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Lesser prairie-chicken

The lesser prairie-chicken (*Tympanuchus pallidicinctus*; LPC) breeds in Texas, New Mexico, Oklahoma, Kansas and Colorado. The occupied range of the LPC is estimated to have decreased 92% from its original range in the late 1800s, due to conversion of prairies to farmland and overgrazing of rangelands (Taylor and Guthery 1980). Population estimates in the early 1990s were approximately 50,000 birds overall with 1,200 to 1,800 birds in Colorado (Davies 1992). The LPC is listed as a threatened species by the state of Colorado; Kansas manages it as a game species. In 1998, the USFWS determined that listing the species as federally threatened was warranted but precluded by other higher listing priorities, so it is currently a candidate for listing under the Endangered Species Act. The global ranking for LPC by NatureServe is G3, with a state rank of S2 in both Kansas and Colorado. Details concerning the species' natural history and conservation threats are summarized by Mote, et al. (1999). Current standards and guidelines regarding LPCs in the Land and Resource Management Plan (LRMP) for the Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands (PSICC) (USDA-FS 1984) are discussed by Ryke (1995).

LPCs occur south of the Cimarron River on the Cimarron and in the southeastern portions of the Comanche. Surveys conducted on the Cimarron during 1988 - 1997 identified 44 leks (locations where males congregate during the breeding season) and indicate that all NFS land south of the Cimarron River (64,387 acres total, of which 61,638 acres is sandsage prairie) is occupied by LPC. Suitable habitat for LPC is not present north of the Cimarron River or along the river corridor. On the Comanche, surveys conducted during 1984 - 2005 identified 53 leks on or immediately adjacent to NFS lands. Studies on the Comanche determined that the maximum area of sandsage prairie used by LPC attending a single lek was approximately 24 mi² (61.9 km²), which corresponds to a 2.75 mile (4.4 km) radius around the lek (Giesen 1991). Using this radius around all documented leks on the Comanche, the estimated area occupied by LPC during the past 20 years is 65,168 acres, of which 59,167 acres are sandsage prairie (Table 1). On both Grasslands, year-round LPC habitat consists of sandsage prairie (sandy plains, choppy sand, deep sand, gravelly breaks, dry creek beds and sandy bottomland range sites) dominated by sand sagebrush (*Artemisia filifolia*) and mid-grass prairie.

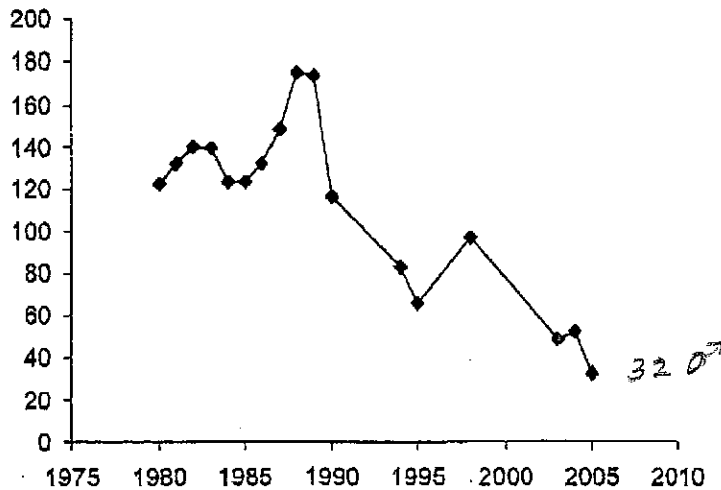
LPC use several different types of habitat during the year, which correspond to different stages in their reproductive cycle. During the mating season, males congregate in areas termed leks. LPC leks are typically on elevated, open areas where vegetation is short, visibility is good, and calls (gobbling) can be heard for long distances. After mating on leks, hens select a nest site to lay and incubate the eggs, usually within a mile of the lek, but occasionally up to 2 or more miles distant. Nesting habitat consists of sandsage prairie with tall grass and forb cover, and may be interspersed with patches of shorter vegetation. Patches with native grasses 18-20 inches tall are important to completely conceal nesting hens and provide thermal cover (Bidwell et al. 2002). Adequate vegetative cover to provide suitable nesting habitat can be a major limiting factor for LPC populations (Mote et al. 1999). Brood rearing and foraging habitat is provided by areas with a mosaic of grasses and forbs; areas that are re-growing following recent grazing or fire often produce more food (seeds and insects) than areas that are ungrazed or heavily grazed. For further discussion of LPC habitat needs, see Appendix J.

