2.3 Shrubland/Successional Breeding Bird Surveys**

#### **Background**

The shrubland habitat located in and adjacent to the Project location supports five breeding shrub/successional bird species that have been identified as priority species by Ontario Partners in Flight (**NHA/EIS, Section 4.2.5.3**). In consideration of the observed pair density of these species and the extent of the shrubland habitat, the site was determined to provide significant wildlife habitat in the form of habitat for species of conservation concern (declining avian shrub/successional breeding species).

A post-construction point count-based study will be implemented to assess any actual disturbance effects to breeding shrubland and successional bird species. Fourteen pre-construction point count stations will be surveyed in shrubland habitat within the area considered to be significant habitat for declining shrub/successional breeding bird species.

### ***Monitoring***

All of the 14 pre-construction point count stations located in shrub/successional habitat will be resurveyed using the same protocols used during the pre-construction surveys as described in **Appendix E** of the **Draft NHA/EIS**, and attached as **Appendix A**. Seven of the stations are within 120 m of the project location and 7 are more than 120 m outside of the project location and will be considered 'control' sites. Each of the surveys will include a ten-minute point count at each location and each point will be surveyed twice in June, during the peak of the breeding season, for a minimum of three years. Breeding pair density is a standard measure that will be used to compare among years or between control (> 120 m) and impact sites (< 120 m).

The number of shrub/successional species observed will be compared to pre-construction conditions. Particular attention will be paid to dominant species or those species identified as priority species that breed consistently or in high numbers on the site.

MNR, along with the proponent and other relevant agencies, will be asked to collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect is occurring, and whether such an effect is attributable to the wind turbines and not external factors. These discussions will determine if and when the response and contingency plan will be implemented and if any additional measures are warranted. The best available science and information will be considered when determining appropriate mitigation.

## **2.2.4 Migratory Landbirds**

### ***Background***

Woodland adjacent to the Great Lakes shoreline can serve as important stopover location for migrating landbirds. Additionally, the Prince Edward County South Shore IBA has been identified in part due to its importance to migratory landbirds. In consideration of the woodland's proximity to the shoreline, and the results of field surveys during migration, it was determined that the site supports significant wildlife habitat in the form of seasonal concentration areas (migratory landbird stopover areas) (**NHA/EIS, Section 4.2.5.1**).

Disturbance effects on migratory landbirds was assessed because the project is located within an IBA which BirdLife International has identified an area of global significance for concentrations of landbirds (e.g., Tree Swallow, Blue Jay, Black-capped Chickadee, Golden-crowned Kinglet, Ruby-crowned Kinglet, Yellow-rumped Warbler, Dark-eyed Junco and White-throated Sparrows) during spring and fall migratory periods (Wilson and Cheskey, 2001). Post-construction transect surveys will be implemented to assess any actual disturbance effects to migratory landbirds.

### ***Monitoring***

Transect survey routes for migrating landbirds will be conducted through a variety of habitats. The route locations and survey methods will be the same as during pre-construction (**Appendix A**), providing technical and statistical validity to assess disturbance effects. Surveys begin half an hour after sunrise and continue for approximately two hours. The number of individuals of each species observed on the surveys is recorded and the results will be compared to pre-construction data. The surveys will be conducted on four days per week in spring (during the month of May) and fall (between mid-August and October) for a minimum of three years. Pre-construction data were collected seven days per week and so the post-construction results will be pro-rated for survey effort (e.g., compared as individuals or species per surveyor hour or per 100 m of transect).

MNR, along with the proponent and other relevant agencies, will be asked to collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect is occurring, and whether such an effect is attributable to the wind turbines and not external factors. These discussions will determine if and when the response and contingency plan will be implemented and if any additional measures are warranted. The best available science and information will be considered when determining appropriate mitigation.

### **2.2.5 Amphibian Breeding Habitat**

#### ***Background***

Field surveys conducted in support of the NHA/EIS indicated the presence of habitat features, such as water that persists through the breeding season, appropriate canopy coverage, and supporting downed woody debris, that are indicative of amphibian breeding habitat. Considered together with the results of call counts, the ash swamp adjacent to the southeast corner of the Project location was determined to be significant wildlife habitat in the form of specialized habitats (amphibian woodland breeding).

Noise disturbance from turbine operations has the potential to affect breeding amphibians because they communicate by call. Reproductive success is related to calling effort in frogs (Sun and Narins, 2004) and if noise disturbance from turbines interferes with calling rates, their breeding success could be affected (Sun and Narins, 2004, Penna et al., 2005). Post-construction amphibian surveys will be implemented to assess any actual disturbance effects on breeding amphibians.

