

Status Assessment and Conservation Plan for the Henslow's Sparrow

(Ammodramus henslowii)



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**Status Assessment
and Conservation Plan
for the
Henslow's Sparrow
(*Ammodramus henslowii*)**

**Version 1.0
2012**

prepared by

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—TRC

Note

Unforeseen circumstances delayed final release of this Conservation Action Plan, with the result that some assessments and analyses are slightly out of date as of 2012. All data presented in the plan were the most current available as of June 2007. Some analyses have been revised since 2007—e.g., predicted losses of CRP have been updated with actual figures—and notations in the text or on figures indicate where that has been the case. Rather than delay publication further by producing a thoroughly updated assessment, we thought that Henslow's Sparrow conservation would be better served by publishing this document as is in the hopes that it would inspire the present generation of grassland bird researchers and conservationists to take the next giant leap forward.

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I. Executive Summary

The Henslow's Sparrow (*Ammodramus henslowii*) breeds locally throughout the northeastern United States (U.S.), Midwestern U.S., and into southern Ontario; and it winters in coastal states from Texas east to Florida and north to southern North Carolina. Research indicates that the species requires large patches of grassland, with dense vegetation and a well-developed litter layer for breeding and grassland habitats, often associated with longleaf pine forests during wintering periods. Analyses of available data show range-wide population declines from the late 1960s through the mid-1980s, primarily caused by habitat loss and fragmentation. Stakeholder concern over population declines resulted in the species receiving special conservation status throughout its range at both the state and national level. Since the mid-1980s, the population has stabilized and has shown growth over the past 10-15 years. Although the population is increasing as a whole, regional populations are still declining, and significant habitat threats exist throughout the species range.

Because of past and present concerns for the species, a Henslow's Sparrow Conservation Plan Workshop was held in March 2007 to get stakeholder input for developing a comprehensive Henslow's Sparrow Conservation Plan that will guide future conservation efforts. At the workshop, participants discussed developing population goals and identifying conservation priorities for both the breeding and wintering range of the species. Participants developed population goals based on the current distribution of the species, population indices derived from the North American Breeding Bird Survey, and goals set by Partners in Flight as part of the North American Landbird Conservation Plan. They also developed conservation actions containing research, education, and management components for the breeding and wintering range. The goals for breeding and wintering ground actions are presented below (see text for more detail).

Goals for Breeding Ground Actions identified in the plan are:

- Determine the current status and distribution of the Henslow's Sparrow throughout its breeding range.
- Improve our understanding of Henslow's Sparrow population demographics and how they are affected by differing habitat management regimes and landscape changes across the species breeding range.
- Protect, restore, maintain, and manage grassland habitats that are needed to sustain a stable or increasing Henslow's Sparrow population.
- Cooperate with non-traditional partners to create and manage habitat for breeding grassland birds including the Henslow's Sparrow.

Goals for Wintering Ground Actions identified in the plan are:

- Assess the current status and distribution of wintering Henslow's Sparrows, as well as, the distribution of important wintering habitat.
- Maintain or increase the current use of prescribed fire to manage longleaf pine savanna habitat for wintering Henslow's Sparrows.
- Protect, manage, and restore longleaf pine savanna habitat for wintering populations of Henslow's Sparrows.

- Improve our understanding of the connectivity between breeding and wintering areas.

Actions identified in the plan will likely benefit other grassland birds requiring similar habitat conditions and facing similar threats. Therefore, participants at the Henslow's Sparrow Workshop recommended forming an *Eastern Grassland Bird Working Group* to foster partnerships benefitting the entire suite of grassland birds found in the eastern United States and Canada.

II. Introduction

The Henslow's Sparrow has been identified as a focal species by the USFWS through its "Focal Species Strategy for Migratory Birds". The strategy was initiated to provide explicit, strategic, and adaptive sets of conservation actions required to return species of concern to healthy and sustainable levels. As part of the strategy, the USFWS identified 139 species of management concern that are to receive increased attention over the short-term. Included on this list was the Henslow's Sparrow, whose populations have shown long-term declines in the past and are currently threatened by range-wide habitat stressors. The Henslow's Sparrow was one of nine initial species chosen for developing a comprehensive conservation action plan in cooperation with conservation partners and stakeholders. For more information on the Focal Species Strategy, visit <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/HenslowSparrow.html>.

The first step in developing a comprehensive Henslow's Sparrow Conservation Plan (the plan) was to organize a workshop to receive input from concerned stakeholders. As such, a Henslow's Sparrow Conservation Plan Workshop (hereafter HESP Workshop) was held March 7-8, 2007 at the Minnesota Valley National Wildlife Refuge, Bloomington, Minnesota. Twenty-two people, representing the U. S. Geological Survey (USGS), state conservation agencies, private conservation organizations, academic institutions, and various regions/programs within the USFWS attended the workshop (Appendix A). The workshop began with presentations on the current status of the Henslow's Sparrow and updates on current research. The remainder of the workshop was devoted to setting population objectives and identifying action items participants felt were necessary to reach the population objectives for the species. At the conclusion of the workshop, working groups were formed for the breeding and wintering ranges to help refine action items for inclusion in the plan.

The plan was developed to facilitate cooperative efforts toward the long-term conservation of the Henslow's Sparrow. The partners that provided input for the plan are committed to taking steps to secure the long-term viability of the species. Included in the plan are: 1) a description of the target population and habitat requirements; 2) a population status assessment; 3) a natural history overview; 4) population objectives; and 5) conservation actions for the breeding and wintering ranges. Specific *goals*, *objectives* to reach the goals, and *tasks* to reach the objectives are presented for the breeding and wintering range action items.

Other species, with habitat needs similar to those of the Henslow's Sparrow, are likely to benefit through the implementation of the actions presented in the plan. On the breeding range, a host of grassland nesting bird species will benefit during various phases in the management of grassland habitat for Henslow's Sparrows. Breeding species include: Bobolink (*Dolichonyx oryzivorus*), Sedge Wren (*Cistothorus platensis*), Grasshopper Sparrow (*Ammodramus savannarum*), Savannah Sparrow (*Passerculus sandwichensis*), Eastern Meadowlark (*Sturnella magna*), and Western Meadowlark (*Sturnella neglecta*). Wintering species likely to benefit include: American Robin (*Turdus migratorius*), Yellow-rumped Warbler (*Setophaga coronata*), Red-winged Blackbird (*Agelaius phoeniceus*), Sedge Wren (*Cistothorus platensis*), Swamp Sparrow (*Melospiza georgiana*), Cedar Waxwing (*Bombycilla cedrorum*), Eastern Meadowlark (*Sturnella magna*), Eastern Bluebird (*Sialia sialis*), Brown-headed Nuthatch (*Sitta pusilla*), Le Conte's Sparrow (*Ammodramus leconteii*), Northern Harrier (*Circus cyaneus*), and Short-eared Owl (*Asio flammeus*).

The plan builds on previous reports that have summarized the status, threats, and conservation needs of the Henslow's Sparrow, including: 1) *Henslow's Sparrow Status Assessment*, completed by the USFWS (Pruitt 1996); 2) *Conservation Assessment – Henslow's Sparrow*, completed by the U.S. Forest Service (Burhans 2002); 3) *National Recovery Plan for Henslow's Sparrow*, completed by the Canadian Wildlife Service (Austen et al. 1995); 4) *The Birds of North America Henslow's Sparrow Species Account* (Herkert et al. 2002); 5) Partners In Flight (PIF) Physiographic Region Plans; and 6) State Wildlife Action Plans (see appendix B for bibliography of State Wildlife Action Plans). All data presented in the plan were the most current data available as of June 2007.

III. Description of Target Population

A. Range

The Henslow's Sparrow breeds locally throughout the Northeast and Midwest United States and into southern Ontario (Figure 1), with the primary range including all or part of 17 states or provinces: New York, Ontario, Michigan, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, Oklahoma, Missouri, Illinois, Indiana, Kentucky, Tennessee, Ohio, West Virginia, and Pennsylvania (Pruitt 1996; Burhans 2002; Herkert et al. 2002). Recent studies suggest that the species' breeding range is contracting in the Northeast and expanding southwestward (Herkert et al. 2002). The historic range of the species coincided with the distribution of tallgrass prairie and coastal marshes in the Northeast, with the range expanding as eastern forests were cleared (Pruitt 1996, Herkert et al. 2002). The species formerly breed in the New England states, but it is now considered very rare or extirpated in most New England states (Pruitt 1996; Jones et al. 2001; Herkert et al. 2002; Maiken Winter, Cornell University, pers. com. 2007). An isolated breeding population also occurs in eastern North Carolina (Pruitt 1996).

Wintering Henslow's Sparrows are primarily found in coastal states in the southeastern United States (Figure 1). The winter range extends from the Gulf Coast of Texas east into the northern two-thirds of Florida and north into North Carolina, with infrequent records north into the Midwest and Middle Atlantic states (Pruitt 1996;

Burhans 2002; Herkert et al. 2002). The wintering range of the Henslow's Sparrow closely mirrors the historic distribution of longleaf pine in the southeastern United States (Phil Stouffer, LSU, pers. com. 2007; Figure 2). Researchers working on the winter range noted that Henslow's Sparrows appear to winter primarily in coastal areas, with densities decreasing as one moves inland (Cooper 2007).

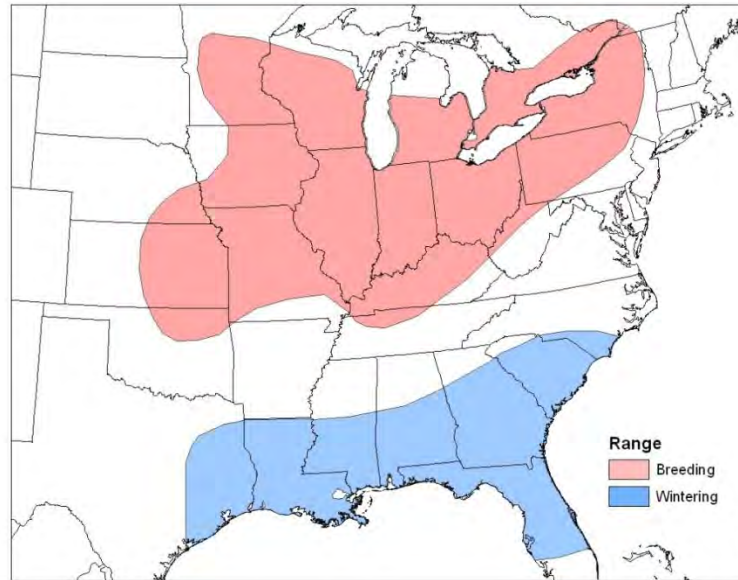


Figure 1. Breeding and wintering distribution of the Henslow's Sparrow. Populations are local and variable in many regions. Map based on Herkert et al. (2002) and recent analysis of breeding and wintering records from multiple sources.



Figure 2. Historic range of longleaf pine in the southeastern United States (from Noss 1989).

B. Habitat

Breeding Habitat

Henslow's Sparrows historically bred in native prairie habitat, but they now inhabit a variety of other grassland types including hayfields, pastures, wet meadows, undisturbed grasslands enrolled in the Conservation Reserve Program (CRP), upland portions of salt marshes, and old fields (Pruitt 1996; Herkert et al. 2002). However, it should be noted that a majority of pastures and hayfields are not suitable for Henslow's Sparrows due to intensive, modern agricultural practices (Pruitt 1996; Giocomo 2005). More recent studies have also documented the importance of reclaimed surface mine habitats for the species (Bajema et al. 2001, Bajema and Lima 2001, DeVault et al. 2002; Monroe and Ritchison 2005; Mattice et al. 2005). Monroe and Ritchison (2005) concluded that thousands of hectares of reclaimed surface mine grasslands in Kentucky may provide important habitat for stabilizing Henslow's Sparrow populations.

Breeding season habitat requirements have been the most frequently studied aspect of the species' biology. Many studies have been conducted throughout the species' breeding range in a variety of grassland types with different management histories (Wiens 1969 in Wisconsin; Robins 1971a in Michigan; Skinner et al. 1984 in Missouri; Kahl et al. 1985 in Missouri; Zimmerman 1988 in Kansas; Sample 1989 in Wisconsin; Hanson 1994 in Minnesota; Herkert 1994a in Illinois; Bollinger 1995 in New York; Mazur 1996 in New York; Winter 1999 in Missouri; Cully and Michaels 2000 in Kansas; Reinking et al. 2000 in Oklahoma; Bajema et al. 2001 in Indiana; Harroff 2001 in Illinois; Giocomo 2005 in Tennessee and Kentucky; Guzy 2005 in Wisconsin; Monroe and Ritchison 2005 in Kentucky; Murray et al. 2008 in Wisconsin; Powell 2008 in Kansas). More recently, several of these studies have focused on the relationship of grassland birds, including Henslow's Sparrows, to landscape structure. Results from the studies suggest that grassland bird abundance may be associated with patch size (e.g., Herkert 1994b; Vickery et al. 1994; Winter and Faaborg 1999) and the amount of grass in the surrounding landscape (e.g., Ribic and Sample 2001; Bakker et al. 2002, and Fletcher and Koford 2002). However, Murray et al. (2008) cautioned that landscape-scale management may not benefit the rarest species (i.e., Henslow's Sparrows), and plans for these species should still include species-specific habitat preferences.

Pruitt (1996) and Herkert et al. (2002) generally characterized breeding habitat (Figure 3) as having the following five components: 1) tall, dense grass; 2) a well-developed litter layer; 3) presence of standing dead vegetation used as song perches; 4) sparse woody vegetation; and 5) large patch size (most research has recommended a minimum patch size \geq 30-40 ha). For more detailed information on specific habitat requirements consult *Effects of Management Practices on Grassland Birds: Henslow's Sparrow* (Herkert 2003), a guide that summarizes habitat requirements and provides recommendations for managing breeding habitat.

The outlined habitat requirements should be viewed as general across the species range because most breeding habitat research was conducted when populations were at their lowest levels (Pruitt 1996). Smith (1992) cautioned that during periods of decline a

species may only occupy the highest quality habitat. This may give researchers an inaccurate impression of the range of field sizes and conditions that the species may occupy at higher population densities. Recent observations from Illinois provide evidence for this hypothesis. Jim Herkert reported at the 2007 Henslow's Sparrow Workshop that birds have been using less preferred habitat (i.e., smaller patches and recently disturbed sites) in Illinois at a higher rate in recent years than in the past (Cooper 2007). These observations may be a result of preferred habitat being saturated, forcing some individuals to use less preferred habitat.



Figure 3. Photo from Goose Lake Prairie State Natural Area in Illinois showing typical breeding habitat used by the Henslow's Sparrow (Photo by Jim Herkert, TNC).

Wintering Habitat

The primary winter habitat for the Henslow's Sparrow is within longleaf pine (*Pinus palustris*) forest ecosystems (Figure 4), primarily in savanna and pitcher plant (*Sarracenia spp.*) bog areas (Plentovich et al. 1999; Carrie et al. 2002; Tucker and Robinson 2003; Bechtoldt and Stouffer 2005; DiMiceli et al. 2007). At the HESP Workshop, it was noted that most birds are probably using public lands because that is where most remaining large patches of fire-managed longleaf pine forest are located (Cooper 2007).

Recent research indicates that habitat use is related to fire history, with bird densities highest in recently burned savannas and densities declining during each subsequent year (Figure 5; Plentovich et al. 1999; Carrie et al. 2002; Tucker and Robinson 2003; Bechtoldt and Stouffer 2005). Initial studies (cited above) show densities were highest the winter following a growing season burn, while more recent research indicates that abundance probably peaks one to two years after a fire in western Louisiana (Palasz 2008). Other variables associated with habitat use were high seed abundance and dense herbaceous vegetation (Carrie et al. 2002; Tucker and Robinson

2003; Bechtoldt and Stouffer 2005). Winter sites were found to have minimal litter accumulation, which differs from breeding habitat conditions (Carrie et al. 2002; Bechtoldt and Stouffer 2005). Site fidelity for wintering birds was high within a winter, but not between winters (Plentovich et al. 1998, Bechtoldt and Stouffer 2005).



Figure 4. Photo from Mississippi Sandhill Crane National Wildlife Refuge (NWR) in Mississippi showing longleaf pine savanna winter habitat (Photo by Mark Woodrey, Mississippi State University).

Other habitats where birds have been observed throughout the wintering range include moist, grassy areas associated with power line corridors, saline soil barrens, roadsides, and unmowed fields (Pruitt 1996; Holimon et al. 2008). Use of power line corridors in South Carolina was associated with depressions located on relatively exposed plateaus (Paul Champlin, Clemson University, pers. com. 2007). Holimon et al. (2008) indicated that saline soil barrens in southeastern Arkansas supported Henslow's Sparrows for longer time periods post-disturbance than longleaf pine savanna habitats. Densities found on the saline barrens were similar to those found in longleaf pine savannas in the southeastern U.S. Further research is needed to assess the importance of alternative habitats for wintering Henslow's Sparrows (Cooper 2007).

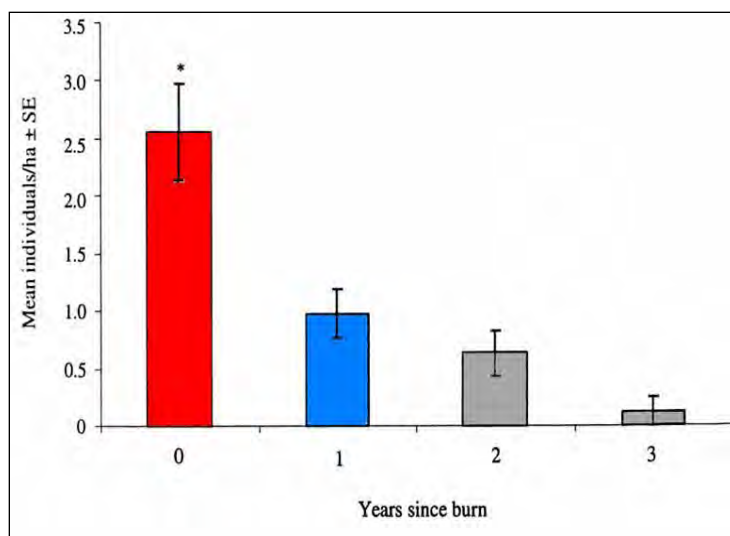


Figure 5. The density of Henslow’s Sparrows in relation to the year since last burn in southeastern Louisiana (Bechtoldt and Stouffer 2005).

