

# Improving Lesser Prairie-Chicken Habitat Through Revegetation and Rangeland Management



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### A Population In Peril

The lesser prairie-chicken, *Tympanuchus pallidicinctus*, is an upland, grassland-nesting bird native to regions of Kansas, Colorado, Oklahoma, New Mexico, and Texas. It is related to the sharp-

tailed grouse and differs slightly from the greater prairie-chicken in color, size, and behavior, and significantly in range. The lesser prairie-chicken is best known for its unique spring courtship displays and gobbling grounds, also known as leks.

Lesser prairie-chicken populations and habitat have declined significantly since the 1800s. Populations are currently found in southeastern Colorado, southwestern Kansas, northwestern Oklahoma, portions of eastern New Mexico, and the Texas panhandle. Human influences such as the conversion of native rangelands to croplands, declines in habitat quality due to herbicide use, petroleum and mineral extraction activities, road and trail construction, fire exclusion (resulting in tree and woody plant invasion), and excessive grazing of rangelands all contributed to the decline of the lesser prairie-chicken. The continued loss and fragmentation of shrub/grassland habitat remains the greatest threat to the lesser-prairie chicken's future.

## Habitat Highlights

- The primary threat to lesser prairie-chicken populations is loss of habitat.
- A diversity of habitats is required throughout the life cycle of the prairie-chicken to provide food and shelter.
- Planting to improve lesser prairie-chicken habitat requires not only the correct species of grasses, wildflowers, and shrubs, but, also the selections which have proven success or which are locally adapted.
- Proper management of lesser prairie-chicken habitat maintains plant diversity and keeps unwanted plant species from invading. Management with other uses, such as grazing, are very effective and benefit both livestock and wildlife.

## Habitat Requirements

Optimum habitat for lesser prairie-chicken consists of open, relatively flat rangeland in different stages of plant succession that includes a diversity of native, short to mid-height grasses and wildflowers interspersed with low-growing shrubby cover. The species avoids areas containing tall features such as power lines, structures, and tree-invaded grasslands. For successful survival and reproduction, all required habitat components must be available in relatively close proximity to one another. These seasonal habitat components are often defined in terms of their proximity to a lek (spring communal breeding area).

This habitat consists of four distinct communities. The northern habitat (Kansas, Colorado, northeastern Texas panhandle, and northern Oklahoma including the panhandle) consists of sand sagebrush communities dominated by sand dropseed, sideoats grama, and little bluestem. The southern habitat (southwestern Texas panhandle, New Mexico, and select portions of western Oklahoma) consists of shinnery oak/bluestem habitat dominated by sand bluestem, little bluestem, Indiangrass, switchgrass, buffalograss, sand dropseed, and sand sagebrush. Mixed-grass prairie void of sagebrush and short-grass prairie also serve as habitat, especially in northwest Kansas, where lesser prairie-chicken populations have expanded with native grass plantings under the Conservation Reserve Program. Sand plum and skunkbush sumac are valuable shrubs that provide shade and brood-rearing cover across the entire range of lesser prairie-chicken,

especially within the mixed-grass prairie habitat.

A diverse mix of shrubs, grasses, and wildflowers or legumes is necessary to provide all the habitat requirements of lesser prairie-

chicken. This diversity provides adequate ground-level openings to allow for travel, as well as food sources from the plants themselves, or from insects feeding on the plant species.



*Lesser prairie-chicken habitat in a sand sagebrush mosaic found in Oklahoma. Photo by Steve Tully, NRCS.*



*Ideal lesser prairie-chicken habitat in the Texas panhandle with interspersed areas of loafing and nesting cover. Photo by Heather Whitlaw, U.S. Fish and Wildlife Service.*

