

APPENDIX G

Deer River Wind Project Avian Survey Work Plan

Lewis County, New York



Prepared for:

Iberdrola Renewables, LLC
Two Radnor Corporate Center
Suite 200
100 Matsonford Road
Radnor, PA 19087

Prepared by:

Stantec Consulting Services Inc.
30 Park Drive
Topsham, ME 04086

June 3, 2016

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DEER RIVER WIND PROJECT AVIAN SURVEY WORK PLAN

1.0 Introduction

Iberdrola Renewables, LLC (Iberdrola) is considering the construction of the Deer River Wind Project (Project) located in Lewis County, New York. The Project is in preliminary stages of design 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 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). Due to

DEER RIVER WIND PROJECT AVIAN SURVEY WORK PLAN

a limited amount of leased land greater than 800 meters from any proposed turbine location, the 3 forested control transects will be placed on nearby State Forests (Lookout and Grant Powell Memorial State Forests) and the field control transects will be located adjacent to roads.

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).

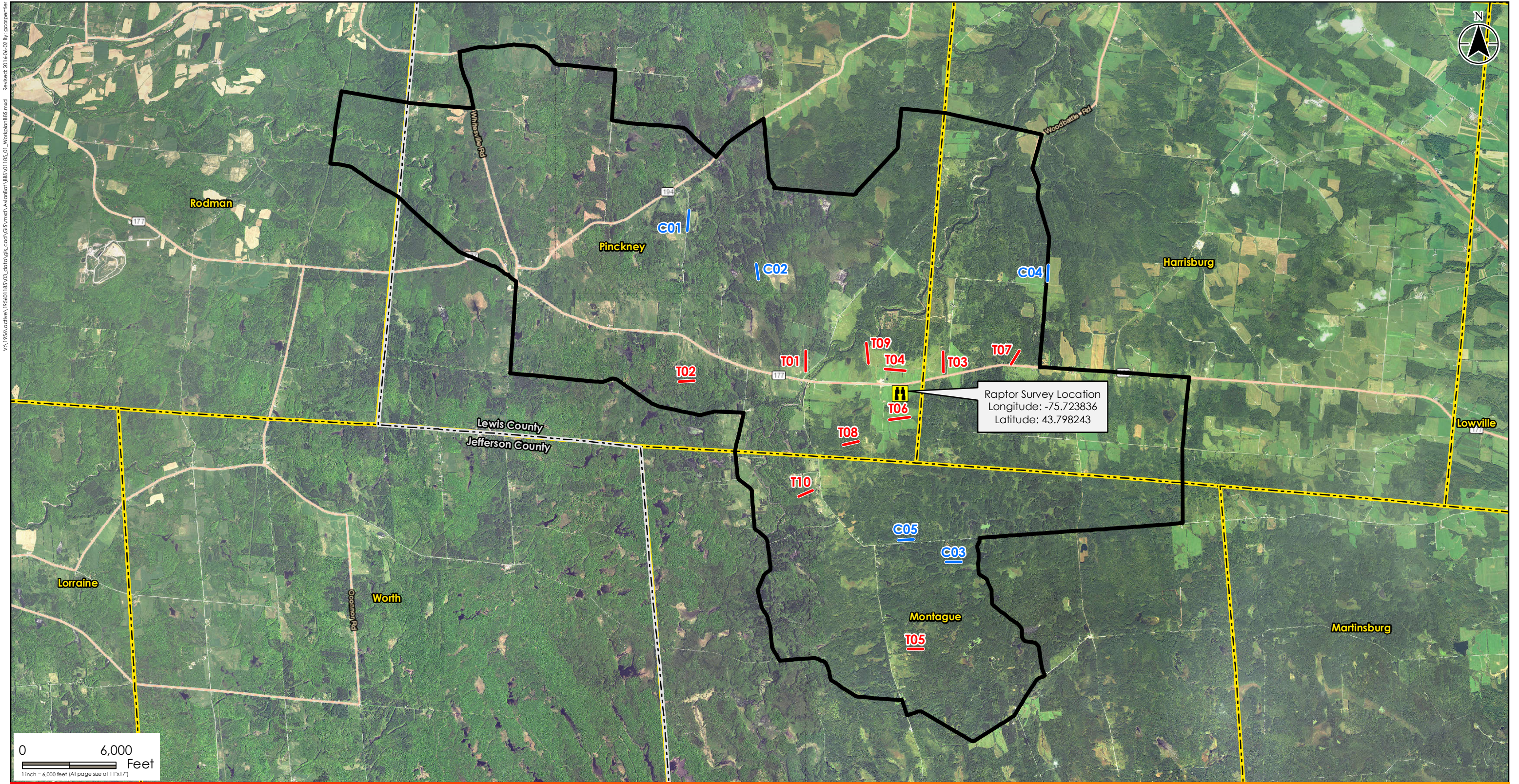
4.0 Reporting

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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




