

Post-Construction Follow-Up Plan for Bird and Bat Resources
for the Wolfe Island Wind Plant
(the “Plan”)

FINAL

May 2009

Developed Among

Canadian Renewable Energy Corporation (“CREC”)

Environment Canada / Canadian Wildlife Service (“EC”)

Natural Resources Canada (“NRCan”)

Ontario Ministry of Natural Resources (“MNR”) and

Ducks Unlimited Canada (“DUC”)

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ATTACHMENT A: Letter of Commitment – CREC to the Ontario Ministry of the Environment

1.0 Introduction

1.1 BACKGROUND

Canadian Hydro Developers, Inc. (“Canadian Hydro”), through its wholly owned subsidiary CREC, is developing a 197.8 megawatt (“MW”) wind plant on Wolfe Island, Township of Frontenac Islands, Frontenac County, Province of Ontario. Eighty-six 2.3 MW wind turbine generators (“WTG”) and ancillary facilities will be placed strategically over the western portion of Wolfe Island with additional supporting electrical infrastructure on the Kingston mainland (the “Project”). This Plan has been designed in consideration of the unique environment surrounding the Wolfe Island Wind Plant.

BirdLife International, in cooperation with Bird Studies Canada and Nature Canada has identified Wolfe Island as an Important Bird Area (“IBA”) due to the presence of globally and continentally significant numbers of “congregatory” waterfowl species that gather offshore during the spring migration, specifically Greater Scaup and Canvasback (~ 2% and 1% of their respective North American populations), and Canada Goose ($\geq 1\%$ of combined biogeographic populations) (information is available at www.bsc-eoc.org/iba/site.jsp?siteID=ON037). In addition, Wolfe Island supports notable landbird populations (albeit not in numbers of global or continental importance) including wintering raptors and Tree Swallows. The high quality grassland habitat that attracts wintering raptors also supports a high abundance and diversity of grassland breeding bird species of conservation priority (Cadman et al. 2007; Ontario Partners in Flight 2006). As discussed in Section 7.9.1 of the Project’s Environmental Review Report (“ERR”), Wolfe Island is a Category 4 Level of Concern¹ project from the perspective of bird use, based on criteria provided in Environment Canada’s *Wind Turbines and Birds: A Guidance Document for Environmental Assessment* (April, 2007).

Recognizing the IBA designation related to waterfowl, as documented in the Project’s ERR, and the importance of the area to wintering raptors and breeding grassland birds, extensive primary data was collected through multiple-year bird and bat baseline studies on Wolfe Island pre-construction. This data was further augmented with secondary data from published and unpublished sources to generate a robust data set from which to assess the potential effects of the Project.

Wolfe Island would be a Sensitivity Rating 3 (High) project for bats based on the criteria provided in the Ontario Ministry of Natural Resources *Guideline to Assist in the Review of Wind Power Proposals: Potential Impacts to Bats and Bat Habitats* (August 2007). Potential concerns with bats are generally associated with the Projects proximity to the shoreline of Lake Ontario as an area that could potentially act as a corridor or channeling feature for migrating bats.

The potential environmental effects to birds and bats and associated mitigation measures, based upon this dataset, ornithological advice, and professional opinion, among other factors, are provided in ERR Section 7. Additionally, bird and bat post-construction monitoring commitments are provided in ERR Section 9. These commitments provide the first step of

¹ Projects in this category are considered to present a relatively high level of potential risk to birds.

confirming the ERR predictions noted in ERR Section 7 and provide the basis from which actions contained in the Plan may stem.

As stated in ERR Section 7, the environmental effects of Project components are predicted to be limited on birds and bats during construction and operation of the wind plant. The level of impact to birds and bats (excluding species at risk) after protection and mitigation measures have been employed is rated as low (i.e., slight decline in these species over the life of the Project).

