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**Post-Construction Monitoring  
Plan for Black Oak Getty Wind  
Project**

## STUDY PLAN

### Post-Construction Eagle Fatality Monitoring for the Black Oak Getty Wind Project

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#### 1. INTRODUCTION

Black Oak Wind, LLC (the Owner) is operating the Black Oak Getty Wind Project (Project) in Stearns County, Minnesota. The Project is a 78-megawatt (MW) wind energy facility consisting of 39 Vestas 2.0 MW V110 turbines with operations beginning at the end of 2016. To follow the recommendations included in the U.S. Fish and Wildlife Service's (USFWS) *Land-based Wind Energy Guidelines* (USFWS 2012) and meet the commitments included in the site-specific Eagle Conservation Plan (ECP) prepared for the Project, post-construction monitoring studies will be conducted once the Project is operational. The objective of post-construction eagle monitoring at the Project is to systematically search the turbine locations for eagle remains that are potentially attributable to collisions with Project facilities.

#### 2. STUDY PLAN

The post-construction third-party eagle fatality monitoring will be completed over a two-year period, and will be conducted by qualified third-party biologists, as described below in Section 2.a. The second year of monitoring will follow the same general approach as described for the first year. However, the procedures may be modified by the Owner in consultation with USFWS based on the results of the first year of monitoring.

After the first two years of third-party monitoring, operations and maintenance (O&M) staff will conduct eagle fatality monitoring at the Project during years 3, 4 and 5 of the first 5-year permit period when third-party monitoring is not being conducted. The approach to these O&M Monitoring surveys is described below in Section 2.b.

For the remaining 25 years of the permit term, third-party monitoring will occur at five year intervals for the operational life of the Project (Years 6, 11, 16, 21 and 26), following the same general approach as described below for the first year. In the years when third-party monitoring is not conducted in the remaining 25 years, operations staff will visit each turbine regularly; during visits, the staff will inspect roads, pads and any other cleared area in the immediate vicinity of turbines visible from their vehicle. Any eagle carcasses that are discovered by operations staff or incidentally observed will be reported.

##### a. Third-Party Eagle Post-Construction Monitoring Surveys

###### *Visual Scans*

The primary objective of this monitoring is to scan the area surrounding Project turbines for injured or dead eagles. Scans will be conducted for the first two years after the eagle take permit is received. Searches will be conducted of all 39 Project turbines twice monthly resulting in a total of up to 24 search events per year, including the initial search constituting a clearing search. The initial search for any surveys will clear the search plot of any old carcasses prior to

conducting searches. Searches may be discontinued when biologists confirm during a site visit that crops are greater than 12 inches high and/or significantly obstruct the view. Twice-monthly checks will begin again when operations and maintenance (O&M) staff notify the biologists that crops have been harvested.

All of the Project turbines will be surveyed using visual searches from the turbine pad in all directions. Personnel will walk at a casual walking rate of approximately 45-60 meters per minute around the turbine pad, scanning all allowable terrain from the turbine out to 150 meters. Personnel will stop at each of the cardinal compass points and scan the landscape for carcasses out to 30 m, and then using binoculars, will make successive scans until all areas out to 150 m have been searched. Once each season, searchers will map viewshed complexity on the landscape. Viewshed complexity refers to the amount of visual clutter on the landscape and can influence searcher efficiency, so the extent and location of different viewshed complexity classes needs to be accounted in the analysis. Areas that are “unviewable” due to topographic screening or robust vegetation growth will also be mapped so that the analysis can account for these unsearched areas.

Should bald eagle remains be located, a qualified biologist will complete a data sheet and take photographs of the remains in the field. The remains will be immediately reported to the USFWS Office of Law Enforcement, USFWS Migratory Bird Permit Office, followed by the Owner. If directed by the USFWS, the carcass will be transported to the nearest USFWS Field Office. All other dead or injured wildlife species will also be recorded.

### *Searcher Efficiency Trials*

The objective of the searcher efficiency trials is to estimate the percentage of carcasses which are found by searchers. Searcher efficiency trials will be conducted in the same 150-meter plots where the eagle scans occur. Trials will be conducted throughout the survey period where searcher efficiency will be estimated by viewshed complexity class (e.g., tilled ground, crops). Searcher efficiency trials will begin when monitoring scans begin. Personnel conducting the scans will not know the location or timing of the detection trials.