#### ***Monitoring***

Amphibian call count surveys will be conducted following the pre-construction protocols, which followed the protocols identified in the Marsh Monitoring Program Manual (Bird Studies Canada 1994) and the Amphibian Road Call-Counts Participants Manual (Environment Canada, 1997). The protocol involves a surveyor standing at the call station and listening for three minutes. Amphibians are recorded if they are within 100 m of the surveyor. Calling activity will be ranked using the following abundance code categories: (1) calls not simultaneous – number of individuals can be accurately counted; (2) some calls simultaneous – number of individuals can

be reliably estimated; and (3) full chorus – calls continuous and overlapping, so number of individuals cannot be reliably estimated.

Post-construction monitoring will include monitoring of the presence of calling amphibians in seasonal concentration areas within 120 m of the Project Location (with consideration for pre-construction species presence), at a newly-established point in the wetland adjacent to Turbine 9 (which is 100 m from the provincially significant coastal wetland), once in each of April, May, and June for a minimum of two years post-construction. The proposed location of the point is shown on Figure 1 of **Appendix A**. Surveys are conducted between one-half hour after sunset and midnight. Consistency in the survey methods will provide technical and statistical validity to compare disturbance effects pre- and post-construction.

MNR, along with the proponent and other relevant agencies, will be asked to collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect is occurring, and whether such an effect is attributable to the wind turbines and not external factors. These discussions will determine if and when the response and contingency plan will be implemented. The best available science and information will be considered when determining appropriate mitigation.

## **2.2.6 Alvar Habitat**

### ***Background***

Meadow, shrub and treed alvar communities, together with alvar indicator plant species, were identified within and adjacent to the Project location. The MNR considers all alvar habitat in Ecoregion 6E to be provincially rare, and as a result these communities are all considered significant wildlife habitat in the form of rare habitats.

Limited clearing of natural alvar vegetation is required for the Project. Additionally, areas adjacent to constructed roads and turbine pads have increased potential for the introduction or spread of exotic species. The invasive Common Buckthorn was found throughout the subject property. The success of alvar restoration (reseeding and/or transplantation of alvar species into suitable cultural meadow habitat) and management (mechanical removal and control of Common Buckthorn) will be monitored in years 2 and 3 following construction of the Project.

### ***Monitoring***

Monitoring of alvar restoration areas will involve a complete ELC assessment, and quantitative visual inspections of reseeded or transplanted specimens. Six 1 x 1 m plots will be established in each of the three restoration areas prior to restoration activities. In the fall of year two and year three, following construction, each plot will be examined and information recorded regarding the species composition, coverage and vegetation height. Together with the seeding/planting densities and composition, this information will be used to determine the following:

- Percentage of species successfully seeded (# of species present/# species seeded)

- Transplant survival rate (# specimens present/# specimens transplanted, or density of specimens present/density of specimens transplanted)
- Ground coverage of alvar species and all species

Monitoring of the alvar management area will involve visual inspection of ten 10 x 10 m plots to quantify the number of Common Buckthorn specimens that are successfully eliminated. In the fall of year one and year three, following construction, the density of Common Buckthorn (stems >5 cm dbh per m<sup>2</sup>) will be determined through direct count and compared to pre-construction densities. In plots where Common Buckthorn is very dense, counts in several smaller subplots may be extrapolated to determine the number of stems in the 10 x 10 m plot. In plots where Common Buckthorn is less abundant, it may be possible to relocate a sampling of cut stems and estimate the percentage of cut stems that have successfully been eliminated.

The monitoring of restoration and management areas will also include a botanical inventory to detect the presence of any new invasive species (defined as non-native species with a Weediness Index of -2 or -3).

Any changes to hydrological conditions will be determined through weekly visual inspection during construction, and once seasonally in spring and summer the first year post-construction.

### **2.3 Reporting and Review of Results**

Annual post-construction monitoring reports will summarize and analyze the results of all wildlife surveys. Reports will be submitted to the MOE within three months of the conclusion of the October mortality monitoring. All pre- and post-construction data, collected in accordance with MNR guidance and reported to MOE, will be made available for entry into the joint Canadian Wildlife Service – Canadian Wind Energy Association – Bird Studies Canada – Ontario Ministry of Natural Resources Wind Power and Birds Monitoring Database.

The monitoring program will be reassessed by MNR and Gilead at the end of each monitoring year. Pending the reassessment results, modifications to the program methods, frequencies, and duration may be proposed by Gilead in consultation with the MNR or directed by the MNR as circumstances and the ongoing monitoring program results warrant.

### 3.0 Adaptive Management Program

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The adaptive management program described in this section outlines performance objectives, and a response and contingency plan that will be implemented should the performance objectives not be met.