Table 1. Acres of Sand-Sage Prairie and Other Habitat (Summarized by Range Site) within the Estimated Occupied Range of LPCs on the Comanche and Cimarron National Grasslands.

Range Site	Comanche Acres	Cimarron Acres
Sandsage Prairie		
Sandy plains	50,455	17,130
Deep sand	4,828	30,122
Sandy bottomland	766	858
Choppy sand	40	13,330
Gravelly breaks	2,759	0
Dry creek beds	319	197
Total	59,167	61,638
Other Range Sites		
Loamy plains	5,181	2,722
Loamy bottomland	0	7
Limy uplands	0	20
Sandstone breaks	821	0
Total Other	6,002	2,749

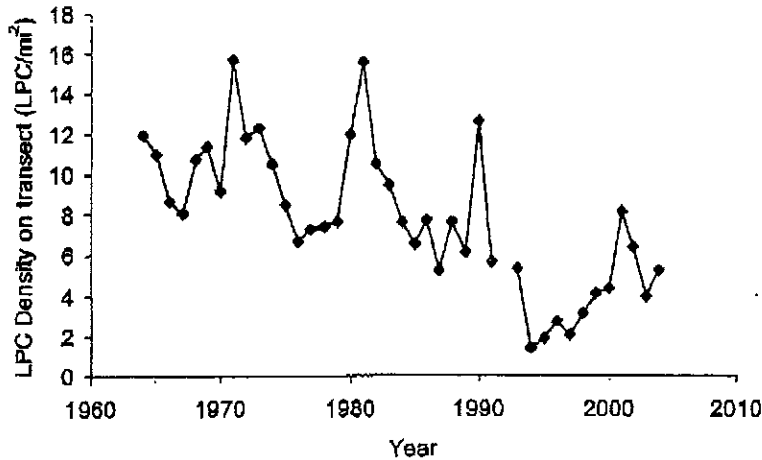
On the Comanche, lek censuses conducted during 1980 – 2005 show a sharp decline in the population after 1989 (Figure 1). The total LPC population estimate on the Comanche was highest in 1988 with 348 birds and the lowest in 2005 with 64 birds. The total population estimate in 2005 was only 25% of the mean population size documented during the 1980s.

Figure 1. Total number of male LPCs counted via lek censuses on the Comanche NG during 1980 – 2004.



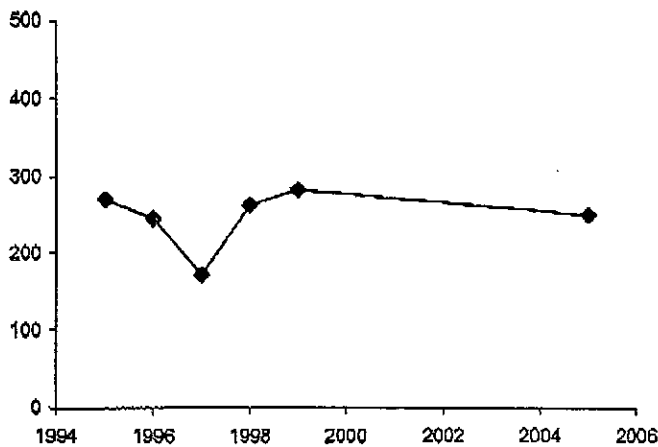
On the Cimarron, counts conducted along the Kansas Parks and Wildlife LPC survey route showed a decline from a mean of 10.1 birds/mi² during the first 15 years of the survey (1964-1978) to an average of only 4.9 birds/mi² over the past 15 years (1989-2004). However, the KDWP surveys also indicate the population has been recovering in recent years (Figure 2; 1993 – 2004).

