

Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*)

September 1999

Fish and Wildlife Habitat Management Leaflet

Number 6



General Information

The lesser prairie-chicken is an upland, grassland-nesting bird present in regions of Kansas, Colorado, Oklahoma, New Mexico, and Texas. Related to the sharp-tailed grouse and differing only slightly from the greater prairie-chicken in color, size, and primarily in range, the lesser prairie-chicken is best known for its unique courtship displays and “gobbling” grounds. A highly social animal, the lesser prairie-chicken is most easily observed in spring when males gather to display for females. Once present in large numbers, the lesser

prairie-chicken population and its original distribution have declined significantly since 1800. In the twentieth century, human influences such as the conversion of native rangelands to cropland, decline in habitat quality due to herbicide use, petroleum and mineral extraction activities, and excessive grazing of rangelands by livestock have contributed to this decline. Severe drought has also significantly impacted prairie-chicken populations. Unfortunately, the lesser prairie-chicken has been studied less than many other more common and widely distributed grassland birds. Due to these factors, the lesser prairie-chicken is now being considered by the U.S. Fish and Wildlife Service as a species in need of protection through the Endangered Species Act.

This leaflet is designed to serve as an introduction to the habitat requirements of the lesser prairie-chicken and to assist landowners and managers in the development of a comprehensive lesser prairie-chicken management plan. The success of any individual species management plan depends on targeting the specific needs of the desired species and analyzing the designated habitat area to ensure that all required habitat elements are present. This leaflet provides a number of practical habitat management activities that can be conducted on private lands to boost local lesser prairie-chicken populations and encourages involving fish and wildlife professionals in the management plan to identify additional management actions needed over time.

Range

As a year-round resident, the breeding, summer, and winter ranges of the lesser prairie-chicken are identical. The lesser prairie-chicken is present in southeastern Colorado in Baca, Prowers, and Kiowa counties. In Kansas, the lesser prairie-chicken exists in nearly the entire southwestern quarter of the state bordering Oklahoma and Colorado. The species occurs in Oklahoma’s panhandle and north-west counties, and New Mexico counties of Harding and Union on the north to Eddy and Lea counties on the south. The northeastern and southwestern counties of Hemphill,



Lipscomb, Wheeler, Donley, Cochran, Yoakum, and Gaines in the Texas panhandle support populations as well.

Habitat Requirements

General

Native rangeland in different stages of plant succession and consisting of a diversity of native, short- to mid-height grasses and forbs interspersed with low-growing shrubby cover comprises optimum lesser prairie-chicken habitat. Sand sagebrush (*Artemisia filifolia*) communities dominated by sand dropseed (*Sporobolus cryptandrus*), side oats grama (*Bouteloua curtipendula*), and little bluestem (*B. scoparium*) make up the most preferred lesser prairie-chicken habitat in Kansas, Colorado, Texas and northern Oklahoma. Texas, New Mexico, and western Oklahoma provide shinnery oak/bluestem habitat dominated by sand bluestem (*B. hallii*), little bluestem, Indiangrass, switchgrass, buffalo grass, sand dropseed, and sand sagebrush. These habitat types provide protective cover for nesting and brood-rearing activities, as well as food. Sand plum (*Prunus angustifolia*) and skunkbush sumac (*Rhus aromatica*) are valuable shrubs for providing shade and brood-rearing cover as well. Display grounds, or leks, are established in open areas of low-growing vegetation and generally are located within or close to grassland nesting cover. Adequate cover is among the greatest factors affecting lesser prairie-chicken populations, and the continued loss of shrub/grassland habitat remains the greatest threat to the lesser prairie chicken's future. Preserving these shrub/grassland communities and properly managing rangelands can help landowners boost local lesser prairie-chicken populations, as well as populations of other species that rely on similar habitat.

Food

The lesser prairie-chicken's diet consists of insects, seeds, and leaves, catkins, and buds of forbs (broad-leaved plants) and cultivated crops. Juveniles less than 10 weeks old feed primarily on insects such as short-and long-horned grasshoppers and beetles; however leafhoppers and other smaller insects are eaten in the initial weeks following hatching. Within shinnery oak/grassland habitat, insects make up more than half of the spring and summer diet of adult lesser prairie-chickens. Sand sage leaves and buds and various forbs are consumed in spring and summer as well. Seeds are primary foods in autumn, supplemented with vegetative matter and insects. Shinnery oak acorns, sage leaves, wild buckwheat, rye and seeds from native wild plants, fruits, and flowers are eaten in winter months. Lesser prairie-chickens will eat corn, oats, wheat, rye, grain sorghum, and other small grain crops left as waste grain after harvest, or left standing as a food plot.

