

RECOVERY PLAN FOR THE HENSLOW'S SPARROW,

Ammodramus henslowii, IN KANSAS



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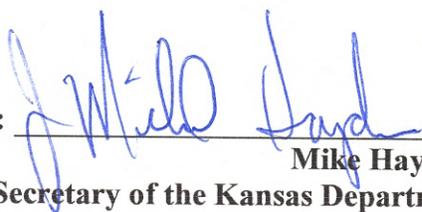
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I. INTRODUCTION

The Henslow's sparrow, *Ammodramus henslowii*, is listed as a "Species in Need of Conservation" (SINC) in Kansas (K.A.R. 115-15-2, KDWP 2000). The species ranges from the Great Plains, the upper Midwest, southern Ontario, and on to the northeastern U. S. during breeding season. It occupies southern states during winter, primarily those states bordering the Gulf of Mexico. Identification of the species in the field is extremely difficult, and many unknown factors make determining its correct status difficult. This plan provides an outline of specific strategies and methods to recover and de-list Henslow's sparrow.

II. SPECIES ACCOUNT

A. TAXONOMY DESCRIPTION

1. Original Description

The species was first discovered by John James Audubon in Kentucky in 1820 just across the Ohio River from Cincinnati. Audubon painted the bird in 1829 and named the bird for the Reverend John Steven Henslow who was a botany professor at Cambridge University in England and a professor of Charles Darwin (Graber 1968). The western subspecies (*A.h. henslowii*) differs from the Atlantic coastal subspecies (*A.h. sysurrans*) in being generally lighter, with less yellow at the wing bend, heavier black streaking and less chestnut on the back and scapulars, and a thinner bill (Smith 1968; Smith 1992).

Roberts (1949) describes the species as follows: "adults: sexes alike, length 4.75 – 5.25 in (12.1 – 13.3 cm); average weight 13.0 g; head and hindneck buffy-olive or yellowish olive; crown (except a light median stripe), nape, and

hindneck streaked with black; broad pale olive stripe over eye; black line back of eye; ear coverts dusky-olive, bordered by a light and a black spot; two (usually) black lines along side of throat; sides of neck clear buffy or yellowish-olive; narrow light eye ring; back feathers black centrally, bordered widely with chestnut and narrowly with white, producing a streaked appearance; rump and upper tail coverts tawny; below – white, buffy-tinged on sides, flanks and across breast; breast sharply striped with black, stripes extending along sides to and including flanks; closed wing (1.95 – 2.20 in, 4.95 – 5.29 cm) appears largely chestnut; flight feathers grayish-brown; secondaries, tertiaries, and coverts bright rufous or chestnut; bend of wing pale yellow; tail (1.90 – 2.05 in, 4.80 – 5.20 cm) narrow and tapering; outer feathers on each side nearly ½ inch (1.2 cm) shorter than middle ones; middle tail feathers rufous or chestnut with dark shaft streaks and edged with a grayish-white; other tail feathers grayish-brown with pale outer webs; bill reddish-flesh color; legs and feet pale flesh color; iris brown.

Juvenile plumage; above clay-color, streaked on head and back with black, feathers with rounded central spots; wings and tail clove-brown edged; secondaries and tertiaries with russet; alulae with white. Below – faint yellow, buffy on chin and throat; unstreaked or an occasional streak at sides of throat.”

Peterson (1980) offers the following description: Henslow’s sparrow has a short tail, large pale bill, reddish wings, an olive-colored flat head, and fine streaks across the breast. A shy, secretive sparrow; its presence is often detected by its song – a very short, hiccupping “tsi-lick”. When flushed, it flies low and jerkily, with a twisting motion of its tail. Others offer further description (Reed

1951; Robbins et al. 1966; Bull and Farrand 1977; Sibley 2000; Peterson and Peterson 2002)

2. Taxonomic Description

Henslow's sparrow is taxonomically categorized in the following taxonomic groups: Class, Aves; Subclass, Neornithes, True Birds; Superorder, Neognathae, Typical Birds; Order, Passeriformes, Perching Birds; Family, Emberizidae, New World Nine-primaried Songbirds; Subfamily, Emberizinae, Buntings, New World Sparrows, and allies (Pettingill 1985).

