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GRASSLAND BIRD MANAGEMENT ON PUBLIC LANDS IN THE UNITED STATES: AN EXAMPLE FROM THE NORTHERN GREAT PLAINS

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INTRODUCTION

Grassland birds have shown steeper, more consistent, and more geographically widespread declines than any other behavioral or ecological guild of North American species (Knopf 1996). This has raised conservation concern for these birds and resulted in an increased emphasis on their management. Within the United States, such management is most easily observed on publicly-owned lands, although public ownership includes only a small fraction of the grassland-dominated landscapes present.

The United States' 20 National Grasslands encompass approximately 1 600 000 ha in 12 western states. Herein I describe how four of these (Cedar River, Grand River, Little Missouri, and Sheyenne) National Grasslands are managed for grassland bird conservation.

STUDY AREA

The Dakota Prairie Grasslands (DPG) encompasses four national grasslands in the United State's portion of the Northern Great Plains (Fig. 1). The 445 350 ha Little Missouri National Grassland in western North Dakota includes two landforms: rolling prairie and badlands. Both landforms are dominated by northern mixed-grass prairie vegetation, particularly western wheatgrass (*Pascopyron smithii*), green needlegrass (*Nasella viridula),* needle and thread (*Stipa comata*), and blue grama (*Bouteloua gracilis*). Similar vegetation is found on the rolling prairie landforms that characterize the 2753 ha Cedar River National Grassland in south-central North Dakota and 61 133 ha Grand River National Grassland in northwestern South Dakota. The 28 340 ha Sheyenne National Grassland in southeastern North Dakota includes deltaic plains, hummock and swale, river valley, and choppy sandhill landforms. The non-forested portions are dominated by northern tallgrass prairie vegetation, particularly big bluestem (*Andropogon geradii*), switch grass (*Panicum virgatum*), prairie dropseed (*Sporobolus heterolepis*), and porcupine needlegrass (*Stipa spartea*). The majority of the Sheyenne National Grassland's northern tallgrass prairie also contains exotic forbs, particularly leafy spurge (*Euphorbia esula*) and exotic grasses, especially Kentucky bluegrass (*Poa pratensis*). The DPG supports approximately 600 active oil wells and 468 000 animal unit months each year. These represent both the largest single oil program and the largest single range program on National Forest System lands in the United States.

METHODS

In August 2007, the DPG completed an 11 year-long public-participation process to develop a land and resource management plan (LRMP). The purpose of the LRMP was to provide guidance on how the DPG would be managed for multiple uses, as required by the National Forest Management Act of 1976. I reviewed this document for provisions pertinent to grassland bird conservation.

The DPG's ecologists, botanists, and biologists form a self-managing group (hereafter the "ecology team"). I reviewed the DPG's ecology team accomplishments from 1999 to 2007 for projects pertinent to grassland bird conservation.

RESULTS

The DPG's LRMP contained extensive general direction on vegetative structure and composition, as well as extensive specific direction on prairie grouse, black-tailed prairie dog (*Cynomys ludovicianus*), and raptor management. Specifically, the LRMP directed that

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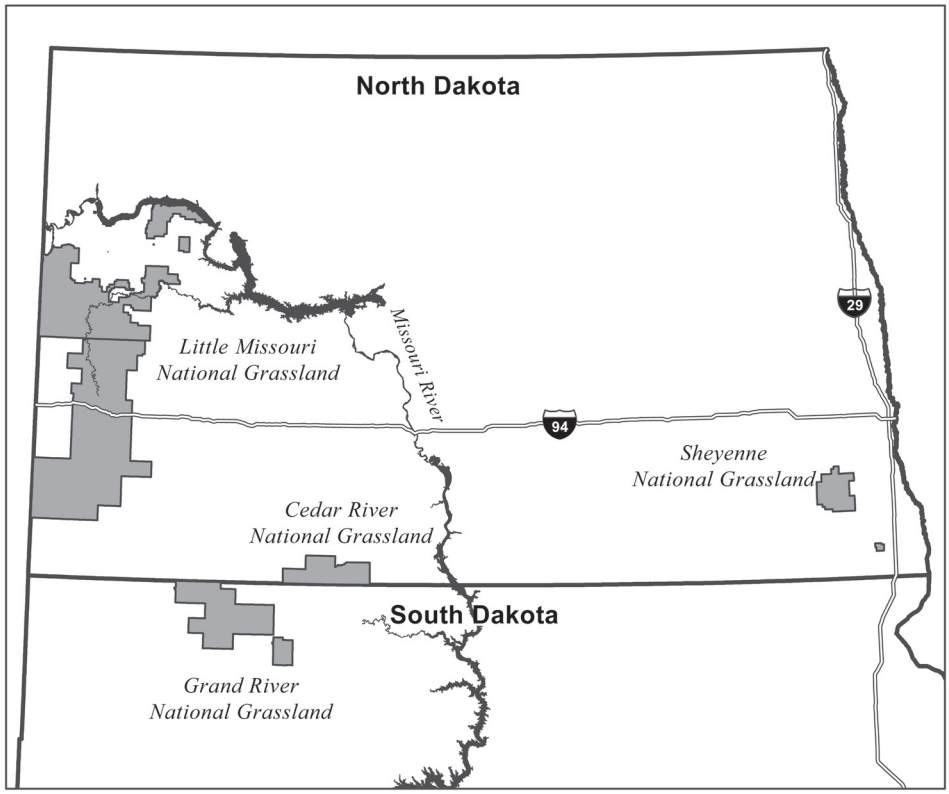

FIGURE 1. The Dakota Prairie Grasslands (DPG) encompasses four national grasslands in the United State's portion of the Northern Great Plains.

the northern mixed-grass prairie habitats be managed to provide 10–20% low structure vegetation, 50–70% moderate structure vegetation, and 20–30% high structure vegetation. Vegetative structure categories were defined by visual obstruction readings. Furthermore, these habitats were to be managed to provide 10–15% early seral vegetation, 65–75% mid seral vegetation, and 15–20% late seral vegetation. Seral categories were defined by dominant and codominant vegetative species, based on either ocular inspections of vegetative canopy or point-frame measurements of basal canopy cover. Similar, but not identical, objectives were listed for northern tallgrass prairie habitats. The desired amount of each vegetative structural and seral category had been determined during the public-participation process, and included consideration of biological, social, and economic tradeoffs.

