

**Avian and Bat Study Plan for the  
Proposed  
Lighthouse Wind Project,  
Niagara and Orleans Counties,  
New York**

**May 22, 2015 (revision 1)  
February 20, 2015 (original)**

**Prepared for:**

**Lighthouse Wind, LLC**  
Charlottesville, Virginia

**Prepared by:**

**ECOLOGY AND ENVIRONMENT, INC.**  
368 Pleasant View Drive  
Lancaster, New York 14086

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## List of Abbreviations and Acronyms

agl	above ground level
E & E	Ecology and Environment, Inc.
ECPG	USFWS Eagle Conservation Plan Guidance
kHz	kilohertz
Lighthouse	Lighthouse Wind, LLC
met tower	meteorological tower
MW	megawatt
NYSDEC	New York State Department of Environmental Conservation
Guidelines	<i>(NYSDEC) Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects</i>
Project	wind energy facility under development by Lighthouse Wind, LLC
Study Plan	Avian and Bat Study Plan
USFWS	United States Fish and Wildlife Service
WEG	Wind Energy Guidelines

# 1

## Project Background and Study Area

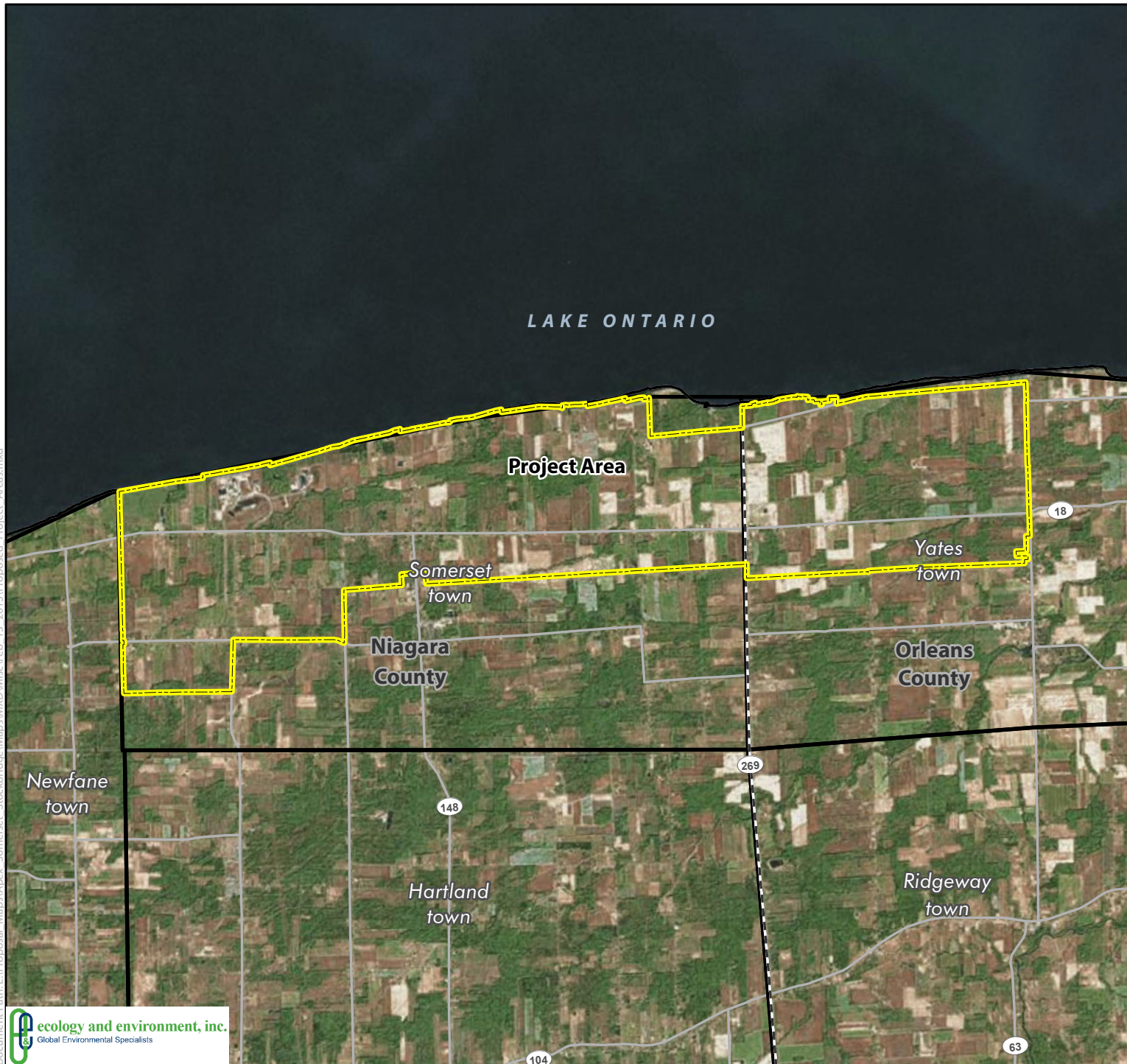
### 1.1 Project Description

Lighthouse Wind, LLC (Lighthouse) is developing the Lighthouse Wind Project (Project) in the towns of Somerset and Yates that would generate up to 200 megawatts (MW) of electricity. The preliminary area identified by Lighthouse is located in Niagara and Orleans counties (Figure 1-1). Other facilities that would be necessary to develop the Project include access roads, electrical collection lines and substation, and construction staging areas and will be included within the proposed Project area.

At Lighthouse's request, Ecology and Environment, Inc. (E & E) has prepared this *Avian and Bat Study Plan* (Study Plan) for the Project that is consistent with NYSDEC and USFWS expectations and guidance for projects located near the Lake Ontario area of New York. The surveys described herein were established to estimate the seasonal, spatial, and temporal use of the study area by birds and bats in accordance with the NYSDEC Guidelines (August 2009), USFWS WEGs and comments provided by NYSDEC and USFWS, and to respond to the Tier 3 Questions identified in the WEGs as follows:

1. Do field studies indicate that species of concern are present on or likely to use the proposed site?
2. Do field studies indicate the potential for significant adverse impacts on affected population of species of habitat fragmentation concern?
3. What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed wind energy project?