Important lesser prairie-chicken food items. The following items are known to be important foods in the diet of the lesser prairie-chicken.

Insects:

short-horned grasshoppers leafhoppers long-horned grasshoppers beetles treehoppers others.....

Seeds/mast and forbs:

sage leaves winter wheat buds seeds wild buckwheat shinnery oak acorns and galls dayflower evening
primrose queensdelight wild sweet pea prairie ragwort ragweed beard-tongue wild four-o'clock

Cultivated crops:

corn oats wheat rye grain sorghum milo sunflowers other small grain crops

Cover – Breeding

Display grounds (leks) used for breeding are characterized by low-growing vegetation on open ground. In grassland communities, elevated knolls or ridges with flat surfaces often serve as leks. Grazed rangelands, agricultural fields, prairie dog towns, and other open areas where vegetation height is short in spring are also used. Human disturbances such as roads, oil pads, and bare areas resulting from herbicide treatments have also been used as leks.

Cover – Nesting and Brood-rearing

Nesting and brood-rearing cover for lesser prairie-chicken consists of grassland dominated by sand bluestem, sand dropseed, side oats grama, and little bluestem, interspersed with sand sagebrush, sand plum, skunkbush sumac, and shinnery oak shrubs. Dense tall grasses growing in clumps, or mottes, varying from 3 to 10 feet in diameter are best for nesting lesser prairie-chickens; thick stands of even-growth vegetation do not. Females scratch shallow, bowl-shaped depressions in the soil and line them with dried grasses, leaves, and feathers to serve as nests.

Ideal nesting habitat consists of an interspersion of 65 percent grassy mottes, 20 to 30 percent shrubs, and 5 to 15 percent forbs, with grasses and shrubs averaging at least 20 inches in height. Present-day range conditions rarely meet these conditions, however. Rangelands with taller grass species in good range condition can still be valuable to lesser prairie-chickens with a lesser shrub component. Tall grass in good condition is more important for nesting cover than the condition of the shrub component. Nesting sites are frequently established on north or northeast facing slopes to reduce exposure to southwest winds and direct sunlight, and are usually located one to two miles from the nearest lek.



Native grasses and sand sage provide ideal lesser prairie-chicken nesting cover.

Where grass condition seems to dictate the quality of nesting cover, existence of shrubs and forbs is more important for good brood-rearing cover. Ideal brood-rearing cover consists of an interspersion of 40 to 45 percent sand sagebrush, sand plum, and shinnery oak; 40 to 45 percent of short- to medium-height grasses; and 15 to 20 percent forbs containing a high insect abundance. In areas where lesser prairie-chickens are present, proper grazing management practices that provide various stages of plant succession can help increase nesting and brood-rearing cover quality. Vegetation communities within two miles of active leks should be managed for optimal nesting and brood-rearing habitat.

Cover – Winter

Winter habitat requirements for lesser prairie-chickens differ little from nesting, brood-rearing, and summer cover types. Short- to medium-height grasslands comprised of sand dropseed, side oats grama, sand bluestem, and little bluestem interspersed with shinnery oak, sand plum, skunkbush sumac, or sand sagebrush are used as winter cover by lesser prairie-chickens. Grain fields near high range condition grassland/shrubland cover are used for foraging in winter months. Due to the varying winter temperatures within the five states supporting lesser prairie-chicken populations, availability of common food sources (especially insects) may differ, but cover requirements are similar.

Water

Daily foraging activities and the types of foods eaten provide lesser prairie-chickens with an adequate amount of water. However, birds will use open water during droughts when available in close proximity to sufficient cover.

Interspersion of Habitat Components

Ideal interspersion of lesser prairie-chicken habitat components consists of a complex of sand sagebrush, sand plum, skunkbush sumac, and shinnery oak shrubs and sand dropseed, side oats grama, sand bluestem, and little bluestem grasses growing in various stages of development on open rangelands with flat surfaces. In order for successful lesser prairie-chicken reproduction and survival to occur, all required habitat components must be available in relatively close proximity to one another (within 2-4 mi²). For example, the highest-quality nesting habitat is of little use if the nearest open foraging habitat is not close by. Distribution and interspersion of food and cover in the form of varying habitats determines whether or not an area can support a lesser prairie-chicken population and the number of individuals in a population.

