Observations of Avian Nesting Activity in Burned and Non-burned Weeping Lovegrass CRP

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ABSTRACT

Weeping lovegrass (*Eragrostis curvula*) has been established on over one million acres of Conservation Reserve Program (CRP) lands in the Southern High Plains of Texas. Weeping lovegrass has been suggested to have minimal value as wildlife habitat, but little research is available to support this claim. We conducted nest searches during June and July 1996 and June 1997 to determine nesting activity in burned and non-burned weeping lovegrass CRP. Ten nests of three different species were located, nine in non-burned areas and one in burned areas. Although few nests were located, this study documents use of weeping lovegrass as nesting habitat by Cassin's sparrow, a species declining throughout its range, during drought. Prescribed burning did not improve weeping lovegrass for nesting habitat for at least one year after burning due to reduced cover.

KEYWORDS: *Aimophila cassinii*, Conservation Reserve Program, fire, prescribed burning

Populations of many grassland nesting birds have recently declined and habitat loss has been considered the major cause (Johnson and Schwartz, 1993; Peterjohn et al., 1995). The CRP was initiated in the 1985 Food Security Act to protect highly erodible lands, reduce crop surpluses, improve water quality, and enhance wildlife habitat (Bartlett, 1988). Land seeded to native grasses in CRP benefitted grassland nesting birds by providing suitable nesting and brood-rearing habitat (Berthelsen and Smith, 1995; Johnson and Schwartz, 1993). In addition to native grasses and other exotics, more than one million acres of weeping lovegrass were seeded during CRP on the Southern High Plains of Texas. Although weeping lovegrass is considered poor wildlife habitat, little research has been conducted to determine its value as wildlife habitat. Prescribed burning is commonly applied to weeping lovegrass to improve livestock production (Dahl and Cotter, 1984). However, avian nesting activity in weeping lovegrass and the impacts of prescribed burning on nesting activity is unclear. Our objective was to describe avian nesting activity in burned and non-burned weeping lovegrass CRP in the Southern High Plains of Texas.

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Table 1. Number of nests located in non-burned and burned weeping lovegrass CRP in June and July 1996 and July 1997. The nest located in a burned area is in parentheses.

	Nests Located			
Sampling Date	Cassin's sparrow	Mourning dove	Total	
	---number---			
4 June 1996	3	1	0	4
25 June 1996	3	0	(1)	4
31 July 1996	0	0	0	0
26 June 1997	1	1	0	2

METHODS

This study was conducted in 1996 and 1997 in central Lynn County, TX. Average annual precipitation is 20 inches, with most precipitation occurring in April, May, September, and October (NOAA, 1996). Annual precipitation in 1996 prior to burning was 57% below the long-term average. After burning, rainfall was 33% below the long-term average for April, May, and June. Precipitation in 1997 was 94% above average from 1 January to 1 June (NOAA, 1997).

The 360 acres of CRP were seeded to weeping lovegrass in 1989, and was divided into 12, 21 acre plots. Six randomly selected plots were burned independently in April 1996 and six non-burned plots were evaluated as controls. During burning, maximum air temperature was 73°F, minimum relative humidity was 26%, average wind speed was 10 mph, and average fine fuel load was 6050 lb/acre. Nesting cover in each plot was characterized by vertical structure, which was measured to the nearest 2-in segment at 25 points within each area using a Robel pole (Robel et al., 1970). Sighting distance to the Robel pole was 13 ft and measurements were read from 3.3 ft above the soil surface. Vertical structure was measured before burning in April 1996, immediately after burning, 3 months after burning (July 1996), and 15 months after burning (July 1997).

Nest searches were conducted on 4 June, 25 June, and 31 July 1996, and 26 June 1997 using a modified flushing rope (Labisky, 1957) and cable-chain device (Higgins et al., 1969). Ralph et al. (1993) indicated this technique is an effective method for estimating nest density in open grassland habitats. The 250 ft rope, with five 2.5 ft lengths of 3/8 in diameter chain attached, was stretched to an effective sampling length of 200 ft between two vehicles. Three spotters walked behind the rope to determine flushing locations of birds, and nests were found by systematically surveying flushing locations. The rope was dragged through the central 10 acres of the plot to avoid potential bias of edges. Nesting species were identified by plumage, song, identification of eggs at the nest, and visual observation of the nests during incubation. Sampling areas on 25 June 1996 and 26 June 1997 provided a comparison for nest densities in 1996 and 1997. In 1997, 5 acres were sampled per plot.

RESULTS AND DISCUSSION

Ten nests of three species, Cassin's sparrow (*Aimophila cassinii*), mourning dove (*Zenaida macroura*), and common nighthawk (*Chordeiles minor*), were located in the study area on four sampling dates (Table 1). All nests were located in non-burned areas, except

Table 2. Vertical structure (in) of non-burned and burned weeping lovegrass CRP prior to burning (April 1996 Pre fire), immediately after burning (April 1996 Post fire), 3 months after burning (July 1996), and 15 months after burning (July 1997).