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195601185

 **Stantec**
30 Park Drive
Topsham, ME USA 04086
Phone (207) 729-1199
Prepared by GAC on 2016-06-02
Quality Review by SBG on 2016-06-02
Independent Review by BR on 2016-06-02
01185_01_WorkplanBBS.mxd



- 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
Deer River Wind Project
Lewis County, New York

Figure No.
1

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

Deer River Wind Project Bat Survey Work Plan

Lewis County, New York



Prepared for:

Avangrid Renewables
Two Radnor Corporate Center
Suite 200
100 Matsonford Road
Radnor, PA 19087

Prepared by:

Stantec Consulting Services Inc.
30 Park Drive
Topsham, ME 04086

August 8, 2016

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DRAFT DEER RIVER WIND PROJECT BAT SURVEY WORK PLAN

1.0 Introduction

Avangrid Renewables, LLC (Avangrid) is considering the construction of the Deer River Wind Project (Project) located in Lewis 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 the Project is within the dispersal range of Indiana bats (*Myotis sodalis*) known to use the Glen Falls Park hibernaculum, located near Watertown, New York. However, the USFWS also noted that past telemetry data indicates that these bats do not use summer ranges above 900' in elevation. The Project area occurs from 1,000' to 1,700' in elevation. 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.

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>>

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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 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 51.3 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 52 sampling sites were targeted for this effort (Figure 1).

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

Land Cover Types	Access Road	Collector	Alternate Access Road	Alternate Collector	Total
Cultivated Crops	0.4	1.5	0.0	0.4	2.3
Deciduous Forest	15.9	5.9	5.6	6.7	34.1
Developed, Open Space	0.2	0.4	0.0	0.0	0.6
Emergent Herbaceous Wetlands	0.0	0.2	0.0	0.1	0.3
Evergreen Forest	0.8	1.5	0.2	1.9	4.4
Grassland/Herbaceous	0.6	0.1	0.2	0.6	1.5
Mixed Forest	0.2	0.1	0.1	0.2	0.6
Open Water	0.0	0.1	0.0	0.0	0.1
Pasture/Hay	3.5	2.2	2.4	2.6	10.7
Shrub/Scrub	0.6	1.2	1.1	0.5	3.3
Woody Wetlands	2.5	3.6	1.0	1.7	8.9
Total	24.7	16.7	10.5	14.6	66.6
Total within Bat Habitat	20.0	12.3	8.0	11.0	51.3

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.

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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 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 2 – 10 bat sampling sites (average of 6.0) 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 (KNYCOPEN9 in Copenhagen, 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

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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.

