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# Dramatic Increase of Le Conte's Sparrow in Conservation Reserve Program Fields in the Northern Great Plains.

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**Abstract**—During a continuing investigation in the northern Great Plains, we documented substantial increases of the Le Conte's Sparrow (*Ammodramus leconteii*) in Conservation Reserve Program (CRP) fields in 1994 compared with 1990-93. The most dramatic increases occurred in Eddy County, North Dakota, and Sheridan County, Montana. The changes in habitat associated with the drought from 1989 to early 1993 and above-normal precipitation from mid-1993 through mid-1994 likely produced favorable breeding conditions for this species in CRP fields in 1994.

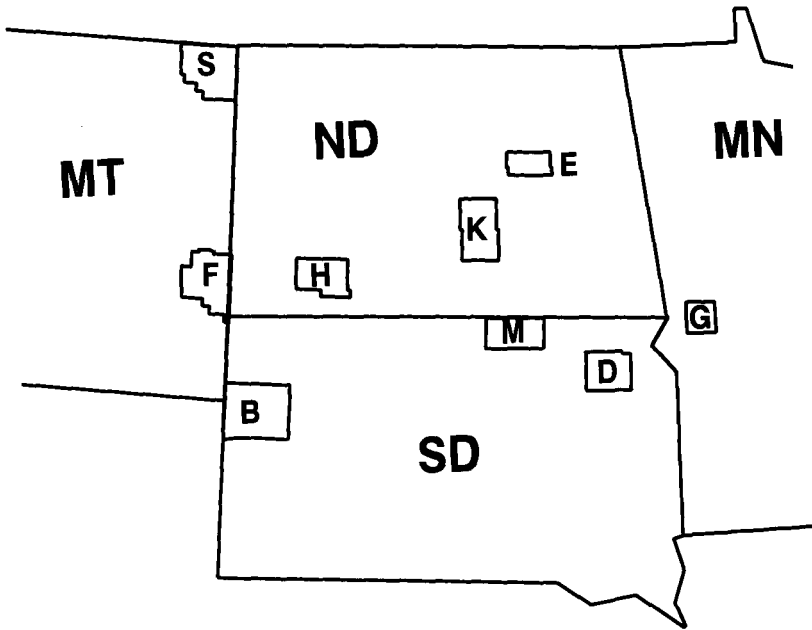
**Key words:** Le Conte's Sparrow, *Ammodramus leconteii*, distribution, Conservation Reserve Program, northern Great Plains

The Conservation Reserve Program (CRP) of the 1985 Food Security Act (Farm Bill) removed millions of hectares of highly erodible and marginal land from crop production and established perennial grassland in its place (Young and Osborn 1990). Many breeding bird species have benefitted from the grassland habitats established by this federal land retirement program (King 1991; Johnson and Schwartz 1993a,b; Kantrud 1993; Patterson 1994; Reynolds et al. 1994). During an ongoing study of breeding bird communities in CRP fields, we observed dramatic increases in the number of breeding pairs of the Le Conte's Sparrow (*Ammodramus leconteii*) using CRP fields in the northern Great Plains in 1994 compared with the previous four years.

## STUDY AREAS AND METHODS

Our study areas included CRP fields in nine counties in Montana, North Dakota, South Dakota, and Minnesota (Fig. 1), including 240 fields (4,654 ha) in 1990, 335 fields (6,181 ha) in 1991, 371 fields (6,904 ha) in 1992, 354 fields (7,243 ha) in 1993, and 359 fields (7,042 ha) in 1994. Once fields were selected, we surveyed them in subsequent years unless permission to access a field was denied.