B. HISTORICAL AND CURRENT DISTRIBUTION

1. Description of Habitats and Locations of Occurrence

Habitats utilized by the species in the eastern portions of its range such as Vermont have been described as moist upland meadows not under the plow (Kibbe and Laughlin 1983). While declines of the species (Ehrlich et al. 1992) have been noted or surmised by some researchers other author's demonstrate increases in range, distribution, and abundance at least during some initial phases of landscape alteration by man. Graber (1968) quoting (Hyde 1939) suggests that the eastern forests must have originally offered little habitat for this species. Clearing of forests made more habitat available to this species with marked increases in abundance occurring from Ohio, southern Michigan, and Ontario. Locations of breeding colonies in the eastern United States suggest migration patterns are influenced by rivers or watercourses. Meszaros (1981) suggests that the species is not as rare as formerly believed.

The western subspecies of Henslow's sparrow occupies breeding habitat that is categorized as weedy prairies and meadows, neglected grassy fields and pasturelands that are dotted with shrubs or bushes. In northeastern Kansas the species occupies lower and moister depressions in upland prairie (Graber 1968). In Kansas, the species is both a transient and a breeder. The species occurs commonly on the Ft. Riley Military Reservation which represents 106,000 acres of primarily unfragmented grasslands (Suleiman personal communication 2005).

Henslow's sparrow prefers dense vegetation with ground litter, where it spends most of its time (Thompson and Ely 1992). Schulenberg et al. (1994) suggests that Henslow's sparrow does not occupy recently burned grasslands as does Herkert (1994a), and prefers grasslands with dead, standing grasses with extensive litter. He also suggests that areas which become increasingly invaded by woody shrubs are also avoided. Zimmerman (1988) reports spring burning preempts usage of pastures by the species. Fragmentation of grassland habitats and size of fragments influences usage of such habitats (Herkert 1994b).

Wetmore (1920) found that skins of breeding birds collected near Wilsey, KS in Morris County in 1907 that were formerly reported to be Baird's sparrow (*Ammodramus bairdi*) were actually Henslow's sparrow. Specimens have been collected in Kansas from April 14th to October 15th. Nesting has been documented in Anderson, Geary, Morris, Riley, and Shawnee counties in Kansas (Thompson and Ely 1992). Singing males have been recorded at many other locations in eastern Kansas. Breeding habitats are discussed under the title "Reproduction".

Populations of Henslow's sparrow have been known from Washington County, OK since 1974 (Verser 1990). Other occurrences include Nowata County. These counties lie just to the south of the Kansas border. Occurrences in Anderson County and Wilson County in southern Kansas suggest a potentially wide distribution throughout the southern part of Kansas. Henslow's sparrow has also been found breeding in Tulsa County in north-central Oklahoma (Seibert 1993). Large numbers of Henslow's sparrows have been found on the Tallgrass Prairie Preserve owned by The Nature Conservancy (Reinking and Hendricks 1993). Busby (1995) indicates that the historic and current ranges of the species in Kansas are similar. Habitat however has become fragmented and occurs across the eastern one third of Kansas (Busby ____).

Johnsgard (2001) indicated that four decades ago, the species was a rarity in Nebraska, but with lands being enrolled in the Conservation Reserve Program (CRP), the species has become locally common and has spread considerably westward along the Platte River. Similar expansions are noted in other states as well according to the same author, however, no references are cited to support the claim.

2. Known Collection Sites

Occurrences of Henslow's sparrow were plotted on county maps produced by the Kansas Department of Transportation and provided to KDWP. However, those maps are not included in this document to maintain landowner privacy and to prevent unwanted collection or disturbance of the species. Occurrences of

Henslow's sparrow are tabulated (Table I). All locational data were provided by the Kansas Natural Heritage Inventory (2004).

