STUDY PLAN

Pre-Construction Tier 3 Avian and Bat Survey Protocol
Summit Lake Wind Project
Baraga County, Michigan

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BACKGROUND AND PROJECT INFORMATION

Renewable Energy Systems America, Inc. (RES) is considering the development of the Summit Lake Wind Project (Project) in Baraga County, Michigan (Figure 1). To assist in the development process, RES contracted Western EcoSystems Technology, Inc. (WEST) to conduct baseline ecological studies at the Project pursuant to Tier 3 of the US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines (WEG; USFWS 2012), the Eagle Conservation Plan Guidance (ECPG; USFWS 2013), and the Revisions to Regulations for the Eagle Incidental Take and Take of Eagle Nests (USFWS 2016a).

The survey protocols discussed below have been developed with input from USFWS and Michigan Department of Natural Resources (DNR) staff during a meeting on March 10, 2017.
Figure 1. Location and land cover types within the Summit Lake Wind Project in Baraga County, Michigan.
METHODS

Fixed-Point Count Avian Use Surveys

WEST will conduct year-round avian use surveys using point count methodology that is outlined within the USFWS WEG (2012) and the USFWS ECPG (2013). The objective of the fixed-point avian use surveys is to provide information regarding levels of use by birds, with a particular focus on bald eagles (Haliaeetus leucocephalus) and other large bird species. The avian use surveys will consist of fixed-point counts of bird use within circular plots around fixed observation points following methods similar to Reynolds et al. (1980).

To assess eagle use, the USFWS ECPG (2013) suggests that enough point count locations be placed to cover at least 30% of Project area. The current Project area is 27,235 acres (ac; 110 square kilometers [km²]) in size. To cover 30% of the Project area, 17 point count locations consisting of 2,625-feet (ft; 800-m) radius circular plots would be needed. However, the Project area consists primarily of deciduous forest, which limits the number of locations that have adequate viewsheds surrounding point count locations. Locations with adequate viewsheds are limited to clear cuts within the Project area. Ten points will be surveyed, all of which will be located in clear cuts to maximize viewsheds surrounding each point. These locations do not have open visibility within all directions up to 800 meters, however they are in areas where forest has been cleared at high elevations and therefore represent the best available locations to conduct avian fixed-point count surveys within the Project. Points will be separated by at least 5,249 ft (1,600 m) to avoid overlap of the 2,625-ft (800-m) radius plots, and the viewshed surrounding each point will be measured.

Surveys will be conducted for twelve months from April 2017 to March 2018 to quantify temporal and spatial use of the Project area by large and small birds. Each point count location will be surveyed once per month for at least 1.7 hours (102 minutes) each for a total of 204 hours of survey effort, which results in an equivalent amount of total survey time to surveying 17 points for one hour per month. The first 20 minutes the technician will be recording all large bird activity, and the final 82 minutes recording only eagle observations. The locations of survey points will be reviewed with the USFWS after WEST’s initial field review.

An additional 10-minute survey will be conducted at each point count location each month for small birds with a specific focus on Kirtland’s warbler (Setophaga kirtlandii) and other passerines.

Several variables will be recorded for each survey point and bird observation. Estimated distance to each bird observed will be recorded to the nearest 16 ft (five m). Landmarks will be located to aid in estimating distances to each bird. 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 (m), closest distance (m), height above ground (m), activity, and habitat/vegetation type will be recorded.
Bird behavior and habitat will be recorded for each bird observation. For bald eagle or golden eagle (*Aquila chrysaetos*) observations, additional behavior and habitat data will be recorded during each 1-minute interval the bird is within view, per the USFWS ECPG (2013). 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 (noted in comments). The initial flight patterns and habitat types (at first observation) will be uniquely identified on the data sheet, and subsequent patterns and habitats will also be recorded. The flight direction of observed birds will also be recorded on the data sheet map. Similarly, the flight path and movement of federal- or state-listed species will be mapped. Approximate flight height at first observation will be recorded to the nearest 16 ft (five m); the approximate lowest and highest flight heights observed will also be recorded. Any comments or unusual observations will be noted. Weather information recorded for each survey point will include temperature, wind speed, wind direction, precipitation, and cloud cover.

A pre-established schedule will be developed prior to the field surveys to ensure that each fixed-point count location is surveyed approximately the same number of times, to spread survey times throughout the day, and to minimize travel time between plots. Observers will be on-site four times per month (two to three points surveyed each visit) throughout the year. Observers will use the most efficient, logical route to move among survey plots throughout the day, changing the starting survey plot with the beginning of each survey cycle such that each point is surveyed during a range of daylight hours throughout the year.
Figure 2. Preliminary locations of fixed-point count avian use surveys within the Summit Lake Wind Project. Point count locations will be adjusted in the field to maximize viewsheds.
Figure 3. Preliminary locations 2-6 of fixed-point count avian use surveys within the Summit Lake Wind Project.
Figure 4. Preliminary locations 1 and 7-10 of fixed-point count avian use surveys within the Summit Lake Wind Project.
Spring Raptor Migration Surveys

The objective of the raptor migration surveys is to estimate the rate of use of the Project area by migrant raptors during spring. Point counts using variable circular plots (similar to Reynolds et al. 1980) will be conducted within the Project area according to methods used by the Hawk Migration Association of North America (HMANA; Keweenaw Bird Resource Group [KBRG] 2017), with observers continuously scanning the sky and surrounding areas for raptors from the survey point with an unlimited radius. The emphasis of the raptor migration surveys is to locate and count raptors migrating through the Project area.

