

Based on Research Results: Questions to Address

moderated by

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Effects of Wind Power Development on Sage-grouse

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There is a lack of published data on wind power development within the occupied range of both species of sage-grouse (*Centrocercus* spp.). Presently, most wind power developments within the range of either species are in marginal habitat for sage-grouse or their impacts are not easily identified because of other confounding factors including major highway systems. We expect this to change, however, as the number of wind power developments increases.

Potential Effects

The greater sage-grouse (*C. urophasianus*) is a wide-ranging species while Gunnison sage-grouse is more restricted, but both species are large-bodied, long-lived animals exhibiting low productivity and low density. This creates a challenge when looking for possible effects from development. Unlike other bird species, direct collision mortality with scattered obstacles (such as turbines) is likely not as much of an issue for sage-grouse as fences, guy-lines, and power lines. There is only one known example of a grouse that was most likely killed by a turbine. The primary concerns with development are direct loss and degradation of habitats, and indirect impacts due to habitat fragmentation, increases in predation risk, and increases in visual and auditory disturbance.

Impacts on other species of prairie grouse and from other types of development

Data on wind power effects on sage-grouse are lacking, but there are data on other types of development and with other similar species of grouse. Kansas State University Professor R. J. Robel recently argued that a proposed 8,000-acre wind development in the Flint Hills of Kansas, with about 80 turbines, would adversely impact the suitability of “15,000 to 18,000 acres [~6,100-7,300 ha] of very good to excellent greater prairie-chicken [*Tympanuchus cupido*] nesting and brood-rearing habitat” (Robel 2002). Although the direct footprint of a wind development may be as little as 2% of the overall area, there is potential for much more extensive impacts on grouse. Robel argued that greater prairie-chickens have “a low tolerance for human disturbance” and would likely avoid areas within 1 mile [1.6 km] of turbines. This effect is exacerbated by the large home ranges of

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prairie grouse, including sage-grouse.

Research on lesser prairie-chickens (*Tympanuchus pallidicinctus*) illustrates some of the potential affects suggested by Robel (2002). Robel and his graduate students observed avoidance by lesser prairie-chickens of houses, well-traveled roads, and compressor stations in southwestern Kansas. These observations were consistent with those of Hunt (2004) in New Mexico. Hunt found that development (gas wells, roads, power lines) had an adverse affect on occupancy by lesser prairie-chickens.

Similar adverse affects of development have been documented for greater sage-grouse in the sagebrush (*Artemisia* spp.) steppe (Lyon 2000; Braun et al. 2002; Lyon and Anderson 2003; Connelly et al. 2004; Holloran 2005; Naugle et al. 2006a, b). For example, Holloran (2005) documented decreased sage-grouse activity close to drilling rigs, gas wells, and haul roads; overall, energy development had a negative affect on sage-grouse. Connelly et al. (2004) documented a negative affect on Interstate 80 (I-80) in southern Wyoming. Of 802 leks identified within 100 km of I-80, there were no leks within 2 km of the highway, and very few within 4 km of the interstate; leks outside the I-80 corridor tended to be somewhat evenly distributed. Leks relatively close to I-80 were also more likely to be inactive; 44% of the 34 leks found within 7.5 km of I-80 were active, compared with 67% of the 84 leks found between 7.5 and 15 km of I-80. Similar observations were noted for leks in relation to power lines in Washington State; the likelihood of lek extirpation appears to be negatively correlated with distance to the nearest power line.

Despite these documented relationships between development and prairie grouse in general, and sage-grouse in particular, there is a great deal that is not known. For example, little is known about the specific relationships between grouse and environmental disturbances. Are grouse responding to habitat loss, auditory disturbance, visual distance, increased risk of predation, an unidentified factor, or a combination of factors? Identification of the specific relationships between sage-grouse and disturbance will be important so that suitable minimization and mitigation measures can be considered, where appropriate.

Case studies

It is difficult to document current impacts of wind development on sage-grouse for 2 basic reasons: (1) sage-grouse typically inhabit sagebrush habitats at relatively low densities; and (2) few wind developments are in prime sage-grouse habitat. For example, Foote Creek Rim in Wyoming is the only development with a documented sage-grouse mortality, and yet it can be argued that it is not in the best sage-grouse habitat. Other current or potential developments (Pleasant Valley, Medicine Bow, Elkhorn, Stateline, Nine Canyon, Cotterel) are either in marginal sage-grouse habitat or they are in areas where sage-grouse populations have been inadequately monitored.

Some of the best pre-treatment data for sage-grouse in a wind development site exists for the Wild Horse development near Ellensburg, Washington (numerous observations of unmarked and radio-marked sage-grouse). Ironically, even with the grouse observations,

the Wild Horse development is not considered to be part of the current breeding distribution of sage-grouse in Washington (Schroeder et al. 2000, 2004). The rapid expansion of wind power in the west is likely to result in marked increases in potential conflicts with sage-grouse. This is the primary reason why the Washington Department of Fish and Wildlife's Wind Power Guidelines (2003) recommend that "Wind project developers should be discouraged from using or degrading high value habitat areas, especially shrub-steppe habitat in 'excellent' condition."

Response to Presentation

Question: The wind developer in Douglas County went ahead with development; was there some other mitigation that was used?

Response: The local public utility is the developer and, at this point, the development is only proposed. The utility has been very forthright; there is an existing power line with capacity to handle 10 turbines in a pilot project, with a maximum buildout to 47 turbines. Douglas County PUD has all the energy it needs to serve a relatively small population in a huge county, so the issue is whether to develop wind energy as an export, helping other communities to meet the state's requirement that 15% of energy production be non-hydro renewable. In other words, there are other issues to consider besides sage-grouse habitat.

Question: In Idaho, the Fish & Game Department is funded by the sales of hunting licenses; yet the same agency is charged with sage grouse study and protection. How do we resolve this conflict?

Response: In Washington State the population of sage-grouse is under Federal scrutiny, so no hunt tags for sage-grouse are being sold. The question is valid, but it doesn't apply in the case of Douglas County or elsewhere in Washington State. It should also be noted the issue is not necessarily the loss of a few individuals due to mortality, but rather the permanent loss of the habitat needed to support populations.

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