

## **BEST MANAGEMENT PRACTICES FOR LESSER PRAIRIE-CHICKEN IN NEW MEXICO**

### **Background and Identification of Interaction with Wind Development**

Lesser prairie-chicken (*Tympanuchus pallidicinctus*) is a species that is found in the southern Great Plains, including parts of Colorado, Kansas, New Mexico, Oklahoma, and Texas.<sup>1</sup> This species has experienced dramatic population declines throughout much of its range due to widespread conversion of native prairie to other land use, particularly agricultural and oil and gas energy development.<sup>1</sup> This species has been found to be “warranted but precluded” for protection under the Endangered Species Act by the United States Fish and Wildlife Service.

Lesser prairie-chickens rarely fly high enough to be at risk for collision with wind turbines; however, these prairie grouse are sensitive to habitat alteration, the presence of manmade vertical structures, and noise in its habitat. Research has shown that lesser prairie-chickens locate their nest sites further from buildings, transmission lines, and improved roads than would be expected at random.<sup>2</sup> Researchers in Oklahoma used radio telemetry to demonstrate that both greater and lesser prairie-chickens avoided crossing beneath overhead powerlines.<sup>3</sup>

Lesser prairie-chickens require large blocks of grassland, sandsage, or shinnery oak habitat to meet all of their life history requirements.<sup>4</sup> Mating takes place at relatively open areas (e.g., low visual obstruction and low horizontal cover) of the prairies (called leks) where males congregate to perform a courtship dance. After mating, females will make a nest in appropriate habitat near the lek site.<sup>5</sup> Appropriate nest sites have high visual obstruction and horizontal cover for concealing brooding hens. Once the chicks have hatched, they move to another part of the prairie with high amounts of bare ground for foraging, but with some residual cover for hiding from predators. Winter habitat requirements are different from other times of the year. In winter, lesser prairie-chickens require areas with high food potential including areas with seeds, residual vegetation, and waste grain. Management guidelines for lesser prairie-chickens recommend maintaining large continuous blocks of grassland for breeding habitat (4,942 acres or  $\geq 2,000$  ha).<sup>4</sup> Studies have suggested that the presence of vertical structures and noise can fragment large blocks of grassland, making them less suitable for lesser prairie-chickens.

### **State of the Science**

Presently, little is known about how wind energy developments affect lesser prairie-chicken and their habitat. Areas within eastern New Mexico are currently being monitored for suitability as wind energy sites. These developments include the turbine to harness the energy, as well as access to the sites, and transmission line connections to substations or other existing power grids. Physical disturbance affected by the construction of turbines, turbine noise, and physical movement of turbines during operation have the potential to disturb nesting lesser prairie-chicken.<sup>2</sup> The effects of habitat fragmentation may indirectly affect local lesser prairie-chicken populations by decreasing the area of habitat available for nesting and brood-rearing.<sup>5</sup> It is predicted that nesting and brood-rearing hens will avoid large wind turbines by at least a one-mile radius.<sup>2</sup> Fragmentation and changes in habitat structure may increase the amount of edge, which serve as lanes for terrestrial predators,<sup>6</sup> and are consequently avoided by nesting prairie grouse.<sup>5</sup> In addition to the effects of habitat fragmentation, prairie grouse avoidance of vertical structures<sup>7</sup> and human disturbance activities may further impact lesser prairie-chicken movements and habitat use.

### **Best Management Practices**

Conduct surveys in suitable habitat on the proposed development site and within a reasonable radius to determine presence of lesser prairie-chicken. Consult New Mexico Department of Game and Fish (NMDGF) for appropriate survey methods. Current information on locations of lesser prairie-chicken may be obtained from NMDGF and Natural Heritage New Mexico.

1. Development of proposed wind generation projects within known current range of lesser prairie-chicken should be done in close consultation with NMDGF and other appropriate wildlife agencies.

#### Avoid

Avoid placing wind energy development in the interior (as opposed to edge) of a large block of intact prairie within historic lesser prairie-chicken range. Where practical, place turbines on lands already altered or cultivated (such as agriculture or developed oilfields), and away from areas of intact and healthy native grasslands.

#### Minimize

1. Conducting site construction of wind development areas in proximity of leks outside of the breeding season (Feb 15 – July 1) may reduce habitat abandonment, in conjunction with construction and maintenance timing determined in consultation with NMDGF.<sup>8</sup>
2. Avoid construction activities in proximity of leks during early morning lekking periods (3:00am – 9:00am) during lekking season (Feb 15 – May 15).
3. The Federal Advisory Committee Draft Recommendations for wind energy development recommend the following: “To reduce avian collisions, place low and medium voltage connecting power lines associated with the wind energy development underground to the extent possible, unless burial of the lines is prohibitively expensive (e.g., where shallow bedrock exists) or where greater adverse impacts to biological resources would result: a. Overhead lines may be acceptable if sited away from high bird crossing locations, to the extent practicable, such as between roosting and feeding areas or between lakes, rivers, prairie grouse and sage grouse leks, and nesting habitats...” (Chapter 3, page 44; Draft Recommendations 3/2010).<sup>9</sup>
  - Burying these power lines will reduce the incidence of mortality of lesser prairie-chicken related to raptor predation by reducing perch availability.
4. Using a minimum amount of fencing will reduce the risk of collision-related mortality.

