

Appendix G

Avian and Bat Work Plans

North Ridge Wind Project Avian Survey Work Plan

St. Lawrence County, New York



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NORTH RIDGE WIND PROJECT AVIAN SURVEY WORK PLAN

Table of Contents

1.0	INTRODUCTION	1
2.0	SPRING RAPTOR MIGRATION SURVEYS	1
3.0	BREEDING BIRD SURVEYS	1
4.0	REPORTING	2

NORTH RIDGE WIND PROJECT AVIAN SURVEY WORK PLAN

1.0 Introduction

Iberdrola Renewables, LLC (Iberdrola) is considering the construction of the North Ridge Wind Project (Project) located in St. Lawrence County, New York. The Project is in preliminary stages of design and includes up to 40 potential turbine locations within the Project boundary depicted in Figure 1.

This work plan outlines the scope of work for 2016 spring raptor migration surveys and breeding bird surveys. The survey effort is based on the New York State Department of Environmental Conservation (DEC) *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (DEC Guidelines), dated April 2016, and a teleconference held on May 9, 2016, with DEC.

2.0 Spring Raptor Migration Surveys

Spring raptor migration surveys will be conducted during the months of March, April, and May 2016. Surveys will generally be conducted weekly for a total of 11 survey days over the spring migration period. As per DEC Guidelines, surveys will be conducted from 1 prominent location with a good view of the Project area throughout the survey period (Figure 1). Surveys will take place from 8:00 am to approximately 2 hours before sunset. Surveys will target days with optimal migration weather (southerly, moderate winds) and days with good visibility. Data will be collected on standard raptor datasheets and flight paths will be drawn on Project area maps. Data collected will include species identification, number of individuals, sex and age class (if possible), flight pattern and location, flight behavior, flight height, flight time inside the Project area, time of observation, and weather conditions. Other birds, including flocks of birds, will be recorded as incidental observations to the raptor survey.

3.0 Breeding Bird Surveys

Breeding bird surveys will be conducted once each week from May 23 to July 1 (6 weeks). Surveys will be conducted from sunrise until no later than approximately 10:00 am, in weather conditions conducive to hearing and seeing birds. All birds identified by sight or sound within a 10-minute sampling period, including soaring raptors, waterfowl, and other fly-overs, will be recorded at each survey point. Habitat and weather information will be recorded at each survey point. Any distractions or noises affecting bird detection will be noted and the 10-minute point counts themselves will be initiated after a 2-minute quiet period to allow bird activity to return to normal, should it be affected by the observer walking between points.

Surveys will be conducted at 90 points along 15 transects, each between 300 to 400 meters long. Ten transects (with 60 points) will begin at proposed turbine locations (treatment) and 5 transects (with 30 points) will be located greater than 800 meters from proposed turbine locations (control). Transects will be distributed, to the extent possible, on available habitat (forest vs. field). Based on the availability of habitat within the Project area and existing land

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control, 8 transects will be located in forested habitat (5 treatment and 3 control), and 7 transects will be located in open field or agricultural habitat (5 treatment and 2 control).

Survey points along the forested habitat transects will be spaced 50 meters apart. Seven points will be placed on these transects, resulting in transects 300 meters long. The 8 transects in forested habitat will therefore contain a total of 56 survey points (7 points X 8 transects).

Survey points along the field habitat transects will be spaced 100 meters apart due to the increased detection distances in these open habitats. Field transects will contain either 4 or 5 survey points and will therefore be 300 or 400 meters long and will contain a cumulative total of 34 points. Data analysis will account for the difference in spacing between points along forest and field transects.

On average, 5 to 7 transects will be surveyed during each week within the survey period, and each point will be visited at least twice within the survey window. The final location of each survey point will be recorded with a Global Positioning System (GPS).