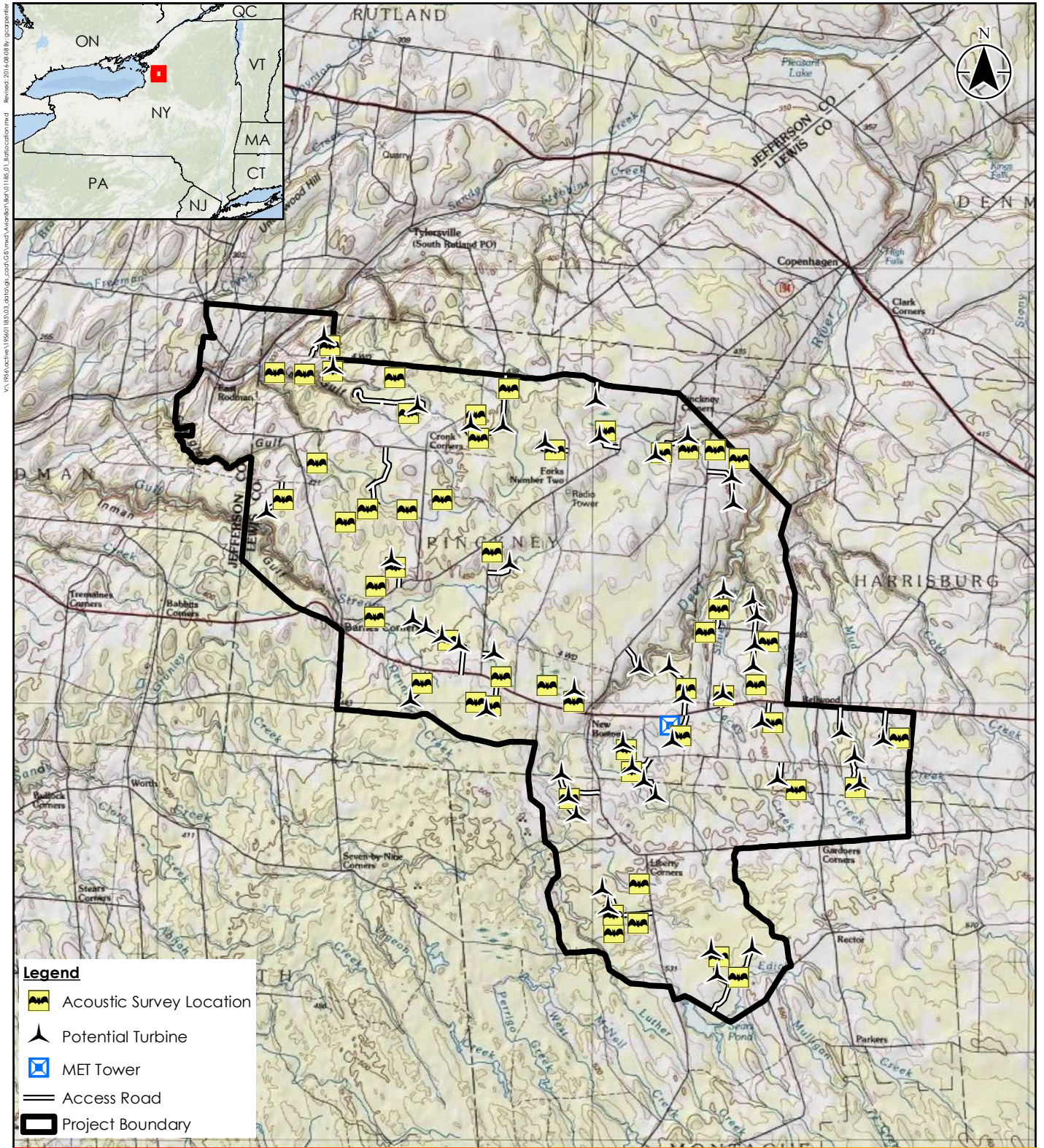
3.3 DATA ANALYSIS

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

30 Park Drive
Topsham, ME USA 04086
Phone (207) 729-1199

Prepared by GAC on 2016-08-01
Reviewed by BR on 2016-08-01

01185_01_BatLocation.mxd

Client/Project

Avangrid
Deer River Wind Project
Lewis County, New York

Figure No.

1

Title

Acoustic Survey Locations
8/8/2016

DRAFT Deer River Wind Project Upland Sandpiper Survey Work Plan

Lewis County, New York



Prepared for:

Avangrid Renewables, LLC
Two Radnor Corporate Center
Suite 200
100 Matsonford Road
Radnor, PA 19087

Prepared by:

Stantec Consulting Services Inc.
30 Park Drive
Topsham, ME 04086

April 19, 2017

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1.0 Introduction

Avangrid Renewables, LLC (Avangrid) is considering the construction of the Deer River Wind Project (Project) located in Lewis County, New York. The Project is in preliminary stages of design and includes up to 40 potential turbine locations (Figure 1).

This work plan outlines the scope for a 2017 upland sandpiper (*Bartramia longicauda*) (UPSA) survey. UPSA are listed as threatened in New York. The survey effort is based on feedback provided by the New York Department of Environmental Conservation (NYSDEC) on the 2016 Deer River Wind Project Breeding Bird Survey Report (Stantec 2017) and a February 17, 2017, follow-up conference call held with NYSDEC specifically to address their concerns about UPSA. No UPSA were detected during the 2016 Breeding Bird Survey (BBS) at the Project (Stantec 2017).

1.1 UPLAND SANDPIPER BACKGROUND

UPSA are considered an uncommon breeding bird throughout New York in agricultural areas and grasslands in the St. Lawrence Valley in Jefferson County and the Mohawk Valley (NYSDEC no date provided). Generally, UPSA nest in dry grasslands with low to moderate forb cover, low woody cover, moderate grass cover, and little bare ground (Vickery et al. 2010). They arrive in New York by late April and construct nests within approximately 2 weeks from arrival (NYSDEC no date provided). Incubation lasts 21–29 days and precocial chicks leave the nest within 24 hours of hatching; chicks fledge after 30 days, typically by mid-July in New York (NYNHP 2015). UPSA leave the state for wintering grounds by mid-September (NYNHP 2015).

