

RAPTORS

Background and Identification of Interaction with Wind Development

Raptors, or birds of prey, are regularly recognized as a group of birds including vultures, eagles, hawks, falcons, kites, and owls. Raptor collisions are a concern regarding the impacts of wind energy development on wildlife. There is concern with raptor fatality due to comparatively long life spans, delayed reproduction, and small clutch size.¹

Higher levels of raptor mortality have typically been attributed to placement of wind farms in areas with high densities of mammalian prey species on which raptors feed and landscape features such as ridge saddles, plateaus, canyons, ravines, or steep slopes and cliffs that attract raptors.² Construction of wind farms and associated infrastructure in proximity to raptor nests during the breeding season may cause abandonment of nests.³

Migratory Bird Treaty Act Compliance

The federal Migratory Bird Treaty Act (MBTA) prohibits activities that may harm migratory birds, their young, or their eggs, including the removal of active nests that results in the loss of eggs or young. In Colorado, most non-game birds except for European starling, house sparrow, and rock pigeon (pigeon) are protected under the MBTA (§§ 703-712).

Bald and Golden Eagle Protection Act Compliance

The federal Bald and Golden Eagle Protection Act (BGEPA) prohibits activities that may take bald and golden eagles, their young, or their eggs. This act also forbids any human activity that may cause take to an existing eagle nest, even outside the breeding season (§§ 668-6668c). Under the BGEPA “take” is defined as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest or disturb.” “Disturb” is defined in regulations as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

State of the Science

Raptor collisions with wind turbines have been documented. Raptors may collide with wind turbines for at least two reasons; they do not see the turning blades or they are focusing on a perch or prey item beyond the turbines and are hit flying through the rotor-swept zone to the particular point.⁴ Studies continue on the interactions of raptors and wind energy facilities. It is likely that these studies will inform improved BMPs for raptors and wind energy facilities.^{5,6}

Best Management Practices

1. The Federal Advisory Committee Draft Recommendations for wind energy development addresses raptor habitat: “...to the extent practicable, the site should evaluate the topography, physiographic features and uniqueness of the site in relation to the surrounding region to assess the potential for the project area to concentrate resident or migratory birds...” (Chapter 3, page 21-22; Draft Recommendations 3/2010).⁷
 - An assessment based on site attributes should be conducted to identify raptors likely to use the wind energy development site. Existing information on the species, abundance, and seasonal occurrence of raptors potentially occurring at the project site should be collected and reviewed.
 - Sites proposed for wind energy development should be evaluated for the existence of important topographic features. Existing information may be available from National Audubon Society’s Important Bird Area (IBA) network,⁸ Colorado Division of Wildlife’s (CDOW) Natural Diversity Information Source (NDIS),⁹ the Colorado Natural Heritage

Program (CNHP) database,¹⁰ and other sources. Because mortality risk varies by species and location, habitat conditions and raptor use should be evaluated on a site-specific basis; an adaptive management approach should be adopted.

2. Apply the buffer distances in table 1. These buffer distances are based on CDOW Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors.¹¹
3. The Federal Advisory Committee Draft Recommendations for wind energy development addresses raptor surveys: “Searches for raptor nests or raptor breeding territories on projects with potential for impacts to raptors should be conducted in suitable habitat during the breeding season.” (Chapter 3, page 34; Draft Recommendations 3/2010).⁷
 - A pre-project survey that examines raptor species, abundance, seasonal occurrence, and nest sites should be conducted at the wind energy development site. Results of pre-construction surveys should be used to identify potential impacts of the project on raptors, develop appropriate measures to avoid and minimize impacts, and identify topics that merit further study. The CDOW¹¹ recommends a minimum of one-year pre-construction surveys and encourages early consultation if commercial operation is anticipated within two years of final site selection. Studies conducted at similar sites nearby may help identify areas where raptors are particularly vulnerable to the effects of wind energy development. Pre-construction studies should be designed to account for site-specific variability while allowing integration with other studies within the grassland/prairie ecoregions so that patterns can be identified that might allow a better assessment of the probability of collision risk.
4. The need for post-construction surveys should be determined in consultation with the CDOW and U.S. Fish and Wildlife Service (FWS). The Federal Advisory Committee Draft Recommendations for wind energy development address post-construction studies.⁷