4. What are the potential risks of adverse impacts of the proposed wind energy project to individuals and local populations of species of concern and their habitats? (In the case of rare or endangered species, what are the possible impacts to such species and their habitats?)
5. How can developers mitigate identified significant adverse impacts?
6. Are there studies that should be initiated at this stage that would be continued to post-construction?

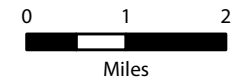
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**Figure 1-1**  
**Proposed Lighthouse Wind**  
**Project Area**  
 Somerset and Yates,  
 Niagara and Orleans Counties, NY  
 Apex Clean Energy, Inc.

**Legend**

- Major Road
- ▭ Town Boundary
- - - County Boundary
- ▭ Proposed Lighthouse Wind Project Area



# 2

## Study Objectives

This Study Plan is designed to determine the extent and nature of bird and bat use of the Project area throughout the year so that information can be used in Project planning and permitting. The planned pre-construction bird and bat surveys are based on the New York State Department of Environmental Conservation (NYSDEC) *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (NYSDEC Guidelines; NYSDEC August 2009; the USFWS *Land-Based Wind Energy Guidelines* (WEG; USFWS 2012); the USFWS *Eagle Conservation Plan Guidance, Module 1 – Land Based Wind Energy, version 2* (ECPG; USFWS 2013); and comments provided by NYSDEC and USFWS on the February 20, 2015, version of this Study Plan.

The objectives of the Study Plan are to:

1. Collect information on the occurrence and distribution of birds in the Project area throughout the year (Tasks 1, 2, and 5);
2. Collect information on use of the Project area by bats during summer and migration periods (Task 3);
3. Determine whether suitable or occupied habitat for bird and bat species listed as threatened or endangered by New York State or the USFWS is found within the Project area (Task 4); and
4. Report the baseline data resulting from surveys.

# 3

## Methodology

### Task 1: Migratory Raptor Surveys

A survey plan to evaluate year round use of the Project by small birds, large birds, and eagles was developed by Lighthouse in December 2014 with NYSDEC and USFWS input and is included in Appendix A. Per NYSDEC input, raptor migration requires additional effort; therefore the approach presented herein will meet the weekly spring and fall raptor migration survey recommendations in the NYSDEC Guidelines (August 2009) and adhere to recommendations of the ECPG/WEG, allowing data to be collected concurrently for both NYSDEC and USFWS survey expectations.