During courtship displays, male sandpipers fly with short bursts of alternating rapid flight and long gliding in circular or elliptical patterns as high as 200 meters (m) (656 ft) above the ground (Weik 2000). These vertical displays can reach heights within the rotor-swept zone (RSZ) of turbines.

2.0 2017 Upland Sandpiper Survey

2.1 SURVEY GOALS

The goal of the UPSA survey is to document and locate occurrences of UPSA within potentially suitable habitat proximal to proposed turbine locations. A secondary goal is to document the timing and characteristics of flight displays, i.e., flight heights, percent within the RSZ, and time spent in the RSZ.

2.2 SITE SELECTION

Using GIS, Stantec overlaid the U.S. Geological Survey's National Land Cover Database (NLCD) (USGS 2011) onto a Project infrastructure data layer. The land cover types of the NLCD were combined into 4 general categories: water/wetland; forest/shrub; grassland/pasture/crops; and developed (Figure 1). Open fields occur mainly in the northwestern and eastern portions of the Project area. We then overlaid the 15 BBS transects surveyed in 2016 in the Project area, which included 7 transects located in open hay fields up to 400 m (1,312 ft) long.

DRAFT DEER RIVER WIND PROJECT UPLAND SANDPIPER SURVEY WORK PLAN

UPSA are uncommon on sites within suitable habitat that have a minimum size of < 50 to 64 hectares (ha) (Vickery et al. 1994; Walk and Warner 1999). Therefore, we identified areas where proposed Project turbines or access roads were located within the grassland/pasture/crop cover types that were > 50 ha and not previously sampled by the BBS effort in 2016. Most of the open fields in the central portion of the Project area were sampled via BBS (Figure 2). This resulted in the selection of 6 survey points for UPSA mainly in the northwestern corner east of Route 175 and in the northeast, north of Route 194 (Figure 2).

2.3 FIELD METHODS

Field visits will occur during the breeding season from early May before egg-laying to early June when birds are on eggs or eggs hatch. Each of the 6 points will be visited twice in May and once in June by a Stantec bird biologist with experience identifying grassland bird species. Visits will occur one-half hour before sunrise until 10:00 am. The temporal distribution of the surveys will be randomly assigned. Each point will have a 250-m (820 ft) radius plot, although any UPSA detected outside of this distance would also be recorded. Visits will occur in all weather conditions except for in heavy rain or high winds where visual or auditory detections would be impaired.

At each point, a Stantec biologist will conduct a passive visual/auditory survey for 10 minutes, scanning 360 degrees around the survey point with binoculars and/or a spotting scope to search and listen for UPSA. The biologist will scan fence posts, sign posts, utility wires, and any other potential perches and over fields. Then, the Stantec biologist will broadcast an UPSA call over a 1-minute period to attempt to elicit a territorial call or response call indicative of breeding individuals. After the call broadcast period, Stantec will listen for an additional 4 minutes for responses.

Locations of UPSA will be mapped within the 250-m radius point circle (as well as locations of UPSA detected beyond this distance). Data collected on standardized datasheets will include number of individuals, the time when first observed, behavior, habitat notes, and weather notes. For any UPSA performing courtship displays, additional data will be collected including flight time, maximum height, duration, and distance to landscape features (e.g., forest edge, perch, windrow, man-made structure). Observed non-target bird species of conservation concern in New York will be recorded as incidental observations.

3.0 Reporting

Stantec will draft a brief report summarizing the survey effort described above. The report will include introduction, methods, results, and discussion sections and photographs, tables, and figures, as appropriate.

4.0 Literature Cited

NYSDEC (New York State Department of Environmental Conservation). No date. Upland Sandpiper Fact Sheet. <<http://www.dec.ny.gov/animals/59582.html>>. Accessed 12 April 2017.