Many areas in the northern Great Plains experienced drought from 1989 to early 1993 and above-normal precipitation from mid-1993 through mid-1994 (National Oceanic and Atmospheric Administration 1989-1994) (Table 1). Most CRP fields remained relatively idle during the study period, although some fields were released for emergency haying and grazing because of drought in 1988, 1989,



**Figure 1.** Counties selected for surveys of breeding birds in Conservation Reserve Program fields. North Dakota: E-Eddy, K-Kidder, H-Hettinger; Montana: S-Sheridan, F-Fallon; South Dakota: B-Butte, M-McPherson, D-Day; Minnesota: G-Grant

**Table 1.** Long-term (1961-1990) average precipitation in centimeters (May of previous year to April of current year) and annual deviations from the average, 1990-1994, taken at the nearest national weather station

County	Long-term average	Deviations from the long-term average				
		1989-90	1990-91	1991-92	1992-93	1993-94
Eddy, ND	45.72	+0.58	-2.11	+3.71	-8.33	+22.81
Kidder, ND	41.10	-13.87	+6.45	+1.83	-7.67	+21.54
Hettinger, ND	41.88	-13.44	-11.68	-9.35	-16.41	+20.04
Sheridan, MT	32.39	-8.36	+1.57	+10.26	-6.38	+24.92
Fallon, MT	36.60	-14.38	-7.90	+1.60	-5.38	+16.69
Butte, SD	42.67	-1.65	-4.83	-13.31	+5.00	+14.38
McPherson, SD	40.18	-10.41	+12.57	-9.02	+18.03	+39.29
Day, SD	53.49	+3.91	+1.40	+12.12	-6.30	+30.10
Grant, MN	64.72	-3.40	+3.38	+5.61	-1.37	+0.25

1990, and 1992, and flooding in 1993 and 1994. These disturbances occurred after birds were surveyed each year.

We surveyed breeding birds using a minor modification of the strip transect procedures used by Stewart and Kantrud (1972). This method allows a fairly rapid assessment of the breeding bird community of a field. Fields were surveyed once each year by one or two observers on foot. We tallied all indicated breeding pairs, based on singing or calling males, females, observed pairs, or presence of an active nest. Small fields were surveyed by a single observer; large fields were surveyed by two observers, each covering about half. The number and configuration of transects varied depending upon field size and shape. Care was taken to avoid double-counting birds. Surveys began about dawn and continued until midafternoon. Surveys extended beyond the time of most active bird vocalization, but Stewart and Kantrud (1972) concluded that activities of open-country birds are not appreciably affected by time of day other than early morning and late evening. Surveys were conducted from late May to early July each year, during the peak breeding season of the Le Conte's Sparrow (Stewart and Kantrud 1972, Stewart 1975). Counts were avoided in adverse weather conditions (precipitation or strong winds).

Some breeding birds were likely missed in our single survey (e.g., Järvinen and Lokki 1978) of CRP fields. The same technique was used in each year, however, so any bias should be consistent.

In each year of the bird surveys, we visually estimated the areal coverage of the most common plant taxa in each field. In the northern Great Plains, most CRP land is planted to a mixture of grasses and legumes, although vegetation varies considerably among fields and counties (Johnson and Schwartz 1993b).

## RESULTS AND DISCUSSION

Within the area of our study (Fig. 1), the Le Conte's Sparrow regularly breeds in northwestern Minnesota (Janssen 1987) and in east and central North Dakota (Stewart 1975). Le Conte's Sparrows were present in CRP fields in five of the nine counties surveyed in 1990-94 (Table 2). Day County, South Dakota, and Grant County, Minnesota, are on the southern edge of the species' breeding distribution (Janssen 1987, South Dakota Ornithologists' Union 1991). There is one recent breeding record of Le Conte's Sparrow in Day County, South Dakota (Skadsen 1987). Skaar et al. (1985) reported that there was only circumstantial evidence to indicate breeding of Le Conte's Sparrow in the region of Sheridan County, Montana. The presence of 52 breeding pairs in 1994 suggests that the Le Conte's Sparrow may breed commonly in this region in certain years. The remaining four counties (Fallon Co., MT; Butte Co., SD; McPherson Co., SD; Hettinger Co., ND) are generally considered outside of the species' normal breeding range.