Minimum Habitat Area

The minimum land area needed to maintain a breeding population of lesser prairie-chickens is an area of prime nesting and brood-rearing cover approximately two-square miles (1,280 acres) in size, surrounded by a minimum of 10,000 acres of feeding and loafing habitat. Complexes of suitable lesser prairie chicken habitat of up to 25,000 acres provide optimum conditions for maintaining populations. While smaller parcels by themselves may not provide the area needed, each contributes to the mosaic of larger habitat blocks that do meet minimum habitat size requirements. Although typically not a limiting factor on rangelands due to cattle grazing patterns, lek areas created through active habitat management efforts should be at least 50 yards in diameter per 15 males and located on higher ground with little or no shrub cover.

Lesser Prairie-Chicken Habitat Requirements Summary Table.

Habitat Component	Habitat Requirements
Food – Young	<ul style="list-style-type: none"> Insects – especially leafhoppers, beetles, and short-and long-horned grasshoppers.
Food – Adult	<ul style="list-style-type: none"> Insects. Vegetative material - sage leaves, buds, flowers, forbs, winter wheat, and wild buckwheat. Mast and seeds - primarily shinnery oak acorns. Cultivated crops – corn, oats, wheat, rye, sorghum, and other small grain crops.
Breeding Cover (Leks)	<ul style="list-style-type: none"> Open rangelands, idle agricultural fields, elevated knolls and ridges with flat surfaces and low-growing vegetation, prairie dog towns. Human disturbances such as roads, oil pads, and bare areas resulting from herbicide treatment, reverted cropland.
Nesting, Brood-rearing, and Winter Cover	<ul style="list-style-type: none"> Mid-grass grasslands growing in different stages of plant succession and comprised of sand dropseed, side oats grama, sand bluestem, and little bluestem interspersed with shinnery oak, sand plum and sand sagebrush. Nesting cover – 65% grass, 20-30% shrubs, 5-15% forbs Brood-rearing cover – 40-45% grass, 40-45% shrubs, 15-20% forbs
Water	<ul style="list-style-type: none"> Foods eaten provide adequate water. Birds will use open water from livestock ponds, playa lakes, and others during drought conditions.
Interspersion	<ul style="list-style-type: none"> Prefer a complex of sand sagebrush, shinnery oak, sand plum, or skunkbush sumac shrubs, sand dropseed, side oats grama, sand bluestem, and little bluestem grasses on open rangelands with flat surfaces.
Minimum Habitat Size	<ul style="list-style-type: none"> Two-square miles, or 1,280 acres, of prime nesting and brood-rearing cover surrounded by a minimum of 10,000 acres of feeding and loafing habitat. Smaller areas that form complexes of suitable habitat contribute to meeting size requirements.

Rangeland Management: Grazing – Season-long grazing systems are typically stocked to include as many cattle on a grazing unit that is financially beneficial; this type of grazing does not leave adequate time for rangeland to recover to a state where it is valuable to wildlife. Grazing livestock rotationally in pastures and on rangelands may be the best management strategy to maintain vegetation in suitable condition for lesser prairie-chickens. For example, rangeland divided into seven different grazing units should have two units left idle for two years at a time. Research shows that light grazing (<35 percent of available forage consumed) maintains good nesting and brood-rearing cover. However, if range condition is deteriorated, then stocking levels would need to be substantially lower. The table below shows suggested stocking levels for maintaining nesting, brood-rearing, and foraging habitat based on average annual rainfall and range condition.

Stocking level (% of available annual forage production) and recommended pasture rest for rangeland based on range condition and average annual precipitation.

Range Condition	Annual Rainfall	
	< 13"	≥ 13"
Poor	10%, rest 1 in 2 years	20%, rest 1 in 3 years
Fair	25%, rest 1 in 3 years	35%, rest 1 in 4 years
Good	40%, rest 1 in 4 years	50%, rest 1 in 5 years

Prescribed Burning – Prescribed burning is best conducted under the advisement of range and/or wildlife management professionals. These professionals can help in the development of a burn plan and possibly provide tools, equipment, supervision, and assistance in obtaining any required permits. Prescribed burns should be conducted on a three to six year rotational basis in early spring (March) to promote new growth of shrubs and grasses valuable as lesser prairie-chickens nesting, brood-rearing, and foraging cover. Leks may be maintained or created using prescribed fire as well. Burning an area to leave undisturbed nesting habitat adjacent to burned plots can be beneficial. Disked firebreaks should be created around burn areas.

Disking – Disking strips or blocks of land near leks and nesting cover on a four- to five-year rotational basis may help increase foraging and brood-rearing habitat and food resources. Disking to a depth of four to eight inches is sufficient to disturb the ground and promote new vegetation growth. It is important to leave ample undisturbed habitat (at least 100 yards) between disked areas and leks or nesting habitat, and it is necessary to disk only a few blocks within a combined area of rangeland. Note: Disking and planting food plots are supplemental management techniques that should be conducted only after good range condition is established.