3. Associated Species and Communities

Breeding habitat for Henslow's sparrow consists primarily of tallgrass prairie that has not been heavily grazed or annually burned and contains standing dead grasses and has litter available for foraging (see "Description of Habitats and Occurrence" above). The species appears to always occur in these habitats or grassland communities in Kansas (Cully and Michaels 2000).

Meszaros (1981) indicates that Henslow's sparrow is often found with other grassland species, especially bobolinks and grasshopper sparrows which are single brooded species. Swengel (1994) found Henslow's sparrow and dickcissels in hay managed sites to be more abundant than sites which had been managed by fire. Grasshopper sparrows were equally abundant in the two management regimes. Both Henslow's sparrow and dickcissels increased in abundance with larger prairie sites. Henslow's sparrow was virtually absent from fire managed prairies in the upper Midwest while it was abundant in southwest Missouri prairies that were not burned. Henslow's sparrow also correlated strongly with the Regal Fritillary butterfly. Swengel (1994) suggested that Henslow's sparrow was an excellent indicator of prairie habitat quality. Zimmerman (1992; 1997) concluded that drought affects abundance in tallgrass prairie communities.

C. POPULATION SIZES AND ABUNDANCE

According to Thompson and Ely (1992), the largest and most stable population in Kansas is at the Konza Prairie. This habitat represents a drier, upland prairie from what it is usually known to occupy. Zimmerman (1987) found Henslow's sparrow numbers to range from 2.5 to 6.2 per kilometer in watersheds not burned recently compared to 0 birds per kilometer in burned watersheds on the Konza Prairie in Kansas. Zimmerman (1987) also found nesting populations in only three of 35 counties which he thought had suitable habitat. His studies also indicated that breeding adult birds were not necessarily the same birds which might return to an area to breed the following year, suggesting that chance plays a major role in whether or not a breeding population occurs at a site in a given year. It also suggests that if habitats are stable, populations may still fluctuate greatly from year to year. Little density information is available for Kansas sites of occurrence. However, it was estimated that three thousand singing males occurred on Ft. Riley, Kansas in 1997 (Federal Register 1998). Johnsgard (1979) indicates that as many as ten pairs of these birds have been known to nest in an area less than one-half acre in size.

Smith (1992) reports that population declines have been noted by others across the species range. In the Midwest the populations declined precipitously over the past 25 years. Grassland habitats declined by up to 75% in Illinois during the period from 1957 to 1979. Density of Henslow's sparrow changed from .90 birds/ 100 acres to less than 0.22 birds / 100 acres in the same time period. Robbins et al. (1966; 1986a; 1986b) concluded that Henslow's sparrows were not common anywhere and nationally the greatest densities for the species were in the Great Lakes Plain and in Minnesota.

D. REPRODUCTION

Habitat required for breeding Henslow's sparrows has been described as areas with intermediate air moisture range, vegetation dominated by dense grasses or herbaceous plants, presence of litter, and singing perches (Robins 1971b). Nests can be either on the ground or up to 50 cm above the litter (Rising 1996). Some nests are domed while others are open. Nests above ground level are attached to grass stalks. Nests are loosely woven dead grasses lined with fine grass or hair. Females build the nests without help from the male. Some five to six days are required for completion of the nest.

Numbers of broods per year appears variable. Some authors suggest single brood production, while others suggest two broods per year (Hyde 1939) and even three broods per year (Robins 1971a). Clutch size varies from three to five eggs. Graber (1968) describes eggs as white with brown spots or blotches and 18.3 by 14.4 mm in size. Clutches are completed by May 20 – 30 in the central part of the birds range while second nesting efforts begin in July and even August. Incubation occurs for eleven days by the female only (Robins 1971a). Most feeding trips for young are initially made by the female with the male participating after four to five days on an equal basis (Robins 1971a).

