

# U.S. Fish and Wildlife Service, Region 6, Recommendations for Avoidance and Minimization of Impacts to Golden Eagles at Wind Energy Facilities

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Version 4.0

The following voluntary guidance was developed through a joint effort between the U.S. Fish and Wildlife Service (USFWS) Migratory Bird Management and Ecological Services Programs in the Region 6 Regional Office in Lakewood, Colorado, and the Wyoming Ecological Services Field Office in Cheyenne, Wyoming. These recommendations have been modified several times, including in 2022 to add five additional recommendations specific to projects in Wyoming. The document includes our joint recommendations to avoid and minimize impacts to golden eagles (GOEA) in relation to wind energy facilities at: (a) recently occupied nests, (b) unoccupied nests, (c) areas of concentrated prey resources, and (d) other project-specific eagle activity areas. To achieve the preservation standard under the Bald and Golden Eagle Protection Act, we aim to maintain stable or increasing breeding populations of eagles through recommendations to avoid and minimize impacts. If implemented, these conservation measures will maintain GOEA breeding territories and minimize impacts to other important areas used by eagles (e.g., eagle nests, foraging areas, and communal roosts; 50 CFR 22.3). This guidance document is intended only for use at wind energy facilities. These USFWS recommendations are for wind energy projects in Region 6 only (Colorado, Utah, Wyoming, Montana, North Dakota, South Dakota, Nebraska, and Kansas).

## RECOMMENDATIONS

I. **Occupied Nests** – Apply a 2-mile buffer for the project area. No wind turbines should be constructed within 2 miles of occupied golden eagle nests.

II. **Unoccupied (Historic) Nests** – No turbines should be constructed within 0.5-mile (800-meters) of any unoccupied (historic) nest. In addition, all turbines between 0.5-mile and 1.0 mile (1,600-meters) of any unoccupied nest should be curtailed during each year starting 15 January until 1 May, unless adequate nest surveys demonstrate that the nests are unoccupied. Also, if the nest becomes occupied, turbines should be curtailed between the 0.5 mile and 2 miles during the breeding season, until the young fledge or the nest becomes unoccupied, whichever happens first.

III. **Areas of Concentrated Prey Resources** – Recommend turbines not be constructed in areas of concentrated prey resources unless it can be demonstrated that they do not overlap or are not immediately adjacent to other important eagle use areas, and where sufficient data are available to confirm that the concentrated prey resources are not present in project-specific eagle activity areas. Examples of concentrated prey resources include prairie dog towns, sage-grouse and prairie chicken leks, and big game calving/fawning areas. For domestic livestock this also includes areas where calving or lambing are concentrated.

**IV. Other Project-Specific Eagle Activity Areas** – Protect or provide special consideration and additional mitigation in areas where there is an intersection of geographic relief (e.g., cliff features used for nesting, ridge features used for migration, rims used for orthographic lift) and documented project-specific eagle activity areas.

## **WYOMING-SPECIFIC RECOMMENDATIONS**

**V. Turbine Curtailment** – In addition to the siting recommendations above, wind energy projects in Wyoming should anticipate the need to incorporate some form of turbine curtailment into project design and operation to further avoid and minimize impacts and reduce eagle fatalities.

**VI. Target Mortality Rate** – As a general guideline, wind energy projects in Wyoming should strive for a golden eagle fatality rate of no more than 1 fatality annually per every 100 megawatts.

**VII. Timely Compensatory Mitigation** – Due to the high number of anticipated golden eagle fatalities from wind energy in Wyoming, compensatory mitigation (e.g., power pole retrofits, etc.) should occur during the same year as the permitted eagle take occurs.

**VIII. Compensatory Mitigation pre-Permit** – Operational wind energy projects in Wyoming that have not yet received an eagle incidental take permit should be prepared to provide compensatory mitigation for any eagle take that occurs prior to receiving a permit.

**IX. Participation in Research** – Eagle remains and carcasses of non-listed birds and bats collected during post-construction monitoring and those found incidentally should be sent to designated repositories supporting ongoing research.

## **DESCRIPTION OF RECOMMENDATIONS:**

### **A. Occupied Nests**

An occupied nest is a nest used for breeding in the current year by a pair of eagles. Presence of an adult, eggs, or young, freshly molted feathers or plucked down, or current year's mutes (whitewash) suggest site occupancy. In years when food resources are scarce, it is not uncommon for a pair of eagles to occupy a nest yet never lay eggs; such nests are considered occupied (Eagle Conservation Plan Guidance [ECPG] 2013, p. 36). For purposes of these recommendations, we further define occupied GOEA nests as nest sites that were occupied at least once during the last five years or last five years of nest surveys. Because GOEAs will often use the same nest in multiple years (Kochert and Steenhof 2012), there is a high likelihood that these nests could be occupied again during the life of the project. Nests form the center of activity during the breeding season and are often centers of activity during the non-breeding season as well (Marzluff et al. 1997). Buffering or otherwise protecting eagle nests should substantially decrease the probability of lethal take, as well as disturbance take, of eagles. Other raptors using the same nesting habitats as GOEA (e.g., prairie falcon) will also benefit from protection of GOEA nest sites.