Food Plots - Food plots are a management tool that can be used to potentially attract lesser prairie-chickens to quality nesting and winter habitat from areas of poor habitat. Areas of good habitat not inhabited by lesser prairie-chickens may be made attractive to birds by planting grain sorghum food plots within one mile of lekking grounds. Food plots planted with the sole intention of providing supplemental food have not been proven to improve lesser prairie-chicken survivability in an area. Landowners should plan with caution to avoid food plots being counterproductive by drawing lesser prairie-chickens from good habitat to poor habitat.

Limiting Factors

For planning purposes, subjectively rate the availability and quality of lesser prairie-chicken habitat within a planning area, based on the above habitat requirements descriptions. Habitat communities and components that are absent or rated low are likely limiting lesser prairie-chicken habitat quality. Land uses on adjacent properties may need to be considered to accurately rate the quality of a planning area as lesser prairie-chicken habitat.

Habitat Component	Availability/Quality			
	High	Medium	Low	Absent
Food				
Breeding cover				
Nesting cover				
Brood-rearing and winter cover				
Interspersion of habitat components				
Minimum habitat size				

Management Prescriptions

Management treatments should address the habitat components that most limit lesser prairie-chicken habitat potential. For planning purposes, select among the possible actions listed below to raise the quality or availability of each habitat component determined to be limiting. NRCS Conservation Practices and various programs that may provide financial or technical assistance to carry out specific management practices are listed where applicable.

Habitat Component	Management Options for Increasing Habitat Quality or Availability	Conservation Practices and Assistance Programs
Food	<ul style="list-style-type: none"> Maintain forb and grass components within sand sagebrush, sand plum, and shinnery oak grasslands by conducting prescribed rotational burning, rotational shrub/brushland management, and rotational or deferred grazing (especially during drought) where appropriate. 	647, 338, 528A WHIP, EQIP, PFW, CRP
	<ul style="list-style-type: none"> Use minimum or no-till farming techniques to leave waste corn, oats, wheat, rye, sorghum, and other small grain crops on the surface after harvest activities. 	329
	<ul style="list-style-type: none"> Limit herbicide and insecticide use on rangelands to small areas or use mechanical means to minimize damage to shrubs, forbs, or insects used as food. 	
	<ul style="list-style-type: none"> Disk strips or blocks of land near leks and nesting cover on a four to five year rotational basis. 	647 WHIP, EQIP, PFW
	<ul style="list-style-type: none"> Plant food plots of grain sorghum within one mile of leks to provide supplemental winter food resources. 	647 WHIP, EQIP, PFW, CRP
Courtship display cover	<ul style="list-style-type: none"> Preserve and maintain open areas on rangelands by conducting prescribed burning and rotational grazing when and where appropriate. 	338, 528A WHIP, EQIP, PFW, CRP
Nesting, brood-rearing, and winter cover	<ul style="list-style-type: none"> Maintain sand sagebrush, sand plum, skunkbush sumac, and shinnery oak mixed-grasslands with occasional prescribed burning, rotational brush management, and rotational or deferred grazing (especially during drought) when and where appropriate. 	647, 338, 528A WHIP, EQIP, PFW, CRP
	<ul style="list-style-type: none"> Restore reverting croplands with native species such as sand dropseed, side oats grama, sand bluestem, and little bluestem grasses, as well as shinnery oak, sand plum, sand sagebrush, and forbs. 	327 WHIP, EQIP, PFW, CRP
	<ul style="list-style-type: none"> Avoid or eliminate herbicide application during peak nesting and brood-rearing months (mid-April-July) and minimize use to occasional small brush treatments. 	
	<ul style="list-style-type: none"> Disk strips or blocks of habitat near leks and nesting cover on a four- to five-year rotational basis. 	WHIP, EQIP, PFW
Interspersion & minimum habitat size	<ul style="list-style-type: none"> Combine above prescriptions to increase interspersion of habitat components or amount of suitable lesser prairie-chicken habitat. 	

NRCS Conservation Practices that may be useful in undertaking the above management actions.

Conservation Practice	Code	Conservation Practice	Code
Conservation Cover	327	Prescribed Grazing	528A
Residue Management	329A,B,C	Upland Wildlife Management	645
Prescribed Burning	338	Early Successional Habitat Development	647

Landowners interested in making their individual efforts more valuable to the community can work with the Wildlife Habitat Council and NRCS to involve school, scout, and community groups and their families, as well as state and federal fish and wildlife agency personnel, in habitat projects when possible. On-site education programs demonstrating the necessity of lesser prairie-chicken habitat management can greatly increase the value of your individual lesser prairie-chicken management project as well. Corporate landowners should encourage interested employees to become involved.