Potential mortality, habitat fragmentation, and disturbance effects to Short-eared Owls, a species of federal and provincial Special Concern, may result in fewer owls being present in the study area² during Project operation. Short-eared Owl appears to be at some risk at the McBride Wind Farm in Alberta (Brown and Hamilton, 2004) so to account for this uncertainty, the level of impact to the Short-eared Owl after protection and mitigation measures have been employed is rated as medium (i.e., potential decline in this species to lower than baseline).

Upon finalization of the ERR there was some concern regarding the level of certainty in these predictions. The mitigation measures contained in the adaptive management section of this Plan were developed to address this situation.

1.2 RATIONALE FOR THE PLAN

The implementation of this Plan will verify the predictions of the environmental assessment ("EA") reports prepared in accordance with the Ontario *Environmental Assessment Act* ("EAA") and the *Canadian Environmental Assessment Act* (the "CEA Act"). Should any unanticipated potentially significant adverse environmental effects be identified, the provisions of this Plan will mitigate those effects so they do not become significant.

The rationale for the Plan relevant to both provincial and federal requirements is outlined below. Given these requirements and the importance of Wolfe Island and the surrounding area to waterfowl, as well as wintering raptors and grassland birds, and particularly the placement of a wind plant on the Island, CREC has actively participated with EC, MNR, NRCan and DUC in the development of this Plan. This plan was developed in consideration of the unique features of Wolfe Island.

The Plan has been designed by CREC to achieve all of the provincial and federal requirements.

Ontario Environmental Assessment Act

As part of the Project's Environmental Screening Process under Ontario Regulation 116/01 the *Electricity Projects Regulation* ("Regulation 116/01"), CREC committed to developing this Plan with the MNR and EC who have specialist or expert information with respect to the Project. This is documented in a letter of commitment sent from CREC to the Ontario Ministry of the Environment on March 14, 2008. A copy of this letter is provided in Attachment A.

² Please refer to section 1.6.1 of the ERR for a description of the study area.

Canadian Environmental Assessment Act

NRCan, as a Responsible Authority for the Project under the CEA Act, S.C. 1992, c. 37, determined pursuant to section 38 of the CEA Act that a follow-up program for the Project is appropriate in the circumstances.

The CEA Act defines “follow-up program” as a program for:

- a. verifying the accuracy of the environmental assessment of a project, and
- b. determining the effectiveness of any measures taken to mitigate adverse environmental effects of the project.

The CEA Act also provides that the results of a follow-up program may be used for implementing adaptive management measures or for improving the quality of future environmental assessments.

In addition to the above, the adaptive management strategy contained in Section 3.0 of this Plan outlines mitigation measures that will be implemented should certain unanticipated adverse environmental effects occur.

1.3 ROLES AND RESPONSIBILITIES

CREC:

As the proponent of the Project, CREC is responsible for designing and implementing the Plan, for implementing the post-construction bird and bat monitoring program and, if necessary, implementing the adaptive management measures or mitigation measures described in the Plan.

In all cases the Parties will work in a collaborative manner in designing and carrying out this Plan.

CREC is also responsible for reporting results to NRCan, EC and MNR, and DUC as appropriate, and preparing material for dissemination to parties and to stakeholders according to the Plan or as may reasonably be requested by NRCan.

NRCan:

As a Responsible Authority for this Project under the CEA Act, NRCan determined that a follow up program was required. Under subsection 17(1) of the CEA Act, NRCan delegated the design and implementation of this plan to CREC. The design and implementation of the plan must be done to the satisfaction of NRCan.

NRCan is responsible for ensuring the implementation of the Plan as per subsection 38(1) of the CEA Act. In its role of ensuring the implementation of the Plan, NRCan will draw on the expertise of EC and the MNR in accordance with their jurisdiction.

NRCan is also responsible for including on the Canadian Environmental Assessment Registry internet site, a description summarizing the Plan and its results or an indication of how a full description of the program and its results may be obtained.

NRCan will receive all reports and notifications required according to this Plan from the proponent and will ensure that these are disseminated to EC and the MNR as appropriate. NRCan will be included in any correspondence between the proponent and EC or the MNR related to the Plan, should this occur.