E. FOOD AND FEEDING REQUIREMENTS

Diets of the Henslow's sparrow in Michigan (Hyde 1939) found adults consumed crickets and short-horned grasshoppers (36%); beetles (19%); plant materials (18%); and spiders and butterfly larva and bees the remainder. Nestlings consumed grasshopper and butterfly larvae (Robins 1971a).

F. OTHER PERTINENT INFORMATION AND SUMMARY

Henslow's sparrows migrate from wintering grounds in Gulf coast states in early March (Hyde 1939). Usually the birds reach Kansas by mid April. Breeding birds are territorial with some populations exhibiting contiguous territories and others establish territories with buffer zones not inhabited with territorial birds. Territory sizes range from 0.8 acres to 1.5 acres and territory size tends to increase throughout the breeding season.

Because of the birds secretive habits, somewhat inconspicuous voice, and seemingly random distribution, Henslow's sparrow occurrences are seldom documented except by those extremely familiar with the bird and often looking specifically for that species (Chandler and Woodrey 1995). Confusion of identification by amateur birders between Henslow's sparrow and the grasshopper sparrow is possible. Johnsgard (2001) states the following with regard to making observations of this species: "Henslow's sparrow is one of those maddeningly difficult species to locate, even for those with perfect hearing. I have yet to hear a Henslow's sparrow in the field and, without that ability, the chances of ever seeing one on my own are virtually nil. I have searched likely looking fields to no avail, even those where I had been assured that Henslow's sparrows are present."

III. OWNERSHIP OF PROPERTIES

Ownership of properties where Henslow's sparrows occur consists of both private holdings as well as public lands. Notable populations have been found on the Konza Prairie in Geary and Riley Counties. This particular grassland ecosystem was purchased by the Nature Conservancy and is utilized as an outdoor research laboratory to study

grassland ecology. Large populations of the Henslow's sparrow also occur on the Ft. Riley Military Reservation in Riley County. Ft. Riley represents 106,000 acres making it the largest public tract of tallgrass prairie in Kansas (Suleiman 2005). Most grasslands in the state are in private ownership and undoubtedly some contain populations of Henslow's sparrows during breeding season. Private grasslands are burned frequently and often overgrazed, making the utilization of such by Henslow's sparrow somewhat less than the probability of finding the species on public grasslands. The large enrollment of CRP lands in Kansas may provide habitats for this species where it did not exist in the recent past.

IV. POTENTIAL THREATS

Henslow's sparrow is considered one of America's fastest declining songbirds (Peterjohn and Sauer 1999; Sauer et al. 2001). Declines are attributable to loss, alteration, and fragmentation of grassland habitats both in breeding grounds and in the winter range of the species (Winter 1996). Some 20 states in the birds breeding range consider it to be threatened, endangered, or at risk.

In general, the species requires grasslands providing dead standing grasses with litter on the ground. Fire seems to eliminate the species from occupying areas. The species will not be found in areas that are left unburned for too long of a period and become dominated by shrub or woody vegetation. Hence, having grasslands in the proper successional stage is imperative for the bird's existence.

Factors affecting the occurrence of Henslow's sparrow include both land use changes as well as management practices on grasslands. Habitat fragmentation is considered a cause of reduced populations due to reduction in size and abundance of

grasslands (NatureServe 2004). Mowing at improper times can cause nestling and egg mortality. Frequent burning removes litter and dead grasses needed for breeding habitats. Burning may also affect winter habitats as well. Loss of habitat from the conversion of grassland to row-crops is considered to be a cause of decline (Busby _____). Grasslands that are developed or abandoned and revert to shrubland is a cause of habitat decline as well (Smith 1992). Urbanization and encroachment of woody vegetation are problems especially cited in the eastern United States. Busby (_____) indicates that most privately owned grasslands are intensively used for agricultural purposes and is too heavily grazed or burned to provide ample habitat for Henslow's sparrow. While conversion of grasslands to agricultural crops may still occur, most tillable lands were converted in past years and this threat is minimal in Kansas. The management practices cited above are probably the greatest threat. Urbanization is also a minimal threat in the State of Kansas to this species; however, some areas are experiencing home building on hay meadow sites.

