

# Lesser Prairie-chicken Management

Roger D. Applegate and Terry Z. Riley

**T**he lesser prairie-chicken is lesser in many respects. It is smaller and less known than its close cousin the greater prairie-chicken. Lessers have finer breast bars than the greater, and fine barring on the back in contrast to a darker more uniform coloration on the back of greater. Male lessers have orange-red neck sacks (Fig. 1) instead of golden-yellow as with greater (Fig. 2). They inflate these neck sacks to challenge other males and attract females during breeding. The world's population of lessers occurs in just 5 states: Colorado, Kansas, New Mexico, Oklahoma, and Texas.

Lesser prairie-chickens occupy slightly different habitats in different parts of the range. In Colorado, Kansas, and portions of Oklahoma, lessers occupy sand-sage prairie whereas in New Mexico, Texas, and Oklahoma, they occur in sand-shinnery oak grasslands. Most populations occur on private grazing and farm lands throughout their range. As a result, private ranch operators have tremendous potential to assist in preserving this valuable game bird species.

The sand-sage prairie consists of sand sagebrush and grasses. Species of grasses include little bluestem, switchgrass, sideoats grama, and red threeawn combined with a variety of forbs (Taylor and Guthery 1980). The sand shinnery oak community primarily consists of shinnery oak along with little bluestem, sand bluestem, sand dropseed, sideoats grama, hairy grama, blue grama, buffalograss, and various forbs (Copelin 1963). Although lessers have evolved in an arid environment, they are still subject to erratic fluctuations, and are affected by drought (Schwilling 1955).

Population fluctuations are normal for lesser prairie-chickens, but recovery from recent declines has not occurred. Lesser prairie-chicken populations declined during the drought periods of the 1930's and 1950's, but since 1800 lesser prairie-chicken range has decreased by > 90% and population size has declined by ~97% (Taylor and Guthery 1980). In Kansas alone, lesser population density has declined by approximately 15–20% since the drought years of 1990–91 (Fig. 3).

Population declines were severe enough that in 1995 biologists from all five lesser prairie-chicken states met in Amarillo, Tex., to discuss the future of the species. They met again in Oklahoma City, Okla., and Ft. Collins, Colo., in 1996. During the Oklahoma City, meeting representatives of the five states formed a partnership known as the Lesser Prairie-chicken Interstate Working Group, to stem decline of the species. Also, at this meeting, biologists attempted to define the primary factors affecting lesser prairie-chicken population decline and recovery. They agreed that lessers are primarily limited by habitat alteration, vagaries of climate, predation, and disease.

The Working Group has established a goal of maintaining a viable population of lesser prairie-chickens rangewide. Objectives identified to address this goal include, but are

not limited to, determining the current status of lesser populations and their habitat, identifying and implementing management practices to conserve habitat, identifying and implementing population management practices, providing information and technical assistance that target lesser habitats, and meeting public needs for lesser prairie-chickens. Priority research has been identified to close information gaps necessary to meet objectives.

In the fall of 1995 the U. S. Fish & Wildlife Service was petitioned to list the lesser prairie-chicken as threatened under the U. S. Endangered Species Act. This petition requires that the U. S. Fish and Wildlife Service review all known information pertaining to the lesser prairie-chicken and its habitat and to determine the biological merit of listing. In June 1997 the Service published its 90-day decision that available information in the petition indicated that lessers merited continued listing evaluation. The final decision whether or not to list is due in mid 1998.

## Habitat Needs

Lesser prairie-chickens require a complex of habitats, depending on the season. These include lekking or gobbling grounds, nesting and brood-rearing habitat, and fall/winter habitat. Leks are at the center of all other habitats. In early spring, when daylight (photoperiod) begins to lengthen, hormones in male prairie chickens cause them to become sexually active. These urges prompt the males to congregate and establish territories on high spots with little or no vegetation. A few weeks after males become active, females start visiting the leks in response to photoperiod and all the noise created by the males. Eventually, most of the females



**Fig. 1.** Male lesser prairie-chicken gobbling. The lessers have finer barring on the breast and back than the greater prairie-chicken. Males have orange-red neck sacks which are inflated during gobbling.