EC:

EC's jurisdictional responsibilities relate to the protection of migratory birds and species at risk as mandated by the *Migratory Birds Convention Act, 1994*, and the *Species at Risk Act (SARA)*. As a Federal Authority under the CEA Act with specialist or expert information or knowledge with respect to this Project, EC will be responsible for providing, on request, to NRCan specialist or expert information or knowledge in its possession. EC will also be responsible for providing any assistance requested by NRCan concerning the implementation of the Plan on which NRCan and EC have agreed.

MNR:

MNR's jurisdictional scope is related to bird and bat species as mandated by the *Fish and Wildlife Conservation Act*. MNR's jurisdiction also includes species under the *Endangered Species Act, 2007*. MNR will be responsible for providing, on request, to NRCan specialist or expert information or knowledge in its possession. MNR will also be responsible for providing any advice requested by NRCan concerning the implementation of the Plan on which NRCan and MNR have agreed.

For any issues associated with a species identified under both the federal *Species at Risk Act, 2003* and the Ontario *Endangered Species Act, 2007*, discussions will take place with EC or MNR or both as each of those agencies considers appropriate.

DUC:

As per DUC's original invitation from CREC to participate in the development of the Plan, DUC will be consulted on issues related to waterfowl.

Canadian Environmental Assessment Agency ("CEAA"):

The CEAA will continue in its role as Federal Environmental Assessment coordinator for the duration of the implementation of the Plan.

1.4 DECISION MAKING

CREC, NRCan, EC and the MNR (collectively 'the Parties') will work together in an open and honest manner, with the goal of making decisions collectively on matters related to this Plan. In the case where a collective decision cannot be achieved, NRCan will consider the expert advice of MNR and EC as appropriate and reasonably determine what is required on the part of the proponent, which may include the implementation of mitigation measures that are technically and economically feasible, in order to ensure that the Project does not cause significant adverse environmental effects.

1.5 GUIDANCE DOCUMENTS

Where applicable, the following guidance documents have been considered in the preparation of this Plan:

- EC's "Wind Turbines and Birds – A Guidance Document for Environmental Assessment" (Environment Canada, 2007a) and "Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds" (Environment Canada, 2007b). Hereafter referred to as 'EC's Guidance.'
- MNR's "Guideline to Assist in the Review of Wind Power Proposals, Potential Impacts to Bats and Bat Habitats" (Ontario Ministry of Natural Resources, 2007a), and the "Guideline to Assist in the Review of Wind Power Proposals, Potential Impacts to Birds and Bird Habitats" (Ontario Ministry of Natural Resources, 2007b).

1.6 PLAN PROVISIONS

The provisions of this Plan set out the following items regarding bird and bat resources:

- the purpose of the post-construction monitoring program as described in ERR Section 9;
- the data to be collected under the post-construction monitoring program and the timing of data collection;
- timing of when data and analysis will be delivered to NRCan, EC, MNR and DUC for review as necessary;
- identification of the Party(ies) who will be responsible for the review of specific information;
- determining how, what, if, and when information will be made available to the public;
- the criteria that will be used to make mitigation decisions (i.e., adaptive management strategies) based upon the post-construction monitoring data;
- identification of the decisions that can be made (e.g., implementation of mitigation measures); and,

- the factors that will be used to decide if the post construction monitoring program or aspects of the program should be extended, shortened, or otherwise altered.

Each of the above items is described in the following sections.

1.7 ENSURING IMPLEMENTATION OF THE PLAN

As described in the roles and responsibilities section, NRCan is responsible for ensuring the implementation of the Plan as per subsection 38(1) of the CEA Act. In its role of ensuring the implementation of the Plan, NRCan will draw on the expertise of EC and the MNR in accordance with their jurisdiction.

NRCan, EC and the MNR have agreed that representatives from the MNR and EC, with appropriate expertise, will conduct site visits during the first year of monitoring. MNR and EC representatives will observe the monitoring being conducted by the proponent to ensure that it is being carried out as outlined in this Plan and report their findings to NRCan. The findings of the site visits will also be made available to members of the public through the Canadian Environmental Assessment Registry. Based on the results of site visits conducted during the first year of monitoring it will be determined whether any further site visits are required in subsequent years.