C. Breeding Distribution

The primary data sources for assessing the breeding distribution of Henslow’s Sparrow are the North American Breeding Bird Survey (BBS) and individual state Breeding Bird Atlas (BBA) projects. Data from these sources are summarized below. In addition, a county-scale map was developed that shows the distribution of counties where Henslow’s Sparrows has been documented since 1996 based on data from multiple sources.

Distribution from Breeding Bird Survey Records

The North American Breeding Bird Survey (BBS) is an annual roadside survey conducted throughout the continental United States and southern Canada. The BBS began in 1966, and over 3,500 routes are surveyed each year in June. Routes are 24.5 miles long with stops placed every 0.5 miles, for a total of 50 stops per route. At each stop, a three-minute count is conducted, and all birds seen or heard within 400-m of the stop are recorded (Sauer et al. 2005). For more information on the BBS, visit <http://www.mbr-pwrc.usgs.gov/bbs/>.

Henslow’s Sparrows has been recorded at least once on 340 Breeding Bird Survey (BBS) routes in 20 states since the start of the survey in 1966 (Figure 6). Over time, there has been a westward expansion in the species distribution, especially into Missouri and eastern Kansas (Figure 6). Areas with routes having birds present 10 or more years since the start of the BBS include southern Wisconsin, southwestern Michigan, east central Ohio, western New York, south central Indiana, and central Missouri (Figure 7). These same areas also have the highest average counts (Figure 8). Average counts were calculated by dividing the total number of Henslow’s Sparrows counted on the route since 1966 by 40 years (1966 to 2005). See individual state status assessments in Section X for specific BBS information.

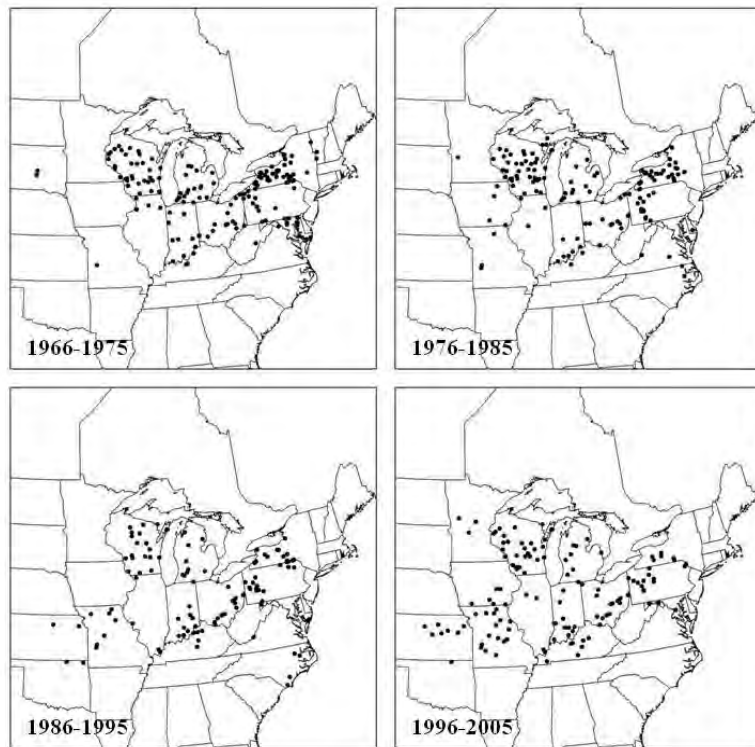


Figure 6. Distribution of BBS routes where the Henslow's Sparrow has been recorded in 10-year increments since the start of the BBS in 1966 through the 2005 survey.

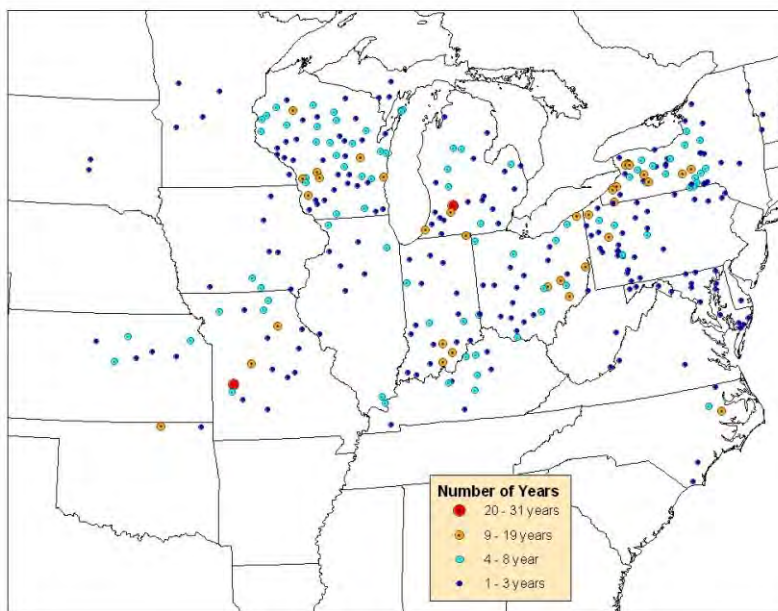


Figure 7. Number of years that Henslow's Sparrows have been recorded on a BBS route since the start of the BBS, 1966-2005.

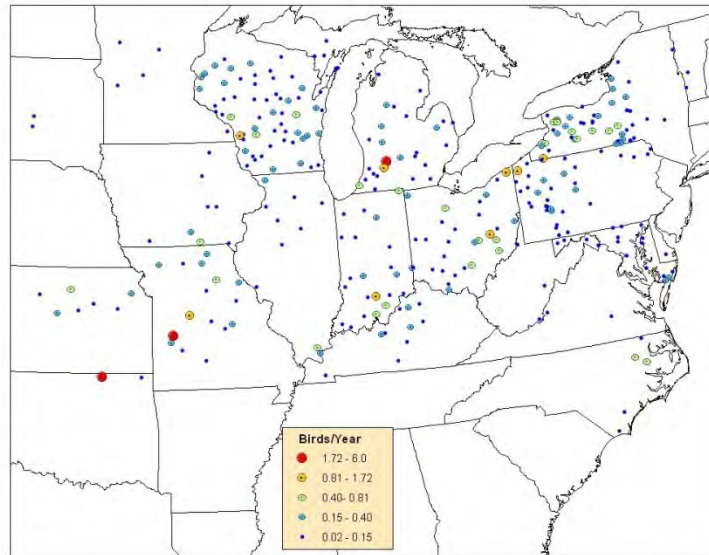


Figure 8. Average number of Henslow’s Sparrows counted per year on each BBS route where the species has been recorded (route total/40 years), 1966-2005.

Distribution from Breeding Bird Atlas (BBA) Records

Many states/provinces within the Henslow’s Sparrow breeding range have completed BBA projects over the past 30 years. Most BBA projects use a sampling process established by the North American Ornithological Atlas Committee (Smith 1990). The sampling frame is based on U. S. Geological Survey 7.5 –minute topographic maps that are divided into six, 25-km blocks, with one block randomly chosen to sample. Birds are then classified as possible breeders, probable breeders, or confirmed breeders for blocks where they have been recorded. Visit <http://www.bsc-eoc.org/norac/atlascont.htm> for more information on breeding classifications and BBA methodology.

Henslow’s Sparrows have been recorded in 1,636 survey blocks for states that have completed a BBA project and had data available as of 2007 (Figure 9). Henslow’s Sparrows were confirmed breeders in 260 blocks, probable breeders in 737 blocks, and possible breeders in 639 blocks (Figure 9). The distribution of locations recording Henslow’s Sparrows is similar to the BBS distribution; however, the species has been documented at more locations due to the more intensive searches conducted during BBA projects. See state status assessments in Section X for specific information on BBA results for each state that has completed a BBA and had data available for inclusion in this report. (Note: only data from the first BBA projects for New York and Pennsylvania are displayed, and data from both BBA projects for Indiana and Maryland are displayed).

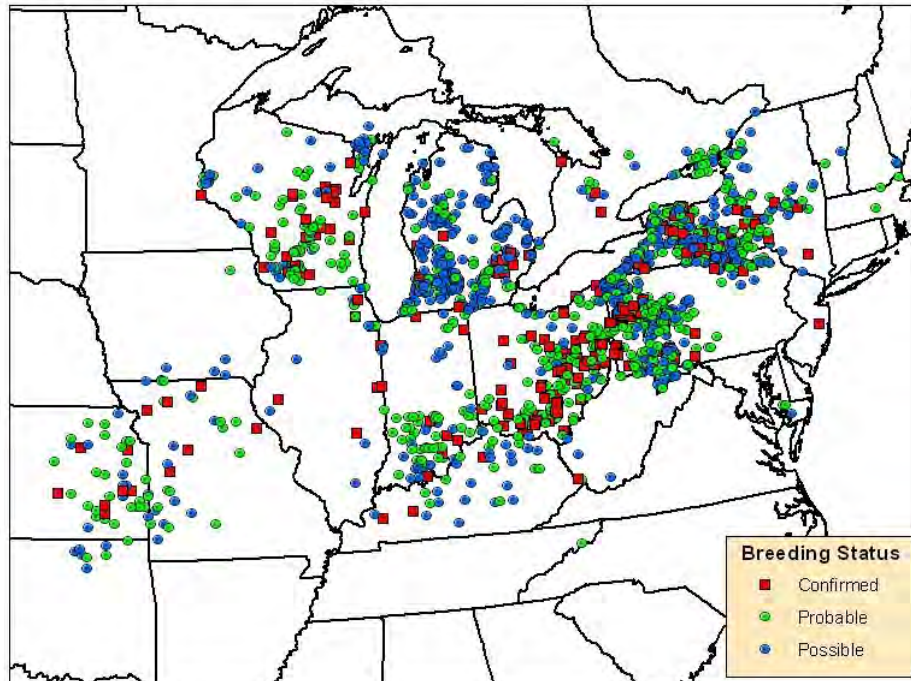


Figure 9. Location of state Breeding Bird Atlas survey blocks where Henslow’s Sparrows were recorded (BBA data were not available for Minnesota or Virginia as of 2007).

County Distribution Based on Current Records

Data sources used to develop the county-scale map of recent (1996-2006) locations where Henslow’s Sparrow presence has been documented include: 1) USGS BBS data; 2) State BBAs; 3) State Natural Heritage Inventory data; 4) The National Audubon Society’s Christmas Bird Count data; 5) USGS Bird Banding Lab records; 6) a survey sent to National Wildlife Refuges; 7) specific research studies; 8) postings on Birder Listserves; 9) the eBird website (<http://ebird.org/content/ebird>); and 10) other records from reliable sources. Henslow’s Sparrows have been observed in 698 counties (or parishes) over the past 10 years (i.e., through 2006) based on the above data sources (Figure 10). The map only indicates that Henslow’s Sparrows have been observed in that county during 1996-2006 and does not indicate confirmed breeding for counties in the breeding range. The map will be updated as new records become available. For a larger scale map of each state, see the state status assessments in Section X. A database of specific locations where Henslow’s Sparrows have been documented can be viewed at http://www.fws.gov/midwest/midwestbird/birds_henslows_sparrow.htm. The database lists the U.S. Fish and Wildlife Service region, state, county, location, and sources documenting presence.

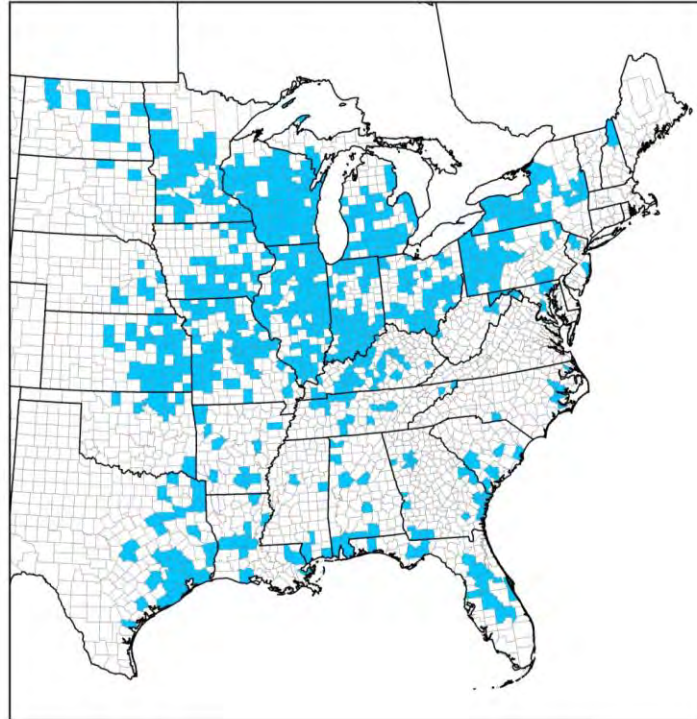


Figure 10. County-scale map showing counties where Henslow’s Sparrows have been documented from 1996-2006 (counties from Texas, Louisiana, southern Arkansas, Mississippi, Alabama, Florida, Georgia, and South Carolina are based primarily on wintering and migratory records). Records from a Henslow’s Sparrow Atlas Project conducted during 2008-09 are included for Illinois, Indiana, Iowa, Kentucky, Missouri, and Tennessee.

D. Winter Distribution

The primary data source for assessing the winter distribution of Henslow’s Sparrows is the Christmas Bird Count (CBC); however, it should be noted that Henslow's Sparrows are secretive on their wintering grounds, which prevents an accurate regional estimation of winter population status (Burhans 2002, Bechtoldt and Stouffer 2005). The CBC is supported by the National Audubon Society and began in 1900. Each year, over 2,000 counts are conducted within 15-mile diameter circles between 14 December and 5 January (National Audubon Society 2002). For more information on the CBC, visit <http://birds.audubon.org/christmas-bird-count>.

Henslow’s Sparrows have been recorded at least once on 199 CBC circles in 24 states during the history of the survey (Figure 11). States with the most detections include Texas, Louisiana, and Florida (Figure 11). Circles where the species was recorded 10 or more years are primarily located in close proximity to the Gulf of Mexico and the South Atlantic Coast (Figure 11). There are many circles scattered throughout the Midwest and Mid-Atlantic coast; however, the species was only recorded during a single year on most of these circles. Over the past 10 years (i.e., as of 2006), the species has been recorded in 10 states, with Texas, Florida, and Louisiana having the most circles (Table 1). Overall, the relative abundance (birds/100 party survey hours) is low across

the wintering range based on analysis of CBC data from 1966-89 (Figure 12; Sauer et al. 1996).

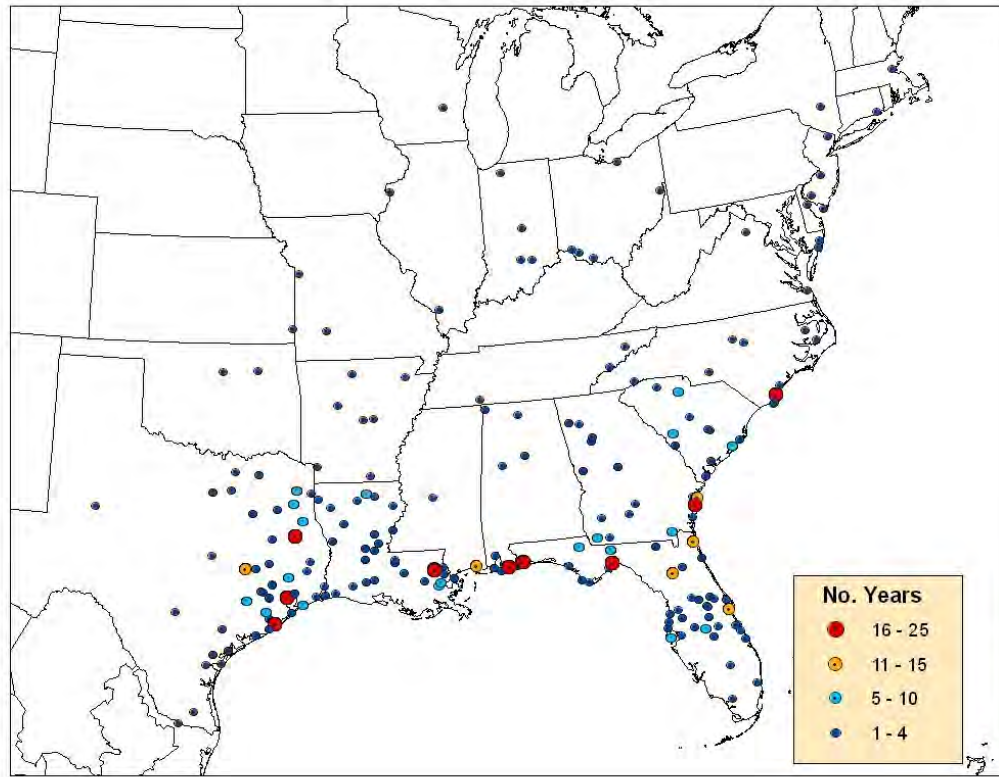


Figure 11. Location of CBC circles where the Henslow's Sparrow has been recorded by number of years.

Table 1. State summary¹ of Henslow’s Sparrows counted on CBC circles, 1996-2006 (National Audubon Society 2002).

State	Year									
	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06
AL	1 (1)	1 (4)	1 (1)	1 (1)	1 (1)	0 (0)	1 (1)	2 (7)	1 (1)	3 (3)
AR	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
FL	6 (15)	2 (6)	3 (12)	9 (23)	6 (8)	6 (9)	6 (11)	5 (11)	5 (13)	3 (4)
GA	0 (0)	2 (2)	2 (9)	1 (1)	3 (7)	2 (7)	2 (9)	3 (8)	1 (7)	3 (5)
LA	5 (21)	5 (17)	4 (18)	5 (8)	3 (8)	3 (7)	6 (11)	4 (6)	3 (7)	2 (4)
MS	1 (8)	1 (10)	1 (18)	0 (0)	0 (0)	1 (15)	1 (18)	2 (108)	1 (29)	2 (48)
NC	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)
OK	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
SC	1 (1)	0 (0)	0 (0)	1 (2)	0 (0)	1 (8)	2 (5)	3 (7)	1 (1)	1 (2)
TX	8 (30)	8 (14)	8 (21)	7 (9)	16 (36)	10 (21)	12 (33)	5 (22)	3 (8)	5 (9)
Totals	22 (76)	19 (54)	19 (79)	25 (45)	30 (61)	23 (67)	31 (89)	24 (169)	15 (66)	20 (75)

¹ Number of circles (Number of birds)

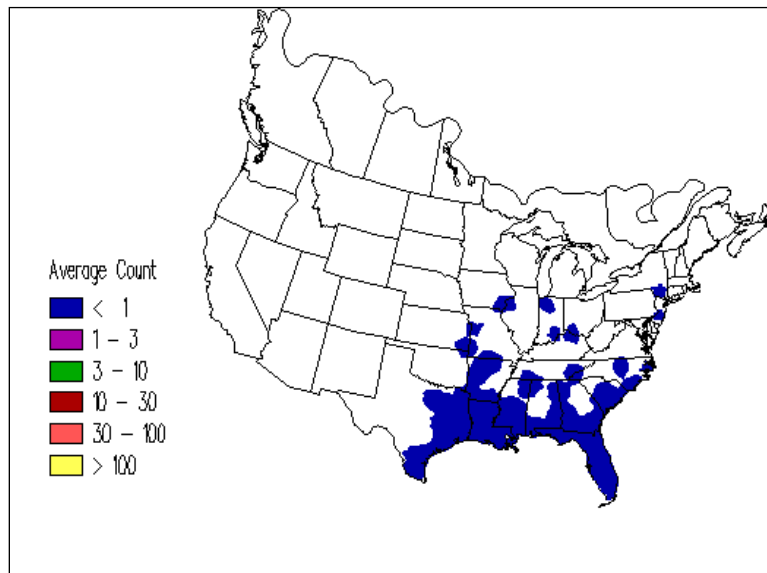


Figure 12. Relative abundance (birds/100 party hours) of Henslow’s Sparrow averaged over CBC survey years 1966-1989 (Sauer et al. 1996).