Other authors have found parasitism of nests by cowbirds, *Molothrus ater* (Reinking and Hendricks 1993). The extent of this threat is unknown but thought to be minimal (Hyde 1939). Other predators on nestlings and eggs and adults are known to occur and include the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), the blue racer (*Coluber constrictor*), northern harriers (*Circus cyaneus*), sharp-shinned hawks (*Accipiter striatus*), skunks, weasels, and raccoons (The Nature Conservancy 1987). Predation would seem to be more of a problem in small grassland patches resulting from fragmentation than in large grassland plots.

V. PROTECTIVE LAWS

A. FEDERAL

Federal laws prohibit the taking of migratory songbirds, nests, or eggs. However this species is not listed as threatened or endangered under federal law and as such is afforded no special habitat protection.

B. STATE

Henslow's sparrow is listed as a "species in need of conservation" under Kansas regulation. This gives no legal protection to the bird's habitats but developers and others are made aware of the existence of the species in an attempt to have such considered in projects potentially affecting habitats that might be utilized by the species.

VI. RECOVERY

A. OBJECTIVES

Monitoring and evaluation of the populations of Henslow's sparrow should be conducted to determine the status of the species in Kansas. Resultant information should be used to guide recovery efforts if needed. The final objective would be to remove the species from the Species in Need of Conservation list if data are available to support such a decision. Should declines occur, the species would be moved to endangered status. Critical habitat would include native grassland areas in Kansas Counties of prior occurrence.

B. RECOVERY CRITERIA

Known populations should be monitored to determine long-term trends. Enough sites should be examined annually to determine statewide trends as local populations appear to fluctuate widely even if habitats remain in good condition.

Other areas should be surveyed to determine if Henslow's sparrow is more widespread than initially thought. Areas to consider for surveys should include a number of state owned lands such as state parks and wildlife management areas. Some of these areas should be selected for management strategies to create habitat for Henslow's sparrows. Privately owned lands should also be surveyed. Perhaps random grassland selection could take place in counties seemingly within the range of the species but with populations not recently recorded. Lands enrolled in CRP within the range of the species should also be surveyed to see if these "new" habitats are being colonized by Henslow's sparrows as alluded to by some authors.

If surveys indicate widespread populations more abundant than thought, in each of the counties within the range of the species, then the species should be removed from the Species in Need of Conservation list. If surveys indicate that populations are no more abundant than what is currently known, such populations should be monitored for a period of ten years. If no overall declines occur, the species should be considered for down-listing. If colonization is documented on CRP lands within the species range, the extent of colonization should be documented. If at least 40 such sites contain Henslow's sparrows, the species should be considered for down-listing.

VII. NARRATIVE OUTLINE

1. Additional species information needs – Biology-life history

Most information on the species life history is well documented. Perhaps the biggest gaps include population densities and distributional information. To better understand population sizes and distributions the following are recommended:

- 1.1 Survey existing populations annually to document numbers of breeding birds and densities of populations on both private lands and public lands.
- 1.2 Survey additional sites on both private and public lands within the birds range to locate other populations not currently known.
- 1.3 Conduct surveys on CRP lands to document whether or not Henslow's sparrow is colonizing these recently developed habitats.

2. Management activities for maintaining species populations and for species recovery

- 2.1 Utilize current knowledge to develop brochures and materials to distribute to private landowners and even public entities who own land that might be managed for Henslow's sparrow. See Herkert (1998; 2003) for pertinent information. Emphasize rotational burning within large pasture units to promote heterogeneous habitat.
- 2.2 Select agency lands to manage for Henslow's sparrow to determine if new breeding colonies can be established with creation of adequate habitat. At least a minimum of five areas should be selected in proximity to known populations. If successful, other areas should be added in the future.
- 2.3 Enter into agreements with public entities to insure that areas where Henslow's sparrow now occurs are managed in a way to maintain existing populations. Agreements could be used for example on Ft. Riley military lands, who already include Henslow's sparrow in their endangered species management plan.