Migratory raptor surveys will be conducted by a qualified E & E avian biologist to document the movement of migrant raptors throughout the Project area and the occurrence of non-raptor species (e.g., waterfowl) migrating through the Project area. Spring and fall raptor migration surveys will be conducted in the Project area twice a week for 13 weeks from March through May and once a week for 17 weeks from late August to early December. As areas along the southern shorelines of the Great Lakes experience increased raptor migration in the spring season, Lighthouse has doubled the weekly effort during this period. Rather than conduct surveys from one representative sampling location as requested in the NYSDEC Guidelines, 1-hour point count surveys will be conducted concurrently with small bird, large bird, and eagle use surveys at 12 locations in accordance with ECPG guidelines. Thus, a total of 12 survey hours will be completed per survey (two days of six point counts) for the spring NYSDEC raptor migration surveys while also addressing necessary protocol of the ECPG. Because the areas along the southern shorelines of the Great Lakes experience very little raptor migration in fall, only one survey (six 1-hour point counts) will be conducted per week to characterize the species migrating through the area, consistent with weekly surveys proposed in the NYSDEC Guidelines. The 12 existing ECPG survey locations will be used (see Figure 3-1).

Surveys will be conducted between 8 a.m. and 5 p.m. during all weather conditions, with the exception of those that limit visibility to below 200 meters vertically and/or 800 meters horizontally. For each raptor observed, the surveyor will record the time of sighting, species, number of individuals, flight direction, flight behavior, approximate flight height (below 50 meters above ground level [agl], 50 to 200 meters agl, and above 200 meters agl), and any additional notes regarding the sighting, as outlined in the NYSDEC Guidelines. All migrant raptor sightings



will be recorded, regardless of distance from the observer (i.e., this includes raptors observed beyond the 800-meter ECPG plot).

This combined survey effort will provide assessment of the Project two times per week for 13 weeks in spring, once per week for 17 weeks in fall (as specified in the NYSDEC Guidelines), while also providing approximately 24 or more hours of eagle surveys per month.

### **Task 2: Breeding Bird Surveys**












Small bird surveys being are being conducted year round per the avian use protocol presented in Appendix A; however, additional breeding bird surveys will be completed in accordance with NYSDEC Guidelines (August 2009). Three sets of breeding bird surveys will be completed: one set in the latter half of May and another two sets in June 2015 in habitats that are generally representative of the area (agriculture, hayfields, forest, and scrub-shrub). The survey sets will be conducted at least one week apart, weather permitting. Because the Project area comprises primarily agriculture/hayfields, and because the turbines will be sited in these areas, the majority of breeding bird survey transects will be established in these habitats. Thus, habitats that are less representative of the Project area as a whole will receive fewer study transects.

Breeding bird surveys will be conducted using 300-meter transects established at potential turbine locations throughout the Project area where Lighthouse has land access. Approximately 25% of the established transects will be considered “control” transects and will not be associated with a preliminary turbine location. Each transect will be 300 meters long and include six 50-meter survey blocks. All birds seen or heard within 50 meters on either side of the transect will be recorded, creating a 300- by 100-meter rectangular survey plot encompassing 30,000 square meters bisected by the transect line. Every 50 meters (beginning and end of each block), the surveyor will stop for a period of 1 to 3 minutes, based on the surveyor’s discretion, for a total of seven stops per transect, during which time the surveyor will record species heard or seen and then continue to slowly walk along the transect. The observer will record species, number of birds per sighting, approximate distance from the observer, how the bird was detected (visual or auditory), whether the bird was within or outside 50 meters from the observer, and any additional notes. Any birds identified outside of the 50 meters will be recorded separately. The habitat will be characterized (agricultural/crop, hayfield, forested, scrub-shrub) for each transect. For habitat characterization of each transect, aerial imagery will be used initially, followed by a field visit to verify habitats and adjust transects, if necessary. The observer will slowly walk along each transect so that each transect survey will take approximately 45 to 60 minutes.

It is anticipated that approximately four transects will be conducted per morning and that each round of surveys will take three to four days.

Surveys will be conducted between a half-hour prior to sunrise and approximately 10:30 a.m. during weather conditions that are conducive to surveying.

**NLCD 2011 Land Cover**

 Open Water	 Evergreen Forest
 Developed, Open Space	 Mixed Forest
 Developed, Low Intensity	 Shrub/Scrub
 Developed, Medium Intensity	 Herbaceous
 Developed, High Intensity	 Hay/Pasture
 Barren Land	 Cultivated Crops
 Deciduous Forest	 Woody Wetlands
	 Emergent Herbaceous Wetlands

LAKE ONTARIO

Project Area

Somerset town  
Niagara County

Yates town  
Orleans County







Newfane town

Hartland town

Ridgeway town

**Figure 3-1**  
**Raptor/Eagle Use**  
**Survey Locations**  
**Lighthouse Wind**  
 Somerset and Yates,  
 Niagara and Orleans Counties, NY  
 Apex Clean Energy, Inc.

