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Habitat Management for Oklahoma's Prairie Chickens

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The greater prairie chicken (*Tympanuchus cupido*) and the lesser prairie chicken (*Tympanuchus pallidicinctus*) both inhabit the rangelands of northern Oklahoma. The greater prairie chicken is found in the northcentral and northeastern part of the state, and the lesser prairie chicken inhabits the northwestern quarter.

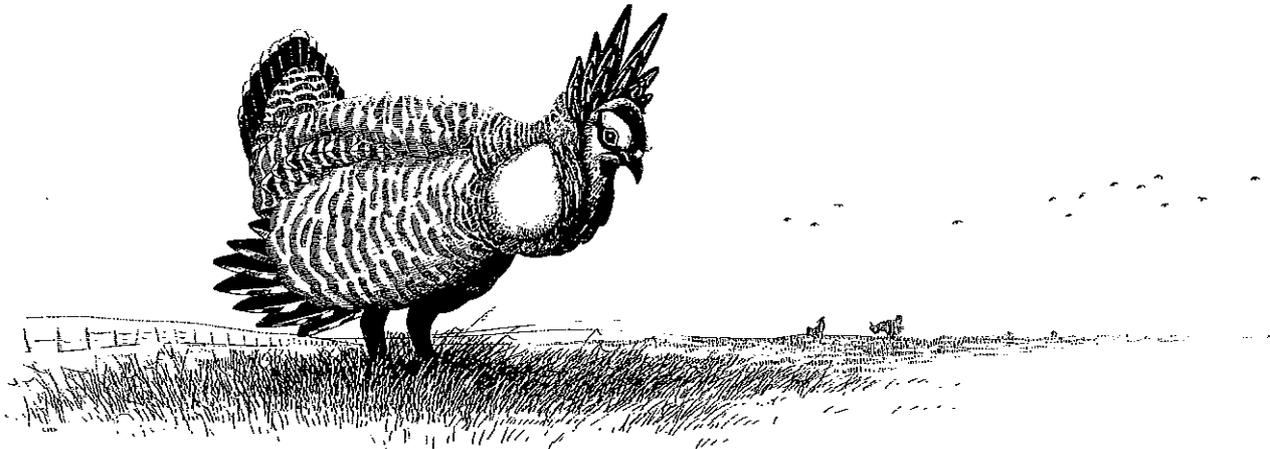
Rangeland is a type of land, not a land use. Rangeland is land that is dominated by grasses, forbs, and shrubs. Rangeland that is dominated by grasses and forbs is called prairie. Prairie is an important type of rangeland in Oklahoma, especially for prairie chickens. Both prairie chicken species occur on rangeland that is used for grazing cattle. Because most of Oklahoma's rangeland is privately owned, population levels of prairie chickens are directly effected by the grazing management used by ranchers.

Programs of managing rangeland for cow-calf and stocker calf grazing programs will favor prairie chicken populations if light to moderate stocking rates are used. Grazing management that maintains rangeland in mid to late seral stages (in

good to excellent condition dominated by tallgrasses) is mutually beneficial to prairie chickens and cattle as well as other large herbivores, such as bison and elk. Since the landrun and settlement by Europeans in the 1890s, high quality prairie chicken habitat has been lost due to the cessation of widespread prairie fires and cumulative effects of many years of overstocking by cattle, which has caused changes in species composition and structure of the prairie plant community. Overstocking eventually reduces desirable tallgrasses that dominate the latter seral stages and results in dominance by shorter grasses and forbs.

Life History of Prairie Chickens

Current populations of the greater prairie chicken are distributed from southern Manitoba to western Missouri and Oklahoma; isolated populations occur in Michigan, Wisconsin, Illinois, and Texas. Adult greater prairie chickens are 16 to 18 inches long, slightly longer than adult lesser prairie chickens, which average 15 to 16 inches in length. Both species display a feather pattern that consists of crosswise bars of brown, buff, blackish and white colorations. Lesser prairie chickens can be identified by a brown-banded feather pattern on the back and rump in contrast to the darker, blackish pattern of the greater prairie chicken. Elongated feathers termed "pinnae", which are erected during sexual displays, are located on the back of the neck of both species. Underneath the pinnae are featherless areas of skin called



"gular sacs." These sacs are also used during sexual display and their colors, yellow-orange on the greater and reddish on the lesser, aid in species identification. In addition to these reproductive adaptations, both species have conspicuous yellow-orange combs above the eyes which are also secondary sex characteristics most prominent on males.