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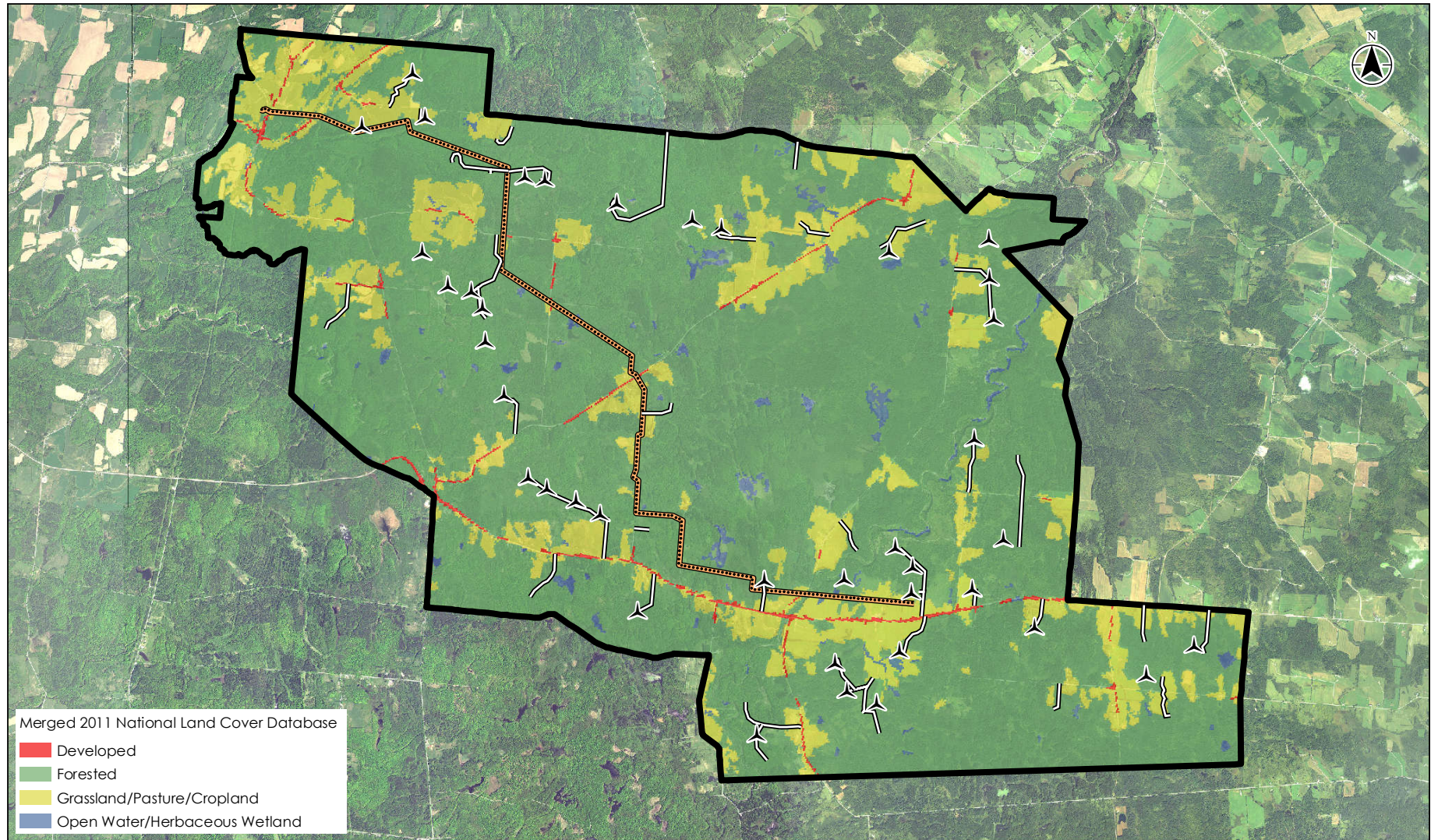
Vickery, P. D., D. E. Blanco, and B. Lopez-Lanus. 2010. Conservation Plan for the Upland Sandpiper (*Bartramia Longicauda*). Version 1.1. Manomet Center for Conservation Sciences, Manomet, Massachusetts.

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FIGURES



Legend

- Proposed Turbines (1-17-2017)
- Access Road (7-20-2016)
- Overhead Collector (7-20-2016)
- Project Boundary (1-17-2017)

0 1.5 Miles
1 inch = 1.5 miles (At original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. The 2011 National Land Cover Data Base provided by the Multi-Resolution Land Characteristics (MRLC) Consortium.
3. Orthomogery: NAIP 2015



Project Location: Lewis County, New York
Prepared by GAC on 2017-04-13
Technical Review by SBG on 2017-04-13
Independent Review by BR on 2017-04-13