E. Spatial Extent of Action Plan

The Henslow’s Sparrow Conservation Action Plan is a range-wide plan including the breeding and wintering range. Conservation actions were identified for both the breeding range and wintering ranges (Section VII).

IV. Population Status

A. Population Trend

The BBS is the primary survey used to estimate population change for many migratory birds in North America, including Henslow's Sparrows (Robbins et al. 1986, Link and Sauer 1998, Sauer et al. 2005). Trends and indices presented below were estimated using hierarchical modeling methods developed by Link and Sauer (2002). The hierarchical methods used differ from the route-regression methods (Geissler and Sauer 1990) used in previous BBS data analysis, such as those presented on the BBS Results website (<http://www.mbr-pwrc.usgs.gov/bbs/>). Results for Henslow's Sparrows using the earlier route-regression method are limited by large magnitudes of predicted trends. They cause the indices in later years to be very low, as the analysis effectively takes the long-term trend line and hangs estimated year effects off of it as residuals (John Sauer, USGS, pers. com. 2007). Trend results using BBS data for Henslow's Sparrows should be viewed with caution since estimates are based on a small number of routes having the species present, a very low relative abundance of birds per route, and many of the trends containing zero in the 95% confidence interval (Sauer et al. 2005). Because of data deficiencies for Henslow's Sparrows, the PIF Science Committee recommended that the BBS be improved to better monitor the species population trend (Dunn et al. 2005).

Survey-wide, Henslow's Sparrows had a declining index of relative abundance from 1966 through the late 1980s, with an increasing index since the early 1990s (Figure 13, John Sauer, USGS, unpublished data 2007). The long-term population trend (1966-2006) is -1.1 %/year survey-wide, whereas the short-term trend (1997-2006) is + 8.2 %/year (Table 2, John Sauer, USGS, unpublished data 2007). Results from the CBC survey provide support for the increasing short-term trend. In the mid-1980s, approximately 1% of CBC circles reported Henslow's Sparrows (Figure 14). Since that time, there has been a general increase in the number of circles reporting the species, with a high of 9% in 2000 and 2002 (National Audubon Society 2002).

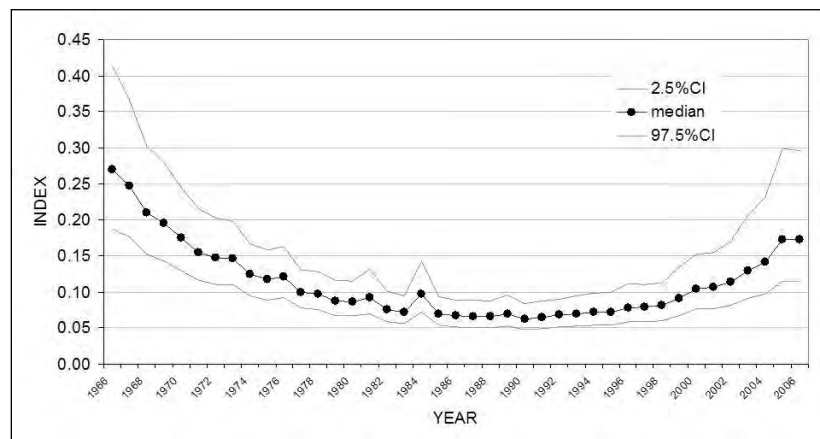


Figure 13. Annual indices of Henslow's Sparrow relative abundance (birds/route) from Breeding Bird Survey calculated using hierarchical modeling methods, 1966-2006 (John Sauer, USGS, unpublished data 2007).

Fourteen states/provinces had sufficient data for modeling state/provincial population trends (Table 2). Eight of these states/provinces have declining long-term trends, whereas seven show negative short-term trends (Table 2). Locations experiencing population declines, both long- and short-term, primarily come from the northeast part of the species range (i.e., Michigan, New York, Pennsylvania). Results from the two New York BBA projects support the declining trends indicated by the BBS in the northeast. Henslow’s Sparrows occurred in 348 blocks during the first New York BBA (1980-85) and were recorded in only 70 blocks during the second BBA (2000-05) (New York State Dept. of Environmental Conservation 2006). In addition, Maiken Winter from Cornell University reported that Henslow’s Sparrows were historically present in many of the New England states and are now considered extirpated from most (Cooper 2007).

Six states had increasing long-term population trends, whereas seven had increasing short-term trends (Table 2). States with the largest increasing trends primarily came from the southwestern part of the species range (i.e., Illinois, Iowa, Kansas, and Missouri). In Illinois, evidence from the annual Illinois Spring Bird Count, an annual survey conducted by the state, supports the increasing population trend indicated by the BBS (Figure 15).

Table 2. Long-term (1966-2006) and short-term (1997-2006) population trends for the Henslow’s Sparrow by states/provinces and survey-wide (John Sauer, USGS, unpublished data, 2007).

State	1966 – 2006 Trend		1997 – 2006 Trend	
	Trend¹	95% CI	Trend¹	95% CI
Illinois	3.4	-2.6 to 11.5	4.4	-4.7 to 29.7
Indiana	0.2	-3.2 to 3.2	3.4	-1.5 to 9.0
Iowa	16.0	8.3 to 25.0	16.5	2.3 to 33.4
Kansas	8.3	1.7 to 17.0	17.7	3.9 to 37.6
Kentucky	6.4	1.5 to 12.9	6.4	-6.6 to 24.2
Michigan	-9.9	-13.6 to -6.4	-6.8	-22.9 to 4.2
Missouri	8.4	5.0 to 12.0	11.4	5.5 to 20.1
New York	-9.2	-11.8 to -6.5	-7.3	-13.0 to 5.8
North Carolina	-3.5	-10.8 to 4.1	-3.4	-16.6 to 13.4
Ohio	-2.7	-5.9 to 0.4	-1.9	-12.3 to 5.1
Ontario	-1.6	-9.1 to 6.2	-1.6	-15.9 to 14.7
Pennsylvania	-3.6	-6.7 to -0.9	-3.2	-12.8 to 2.5
West Virginia	-10.9	-18.7 to -2.1	-9.3	-12.1 to 68.9
Wisconsin	-1.6	-4.1 to 1.1	6.6	-2.9 to 19.4
Survey-wide	-1.1	-2.4 to 0.4	8.2	3.9 to 14.1

¹% change/year

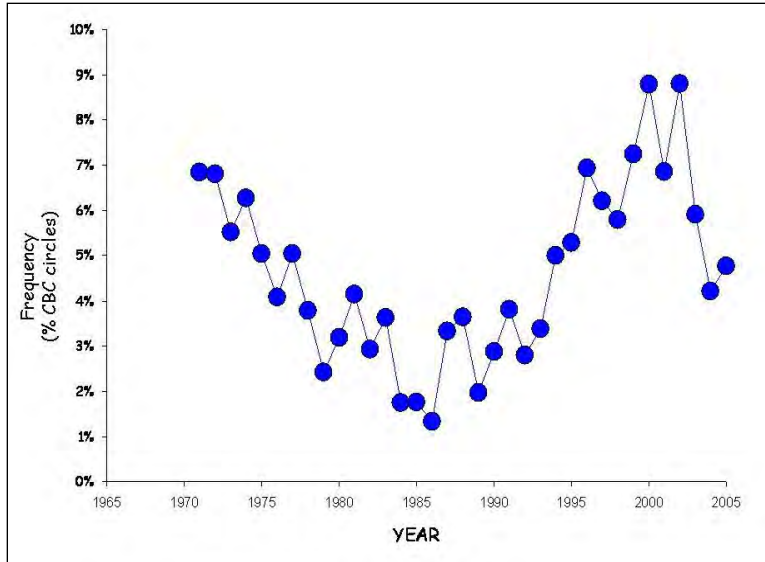


Figure 14. Percent of CBC circles recording Henslow’s Sparrows, 1970-2005 (from Jim Herkert, TNC, unpublished data 2007).

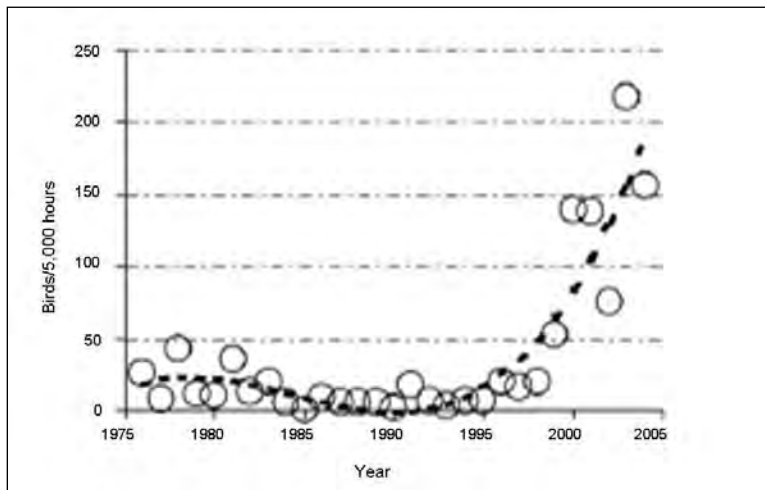


Figure 15. Population trend for Henslow’s Sparrows in Illinois, USA, 1976-2004, based on data from Illinois’ Spring Bird Count (adapted from Herkert 2007).

B. Legal and Priority Status

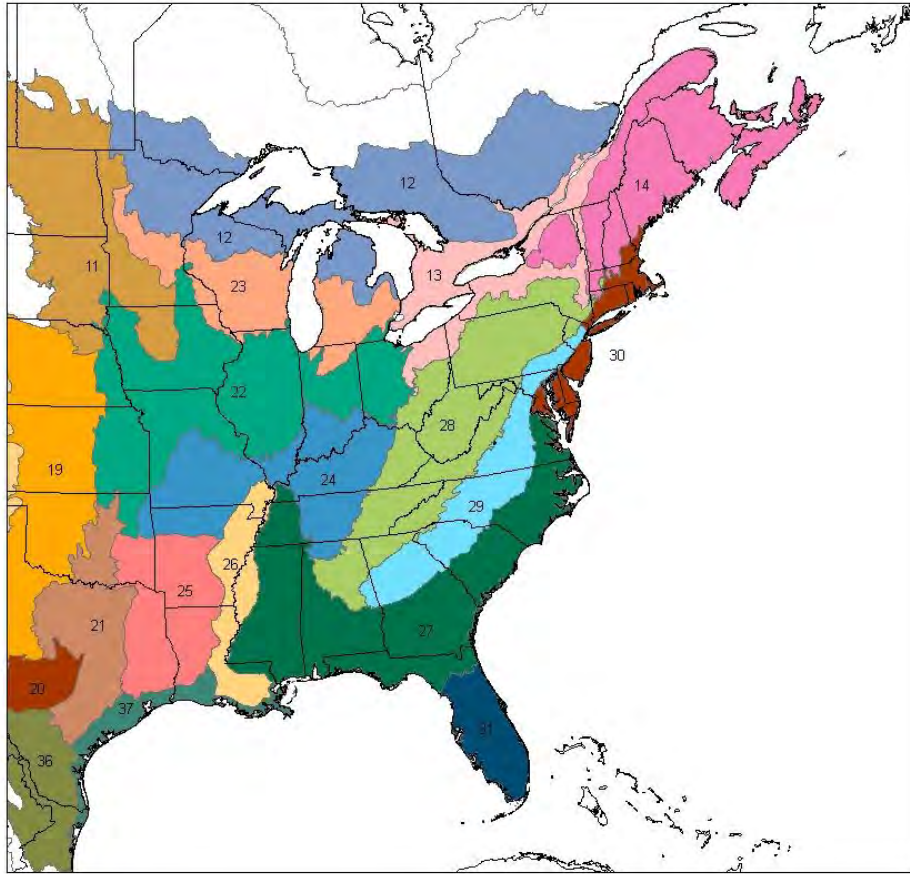
The Henslow’s Sparrow is classified as a “Bird of Management Concern” in the United States by the U.S. Fish and Wildlife Service (2008) and is a federally endangered species in Canada (Austen et al. 1995). A petition was submitted to the USFWS in 1998 to federally list the species as threatened under the Endangered Species Act; however, a subsequent review by the USFWS concluded that listing was not warranted (Office of the Federal Register 1998). The American Bird Conservancy’s 2007 *Watchlist* classifies it as a Red List species (American Bird Conservancy 2007), while the North American

Landbird Conservation Plan developed by Partners in Flight (PIF) classifies Henslow’s Sparrow as a “Watch List Species in need of Immediate Action” (Rich et al. 2004). At a regional scale, Henslow’s Sparrow is classified as a regional conservation priority in 11 Bird Conservation Regions (BCRs) (Table 3; Figure 16). Links to PIF Physiographic Region Plans for each BCR can be viewed at <http://www.partnersinflight.org/bcps/pifplans.htm>. The Henslow’s Sparrow is also listed as a state threatened or endangered species in 13 states and is listed as a “Species of Greatest Conservation Need” (SGCN) in 30 State Wildlife Action Plans (Table 4, see Appendix D for a bibliography of State Wildlife Action Plans). It was reported at the 2007 HESP Workshop that two states, Illinois and Minnesota, are considering downgrading state protected status due to recent population increases in both states (Cooper 2007).

Table 3. Henslow’s Sparrow conservation assessment factor scores¹ for Bird Conservation Regions where the species has been classified as a Regional Conservation Priority (See Panjabi et al. 2005 for a definition of assessment scores).

Bird Conservation Region	PS-g	BD-g	TB-r	PT-r	RD-b	RCS-b	% Pop	Action
Eastern Tallgrass Prairie – BCR 22	4	3	4	3	5	19	48	MA
Central Hardwoods – BCR 24	4	3	4	2	5	18	18	MA
Prairie Hardwood Transition – BCR 23	4	3	4	5	5	21	13	IM
Appalachian Mountains – BCR 28	4	3	4	5	4	20	9	IM
SE Coastal Plain – BCR 27	4	3	5	3	2	17	4	CR
Low. Great Lakes/St. Lawrence Plain – BCR 13	4	3	4	5	3	19	3	IM
Central Mixed-grass Prairie – BCR 19	4	3	4	3	2	16	3	MA
Boreal Hardwood Transition – BCR 12	4	3	4	2	2	15	2	MA
New England/Mid-Atlantic Coast – BCR 30	4	3	5	5	2	19	<1	CR
Piedmont – BCR 29	4	3	5	5	2	19	<1	CR
Gulf Coastal Prairie – BCR 37	4	3	5	5	2	19	<1	CR

¹Ps-g = Global Population Size score, BD-g = Global Breeding Distribution score, TB-r = Regional Threats to Breeding score, PT-r = Region Population Trend score, RD-b = Regional Relative Breeding Density Score, RCS-b = Regional Breeding Season Combined Score, % Pop = percentage of entire population breeding in the BCR, Action = recommended conservation action (MA = management attention, IM = immediate management, and CR = critical recovery). Each category ranked from 1-5 with higher numbers indicating more concern (see Panjabi et al. 2005 for specific definition of each rank).



- | | |
|---|--|
| BCR 11 – Prairie Potholes | BCR 25 – West Gulf Coastal Plain/Ouachitas |
| BCR 12 – Boreal Hardwood Transition | BCR 26 – Mississippi Alluvial Valley |
| BCR 13 – Lower Great Lakes/St. Lawrence Plain | BCR 27 – Southeastern Coastal Plain |
| BCR 14 – Atlantic Northern Forest | BCR 28 – Appalachian Mountains |
| BCR 19 – Central Mixed-grass Prairie | BCR 29 – Piedmont |
| BCR 20 – Edwards Plateau | BCR 30 – New England/Mid-Atlantic Coast |
| BCR 21 – Oaks and Prairies | BCR 31 – Peninsular Florida |
| BCR 22 – Eastern Tallgrass Prairie | BCR 36 – Tamaulipan Brushlands |
| BCR 23 – Prairie Harwood Transition | BCR 37 – Gulf Coastal Prairie |
| BCR 24 – Central Hardwoods | |

Figure 16. Bird Conservation Regions within the range of the Henslow’s Sparrow in the eastern United States and southeastern Canada.

Table 4. State status of the Henslow's Sparrow based on State Wildlife Action Plans, Natural Heritage Rank, and State Conservation Status (current as of 2007).