Sexual displays of male prairie chickens are conducted on traditional "booming" or display grounds. These are typically located on elevated, open areas where grassland vegetation is sparse. Males concentrate on these communal booming grounds and re-establish territories or try to acquire new ones as is the case for young birds. The most advantageous territories are in the central region of the booming ground and are usually held by dominant males. Peripheral territories are established by young males. Most females visiting the booming ground mate with dominant males that hold central territories.

The conspicuous "booming" display of the male serves to advertise his territory. In this display the male erects the feathered pinnae above his head, inflates the gular sacs on the sides of his neck, drops his wings, stamps his feet, and calls. Short vertical flights called "flutter-jumps" are performed often in conjunction with booming. When in the presence of a female, the male may perform a "nuptial bow" with wings spread, pinnae erect, and bill lowered to the ground. The hen usually visits two or three different booming grounds before she finally mates. After mating, the hen selects a nest site to lay and incubate eggs.

Normal clutch size of the prairie chicken is 12 to 14 eggs. The incubation period is 23 to 26 days, and the nest usually is deserted 24 hours after the last chick has hatched. The brood usually remains with the hen six to eight weeks, after which the family brood disperses. Cocks take no part in brood-rearing activities. Re-organization of mixed-sex flocks begins shortly after the brood disperses.

Habitat Requirements

General deterioration in range condition has resulted in a loss of the prairie chicken's nesting and chick-rearing habitat and a decline in their population statewide. Recommendations for management systems are based on reversing these habitat losses. The key to improving prairie chicken populations lie in maintaining portions of rangeland in native tallgrasses, which are indicators of high seral stage and excellent range condition in most of Oklahoma. Good nesting habitat is dominated by the tallgrasses including eastern gama grass, big and little bluestem, indiagrass, and switchgrass. These should average at least 20 inches tall during the dormant season so as to completely conceal a nesting hen and foraging chicks. Maintenance and establishment of tallgrass prairie rangeland is a basic requirement for managing and increasing their populations.

Habitat preferences of the greater and lesser prairie chicken influence the type of management to be considered. Preferred habitat of the greater prairie chicken is the tallgrass

prairie of northeastern and northcentral Oklahoma. The lesser prairie chicken prefers three commonly interspersed rangeland vegetation types found in northwestern Oklahoma: sand shinnery oak, sand sagebrush, and mixed-grass rangelands. An interspersed of at least two of these vegetation types is important to the lesser prairie chicken. Open stands rather than large blocks of continuous sand shinnery oak are necessary. Preferred habitat of the lesser prairie chicken is shrub-grassland of low to moderate density where most shrubs are less than 40 inches tall. Proper mixture of grass and brush helps to achieve savannah-type vegetation most often used by this species. Both lesser and greater prairie chickens select last year's grass growth for nest sites.

Land Management Area

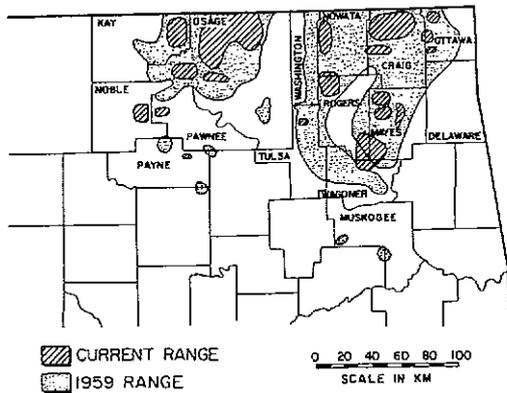
The recommended minimum land management unit is usually two square miles (1,280 acres), but management efforts on smaller areas are encouraged. The smallest blocks of high quality grassland habitat appear to be 160 acres with a minimum width of 0.5 miles. Management areas do not have to be contiguous.