Information on the breeding biology of the Le Conte's Sparrow is limited (Ehrlich et al. 1988). The species primarily breeds in moist grass or sedge meadows (American Ornithologists' Union 1983). In North Dakota, the Le Conte's Sparrow

**Table 2.** Number of breeding pairs and density (pairs/100 ha) of Le Conte's Sparrows observed in Conservation Reserve Program fields in the northern Great Plains, 1990-1994

County	Number of breeding pairs					Density	
	1990	1991	1992	1993	1994	1991-93	1994
Eddy, ND	0	1	0	0	206	0.03	21.47
Kidder, ND	0	0	0	1	26	0.03	2.74
Hettinger, ND	0	0	0	0	0	0	0
Sheridan, MT	0	0	8	0	52	0.30	7.76
Fallon, MT	0	0	0	0	0	0	0
Butte, SD	0	0	0	0	0	0	0
McPherson, SD	0	0	0	0	0	0	0
Day, SD	0	0	0	0	2	0	0.23
Grant, MN	0	0	0	2	4	0.09	0.76

favors wet habitats (Murray 1969), and Stewart (1975) considered the optimal habitat for this species to be the hummocky vegetation of fens. Less commonly, the species breeds in other grassland habitats such as tallgrass prairie, hayfields, and retired cropland (Stewart 1975). In this study, we found no breeding pairs in 1990, one in 1991, eight in 1992, three in 1993, and 290 in 1994 in the perennial grasslands established by the CRP. The changes in habitat associated with the increase in precipitation between 1989-93 (drought conditions) and 1993-94 (wet conditions) likely produced favorable breeding conditions for this species in 1994 (Table 1). In this context, Stewart (1975) commented that local populations of the Le Conte's Sparrow fluctuate annually in North Dakota and that the species "reaches peak numbers during wet years, while during dry years it may be scarce or absent." Many of the breeding pairs observed in CRP fields in 1994 were found in damp and low-lying areas within the fields, although breeding pairs in dry, upland areas were not uncommon. In 1994, Le Conte's Sparrows also were common in other grassland-like habitats (e.g., hayland, native grassland, etc.) in North Dakota (G.B. Berkey, Minot State Univ., ND, pers. commun.).

The most dramatic increase in Le Conte's Sparrows occurred in Eddy County, North Dakota (Table 2). In 1994, we found Le Conte's Sparrows in 27 of 43 (63%) CRP fields, totalling 206 indicated breeding pairs. Of the 27 fields containing Le Conte's Sparrows, the average density was 35.37 (SD = 19.72) pairs per 100 ha, with a range of 2.41 to 73.20 pairs per 100 ha. In 15 of the 27 fields, Le Conte's Sparrow populations surpassed or equalled those of the next most abundant species. In strong contrast, we found only one pair in CRP fields in Eddy County during the previous four years.

In Eddy County, wheatgrasses (*Agropyron elongatum*, *A. smithii*, or *A. intermedium*) dominated the vegetation cover (average: 41%) of CRP fields supporting Le Conte's Sparrows, followed by smooth brome (*Bromus inermis*;

20%) and alfalfa (*Medicago sativa*; 8%). In Saskatchewan, Hartley (1994) found that the Le Conte's Sparrow was the most common breeding bird in grasslands managed for waterfowl production and dominated by wheatgrass, smooth brome, and alfalfa.

The rapid colonization of CRP fields by Le Conte's Sparrows in 1994 suggests that CRP fields may be an important breeding habitat for this species only under certain (i.e., wet) conditions. Moreover, the current practice of releasing CRP fields for emergency mowing and grazing during extreme wet or dry years may negatively impact species that breed in CRP fields only under these conditions. Murray (1969) suggested that the changes in litter associated with annual mowing in North Dakota would eliminate Le Conte's Sparrows from hay fields. Kantrud (1981) found that Le Conte's Sparrow populations were reduced or extirpated by heavy grazing. Conversely, some species may respond positively to the changes in vegetation and residual cover produced from infrequent mowing (e.g., Frawley and Best 1991, Herkert 1991). The influence of emergency mowing and grazing of CRP fields on breeding bird populations remains poorly understood.

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