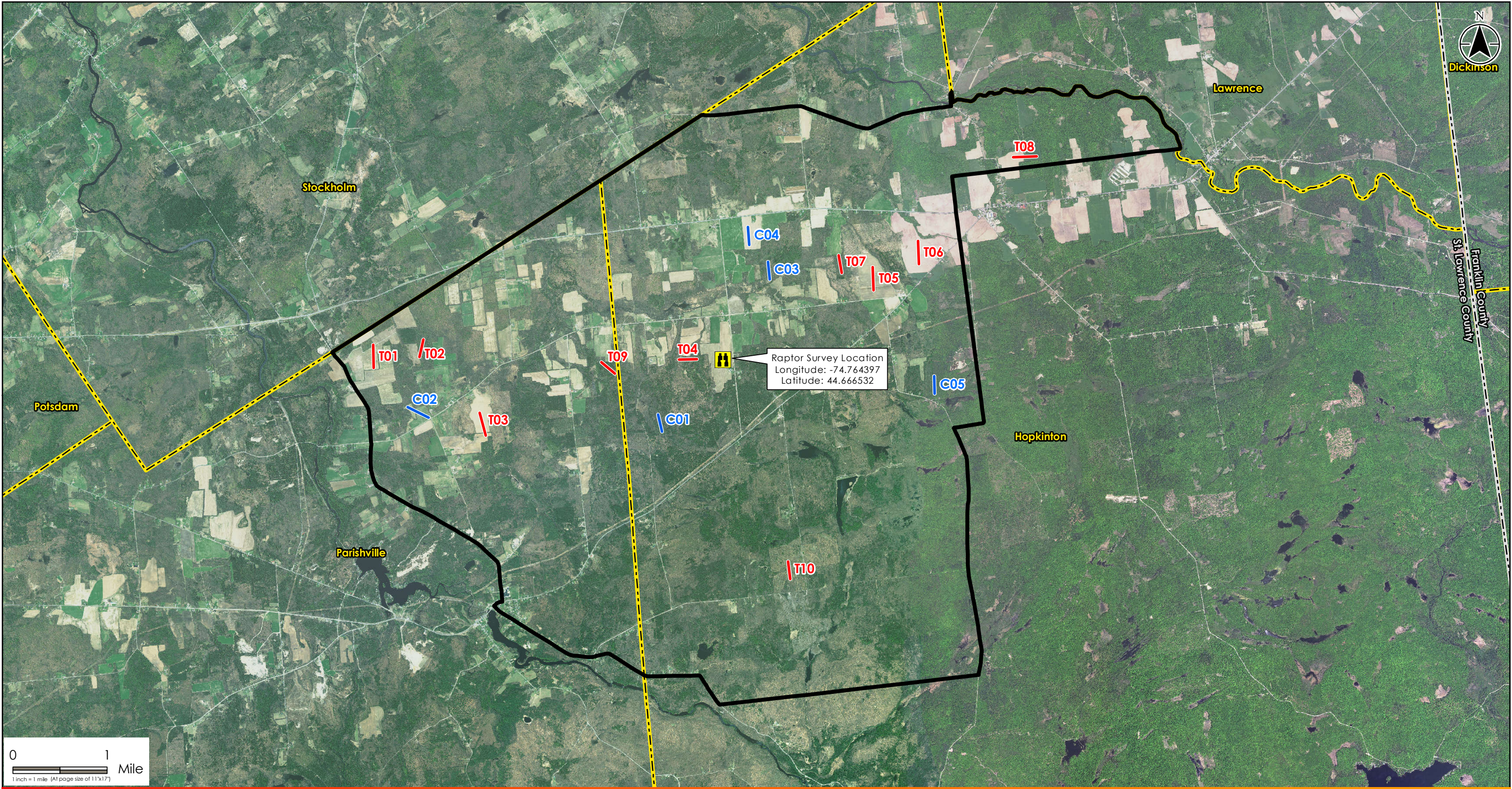
4.0 Reporting

Stantec will draft a report summarizing the results of the surveys described above. The report will include Introduction, Methods, Results, and Discussion sections for both the raptor and the breeding bird surveys. The report will include appropriate photographs, tables, and figures, as suggested in the DEC Guidelines.

The raptor survey portion of the report will summarize survey effort and weather on survey days. Summary metrics of the raptors observed each day and over the course of the entire survey will be provided, including species composition, flight heights, flight behaviors, and flight locations.