2.4 Develop work shops for Natural Resource Conservation Service (NRCS) and County Conservation District employees to maximize the use of USDA farm programs such as EQIP, CRP, and other incentives to manage grasslands in a manner to benefit Henslow's sparrow.

2.5 Work with other partners, such as The Nature Conservancy, who own, manage, or acquire grasslands, to insure Henslow's sparrow is addressed in their management goals. Model programs after Ft. Riley's management plan of prescribed burning every three years.

2.6 Encourage landowners near Ft. Riley to restore private grasslands using Ft. Riley's program that has teamed up with the USFWS's Partners in Wildlife Program. Landowners are paid to remove woody tree invasion if they agree to burn three times in a ten year period. Develop similar programs in other grassland areas.

VIII. COSTS OF RECOVERY PLAN IMPLEMENTATION

Surveys of various habitats identified in section VII.1 would require considerable effort. Costs estimated for such surveys are dependent on who does the survey, travel requirements, and other factors. Estimated survey costs are as follows:

Item 1.1 Costs for surveying existing populations may exceed \$10,000 per year if all sites are surveyed each year. Costs could be reduced for a ten year period if populations were only surveyed every other year.

Item 1.2 Surveys on additional lands within the range of the species would cost perhaps \$15,000 per year. These surveys need to be conducted to determine "how common" the species actually is. Such surveys could

be done perhaps twice in a five year period. If populations are found, the sites of occurrence should be added to the monitoring sites surveyed in item 1.1.

- Item 1.3 CRP lands should be surveyed to document colonization if occurring. Locating CRP sites could be aided by NRCS personnel. Surveys for such sites would require costs similar to item 1.2, around \$15,000 per year. Sites surveyed should range in age of establishment of grassland communities to document at what point colonization may occur.

Management activities vary in costs depending on who does the work. Costs are estimated as follows:

- Item 2.1 Brochure development could be performed at a cost of about \$6,000. If in-house expertise is used, layout design and writing could be done as part of routine employee duties and printing costs would run about \$3,000 per 1000 brochures would should be adequate to inform a number of entities and landowners concerning management practices benefiting Henslow's sparrow.
- Item 2.2 Existing agency lands to be included in a management experiment could be selected by agency personnel as part of in-house activities resulting in no real new expenditure. Management practices include limiting grazing and doing prescribed burns and periods of no burns to create habitat needed by Henslow's sparrow. These activities could be part of routine management of selected lands at little additional cost over existing management needs.

- Item 2.3 Management agreements could be done by establishing MOU's with particular entities. These agreements could be drafted in-house as part of agency personnel duties at little new cost.
- Item 2.4 Costs would be primarily administrative, using existing personnel.
- Item 2.5 Costs would be primarily administrative, using existing personnel.
- Item 2.6 Review of Ft. Riley's agreement with the USFWS should be performed to determine methods of payment for tree removal from native grasslands which have been invaded. USDA has some programs such as EQIP which may cost share for brush control on pasture lands. Using these programs may reduce costs to the state by utilizing already existing federal funds.

Table 1. Henslow's sparrow sites of occurrence and number of sparrows observed.

