Research Note

Conservation Reserve Program Benefits on Henslow's Sparrows Within the United States

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ABSTRACT Henslow's sparrow (*Ammodramus henslowii*) is one of North America's fastest declining songbirds. Population declines combined with a small global population have led to heightened conservation concern. I used data from the North American Breeding Bird Survey to assess the impact that the Conservation Reserve Program (CRP) has had on Henslow's sparrows throughout their United States breeding range. My analysis suggests local Henslow's sparrow population trends are correlated with CRP enrollment, with populations increasing more in areas with relatively high local CRP enrollment, and that CRP appears to be playing a significant role in reversing long-term population declines. (JOURNAL OF WILDLIFE MANAGEMENT 71(8):2749–2751; 2007)

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KEY WORDS *Ammodramus henslowii*, Conservation Reserve Program, Henslow's sparrow.

The Henslow's Sparrow (*Ammodramus henslowii*) was formerly a common bird of the midwestern prairies (Herkert 1991) and wet grasslands of eastern North America (Askins 1999) but over the past 4 decades has become one of North America's fastest declining songbirds (Sauer et al. 2005). These declines combined with a small global population and narrow distribution have led to high conservation concern for the species (e.g., United States Fish and Wildlife Service 2002, Rich et al. 2004).

Loss of suitable breeding habitat is considered a major threat to Henslow's sparrow populations, and loss and degradation of habitat has been widely cited as the most probable cause of population declines (Pruitt 1996, Herkert et al. 2002). As a result, conservation recommendations call for the creation and maintenance of suitable breeding habitat (Zimmerman 1988, Smith 1992, Winter 1998, Herkert et al. 2002). One potential source of increased breeding habitat is agricultural set-aside programs, such as the Conservation Reserve Program (CRP). The CRP was originally established in the 1985 United States Farm Bill as a commodity supply control and soil erosion reduction program (Heard 2000). The program has been reauthorized 3 times, and each reauthorization has increased emphasis on providing wildlife habitat (Farrand and Ryan 2005). Expectations are high that CRP would benefit grassland wildlife because approximately 80% of CRP lands nationwide are planted with grass cover (Heard 2000).

Recent analyses have shown that Henslow's sparrow populations within Illinois, USA, have benefited from CRP (Herkert 1997, 2007). I used data from the North American Breeding Bird Survey (BBS) to assess whether CRP has affected Henslow's sparrows broadly throughout their United States breeding range by examining the relationship between local CRP enrollment and route-level BBS population trends.

STUDY AREA

I used data from the BBS (Sauer et al. 1997) to estimate local Henslow's Sparrow population trends. I drew BBS data from 170 routes in 17 states (IL, IN, IA, KS, KY, MD, MI, MN, MO, NY, NC, OH, OK, PA, VA, WV, WI), which included all states in the United States breeding range identified by Pruitt (1996), except New Jersey.

METHODS

The BBS consists of randomly located routes established along secondary roads throughout the United States and southern Canada (Sauer et al. 1997). Routes are 39.4 km and consist of 50 stops at 0.8-km intervals (Sauer et al. 1997). Each route is surveyed once annually, and birds detected within 0.4 km of each survey stop during a 3-minute census are recorded (Sauer et al. 1997).

I calculated Henslow's sparrow population trends using a route-by-route linear regression of counts on years with observer covariates (Geissler and Sauer 1990). I included covariates for observers because changes in observers along BBS routes may bias trend estimates (Sauer et al. 1994). I only used BBS routes with recent Henslow's sparrow records, and of those only that had been surveyed in $\geq$8 years between 1987–2005. I included 170 BBS routes from 17 states that met these criteria.

I used county-level data from the 2002 Census of Agriculture as the source of my CRP data (e.g., United States Department of Agriculture 2004). For each BBS route, I estimated local CRP enrollment by determining the percentage of total land area in the county in which the route was located that was enrolled in CRP. For routes that ran through multiple counties, I estimated local CRP enrollment as the combined percent enrollment for all counties in which the route passed. Local CRP enrollment within the primary (the county in which the BBS route started) and secondary counties (additional counties) were highly correlated ($r = +0.83$, $N = 110$, $P = 0.001$), indicating that CRP enrollment was consistent along routes that spanned multiple counties. Based on Census of Agriculture data, there were 5.0 million ha of CRP in this 17-state area in 2002, 4.4 million ha in 1997, 3.3 million ha in 1992, and 1.5 million ha in 1987.