Habitat	Habitat Requirements
Food—young	<ul style="list-style-type: none"> <li>Insects—especially leafhoppers, beetles, and short- and long-horned grasshoppers.</li> </ul>
Food—adult	<ul style="list-style-type: none"> <li>Insects</li> <li>Vegetative material—sage/shinnery oak leaves, buds, flowers, wildflowers, winter wheat, and wild buckwheat.</li> <li>Mast—primarily shinnery oak acorns and a wide variety of seeds.</li> <li>Cultivated crops (not required, but readily used if available), such as corn, alfalfa, oats, wheat, rye, sorghum, and other small grain crops.</li> </ul>
Breeding cover (leks)	<ul style="list-style-type: none"> <li>Open rangelands, idle agricultural fields, elevated knolls, ridges with flat surfaces and low-growing vegetation, and prairie dog towns represent preferred lek sites. Trees should be absent, and fences should be marked according to State-specific guidelines.</li> </ul>
Nesting, brood-rearing, and winter cover	<ul style="list-style-type: none"> <li>Mid-grass prairies in different stages of plant succession and comprised of sand dropseed, sideoats grama, sand bluestem, and little bluestem interspersed with shinnery oak, sand plum, and/or sand sagebrush, but absent of trees.</li> <li>Nesting cover—65% grass, 20 to 30% shrubs, 5 to 15% wildflowers (will vary with habitat type and ecological site). The most important aspect is to provide cover with adequate visual obstruction from above as well as adequate bare ground to allow for chick mobility.</li> <li>Brood-rearing cover—40 to 45% grass, 40 to 45% shrubs, 15 to 20% wildflowers with an adequate bare-ground component. Must be in close proximity to nesting cover.</li> </ul>
Water	<ul style="list-style-type: none"> <li>Consumed foods provide adequate water. Birds will use open water from livestock ponds, playa lakes, and other water sources during drought conditions.</li> </ul>
Interspersion	<ul style="list-style-type: none"> <li>Prefer a complex of sand sagebrush, shinnery oak, sand plum or skunkbush sumac shrubs, sand dropseed, sideoats grama, sand bluestem, little bluestem grasses, and abundant wildflowers on open rangelands with relatively flat topography.</li> </ul>
Minimum habitat size	<ul style="list-style-type: none"> <li>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.</li> <li>Smaller areas appropriately juxtaposed to form complexes of suitable habitat contribute to meeting size requirements. To be effective, consideration must be given to appropriate juxtaposition for lesser prairie-chicken habitat rather than convenient juxtaposition for land management.</li> </ul>



*Lesser prairie-chicken habitat in the Texas panhandle.*  
Photo by Clint Rollins, NRCS.



*Lesser prairie-chicken habitat with a diversity of plant succession and types of native forb, shrubs, and grasses in Oklahoma.* Photo by Alva Gregory, OK Department of Wildlife Conservation.

## Revegetation and Management for Improving Lesser Prairie-Chicken Habitat

Identifying appropriate sites and proposed actions through regional coordination is one of the best methods to cohesively manage for lesser prairie-chicken habitat. Habitat can be established by reclaiming disturbed lands with diverse plant communities that include native grasses, wildflowers, and shrubs. Uniform stands with just a few species of plants are undesirable, though areas of cultivated crops may be a beneficial food source. Sites that already contain shinnery oak or sand sagebrush can be readily improved with additional species for diversity. (These two species are not commercially available.) The selection of appropriate native species and plant selections (e.g., cultivars or germplasm) is critical to provide appropriate habitat and ensure that the plants are adapted to the site location and conditions. Local source ecotypes may also be used if appropriate for your area. These plant materials are typically available from suppliers specializing in native and conservation plants. For more information on selecting plants, obtaining plant materials, and developing seed mixes, contact your local USDA Natural Resources Conservation Service (NRCS) field office at <http://offices.sc.egov.usda.gov/locator/app>.



*'Bighorn' skunkbush sumac, a native shrub plant release from the Los Lunas PMC. Photo by Dave Dreeson, NRCS.*



*Partridge pea. Photo by Clarence A. Rechenthin, NRCS.*



*'Aztec' Maximilian sunflower, a native wildflower release from the James E. 'Bud' Smith Plant Materials Center (PMC). Photo by Brandon Carr, NRCS.*



*Eureka thickspike gayfeather, a native wildflower plant release from the Manhattan PMC. Photo by Alan Shadow, NRCS.*