Avoid

1. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “Avoid locating wind energy facilities in areas identified as having a demonstrated and unmitigatable high risk to birds...” (Chapter 3, page 44; Draft Recommendations 3/2010).⁷
 - Avoid placing turbines near landscape features that attract high numbers of foraging, migrating, roosting, or nesting raptors.⁸ Such features include (but are not limited to) ridges, cliffs, canyons, ravines, prairie dog towns, and large trees.
2. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “Locate turbines to avoid separating bird and bat species of concern from their daily roosting, feeding, or nesting sites if documented that the turbines’ presence poses a risk to a species.” (Chapter 3, page 45; Draft Recommendations 3/2010).⁷

Minimize

1. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “Minimize, to the extent practicable, the area disturbed by pre-construction site monitoring and testing activities and installations.” (Chapter 3, page 44; Draft Recommendations 3/2010).⁷
2. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “Instruct employees, contractors, and site visitors to avoid harassing or disturbing wildlife, particularly during reproductive seasons.” (Chapter 3, page 46; Draft Recommendations 3/2010).⁷
 - Such instruction will help minimize activity of onsite staff around nest sites, roosting areas, and active prairie dog towns.
3. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “Above-ground low and medium voltage lines, transformers and conductors should

follow the 2006 or more recent APLIC...” (Chapter 3, page 44; Draft Recommendations 3/2010).⁷

4. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “...If guy wires are necessary [permanent met towers], bird flight diverters or high visibility marking devices should be used.” (Chapter 3, page 45; Draft Recommendations 3/2010).^{7,12,13}
5. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “...place low and medium voltage connecting power lines associates with the wind energy development underground to the extent possible, ...” (Chapter 3, page 44; Draft Recommendations 3/2010).⁷
6. The Federal Advisory Committee Draft Recommendations for wind energy development recommends: “Minimize the number and length of access roads; use existing roads when feasible.” (Chapter 3, page 45; Draft Recommendations 3/2010).⁷

Conservation Offsets (Mitigation)

If tree removal is necessary for project construction, consider mitigating the tree removal by creating roosting/nesting locations elsewhere.

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Additional Information and Resources Consulted

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3. Bildstein, K.L. 2006. Migrating Raptors of the World: Their Ecology and Conservation. Cornell University Press. Ithaca, N.Y.
4. Anderson, R. L., M. Morrison, K. Sinclair, and M. D. Strickland. 1999. Studying wind energy/bird interactions: a guidance document. Prepared for avian subcommittee and National Wind Coordinating Committee, Washington, D.C.
5. Smallwood, KS. 2007. Estimating Wind Turbine-Caused Bird Mortality. *Journal of Wildlife Management* 71(8):2781-2791
6. Lucas, M.D., G.F.E Janss, D.P. Whitfield, M. Ferrer. 2008. Collision fatality of raptors in wind farms does not depend on raptor abundance. *Journal of Applied Ecology*. 46(6):1695-1703
7. U.S. Fish and Wildlife Service Wind Turbine Recommendations Advisory Committee. March 4, 2010.
8. For additional information on the Audubon Society Important Bird Areas (IBA) Program and IBAs identified in Colorado, see: http://www.audubon.org/bird/iba/iba_intro.html.
9. For additional information on Natural Diversity Information Source habitat mapping, see: <http://ndis.nrel.colostate.edu/mapindex.asp>.
10. Colorado Natural Heritage Program website: <http://www.cnhp.colostate.edu/>.
11. Colorado Division of Wildlife. 2008. Recommended buffer zones and seasonal restrictions for Colorado Raptors.
12. Avian Power Line Interaction Committee (APLIC). 2006. Suggested practices for avian protection on power lines: State of the art 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C., and Sacramento, California.
13. National Wind Coordinating Committee. 2010. Wind turbine interactions with birds, bats and their habitats: a summary of research results and priority questions. Washington, D.C.

Table 1: CRCC recommended buffer distances for disturbance effects around raptor nest and roost sites

Species	Above-ground structure buffer distance from active nest	Limit construction within the buffer distance during the following dates
bald eagle	1/2 mile	October 15 - July 31
golden eagle	1/2 mile	December 15 - July 15
osprey	1/2 mile	April 1 - August 31
ferruginous hawk	1/2 mile	February 1 - July 15
red-tailed hawk	1/3 mile	February 15 - July 15
Swainson's hawk	1/4 mile	April 1 - July 15
peregrine falcon	1/2 mile	March 15 - July 31
prairie falcon	1/2 mile	March 15 - July 15
northern goshawk	1/2 mile	March 1 - September 15