I examined the possible influence of CRP on local Henslow's sparrow trends by comparing the trend slopes

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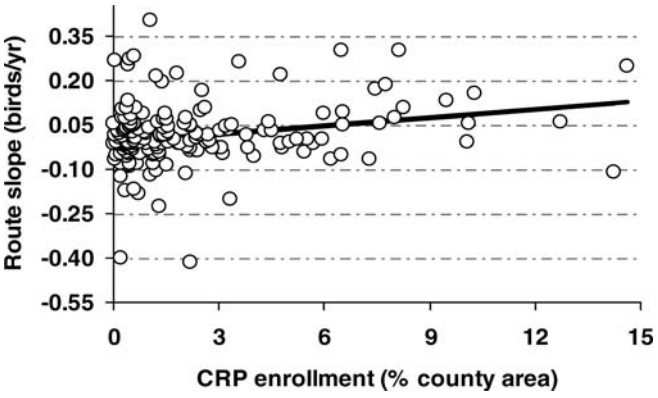

Figure 1. Local Henslow's sparrow population trends and the amount of Conservation Reserve Program (CRP) land in the surrounding landscape. Population trend is expressed as the slope of 170 individual North American Breeding Bird Survey routes located throughout the United States range of the species for the years following CRP establishment (1987–2005). The CRP enrollment is expressed as the percentage of land area within the counties that was enrolled in CRP that each BBS route runs through. The CRP enrollment figures are from the United States 2002 Census of Agriculture.

from each BBS route with the amount of CRP in the surrounding landscape using product–moment correlation (Analytical Software 2003). I used a significance level of $P = 0.05$.

RESULTS

There were nearly equal numbers of increasing and decreasing route trends. Between 1987 and 2005, 87 of the 170 (51%) routes had increasing trends, 81 (48%) had declining trends, and 2 had no trend (i.e., route slope = 0).

Route slopes were significantly related to the amount of CRP in the surrounding landscape ($r = 0.21$, $N = 170$, $P = 0.006$), with trends on routes in landscapes with relatively high amounts of CRP increasing more than trends on routes in landscapes with relatively little CRP (Fig. 1). Route slopes were highly variable, however, and local CRP enrollment explained only a modest amount of variation in slopes among routes.

DISCUSSION

My analysis indicates that Henslow's sparrow population trends are influenced by CRP enrollment, with populations increasing most in areas with high local CRP enrollment (Fig. 1). This extends recent research showing a similar pattern within Illinois (Herkert 1997, 2007) to the full range of the species and suggests that local CRP enrollment positively influences Henslow's sparrow population trends throughout their United States range.

Before the establishment of CRP (1966–1986), Henslow's sparrow populations in the United States were declining at a rate of 6.5%/year (Sauer et al. 2005). Since that time (1987–2005), Henslow's sparrow trends have stabilized, with the species showing a nonsignificant ($P = 0.51$) increase of 2.9%/year (Sauer et al. 2005). Because of the relationship between Henslow's sparrow population trends and local CRP enrollment, it seems likely that the CRP program has played an important role in stabilizing range-wide trends for the species.

Nationwide, 78% of the current 14.9 million ha of CRP is set to expire between 2007–2010 (Farm Service Agency 2007), and there is concern that high corn prices and other factors may substantially reduce enrollment. The largest proportion of this total, 6.5 million ha, was set to expire in 2007 (Farm Service Agency 2007). Farm Service Agency (2007) has recently announced re-enrollment of 5.3 million of these acres, leaving contracts on 1.2 million ha to expire in 2007. Another 5.1 million ha is set to expire between 2008–2010, and contracts for 4.1 million ha are seeking re-enrollment, indicating that ≥1 million additional ha will be lost from the program between 2008–2010 (Farm Service Agency 2007). The impact these enrollment reductions may have on Henslow's sparrow populations should be monitored because of the benefits CRP has provided to this species.

MANAGEMENT IMPLICATIONS

The Henslow's sparrow is a species of continental conservation concern because of a combination of large population declines, small global population, and narrow geographic distribution (United States Fish and Wildlife Service 2002, Rich et al. 2004). The establishment of a large acreage of grassland habitat through the CRP has helped stabilize the United State's population of Henslow's sparrows. As a result, maintenance of the CRP habitat base appears to be important for sustaining recent range-wide population increases of the species.