**Fig. 2.** Male greater prairie-chicken booming. Greater have coarser breast bars and look uniform dark on the back. Males have golden-yellow neck sacks.

are bred by the more dominant males on the lek and they move off to select a place to nest.

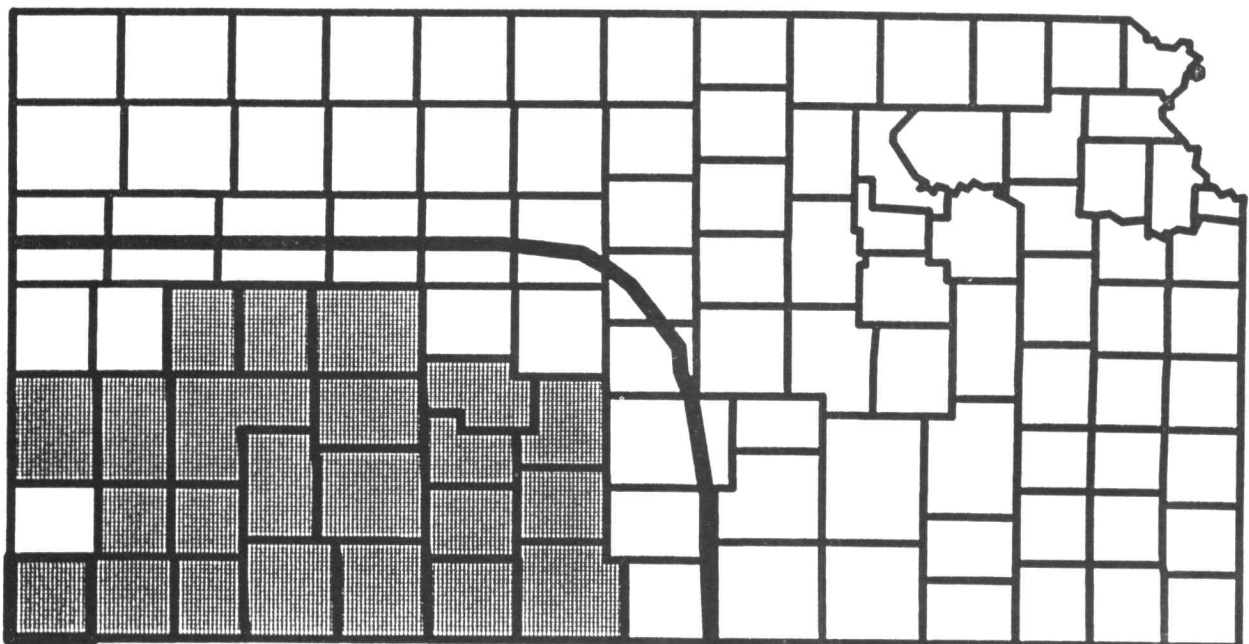
Most birds spend their entire life within a 3-mile radius of the lek. A viable lek will have from 6 or more males and nearly the same number of females. Some leks may have over 50 males. Usually, leks are located on high ground with very short or little vegetation. In agricultural areas, leks may be established on green wheat fields, bare corn fields, or cut hay. Leks need to be clustered so that interchange among different leks can occur; generally inter-lek distance should not be greater than 1.2 miles, however, prairie chickens will move over 5 miles between leks. Complexes

should consist of at least 6 leks; ten or more would be better. A high density of leks reduces interbreeding problems on an individual lek, since dominant males and their male offspring often do most of the breeding.