Site Number	Site Name	Number of Henslow's sparrows present & observation year
ABPBXA0030*001*KS	KONZA PRAIRIE	1983: 89, 1984: 105
ABPBXA0030*002*KS	WELDA PRAIRIE	1988
ABPBXA0030*005*KS	WELDA PRAIRIE NORTH	1988: 1
ABPBXA0030*003*KS	SUNSET PRAIRIE	1988; 2+, 1956: 5
ABPBXA0030*006*KS	MELVERN LAKE PRAIRIE	1988, 1980
ABPBXA0030*004*KS	ECCO PRAIRIE	1988: 5, 1987: 4
ABPBXA0030*019*KS	WOODSON STATE LAKE SITE	1990: 1-3
ABPBXA0030*011*KS	OWL CREEK PRAIRIE	1990: 4
ABPBXA0030*012*KS	MULSOW MEADOW	1990: 1
ABPBXA0030*010*KS	MIDDLE CREEK PRAIRIE	1990
ABPBXA0030*016*KS	CROOKED CREEK PRAIRIE	1990: 1
ABPBXA0030*015*KS	BAKER PRAIRIE	1990: 1
ABPBXA0030*020*KS	COLUMBINE CLIFF PRAIRIE	1990: 2
ABPBXA0030*013*KS	TWENTIETH STREET PRAIRIE	1990: 1
ABPBXA0030*017*KS	FRONTENAC PRAIRIE	1990: 1
ABPBXA0030*014*KS	TRAIL PRAIRIE	1990: 1
ABPBXA0030*018*KS		1990: 1
ABPBXA0030*026*KS	HONEY CREEK PRAIRIE	1991
ABPBXA0030*021*KS		1991: 1
ABPBXA0030*025*KS		1991
ABPBXA0030*023*KS	MELVERN LAKE SITE	1991: 2
ABPBXA0030*031*KS		1992: 3
ABPBXA0030*038*KS		1992: 1
ABPBXA0030*024*KS		1992: 1
ABPBXA0030*022*KS	MELVERN LAKE SITE	1992: 3, 1991: 4
ABPBXA0030*028*KS	FALL RIVER STATE PARK SITE	1991: 1, 1992: 2,3
ABPBXA0030*029*KS	NORTH WIND PRAIRIE	1992: 1
ABPBXA0030*039*KS		1992: 2
ABPBXA0030*027*KS	FALL RIVER STATE PARK SITE	1991: 3, 1992: 4-6
ABPBXA0030*033*KS	MIDDLETON SITE	1993: 5+
ABPBXA0030*032*KS	MIDDLETON SITE	1993: 1
ABPBXA0030*009*KS	FLINT HILLS PRAIRIE SITE	1993: 2+, 1989: 3
ABPBXA0030*045*KS		1993: 1
ABPBXA0030*040*KS		1993: 3-4
ABPBXA0030*035*KS		1993: 4
ABPBXA0030*034*KS		1993: 1-2
ABPBXA0030*063*KS	FLINT OAK RANCH	1995
ABPBXA0030*044*KS		1995: 1
ABPBXA0030*041*KS	SNAKE CREEK PRAIRIE	1995: 1-5
ABPBXA0030*030*KS	KU ECOLOGICAL RESERVE-ROCKEFELLER TRACT SITE	1995: 3, 1993: 6
ABPBXA0030*042*KS		1995: 1
ABPBXA0030*043*KS	RAINBOW PRAIRIE	1995
ABPBXA0030*058*KS		1995: 1
ABPBXA0030*008*KS	HOLLISTER WILDLIFE AREA SITE	1995: 2, 1989: 1
ABPBXA0030*062*KS		1995: 1-2

Table 1 Continued

ABPBXA0030*061*KS		1995: 5+,
ABPBXA0030*037*KS	FT. RILEY MILITARY	1996: 21, 1995: 81, 1994, 1993
ABPBXA0030*060*KS	RESERVATION	1996: 1
ABPBXA0030*047*KS		1996: 5+
ABPBXA0030*046*KS		1996: 1
ABPBXA0030*048*KS	POTAWATOMI RESERVATION	1996: 4+
ABPBXA0030*049*KS	SITE	1996: 1
ABPBXA0030*050*KS		1996: 1
ABPBXA0030*051*KS		1996: 3
ABPBXA0030*055*KS		1997: 1, 1996: 1
ABPBXA0030*054*KS		1997
ABPBXA0030*052*KS		1997: 2
ABPBXA0030*053*KS		1997: 1
ABPBXA0030*056*KS	TONGANOXIE SW	1998: 1
ABPBXA0030*057*KS	HAYMEADOW	1999: 2
ABPBXA0030*059*KS	MILFORD LAKE	1999: 23, 1998: 20
ABPBXA0030*036*KS	KANSAS ARMY NATIONAL	1999: 5, 1994: 1
ABPBXA0030*064*KS	GUARD TRAINING RANGE	2000: 1
ABPBXA0030*065*KS	KAAP PRAIRIE-CENTRAL	2000: 1
ABPBXA0030*007*KS		2003: 4, 1988: 7
ABPBXA0030*067*KS	LITTLE SOLDIER PRAIRIE	2004: 2
ABPBXA0030*066*KS	COBLENZ MARSH ROAD	2004: 1, 2002
	PRAIRIE	