The response and contingency plan includes an adaptive management approach. An adaptive management approach allows mitigation measures to be implemented in the event that unanticipated potentially significant adverse environmental effects are observed. Potentially significant adverse effects will be assessed through review of the annual report.

The following sections describe the procedures for notifications, reporting, and adaptive management for mortality and disturbance effects monitoring.

#### 3.1 MORTALITY MONITORING

All bird and bat mortality will be reported in the annual report submission. Mortality rate is expressed as the number of fatalities per turbine per year (i.e. from May 1 to November 30). Mortality of priority species in Bird Conservation Region (“BCR”) 13 and mortality of all species of conservation concern, such as raptors and declining shrubland/successional species, will be highlighted in the annual post-construction monitoring reports. A threshold approach will be used to assess negative effects resulting from the operation of wind turbines which require response and contingency measures.

##### 3.1.1 Birds

Appropriate contingency measures, as described below, including operational controls, will be determined in consultation with MNR if annual mortality of birds exceed the following thresholds established by the MNR:

- 18 birds/ turbine/year at individual turbines or turbine groups
- 2 raptors or vultures/wind power project (<10 turbines)

or if bird mortality during a single mortality monitoring survey exceeds:

- 10 or more birds at any one turbine or
- 33 or more birds (including raptors) at multiple turbines.

Any and all mortality of species at risk (i.e., a species listed as Endangered, Threatened or Special Concern under Schedule 1 of the federal Species at Risk Act or a species listed on the Species at Risk in Ontario list as Extirpated, Endangered, Threatened, or Special Concern under the provincial Endangered Species Act, 2007) will be reported immediately to EC and/or the MNR.

If with due consideration of seasonal abundance and species composition, annual mortality levels exceed the thresholds noted above, MNR direction will be sought on an appropriate response plan as set out in the MNR's Bird Guidelines (2010a), which may include some or all of the following mitigation measures (or alternate plan reasonably agreed to between Gilead and the MNR<sup>1</sup>):

- Periodic shut-down of select turbines (MNR, 2010a)
- Blade feathering (operational control of the turbine cut in speed) at specific times of year (MNR, 2010a)
- Increased reporting frequency to identify potential threshold exceedance in a timely way
- Additional behavioural studies to determine factors affecting mortality rates

### **3.1.2 Bats**

- Operational mitigation is required where annual post-construction mortality monitoring exceeds 10 bats per turbine per year (MNR, 2010b).

Operational mitigation to be implemented includes increasing cut-in speed to 5.5 m/s or feathering wind turbine blades when wind speeds are below 5.5 m/s between sunset and sunrise, from July 15 to September 30, as set out in the MNR's Bat Guidelines (2010b).

## **3.2 DISTURBANCE EFFECTS**

### **3.2.1 Wildlife**

A performance objective of no ecologically significant disturbance effects on breeding birds, migrating landbirds, or amphibians was identified in the NHA/EIS (see Table 5.3).

Gilead in consultation with the MNR will review the post-construction monitoring results to determine if an ecologically significant disturbance effect on breeding birds, migrating landbirds, or amphibians is occurring, and whether such effect is attributed to the wind turbines and not external factors.

Should the performance objectives not be met, there are a number of response and contingency measures that may be implemented in consultation with MNR. These include the following:

- Compare declines to population trends noted through province or continent-wide breeding bird surveys
- Develop additional paired point count study and/or control/impact study to confirm that decline is due to turbine disturbance, and determine extent of disturbance effect
- Investigate habitat management means to increase breeding density

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<sup>1</sup> An alternate plan maintains flexibility within the Plan to consider alternative response ideas that may arise over the course of the Plan (e.g., changes in technology).

- Additional post-construction monitoring and/or mitigation as determined by MNR where post-construction monitoring identifies ecologically significant disturbance effects.

Discussions with MNR based on post-construction disturbance monitoring will determine whether mitigation is required to replace the habitat lost through displacement, and could include, for example:

- Expanding survey to adjacent areas (e.g., to determine if the effects are localized)
- Mitigation banking, land donation, or conservation easements may be considered
- A reasonable financial contribution from Gilead to an independent, qualified third party (e.g., university) to further expand the knowledge base related to bird or amphibian conservation through research.
- Operational controls, such as periodic turbine shut-down and/or blade feathering

### **3.2.2 Wildlife Habitat**

The performance objective for alvar management is reduction in the amount of Common Buckthorn >5 cm dbh within 120 m of the Project location by 75% over three years, and an overall reduction of Common Buckthorn in the study area. If initial control measures do not achieve a 75% success rate, the mechanical removal should be repeated. If new invasive species are introduced, a species-specific control and monitoring plan will be developed in consultation with MNR.