State	SGCN¹	NH Rank²	State Status
Alabama	Yes	S2N	Highest Concern
Arkansas	Yes	S1B,S2N	Inventory Element
Connecticut	No	SHB,SHN	Extinct
Delaware	Yes	SHB,S1N	Endangered
Florida	Yes	SNR	No Status
Georgia	Yes	S3N	Rare
Illinois	Yes	S2B	Threatened
Indiana	Yes	S3B	Endangered
Iowa	Yes	S3B, S2N	Threatened
Kansas	Yes	S3B	Conservation Concern
Kentucky	Yes	S3B	Special Concern
Louisiana	Yes	S3N	No Status
Maryland	Yes	S1S2B	Threatened
Massachusetts	Yes	S1B	Endangered
Michigan	Yes	S3B	Threatened
Minnesota	Yes	S1B	Endangered
Mississippi	Yes	S3N	Special Concern
Missouri	No	S3B	Special Concern
Nebraska	Yes	S1B	No Status
New Hampshire	No	SHB	Extinct
New Jersey	Yes	S1B	Endangered
New York	Yes	S3B	Threatened
North Carolina	Yes	S2B	State Rare
Ohio	Yes	S4B	Species of Concern
Oklahoma	Yes	S2B	No Status
Pennsylvania	Yes	S4B	Protected
Rhode Island	No	SXB	State Historical
South Carolina	Yes	SZN	Concern
South Dakota	No	SNR	No Status
Tennessee	Yes	S1B	Need of Management
Texas	Yes	S2S3N,SXB	Special Concern
Vermont	Yes	S1B	Endangered
Virginia	Yes	S1B	Threatened
West Virginia	Yes	S1B	Rare
Wisconsin	Yes	S3B	Threatened

¹ Listed as a Species of Greatest Conservation Need in State Wildlife Action Plan

² SH = possibly extirpated, SX = presumed Extirpated, S1 = critically imperiled, S2 = imperiled, S3 = Vulnerable, S4 = apparently secure, S5 = secure, and SNR = not ranked (qualifiers: B = breeding, N = nonbreeding)

C. Known or Suspected Limiting Factors and Threats

Pruitt (1996) assessed threats to Henslow's Sparrows based on the five factors used to determine the status of a species under the Endangered Species Act of 1973. The factors examined were: 1) the present or threatened destruction, modification, or curtailment of its habitat or range; 2) overutilization for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) the inadequacy of existing regulatory mechanisms; and 5) other natural or man-made factors affecting its continued existence. Pruitt (1996) concluded that habitat loss was probably the largest threat to the species. Furthermore, the general consensus at the HESP Workshop was that habitat loss, primarily on the breeding range, was probably the most important limiting factor toward maintaining or increasing current population levels (Cooper 2007). As such, this section will focus on the causes of habitat loss with specific threats to breeding and wintering habitat listed in the following sections. Consult Pruitt (1996) for an in-depth review of the other factors suspected of limiting Henslow's Sparrow populations.

Breeding Range Habitat Loss

The main sources of breeding habitat loss as identified from State Wildlife Action Plans, other status assessments, and PIF Physiographic Region Plans include: 1) grassland conversion for agriculture; 2) intensified use of agricultural habitats such as hayfields and pastures; 3) woody encroachment into grasslands; 4) grassland loss to industrial and residential development; 5) sea-level rise associated with climate change; and 6) invasive species displacing native vegetation.

An immediate threat identified at the HESP Workshop was the fate of the U.S. Department of Agriculture's Conservation Reserve Program (CRP) grasslands throughout the species breeding range, especially in areas where populations are stable or increasing (Cooper 2007). Significant CRP loss is predicted throughout the species' breeding range because of increasing corn prices related to the current growth of the corn-based ethanol industry. High corn prices translate into increased cropland rental rates, which exceed current CRP rental rates. The projected loss of CRP grasslands is alarming because research indicates that CRP may be responsible for the recent reversal of population declines as reported in the population trend section (Herkert 1997; Harroff 2001; Herkert et al. 2002; Cooper 2007; Herkert 2007a, Herkert 2007b).

Researchers from Iowa State estimated that 50-55% of the acreage enrolled in the CRP in Iowa could be converted back to cropland if corn prices stay at \$3.00 to \$3.50 per bushel (Secchi and Babcock 2007). The United States Department of Agriculture (2012) reported that approximately 3.3 million acres of CRP were lost during 2007-2012 in states within the Henslow's Sparrow's breeding range (Table 5). Collectively, this represents a 20% loss in CRP acreage (Table 5). Although this is not as high as predicted by Secchi and Babcock (2007), continued losses are expected with current corn prices topping \$7 per bushel (Chicago Board of Trade 2012). Certain counties within the Henslow's Sparrow range lost over 10,000 acres of CRP during 2007-2010 (Figure 17). Action items presented in the Breeding Range Action Item Section of the plan provide guidance for documenting the effect of CRP loss on Henslow's Sparrows and for maintaining CRP in high priority landscapes.

There is currently wide support in the conservation community for maintaining CRP and other Farm Bill-related conservation programs. Recommendations for maintaining a strong Farm Bill Conservation Title were summarized in a report entitled “Growing Conservation in the Farm Bill”. The report was prepared by the Theodore Roosevelt Conservation Partnership (TRCP) and can be found online at <http://www.trcp.org/issues/farmbill.html>. The TRCP is a partnership of leading U.S. conservation organizations.

Table 5. Acreage enrolled in the Conservation Reserve Program during 2007 and 2012 for selected states within the Henslow’s Sparrow breeding range. (U.S. Department of Agriculture Statistics 2012).

Acreage Enrolled in CRP				
State	2007	2012	Difference	% Lost
Illinois	1,086,695	1,030,566	-56,129	5.2
Indiana	316,599	280,366	-36,233	11.4
Iowa	1,970,486	1,644,410	-326,076	16.5
Kansas	3,258,989	2,522,811	-736,178	22.6
Kentucky	358,351	332,242	-26,109	7.3
Michigan	276,151	221,688	-54,463	19.7
Minnesota	1,829,428	1,555,676	-273,752	15.0
Missouri	1,592,913	1,282,776	-310,137	19.5
Nebraska	1,341,217	993,925	-347,292	25.9
New York	66,544	50,658	-15,886	23.9
Ohio	362,311	336,184	-26,127	7.2
Oklahoma	1,074,041	818,970	-255,071	23.7
Pennsylvania	230,219	205,551	-24,668	10.7
South Dakota	1,559,343	1,110,292	-449,051	28.8
Tennessee	278,030	190,174	-87,856	31.6
West Virginia	4,263	6,232	1,969	NA
Wisconsin	606,755	368,112	-238,643	39.3
Total	16,212,335	12,950,633	-3,261,702	20.1

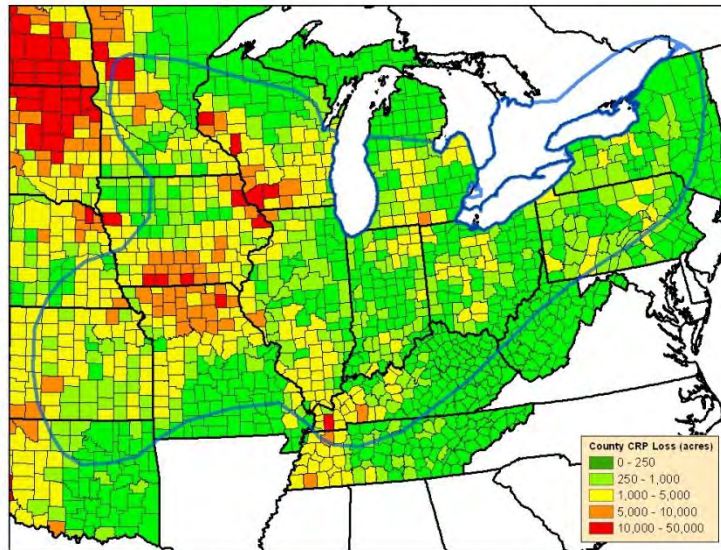


Figure 17. Projected CRP loss by county for CRP contracts expiring, 2007-2010 that were not re-enrolled or extended (breeding range indicated by blue outline).

Another breeding habitat threat identified at the HESP Workshop was woody encroachment into existing grassland habitat (Figure 18; Cooper 2007). Several studies have shown a negative association between Henslow's Sparrows and woody vegetation (Cully and Michael 2000; Peterson 1983; Kahl et al. 1985; O'Leary and Nyberg 2000). Likewise, other research has indicated that grassland birds, in general, are negatively impacted by the amount of woody vegetation in the surrounding landscape (Ribic and Sample 2001; Fletcher and Koford 2002; Cunningham and Johnson 2006). Maiken Winter reported at the HESP Workshop that succession of open agricultural lands to shrubland/forest is one of the primary causes for declining populations in the Northeast. In another example, available habitat at Big Oaks NWR has declined from 1,900 ha in 2005 to approximately 700 ha in 2007 due to woody encroachment. The estimated breeding population on the refuge declined from a high of over 1,100 singing males to 400 in response to the woody encroachment (Joe Robb, Big Oaks NWR, unpublished data 2007).

Woody succession is also beginning to be a problem on unmanaged reclaimed surface mine grasslands that are not periodically disturbed (Cooper 2007). HESP Workshop participants thought that decisions on which reclaimed sites to manage as grasslands should be based on priorities for all birds of conservation concern. For example, many reclaimed surface mine grasslands are located in landscapes that were historically forested. So, should these sites be allowed to revert to forest to benefit forest birds, or should they be managed as grasslands to benefit grassland birds? The general consensus at the HESP Workshop was that each site needs to be evaluated on an individual basis for its value to the overall conservation goals for grassland and forest birds. Action items presented in Section VII recommend increased management of grasslands in high priority landscapes, including control of woody vegetation.



Figure 18. An example of extensive woody encroachment into grassland habitat (Photo by Nick Palaia, USFWS).

Winter Range Habitat Loss

Participants at the HESP Workshop generally agreed that Henslow's Sparrow populations were not being limited by factors on the winter range (Cooper 2007). The current habitat base on the winter range has sustained the recent population growth as measured on breeding ground surveys. However, there was still concern about winter range habitat loss at the workshop. Pruitt (1996) reported that only 3% of the historic longleaf pine ecosystem exists and less than 10% of the historic fire-dependent savannas remain on the landscape. The primary sources of continued habitat loss identified in State Wildlife Action Plans and during the HESP Workshop include: 1) altered fire regimes; 2) residential and industrial development; 3) incompatible forestry practices; 4) invasive species; and 5) land conversion to agriculture.

The main concern discussed at the HESP workshop was the loss of suitable habitat due to the suppression of natural fire regimes (Cooper 2007). As indicated earlier in the plan, fire plays an important role in maintaining suitable winter habitat. Reasons for the lack of fire management discussed at the HESP Workshop include: 1) a shortage of qualified burn bosses to supervise prescribed burns; 2) the complexity of conducting growing season prescribed burns; 3) local, state, and federal government ordinances making it difficult to burn; and 4) minimal public support for prescribed burning. Actions to address these problems can be found in the Winter Range Action Items listed in Section VII.

The impact of invasive plant species on longleaf pine savanna habitat was another concern identified at the HESP Workshop (Cooper 2007). Cogon grass (*Imperata cylindrical*) and gallberry (*Ilex* spp.) were the primary species of concern discussed at the workshop. Cogon grass is an aggressive, non-native species that displaces native vegetation, while gallberry is a native shrub that often crowds out desirable grasses in winter habitats. Researchers at the HESP Workshop indicated that growing season fires

do the best job of controlling gallberry, and steps are being taken to control the spread of Cogon grass throughout the winter range (Cooper 2007).

V. Natural History

A brief natural history overview for the Henslow's Sparrow is presented in this section to cover items not discussed in previous sections. Primary topics include migration, reproduction, and food habits. The following sections are updates from Pruitt (1996) with research completed between 1996 and 2007 included in the summary. For a comprehensive summary on the natural history of the Henslow's Sparrow, consult *The Birds of North America Henslow's Sparrow Species Account* (Herkert et al. 2002).

A. Migration

Henslow's Sparrows begin their spring migration from southern wintering grounds in mid-March to early-April (Hyde 1939; Graber 1968; Herkert et al. 2002). Most summaries of their migration concur with Hyde's (1939) account: "By the end of the second or third week in April, the species has reached Kansas, northern Illinois, southern Michigan, and New Jersey. The middle of May sees the species at its northern limit..." Fall migration begins by mid-September and continues into December (Hyde 1939). Graber (1968) and Smith (1968) provided arrival dates at specific locations for both spring and fall migration. Research in Louisiana indicated a large turnover of newly arriving migrants in the fall, with birds becoming site faithful from late November through the start of spring migration in March and males migrating earlier than females (Johnson et al. 2009). Based on stable isotope analysis, Iburguen (2004) concluded that there were not clear linkages between specific breeding and wintering locations.

Little is known about habitat use during migration (Burhans 2002). Graber (1968) and Hyde (1939) both reported that most migrating birds were seen along hedgerows or at the edges of shrubby places. Austen et al. (1995) noted that: "The elusive nature of Henslow's Sparrows makes it difficult to spot them in migration when they may not be singing." They further noted that Henslow's Sparrows are thought to migrate solitarily or in small groups at night (citing Knapton 1982), and that the relatively short distance between breeding and wintering grounds is probably covered in 1-2 weeks. The general consensus at the HESP Workshop was migration habitat was not a limiting factor during the species' annual cycle (Cooper 2007).

B. Reproduction

Henslow's Sparrows are monogamous (Graber 1968; Wiens 1969; Robins 1971a; Herkert et al. 2002). The species usually begins nest building in early May. Most nests are built near the ground up to 17 cm in height at or near the base of a thick clump of grass (Hyde 1939; Robins 1971a; Winter 1999; Monroe and Ritchison 2005). Most nests contain 3-5 ovate eggs that are incubated for 10-12 days, and young fledge at 9-10 days after hatching (Pruitt 1996; Herkert et al. 2002; Winter 1999; Monroe and Ritchison

2005; Giocomo et al. 2008). Henslow's Sparrows often raise two (on occasion three) broods of young per year (Hyde 1939; Robins 1971a; Monroe and Ritchison 2005; Giocomo et al. 2008). First clutches are normally completed by mid-to-late May, and second nests are frequently initiated in July and August (Hyde 1939; Robins 1971a). Hyde (1939), Robins (1971a) and Herkert et al. (2002) provide details of courtship, mating, incubating and brooding behaviors. Robins (1971b) detailed foraging patterns during the nestling period and compared foraging behavior of males versus females. Guzy et al. (2002) documented adults helping at a nest in Wisconsin, with two unbanded adults and one banded female feeding chicks.

Henslow's Sparrows are referred to by many authors as being "loosely colonial", "semi-colonial", or "somewhat colonial" because territories of breeding Henslow's Sparrows tend to be clumped, rather than uniformly distributed over nesting habitat. However, Smith (1992) cautioned that Henslow's Sparrows are not colonial in the true sense of the word (as applied to herons, gulls, etc.). He noted: "The 'clumping' of Henslow's Sparrow may be a secondary effect of the clumped nature of suitable habitat for this species in most situations." Males establish and maintain territories, primarily through song (Hyde 1939; Robins 1971a). Graber (1968) stated that territory boundaries "are not too rigid and may be violated occasionally."

Territory size estimates range from approximately 0.3 ha to 0.6 ha (Wiens 1969; Robins 1971a; Monroe and Ritchison 2005). Past research has shown that territory size can increase during the breeding season and may be related to density and the quality of the habitat (Robins 1971b; Monroe and Ritchison 2005). Several studies have estimated Henslow's Sparrow densities (for ease of comparison all estimates have been converted to the number of birds/100 ha). Robins (1971a) reported an average of 57 breeding pairs/100 ha based on records from 27 studies. Herkert (1994b) reported an average density of 20.8 males/100 ha on grasslands where the species was present in Illinois, while Winter (1999) found densities ranging from 55.6-91.9 males/100 ha in Missouri over three field seasons. Others have noted that density varies with grassland patch size. In Illinois, Harroff (2001) found densities of 28.3 birds/100 ha in CRP fields < 40 ha and 34.1 birds/100 ha in CRP fields > 40 ha, while annual density estimates from 1995 to 2005 at Big Oaks NWR in Indiana ranged from 40-80 males/100 ha in large grasslands (>50 ha), 30-60 males/100 ha in medium grasslands (10-50 ha), and 10-35 males/100 ha in small grasslands (<10 ha) (Joe Robb, Big Oaks NWR, unpublished data 2007). Hyde (1939) noted: "In fields inhabited by colonies of Henslow's Sparrows, the numbers of birds an acre may run rather high, but over any extensive area, taken as a whole, the population will be low because of the large amount of uninhabited land."

Some authors have suggested that the "colonial" nature of Henslow's Sparrow may account for its area-sensitivity. However, Herkert (1994a) observed that the colonial tendency of the species was unlikely to account for the avoidance of small grasslands. He noted that grassland areas (with suitable habitat) as small as 10-ha should be large enough for several pairs (based on territory size), and yet birds were regularly absent from grasslands larger than 10-ha in Illinois.

Limited data regarding site-fidelity in Henslow's Sparrow are available. In Kansas, none of 13 banded Henslow's Sparrows were recaptured the following year, even though the sites were still suitable and supported 37 territorial males (John Zimmerman, Kansas

State University, pers. com. from Pruitt 1996). Based on his work in Kansas, J. Zimmerman (pers. com. from Pruitt 1996) suspected that Henslow's Sparrows did not exhibit site-fidelity. In Minnesota, one bird banded in 1988 (5 birds banded in total) was recaptured at the same site in 1989 (Hanson 1994). Robins (1971a) banded 24 adult, 18 nestling, and two juvenile Henslow's Sparrows in Michigan in 1966 and had no returns the following year. At Fort Campbell, some color-banded birds returned the year following banding, and one bird recaptured in 2002 was banded as a nestling in 2000 (Jim Giocomo, University of Tennessee, unpublished data). At two study sites in Kentucky, Monroe and Ritchison (2005) relocated two of nine banded individuals and two or 28 individuals, respectively. Ingold et al. (2009) observed a 13% return rate for 114 individuals banded on reclaimed mine land in southeastern Ohio. Austen et al. (1995) noted that the absence of recaptures at banding sites does not necessarily indicate lack of site-fidelity.

Several authors have noted the tendency for local populations of Henslow's Sparrows to be unstable from year to year. Hyde (1939) stated: "It has been my experience as well as that of other observers that in certain localities the Henslow's Sparrow is well established as a breeder, whereas in other ones it is irregular, and its presence in a given season cannot be certainly predicted." Persistent breeding populations have been documented in some managed, protected areas (Birkenholz 1983; Drilling 1985; Zimmerman 1992; Herkert 1994a; Burhans 2002; Joe Robb, Big Oaks NWR, pers. com. 2007; Daniel Moss, Suckchon DZ, Fort Campbell, pers. com. 2007). As previously discussed, some researchers speculate that large grasslands are more likely than small grassland patches to sustain breeding populations.