**Legend**

-  Raptor/Eagle Use Survey Center Point
-  Raptor/Eagle Use Survey Center, 800-meter Radius
-  Major Road
-  Town Boundary
-  County Boundary
-  Proposed Lighthouse Wind Project Area



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A figure showing transect locations will be shared with NYSDEC and USFWS in advance of the first set of surveys.

### **Task 3: Bat Acoustic Monitoring**

One year of bat acoustic monitoring will be conducted at one meteorological (met) tower planned for installation in the Project area during spring 2015. The monitoring will be used to broadly characterize species groups present and general bat activity in the detectable range of the acoustic devices during the bat activity period (from April 17 to approximately October 15).

Bat acoustic monitoring will be initiated in mid-April and continue to at least October 15 (approximately 27 weeks) using two AnaBat detectors programmed to record from one-half hour before sunset to one-half hour after sunrise the following morning. Prior to installation, all units will be calibrated to detect a standardized calibration tone at 20 meters, using a bat-chirp board (Tony Messina, Nevada Bat Technology, Las Vegas, Nevada, or equivalent).

Detectors will be housed in a weatherproof housing mounted near the base of the met tower. The microphones will be housed in a Bat-Hat (EME Systems, Berkeley, California), a weatherproof enclosure, and connected to the detectors via a cable. As the met tower is not affixed with brackets to mount the AnaBat detectors, E & E will need to use a pulley system to raise the upper level detector. The other detector will be placed near ground level at the met tower and will not require a pulley system. One microphone will be placed approximately 3 meters above ground level at the met tower (low detector) and the second detector will be approximately 45 meters above ground level (high detector). The high detector cannot exceed this height due to the presence of aviation marking balls that are affixed to the guyed wires of the met tower. Exchange of detector data cards will occur at least every two weeks.

Call echolocation data recorded on the data cards will be analyzed for total bat activity and identified to species groups using a combination of AnaLook DOS and AnaLook Windows software. Total bat activity will be quantified for both detectors for each successful detector night, and will be reported as the number of bat passes per detector per night. A bat pass is defined as any file that contains two or more distinct bat echolocation pulses. In addition, hourly, nightly, monthly, and seasonal averages will be calculated for each detector to identify peaks in bat activity. These analyses will be used to deduce potential trends in the level and timing of bat activity.

Call files with at least five echolocation pulses will be identified to one of three species groups (low frequency, mid frequency, or *myotis* spp.) using a combination of call characteristics (minimum frequency and slope) calculated in AnaLook. The low frequency group includes bat passes with minimum frequencies, typically below 30 kHz and could include hoary bats, big brown bats, and silver-haired bats. The mid-frequency group includes calls with minimum frequencies typically between 30 and 45 kHz and minimum slope values < 40 octaves per sec-

ond. The mid-frequency group could possibly include eastern red bats and tri-colored bats. Bats in the *Myotis* genus typically produce echolocation calls with minimum frequencies of 38 to 50 kHz and have minimum slope values of > 40 octaves per second. Bat passes identified to the *Myotis* spp. group could possibly include the eastern small-footed bat, the little brown bat, and the federally listed (threatened) northern long-eared bat; however, this study is designed to assess overall bat activity and seasonal variation. Species specific surveys may be warranted to assess presence/probable absence during summer of federally listed species. Lighthouse is in discussion with USFWS on the most appropriate approach to addressing listed species risk.

#### **Task 4: Threatened and Endangered Species Habitat Surveys**

To satisfy the recommendations of the NYSDEC Guidelines (August 2009), E & E will map and describe habitats within the Project area to develop a better understanding of the potential for species listed as threatened or endangered at the state or federal level, and/or habitats of significant ecological value, to occur. This effort will include use of desktop analyses and remote sensing, followed by verification. Desktop analyses will employ the use of several data layers to identify areas of likely ecological significance, as well as potential habitat for threatened and/or endangered species likely to occur in the vicinity of the Project area.

#### **Task 5: Wintering Grassland Raptor Surveys (November – December)**

The protocol for wintering grassland raptor surveys is described in detail in a letter sent to Brianna Gary of NYSDEC from Lighthouse on February 13, 2015, and is presented in Appendix B. Per NYSDEC recommendations, surveys were initiated in January 2015 and will continue through March 2015, with the possibility of surveys in April 2015 depending on the March results. Surveys are also planned for November and December 2015 to satisfy requirements identified in the NYSDEC Guidelines (August 2009).