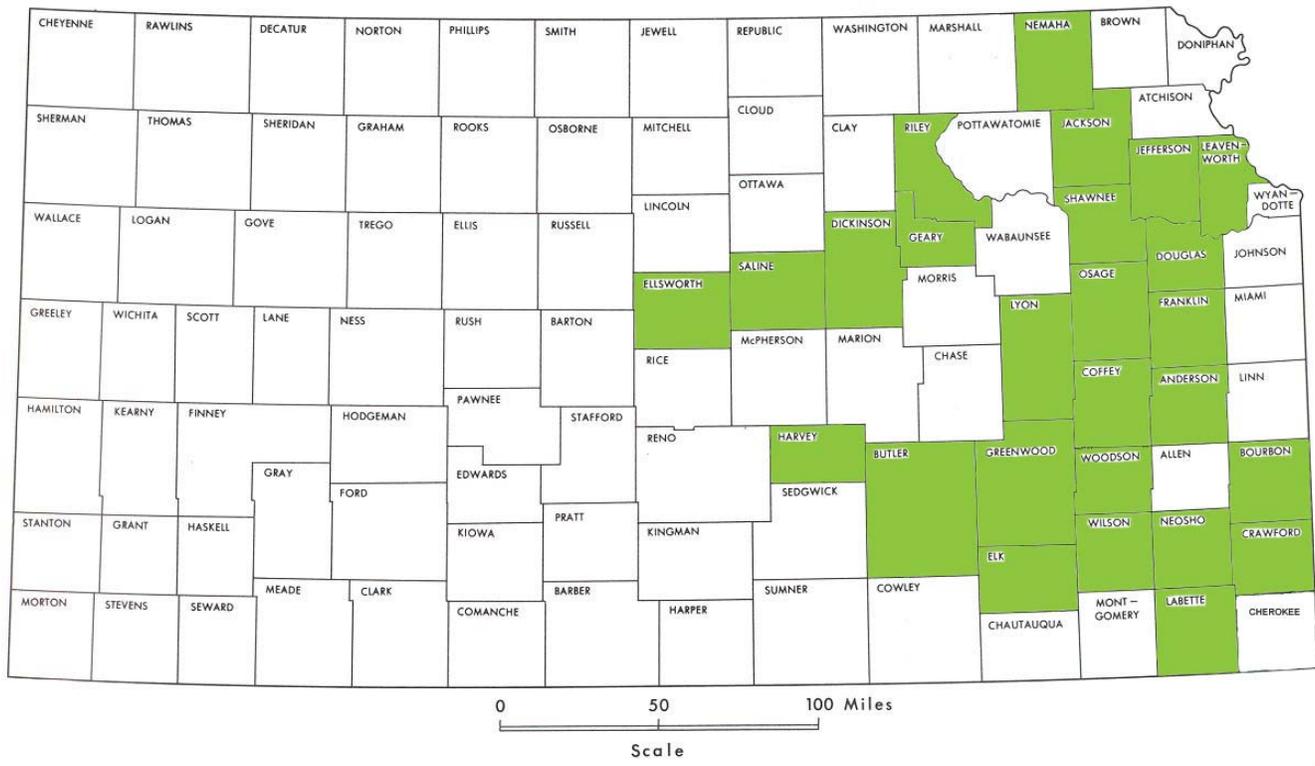


Figure 1: Counties in Kansas where Henslow’s sparrow has been recorded since 1980 (green).

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