Henslow's Sparrow nests are notoriously difficult to locate, but more recent studies have been successful in finding and monitoring nests. Based on limited data, apparent nest success rates have ranged from 40.0% to 57.6% (Robins 1971a; Reinking and Hendricks 1993; Winter 1999; Guzy 2005; Monroe and Ritchison 2005). Working in Michigan, Robins (1971a) found an apparent success of 54.5%, with six of 11 nests successfully fledging young. He did not document the causes of nest loss. In Oklahoma, Reinking et al. (2000) found that 10 of 22 nests were successful for a 45.4% apparent success rate (29% Mayfield rate). Winter (1999) reported an apparent nest success of 57.6% (37.5% Mayfield rate), with 34 of 59 nests successful in Missouri. Monroe and Ritchison (2005) found an apparent nest success of 61.7% (27.5% Mayfield rate) on reclaimed surface mine and unmined grasslands in Kentucky. Six of 15 nests were successful (40% apparent success) in a southwestern Wisconsin study, with eight nests depredated and one infertile (Guzy 2005). The daily nest survival rate for the study was 0.929 (S.E. = 0.022, 95% CI = 0.887-0.972), with nests having a 21.3% chance of fledging at least one chick. At Big Oaks NWR (1998-2001) in Indiana, apparent nest success was 54.8% (22% Mayfield); with 74 of 135 nests successful (Joe Robb, Big Oaks NWR, unpublished data 2007). At Fort Campbell (1999-2003) in Tennessee and Kentucky, apparent nest success was 58% (Mayfield 26.9%); with 65 of 113 nests successful (Moss 2001, Giocomo 2005, Giocomo et al. 2008).

There are scattered reports of nest parasitism by the Brown-headed Cowbirds (Hyde 1939; Robins 1971a; Reinking and Hendricks 1993; Zimmerman 1993; Austen et al. 1995; Winter 1999; Monroe and Ritchison 2005). Overall, parasitism rates appear to

be relatively low (Herkert et al. 2002). Monroe and Ritchison (2005) found one out of 37 nests parasitized in Kentucky; Guzy (2005) did not document any parasitism of 15 nests in southwestern Wisconsin; Winter (1999) found 5 of 59 nests in Missouri parasitized; two out of 22 nests were parasitized in Oklahoma (Reinking et al. 2000); and one out of 113 nests were parasitized at Fort Campbell (Giocomo et al. 2008). Overall, nest parasitism is probably low because nests are well hidden (Winter 1999). Austen et al. (1995) noted parasitism is low because the species probably co-evolved with the Brown-headed Cowbird and has adapted to avoid parasitism. The level of parasitism experienced by grassland birds may be related to the level of habitat fragmentation; rates of nest parasitism may be higher in small grassland patches compared to larger patches (Johnson and Temple 1990). Herkert (2003) found that the level of brood parasitism was more related to regional cowbird abundance than patch size, which has also been documented for forest-breeding birds (Robinson et al. 1993).

Limited information has been compiled on the frequency of predation of Henslow's Sparrow eggs or young. Robins (1971a) observed a thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*) preying on a young Henslow's Sparrow. Based on his observations of nesting Henslow's Sparrow, he concluded that: "Because of the continuous cover of the vegetation and secretive habits of Henslow's Sparrow... the most important enemies were probably mammals or snakes..." Hyde (1939) frightened a blue racer (*Coluber constrictor foxii*) from a Henslow's Sparrow nest in Michigan. Based on his observations, he concluded that snakes are probably the worst enemy of the Henslow's Sparrow. Graber (1968) noted that mustelids, raccoons (*Procyon lotor*), canids, opossums (*Didelphis virginiana*), and sciurids are potential predators of Henslow's Sparrows and/or their eggs, but added that no documentation was recorded in the literature. Feral cats are also potential predators; McPeck and Adams (1994) reported a Henslow's Sparrow killed by a cat. Researchers have documented increased nest predation with proximity to woody cover (Gates and Gysel 1978; Johnson and Temple 1990; Burger et al. 1994). Rates of nest predation on grassland birds may be higher in small grassland patches compared to larger patches (Johnson and Temple 1990). In a regional compilation of grassland bird nesting studies, Herkert (2003) found that daily predation rates decreased with increasing patch size for four species of grassland birds, including Henslow's Sparrow.

C. Food Habits

The diet of Henslow's Sparrow reflects its ground-foraging habits. Hyde (1939) evaluated the diet of Henslow's Sparrow based on the contents of 17 stomachs (12 adults and five young birds able to fly) collected between April and October. Animal and vegetable matter constituted 82% and 18% of the food found in the stomachs (by bulk), respectively. The percentage of animal matter in the diet exceeded 85% for the period April to September; two stomachs collected in October contained 9-15% animal matter. Hyde concluded: "It is nearly certain that if fall, winter, and early spring specimens had been examined in proportion to those collected in summer, the percentage of vegetable matter would have been much higher." Orthopterans made up 36% of the April-October diet (and more than 50% of the April-September diet). Coleoptera composed another

19%. A detailed account of stomach contents was provided by Hyde (1939). Hyde (1939) and Robins (1971b) published data on observations of food fed to nestling Henslow's Sparrows. In both studies, lepidopterous larvae and orthopterans were the most common foods of nestlings. Robins (1971b) provided details on feeding behavior and feeding rates. He also compared the foraging patterns of adult males and adult females during the nestling stage.

Until recently, there has been little research on winter diets of Henslow's Sparrows (Herkert et al. 2002). DiMiceli (2006) concluded through fecal analysis that Henslow's Sparrows are diet generalists on the winter range in southeastern Louisiana, with diets containing a variety of sedge/grass seeds and arthropods. The primary arthropods found in samples were Arachnids and insects from the orders Coleoptera, Hymenoptera, and Orthoptera. Captive feeding trials indicated that Henslow's Sparrows preferred seeds from fire-adapted grasses that are most common the winter following a growing season burn compared to seeds from species more common two years post-burn (DiMiceli et al. 2007). Stevenson and Anderson (1994) provided the following narrative on winter food habits for the species: "It forages on the ground, eating weed and grass seeds and smaller amounts of insects, spiders, myriapods, and snails." Oberholser (1974) noted: "The Henslow's eats seeds of grasses, sedges, ragweed, and smartweed, also berries; animal matter in its diet included insects (chiefly beetles, weevils, true bugs, caterpillars, grasshoppers, and crickets), spiders, and small mollusks."

VI. Population Objectives

Partners in Flight (PIF), in the North American Landbird Conservation Plan, estimated a range-wide population of 79,000 Henslow's Sparrows in 1995. The goal in the PIF plan was to double the population to 158,000 individuals (Rich et al. 2004). Goals in the PIF plan were to return bird populations to 1966 levels, which PIF believed was an achievable goal due to only 35 years of habitat loss (Rosenberg and Blancher 2005; Tom Will, U.S. Fish and Wildlife Service, pers. com. 2007). Annual population estimates (Figure 19), based on methods developed by Rosenberg and Blancher (2005) using BBS data, indicate that the current population is above the PIF population goal, with an estimated population of $\approx 191,000$ (127,000-328,000 95% C.I.) in 2006 (Wayne Thogmartin, USGS, unpublished data 2007).

At the HESP Workshop, Jim Herkert, TNC, presented a conceptual model of which management actions should be taken based on current population information for a species (Figure 20; Cooper 2007). Participants generally agreed that Henslow's Sparrows were somewhere between the recovery management and sustainable management boxes on the model, so the population goal should be to sustain the current population. As such, the population objective drafted at the Henslow's Sparrow Workshop was to **maintain a stable or increasing range-wide population trend as measured by the BBS and a stable or expanding distribution based on a current distribution map for the Henslow's Sparrow** (Cooper 2007). Workshop participants felt that continued population increases were not likely, especially with the predicted losses of CRP along with other threats to grassland habitat (Cooper 2007).

Geographic goals may be warranted to decrease the possibility of regional extirpation. However, participants were generally not in favor of establishing regional goals (i.e. by BCR or states). The group agreed that the plan should establish a range-wide goal, and that states, BCR working groups, and Joint Ventures should be responsible for establishing regional population goals through their own planning processes such as State Wildlife Action Plans (SWAP), BCR-scale conservation plans, and Joint Venture “all-bird” planning efforts.

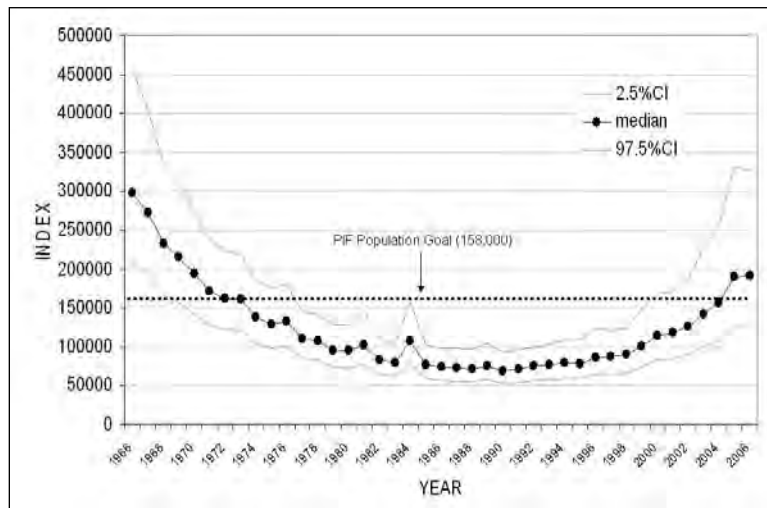


Figure 19. Population estimates and 95% confidence intervals for the Henslow’s Sparrow, 1966-2006, as calculated from BBS data using the methodology developed by Rosenberg and Blancher (2005) (Figure created by Wayne Thogmartin, USGS, and presented at the March 2007 Henslow’s Sparrow Workshop).

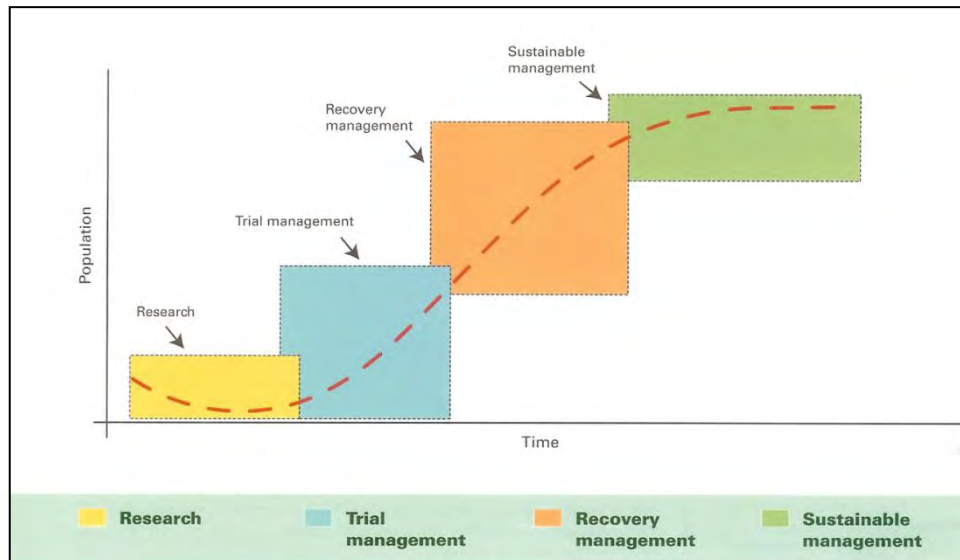


Figure 20. A conceptual model showing recommended management actions based on different population levels (from the Royal Society for the Protection of Birds, included in Herkert presentation at the March 2007 Henslow’s Sparrow Workshop).

VII. Henslow's Sparrow Conservation Action Items

The following breeding and wintering range action items were developed based on stakeholder input at the HESP Workshop. In each section, there are *Goals*, *Objectives* for achieving each goal, and *Tasks* for achieving each objective. A justification is listed for each objective in the breeding range action items and for each goal in the winter range section. Work has been completed on some of the objectives, so a progress section is listed under each objective where work has been completed. It should be noted that one goal is not necessarily more important than another goal; however, objectives under each goal are ranked by priority.

A. Breeding Range Action Items

1. Goal: Determine the current status and distribution of the Henslow's Sparrow throughout its breeding range.

1.1. Objective: Determine the status and distribution of breeding Henslow's Sparrow populations based on existing data sources and professional opinion, and identify important breeding sites.

Justification: Available data sources need to be examined to identify locations that are currently being used by Henslow's Sparrows throughout the breeding range. This is being done as part of the conservation action plan that is being developed and will be included in the state by state status assessment section of the plan. Identifying public areas with breeding populations will be important in the overall conservation of the species especially with the predicted declines in CRP habitat.

1.1.1. Task: Review and summarize existing data sources for Henslow's Sparrow distribution and status including: 1) BBS data; 2) Banding data; 3) National Wildlife Refuge (NWR) bird lists; 4) Research studies; 5) Birder listserves on the internet; 6) State Natural Heritage Databases; 7) State Breeding Bird Atlases; 8) Regional Waterbird Plans; 9) eBird Records; 10) state conservation department records and State Wildlife Action Plans; and 11) PIF Physiographic Region Plans

1.1.2. Task: Determine the current status of the Henslow's Sparrow on National Wildlife Refuges throughout its range by sending a survey to refuge biologists.

1.1.3. Task: Create a county-scale map for the entire breeding range showing the current distribution of the Henslow's Sparrow based on the best, currently available information.

1.1.4. Task: Identify high priority landscapes for conservation actions based on distribution data from tasks 1.1.1 through 1.1.3 and products from various modeling efforts (i.e.; Thogmartin 2006) to strategically focus conservation efforts for breeding Henslow's Sparrows. See Section 8 for tools to identify high priority landscapes.

Progress: A geodatabase has been developed for records from the data sources listed in Task 1.1.1. A Geographic Information System (GIS) was used to develop the maps in the State Status Assessment Section of this plan. In addition, an Excel spreadsheet was created for locations where Henslow's Sparrows have been documented during breeding and wintering seasons. Locations are primarily from the past 10-15 years (through 2007). The database is available at <http://www.fws.gov/midwest/MidwestBird/focalspecies>. The National Wildlife Refuge Survey has been completed and is summarized in the State Status Assessment Section. Collectively, this information can be used by resource agencies to help prioritize conservation actions for the species on a state by state basis until other actions recommended in objective 1.2 are completed. For more information on GIS data, please contact Tom Cooper, plan coordinator, at tom_cooper@fws.gov.

1.2. Objective: Complete a breeding atlas for the Henslow's Sparrow that assesses the current distribution and abundance of the species throughout its breeding range using volunteers from the birding community (modeled after a successful pilot project conducted in Tennessee).

Justification: Workshop participants indicated that completing a Henslow's Sparrow atlas project was one of the greatest needs for the species after maintaining CRP. Getting a better idea of distribution and abundance will enable better habitat association models to be developed and also direct conservation efforts especially with the projected loss of CRP acreage. The approach to collect the data is a unique approach using the birding community. This method was successfully used in Tennessee.

1.2.1. Task: Identify funding sources to support the atlas project.

1.2.2. Task: Identify variables to be measured/collected at survey locations (i.e., field size, vegetation type, GPS coordinates, and landownership).

1.2.3. Task: Use various resources (i.e., birder listserves and publications) to promote the project and recruit volunteers from the birding community.

1.2.4. Task: Create a database for storing and spatially displaying data.

1.2.5. Task: Analyze data and create habitat models which relate bird presence/abundance to habitat variables at multiple spatial scales.

1.2.6. Task: Create spatially explicit maps identifying potential habitat for the Henslow's Sparrow which can be used to guide future conservation actions.

1.2.7. Task: Assess protection level of sites with significant breeding populations.

Progress: A project assessing Henslow's Sparrow distribution, relative abundance, and habitat selection in the Central Hardwoods Bird Conservation Region (BCR 24) was completed in 2011 by researchers at the University of Tennessee (Lituma et al. 2011). The final report from the project includes maps showing distribution and estimates of abundance across BCR 24. Work has yet to be completed for other BCRs within the Henslow's Sparrow breeding range.

2. **Goal:** Improve our understanding of Henslow's Sparrow population demographics and how they are affected by differing habitat management regimes and landscape changes across the species breeding range.

2.1. **Objective:** Better understand the relationship between the Henslow's Sparrow and landscape changes associated with Farm Bill programs, dynamic commodity markets, and corn-based ethanol production.

Justification: Data have shown that the increasing population trend for the Henslow's Sparrow is correlated to the amount of CRP on the landscape. Acreage enrolled in CRP is likely to decline and expiring contracts are likely not to be re-enrolled as a result of high commodity prices related to the current demand for corn-based ethanol. As such, we need to determine the potential impact of CRP loss on Henslow's Sparrow populations.

2.1.1. **Task:** Model the impact of projected CRP loss on Henslow's Sparrow populations under potential scenarios using population and habitat requirement parameters from the literature.

2.1.2. **Task:** Generate products that communicate the results of the modeling project including presentations, written reports, and maps.

Progress: A map of projected CRP loss across the breeding range has been created using data released by the USDA Farm Service Agency. The impact of this loss on the Henslow's Sparrow was modeled and presented at the 2007 Midwest Fish and Wildlife Conference in Madison, Wisconsin.

2.2. **Objective:** Determine the productivity (i.e., nest success, recruitment) of the Henslow's Sparrow in different habitat types under different management regimes from across the species' range.

Justification: As reported in the plan, many studies have looked at breeding habitat requirements of the Henslow's Sparrow. However, many gaps in our knowledge of the species still exist. Gaps identified by Herkert et al. (2002) include reproductive success under differing management regimes, broods per breeding season, lifespan, and annual survivorship. He noted that nearly all research to date has documented changes in abundance in relation to management actions, but little research has looked at how reproductive success is affected by management. Getting a better idea of what factors influence reproductive success is important, especially with the projected CRP losses. Managers will have to maximize reproduction on remaining protected grasslands in order to maintain current populations. Identifying management variables that increase reproductive success will help reach the population objective of this plan, which is to maintain a stable or increasing population trend for the species. A recommendation from the HESP Workshop was that research should be conducted in different regions because of the variability of habitat and land uses across the species' range.

2.2.1. **Task:** Identify priority landscapes in which to assess productivity and how it relates to management regimes.

- 2.2.2. **Task:** Develop a study protocol that will allow comparison of study results from different regions within the species range.
- 2.2.3. **Task:** Identify potential investigators and funding sources to conduct studies in the selected landscapes.
- 2.2.4. **Task:** Generate products that communicate the results of the productivity studies including presentations, written reports, and maps.
- 2.2.5. **Task:** Update existing management guidelines based on the results of completed studies.