#### Conservation offsets (Mitigation)

Mitigation efforts that can benefit lesser prairie-chickens include the following:

1. Remove invasive woody vegetation such as mesquite (*Prosopis glandulosa*) in occupied lesser prairie-chicken habitat. Maintain or enhance native woody vegetation such as shinnery oak (*Quercus havardii*) or sand sage (*Artemisia filifolia*) used for nesting habitat. If woody vegetation is removed from an area adjacent to lesser prairie-chicken populations and the cleared area is maintained with periodic burning, populations can be maintained.
2. CRP – Companies may work with landowners adjacent to blocks of occupied habitat to purchase easements, replace CRP-like grasslands with native grasses, and provide for continued maintenance. Coordinate with NMDGF or Natural Resources Conservation Service regarding beneficial seed mixes.
3. CRP – Much existing CRP is low quality lesser prairie-chicken habitat because a sufficient diversity and abundance of forbs is not present. In many cases, interseeding native forbs and/or disturbance of decadent CRP may increase diversity. Plots receiving these treatments also should be secured indefinitely through an organization that specializes in easements or is a land trust, and ongoing maintenance provided.
4. Work with landowners within occupied lesser prairie-chicken habitat to implement a more wildlife-friendly long-term management plan (i.e., greater than 10 years) with a strategy to maintain the habitat in the long term. The plan should specify vegetation

conditions desired and allow ranchers to use their expertise in adjusting stocking rates, grazing system, and fire frequency to meet those conditions. Most of the rangelands within lesser prairie-chicken range are managed poorly for this species and implementation of range management plans could substantially improve lesser prairie-chicken populations.

5. Degraded rangeland within lesser prairie-chicken range may be purchased and restored to suitable habitat equivalent to the amount disturbed by the wind energy development. During acquisition, preference should be given to larger contiguous tracts and/or tracts that adjoin unfragmented habitats currently occupied by lesser prairie-chicken. An endowment should be created for each of these properties to provide the monetary resources required for regular management activities including tree removal, wildlife-friendly grazing, and periodic burning.
6. Install fence markers along fences that cross through occupied habitat in proximity of active leks.

### **Acknowledgments**

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### **Additional Information and Resources Consulted**

1. Collaborative Conservation Strategies for the Lesser Prairie-chicken and Sand Dune Lizard in New Mexico. Findings and Recommendations of the New Mexico LPC/SDL Working Group. 2005.
2. Robel, R.J., J. A. Harrington, Jr., C. A. Hagen, J. C. Pitman and R. R. Reker. 2004. Effect of energy development and human activity on the use of sand sagebrush habitat by lesser prairie-chickens in southwest Kansas. Transactions of the North American Wildlife and Natural Resources Conference 68.
3. Pruett, C. L., M. A. Patten and D. H. Wolfe. 2009. Avoidance behavior by prairie grouse: implications for wind energy development. Conservation Biology 23:1253-1259.
4. Hagen, C. A., B. E. Jamison, K. M. Giesen and T. Z. Riley. 2004. Guidelines for managing lesser prairie-chicken populations and their habitats. Wildlife Society Bulletin 32:69-82.
5. Pitman, J. C., C. A. Hagen, R. J. Robel, T. M. Loughin, and R. D. Applegate. 2005. Location and success of lesser prairie-chicken nests in relation to vegetation and human disturbance. Journal of Wildlife Management 69:1259-1269.
6. Kuehl, A. K. and W. R. Clark. 2002. Predator activity related to landscape features in northern Iowa. Journal of Wildlife Management 66:1224-1234.
7. Manes, R., S. A. Harmon, B. K. Overseer and R. D. Applegate. 2004. Wind energy and wildlife in the Great Plains: identification of concerns and ways to alleviate them. Proceedings of the Great Plains Wind Power and Wildlife Workshop, March 19-20, 2003, Kansas City, Missouri, USA.
8. New Mexico Department of Game and Fish. 2004. Impacts of Wind Energy Development on Wildlife.  
[http://www.wildlife.state.nm.us/conservation/habitat\\_handbook/documents/WindEnergyGuidelines.htm](http://www.wildlife.state.nm.us/conservation/habitat_handbook/documents/WindEnergyGuidelines.htm)

**Figure 1.** Lesser Prairie-chicken historic and current range in New Mexico with core habitat delineated in red.