2.0 Post-Construction Monitoring Program

2.1 PURPOSE AND TIMING

The purpose of the bird and bat post-construction monitoring program is, in part, to verify the accuracy of the predicted effects documented in the ERR and to determine the effectiveness of the measures taken to mitigate adverse environmental effects of the Project documented in the ERR. Furthermore, any unanticipated potentially significant adverse environmental effects discovered during the post-construction monitoring program will be mitigated as described in Section 3.0. Post-construction monitoring for birds and bats can be conducted in conjunction with each other to improve the efficiency of field monitoring. Therefore, the methods outlined below have been designed to address both birds and bats. Section 9 of the ERR identifies post-construction bird and bat monitoring elements to be conducted during the first three years of plant operation. These elements have since been refined through consultation with NRCan, EC, MNR, and DUC, and are listed below. Note that the timing and frequency of these surveys is described in greater detail in Section 2.2. The monitoring program has been designed to capture the peak periods of activity for each species group.

- *mortality monitoring*: at representative WTGs year round during every month. Searcher efficiency and scavenger trials will be conducted as appropriate each year according to EC's Guidance
- *raptor use surveys*: during December-March. Protocols will match the pre-construction baseline survey protocols used in 2006-2007
- *bi-weekly aerial waterfowl habitat use surveys*: of the Wolfe Island study area shoreline during spring throughout the months of March-May and the autumn from September 1st to freeze-up
- *potential disturbance effects to grassland breeding birds survey*: The surveys will include as many pre-construction point count locations as practicable, and the establishment of new point count locations to ensure adequate sampling to assess effects. Point count surveys will use the same protocols as the pre-construction surveys
- *marsh point counts and area searches*: survey marshes within 500 m of representative wind turbines. Routes, point counts, locations, and survey protocols will be the same as the pre-construction surveys.
- *woodland point counts and area searches*: point count and area search surveys in two woodlots greater than 10 ha in proximity to WTGs (i.e., forested area associated with the Big Sandy Bay ANSI, and the woodlot along the south side of the Sand Bay Wetland).³
- *grassland point counts and area searches*: area searches in the two large grassland areas that were surveyed pre-construction

³ Pre-construction baseline surveys, consistent with EC's monitoring protocols, were conducted in these woodlots during the breeding bird season in 2008. The same point count and area search locations will be surveyed post-construction.

- *wetland point counts and area searches*: breeding waterfowl surveys at random sites located close to WTGs and at comparable sites located further away from WTGs
- *waterfowl inland foraging surveys*: field-feeding geese and ducks surveys.

2.2 PRIMARY DATA COLLECTION

Data collection will be conducted by field personnel skilled at identifying birds by song and sight and bats by sight. 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 methodologies, including duration and frequency, as developed in collaboration with NRCan, EC, and the MNR are discussed below. DUC has also participated in the development of the post-construction monitoring program with regard to waterfowl. The post-construction monitoring program will be reassessed by NRCan, EC, MNR, CREC, and, as necessary, DUC at the end of each monitoring year. Pending the reassessment results, the program methodologies, frequencies, and durations may be reasonably modified by the Parties to better reflect the findings, and this Plan will be updated accordingly. In the event that other wind energy facilities are developed in the vicinity of the Wolfe Island Wind Plant, CREC will discuss with EC, MNR, and NRCan whether this Plan should be revised as appropriate.

Specifically, the three year post-construction monitoring program will include:

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. 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. The Project has been subject to intense public, interest group, and government agency scrutiny, in part because of its importance to a diverse group of bird communities that in sum inhabit the island year-round. Additionally, it is important to address stakeholder concerns over potential significant adverse environmental effects to birds and bats by conducting a comprehensive post-construction monitoring program.