Progress: This objective should be coordinated by the Eastern Grassland Bird Working Group, whose formation is recommended in the plan, and with existing grassland bird research programs. The Migratory Bird Program in Region 3 has recently funded research studying the effects of patch-burn grazing management on grassland birds including Henslow’s Sparrows.

3. **Goal: Protect, restore, maintain, and manage grassland habitats that are needed to sustain a stable or increasing Henslow’s Sparrow population across its breeding range.**

3.1. **Objective:** Maintain current CRP acreage that is enrolled in grassland bird-friendly conservation practices.

Justification: The main conservation priority identified for breeding Henslow’s Sparrows was to maintain current Farm Bill conservation programs (primarily CRP). As indicated in the plan, CRP likely played a role in reversing the long-term declines experienced by the species. Losing significant acres of CRP habitat could potentially lead to population declines much like the declines experienced when the Soil Bank program expired in the 1960’s. Considerable acres of CRP could be lost due to changes in the CRP program or from low enrollment rates due to high commodity prices resulting from the current demand for corn to make ethanol.

- 3.1.1. **Task:** Promote the importance of CRP for Henslow’s Sparrows and other grassland birds throughout their breeding range.
- 3.1.2. **Task:** Design a fact sheet showing the importance of CRP to Henslow’s Sparrows based on peer reviewed studies.
- 3.1.3. **Task:** Distribute fact sheet to policy makers, the media, conservation partners, and other audiences to gain support for maintaining or increasing the current acreage of CRP in grassland bird-friendly practices.
- 3.1.4. **Task:** Work with other groups to encourage equitable CRP rental rates that keep pace with cropland rental rates.

Progress: A fact sheet was designed and distributed to conservation partners. A copy is available at <http://www.fws.gov/midwest/MidwestBird/FocalSpecies/>.

- 3.2. Objective:** Implement a financial incentive program that provides additional income for landowners who enroll or re-enroll land into grassland CRP practices in high priority landscapes for the Henslow's Sparrow.

Justification: Current CRP rental rates are not competitive with current cropland rental rates. Cropland rental rates for farming are projected to continue to increase. If CRP payments do not keep pace, additional incentives from outside sources may be needed to get landowners enrolled.

- 3.2.1. Task:** Conduct a socio-economic study throughout the breeding range to determine what incentives are needed for landowners to enroll in Farm Bill conservation programs that provide habitat for Henslow's Sparrows and other wildlife.
- 3.2.2. Task:** Identify funding sources and partners to provide incentives for landowners who enroll or re-enroll land into the CRP.
- 3.2.3. Task:** Identify high priority landscapes to implement incentive program(s) based on input from the Eastern Grasslands Working Group.

Progress: None. This objective should be coordinated by the Eastern Grassland Bird Working Group, whose formation is recommended in the plan. Incentive programs should be developed in key areas such as eastern Kansas, southwestern Wisconsin, southern Indiana/Illinois, and southern Iowa/northern Missouri.

- 3.3. Objective:** Promote the protection, restoration, and management of Henslow's Sparrow breeding habitat on public lands in high priority landscapes identified through the status assessment and modeling efforts.

Justification: Because of the projected CRP losses, management opportunities on public land should be maximized. This will require identifying these areas and working with managers to implement management actions that will benefit the species.

- 3.3.1. Task:** Using the best available information, identify opportunities to restore or enhance management of Henslow's Sparrow habitat on public lands in high priority landscapes.
- 3.3.2. Task:** Work to educate public land managers in high priority landscapes about management and restoration strategies benefiting the Henslow's Sparrow. Accomplish this by distributing educational materials (brochures and websites) and holding regional workshops that present restoration and management guidelines for the Henslow's Sparrow and other grassland birds relying on similar habitat conditions.
- 3.3.3. Task:** Develop a strategy for prioritizing public land acquisitions that will benefit Henslow's Sparrows within high priority landscapes. Identify existing habitat and areas with high restoration potential. Target these lands for future acquisition from willing landowners.

- 3.3.4. **Task:** Within each priority area, identify financial and technical resources to assist in funding the protection, restoration, and management of habitat on public land.
- 3.3.5. **Task:** Develop performance standards and appropriate measurements of success for evaluating projects completed on public land. For example, conduct surveys on recently restored sites to see if Henslow's Sparrows are using the site. If they are using the site, consider further demographic studies to evaluate productivity.

Progress: This is an ongoing objective. Numerous sites with large breeding populations throughout the species breeding range are known (see state status assessments).

- 3.4. **Objective:** Promote the voluntary protection, restoration, and management of Henslow's Sparrow habitat on private lands that are near high priority public lands through existing private land conservation programs (i.e. Wetland Reserve Program, Conservation Reserve Enhancement Program, CRP, Partners for Fish and Wildlife).

Justification: Much of the land throughout the Henslow's Sparrow range is in private ownership. As such, conservation efforts also need to focus on private land in high priority landscapes.

- 3.4.1. **Task:** Based on the status assessment and modeling efforts, identify priority areas within each region for targeting private land habitat restoration projects and permanent habitat protection through available conservation easement programs.
- 3.4.2. **Task:** Develop an outreach program to educate the public about the concern for the Henslow's Sparrow and to highlight private land conservation opportunities to benefit the species. Education can be accomplished by working through state conservation magazines, issuing press releases, developing an informational website geared toward the public, and holding local conservation forums for private landowners in high priority landscapes.
- 3.4.3. **Task:** Identify conservation practices in existing conservation programs that are beneficial to the Henslow's Sparrow and highlight projects using these programs that have benefited the Henslow's Sparrow.
- 3.4.4. **Task:** Propose new conservation practices that will benefit the Henslow's Sparrow. Work to have them added as eligible practices under existing private land conservation programs.
- 3.4.5. **Task:** Based on the status assessment and modeling efforts, identify priority areas within each region for targeting private land habitat restoration projects and permanent habitat protection through available conservation easement programs.
- 3.4.6. **Task:** Hold regional workshops for local technical assistance providers in high priority landscapes (i.e., NRCS, SWCD, USFWS staff, State Conservation Departments) on how they can incorporate practices beneficial to the Henslow's Sparrow into conservation plans and restoration activities on private land.

- 3.4.7. **Task:** Develop performance standards and appropriate measurements of success for evaluating projects completed on private land (i.e., Conduct surveys on recently restored sites to see if Henslow's Sparrows are using the site. If they are using the site, consider demographic studies to evaluate productivity).
4. **Goal:** Establish Cooperation with non-traditional partners to create and manage habitat for breeding grassland birds including the Henslow's Sparrow.
- 4.1. **Objective:** Work with the developing cellulosic biofuel industry to create and manage habitat for breeding grassland birds including the Henslow's Sparrow.

Justification: Technology for using grassland vegetation to create biofuels is advancing rapidly. Tremendous potential exists to work with the industry to create habitat for grassland birds. As such, the grassland bird conservation community needs to be proactive in working with the industry.

- 4.1.1. **Task:** Establish a collaborative relationship with the developing cellulosic biofuel industry to ensure grassland bird habitat needs are incorporated into management practices.
- 4.1.2. **Task:** Develop a workshop to examine the value of biofuel production fields to grassland birds and identify best management practices for managing biofuel fields for grassland birds.
- 4.1.3. **Task:** Identify research opportunities with the biofuel industry that study the effects of different harvest strategies and vegetation mixes on grassland birds including the Henslow's Sparrow.

Progress: The University of Minnesota hosted a conference in July 2007 entitled *Biofuel Production and Wildlife Protection*. Presenters from the workshop are working on a summary of the workshop that will be submitted for publication in a peer reviewed journal. Relationships with the developing industry need to be created and studies need to be implemented through the Eastern Grasslands Working Group.

- 4.2. **Objective:** Work with the coal mining industry to create and manage habitat on reclaimed surface mine sites for breeding grassland birds including the Henslow's Sparrow.

Justification: Little management is done on reclaimed strip mines after they are reclaimed through grass planting. Workshop participants felt that strip mine habitats could support higher densities of Henslow's Sparrows if they were more intensely managed. Identification of important reclaimed mine sites for grassland bird conservation needs to be considered in the context of other bird initiatives since many of the reclaimed sites are in landscapes that were historically forested.

- 4.2.1. **Task:** Identify reclaimed strip mines that are important to Henslow's Sparrow conservation and do not conflict with management priorities for other bird species of concern.

- 4.2.2. **Task:** Assess management needs (i.e., tree removal, prescribed burning) for each area identified and cooperate with managers to implement the appropriate actions for maintaining quality grassland bird habitat at these locations.
- 4.2.3. **Task:** Identify funding sources to implement prescribed management practices (i.e., prescribed burning or mowing) in cooperation with parties managing reclaimed surface mines.

Progress: Recent studies, cited in the plan, have documented the presence of Henslow's Sparrow on sites from Pennsylvania, Indiana, Kentucky, West Virginia, and Ohio. The Eastern Grassland Bird Working Group, when formed, could prioritize the most important sites for grassland bird conservation and develop a strategy for cooperating with landowners to protect and manage these sites.

B. Winter Range Action Items

1. **Goal:** Assess the current status and distribution of wintering Henslow's Sparrows, as well as, the distribution of important wintering habitat.

Justification: In the short-term, available data sources should be used to identify important areas for wintering Henslow's Sparrows. The important areas identified can then be used to prioritize the protection, management, and restoration of habitat. Workshop participants felt an important next step was to create an atlas of their distribution. A strategic way to do this may be to first assess the distribution of longleaf pine. The importance of longleaf pine savanna habitat for wintering Henslow's Sparrows was evident from the workshop discussion. The historic range of longleaf pine and the winter range of Henslow's Sparrows are highly correlated. As such, the first step in better assessing the status and distribution of Henslow's Sparrows should be to determine the distribution of remaining longleaf pine habitat. Once the distribution of longleaf pine is known, areas with longleaf pine habitat should be surveyed to see if Henslow's Sparrows use these areas (focus on likely habitat where Henslow's Sparrows have not been documented in the past especially in the northern extent of the winter range). Other habitats used by Henslow's Sparrows, such as power line right-of-ways, should also be surveyed to assess the importance of secondary habitats.

- 1.1. **Objective:** Assess the current winter distribution of Henslow's Sparrow based on available data sources.
- 1.1.1. **Task:** Examine current data sources (Christmas Bird Count data, a range-wide refuge survey, research studies, birder Listserve records, and personal communications) for winter records.
- 1.1.2. **Task:** Use GIS to map Henslow's Sparrow location records at a county scale.
- 1.2. **Objective:** Assess the current distribution of longleaf pine in the wintering range of the Henslow's Sparrow.

- 1.2.1. **Task:** Work with state agencies, federal agencies, and other conservation organizations to develop an updated GIS coverage of longleaf pine distribution in the wintering range of Henslow’s Sparrows.
- 1.2.2. **Task:** Use GIS coverage to identify longleaf pine landscapes where Henslow’s Sparrows may be present but have not been documented.
- 1.3. **Objective:** Survey high-probability longleaf pine landscapes to determine the presence or absence of Henslow’s Sparrows.
 - 1.3.1. **Task:** Work with a statistician to develop a sampling protocol for surveying identified landscapes, including the identification of local scale habitat variables to measure while conducting surveys.
 - 1.3.2. **Task:** Identify funding sources to conduct surveys in high-probability landscapes.
 - 1.3.3. **Task:** Recruit researchers/volunteers to survey identified landscapes for the presence of Henslow’s Sparrows.
 - 1.3.4. **Task:** Create a central database for entering and storing survey data.
 - 1.3.5. **Task:** Analyze data and construct a predictive model for identifying important wintering habitat for Henslow’s Sparrows.
- 1.4. **Objective:** Assess Henslow’s Sparrow use of secondary habitat types throughout its wintering range.
 - 1.4.1. **Task:** Identify other habitats (i.e., power line right-of-ways) important to Henslow’s Sparrows based on the opinion of Henslow’s Sparrow Wintering Range Working Group members.
 - 1.4.2. **Task:** Work with a statistician to develop a sampling protocol for surveying identified landscapes including the identification of local scale habitat variables to measure while conducting surveys.
 - 1.4.3. **Task:** Identify funding sources to conduct surveys in high-probability landscapes.
 - 1.4.4. **Task:** Recruit researchers/volunteers to survey identified landscapes for the presence of Henslow’s Sparrows.
 - 1.4.5. **Task:** Create a central database for entering and storing the survey data.
 - 1.4.6. **Task:** Analyze data and assess the importance of secondary habitats to wintering Henslow’s Sparrows.

2. **Goal:** Improve our understanding of the connectivity between breeding and wintering areas for Henslow's Sparrows.

Justification: Studies to date have been inconclusive for connecting breeding and wintering areas. Understanding the connectivity between areas may be important to the overall management of Henslow's Sparrows. Determining if there are linkages will help guide habitat protection, management, and restoration activities on a landscape scale especially with the apparent Henslow's Sparrow breeding range shift/expansion to the north and west of its historic breeding range. For example, will the western breeding range expansion require more protection of wintering habitat in the western portion of the wintering range?

- 2.1. **Objective:** Determine if there are links between the breeding and wintering range for Henslow's Sparrows.
 - 2.1.1. **Task:** Continue stable isotope analysis on wintering populations of Henslow's Sparrows using new techniques and additional isotopes to determine the origin of birds wintering in selected locations.
 - 2.1.2. **Task:** Implement a large-scale banding program to document spatial and temporal patterns of Henslow's Sparrow movements in designated geographic areas across their range (both breeding and wintering).

3. **Goal:** Maintain or increase the current use of prescribed fire to manage longleaf pine savanna habitat for wintering Henslow's Sparrows.

Justification: Research has shown that Henslow's Sparrow density is greatest in longleaf pine habitat the year after a growing season burn and declines in following years. Workshop participants felt one of the top wintering ground priorities was to maintain or increase the use of prescribed fire to maintain longleaf pine savanna, which is the primary wintering habitat for Henslow's Sparrows. The limiting factors for maintaining or increasing prescribed burning are the number of qualified burn bosses and public/government opposition to prescribed burning. More research is also needed on the effects and behavior of growing season fires. Many fuel models exist for the behavior of dormant season fires, however, knowledge of growing season fires is lacking.

- 3.1. **Objective:** Increase the number of qualified burn bosses for conducting prescribed burns to manage winter habitat for Henslow's Sparrows.
 - 3.1.1. **Task:** Meet with agencies (USFWS, U.S. Forest Service, and state conservation agencies) conducting prescribed burns to emphasize that there is a shortage of qualified burn bosses for conducting the complex burns required to manage winter habitat for Henslow's Sparrows and other birds requiring similar habitat.
 - 3.1.2. **Task:** Develop a multi-agency strategy for recruiting and training more qualified burn bosses for conducting the complex burns required to manage winter habitat for Henslow's Sparrows and other birds requiring similar habitat.
- 3.2. **Objective:** Educate the public and state/local governments about the importance of prescribed burning as a wildlife habitat management tool for maintaining longleaf pine savanna.

- 3.2.1. **Task:** Develop an educational brochure and informational website outlining the importance of prescribed burning to the longleaf pine ecosystem and Henslow’s Sparrows. Distribute brochures to state/local governments and the public.
- 3.2.2. **Task:** Send press releases to area newspapers about the importance of prescribed burning to the longleaf pine ecosystem and Henslow’s Sparrows.
- 3.2.3. **Task:** Hold “neighborhood gatherings” in high priority landscapes to highlight the benefits of using prescribed fire as a wildlife habitat management tool.
- 4.3. **Objective:** Enhance our understanding of complex, growing season prescribed burns in longleaf pine savanna.
 - 4.3.1. **Task:** Identify a principal investigator to design a study examining the effects and behavior of growing season fires in longleaf pine savanna.
 - 4.3.2. **Task:** Identify funding sources for conducting research.
 - 4.3.3. **Task:** Analyze data and develop better fire behavior models for complex growing season burns in longleaf pine habitat.
- 4. **Goal: Protect, manage, and restore longleaf pine savanna habitat for wintering populations of Henslow’s Sparrows.**

Justification: Longleaf pine habitat is the primary habitat used by wintering Henslow’s Sparrows. As such, it is critical to maintain or increase the amount of longleaf pine habitat in areas important to Henslow’s Sparrows. After important areas are identified, we need to work with public and private landowners in these areas to protect, manage, and restore longleaf pine habitat.

- 4.1. **Objective:** Identify high priority landscapes for winter habitat protection, management, and restoration based on existing knowledge and products generated from future range-wide surveys.
 - 4.1.1. **Task:** Have the Henslow’s Sparrow Wintering Range Working Group identify high priority landscapes for protecting, managing, and restoring longleaf pine savanna habitat (based on current knowledge of Henslow’s Sparrow habitat requirements and distribution).
 - 4.1.2. **Task:** Periodically update the priority areas based on new data collected during surveys and studies recommended in the Research and Monitoring action items.
- 4.2. **Objective:** Promote public land management and restoration of longleaf pine savanna within high priority landscapes identified by working group members.
 - 4.2.1. **Task:** Determine the location and amount of existing/restorable longleaf pine savanna on public lands in high priority landscapes. Contact managers of these lands about potential projects for longleaf pine savanna management.

- 4.2.2. **Task:** Identify funding sources to assist in the management and restoration of longleaf pine on public lands by working with other groups with similar habitat goals (i.e. Quail Forever, Quail Unlimited, and the Longleaf Alliance).
 - 4.2.3. **Task:** Work with public land managers to incorporate conservation practices for Henslow’s Sparrows by creating a brochure and informational website containing guidelines for managing and restoring longleaf pine savanna habitat.
 - 4.2.4. **Task:** Hold public land manager workshops or create forums to discuss management and restoration techniques of longleaf pine savanna.
 - 4.2.5. **Task:** Develop performance standards and appropriate measurements of success for habitat restoration and management projects on public lands.
- 4.3. **Objective:** Promote the protection, restoration, and management of longleaf pine savanna on private property in high priority landscapes through voluntary private land programs.
- 4.3.1. **Task:** Work with private landowners to restore or manage longleaf pine savanna by providing technical assistance and cost-share programs.
 - 4.3.2. **Task:** Hold landowner forums highlighting technical assistance and cost-share programs that are available for restoring longleaf pine savanna.
 - 4.3.3. **Task:** Identify funding sources to assist in the management and restoration of longleaf pine on public lands by working with other groups with similar habitat goals (i.e. Quail Forever, Quail Unlimited, and the Longleaf Alliance).
 - 4.3.4. **Task:** Promote the implementation of the United States Department of Agriculture’s (USDA) CRP Conservation Practice CP3A (longleaf pine tree planting).
 - 4.3.5. **Task:** Develop or use existing conservation easement programs to permanently protect existing and restored longleaf pine savanna.
 - 4.3.6. **Task:** Develop performance standards and measurements of success for all habitat restoration and management projects on private lands.