The breeding bird survey portion of the report will identify the final location of each transect and summarize survey effort and weather on survey days. Summary statistics including total number of individuals observed, species richness, relative abundance, species frequency, and community diversity will be provided for both the treatment (turbine) and control (non-turbine) transects.

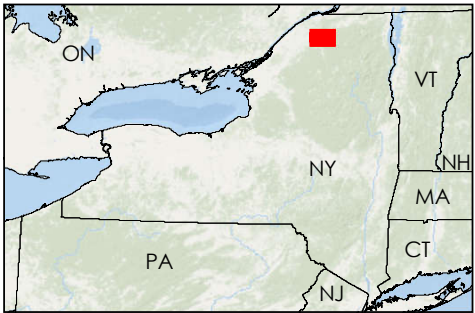
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- Legend**
-  Raptor Survey Location
 -  BBS Control Transect
 -  BBS Transect
 -  Project Boundary
 -  County Boundary
 -  Town Boundary

Data Source
1. 2015 National Agriculture Imagery Program (NAIP) aerial orthoimagery provided by USDA's Farm Service Agency.

Client/Project
Iberdrola Renewables
North Ridge Wind Project
St. Lawrence County, New York

Figure No.
1

Title
2016 Spring Raptor and
Breeding Bird Locations
6/2/2016

DRAFT North Ridge Wind Project Bat Survey Work Plan

St. Lawrence County, New York



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August 8, 2016

Table of Contents

1.0	INTRODUCTION	1
2.0	BAT PRESENCE-ABSENCE SURVEY	1
2.1	STUDY DESIGN.....	1
2.2	FIELD METHODS	3
2.3	DATA ANALYSIS	4
3.0	FALL BAT MIGRATION SURVEY	4
3.1	SURVEY DESIGN	4
3.2	FIELD METHODS	4
3.3	DATA ANALYSIS	4
4.0	REPORTING	4

LIST OF TABLES

Table 1. Linear Distances (km) of Project Features, by Habitat	2
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LIST OF FIGURES

Figure 1. Acoustic Survey Locations	
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DRAFT NORTH RIDGE WIND PROJECT BAT SURVEY WORK PLAN

1.0 Introduction

Avangrid Renewables, LLC (Avangrid) is considering the construction of the North Ridge Wind Project (Project) located in St. Lawrence County, New York. The Project is in preliminary stages of design and includes up to 38 potential turbine locations within the Project boundary depicted in Figure 1.

This work plan outlines the scope of work for 2016 summer bat presence-absence and fall migration surveys. The survey effort is 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)¹, dated April 2016, the United States Fish and Wildlife Service (USFWS) 2016 Range-wide Indiana bat summer survey guidelines (USFWS Guidelines)², and phone conversations held with NYSDEC and USFWS staff in mid- to late-July.

2.0 Bat Presence-Absence Survey

2.1 STUDY DESIGN

The NYSDEC Guidelines recommend use of the USFWS Guidelines for documenting the presence or probable absence of the federally and state-listed threatened northern long-eared bat (*Myotis septentrionalis*; NLEB) as part of the standard bat surveys at wind projects. During conversations with the USFWS it was noted that records of the Indiana bat would be associated with bats from the Fort Drum area, which are known to use the Glen Falls Park hibernaculum, located near Watertown, New York. Since Fort Drum and the Glen Falls Park hibernaculum are located more than 60 miles southwest of the Project area, Indiana bats are highly unlikely to occur. Despite this, data analysis for this survey will include both bat species.

The USFWS Guidelines prescribe the allocation of summer bat acoustic monitoring based on acreage of potential habitat for projects that cover localized areas or based on the linear (number of km) extent of potential habitat for projects that are more linear in design. Both methods provide challenges when applied to wind projects. Use of the area-based method typically results in excessively and unattainably large sampling requirements if it is applied to the total acreage of leased land, the outer boundary of all project features, or a bat home range buffer around the proposed project infrastructure. Additionally, the term "project area" is ambiguous and is often defined differently from site to site, resulting in inconsistent levels of effort to evaluate bat presence or absence.