Females search for nesting habitat in grassy spots usually within a mile or two of leks. Bluestems, dropseeds and other grasses and grass-like plants provide overhead and ground cover necessary for successful nesting. Such grassy habitats usually are dense and clumpy rather than dense and continuous, with clumps ranging from 3 to 10 feet in diameter. Grassy clumps should be composed of ~65% tallgrasses, 30% shrubs such as shinnery oak and/or sand sagebrush, and some annual or perennial forbs (Riley et al. 1992). Mean grass height in clumps should be 1 foot when nests are constructed. There should be a high density (several per acre) of these grassy habitats available for nesting, otherwise predators will be able to locate and destroy most nests.

Within a few hours after hatch, the chicks are ready to begin foraging. Broods begin feeding near the nest, but the female will move them more than a mile during the first few days of life if food resources are in short supply. Brood-rearing habitat should be composed of 40%–45% grasses and an equal quantity of shrubs (either shinnery oak or sand sagebrush). The remainder should be perennial and annual forbs. Broods need areas that are open at ground level with ~ 60% bare ground, the rest covered with live and residual plants that provide overhead cover to about 1 foot (Riley and Davis 1993). These habitats support healthy populations of grasshoppers and treehoppers, which are the primary food of young prairie chickens. Forbs and shrubs are necessary as a substrate for production of tree-

### 1997 Occupied Lesser Prairie-chicken Range in Kansas as Compared to Historic Range



**Fig. 3.** Current and historic range of the lesser prairie-chicken in Kansas. Since 1990–91 lesser density has declined by about 15–20%.

hoppers, whereas, grasshoppers are a product of grasses. Treehoppers are one of the primary insect foods of chicks less than 4 weeks of age, and grasses are extremely important for chicks between ages 5 and 10 weeks because they feed almost exclusively on grasshoppers (Davis et al. 1980). Green wheat fields also support healthy insect populations and can provide excellent brood-rearing habitat.

By late summer, precipitation becomes light and infrequent. Insect populations decline and prairie chicken diets change to seeds and leafy material (Riley et al. 1993a). Family groups often join together in late summer and early autumn and form into large flocks. These flocks travel great distances to forage as food supplies dwindle into winter. Many birds are attracted back to the leks in autumn when photoperiods are similar to those that stimulated breeding in spring. Autumn and winter foraging habitat should consist of 60-65% grasses and 35-40% shinnery oak or sand sagebrush (Riley et al. 1993b). Birds forage in grain fields, green wheat fields, or on oak mast and sagebrush leaves during winter. These habitats are extremely important to winter survival, particularly during droughts. There is little free water across most of the range of lesser prairie chickens, and leafy vegetation may be the only moisture available in winter during periods of drought. An extended drought over several years can be devastating to prairie chickens. Flocks will travel great distances to find sources of food and moisture, but mortality rates increase dramatically when sources are difficult to locate.

### Management of Habitats

Before modern-day agriculture and intensive livestock grazing systems, lesser prairie chickens roamed over vast areas of shinnery oak and sand sagebrush grasslands. Populations fluctuated with wet and dry cycles, but the species thrived over their historic range in five or more states. Early agriculture actually enhanced prairie chicken populations by providing a more dependable winter food source, and providing a better mosaic of habitats. Intensive agriculture and livestock grazing systems have reduced the mosaic of available habitats, and in some cases prairie chicken populations have been completely eliminated over large areas of their historic range. In order to restore viable lesser prairie chicken populations a mosaic of habitats around leks is needed across gently rolling landscapes of shinnery oak or sand sagebrush grasslands. Light grazing by livestock or wildlife will enhance the mosaic of habitats, and corn and wheat farming will improve winter food resources.

The following management techniques can help to insure healthy lesser prairie-chicken populations on landscapes supporting healthy shinnery oak or sand sagebrush grasslands.

1. Grazing systems that create a mosaic of native grassland patches are preferred over intensive systems that reduce grass and shrub cover. This type of habitat can be created in large pastures with year-long or season-long grazing systems if grazing pressure is light and livestock water sources are not well distributed. Deferred and rest-rotation systems with moderate grazing pressure can be used to maintain good habitat in small pastures if residual grass cover is available for nesting and brood rearing in deferred and rested pastures.