#### **Reporting**

E & E will prepare a baseline bird studies report presenting the results and analysis of each avian survey and figures identifying the bird survey locations.

# 4

## Schedule

Task	Date
Avian/Eagle Use Surveys	December 2014 through December 2015
Migratory Raptor Surveys	March – May 2015 (spring migration), August 15 – December 15, 2015 (fall migration)
Breeding Bird Surveys	Late May, June 2015
Bat Acoustic Monitoring	April - October 2015
Threatened/Endangered Species Habitat Survey	Summer 2015
Wintering Grassland Raptor Surveys	January – April 2015, November and December 2015
Reporting	Following completion of all surveys

# 5

## References

NYSDEC (New York State Department of Environmental Conservation). August 2009. Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects. Prepared by the New York State of Environmental Conservation – Division of Fish, Wildlife and marine Resources.

USFWS (United States Fish and Wildlife Service). 2013. Eagle Conservation Plan Guidance, Module 1 – Land-based Wind Energy Version 2. U.S. Fish and Wildlife Service – Division of Migratory Bird Management.

\_\_\_\_\_. 2012. U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines. [http://www.fws.gov/windenergy/docs/WEG\\_final.pdf](http://www.fws.gov/windenergy/docs/WEG_final.pdf). Accessed February 2015.

# A

## General Avian and Eagle Use Surveys Protocol

## **Apex – Lighthouse Wind Project General Avian and Eagle Use Surveys (Updated 12/24/2014 per NYDEC Review and Input)**

### **Introduction**

Avian/eagle point count surveys will be completed at 12 point locations twice per month, for one year to document the avian community onsite and evaluate potential risk posed by an operating wind project if located at the project site. Because at this stage the project size and layout is not well defined, the project area will be assessed for avian use to evaluate the avian community, assess risk to all species and inform sighting of project features. Additionally, data will be collected for eagles that will be used to estimate potential take using the US. Fish and Wildlife Service (USFWS) Bayesian model if appropriate.

### **Objectives**

The objectives of the avian surveys are to estimate the seasonal, spatial, and temporal use of the study area by all birds and to provide information to assess risk of eagle take. Two survey types will be used due to the different visual scanning techniques required to detect birds with smaller ranges and those that are difficult to detect and identify at longer distances (called “small birds” for the purposes of this study: passerines, cuckoos, woodpeckers, small corvids) compared to those used to detect raptors and other larger birds that are highly visible and easier to identify at longer distance (i.e. vultures, hawks, falcons, eagles, accipiters, kites, northern harrier, osprey, owls, waterfowl (ducks and geese), shorebirds (sandpiper, plovers, etc.), waterbirds (cranes, herons, egrets, etc.), upland game birds, doves and pigeons, large corvids, and goatsuckers).

### **Methodology**

Small bird surveys will evaluate a 100-m radius plots to assess small bird use and large bird surveys will evaluate 800-m radius plots to assess the raptor and large bird community. Point count locations will be located to optimize spatial coverage of the project and to sample habitats that are representative of areas proposed for turbine installation. Four of the 12 points will be placed fairly close to the Lake Ontario shoreline, 4 points will be placed in a more centrally located area of the project, and 4 points will be placed towards the south edge of the project area. This point count layout across the project will allow evaluation of the avian community using the project and assessment of avian use differences associated with distance from the shoreline, if present. Timing for completing these surveys will be distributed across the daylight period to allow assessment of birds with different detectability at different times of day. To address this issue as best as possible at the point-count level, the starting and ending points will be rotated for each survey to allow even sampling of each point throughout the daylight period within each season.

A conceptual layout of the point locations is presented in **Figure 1**; however, survey locations will be microsited in the field based on biologist’s ability to optimize viewshed of habitats representative of turbine locations and to efficiently access survey locations. Many survey plots



may need to be completed from public roads to accommodate for limited access to private lands at this stage of project development.



**Figure 1.** Conceptual Layout of Avian Use Survey Plots, with 800-m radius plots shown

**Small Bird Point Counts:** Small bird point counts will be completed at the 12 survey points, twice per month for 5 minutes per point. Upon arrival at each survey point, a 100-meter radius plots will be sampled for 5 minutes and all small birds seen or heard will be recorded. Species, location (distance and direction from observer), number of individuals if observed in groups, flight heights and habitat will be recorded. Unique sightings beyond 100 m, such as rare or listed species will be recorded, although not used in sampling-based statistical summaries and analyses of data (e.g., comparisons of mean use).