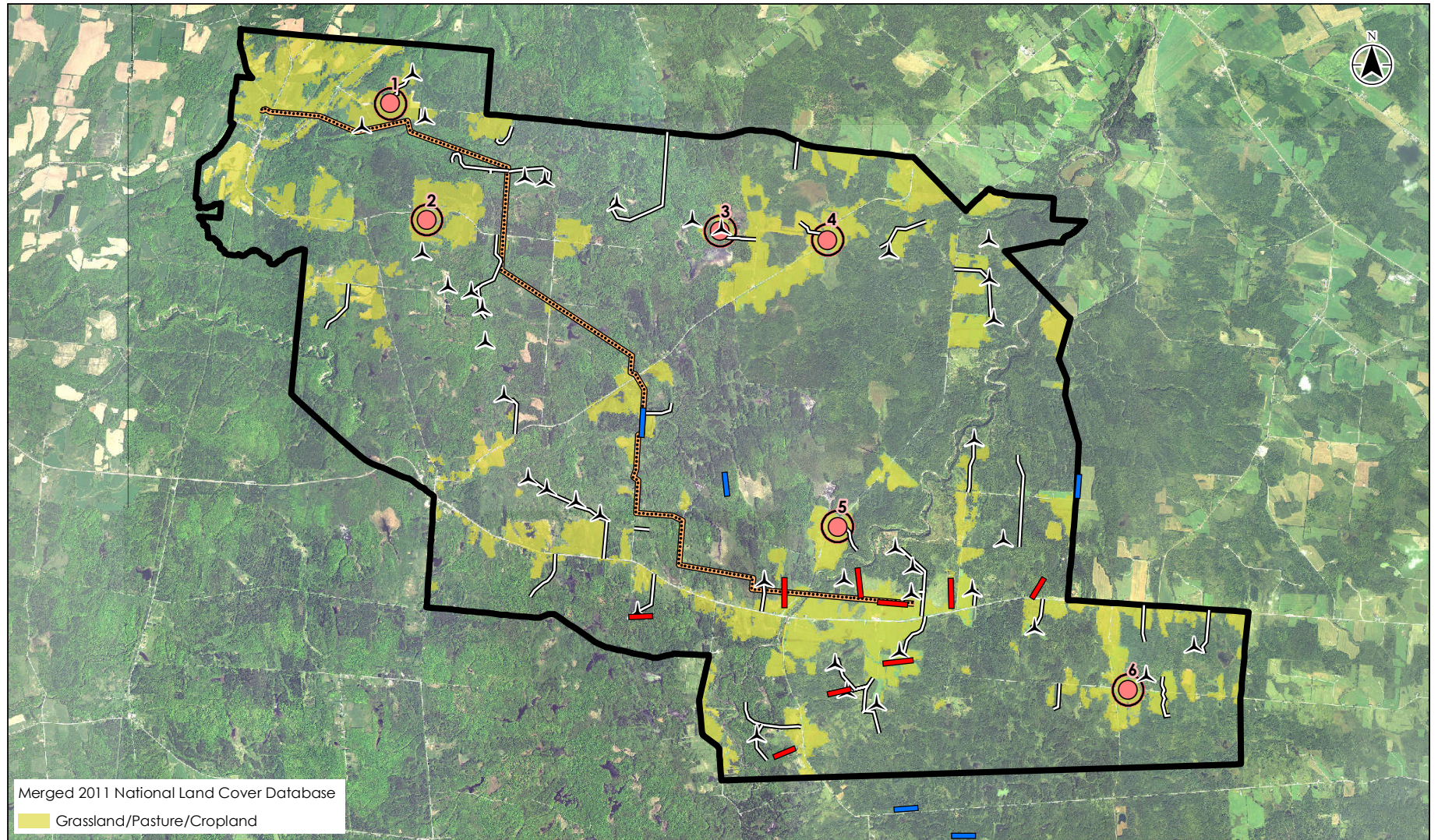
Client/Project:
Avangrid
Deer River Wind Project
Lewis County, New York

Figure No.
1

DRAFT

Project Area and Land Cover

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Legend

- ▲ Proposed Turbines (1-17-2017)
- == Access Road (7-20-2016)
- Overhead Collector (7-20-2016)
- Project Boundary (1-17-2017)
- Upland Sandpiper Survey Locations
- 250m Sample Plot
- BBS Transects
- BBS Treatment Transect
- BBS Control Transect

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Client/Project: Avangrid
Deer River Wind Project
Lewis County, New York

Figure No. 2

Title

Upland Sandpiper and Breeding Bird Survey (BBS) Locations

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