2. Late winter or early spring burns can be used every 3 or 4 years over 20-33% of rangeland to rejuvenate grasses. Summer or fall burns will provide annual forbs on small areas.

3. Manage and protect a mosaic of shinnery oak or sand sagebrush patches (20 acres and larger) in areas of widespread agriculture or intensive livestock grazing.

4. Utilize minimum or no-till cultivation practices on grainfields to provide for winter food. If there are no grainfields within 5 miles of the general area, use 10-15 acre food plots of corn, soybeans, or milo to provide winter food.

5. Minimize herbicide and insecticide use. These are particularly detrimental because they will reduce insect populations and insect-producing shrubs and forbs.

6. Areas of trees or exotic grasses should be converted to native shinnery oak, sand sagebrush and warm season grasses.

7. CRP fields should be seeded to mixtures of native tall and mid-grasses and forbs, forbs also can be provided by discing strips into existing grass stands. Appropriate seed mixtures can be supplied by local Natural Resource Conservation Service or state wildlife agency personnel.

Because most lands within the range of the lesser prairie-chicken are privately owned, it is apparent that proper habitat management for these birds rests with individual private landowners. We would like to encourage landowners to manage at least a portion of their lands to create conditions favorable to lesser prairie-chickens. Interested landowners should contact the local office of their state wildlife department or an office of the Natural Resources Conservation Service to obtain advice on management for lesser prairie-chickens on their land

### References

- Copelin, F. F. 1963.** The lesser prairie chicken in Oklahoma. Oklahoma Wildlife Conservation Department Tech. Bull. 6. 58 pp.
- Davis, C. A., T. Z. Riley, R. A. Smith, and M. J. Wisdom. 1980.** Spring-summer foods of lesser prairie chickens in New Mexico. pp. 75-80 In: P. A. Vohs, Jr., and F.L. Knopf, eds. Prairie Grouse Symp. Proc. Oklahoma State Univ., Stillwater, Okla.
- Riley, T. Z. and C. A. Davis. 1993.** Vegetative characteristics of lesser prairie-chicken brood foraging sites. *Prairie Nat.* 25:243-248.
- Riley, T. Z., C. A. Davis, and R. A. Smith. 1993a.** Autumn and winter foods of the lesser prairie-chicken (*Tympanuchus pallidicinctus*) (Galliformes: Tetraonidae). *Great Basin Nat.* 53:186-189.
- Riley, T. Z., C. A. Davis, and R. A. Smith. 1993b.** Autumn-winter habitat use of lesser prairie-chickens. *Great Basin Nat.* 53:409-411.
- Riley, T. Z., C. A. Davis, M. Ortiz, and M. J. Wisdom. 1992.** Vegetative characteristics of successful and unsuccessful nests of lesser prairie chickens. *J. Wildl. Manage.* 56:381-385.
- Schwilling, M. D. 1955.** A study of the lesser prairie chicken in Kansas. Unpublished Job Completion Report, Kansas Forestry, Fish and Game Commission, Pratt. 51 pp.
- Taylor, M. A. and F. S. Guthery. 1980.** Status, ecology, and management of the lesser prairie chicken. USDA Forest Service Gen. Tech. Rep. RM-77. 15 pp. Rocky Mountain Forest and Range Experiment Station, Ft. Collins, Colo.

The authors are Small Game Coordinator, Kansas Department of Wildlife and Parks, P.O. Box 1525, Emporia, Kans. 66801-1525 and Midwest Field Representative, Wildlife Management Institute, 13377 382<sup>nd</sup> Avenue, Aberdeen, SD 57401-8426.

This article is a contribution, in part, of Kansas Federal Aid in Wildlife Restoration Project W-39-R.