**Raptor/Large Bird Point Counts:** Following small bird point counts, 800-m radius plots will be sampled for 60 minutes using visual scanning techniques to assess use by large birds. All birds (including eagles) will be counted in the first 20 minutes. Only eagles will be counted in the remaining 40 minutes; however, unique sightings (such as rare or state/federal listed species), as well as large flocks of birds (kettles of raptors with more than 3 birds, waterfowl flocks with more than 10 birds), will be recorded regardless of time and distance from observer; however, those recorded outside the 20 minute period and 800-m radius area will be excluded from sampling-based statistical summaries and analyses of data.

During the first 20 minutes, data will be collected consistent with avian survey data for other wind energy projects: the date, start, and end time of observation period, plot number, species or best possible identification, number of individuals, sex and age class (if possible), distance from plot center when first observed, closest distance, height above ground level (agl) in three categories (<50 m agl, 50-200m agl, > 200m agl), activity, and habitat.

For bald eagle or golden eagle observations, additional behavior and habitat data will be recorded during each one-minute interval the bird is within view, per the 2013 USFWS Eagle Conservation Plan Guidance. Behavior categories will include soaring flight, flapping-gliding, hunting, kiting-hovering, stooping/diving at prey, stooping or diving in an antagonistic context with other bird species, perched, being mobbed, undulating/territorial flight, auditory, and other. The initial flight patterns and habitat types will be uniquely identified on the data sheet. The flight direction of observed eagles will also be recorded on the data sheet map. Approximate flight

height at first observation will be recorded to the nearest height categories described above; the approximate lowest and highest flight heights observed will also be recorded.

Flight or movement paths for large birds and observed federal or state listed species will be mapped and given corresponding unique observation numbers. Landmarks and recent aerial photographs will be used to aid in recording flightpaths and locations of observations as accurately as possible.

Weather information will be recorded for each survey point consisting of temperature, wind speed, wind direction, precipitation, and cloud cover.

Sample Frequency and Schedule: Both small and large bird surveys will be completed approximately every other week (twice per month), during daylight hours, for one year. During a set of surveys, each plot will be visited once. A pre-established schedule will be developed prior to the field surveys to ensure that each station is surveyed approximately the same number of times, with survey times spread throughout the day within each season. The survey schedule will also be designed to minimize travel time between observations.

Migration: Apex proposes to increase sample frequency to every week during spring (Mar 1-Jun 1 and) and fall (Aug 15-Dec 1) to evaluate species composition and changes in levels of bird use during migration; however, per the December 15, 2014 meeting, additional discussion with New York Department of Environmental Conservation (NYDEC) and USFWS is warranted before a migration protocol will be approved and implemented.

## **Data Analysis**

Mean Use: Small birds recorded within 100-m radius plots and large birds detected within the 800-m radius plots will be used to calculate mean use and frequency of occurrence. For non-eagle birds, mean use will be measured as the number of birds per plot per 5 or 20-minute survey. Seasonal mean use will be calculated by species, averaging the total number of individuals seen within each plot during a visit, then averaging across plots within each visit, followed by averaging across visits within the season. Overall mean use will be calculated as a weighted average of seasonal values by the number of days in each season. Frequency of occurrence will be calculated as the percent of surveys in which a particular bird type or species was observed.

Although not perfect, these measures provide relative indices of abundance and/or measures of species exposure to the proposed facility and may be useful for assessing timing/seasonality of diurnal use and for making comparisons of risk between species, seasons, and project site in similar habitats and geographic areas. High mean use with low frequency of occurrence (e.g., large flocks observed on rare occasions) may indicate that a species has higher exposure relative to other species, but in reality is unlikely to be adversely affected. Conversely, a species that has low mean use and a high frequency of occurrence would have consistent exposure to the facility, potentially increasing the likelihood that this species may be negatively affected. Therefore, exposure to facility infrastructure is more accurately assessed by evaluating both mean use and frequency of occurrence and careful interpretation of these data will be provided in the final report for the project.

Flight Height and Behavior: Bird flight heights are important metrics to assess potential exposure. Flight height information will be used to calculate the percentage of birds observed flying approximately within the rotor-swept heights (RSH; approximated as between 50 and 150 m agl). The flight height recorded during the initial observation will be used to calculate mean flight height by species and used to assess the percentage of birds flying within the potential RSH. The percentage of birds flying within the RSH at any time will also be calculated using the lowest and highest flight heights recorded. Auditory only observations will be excluded from flight height calculations.