<b>Shrubs</b>	<b>Plant Selections</b>	<b>Area of Adaptation</b>
wild plum ( <i>Prunus sp.</i> )	'Rainbow'	OK, TX
Chickasaw plum ( <i>Prunus angustifolia</i> )	Chisholm Germplasm	KS, OK
skunkbush sumac ( <i>Rhus trilobata</i> )	'Autumn Amber' 'Bighorn'	CO, KS, NM, OK, TX CO, KS, NM, OK, TX
<b>Grasses</b>	<b>Plant Selections</b>	<b>Area of Adaptation</b>
sand bluestem ( <i>Andropogon hallii</i> )	'Chet' 'Elida' 'Garden' Cottle County Germplasm 'Woodward'	CO, KS, OK, TX CO, NM KS OK, TX CO, KS, NM, OK, TX
sideoats grama ( <i>Bouteloua curtipendula</i> )	'El Reno' 'Haskell' 'Niner' 'Premier' 'Vaughn'	KS, OK TX CO, NM, OK, TX OK, TX CO, NM, OK, TX
buffalograss ( <i>Bouteloua dactyloides</i> )	'Texoka'	KS, OK, TX
blue grama ( <i>Bouteloua gracilis</i> )	'Alma' 'Hachita' 'Lovington'	CO, NM, OK CO, NM, OK, TX CO, NM
green sprangletop ( <i>Leptochloa dubia</i> )	'Van Horn'	OK, TX
switchgrass ( <i>Panicum virgatum</i> )	'Alamo' 'Blackwell' Grenville Germplasm 'Kanlow'	NM, TX CO, KS, NM, OK CO, NM, west TX CO, KS, OK
western wheatgrass ( <i>Pascopyrum smithii</i> )	'Arriba' 'Barton'	CO, NM, TX KS, OK, TX
little bluestem ( <i>Schizachyrium scoparium</i> )	'Aldous' 'Cimarron' OK Select Germplasm 'Pastura'	KS, OK KS, OK OK, TX CO, NM
Indiangrass ( <i>Sorghastrum nutans</i> )	'Cheyenne' 'Llano' 'Lometa' 'Osage'	KS, OK CO, NM CO, KS, OK, TX KS, OK
sand dropseed ( <i>Sporobolus cryptandrus</i> )	Borden County Germplasm	OK, TX, NM
<b>Wildflowers and Legumes</b>	<b>Plant Selections</b>	<b>Area of Adaptation</b>
partridge pea ( <i>Chamaecrista fasciculata</i> )	'Comanche' 'Riley'	OK, TX KS, OK, TX
purple prairie clover ( <i>Dalea purpurea</i> )	Cuero Germplasm 'Kaneb'	NM, OK, TX KS, NM, OK, TX
Illinois bundleflower ( <i>Desmanthus illinoensis</i> )	'Sabine' Reno Germplasm	NM, OK, TX KS, NM, OK
Maximilian sunflower ( <i>Helianthus maximiliani</i> )	'Aztec' 'Prairie Gold'	KS, NM, OK, TX KS, NM, OK
thickspike gayfeather ( <i>Liatris pycnostachya</i> )	'Eureka'	KS, OK
awnless bushsunflower ( <i>Simsia calva</i> )	'Plateau'	OK, TX

## Establishing Habitat

Successful establishment of grasses, wildflowers, and legumes from seed begins well in advance of planting, typically the season before. A proper seedbed is firm and free of competing vegetation: weed control is one of the most important factors to successful native plant species establishment. Site preparation such as mowing, herbicide application, disking, or tilling should begin the season prior to planting to clear undesirable vegetation. An important action at this stage is to protect existing shrubs occurring on the treatment area. Rangeland seedings typically require a conventionally prepared seedbed that has been cleared of vegetation, tilled, smoothed, and packed to get proper seed placement and distribution. Seedbed packing can be done with a cultipacker or roller. Correct firmness is when an adult footprint is only slightly visible on the prepared bed prior to the seeding operation. A no-till planting might produce acceptable results on abandoned cropland being converted to rangeland provided that weeds and residue are managed prior to planting. Repeat vegetation management operations in the spring prior to planting and allow time for the site to settle and accumulate moisture. Certain conditions and environmental situations may require planting into an established cover crop. Contact your local USDA NRCS field office at <http://offices.sc.egov.usda.gov/locator/app> for site-specific recommendations.

Plant seeds when soil moisture and temperature are optimum for germination, usually late winter or early spring. Shrubs established from container or bare-root stock can be planted after the site has

been seeded. Seeding and planting times vary according to location and should be planted according to State-specific guidance.

Several of the recommended grass species (sand bluestem, little bluestem, and Indiangrass) have appendages attached to the seeds that prevent them from flowing smoothly through conventional seeding equipment. Such “fluffy” seed will require either debearding to remove the fluff and help it flow better or the use of a native grass seed drill that is equipped

with seedbox agitators and picker wheels. Smooth seed can be planted with conventional equipment.