Monitoring

Mortality monitoring within a 60 m search area radius from the base of all WTGs will be conducted year-round from January to December. EC's Guidance suggests that a subset of turbines at large facilities be initially visited twice-weekly. Given the importance of the study area to swallows in late July and August, and to raptors and other bird groups during spring and fall migration, twice-weekly surveys are justified during these periods to assess the magnitude of mortality effects.

This rigorous survey schedule is also initially targeted during the winter months (i.e., November through March) to determine whether wintering raptors are also subject to mortality due to the Project.

During these survey periods, half the WTGs (i.e., 43 WTGs) will be searched twice a week and the other half once a week, and the two groups will be rotated so that one week they receive the less intensive treatment, the next week the more intensive. In addition to the WTGs, the two new meteorological towers erected as part of the Project, will be monitored for direct effects to birds and bats. Monitoring of the meteorological towers will be completed using the same survey methodologies and frequencies as the WTGs. Although all reasonable efforts will be made to conduct surveys as scheduled, surveys will not be conducted if snowfall and snow drift would limit the effectiveness of searches or if weather presents safety concerns. Weather and snow depth conditions will be noted when surveys were not conducted as scheduled.

Searcher efficiency and scavenger trials will be conducted in accordance with EC guidelines. Searcher efficiency trials will typically be conducted once each year, 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. Search efficiency will vary for each individual based upon their own unique characteristics. Searcher efficiency trials involve a “tester” that places bird and bat carcasses under WTGs prior to the standard carcass searches to test the searcher’s detection rate. Environment Canada (2007b) provides detailed recommendations on determining searcher efficiency, expressed as a proportion of carcasses expected to be found by individual searchers. Searcher efficiency (Se) is calculated for each searcher as follows:

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

Scavenger trials will be conducted six times per year (i.e., early winter, and monthly through spring, summer and early fall). The frequency of monitoring may be adjusted seasonally based on the results of these scavenger trials, and in consultation with EC and MNR. Scavenging trials may show that it is not necessary to visit each WTGs twice weekly during alternating weeks from April to October. Based on results from other Ontario wind plants, mortality during the migration period and during the breeding season are likely to be fairly low. If scavenging rates are low, the searches may be scaled back to once a week for all of the WTGs, and if mortality levels are low in Year 1, the number of WTGs searched during the non-winter months in subsequent years may be reduced as well.

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 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:

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

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

n_{visit0} is the total number of carcasses placed

n_{visit1} – n_{visit3} are the numbers of carcasses remaining on visits 1 through 3

EC staff observed many predators (e.g., coyotes and foxes) during a February 2007 visit to the study area. Accordingly, as noted above, there will be a scavenging trial early in the winter search period. These trials will include raptor carcasses if at all possible since raptors might have lower scavenging rates in comparison to chickens, for example, because of an inherent bias in scavengers.

D. Strickland (2008) reported that eagles and large hawks were rarely scavenged in Oregon and Washington because of what appeared to be an intrinsic aversion of foxes, coyotes, etc. to these birds. If scavenging rates are calculated to be low in the study area, the winter searches may be adjusted to once every week at all WTGs, and ultimately once every two weeks at all WTGs.

There are numerous published and unpublished approaches to incorporating these corrective factors into an overall assessment of total bird and bat mortality. Currently, EC's protocols suggest the use of the following correction formula (Environment Canada, 2008):

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

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.

Although not prescribed in any guideline, EC has indicated that most birds and bats will fall within 50 m of the WTG base. This value will be used to determine the percent of area searched (Ps). With the 60 m radius search area, Ps will equal 100%.

This approach to mortality monitoring will facilitate any potential correlation between mortality occurrences, WTG location, habitat/land use features, and season. Data collected during the mortality monitoring surveys will also be analyzed to determine if mortality rates are different at lit versus unlit (i.e., aviation safety lights) WTGs.

Bird carcasses in good condition may be collected for use in searcher efficiency trials. Persons handling bird carcasses should 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 new *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) and turned over to the relevant agency. All other bird carcasses will be left in place.