Two survey points have been selected for monitoring of raptor migration through the Project area, which provide the best visibility at high elevations with defined topography within the project area (Figure 2-4; Locations 1 and 2). According to the Brockway Mountain Hawk Watch survey location in Copper Harbor, Michigan, higher raptor migration events occurred from early April to the end of May in 2015 and 2016 (KBRG 2017). Each point will be monitored twice weekly for a duration of six hours each day, pending weather and access delays, from April 1 to May 31, 2017.

Raptor Nest Survey

WEST will conduct an aerial nest survey within the Project area and 2.0-mi (3.2-km) buffer. The principal objective of the raptor nest survey will be to document the presence of bald eagle and other large raptor nests.

The USFWS ECPG (2013) recommends that surveys be conducted within 10 mi (16 km) of wind projects, to further inform potential impacts to local eagle populations. Michigan DNR conducts a statewide eagle nest survey; eagle nest data will be obtained from the Michigan DNR to assess nest density and activity within 10 mi (16 km) of the Project.

One aerial survey for raptor nests will be conducted in March 2017, prior to leaf out. Surveys will be completed by flying transects that are spaced approximately 0.5 mi (0.8 km) throughout the Project area while looking for raptor nest structures. Areas containing highly suitable bald eagle nesting habitat, such as mature forest located adjacent to fish bearing water, will be surveyed more intensely by flying the helicopter over highly suitable habitat and looking for nest structures. Raptor nest structures are defined as stick nest structures large enough to accommodate Buteo-sized raptors or larger.

All potential nest sites will be recorded using Global Positioning System technology, and locations of nests will be digitized in Geographic Information System. Data recorded for each nest site will include nest condition (poor, fair, good), nest use (occupied, unoccupied), nest substrate (e.g., size of material in substrate, height off the ground), and species in occupied nests. To the greatest extent possible, disturbance to nests occupied by raptors during surveys will be minimized.
Bat Activity Survey

The Project area is largely forested and contains a mixture of forest habitat types with small scattered open areas. The federally threatened northern long-eared bat (NLEB; *Myotis septentrionalis*) occurs throughout the Upper Peninsula of Michigan. The USFWS has expressed concern over potential impacts of wind energy to bats, including the northern long-eared bat. WEST will conduct acoustic surveys for bats to further assess risk to bat species. The objectives of bat acoustic surveys are to: 1) measure general bat activity levels at meteorological (MET) towers during migration periods to compare activity levels to other wind energy projects, and 2) determine if NLEB use of the Project area varies by habitat type within the Project area.

WEST will conduct acoustic monitoring studies using Anabat™ ultrasonic detectors (Titley Electronics Pty Ltd., NSW, Australia) and full-spectrum song meter (SM) ultrasonic detectors (SM3/SM4, Wildlife Acoustics, Maynard, Massachusetts). WEST technicians will visit detector units once per week to ensure units are working properly and to change data cards and batteries.

Surveys at MET towers within the Project area will use paired Anabat ground-based detectors (placed 9.8 ft [3.0 m] above ground level) and raised detectors (148 ft [45 m]). Anabat units will be deployed in early June after MET towers have been installed and will continue monitoring through November 15. Data will be used to assess rates of bat activity which can be compared to other wind energy projects.

Northern long-eared bat use of the Project area will be assessed by sampling bat activity of three major habitat types (mature forest, young forest, and forested wetland) within the Project area during the summer and fall seasons. Three full-spectrum detectors will be placed at ground stations that will be rotated among the three major habitat types from May 15 to October 15. Four patches of each habitat type will be surveyed, spread throughout the Project area, and detectors will be rotated among the four patches on a weekly basis. Precise sampling locations will be assessed after a site visit. The data will be used to determine if certain habitat types or areas of the Project receive higher use by NLEB.

To standardize acoustic sampling effort across the Project, units will be calibrated and sensitivity levels will be set accordingly. Detectors will monitor bat activity from approximately 30 minutes before sunset until 30 minutes after sunset each night. Acoustic data will be analyzed to determine the number of recorded bat calls per detector per night. The total number of bat passes will be used as an index of bat activity within the Project area. All data files collected at each detector will be analyzed, and bat calls will be separated from non-bat noise files. Echolocation calls will be identified to two frequency groups: 1) low frequency (LF; minimum frequency <30 kilohertz [kHz]) and 2) high frequency (HF; minimum frequency >30 kHz.). Bat calls will further be identified to species following the USFWS *Range-Wide Indiana Bat Summer Survey Guidelines* for presence or absence surveys (USFWS 2016b). Bat calls will be identified using an approved automated acoustic identification program. All calls identified as NLEB calls by automated ID software will be examined and verified by a qualified biologist with extensive knowledge.
acoustic identification experience. In addition, all calls recorded on nights with probable NLEB detections will be reviewed. If call sequences are not characteristic of the NLEB, contain distinct calls produced by another species, or are of insufficient quality, they will be reclassified.

Incidental Observations

Eagles and state- or federally-listed species observed in the Project, but outside of scheduled surveys, will be recorded on incidental wildlife observation data sheets. The data recorded are similar to those recorded during bird use surveys, including observation number, date, time, species, number of individuals, distance from observer (m), sex/age class, and habitat. Observations will be recorded in additional detail, digitized onto updated aerial imagery maps, and summarized in a report.
REFERENCES