The linear method appears to be more appropriate for determining level of survey effort for wind projects in forested habitats of the northeastern United States because the typical layout of these projects essentially consists of roads and transmission line corridors. However, the USFWS

¹ NYSDEC. 2016. Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects. <http://www.dec.ny.gov/docs/fish_marine_pdf/dwinguide16.pdf>

² USFWS. 2016. Range-wide Indiana Bat Summer Survey Guidelines, 11 April. <<http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html>>

DRAFT NORTH RIDGE WIND PROJECT BAT SURVEY WORK PLAN

has expressed concern that it may not result in enough effort to adequately assess whether or not the species is present at a proposed project. To address these concerns, the linear method was used to determine the number of bat detector sampling sites. These sites were then allocated across the Project area and surrounding landscape based on turbine locations and distribution of potential suitable habitat. Finally, the amount of survey effort within 1.5 mile (the typical NLEB home range radius provided by the USFWS during phone conversations) buffers around turbines was evaluated to confirm adequate coverage of potential habitat within these areas.

Based on the most recent preliminary site layout (July 22, 2016) there is approximately 29.5 kilometers (km) of Project infrastructure located within potential bat roosting habitat in the Project area (Table 1). This distance was tallied by including all forested land cover types, upland or wetland, as well as other woody land cover types, such as scrub/shrub within the National Land Cover Database³. Therefore, a total of 30 sampling sites were targeted for this effort (Figure 1).

Table 1. Linear Distances (km) of Project Features, by Habitat

Land Cover Type	Turbine Access Road	Alternate Turbine Access Road	Collector Line	Total
Cultivated Crops	1.7	0.4	2.1	4.2
Deciduous Forest	15.5	3.6	3.6	22.6
Developed, Open Space	0.2	0.0	0.1	0.3
Emergent Herbaceous Wetlands	0.1	0.0	0.0	0.1
Evergreen Forest	2.1	0.5	1.0	3.7
Grassland/Herbaceous	0.2	0.0	0.1	0.4
Mixed Forest	0.6	0.1	0.6	1.2
Pasture/Hay	2.8	0.3	0.8	3.9
Shrub/Scrub	0.4	0.1	0.2	0.8
Woody Wetlands	0.4	0.5	0.3	1.2
Total	24.0	5.5	8.9	38.3
Total within Bat Habitat	19.0	4.8	5.7	29.5

Individual sampling sites were chosen to target areas with suitable microhabitat features for northern long-eared and Indiana bats during the summer (e.g., narrow corridors and openings within forest, wetland margins, forest edges) as indicated by recent aerial imagery. These sites

³ Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. Photogrammetric Engineering and Remote Sensing, v. 81, no. 5, p. 345-354.

DRAFT NORTH RIDGE WIND PROJECT BAT SURVEY WORK PLAN

also appeared to meet the criteria for survey sites in the USFWS Guidance, although this final determination and detector placement will be made in the field.

While the level of effort was determined using the linear method, the selection of sites was not limited to the narrow footprint of the Project. Rather, sites were selected across the leased Project parcels where suitable sampling conditions appeared to occur. Emphasis was placed on distributing the sites across and throughout the Project with a fairly uniform distribution to sample the greater landscape as a whole. The primary limitation of site selection was land access, as wind projects typically lease land only on those parcels on which Project features (turbine, access road, collection line, etc.) occur. However, leased parcels provided an adequate extent of a variety of potential habitats representative of the larger area within 1.5 mile buffers of turbines.

The sample site distribution was then evaluated to ensure that they were suitably dispersed across the Project area. This was completed by tallying the number of bat sampling sites located within 1.5 miles of each proposed turbine. Overall, there are 3 – 9 bat sampling sites (average of 5) within 1.5 miles of the proposed turbine locations, indicating that even though micro-habitat features were targeted for this effort they were evenly distributed and selected across the Project area and should provide a comprehensive dataset on which to evaluate the potential presence of northern long-eared and Indiana bats in the vicinity of the Project.