Spatial Use: Flightpaths of all raptors and rare or special status large birds will be presented in figures by season and pooled across the entire year as a qualitative means of assessing use patterns by species. Additionally, spatial use of the project will be evaluated comparing mean use by point within each season, and evaluating potential differences in species use and mean use between near, mid and far points as grouped in proximity from the Lake Ontario shoreline. Comparisons will be made primarily in a qualitative manner as sample size is unlikely to be sufficient for strong statistical comparisons, particularly for rare or special status species that are observed infrequently; however, statistical comparisons will be completed if appropriate to test for differences.

Opportunistic Sightings: Rare or special status (federal and state threatened or endangered) species observed within or near the project boundaries outside of scheduled surveys, or outside described survey areas, will be recorded as incidental wildlife observations. The data recorded for these opportunistic sightings will be similar to that recorded during bird use surveys, and include species, location, date, time, number of individuals, sex/age class, and habitat. Opportunistic sighting data will provide additional information on frequency and distribution of these special status species if they are using the project area.

## **Reporting**

A year-end report will be provided that summarizes the methods, results and analysis based on the study plan discussed above. The implications of the findings as it relates to risk to avian species will be discussed. A draft report will be provided to NYDEC and USFWS within 60 days of completion of field data collection for review, input and discussion.

# B

## Wintering Grassland Raptor Survey Protocol



**BUFFALO CORPORATE CENTER**

368 Pleasant View Drive, Lancaster, New York 14086

Tel: (716) 684-8060, Fax: (716) 684-0844

February 13, 2015

Ms. Brianna Gary

*Submitted electronically to:* [Brianna.Gary@dec.ny.gov](mailto:Brianna.Gary@dec.ny.gov)

Avian Ecologist

Division of Fish, Wildlife and Marine Resources

Bureau of Habitat

625 Broadway, 5th Floor

Albany, NY 12233-4756

Re: Revised Study Plan for Wintering Grassland Raptor Surveys

Proposed Lighthouse Wind Project

Niagara and Orleans Counties, New York

Dear Ms. Gary:

Ecology and Environment, Inc., (E & E) has prepared this revised study plan for Apex Clean Energy, Inc. (Apex) based on our recent discussions with you and comments received on February 6, 2015, from regional New York State Department of Environmental Conservation (NYSDEC) staff regarding wintering grassland raptor surveys at the proposed Lighthouse Wind Project. This study plan has been revised based on NYSDEC review comments on our January 9, 2015 study plan. Surveys were initiated in January to document the presence and site use of wintering grassland raptor species while NYSDEC reviewed and provided multiple rounds of recommended revisions to the study plan. E & E and Apex believe that this plan incorporates NYSDEC comments in their entirety and should be approved as final. The ongoing winter grassland bird studies have been modified as of the date of this letter to incorporate these changes.

## **INTRODUCTION**

Apex is developing the approximately 200-megawatt Lighthouse Wind Project (Project) in the towns of Somerset (Niagara County) and Yates (Orleans County), New York. The number, type, and location of turbines have not been determined at this time. Wintering grassland raptor surveys will be conducted as part of a larger effort to determine bird use in the Project area. The primary focus of these surveys is to collect information on the occurrence and distribution of wintering raptor species, including New York State-listed raptor species, such as the Short-eared Owl (endangered) and the Northern Harrier (threatened) in the Project area. This study plan was prepared based on the NYSDEC *Draft Project Applicant Survey Protocol for State-listed Wintering Grassland Raptor Species* (12/22/2014 working draft edition) and recommended revisions per NYSDEC input. The results of these surveys will be used to assess Project risk to wintering raptor species and inform the siting of Project features.

## **OBJECTIVE**

The objective of the wintering grassland raptor surveys is to collect information on the presence and site use of winter raptor species in the Project area, including state-listed species such as the Short-eared Owl and the Northern Harrier. Surveys will allow a determination of the presence or apparent absence of wintering raptors and the identification of particular “concentration” areas, such as roosting or primary foraging locations.

## **METHODOLOGY**

As per NYSDEC guidance, two survey methods will be employed to assess winter raptor use and distribution: stationary surveys and driving routes. Surveys will be conducted during appropriate weather conditions and will not be conducted or continued during periods of inclement weather, such as heavy precipitation, fog limiting visibility to less than one-quarter mile, or strong winds exceeding 20 mph.