Programs that provide technical and financial assistance to develop habitat on private lands.

Program	Land Eligibility	Type of Assistance	Contact
Conservation Reserve Program (CRP)	Highly erodible land, wetland, and certain other lands with cropping history. Stream-side areas in pasture land	50% cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10 to 15-year contracts. Additional financial incentives are available for some practices	NRCS or FSA State or local Office
Environmental Quality Incentives Program (EQIP)	Cropland, range, grazing land & other agricultural land in need of treatment	Up to 75% cost-share for conservation practices in accordance with 5 to 10-year contracts. Incentive payments for certain management practices	NRCS State or local Office
Partners for Fish and Wildlife Program (PFW)	Most degraded fish and/or wildlife habitat	Up to 100% financial and technical assistance to restore wildlife habitat under minimum 10-year cooperative agreements	Local office of the U.S. Fish and Wildlife Service
Waterways for Wildlife	Private land	Technical and program development assistance to coalesce habitat efforts of corporations and private landowners to meet common watershed level goals	Wildlife Habitat Council (301-588-8994)
Wildlife at Work	Corporate land	Technical assistance on developing habitat projects into a program that will allow companies to involve employees and the community	Wildlife Habitat Council (301-588-8994)
Wildlife Habitat Incentives Program (WHIP)	High-priority fish and wildlife habitats	Up to 75% cost-share for conservation practices under 5 to 10-year contracts	NRCS State or local Office
State fish and wildlife agencies and private groups such as Pheasants Forever may have assistance programs or other useful tools in your state.			State or local contacts

References

- Bidwell, T. G., C. B. Green, A. D. Peoples, and R. E. Masters. Prairie chicken management in Oklahoma. E-945. Oklahoma Cooperative Extension Service. Stillwater, OK.
- Crawford, J. A., and E. G. Bolen. 1976. Effects of land use on lesser prairie chickens in Texas. J. Wildl. Manage. 40:96-104.
- Giesen, K. M. 1998. Lesser prairie-chicken (*Tympanuchus pallidicinctus*) in The Birds of North America, No. 364 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Hitchcock, A. S. 1971. Manual of the grasses of the United States, Volumes I&II. Second ed. Dover Publications, Inc., New York, NY. 1051 pp.

- Riley, T. Z., C. A. Davis, M. A. Candelaria, and H. R. Suminski. 1994. Lesser prairie-chicken movements and home ranges in New Mexico. *Prairie Naturalist* 26:183-186.
- Sauer, J. R., J. E. Hines, G. Gough, I. Thomas, and B. G. Peterjohn. 1997. The North American Breeding Bird Survey Results and Analysis. Version 96.4. Patuxent Wildlife Research Center, Laurel, MD.
- Taylor, M. A., and F. S. Guthery. 1980. Status, ecology and management of the lesser prairie-chicken. USDA Forest Service General Technical Report RM-77. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 15 pp.

NRCS

Wildlife Habitat Management Institute

100 Webster Circle, Suite 3
Madison, MS 39110
(601) 965-5886

In cooperation with partners, the mission of the Wildlife Habitat Management Institute is to develop and disseminate scientifically based technical materials that will assist NRCS field staffs and others to promote conservation stewardship of fish and wildlife and deliver sound habitat management principles and practices to America's land users.



www.whmi.iastate.edu

Wildlife

Habitat Council

1010 Wayne Avenue, Suite 920
Silver Spring, MD 20910
(301) 588-8994

The Wildlife Habitat Council's mission is to increase the amount of quality wildlife habitat on corporate, private, and public land. WHC engages corporations, public agencies, and private, non-profit organizations on a voluntary basis as one team for the recovery, development, and preservation of wildlife habitat worldwide.



www.wildlifehc.org



This leaflet was developed in cooperation with the members of the
HIGH PLAINS PARTNERSHIP



**Western Governors'
Association**



We received helpful comments on the draft manuscript from Roger Applegate, Jim Bailey, Colin Berg, Ken Giesen, Stephanie Harmon, Russ Horton, John Hughs, Ken Kuiper, Roger Peterson, Terry Riley, Randy Rodgers, Dave Seery, Terry Skadeland, Steve Tully, and Gary Valentine.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternate means for communication of program information (Braille, large print, audiotope, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.