2.2 FIELD METHODS

Full-spectrum (e.g., Wildlife Acoustics® SM3 or SM4) acoustic bat detectors will be deployed for this survey. Each detector will be fitted with a SMM-U1 ultrasonic omnidirectional microphone and the audio and data storage settings will be adjusted according to manufacturer recommendations (i.e., detectors will operate in “triggered .wav” mode using default trigger threshold settings recommended by the manufacturer).

Each detector will be deployed at a sampling site for 2 nights and will be programmed to record for the period between 30 minutes before sunset until 30 minutes after sunrise for each night of survey. In compliance with the USFWS Guidelines, weather conditions at the nearest weather station (KNYPOTSD6 in Potsdam, New York) will be reviewed to confirm that during the first 5 hours of each night the temperature does not fall below 50°F (10°C), precipitation (including rain and/or fog) does not exceed 30 minutes or continue intermittently, and sustained wind speeds are not greater than 9 miles/hour for 30 minutes or more. Should these weather conditions not be met during this 2-night deployment, detectors will be left in place for additional night(s) until data have been collected on 2 survey nights with suitable weather conditions. Data analysis will only occur on the data from the first 2 nights with suitable weather.

The location of detectors will be based on the site selection process described above. However, final micro-siting of each detector will be based on site conditions observed in the field and detector deployment criteria (e.g., distance from vegetation, microphone height above ground) described in Appendix C of the USFWS Guidelines. Final detector locations will be located by GPS and documented on datasheets.

2.3 DATA ANALYSIS

Data from the presence-probable absence survey will be analyzed using 2 of the analysis programs approved by USFWS: Kaleidoscope Pro software (version 3.1.7, classifier version 3.1.0) and BCID software (version 2.7d). Kaleidoscope and BCID software will calculate a maximum likelihood estimate (MLE) for presence of northern long-eared and Indiana bats for each detector night of data. The results of the automated acoustic analyses will be compared to one another to identify similarities or differences in the outcome. All calls determined by either analysis program to be either a northern long-eared bat or an Indiana bat will then be visually inspected by an experienced bat biologist to manually assess the species determination.

3.0 Fall Bat Migration Survey

3.1 SURVEY DESIGN

A passive acoustic bat survey will be conducted to characterize activity, timing of activity, and when possible, species composition of bats in the area during the late summer and fall migration period of 2016. Although this survey is not required by NYSDEC, this data could help inform an appropriate curtailment plan, should listed species be documented during the presence-absence surveys and NYSDEC recommends bat minimization measures.

3.2 FIELD METHODS

A bat detector will be placed on the on-site meteorological (met) tower in late July and will be programmed to record daily from 30 minutes before sunset until 30 minutes after sunrise during the survey period until mid-October (Figure 1). The detector will be hung on the tower at a height of approximately 45 m. Bi-weekly visits will be conducted to download data, verify proper operation of the detector and maintain the detector's power system.

3.3 DATA ANALYSIS

Following completion of this acoustic survey, data will be compiled and evaluated. Once downloaded, each data file will be analyzed using 2 automated analysis programs. These automated programs can provide different results. Consequently, the results will be compared with one another to determine if there is agreement between the 2 on call file identification and, more importantly, reduce the likelihood of false positive identification of a northern long-eared or Indiana bat. Each call file will be identified to guild and to species, when possible. A biologist will also visually review each bat call to manually assess of the results of the analysis.