The performance objective for alvar restoration is to increase the amount of alvar habitat within the study area by 4.2 ha (as determined through ELC), and defined as persistence of 75% of species introduced by seed, with 30% ground coverage of these species after three years, or survival of 75% of transplanted stock. If initial restoration efforts do not meet the performance objectives, seeding or transplantation will be repeated.

The purpose of the hydrological monitoring described in Section 2.2.6 of this document is to avoid significant ponding or drying of alvar habitat. Should such changes be observed, contingency measures will be developed on a site-specific basis, and may include installation of additional culverts.

The results of the alvar management and restoration project will be collectively evaluated at the end of the three-year program.

## 4.0 Best Management Practices

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The following best management practices will be incorporated into the post-construction monitoring program (per MNR, 2010b).

### 4.1 WHITE-NOSE SYNDROME

Carcasses of the following species found during bat mortality searches may be sent to the Canadian Cooperative Wildlife Health Centre for analysis of White-nose Syndrome and should not be used in carcass removal or searcher efficiency trials.

- *Myotis septentrionalis*
- *Myotis lucifugus*
- *Myotis leibii*
- *Perimyotis subflavus*
- *Eptesicus fuscus*

### 4.2 BAT TISSUE SAMPLES

Tissue samples from bat carcasses may be used in a number of DNA analyses to provide insight into population size and structure, as well as the geographic origin migrants. Gilead will contact the local MNR office prior to disposing bat carcasses, to determine if either of the foregoing are appropriate.

## 5.0 References

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## **Appendix A**

# **Summary of Pre-Construction Survey Methods**

## Summary of Pre-Construction Survey Methods

### **Migratory Landbirds**

Daily spring migrant area searches were completed by Acadia between May 2 and June 2, 2008. Daily fall migrant surveys were conducted by Acadia between August 12 and October 28, 2008. Early morning area searches were conducted daily starting 0.5 hours after sunrise and continuing for approximately 2 hours in spring and 1 hour in fall. The same route was walked each day and is shown in **Figure 1**. Species and number of birds observed along the route were recorded.

### **Breeding Birds**

Two, two-day rounds of surveys for breeding birds were conducted, one in early June and one in late June, 2008. Surveys were comprised of point counts and were augmented by area searches through the Study Area. Surveys began at, or within, half an hour of sunrise and were completed by 10:00 a.m. Weather conditions (i.e., precipitation and visibility) were within the parameters required by monitoring programs such as Environment Canada's Breeding Bird Survey or the Ontario Forest Bird Monitoring Program. The majority (14) of point counts were conducted in shrublands.

Point counts were conducted in compliance with Environment Canada's "Recommended Protocols for Monitoring Impacts on Wind Turbines on Birds" (Environment Canada, 2007b). Ten minute point counts were conducted twice at each station, in early June and late June. Bird observations were recorded at four distance regimes, within a 50 m radius, 50 to 100 m, outside the 100 m radius, or flyovers. For each point count, a record was made of the start time and a hand held GPS unit was used to georeference its location. A brief description of the habitat was made for each point count.

The heights of birds within the 100 m radius were recorded. Four height regimes were used, on ground or below blade sweep (0 to 35 m), at blade sweep (35 to 125 m), above blade sweep (125 to 150 m), and well above blade sweep (over 150 m).

To standardize the data, densities per 10 ha were calculated for each point count.

Ministry of  
Natural Resources  
Peterborough District Office  
300 Water Street  
1<sup>st</sup> Floor, South Tower  
Peterborough, Ontario K9J 8M5

Ministère des  
Richesses naturelles

Telephone: (705) 755-2001  
Facsimile: (705) 755-3125



December 9, 2010

Valerie Wyatt  
Senior Project Manager  
Stantec  
Suite 1 - 70 Southgate Drive  
Guelph ON N1G 4P5  
[valerie.wyatt@stantec.com](mailto:valerie.wyatt@stantec.com)

**RE: Ostrander Point Wind Energy Park Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat, FINAL DRAFT, December 2010, MNR Review**

Dear Ms. Wyatt:

Thank you for the opportunity to review and provide input into the development of the Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat for the Ostrander Point Wind Energy Park.

Based on our review of the final draft MNR is satisfied that our comments have been addressed and that the report was developed in accordance with MNR's Bird and Bat Guidelines.

If changes are required as the Plan is implemented, please consult MNR prior to any deviation from the current proposed (final draft) monitoring plan.

Thank you,

A handwritten signature in blue ink that reads "Tammy Tellier".

Tammy Tellier, RPF  
Supervisor  
Planning and Information Management  
Peterborough District MNR