**We recommend a 2-mile buffer be applied for the wind project area. No wind turbines should be constructed within 2 miles of an occupied GOEA nest.**

Eagle pairs that nest within 2 miles are potentially susceptible to disturbance take and blade strike mortality, as these pairs and offspring may use the project footprint. Lacking other agency policy recommendations, guidance and regulations, our recommendation is to apply a 2-mile buffer to occupied GOEA nests as an avoidance measure to maintain their nesting territories in relation to wind energy projects. The 2-mile buffer recommendation for occupied nests can be adjusted if site-specific data (e.g., telemetry, prey analysis, other data) are available and they provide adequate evidence to suggest the buffer should be larger/smaller/non-circular.

## **B. Unoccupied (Historic) Nests**

We define unoccupied GOEA nests as those nests not selected by raptors for use in the current nesting season (ECPG 2013, p. 37). For purposes of these recommendations, we further define unoccupied GOEA nests as nest sites that were not occupied during the last five years or last five years of nest surveys. It should be noted that occupied nests can be incorrectly assigned as unoccupied if the nests are not repeatedly surveyed during the same nesting season. Even if a nest was unoccupied in one or more years, it is still possible that eagles could reuse that nest in future years (Kochert and Steenhof 2012), especially since the intervals between nest reuse can be lengthy (Kochert and Steenhof 2012, Slater et al. 2013). Given that the anticipated life of a wind project is 30 years (though repowering could extend that indefinitely) it is likely that some unoccupied nests will become occupied during the life of the project. In addition, nests usually occur in areas of historical eagle use (due to topographic features and prey resources) and represent areas where eagles are expected to return in the future. Wind turbines should not be constructed within 0.5-mile (800-meters) of any unoccupied (historic) nest. In addition, all turbines between 0.5-mile and 1.0 mile (1,600-meters) of any unoccupied nest should be curtailed during each year starting 15 January until 1 May, unless adequate nest surveys demonstrate that the nests are unoccupied. Further, if the nest becomes occupied, turbines should be curtailed between 0.5-mile and 2.0 miles during the breeding season until the young fledged or the nest becomes unoccupied.

## **C. Areas of Concentrated Prey Resources**

Protection buffers for prey base areas likely used by GOEA. These areas typically receive use by GOEA during the nesting season, migration, and during wintering (so potentially year-round). We recommend that wind turbines not be constructed in areas of concentrated prey resources unless it can be demonstrated that they do not overlap or are not immediately adjacent to other important eagle use areas, and where sufficient data are available to confirm that the concentrated prey resources are not present in areas of project-specific eagle activity areas.

## **D. Other Project-Specific Eagle Activity Areas**

Apply protections (e.g., buffers) for other project-specific eagle activity areas identified by eagle use survey data (e.g., 800-meter point counts) (these are different than “important eagle use areas”

defined in regulations and the ECPG 2013). Although project-specific, certain areas (e.g., topographic relief creating uplifts, migration corridors, perch sites) are typically used by eagles; therefore, it is appropriate to identify these and to apply buffers to these areas. Focus on areas where there is an intersection of geographic relief (e.g., cliff features used for nesting, ridge features used for migration, rims used for orthographic lift) and documented project-specific eagle activity areas.

Identify specific locations where the project-specific eagle activity areas intersect topographic and/or geographic features used by eagles and apply a buffer where there is overlap. Recommended buffers for geographic features would vary based on the value/use of the geologic feature to eagles, with those having greater value/use by eagles receiving larger buffers. For this option, avoidance and minimization is site-specific, with custom-designed buffers for eagle activity areas based on project-specific geography and documented eagle use of those features.

We recommend that wind turbines not be constructed within buffer areas established for project-specific eagle activity areas.

### **Eagles and Wind Energy Development in Wyoming**

Based on existing and proposed projects (as of September 2022), the Wyoming Field Office anticipates 18 to 22 gigawatts (GW) of wind energy will be installed in Wyoming within the next 10 years. The following recommendations are intended to provide actions that wind energy developers and operators can take to maintain stable and/or increasing golden eagle populations while adding wind energy capacity in Wyoming.

#### **E. Turbine Curtailment**

Adhering to recommendations I through IV to buffer eagle nests and to avoid high use areas, including topographic features (e.g., rims, ridges) and concentrated prey resources, will greatly reduce the number of eagle fatalities at wind energy projects. However, given the substantial amount of wind energy expected to be built over the next decade (20 GW) and the observed high rate of eagle fatalities at some existing projects, we recommend all projects incorporate some form of turbine curtailment into project designs to further reduce golden eagle fatalities in Wyoming. Reducing eagle fatalities through seasonal or informed or autonomous curtailment will avoid high levels of cumulative eagle take year-round and will allow for robust renewable energy development while at the same time protecting eagle populations.

