

**Conservation Needs of the Lesser Prairie-Chicken**  
**U.S. Fish and Wildlife Service**  
**Technical White Paper**  
**July 2012**

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***Introduction***

The lesser prairie-chicken (*Tympanuchus pallidicinctus*) became a candidate species on June 9, 1998. The species' preferred habitat consists of native short- and mixed-grass prairies with a shrub component dominated by sand sagebrush (*Artemisia filifolia*) or shinners oak (*Quercus havardii*) (Taylor and Guthery 1980, p. 6; Giesen 1998, pp. 3-4). The species' range extends northward from western Texas and eastern New Mexico into western Oklahoma, eastern Colorado, and western Kansas. The overall distribution of lesser prairie-chickens within all states except Kansas has declined sharply, and the species is generally restricted to limited parcels of untilled native rangeland (Taylor and Guthery 1980, pp. 2-5) or areas with significant Conservation Reserve Program (CRP) enrollments that were initially seeded with native grasses (Rodgers and Hoffman 2005, pp. 122-123). Despite consistent findings that the species warrants listing under the Endangered Species Act, higher priority listing actions have precluded development of a proposed listing rule for the lesser prairie-chicken. Due to the magnitude and immediacy of the threats now faced by the species, the U.S. Fish and Wildlife Service (Service) is in the process of evaluating the current status of the species in preparation of a proposed listing rule with anticipated publication no later than September 2012.

The Service has drafted this white paper as a synopsis of our thoughts on long term conservation and recovery of the lesser prairie-chicken. We appreciate the past and on-going efforts of all stakeholders in lesser prairie-chicken conservation and have taken these into consideration. The Service, however, has the additional responsibility to look into the future and assess future threats to the species. Therefore, as a partner in the conservation of the lesser prairie-chicken, we present this forward-looking document to our partners for their consideration in the on-going development of conservation strategies.

***Challenges to Lesser Prairie-Chicken Conservation***

The Service has reviewed the available literature on the lesser prairie-chicken and identified three primary challenges to its long-term conservation. First, there are currently insufficient strongholds within the species' occupied and historical ranges to prevent further decline and to increase the chances for long-term survival of the lesser prairie-chicken. In general, the Service considers these strongholds to be important conservation areas within the species' native habitat that is managed or set aside for long-term lesser prairie-chicken conservation and of sufficient size to support a viable lesser prairie-chicken population (see additional description below).

Second, there is a high degree of habitat fragmentation within occupied habitat patches and across the entirety of the species' historical range. Habitat fragmentation occurs when some form of disturbance, usually habitat alteration or loss, results in the separation or splitting apart of larger, previously contiguous, functional components of habitat into smaller, often less valuable, non-contiguous parcels (Wilcove *et al.* 1986, p. 237; Johnson and Igl 2001, p. 25; Franklin *et al.* 2002, entire). Lesser prairie-chickens are impacted by habitat fragmentation and

this threat is expected to increase over time due to proposed energy developments coupled with potential agricultural conversion, incompatible livestock grazing, and other ongoing land uses.

Third, due to the species' small population size, low survival rates, and scattered distribution resulting from fragmentation, it does not appear to be resilient to stochastic events (e.g., drought, severe storms). The Service believes that these combined factors have likely reduced the reproductive success of lesser prairie-chickens, possibly resulting in a loss of genetic variation and diversity, making the issue of the species' resiliency of greater concern. Conservation of the lesser prairie-chicken requires that each of the challenges be addressed.

### ***Management Recommendations for Lesser Prairie-Chicken Conservation***

In order to address the long-term conservation of the lesser prairie-chicken, the Service suggests implementation of four management goals to address the three primary challenges facing the species. The four management goals are described in detail below and include establishing strongholds, ensuring connectivity, committing to implementation, and providing long-term certainty.

#### ***Strongholds***

To address the challenge of inadequate strongholds for the lesser prairie-chicken, the Service recommends that efforts are taken to establish strongholds throughout the species' occupied range. The Service suggests that a minimum of four strongholds be established initially across the landscape in order to ameliorate effects from current and future fragmentation and to increase the chances for long-term survival of the lesser prairie-chicken. Cooperation of private landowners is crucial to conservation of the lesser prairie-chicken, especially in regards to stronghold establishment, because about 95 percent of the occupied range occurs on private land. Within the occupied range of the lesser prairie-chicken, precipitation varies from west to east, temperature varies from north to south, and vegetation type varies from both west to east and north to south. Due to this variability, the Service views the species' occupied range as a matrix comprised of four primary quadrants, each one exemplifying a unique combination of precipitation, temperature, and vegetation type variables. These four quadrants are separated from east to west by the boundary between Bird Conservation Regions 18 (shortgrass prairie) and 19 (central-mixed grass prairie) and from north to south by the Canadian River. To ensure redundancy, resiliency, and representation across the species' range, the Service recommends at least one lesser prairie-chicken stronghold be established and maintained in each quadrant; however, an undetermined number of additional strongholds will be necessary across the species' range in order to expand, connect, and/or re-connect local populations to ensure survival and long-term population viability, as informed by current and future spatial habitat modeling efforts. The distribution, location, and number of strongholds necessary for lesser prairie-chicken conservation must be informed by population goals.