The discovery of injured birds is a rare occurrence (Jain et al., 2007); however, if found, they will be transported to a licensed migratory bird care centre.

As of 30 June 2008, species that are extirpated, endangered, or threatened are protected under the new *ESA (2007)*. Consequently, unless otherwise authorized, possession and transport of species at risk is prohibited under the ESA. In order to carry out the various activities contemplated in this Plan, and to ensure consistency with ESA clause 17(2)b, the MNR will allow CREC and its agents to collect, possess, and transport species at risk as obtained from the study area once a 17(2)b permit has been issued under the ESA. Any conditions attached to the permit relating to handling of injured birds, including raptors and species at risk, will be adhered to.

Additionally, in support of the activities contemplated in this Plan, CREC will apply for a scientific collector’s permit under the *Fish and Wildlife Conservation Act* (“FWCA”) from the MNR that would allow the CREC and its agents to possess and transport a species protected by this legislation, as obtained from the Plant

Finally, CREC will apply to EC (Canadian Wildlife Service) for a scientific collector’s permit under the *Migratory Bird Convention Act, 1994* (“MBCA”) that would allow CREC 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 various activities contemplated in this Plan.

2.2.2 Bat Mortality Monitoring

Background

The Project is considered to have a Sensitivity Rating 3 (High) for bats based on the criteria provided in MNR’s *Guideline to Assist in the Review of Wind Power Proposals: Potential Impacts to Bats and Bat Habitats* (August 2007). Potential concerns with bats are generally associated with the Project’s proximity to the shoreline of Lake Ontario as an area that could potentially act as a corridor or channeling feature for migrating bats.

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 between < 1 and 50 bat mortalities/WTG/year (MNR 2006). The majority of bat mortalities 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 *Guideline to Assist in the Review of Wind Power Proposals: Potential Impacts to Bats and Bat Habitats* (August 2007). In general, the mortality monitoring requirements for bats will be captured in conjunction with bird mortality monitoring (described above) to improve field and data collection efficiencies. There are a few notable exceptions because bird and bat mortality monitoring is being conducted in tandem:

- Bat mortality monitoring is normally required by MNR for the first two years of wind turbine operation at a site with a High Sensitivity Rating for bats. However, because bird mortality monitoring is generally planned for a 3rd year, any bat mortalities in the 3rd year of monitoring will also be documented.
- Bat mortality monitoring is normally required during the core season when bats are active (i.e., May 1st to September 30th; resident and migratory bats) at a site with a High Sensitivity Rating. However, because bird mortality monitoring is generally planned year-round, any bat mortalities outside this monitoring timeframe will also be documented.
- Bat mortality monitoring will be conducted generally every three days during the core period of activity (May 1st through September 30th) in keeping with MNR guidelines for a site categorized as High Sensitivity. Bat mortality monitoring will be conducted in conjunction with other monitoring activities (birds) for efficiency. The frequency of mortality monitoring for the first two years within the core period of activity for bats, may be increased based on collected data, results, and scavenging rates. MNR guidelines prescribe two years of post-construction mortality monitoring for a site categorized as High Sensitivity, however this Plan will monitor bat mortality for the three year period. The frequency of mortality monitoring for the third year within the core period of activity for bats may be increased or decreased based on collected data, results and scavenging rates. During bat mortality monitoring, half the turbines will be searched twice a week and the other half once a week, and the two groups will be rotated so that one week they receive the less intensive treatment, the next week the more intensive.
- Searcher efficiency and carcass removal trials will be conducted once a month during the core bat season, from May 1st to September 30th. 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). Frequency of these trials may be reduced based on collected data and results.

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 Winter Raptor Use Surveys

Background

Pre-construction baseline winter raptor surveys were conducted to establish areas of raptor use and general flight heights in the study area. The purpose of the post-construction winter raptor use surveys is to assess potential displacement or disturbance effects (i.e., distribution and abundance) to these species compared to pre-construction conditions.