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LITERATURE CITED

Analytical Software. 2003. Statistix 8 user's manual. Analytical Software, Tallahassee, Florida, USA.

Askins, R. A. 1999. History of grassland birds in eastern North America. Studies in Avian Biology 19:60–71.

Farm Service Agency. 2007. Questions and answers about Conservation Reserve Program contract re-enrollments and extensions (REX). Farm Service Agency News Release 1425.07. <http://www.fsa.usda.gov>. Accessed 10 Mar 2007.

Farrand, D. T., and M. R. Ryan. 2005. Impact of the Conservation Reserve Program on wildlife conservation in the Midwest. Pages 41–62 *in* J. B. Haufler, editor. Fish and wildlife benefits of Farm Bill conservation programs: 2000–2005 update. The Wildlife Society Technical Review 05-2, Bethesda, Maryland, USA.

Geissler, P. H., and J. R. Sauer. 1990. Topics in route regression analysis, Pages 54–57 *in* J. R. Sauer and S. Droege, editors. Survey designs and statistical methods for the estimation of avian population trends. United States Fish and Wildlife Service, Biological Report 90(1), Washington, D.C., USA.

Heard, L. P. 2000. Introduction. Pages 1–4 *in* W. L. Hohman and D. J. Halloum, editors. A comprehensive review of farm bill contributions to wildlife conservation, 1985–2000. U.S. Department of Agriculture, Natural Resources Conservation Service, Wildlife Habitat Management

Institute, Technical Report, USDA/NRCS/WHMI-2000, Washington, D.C., USA.
Herkert, J. R. 1991. Prairie birds of Illinois: population response to two centuries of habitat change. Illinois Natural History Survey Bulletin 34: 393–399.
Herkert, J. R. 1997. Population trends of the Henslow's Sparrow in relation to the Conservation Reserve Program in Illinois, 1975–1995. Journal of Field Ornithology 68:235–244.
Herkert, J. R. 2007. Evidence for a recent Henslow's sparrow population increase in Illinois. Journal of Wildlife Management 71:1229–1233.
Herkert, J. R., P. D. Vickery, and D. E. Kroodsma. 2002. Henslow's sparrow (*Ammodramus henslowii*). *In* A. Poole and F. Gill, editors. The birds of North America, No. 671. The Birds of North America, Philadelphia, Pennsylvania, USA.
Pruitt, L. 1996. Henslow's sparrow status assessment. United States Fish and Wildlife Service, Bloomington Field Office, Bloomington, Indiana, USA.
Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. nigo-Elias, I, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, and T. C. Will. 2004. Partners in flight North American landbird conservation plan. Cornell Lab of Ornithology. Ithaca, New York, USA.
Sauer, J. R., J. E. Hines, and J. Fallon. 2005. The North American Breeding Bird Survey, results and analysis 1966–2004. Version 2005.2. United States Geological Survey Patuxent Wildlife Research Center, Laurel, Maryland, USA. <http://www.mbr-pwrc.usgs.gov/bbs>. Accessed 21 Nov 2005.
Sauer, J. R., J. E. Hines, G. Gough, I. Thomas, and B. G. Peterjohn. 1997. The North American Breeding Bird Survey results and analysis. Version 96.4. Patuxent Wildlife Research Center, Laurel, Maryland, USA.
Sauer, J. R., B. G. Peterjohn, and W. A. Link. 1994. Observer differences in the North American Breeding Bird Survey. Auk 111:50–62.
Smith, C. R. 1992. Henslow's sparrow, *Ammodramus henslowii*. Pages 315–330 *in* K. J. Schneider and D. M. Pence, editors. Migratory nongame birds of management concern in the Northeast. United States Department of the Interior, Fish and Wildlife Service, Newton Corner, Massachusetts, USA.
United States Department of Agriculture. 2004. 2002 census of agriculture—Illinois. Volume 1. Geographic Area Series Part 13. National Agricultural Statistics Service, United States Department of Agriculture, Washington, D.C., USA.
United States Fish and Wildlife Service. 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia, USA.
Winter, M. 1998. Effect of habitat fragmentation on grassland-nesting birds in southwestern Missouri. Dissertation, University of Missouri, Columbia, USA.
Zimmerman, J. L. 1988. Breeding season habitat selection by the Henslow's Sparrow (*Ammodramus henslowii*) in Kansas. Wilson Bulletin 100:17–24.

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