Projects should incorporate curtailment into early project designs to improve the effectiveness of the curtailment system and allow companies to plan for potential reductions in power production. Curtailment options include seasonal (during daylight hours), informed (human observation), and autonomous informed (image sensors and artificial intelligence), and includes full or partial coverage of the project footprint.

## **F. Target Mortality Rate**

In Wyoming, golden eagle fatalities at existing wind facilities (prior to additional minimization) and predicted golden eagle fatalities at proposed wind facilities varies from 1 golden eagle per 15 megawatts to 1 golden eagle per 140 megawatts. Because 18 to 22 gigawatts of wind energy could become operational in Wyoming over the next decade, golden eagle fatalities could quickly exceed the local area population threshold of 5 percent identified in the 2016 Programmatic Environmental Impact Statement, if fatalities occur at the higher rates. To stay at or under the 5 percent threshold at build-out of 20 gigawatts, wind projects should strive—on average—for an eagle fatality rate of no more than 1 eagle per 100 megawatts. In some areas of Wyoming with more golden eagles and less wind energy development, a higher rate may still maintain the 5 percent threshold. Other considerations include eagle density and the volume of hazardous area compared to megawatts.

## **G. Contemporaneous Mitigation**

Because permitted levels of golden eagle take are approaching the 5 percent local area population (LAP) threshold, compensatory mitigation should occur during the same year as the permitted eagle take occurs. Providing compensatory mitigation (e.g., power pole retrofits, in lieu fee program, etc.) in the same year that the permitted eagle take occurs will help ensure a stable or increasing population of golden eagles by avoiding a gap in species reproduction, subsequent loss of eagle generations, and a reduction in population size that could occur when mitigation is delayed. The resource equivalency analysis for power pole retrofits may be used to calculate mitigation credit into future years (e.g., 20 years of avoided loss), but the mitigation (i.e., the years of avoided loss) should start in the year of, or prior to, when the permitted take occurs. Projects may also bank credits by starting compensatory mitigation prior to operation of the project. While the compensatory mitigation may occur anywhere within the Eagle Management Unit, the preference is for the mitigation to occur within the local area population (LAP) or as close to the LAP as possible.

## **H. Compensatory Mitigation pre-Permit Issuance**

Recognizing there could be delays between operation of a wind project and the issuance of an incidental eagle take permit, and in an effort to maintain stable golden eagle populations, we recommend wind companies work with the Service to identify options to mitigate for eagles that are killed prior to permit issuance.

The Office of Law Enforcement (OLE) carries out its mission to protect bald and golden eagles through investigation and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of eagles; and by encouraging others to implement measures to avoid take of eagles. It is not possible to absolve individuals or companies from liability for unpermitted take of eagles, even if such take occurs despite the implementation of appropriate take avoidance measures. However, the OLE focuses its enforcement resources on individuals and companies that take eagles without identifying and implementing all reasonable, prudent, and effective measures to avoid such take.

## I. Participation in Research

Eagle remains and carcasses of other non-listed birds and bats collected during post-construction monitoring and those found incidentally should be sent to designated repositories supporting ongoing research (see attached “The Renewables-Wildlife Solutions Project”). Feathers and/or tissue samples may be submitted with pictures, in accordance with repository sample collection protocols, for this important research, while the remainder of the bird and bat carcasses may be used in bias trials (searcher efficiency and carcass persistence), with the appropriate permits. Prior to handling bird and bat carcasses, proponents must acquire a Chapter 33 Scientific Research / Educational Special Purpose Wildlife Permit from the Wyoming Game and Fish Department (WGFD), as well as a Special Purpose Utility<sup>1</sup> (SPUT) permit from the U.S. Fish and Wildlife Service for birds. Coordinate with WGFD Nongame Section before transporting bat remains out of the county of origin and follow appropriate bat handling protocols to prevent the spread of white-nose syndrome. See <http://www.whitenosesyndrome.org/static-page/decontamination-information> for more information. With the appropriate permits, bird and bat carcasses may be stored on-site and reused in bias trials. Outside of bias trials, leaving carcasses on the ground may increase scavenger presence, which may lead to increased raptor and avian scavenger fatalities and decreased carcass persistence, and less accurate fatality rate estimations.

<sup>1</sup> SPUT permits allow you to collect, transport and temporarily possess migratory birds found dead on the project property. Authorization can also proactively include emergency relocation or destruction of an active nest. We recommend reaching out to [PermitsR6MB@fws.gov](mailto:PermitsR6MB@fws.gov) to learn more about SPUT permits and to streamline the application process, prior to submitting an application through the online portal.