Figure 2. Long-term trend in number of LPC counted along the KDPW 10-mile long survey route on the Cimarron NG (expressed as LPC/mi² assuming the transect surveys a 20 mi² area).



More intensive LPC surveys conducted on the Cimarron during 1995 – 1999 and 2005 involved repeated counts of LPC on all known leks. The lek-census method showed a stable LPC population during 1995 – 1999 and provided total population estimates for the Cimarron NG varying annually from 173 – 283 LPC (1.8 – 2.9 birds/mi²; Smith and Smith 1999). This survey method was repeated in 2005 and gave a total population estimate of 249 birds, indicating a stable population on the Cimarron since 1995.

Figure 3. LPC population trend on the Cimarron 1995 – 2005 based on lek censuses.



Primary threats to the LPC and their habitat include overgrazing by livestock, high predation rates by raptors and mammals, and loss of habitat to agriculture. Studies on the Grasslands identified nesting habitat as one limiting factor for LPC (Giesen 1994, Elson 2000). Grazing management affects the quality of nesting habitat. The LPC Interstate

Working Group recommends that livestock be managed in sandsage prairie to provide pastures with a mean VOM of 4 inches or greater and at least 10% of all VOM observations being 12 inches or greater (Mote, et al. 1999) and the same standard has been recommended for the Comanche (Ryke 1995). More recent studies in southwestern Kansas show brood survivorship can be even more limiting to LPC populations than nesting success (Pitman 2003, Hagen 2003). Habitat management that provides patches of abundant forb cover appears to be critical for brood survival in dry years (Rogers 2003). Overall, heterogeneous grazing pressure appears to benefit LPC habitat, while uniform grazing pressure is detrimental. The Oklahoma Cooperative Extension Service's guide to "Ecology and Management of the Lesser Prairie-Chicken" recommends "Do not install extensive electric or other fencing for short duration grazing that creates uniform grazing" (Bidwell, et al. 2002).

Recent studies in Oklahoma found that where fencing constructed for livestock management occurs at high densities, these fences can be a threat to LPC population viability, causing 32% of all documented mortalities in the study area (Wolfe et al. 2003; Patten et al. 2005). They concluded that within their study area, collisions with fences are a major mortality factor, kill more hens than cocks, and appear to have the greatest impact during nesting season. In areas managed for viable LPC populations, they recommended removing unnecessary fencing and discouraged the use of cross fencing, especially cell-type grazing systems (Wolfe, et al. 2003, page 18; Patten et al. 2004).

Several studies have also documented high predation rates on LPC hens by raptors, coyotes and other mammals during the nesting season (Giesen 1994, Elson 2000, Pitman 2003, Wolfe et al. 2003). Increased abundance of these predators, possibly associated with habitats provided by agriculture, grazing management, and tree plantings on private lands within the Planning Area, is another factor affecting LPC populations.

Loss of habitat to agriculture does not affect LPC on NFS lands, but is ongoing within the Planning Area. Land exchanges that seek to acquire LPC habitat on the Grasslands can help mitigate this impact. The Lesser Prairie-Chicken Recovery Plan for the State of Colorado specifically calls on CDOW to "Work with the USFS to acquire additional lesser prairie-chicken habitat in the Comanche Grasslands by purchase of lands or trading of USFS lands for private lands" (Davies 1992, page 16). In addition, implementation of vegetation management practices that increase cover of forbs on CRP lands within the Planning Area may help mitigate the loss of sandsage prairie to cropland (Bidwell et al. 2002). Recent studies found that declining LPC populations were associated with landscapes containing >10% cropland, while stable LPC populations occurred in landscapes with <5% cropland (Fuhlendorf, et al. 2002, Woodward, et al. 2001).