Plant the seed with either a grass drill or a broadcast spreader. Regardless of the planting method, seeding depth and good soil contact is critical in plant establishment success. Seed placement should be  $\frac{1}{4}$ ”– $\frac{3}{4}$ ” deep. This is best accomplished with a grass drill on a clear and firm seedbed. Broadcast seeding can be done on a looser seedbed, but then the site will need to be cultipacked or



*Newly germinated seedlings on a firm, weed-free seedbed. Photo by Alan Shadow, East Texas PMC, NRCS.*



*Firm, weed-free seedbed recently planted with a drill. Photo courtesy of Bismark PMC, NRCS.*

rolled to incorporate the seed into the soil. Shrub species (such as skunkbush sumac and wild plum) are planted from bare-root stock, container-grown plants, or possibly from root cuttings after the seeding is done. Keep in mind that both sand sagebrush and shinnery oak are very important habitat plants that are not currently commercially available and should be conserved as much as possible during site preparations.

## Managing Habitat

Lesser prairie-chickens require and occupy a diverse habitat complex. When part of an overall habitat management plan, practices such as prescribed grazing, flash grazing, brush management, prescribed burning, field borders, food plots, and use exclusion can be planned and installed to create or restore lesser prairie-chicken habitat. Adequate vegetative cover and height for nesting and brood-rearing habitat can be maintained with proper grazing management. Grazing management plans designed to meet these specific habitat requirements should include proper livestock numbers, grazing intensity, frequency, duration and timing, and contingency plans to address varying disturbance events, such as drought and wildfire. Areas with dense grass and few wildflowers could be grazed more intensively (i.e., higher stocking rate) to decrease grass cover. Areas with little nesting cover would benefit from lower stocking rates to ensure residual grass cover during the spring nesting season. Grazing systems that create uniformity of grass structure are detrimental to the birds which require various habitat types throughout the year. Lesser prairie-chickens tend to fly low over vegetation and incur

high mortality from collisions with fences, therefore, unnecessary fences should be removed, and any remaining fences marked with fence markers ([http://www.suttoncenter.org/pages/fence\\_marking\\_instructions](http://www.suttoncenter.org/pages/fence_marking_instructions)).

The habitat management techniques used on individual farms or ranches will vary and should be integrated into a comprehensive

habitat management or conservation plan. While it is occasionally necessary to control invasive weeds, the presence of native broad-leafed wildflowers is highly desirable. Site-specific information relative to practices, grazing, and habitat management can be obtained by contacting your local USDA NRCS field office at <http://offices.sc.egov.usda.gov/locator/app> for assistance.



*Ideal lesser prairie-chicken habitat mosaic of tall grasses and shrubs managed through chemical brush management in New Mexico. Photo courtesy of NRCS.*



*Fence line effect demonstrating good lesser prairie-chicken habitat on left versus poor lesser prairie-chicken habitat on the right, Hemphill County, TX. Photo by Heather Whitlaw, U.S. Fish and Wildlife Service.*

## *Helping People Help the Land*

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) works with landowners through conservation planning and assistance to benefit the soil, water, air, plants, and animals for productive lands and healthy ecosystems. To find out more about NRCS, please visit: [www.nrcs.usda.gov](http://www.nrcs.usda.gov).

The NRCS Plant Materials Program selects conservation plants and develops innovative planting technology to solve the Nation's most important resource concerns. Plants are critical to holding productive soils in place, keeping nutrients from entering streams, and improving habitat for wildlife. To find out more about the Plant Materials Program and the technical information available, please visit: [www.plant-materials.nrcs.usda.gov](http://www.plant-materials.nrcs.usda.gov).

More information about the lesser prairie-chicken and its habitat can be found by visiting the following:

- USDA NRCS Plants Database [plants.usda.gov](http://plants.usda.gov)
- U.S. Fish and Wildlife Service [www.fws.gov](http://www.fws.gov)
- Colorado Division of Wildlife [wildlife.state.co.us](http://wildlife.state.co.us)
- Kansas Department of Wildlife and Parks [www.kdwp.state.ks.us](http://www.kdwp.state.ks.us)
- New Mexico Department of Game and Fish [www.wildlife.state.nm.us](http://www.wildlife.state.nm.us)
- Oklahoma Department of Wildlife Conservation [www.wildlifedepartment.com](http://www.wildlifedepartment.com)
- Texas Parks and Wildlife Department [www.tpwd.state.tx.us](http://www.tpwd.state.tx.us)

*Photo credits from cover page*

*Top: Lesser prairie-chicken habitat in Texas. Photo by Heather Whitlaw, U.S. Fish & Wildlife Service.*

*Lower Left: Lesser prairie-chicken on booming grounds in Texas. By Jon McRoberts, Texas Tech University.*