Monitoring

The post-construction surveys will be carried out using the same survey protocols as the pre-construction baseline surveys conducted in 2006-2007. Survey methodologies are described in ERR Technical Appendix C5. The post-construction surveys will be conducted using two vehicles, each containing an experienced surveyor and a driver. On each survey date, a late afternoon survey will be conducted for raptors and an early evening survey (i.e., from just before sunset to dusk) will be conducted for Short-eared Owls.

All north-south roads and most east-west roads within the study area will be driven at slow speeds. The fields and woodlots will be scanned using binoculars to detect any raptors, and a spotting scope will be used for closer inspection of stationary birds. All raptors and owls will be recorded, their locations mapped, and density estimates provided (e.g., # of raptors /km of road traveled). The winter raptor surveys will be conducted once every two weeks, beginning in early December and will extend to late March.

2.2.4 Aerial Waterfowl Surveys

Background

Pre-construction baseline aerial waterfowl surveys of the Wolfe Island study area shoreline were conducted once every two weeks through April and May, 2008 and in an expanded, regional study area in October through freeze-up, 2008, and will be conducted in March through May, 2009. EC and DUC have actively participated in these surveys. The purpose of the aerial surveys was to estimate the abundance, distribution, and diversity of waterfowl species that utilize the shoreline and bay areas for staging purposes.

Monitoring

Bi-weekly aerial waterfowl surveys of the Wolfe Island study area shoreline will be conducted post-construction using the same survey protocols as the pre-construction surveys (Stantec, in prep.). Data collected at Wolfe Island will be used to provide a comparison of waterfowl abundance, distribution, and species diversity between pre-construction and post-construction conditions. The aerial surveys will be conducted in spring from the time the bays are largely free of ice through to the end of May, and in autumn from early September to freeze-up. As with the pre-construction aerial surveys, EC and DUC representatives are invited to participate in the post-construction surveys.

If a potentially significant decline in waterfowl is noted during the spring or autumn surveys, additional surveys will be conducted at the nearby shorelines of Wolfe Island (east end), Amherst Island, Howe Island and the Cataraqui River north to Highway 401. These areas will be surveyed on the same days as the Wolfe Island study area shoreline. Data collected at Wolfe Island (east end), Amherst Island, Howe Island, and the Cataraqui River will be compared to long term trends observed in data collected during previous CWS surveys (Environment Canada. 1999. Waterfowl Day Totals, 1999 Surveys. Personal Communication, Ken Ross, April 25, 2005), to assist in determining if waterfowl are re-distributing themselves from Wolfe Island to other nearby locations, perhaps as a result of disturbance effects.

2.2.5 Grassland Point Counts and Area Searches

Background

A post-construction point count-based study will be implemented to assess any actual disturbance effects to breeding grassland bird species. In 2006, 30 point counts were conducted in different habitat types within the study area. In 2007, the 30 points were resurveyed and 14 new point counts were added. Of the 44 point counts completed in 2007, 27 were situated in field (grassland) habitat.

Monitoring

All of the previously surveyed points that were situated in suitable grassland habitat will be resurveyed using the same protocols used during the pre-construction surveys as described in ERR Technical Appendix C5. 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.

Ten-minute paired counts at 20 WTGs that are in prime grassland habitat will also be surveyed twice in June, during the peak of the breeding season. This will be accomplished by conducting 20 counts at the bases of the 20 WTGs, and 20 counts at 200 m from the bases of the same WTGs. Birds in distance bands of 50 m will be carefully recorded (e.g. from the turbine base, birds in distance band 0-50 and 51-100 m will be recorded; for the surveys centred at 200m away from the turbine, birds will be recorded separately on the sides towards and away from the turbine, again in two distance bands of 50 m on each side. This sampling design, in conjunction with a repeat of the point count stations (above) and area searches (below), should provide good information on possible disturbance effects, and the distance bands to which they extend.