To estimate searcher efficiency for the scanning searches, about 25 eagle-sized carcasses or turkey decoys will be placed in each viewshed complexity class in each season during which searches occur. Surrogate eagle carcasses will consist of raptors, if available; black domestic turkeys (*Meleagris gallopavo*); ring-necked pheasants (*Phasianus colchicus*), mallards (*Anas platyrhynchos*); and/or fully-feathered turkey decoys, if an insufficient number of carcasses are available. All carcasses will be placed within 150 meters of turbines prior to the scan on the same day. Trial carcasses will be placed using a weighted random draw that puts relatively more trials further from turbines; putting more trials further from turbines improves the ability to fit detection functions, and results in more precise estimates. Carcasses will be dropped from shoulder height and allowed to land in a random posture. Each trial carcass will be discreetly marked with a black zip-tie around the leg. The number and location of the detection carcasses found during the carcass search will be recorded. The number of carcasses available for detection during each trial will be determined immediately after the trial by the person responsible for distributing the carcasses. Undetected carcasses will be retrieved after the trial has occurred.

### *Carcass Removal Trials*

The objective of carcass removal trials is to estimate the likelihood that a carcass is available and not removed, as a function of the time (measured in days) since the trial carcass was placed in the field. Carcass removal includes removal by predation/scavenging or removal by other means such as being plowed into a field. The trial will include up to 25 eagle surrogate carcasses (if fewer than 25 legally obtained raptor carcasses are available, a minimum of 8 raptor carcasses will be used), which will be placed within the 150-meter scanned plots in each season. Only fresh carcasses will be used for carcass removal trials. As there can be differences in the persistence rates between raptors and large game bird carcasses such as pheasants, WEST will attempt to obtain raptor carcasses from the USFWS or local rehabilitation facilities as much as feasible. Raptor surrogates will be left to monitor for up to 90 days if needed.

Trial carcasses for the Carcass Removal Trials placed in search plots will be marked clearly to avoid confusion with fatalities. Carcasses will be dropped from shoulder height and allowed to land in a random posture. Each trial carcass will be discreetly marked with a black zip-tie around the leg prior to dropping so that it can be identified as a study carcass if it is found by other searchers or wind facility personnel.

Personnel conducting carcass searches will monitor the trial birds over a 90 day period according to the following schedule as closely as possible. Carcasses will be checked on day 1, 2, 3, 4, 7, 10, 14, 20, 30, 40, 50, 60, 75, 90. This schedule may vary depending on weather and coordination with the other survey work. Experimental carcasses will be left at the location until the end of the carcass persistence trial. At the end of the 90 day period, any evidence of the carcasses that remains will be removed from the search plot.

Carcass persistence is a measure of the availability of carcasses to searchers. Because the current study proposes to use distance detection, a more conservative standard will be adopted for carcass availability. Feather spots will only be considered available for detection if they cover a 60 cm by 60 cm area. Smaller feather spots might not be detectable from 100 – 150 m and will be considered removed.

### *Trial Schedule*

The following table describes the approximate dates for seasons used in the study, along with a list of what activities are proposed:

Season	Dates	Activities
Winter	November 16 – March 14	Eagle scans, SEEF, CPT
Spring Migration	March 15 – May 14	Eagle scans, SEEF, CPT
Summer	May 15 – July 30	Eagle scans, SEEF (until crops too high, likely first part of June); CPT (continue through high crop time period)
Fall Migration	August 1 – November 15	Eagle scans, SEEF, CPT (not until crops harvested, likely late October)

**b. Operations Staff Monitoring Surveys – Years 3, 4 and 5 of Permit Term**

At the end of Year 2 of the Permit Term, the Owner's O&M staff will be trained, by the third-party monitors, on the eagle monitoring protocol that will be implemented in Years 3, 4 and 5. In Years 3 through 5 of the Permit Term, the Owner's O&M staff will visit each of the operating turbines on a quarterly basis and inspect roads, pads and any other area visible by binoculars (out to approximately 150-m) from a vehicle. The frequency and number of turbines visited may be increased or reduced if deemed appropriate after the first two years of O&M monitoring.

Prior to implementing an O&M staff monitoring program, O&M staff searcher efficiency will be tested by a third-party (e.g., as part of the formal two-year fatality monitoring program described in Section 1.a). These searcher efficiencies (and carcass removal rates measured during the two-year third-party fatality monitoring program) will then be used on a yearly basis along with the number of eagles discovered during monitoring to estimate overall actual eagle fatality numbers.