### **Stationary Surveys**

E & E previously identified four stations for stationary surveys based on suitable habitat for the Short-eared Owl and Northern Harrier and on personal/historical sightings of these species in the area. An additional five stations for stationary surveys have been included as per recent NYSDEC comments. The stations have been located in the field to provide the maximum view of the habitat and with consideration of the surveyor’s safety (see Figure 1). Six rounds of surveys will be conducted at these stations. Each round will be conducted approximately two weeks apart, with two rounds anticipated for each month (January, February, and March 2015). If Short-eared Owls or Northern Harriers are detected during the second round of March surveys, then E & E and Apex will contact NYSDEC to discuss conducting surveys in April 2015. Three rounds of stationary surveys will also be conducted between November 15, 2015, and December 31, 2015.

Surveys will be conducted during the period of one hour before sunset to a half hour after sunset and will be extended up to an additional half hour when visibility conditions allow. Dusk is considered the height of the daily activity period for these raptor species in Western New York.

For the duration of each survey, an E & E biologist will scan the surrounding open areas standing near a vehicle or a blind. Particular attention will be paid to raptors perching on utility poles and fence posts or coursing low over the ground. The biologist will listen for calls of Short-eared Owls and Northern Harriers to best track raptor movements.

### **Driving Routes**

Driving route surveys involve stopping at approximately 36 identified roadside points over two days. Driving surveys will be conducted during the afternoon and take place on the same day as stationary surveys. The locations were selected based on the presence of suitable foraging habitat near each roadside point (e.g., pasture/hayfields), previous experience with the focus raptor species within the Project area, NYSDEC input, and the sight-lines and visibility conditions that are unique to each location. At each point, an E & E biologist will exit the vehicle and, over a 3-minute period (minimum), scan the surrounding open areas while paying particular attention to the behavior and flight patterns

of individuals, before recording the data and then proceeding to the next roadside point. The surveyor will stop if any raptors are observed while driving between route stops to document their occurrence.

Driving route survey rounds will occur once in January, twice in February, and twice in March 2015. Two surveys will be conducted during each of these five periods to cover suitable habitat within the Project area. If Short-eared Owls or Northern Harriers are detected during the second round of March surveys, then E & E and Apex will contact NYSDEC to discuss conducting surveys in April 2015. Three rounds of driving route surveys will also be conducted between November 15, 2015 and December 31, 2015.

### **Data Collection**

Data recorded during the surveys will include weather conditions, local snow depth, and species and the number of individuals observed. The direction of the individual(s) from the observer, the behavior, flight direction (if applicable), and flight height will also be noted. The probability of whether the individual had been observed previously, as well as any notes detailing potential roosting, migration, or breeding behaviors, will also be recorded. Flight directions will be noted when raptors are observed to fly into or out of an area of visibility. Foraging and any possible roost areas will be described. Any potential breeding behavior will be documented.

All other sightings of bird species encountered during the grassland winter raptor surveys will be recorded as incidental observations. Additional details will be noted for any federal and state threatened or endangered bird species encountered.

### **REPORTING**

A draft report detailing the survey results, including summaries and figures of all observations, including those of Short-eared Owls, Northern Harriers, and any other state-listed species encountered during surveys, will be provided to NYSDEC and the U.S. Fish and Wildlife Service within 30 days of completion of field data collection for review, input, and discussion. Apex will contact NYSDEC if foraging and/or roost areas for Short-eared Owls are found during the surveys.

Should you have any questions, please contact me at 716/684-8060, or via e-mail at [mmorgante@ene.com](mailto:mmorgante@ene.com).

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.



Michael M. Morgante  
Project Director

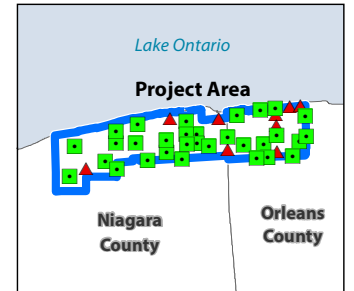
Attachments

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**Proposed Wintering  
Grassland Raptor Surveys  
Viewsheds  
Lighthouse Wind**  
Somerset and Yates,  
Niagara and Orleans Counties, NY  
Apex Clean Energy, Inc.

Legend

- Stationary Point and Driving Route Stop
- Driving Route Stop
- ▲ Stationary Point
- Interstate Highway
- Major Road
- County Boundary
- Town Boundary



Source: ESRI 2010; USGS NLCD 2011  
Service Layer Credits: Source: Esri,  
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