Management direction regarding prairie grouse focused primarily on providing adequate residual nesting cover for the three species present: Sharp-tailed Grouse (*Tympanuchus phasianellus*), Greater Prairie-Chicken (*Tympanuchus cupido*), and Greater Sage-Grouse (*Centrocercus urophasianus*). Management direction regarding black-tailed prairie dogs focused on preventing unwanted colonization of adjacent landownerships, while still providing for an overall increase in prairie dog populations. This was intended to benefit Burrowing Owls (*Athene cunicularia*) and other associated species. Raptor management provisions emphasized reducing anthropogenic disturbance, especially those associated with energy development, during the nesting season. The LRMP also contained management provisions to reduce energy development disturbance to prairie grouse. For example, no surface use can occur between March 1 through June 15 within a 1.2 km line of sight of a Sharp-tailed Grouse display ground. Furthermore, no surface occupancy or use is allowed within 0.4 km of such display grounds at any time of year.

The ecology team's program from 1999–2007 had conservation education, habitat management, and inventory and monitoring components.

Conservation education was focused on informing the public as to the importance of grasslands, and to increase awareness of grassland birds. This was done by publishing a series of annotated bird checklists, writing newspaper articles, leading nature walks, and giving a variety of speeches to interested groups. Habitat management projects focused on removing invasive trees on northern tallgrass prairie and revising livestock grazing plans to provide increased vegetative structure diversity. Inventory and monitoring projects focused on annual monitoring of prairie grouse populations and habitat, and facilitating grassland bird research performed by a variety of cooperators.

DISCUSSION

Several authors have suggested that management for grassland birds should focus on increasing vegetative structure diversity because different bird species respond to livestock grazing differently (e.g. Fuhlendorf 2006, Knopf 1996, Saab et al. 1995). Others have pointed out the importance of diversifying vegetative seral composition to benefit grassland birds, for similar reasons (e.g. Fritcher et al. 2004). Numerous authors have also recommended increasing black-tailed prairie dog populations to benefit associated bird species (e.g. Oldendorff 1993). These recommendations have coincided with a marked increase in public interest in grassland bird conservation in the United States during recent decades. Even with this scientific and popular support, however, public land managers have found effectively implementing such policies both difficult and controversial. In particular, changes in livestock grazing levels to facilitate either increased vegetative structure diversity or increased prairie dog populations has engendered high levels of local opposition. This in turn has resulted in extensive public, agency, and departmental reviews, thus explaining why the process to develop the DPG's LRMP took as long as it did.

Because the DPG's LRMP was only recently finalized, few projects have yet been completed under its guidance. A thorough evaluation of the new LRMP's impacts on grassland birds, therefore, is not yet possible. There are some early indications, however, that grassland bird habitat may well benefit. For example, the portions of the LRMP related to black-tailed prairie dogs went into effect in July 2002. At that time the DPG contained an estimated 2286 ha of active black-tailed prairie dog colonies, based on field mapping of each colony's outermost perimeter of active burrows. Active colonies encompassed 2839 ha in 2005, and 3778 ha in 2008. The increased availability of black-tailed prairie dogs and black-tailed prairie dog burrows to golden eagles (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and burrowing owls should improve prey and/or nest site availability for these species.

Another indication of how the DPG's LRMP might improve grassland bird habitat is provided by the increased availability of high structure vegetation observed on a portion of the Grand River National Grassland. Because this unit opted out of some agency and departmental reviews, the portion of the LRMP pertaining to livestock grazing and vegetative structure objectives went into effect there in 2002. Since the mid-1990s, intermittent monitoring using the visual obstruction reading method had indicated that 0 to 10% of that landscape retained high structure vegetation in the post-grazing season. Based on these and similar data, a decision was made in 2005 to reduce livestock stocking densities approximately 6% to facilitate achievement of vegetative structure objectives (i.e. retention of 20–30% high structure vegetation during the post-grazing season). That decision was implemented in spring 2007. Post-grazing season monitoring in autumn 2007 indicated that approximately 15% of the landscape retained high structure vegetation. Similar monitoring in autumn 2008 indicated that about 19% of the landscape retained high structure vegetation. Both years, however, coincided with above-normal precipitation, so further monitoring is necessary to more fully evaluate the impact that the DPG's LRMP will have on high structure vegetation.

Continued monitoring will also be necessary to evaluate grassland bird response to any changes in habitat quality resulting from the DPG's LRMP. Current or recently completed monitoring projects regarding grassland birds include: Golden Eagle ecology, Burrowing Owl ecology, Ferruginous Hawk international movements, Swainson's Hawk (*Buteo swainsoni*) ecology and international movements, Greater Sage-grouse (*Centrocercus urophasianus*) habitat use, sagebrush bird community, Sprague's Pipit (*Anthus spragueii*) and Baird's Sparrow (*Ammodramus bairdii*) response to grazing, Sharp-tailed Grouse response to energy development, and Sharp-tailed Grouse response to grazing. Permanent plots and routes have also been established to monitor grassland bird populations during the breeding season, long-term.

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