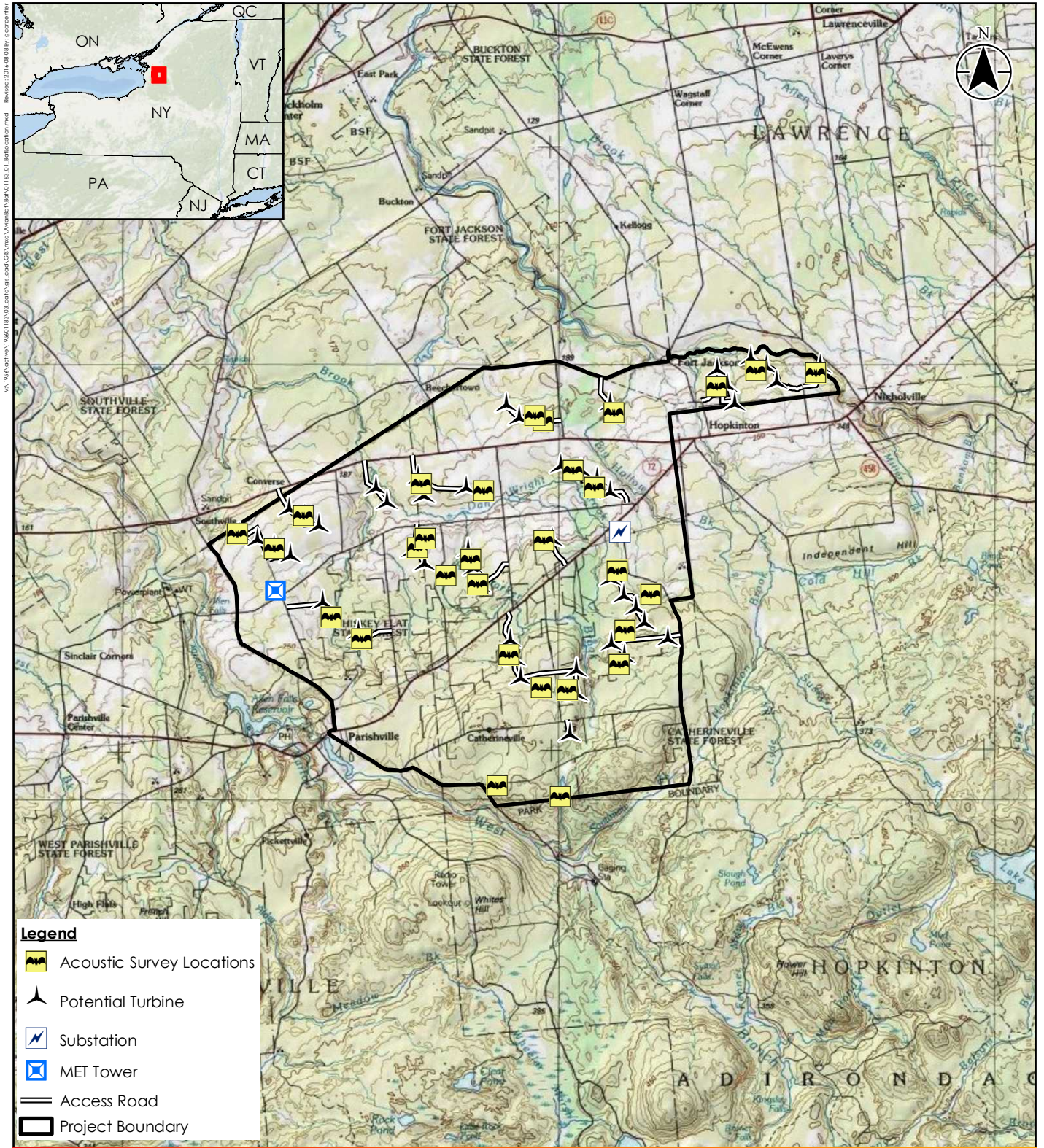
4.0 Reporting

A report will be drafted for each of 2 survey efforts described above. The presence-probable absence survey report will provide a summary of the analysis results for each of the 2 automated analysis programs used. Included will be the identification of the total number of potential northern long-eared or Indiana bat calls identified by these programs. The results of the visual analysis of these calls will then be provided to assess the identity of those calls as belonging to 1

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of the 2 target species or to document if those calls are unlikely to be of those species (false positives). The report will also include a map of the final bat detector sampling locations and photographs and datasheets for each detector.

A similar summary of detector data analysis will be provided for the fall migration data from the met tower. However, this analysis will include data for all bat species or species guild, not just limited to the 2 listed bat species. This survey summary will also include an analysis of wind speed, wind direction, and temperature data from the met tower to assess if these weather variables are correlated with bat activity.



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01183_01_BatLocation.mxd

0 2 Miles
1 inch = 2 miles (At page size of 8.5"x11")

DRAFT

Client/Project

Avangrid
North Ridge Wind Project
St. Lawrence County, New York

Figure No.

1

Title

Acoustic Survey Locations
8/8/2016