VIII. Strategic Conservation for Henslow’s Sparrows

Action items identified in the previous section should be strategically implemented in high-priority landscapes. High-priority landscapes should be delineated following “The Five Elements Process”, which is an adaptive process developed by Partners in Flight (Will et al. 2005). The five components of the process, with a brief explanation of each component, are:

- 1) **Landscape Characterization** – What habitats are important, where are they located on the current landscape, in what amounts, and in what condition;
- 2) **Bird Population Response Modeling** – Based on the best science, how do we think bird populations will respond to current landscape/habitat conditions as well as proposed management alternatives? How do population goals translate into habitat goals ;
- 3) **Conservation Opportunities Assessment** – Where do opportunities for habitat protection, management, or restoration exist based on current landscape conditions? Who are the main partners within a landscape?;
- 4) **Optimal Landscape Design** – How can we bring together conservation strategies for a diverse array of species with different habitat requirements and design landscapes beneficial to all species in a particular area? What are the priority species, landscape capabilities, and costs?;
- 5) **Monitoring and Evaluation** – We need to monitor in order to measure the success of habitat projects in order to evaluate our assumptions that were used to make decisions in the previous four steps. Performance-based objectives need to be developed that can be measured.

To date, several planning efforts have utilized various components of “The Five Elements Process” to identify high-priority landscapes for Henslow’s Sparrow or overall grassland bird conservation within the Henslow’s Sparrow breeding range. These efforts include a model predicting Henslow’s Sparrow abundance throughout BCR 23 (Thogmartin et al. 2006); a landbird habitat conservation strategy developed by the Upper Mississippi River and Great Lakes Joint Venture (Potter et al. 2007); and a model developed by Giocomo (2005) that assesses grassland bird conservation potential in counties located in the eastern United States. A brief description of each project is presented in the following sections.

BCR 23 Henslow’s Sparrow Model

Thogmartin et al. (2006) developed a hierarchical Bayesian spatial count model for Henslow’s Sparrow using BBS data from BCR 23. Observer, temporal, and environmental effects along with other sources of variation were built into the model. Environmental variables, with direction of relationship (+ or -), entering into the final model were: 1) Area-weighted grass patch size (+); 2) Total forest composition (+); 3) Mean temperature during driest season (-); 4) Total warm season precipitation (+); 5) Coefficient of variation in annual precipitation (-); 6) Modified Simpson’s diversity index (+); and 7) Forest composition by grass patch size interaction (+). The area with the highest predicted abundance in BCR 23 occurred in southwestern Wisconsin (Figure 21).

Based on the abundance model, Rohweder and Thogmartin (2007) developed a “Conservation Estate Portfolio” for the Henslow’s Sparrow in BCR 23. In the portfolio, they identified the “Top 10 Hotspots” (Figure 21) of peak predicted abundance and

assessed conservation potential within each hotspot based on the amount of state, federal, and tribal lands present. Rohweder and Thogmartin (2007) stated, “identifying these land management authorities relative to areas in which the species is most abundant may help to focus conservation resources in those areas in which they may do the most good.” Detailed maps of each hotspot are contained in the portfolio. In addition, they report on the amount of managed and unmanaged land (i.e. private land) found in each hotspot.

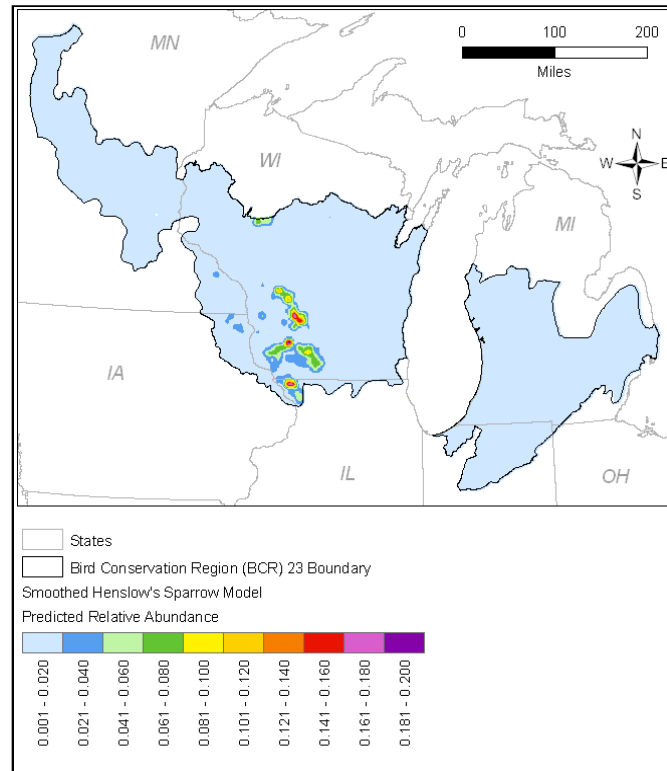


Figure 21. Predicted Henslow’s Sparrow relative abundance within BCR 23 – Prairie Hardwood Transition (Thogmartin et al. 2006).

Upper Mississippi River and Great Lakes Model

The Upper Mississippi River and Great Lakes Region Joint Venture (JV), as part of its all-bird planning efforts, developed a *Landbird Habitat Conservation Strategy* (Potter et al. 2007). The strategy was developed to “step-down” national and ecoregion priorities to the JV and other manageable scales within the region. Potter et al. (2007) stated, “The strategy goal is to establish efficient habitat conservation to maintain or increase carrying capacity for populations of priority landbird species consistent with continental and JV regional goals”. Assessments were completed for 24 focal species with different habitat requirements in the JV area, including the Henslow’s Sparrow. Henslow’s Sparrow habitat suitability was derived from the 1992 National Land Cover Dataset, with larger grassland patches deemed more suitable to Henslow’s Sparrows. For specifics on development of the suitability model, consult the *Landbird Habitat Conservation Strategy* available online at

http://www.uppermissgreatlakesjv.org/docs/UMRGLR_JV_LandbirdHCS.pdf.

Areas with the highest predicted suitability occurred in eastern Kansas, northeastern Oklahoma, southwestern Wisconsin, and southwestern Missouri (Figure 22). Other areas showing lower suitability include southern Iowa/northern Missouri and southern Illinois/Indiana (Figure 22).

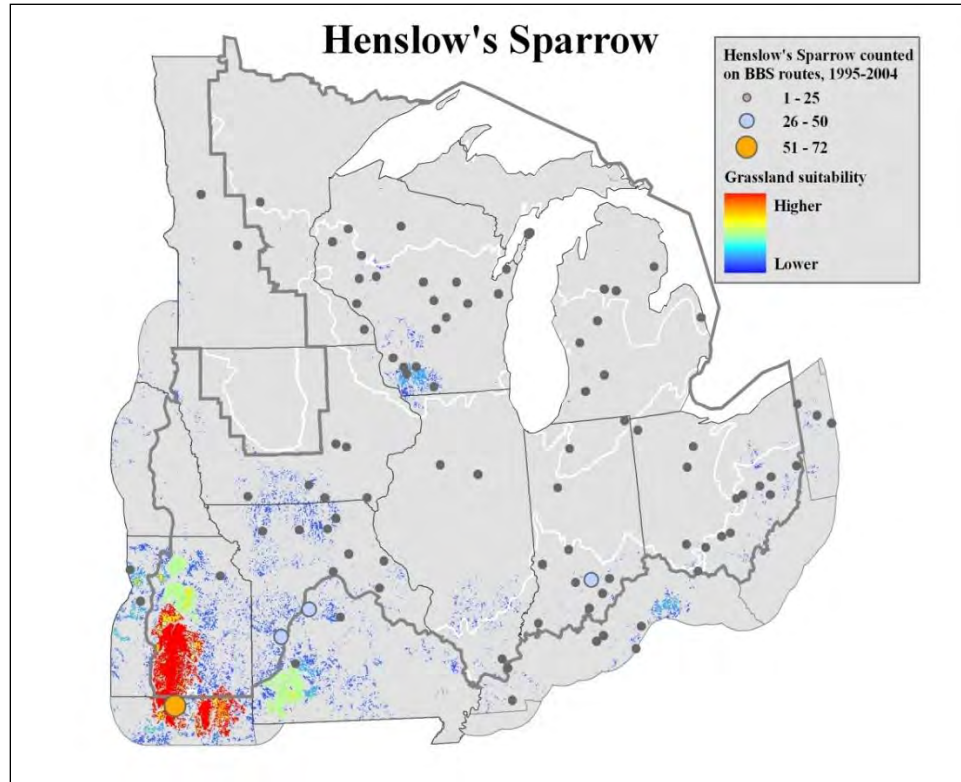


Figure 22. Predicted grassland suitability for the Henslow's Sparrow within the Upper Mississippi River and Great Lakes Region Joint Venture (Potter et al. 2006).

Eastern U.S. Grassland Bird Conservation Potential Model

At the HESP Workshop, Jim Giocomo from the University of Tennessee presented results of analysis that assessed grassland bird conservation potential in the eastern United States (Cooper 2007). The project was completed as part of an effort to determine the conservation value of Department of Defense managed lands for breeding and wintering grassland birds (Giocomo 2005; Giocomo and Buehler 2005). Reclassified U.S. Geological Survey (USGS) National Land Cover Data was used to assess landscape potential for grassland birds. The county-scale model shows management potential based on the amount of grass in each county. Areas with the highest conservation potential within the Henslow's Sparrow breeding range in the eastern U.S. include: 1) southwestern Wisconsin; 2) the tri-state region where Illinois, Indiana, and Kentucky meet; 3) western New York; and 4) a band through the eastern part of Ohio (Figure 23).

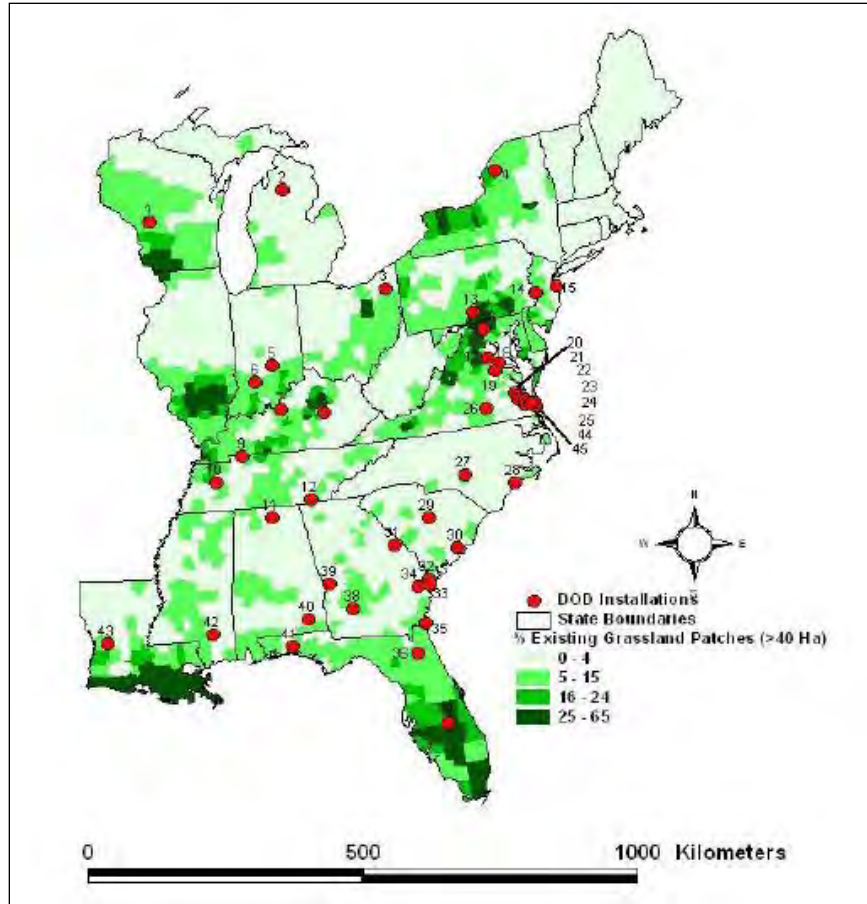


Figure 23. Proportion of existing large (>40 ha) grassland patches in the eastern United States by county (Giocomo and Buehler 2005).

Each of the models presented represent a starting point for implementing breeding ground conservation actions identified in Section VII. These models should continue to be evaluated and refined as more information becomes available. In addition, spatially explicit models similar to the one developed by Thogmartin et al. (2006) for BCR 23 should be developed for other BCRs within the breeding range as well as for the winter range. Another tool that can be used to further focus conservation efforts at a state scale are State Wildlife Action Plans (SWAP). Many SWAPs have already identified where the best management opportunities exist for grassland birds including the Henslow’s Sparrow (see state status assessments in Section X and a bibliography of SWAPs in Appendix B).

IX. Conclusions and Next Steps:

Overall, the Henslow's Sparrow population is currently above the PIF population goal for the species based on estimates derived from the BBS. However, regional concerns still exist, particularly in the northeast part of its breeding range where populations continue to decline. Evidence suggests that the recent increasing trend is related to the creation of breeding habitat through Farm Bill conservation programs such as CRP. The species reliance on CRP grasslands is also why the future status of the species is still vulnerable. CRP is a short-term program (10- to 15-year contracts) that faces an uncertain future with changing agricultural policies and dynamic commodity markets. Loss of considerable acreage could result in population declines much like those experienced prior to the mid-1980s. In order to maintain CRP on the landscape, the disparity between CRP rental rates and cropland rental rates needs to be corrected through increased CRP payments or landowner incentives from outside entities.

Conservation of the species cannot rely on CRP alone. It should follow a two-tiered approach that stresses the importance of Farm Bill conservation programs in maintaining current populations, while also identifying opportunities for long-term protection, restoration, and management of habitat on public and private land in high priority landscapes identified through recent and proposed modeling projects. Additionally, those interested in grassland bird conservation should continue to investigate partnerships to cooperate with private industry to incorporate grassland bird-friendly conservation on working lands. Two such opportunities are with the developing cellulose-based biofuel industry and by creating grassland habitat on reclaimed surface mine in partnership with the coal industry.

Participants at the HESP Workshop recognized that the threats, knowledge gaps, and conservation needs of the Henslow's Sparrow are not unique among grassland birds (Cooper 2007). The actions identified in the plan will likely benefit the entire suite of grassland birds requiring similar habitat conditions and facing similar threats. Therefore, participants at the HESP Workshop recommended the formation of an *Eastern Grassland Bird Working Group* to foster partnerships benefitting grassland birds in the eastern United States and Canada. The formation of such a working group will allow future research needs to be assessed and coordinated as well as provide direction for the action items presented in the plan. The first priority of the working group should be the identification of high-priority landscapes for focusing the conservation actions recommended in Section VII of the plan. The tools identified in Section VIII should be used to choose high-priority landscapes. Furthermore, the working group could provide habitat management recommendations to land managers in the eastern United States and Canada by developing educational materials and organizing regional workshops. Membership in the working group should include managers and researchers from conservation agencies (federal, state, and local), academic institutions, private industry, and non-governmental conservation organizations.

X. State Status Assessment

Key to the State Status Assessment Section:

Bird Conservation Regions: List of Bird Conservation Regions where the species occurs in the state.

State Status: Based on state threatened and endangered species lists.

Species of Greatest Conservation Need: If yes, the Henslow's Sparrow is listed as a species of greatest conservation need (SGCN) in the State Wildlife Action Plan (SWAP) for that state. A brief description of primary threats, conservation action items, and/or important areas listed in the plan is presented. For specifics, consult each state's SWAP. A bibliography of SWAPs is located in Appendix B.

Natural Heritage Rank: Subnational conservation status rank of the Henslow's Sparrow in the state. SX = Presumed Extirpated, SH = Possibly Extirpated (Historical), S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure, S5 = Secure, SNR = State Conservation Status Not Yet Assessed, SNA = Not Applicable. Qualifiers: B= Breeding, N=Non-Breeding.

Breeding Bird Survey: A summary of Henslow's Sparrow Breeding Bird Survey records for the state through the 2006 survey year. Population trends for states with suitable data are presented. Any trend that contains zero in the 95% credible interval is considered non-significant.

CBC Survey: Provides a summary of Henslow's Sparrow Christmas Bird Count Records for the state through count year 106 (2005-2006). Data were provided by the National Audubon Society (2002).

Breeding Bird Atlas: The citation for the BBA is listed and is followed by a summary of BBA data for states that have completed a BBA project. Many of the data for plotting locations in GIS were provided by Bruce Peterjohn (USGS), state conservation agencies, or state ornithological organizations.

National Wildlife Refuge Survey: Provides a summary of a survey that was sent to NWR biologists to assess the status of the Henslow's Sparrow on refuges within its range in the United States.

Other Sources: Provides a summary of specific studies, surveys, or other sources specific to the state. Also identifies sites where Henslow's Sparrows have been observed over multiple years over the past ten years based on birder records from the internet.

Map: Is a compilation of available data sources showing the distribution of Henslow's Sparrow records and counties with recent records (highlighted in blue) from 1996-2006. Maps for Illinois, Indiana, Iowa, Kentucky, Missouri, and Tennessee also include counties where birds were recorded during a 2008-2009 Henslow's Sparrow Atlas Project (David Buehler, University of Tennessee, unpublished data). Counties with recent records that contain no points were identified from eBird records, birder listserv records, and/or personal communications. Data Sources: 1) BBA = Breeding Bird Atlas Data; 2) BBS = Breeding Bird Survey data; 3) BBL = Bird Banding

Lab records; 4) CBC = Christmas Bird Count Data; 5) NWR = National Wildlife Refuge Bird List; and 6) NHI/State = data from state specific surveys or State Natural Heritage Inventories.

Connecticut Status

Bird Conservation Regions: 14, 28, and 30 **State Status:** Extinct

Natural Heritage Rank: SHB

Species of Greatest Conservation Need: No

BBS: No records of Henslow's Sparrow.

BBA: (Bevier 1994) No records of Henslow's Sparrow during the BBA project conducted from 1982 through 1986.

