Wind Power and Human Disturbance of Nesting

In this installment of Raptor Science Digest, we cover new raptor research developments related to wind power and human disturbance of nesting.

Assessing and Reducing Wind Farm Development Risk for Raptors

Raptor collision risk assessment is a crucial step in the evaluation of wind farm siting. A recent publication (Strickland et al. 2011) of the National Wind Coordinating Collaborative (NWCC) provides a number of recommendations for studying wind and wildlife interactions, including detailed information on pre- and post-construction wildlife surveys. However, much additional work remains to be done to hone in on the true relationship between pre-construction raptor activity and realized turbine collision risk. For example, HawkWatch International recently submitted comments to the Bureau of Land Management critiquing methods used to estimate fatality for a proposed large-scale wind development in southern Wyoming. The bottom line is that more work remains to be done in this arena.

For example, a new study (Ferrer et al. 2012) from southern Spain further questions the relationship between pre-construction raptor abundance and future collisions. The authors evaluated 53 proposed wind development sites with pre-survey data, 20 of which were eventually built and collected mortality data. The authors found no clear relationship between predicted risk of individual species or overall raptor abundance and subsequent mortality. Instead the authors suggest mortality was driven primarily by localized topography, wind patterns, and bird behavior. In a related publication (de Lucas et al. 2012), the authors reported that a 50% reduction in mortality of Griffon vultures was achieved through migration season monitoring of ~10% of turbines and selective turbine stopping when vultures approached. Also of great importance, the selective stopping program only reduced wind energy production by 0.07%!

Raptor Avoidance of a New Windfarm

New research from the U.S. (Garvin et al. 2011) also suggests that under the right conditions, raptors recognize and avoid potentially hazardous wind farms. The study in Wisconsin found that local raptor activity declined 47% after wind farm construction and that most birds near the wind farm avoided turbines, translating to very little observed raptor mortality. Of course, the behavior of raptors and other birds and their ability to perceive wind turbines is also influenced by changing weather conditions.

Influence of Weather on Bird Migration at Proposed Ridgeline Windfarm Sites

Recent research from British Columbia (B.C.) suggests wind speed and other weather variables can directly affect the flight height of migrating birds (Thomas et al. 2011). Specifically, the research suggests both diurnal and nocturnal bird migration passage rates increase near ridgelines as wind speeds increase. The study also found the
height of passage for all migrants (day or night) decreased as cloud cover increased. A master’s study (Johnston 2011), also from B.C., found that Golden Eagles’ flight heights within the potential “risk zone” (i.e., area of turbine blades) increased with increasing wind speed, but were lower under head-winds and over sloped topography. Advancing our understanding of how raptors and other at-risk species may interact with proposed wind farms under different weather scenarios and siting configurations will allow great advancements in collision avoidance.

Raptor Response to Human Disturbance

There is also recently published research (Keeley & Bechard 2011) available on raptor nesting disturbance in relation to human activity. A study of exurban Ferruginous Hawks in New Mexico found that a spatial buffer of 650 m would prevent 95% of all nest flushing related to human approach. This is a much larger protection buffer than the 250 m suggested by a similar study (White & Thurow 1985) conducted in Idaho during the 1980s. The NM study also found mixed habituation results: hawks typically flushed only after closer approach in more humanized environments, but increased nest defense activity with more human visits. Similarly, a retrospective analysis (Morrison et al. 2011) of Northern Goshawk nesting in the Lake Tahoe area suggests territories that experienced more human activity and had a greater density of roads and trails were less likely to be active. The authors provide suggestions for the prioritization of restoration at impacted territories.

Upcoming meetings of interest:

NWCC Wind Wildlife Research Meeting IX- November 27-30, 2012
California-Nevada Golden Eagle Symposium- December 11, 2012

Literature Cited


Johnston, N. N. 2011. The associations between weather and topography on golden eagle flight behaviour at a wind farm in the Canadian Rockies. M.Sc., University of Northern British Columbia (Canada), 132 pages; AAT MR75188.