#### **What Constitutes a Lesser Prairie-Chicken Stronghold?**

The components of a stronghold must be defined within the context of a short-term conservation strategy stipulating immediate needs. As stated above, the Service recommends the prompt establishment of at least four strongholds distributed across the landscape as informed by population goals in order to reduce the risk of extinction in the short term. The establishment of

lesser prairie-chicken strongholds requires spatial consideration, temporal consideration, adequate jurisdiction, biological security, and management certainty.

The Service suggests that, in order to provide for viable lesser prairie-chicken populations, potential stronghold sites are a minimum of 25,000 acres in size but may need to be up to 50,000 acres or more. For a stronghold to serve its biological function and foster reproductive success, the available literature suggests that a viable lesser prairie-chicken population may require at least six to ten leks and a minimum of six males per lek (Applegate and Riley 1998, p. 14). The size of a potential stronghold may vary according to the amount and distribution of non-habitat and otherwise suitable habitat; the habitat quality of the area; and the interactions between non-habitat, otherwise suitable habitat, and suitable habitat. Non-habitat is defined as areas entirely avoided by lesser prairie-chickens (e.g., irrigated croplands), whereas otherwise suitable habitat consists of areas that contain features causing an indirect loss of lesser prairie-chicken use (e.g., vertical structures). The Service believes that as the quality of habitat increases, the size of the stronghold can decrease toward the minimum size requirement. For example, a 25,000-acre patch would meet the definition of a stronghold only if the entire area consists of high-quality grassland and shrubland habitat. The diversity of native grasslands and shrublands as appropriately defined by the ecological site descriptions is another factor that contributes to habitat quality. Alternatively, factors that minimize habitat quality and necessitate a larger sized patch for a potential stronghold include the amount and type of agricultural lands (small grains, cotton, etc.), presence of vertical structures, and distribution of roads, for example. Specifically, patches consisting of less than 65 percent high-quality native grasslands may be incapable of supporting viable lesser prairie-chicken populations and would not meet the definition of a stronghold (Crawford and Bolen 1976, p. 102); therefore, the size of a particular stronghold should be influenced by the amount of non-habitat or otherwise suitable habitat encompassed by the potential stronghold, as mentioned above.

In addition to these size requirements, strongholds must have long-term protection in place to address the species' relatively short life span, low nest success, high annual mortality, low recruitment, and high juvenile mortality. In the context of the lesser prairie-chicken, 10 to 15 year timeframes may be too short a period due to the species' life-history traits. In Kansas, implementation of the CRP has resulted in favorable habitat conditions for the lesser prairie-chicken due to landscape scale planting of native grasses (and forbs) thereby allowing for lesser prairie-chicken expansion and reoccupation of 16 counties north of the Arkansas River (Service 2010). This management has been beneficial for the lesser prairie-chicken population as a whole, but long-term certainty regarding protection of native habitat strongholds is recommended in order to ensure future survival and conservation of the species. Furthermore, most "split estate" lands, where surface rights and mineral rights are in different ownership, will not meet the definition of a stronghold. Both surface and mineral rights as well as best management practices must be addressed appropriately in order to avoid future developments that could reduce the quality of the stronghold.

A stronghold must also be secure in its biological function due to the lesser prairie-chickens' lek mating system. Leks are characterized by sparse vegetation and are generally located on elevated features such as ridges or grassy knolls (Giesen 1998, p. 4). Giesen (1998, p. 9) reported that hens typically nest and rear broods within 3 km (1.7 mi) of leks and nest near a lek

other than the one on which they mated. Therefore, a stronghold must provide a variety of habitat components to serve its biological function. Lastly, an area will not constitute a stronghold unless there is a high level of certainty that the quantity and quality of the habitat within the site will be maintained or improved.

### *Connectivity*

In addition to the Service's recommendation to establish strongholds that meet the criteria above, the Service also suggests that efforts be implemented to establish connectivity among strongholds in order to provide for lesser prairie-chicken conservation. Many grouse species are known to be relatively poor dispersers. Most seasonal movements of lesser prairie-chickens are less than 10 km (6.2 mi), but Jamison (2000, p. 107) thought that dispersal movements as large as 44 km (27.3 mi) might occur in fragmented landscapes. The species requires sufficient suitable habitat corridors to facilitate movement among strongholds and to allow for gene flow. The location of these connection corridors should be informed by spatial habitat modeling efforts.

### *Implementation*

The third management component that would assist in lesser prairie-chicken conservation is a commitment to implementation of management strategies that avoid or reduce ongoing habitat fragmentation in conjunction with the establishment of strongholds and connective corridors. To accomplish this goal, the Service encourages all stakeholders to assist in the development of a collaborative system that would target and prioritize appropriate areas for the establishment of strongholds and connective corridors as previously discussed. In addition, the Service encourages industry to plan for new energy and transmission developments to occur outside of strongholds and connective corridors identified through the stakeholder collaborative targeting system. Within strongholds and connective corridors, the Service recommends that habitat improvement and restoration are a priority. Management strategies to accomplish this goal may include the removal of vertical structures causing structural fragmentation and the restoration of croplands to native grasslands to reduce spatial fragmentation. The Service suggests monitoring data of lesser prairie-chicken populations and species' habitat be used for an adaptive management framework as lesser prairie-chicken conservation efforts are implemented on the ground.