Sampling Area	Sampling Periods			
	April 1996 (Pre fire)	April 1996 (Post fire)	July 1996	July 1997
	inches			
Non-burned	8.3 ± 0.8	8.3 ± 0.8	8.3 ± 0.8	12.6 ± 0.4
Burned	8.3 ± 0.8	0.4 ± 0.1	2.4 ± 0.4	9.1 ± 0.4

for the common nighthawk on 25 June 1996. Nesting cover, as estimated by vertical structure, was lower on burned areas than on non-burned areas for all post-burn sample periods (Table 2). In 1996, non-burned areas averaged 2.5 times more vertical structure than burned areas, which likely explains the preference for nesting in non-burned rather than burned areas. However, vertical structure on burned areas 15 months after burning was similar to non-burned areas at the initiation of the study.

Conservation Reserve Program grasslands seeded to native grasses have benefitted many grassland nesting bird species (Berthelsen and Smith, 1995; Johnson and Schwartz, 1993). In the Southern High Plains, CRP seeded to native grasses had Cassin's sparrow nest densities of at least 3 nests/acre (Berthelsen and Smith, 1995). In contrast, weeping lovegrass CRP in our study had one Cassin's sparrow nest to every 60 acres, which was consistent during a drought year as well as a wet year. Several species such as the grasshopper sparrow (*Ammodramus savannarum*) and western meadowlark (*Sturnella neglecta*) that commonly nest sympatrically with Cassin's sparrow in native grass stands, in roadside ditches (Bock and Scharf, 1994), and in CRP seeded to native grasses (Berthelsen and Smith, 1995), were absent in CRP seeded to weeping lovegrass. However, this CRP grassland was bordered by cotton (*Gossypium hirsutum*) on three sides, which provided minimal nesting habitat for grassland birds. Aside from about 700 acres of adjacent CRP, the nearest perennial grassland was more than 3 miles away, which may help explain the low nest density. Although few nests were found, this study documents use of weeping lovegrass as avian nesting habitat during a drought, and Cassin's sparrow nesting in late June, later than is reported for this species in the Southern High Plains. Additionally, Cassin's sparrow males used marestail (*Conyza canadensis*) and sunflowers (*Helianthus* spp.) for perching following breeding display flights in the open grassland habitat since no woody plants were available.

Management practices such as prescribed burning do not apparently improve weeping lovegrass for avian nesting habitat in the short term, either because insufficient thermal cover remains or inadequate vertical structure is present after a fire. The lack of adequate vertical structure on burned areas, or the close proximity of non-burned areas with greater vertical structure apparently deterred nesting for at least two nesting seasons after burning. Managers considering seeding perennial grasses in this area should evaluate species other than weeping lovegrass if providing habitat for grassland nesting birds is a management goal. However, in many situations, weeping lovegrass is the best multiple-use choice for soil conservation, forage production, and livestock production on sandy soils in the Southern High Plains. Additionally, fire in semi-arid environments should be applied in a mosaic array to provide nesting habitat in nearby non-burned areas. Land managers should recognize the potential impacts of burning to grassland bird nesting habitat in non-native semi-arid grasslands for at least two nesting seasons following burning.

REFERENCES

Bartlett, E.T. 1988. Social and economic impacts of the Conservation Reserve Program. *In* J.E. Mitchell ed. Impacts of the Conservation Reserve Program in the Great Plains. U.S. Forest Service Gen. Tech. Rep. RM-158. pp. 52-54.

Berthelsen, P. S., and L. M. Smith. 1995. Nongame bird nesting on CRP land in the Texas Southern High Plains. J. Soil and Water Conserv. 50:672-675.

Bock, C. E., and J. H. Bock. 1992. Response of birds to wildfire in native versus exotic Arizona grassland. Southwest. Nat. 37:73-81.

Bock, C. E., and W. C. Scharf. 1994. A nesting population of Cassin's sparrows in the Sandhills of Nebraska. J. Field Ornithol. 65:472-475.

Dahl, B. E., and P. F. Cotter. 1984. Management of weeping lovegrass in west Texas. Texas Tech Univ. Management Note 5.

Higgins, K. F., L. M. Kirsch, and L. M. Ball, Jr. 1969. A cable-chain device for locating duck nests. J. Wildl. Manage. 33:1009-1011.

Johnson, D. H., and M. D. Schwartz. 1993. The Conservation Reserve Program and grassland birds. Conserv. Biol. 7:934-937.

Labisky, R. F. 1957. Relation of hay harvesting to duck nesting under a refuge-permittee system. J. Wildl. Manage. 21:194-200.

NOAA. 1996. Texas climatological data. National Climatic Data Center, Asheville, NC.

NOAA. 1997. Texas climatological data. National Climatic Data Center, Asheville, NC.

Peterjohn, B. G., J. R. Sauer, and W. A. Link. 1996. The 1994 and 1995 summary of the North American Breeding Bird Survey. Bird Pop. 3:48-66.

Peterjohn, B. G., J. R. Sauer, and C. S. Robbins. 1995. Population trends from the North American Breeding Bird Survey. *In* T.E. Martin and D.M. Finch eds. Ecology and Management of Neotropical Migratory Birds. Oxford Univ. Press, New York.

Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993 Handbook of field methods for monitoring landbirds. General Tech. Report PSW-GTR-144. Albany, California: Pacific Southwest Research Station, Forest Service, USDA; 41 p.

Robel, R.J., J.N. Briggs, A. Dayton, and L. Hulbert. 1970. Relationships between visual obstruction measurements and weight of grassland vegetation. J. Range Manage. 23:295-297.