Habitat Management

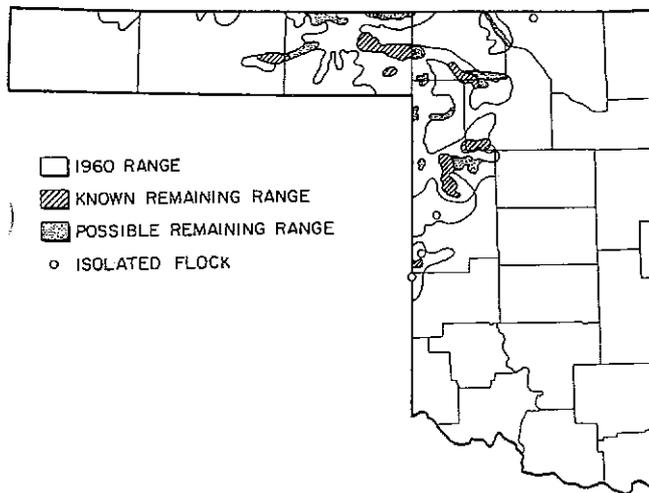
High quality nesting and chick-rearing habitat on the management unit is the primary key to prairie chicken management. A multiple-use land management system can improve prairie chicken habitat on rangelands that are also managed for cattle grazing.

Moderate grazing by cattle or other large herbivores can benefit prairie chickens. Cattle grazing within a management unit affects prairie chicken habitat through the amount and kind of forage removed by grazing and grazing patterns. The characteristically uneven grazing patterns of cattle under season-long and year-long continuous grazing create conditions favoring the prairie chicken populations, provided high quality grasslands are present and stocking rate is light to moderate. Light to moderate grazing pressure on a rotational schedule can result in a beneficial mosaic of vegetation within the unit. Undergrazed areas of taller, denser grasses can be utilized for roosting, nesting, and loafing by the chickens. Chick-rearing habitat is improved in areas of moderate grazing that results in a mosaic of lightly and heavily grazed areas. Grasslands subjected to grazing produce more forbs and insects, which are needed by chicks during summer.

Maximum prairie chicken populations can be maintained on management units through implementation of an intensive habitat management system. Under an intensive management system, portions of the unit should be protected from heavy grazing, burning, and haying to provide high quality nesting and winter cover. If the unit is in a low seral stage (i.e., poor to fair range condition), habitat may be improved by deferment of grazing and prescribed fire.



Greater prairie chicken population distribution in Oklahoma.



Distribution of the lesser prairie chicken in western Oklahoma.

Prescribed burning at three to five year intervals combined with moderate grazing is the preferred method of maintaining rangeland in a late seral stage (i.e., good to excellent range condition). But rangeland in a late seral stage does not produce an adequate forb component to meet dormant season food requirements of prairie chickens. Forbs can be increased by summer or fall burns. Burning 20 to 30 percent of the management unit each spring will allow the entire area to be burned within the desired three to five year interval. The seasonal timing of the burn is critical both in terms of plant response and effect on the prairie chickens. Summer, fall, and winter burns increase forbs and decrease disturbance of nest site selection, provided last years growth

is left in some parts of the home range for nesting. Late winter and early spring burns maintain an abundance of forbs. Late winter and early spring burns will decrease woody species such as eastern redcedar, oaks, and sumac if used on a two-year burning cycle for several years. Summer and fall fires give greater control of woody species than winter and spring fires because of their intensity and timing in relation to carbohydrate storage in the vegetation. Burning improves brood habitat by removing last year's growth and opening up the herbaceous canopy. New succulent growth of both grasses and forbs attract insects which are necessary for high protein diet that is required for chicks.

Food and Cover

Prairie chickens can survive winter storms if food and cover are available. They rarely die of starvation. Some populations may benefit from sorghum grain food plots scattered throughout the management area; however, prairie chicken populations were abundant long before there were sorghum or other grain crops available for food.

Historically, food for prairie chickens was supplied by native forbs that occurred in abundance on areas where summer, fall, or winter fires burned, or spring fires in combination with intensive grazing by bison, elk, deer, and pronghorn occurred. Today, these areas would be considered "weed patches" by cattle producers. These burned and heavily grazed areas represent an early seral stage (i.e., abundant forbs and annual grasses) that are part of plant succession to climax prairie. Thus, it is important to recognize that all of the various plant communities leading up to climax grasses are an integral part of the prairie ecosystem and very important to prairie chickens.