### *Certainty*

A fourth management goal that would provide lesser prairie-chicken conservation is that a high level of certainty that mechanisms will be in place to achieve and sustain the necessary habitat for the creation, maintenance, and conservation of strongholds and connective areas in the long term. Two tools offered by the Service to accomplish this goal are Candidate Conservation Agreements (CCA) for Federal agencies and Candidate Conservation Agreements with Assurances (CCAA) for non-Federal entities including private landowners and/or operators on non-Federal lands. In addition, the NRCS through the Lesser Prairie-Chicken Initiative is working with landowners to enhance, restore, and protect habitat using voluntary conservation practices. Voluntary initiatives and agreements such as these provide landowners and developers with the opportunity to implement conservation practices along with assurances that, if the species is listed, they can continue to manage their land as outlined in their agreements with no additional requirements.

The Service recommends implementation of all four management components in order to ensure the long-term conservation of lesser prairie-chickens. The Service believes that combined implementation of these management strategies may assist in the establishment of viable lesser prairie-chicken populations, ensuring long-term survival.

***Moving Forward with Lesser Prairie-Chicken Conservation***

The Service recognizes the significant efforts of our partners over the years to conserve the lesser prairie-chicken; it is of utmost importance that these efforts and the momentum towards conservation continue. We also applaud the current effort to develop a range-wide conservation strategy. The Service greatly appreciates the opportunity to provide input on what we believe are the key strategies (strongholds, connectivity, implementation and certainty) for lesser prairie-chicken conservation.

With this in mind, we strongly recommend our partners consider and apply the suggested management strategies to ensure the ongoing conservation of the lesser prairie-chicken. As the understanding of lesser prairie-chickens continues to grow, the Service expects to refine these suggested management strategies. We urge our partners to incorporate these strategies in the current planning effort recognizing that refinements will be considered as new information becomes available. We stand ready to work in collaboration and cooperation with our Federal, state, and private partners in this ongoing effort to conserve the lesser prairie-chicken.

### *Literature Cited*

- Applegate, R. D., and T. Z. Riley. 1998. Lesser prairie-chicken management. *Rangelands* 20:13-15.
- Copelin, F.F. 1963. The lesser prairie-chicken in Oklahoma. Oklahoma Wildlife Conservation Department Technical Bulletin No. 6. Oklahoma City. 58 pp.
- Crawford, J.A. and E.G. Bolen. 1976. Effects of land use on lesser prairie-chickens in Texas. *Journal of Wildlife Management* 40:96-104.
- Franklin, A.B., B.R. Noon, and T.L. George. 2002. What is habitat fragmentation? *Studies in Avian Biology* 25:20-29.
- Giesen, K.M. 1998. The lesser prairie-chicken. *In* A. Poole and G. Gill, eds. *Birds of North America*, No. 364. Philadelphia: the Academy of Natural Sciences; Washington, D.C. The American Ornithologist's Union.
- Haukos, D.A. 1988. Reproductive ecology of lesser prairie-chickens. M. S. Thesis, Texas Tech. Univ., Lubbock.
- Jamison, B.E. 2000. Lesser prairie-chicken chick survival, adult survival, and habitat selection and movements of males in fragmented rangelands of southwestern Kansas. M.Sc. Thesis, Kansas State University, Manhattan, KS.
- Johnson, D.H. and L.D. Igl. 2001. Area requirements of grassland birds: a regional perspective. *Auk* 118(1): 24-34.
- Rodgers, R.D., and R.W. Hoffman. 2005. Prairie Grouse Population Response to Conservation Reserve Grasslands: An Overview. Pgs. 120-128 *in* A.W. Allen and M.W. Vandever, eds. *The Conservation Reserve Program- Planting for the Future: Proceedings of the National Conference*, Fort Collins, Colorado, June 6-9, 2004. U.S. Geological Survey, Biological Resources Division, Scientific Investigation Report 2005-5145. 248 pp.
- Taylor, M.A., and F.S. Guthery. 1980. Status, ecology, and management of the lesser prairie-chicken. U.S. Dept. Agri. Forest Serv. Gen. Tech. Rep. RM-77. 15 pp.
- U.S. Fish and Wildlife Service (Service). 2010. Species Assessment and Listing Priority Assignment Form: *Tympanuchus pallidicinctus*. Southwest Region: Albuquerque, New Mexico.
- Wilcove, D.S., C.H. McLellan, and A.P. Dobson. 1986. Habitat fragmentation in the temperate zone. Pages 237-256 *in* M.E. Soule, ed. *Conservation Biology*. Sinauer Associates, Sunderland, Mass.