In addition to the point counts, area searches will be repeated in the same areas that were surveyed using area searches during pre-construction baseline surveys in 2007. For continued reference, these areas are shown on Figure 2.2 of ERR Technical Appendix C5 (Bird Report). The two tracts of land in which area searches will be conducted include a 195 ha block in the southeast portion of the wind plant and a 199 ha block in the northwest portion. These area searches will be conducted twice at each location during the peak of the breeding season in June and will follow the same protocol as used for the pre-construction area searches.

2.2.6 Wetland Point Counts and Area Searches

Background

Area searches within five lakeshore marshes in the study area were conducted on foot and by canoe during June, 2007. For continued reference, the area search routes are shown on Figure 2.3 of ERR Technical Appendix C5.

Monitoring

To obtain a measure of breeding waterfowl density, the pre-construction area searches will be repeated as pairs surveys in early May. Pairs surveys will provide an accurate estimate of breeding effort if timed correctly. The survey dates will therefore be adjusted based on pair chronology to ensure they are conducted at optimal times.

All wetland point counts and area searches will be conducted twice in June in the same locations as the pre-construction surveys using the same survey protocols, timing, and frequency, once the wind plant becomes operational. As such, data collected during the post-construction surveys will be directly comparable to pre-construction data and can be used to verify whether predictions were accurate regarding any disturbance/displacement effects on other breeding wetland birds that may be associated with the wind plant.

2.2.7 Inland Waterfowl Foraging Surveys

Background

Inland pre-construction foraging waterfowl surveys were conducted weekly from the first week in April to mid-May, 2007 and from the first week in September to mid-December, 2007. The methods used for the pre-construction inland waterfowl foraging surveys are described in ERR Technical Appendix C5. These daytime surveys consisted of two experienced surveyors driving all major roads in the study area at slow speeds (i.e., 30-40 km/hr) scanning the fields with binoculars. Information on species, numbers, location, and activity of geese and ducks observed in inland agricultural fields was recorded.

Monitoring

The same protocols, timing, and frequency will be used to conduct the field-feeding surveys during post-construction conditions. Data collected will be used to compare post-construction

inland foraging numbers and areas with those observed during pre-construction, baseline conditions.

2.2.8 Woodland Point Counts and Area Searches in Woodlots Larger Than 10 Ha

Background

Pre-construction breeding bird surveys were conducted in two woodlots greater than 10 ha that are located in proximity to WTGs. These baseline surveys consisted of ten minute point counts beginning at or within half an hour after sunrise. Baseline area searches have also been completed. The survey protocols were consistent with EC's Guidance. Each woodlot was surveyed twice during the breeding season. For continued reference, these forested areas include the woodlot immediately south of the Sand Bay Wetland (16.4 ha) and the wooded area associated with the Big Sandy Bay ANSI (101 ha). One point count location was surveyed in the forested area south of the Sand Bay Wetland and six points were surveyed in the Big Sandy Bay woodlot in June 2008.

Monitoring

The same point count and area search locations will be resurveyed post-construction to facilitate an assessment of the accuracy of predictions of potential disturbance/displacement effects.

2.3 Reporting of Incidental Observations by Stakeholders

The proponent has developed a specific avian and bat observation form which is available on the Project website for members of the public to submit their incidental observations. Comments submitted by the public to the Project website on the avian and bat observation form will be summarized and presented in an appendix to the final bi-annual monitoring reports.

It is noted that members of the public are cautioned not to collect any bird or bat carcass and are advised to leave any fatality in-place. Collection and storage of bird and bat carcasses requires permits from the appropriate agency – collection and storage without the appropriate permits may be in contravention of provincial and federal law.

2.4 Reporting and Review of Results

Bi-annual post-construction monitoring reports will summarize and analyze the results of all bird and bat survey types. Comments submitted by the public to the Project website on the wildlife observation form will be summarized and presented in an appendix to the final bi-annual monitoring reports.

Each report will be submitted to NRCan, EC and the MNR within three months of the bi-annual dates of June and December. Personnel at EC and/or the MNR will conduct reviews of the post-construction monitoring report(s) and report back to NRCan within three months of receipt of the reports. DUC will be circulated the bi-annual monitoring reports for review and comment.