Prairie chickens eat green leafy material throughout the year. During winter, seed from native and cultivated plants, fruits, and flowers are consumed, but insects are a major portion of the diet in summer. Water requirements are met by metabolic water and the consumption of succulent vegetation, insects, and dew. The importance of food plots to prairie chicken populations depends upon the seral stage of the rangeland, the surrounding land-use patterns, the severity of the winter, and the number of birds in the population. Food plots smaller than 10 acres probably have little effect on survival of prairie chickens in winter. Under good rangeland management, cultivated food plots are seldom unnecessary.

Cultivated Lands

Croplands within a management area can benefit prairie chickens under certain conditions. Maximum benefits to prairie chickens occur when the amount of land under cultivation comprises less than 40 percent of the total area. The most suitable combination for chickens is 10 to 25 percent cropland. Cropland in excess of 40 percent of the management area is detrimental to prairie chicken populations.

Summer or fall prescribed fires can be used to increase the native forbs which provide an excellent food source and make croplands or food plots unnecessary.

Booming Ground Sites

Prairie chickens use the same booming grounds year after year. Site locality is so strong that even when a site has been planted with wheat, some prairie chickens will return. Short vegetation is preferred on small booming grounds. Mowing booming grounds in late autumn usually attracts prairie chickens. Burning booming ground sites in autumn or early spring is highly desirable. Intensive grazing by cattle or other large herbivores on the booming ground will also improve its attractiveness.

Specific Management for the Lesser Prairie Chicken in Northwestern Oklahoma

1. Plant food plots of alfalfa, milo, rye, soybean, and wheat in areas of shinnery oak, sand sagebrush, and mixed grass rangelands only if cropland or patches of native annual forbs are unavailable. Plots should be from 10 to 15 acres in size, oblong in shape, and planted on the contour. Exclude domestic livestock.
2. For managing cropland within the prairie chickens home range use minimum or no-till farming techniques to leave crop residue on the soil surface for food availability.
3. Maintain three to five acre patches of sand shinnery oak and sand sagebrush in mosaic patterns to provide food and cover.
4. Burning can be conducted from late winter through early spring every three to four years to increase green forage and insect availability in the spring and summer. Summer or fall burns can be used to increase native annual forbs on relatively small areas (10 to 15 acres for a winter food source).
5. Livestock grazing should be light to maintain good nesting habitat. Overuse of native grass should be avoided except to provide patches of native annual forbs.

Management for the Greater Prairie Chicken North Central and Northeastern Oklahoma

1. Plant food plots of alfalfa, milo, rye, soybean, and wheat in mixed grass and tallgrass rangelands only if cropland or patches of annual native forbs are unavailable. Plots should be from 10 to 15 acres, oblong in shape, and planted on the contour. Exclude livestock.
2. For managing cropland within the prairie chickens home range use minimum or no-till farming techniques to leave crop residue on the soil surface for food availability.
3. Habitat should be managed so that 90 percent of the standing vegetation is distributed below 18 inches. The vertical aspect of the vegetation should be dense up to that height, interspersed with less dense grasses for brood habitat.
4. Burning can be conducted from late winter through early spring every three to four years on a rotational basis to increase green forage and insect availability in the spring and summer. For improving food production (i.e., forbs), summer or fall burns should be initiated on the same rotation where cropland is not available to provide winter food (10 to 15 acres).
5. Livestock grazing should be light to maintain good nesting habitat. Overuse of native grass should be avoided except to provide patches of native annual forbs (10 to 15 acres).

Summary

Oklahoma is one of the few states that still have populations of both lesser and greater prairie chickens. However, total numbers of these birds have decreased during recent times. To survive and reproduce, prairie chickens need rangeland in good to excellent condition to survive. Populations of prairie chickens can be maintained on rangelands where cattle are grazed, but grazing needs to be regulated and closely monitored. Oklahoma's prairie chickens occur almost exclusively on private lands and, thus, are dependent on the wise stewardship of individual landowners.

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