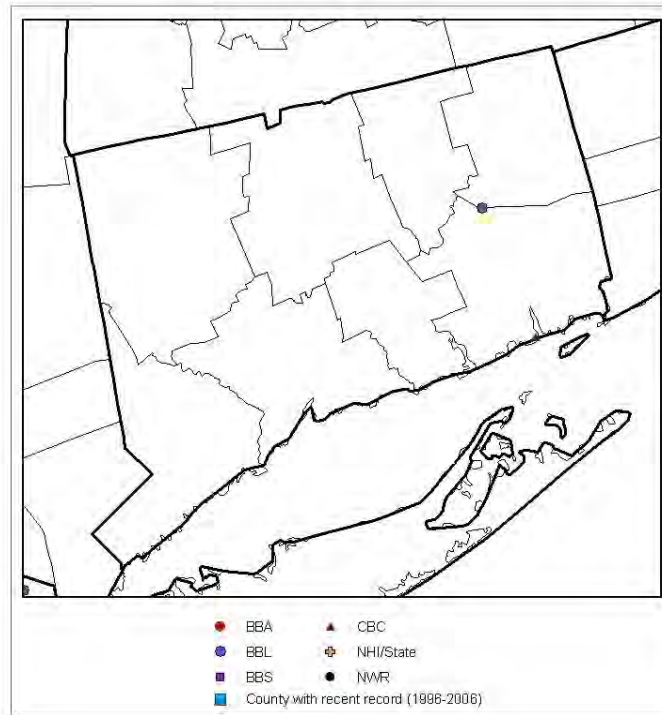
National Wildlife Refuge Survey: Stewart B. McKinney and Silvio O. Conte NWRs indicated that the species does not occur on the refuge. However, the bird list for Stewart B. McKinney lists the species as very rare for the Great Meadows and Salt Meadow Units but data is not available to confirm historic sightings. According to the Connecticut Grassland Working Group, Henslow's Sparrows were extirpated as a nesting species from the state in the 1950's.

Birder Listserve Records: None

Research: None

Other: Natural Diversity database files indicated only historic records of Henslow's Sparrow in Connecticut (Nancy Murray, Connecticut Dept. of Environmental Protection, pers. com.). The database includes six Henslow's Sparrow records for the period 1881-1939. By the early 1900's it was considered a rare nester; the last nesting record was in 1939 (Jenny Dickson, Connecticut Dept. of Environmental Protection, pers. com.). Historic records indicate the species may have been a fairly common breeder in the northern part of the state (Saunders 1922). Zeranski and Baptist (cited *in* Smith 1992) considered the species extirpated from Connecticut as a nesting species but reported observations of "nonbreeding singing males" in 1968 and 1985. The species was not recorded at 34 sites surveyed during a regional inventory of grassland birds in New England conducted between 1997 and 2000 (Jones et al. 2001).

Summary: Henslow's Sparrow historically bred in the state and is now considered extirpated.



Delaware Status

Bird Conservation Regions: 30 **State Status:** Extinct

Natural Heritage Rank: SHB, S1N

Species of Greatest Conservation Need: Yes, the species is listed as a SGCN for early successional upland habitats, of which there is an estimated 25,198 acres in the state with 31% protected. Threats to habitat include development, agriculture, transportation, fire suppression, and invasive species.

BBS: In the history of the BBS (1966-2006), two Henslow's Sparrows have been recorded on two routes in Delaware. Both records are from 1978.

BBA: (Hess et al. 2000) No records of Henslow's Sparrow during the 1983-87 BBA project.

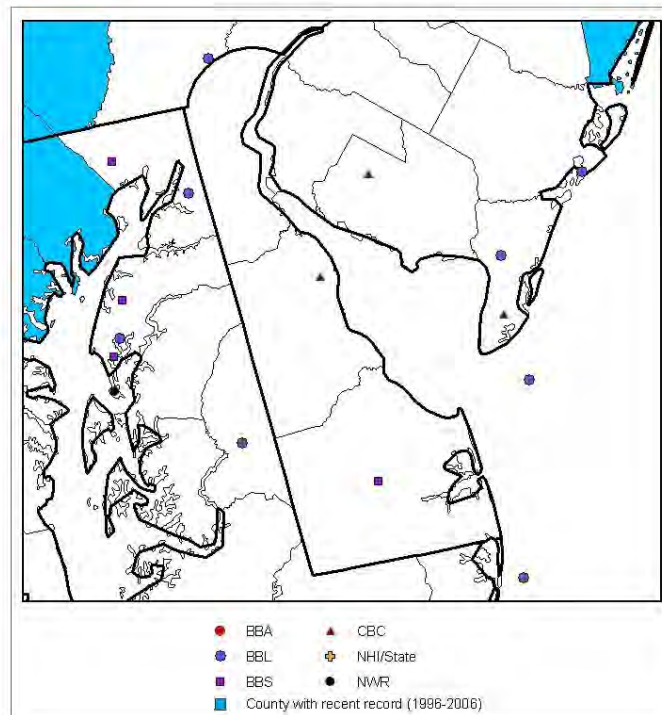
National Wildlife Refuge Survey: Not known to occur on Bombay Hook NWR.

Birder Listserve Records: None

Research: None

Other: (Reference Smith 1992). Historically, Henslow's Sparrow was a regular but uncommon breeder in Delaware but is now considered extirpated. The last recorded breeding occurred in 1981. Herkert et al. (2002) indicated that the species formerly breed in the state around the turn of the 20th century.

Summary: Henslow's Sparrow historically bred in the state and is no longer considered a breeding species in the state.



Illinois Status

Bird Conservation Regions: 22, 23, 24 **State Status:** Endangered

Natural Heritage Rank: S2B

Species of Greatest Conservation Need: Yes, the estimated population in the state is 1,500 individuals, with a population objective of increasing the population to 3,000 individuals by 2025. Severe habitat stresses include limited habitat, habitat fragmentation, loss of disturbance (i.e., fire), development, and invasive species.

BBS: The Henslow's Sparrow has been recorded on 12 BBS routes in the state, with six routes recording individuals recently (1996-2005). The routes are primarily located in the northern part of the state. There is an increasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is + 3.4%/year

and the short-term trend is + 4.4%/year (John Sauer, USGS, unpublished data 2007). Both trends should be interpreted with caution since 0 is contained in the 95% C.I.

BBA: (Kleen et al. 2004). Henslow's Sparrows were recorded as possible (eight), probable (seven), and confirmed (seven) in 22 blocks out of 1,286 surveyed during the Illinois BBA conducted from 1986-1991. Most of the records came from the eastern part of the state, with the highest density occurring in the northeast. The BBA account reports that the species is currently more widespread and common than in the 1980s and early 1990s.

National Wildlife Refuge Survey: No responses.

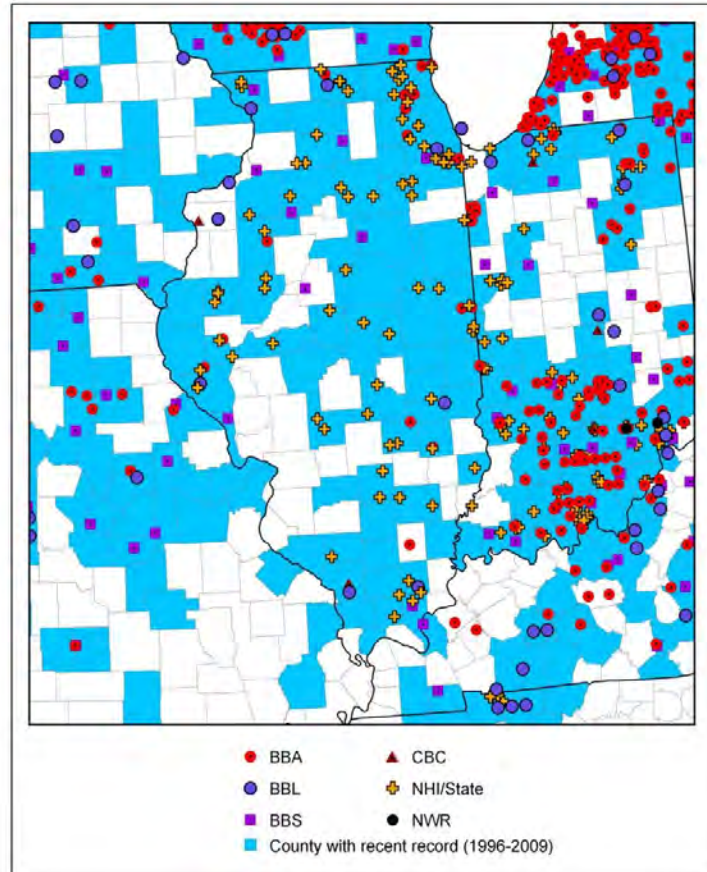
Birder Listserve Records: Bartel Grasslands (Cook), Herrick Lake Fields (DuPage), Illinois Beach State Park (Lake), Orland Grasslands (Cook), Paul Douglas Forest Preserve (Cook), Rolling Savannah (Lake), Springbrook Prairie (DuPage), Fermilab (DuPage), Pratt's Wayne Woods Forest Preserve (DuPage), Goose Lake Prairie SNA (Grundy), Plum Creek Forest Preserve (Cook).

Research: Henslow's Sparrows were detected on 13 of 86 transects surveyed in 24 grassland fragments located in northeastern and north-central Illinois during 1987-90 (Herkert 1994b). Herkert (1997) reported that the species has been recorded in 27 of Illinois' 102 counties between 1975 and 1995, while they were reported in 58 counties as of 2004 (Herkert 2007a). Analysis of Spring Bird Count (a state survey) data showed a declining population trend from 1975-95 and an increasing trend from 1990-2005 (Herkert 1997, Herkert 2007a). County-level population trends were positively related to the amount of CRP enrolled in the county (Herkert 2007a). Henslow's Sparrows were only detected in grassland patches ≥ 40 ha at the Prairie Ridge State Natural Area in Jasper County during a 1994-97 study (Walk and Warner 1999). A model developed by Thogmartin et al. (2006) for the Prairie Hardwood Transition Bird Conservation Region predicted a medium relative abundance for Henslow's Sparrows in the extreme northwestern part of Illinois. In 12 counties in southern Illinois, Henslow's Sparrows were present in seven of 16 CRP fields < 40 ha and 14 of 16 CRP fields > 40 ha (Haroff 2001). The mean density in fields > 40 ha was 3.41 birds/10 ha, while it was 2.83 birds/10 ha in fields < 40 ha. Ibargüen (2004) captured birds at Shawnee National Forest in order to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Henslow's Sparrow populations have grown considerably in the state since Pruitt's (1996) status assessment. Herkert reported at the March 2007 Henslow's Sparrow workshop that the population could be as high as 12,378 individuals in 12 southern Illinois counties based on breeding densities and available habitat (Cooper 2007). He also noted that birds were starting to be found in habitats where they were not previously found (i.e., recently grazed, mowed, or burned), which may be a result of population growth forcing some birds to use marginal habitat. The state is considering delisting the species due to the large number of recent records (Jim Herkert, TNC, pers.

com. 2007). Pruitt (1996) reported that the largest known population occurs on Goose Lake Prairie, where 15-55 pairs have bred consistently since the early 1970's. This population has remained relatively stable between 1972 and 1994. Bohlen (1989) lists several known breeding areas in the state.

Summary: Henslow's Sparrow breeds in the state. Recent information indicates that populations are increasing, but projected CRP losses in the southern part of the state could jeopardize the increase.



Indiana Status

Bird Conservation Regions: 22, 23, 24 **State Status:** Endangered

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: Yes, Farm Bill Program grasslands (i.e., CRP) were identified as a key habitat for Henslow's Sparrows in the state. The plan lists actions for protecting Farm Bill grasslands and managing them to benefit the species.

BBS: The Henslow's Sparrow has been recorded on 27 BBS routes in the state, with 14 routes recording individuals recently (1996-2005). The routes are spread throughout the state, with most routes recording the species > five years located in the southern part of the state. There is an increasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is + 0.6 %/year and the short-term trend is + 3.4 %/year (John Sauer, USGS, unpublished data 2007). Both trends should be interpreted with caution since 0 is contained in the 95% C.I.

BBA: (Castrale et al. 1998) Henslow's Sparrows were recorded as possible (23), probable (31), and confirmed (6) in 60 blocks out of 1,215 surveyed during the Indiana BBA conducted from 1985-90. A majority of the records came from the southern part of the state with a smaller concentration coming from the northeastern part of the state. In the current atlas project (2005-10), it has been recorded as possible (4), probable (19), and confirmed (2) in 25 blocks (Bruce Peterjohn, USGS, unpublished data). The largest remaining populations are at Big Oak NWR (formerly Jefferson Proving Grounds) and Atterbury Fish and Wildlife Area in southern Johnson County. (*Note data from both BBA projects is included on the following map)

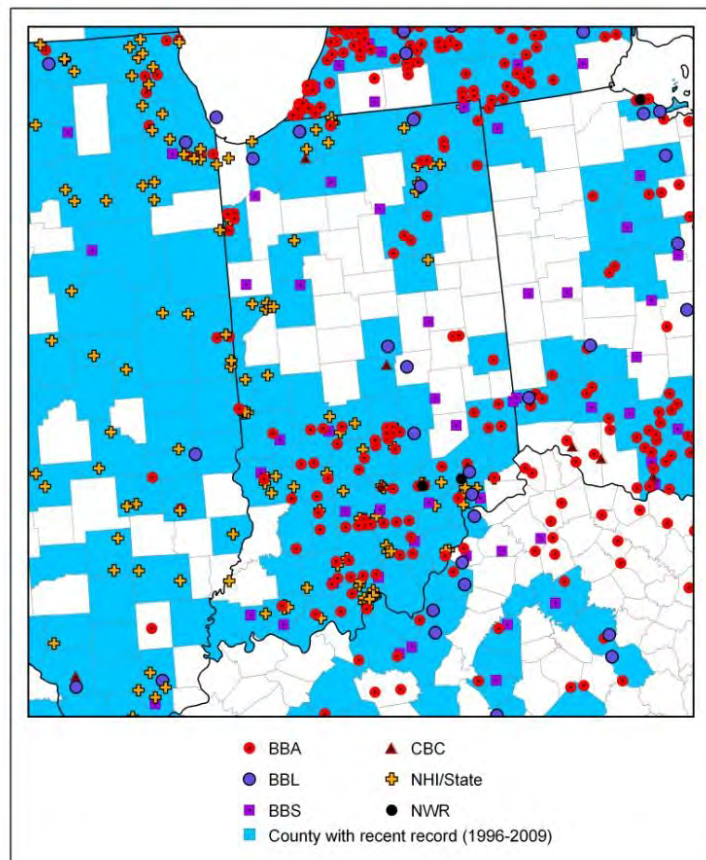
National Wildlife Refuge Survey: The Big Oaks NWR reported that Henslow's Sparrows are common on the refuge, with an estimated breeding population of 500 pairs. The population has been decreasing due to woody encroachment into refuge grasslands. Management is difficult because vehicles are not allowed in many areas because of unexploded ordnances (Joe Robb, refuge manager, pers. com. 2007).

Birder Listserve Records: Bendix Meadows near South Bend (St. Joseph Co.), Big Oaks NWR (Jefferson/Ripley/Jennings Co.), Hawthorn Mine (Sullivan Co.), Atterbury FWA (Johnson), Kankakee Sands TNC project (Newton), Prairie Chicken Refuge (Newton), Whitley Road/County Road 200N vicinity (Whitley),

Research: Results from a study of 19 reclaimed strip mine grasslands located in eight southeastern Indiana counties (Clay, Daviess, Greene, Pike, Sullivan, Vigo, Vermillion, and Warrick) estimated a density of 0.16 males per hectare with a potential population of \approx 2,000 based on available reclaimed grassland habitat (Bajema and Lima 2001, Bajema et al. 2001, DeVault et al. 2002). Surveyors at Camp Atterbury Military Reservation in Bartholomew estimated densities of 45.4 pairs/40 ha and 31.9 pairs/40 ha based on transect counts in grassland and old field habitats, respectively (Pruitt 1996). Koford (1999) recorded 75 singing males at Atterbury State Fish and Wildlife Area and 33 at Camp Atterbury, which are both located in Johnson County. Other sites with small numbers included: Chain O'Lakes State Park (Newton Co.), Beaver Lake Nature Preserve (Newton Co.), Newport Chemical Depot (Vermillion Co.), and Crosley State Fish and Wildlife Area (Jennings Co.). Source/sink analysis at Big Oaks NWR indicated that the refuge is a source population for the species with an estimated 135 female birds added to the population each year (Joe Robb, Big Oaks NWR, unpublished data). Ibargüen (2004) captured birds at Big Oaks NWR in order to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Historic records show the species was present in northern Indiana during 1905-18 (Alphonsus 1918). Under suitable conditions, it may be locally common (Mumford and Keller 1984). Based on loss of grassland habitat, Henslow's Sparrow has likely declined over the past 100 years, especially in northern Indiana. Population estimates are unknown (Catherine Gremillion-Smith, Indiana Dept. of Natural Resources, pers. com.). There were an estimated 100 singing males at Muscatatuck NWR in May, 1981 (Mumford and Keller 1984). Joe Robb (pers. com. 2007), Manager at Big Oaks NWR, reported that population estimates at the refuge have declined from over 1,100 singing males in the late 1990s to approximately 400 in 2005. A population at the Goose Ponds WMA in Greene County seems to be growing, with 189 Henslow's Sparrows tallied during a rapid assessment conducted by the Sassafras Audubon Society (L. Sterrenburg, IN Audubon, pers. com. 2009). Some reclaimed mine grasslands in the state are being threatened with development (Joe Robb, Big Oaks NWR, pers. com. 2007). James Cole (IN Audubon, pers. com. 2008) reported that 60 individual birds (mostly singing males) were counted during a survey on Hillenbrand FWA in Greene County in 2008.

Summary: Henslow's Sparrows breed throughout the state, with growing populations.



Iowa Status

Bird Conservation Regions: 11, 22, 23 **State Status:** Threatened

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: Yes, high-level stresses to grassland habitat in the state include: 1) fragmentation; 2) loss of connectivity; 3) detrimental grazing; 4) conversion to row crops; 5) pesticide/herbicide use; 6) conversion to non-native grasses; 7) development; 8) invasive species; and 9) fire suppression.

BBS: The Henslow's Sparrow has been recorded on nine BBS routes in the state, with six routes recording individuals recently (1996-2005). Only two of the six routes with recent records recorded the species prior to 1996. There is an increasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is +16.0 %/year and the short-term trend is +16.5 %/year (John Sauer, USGS, unpublished data 2007). Both trends do not include 0 in the 95% C.I.

BBA: (Jackson et al. 1996). The Henslow's Sparrow was recorded as possible (six) and probable (one) in seven blocks out of 715 surveyed during the Iowa BBA conducted from 1985-1990. All but one record were from the south-central portion of the state. Records cited in the BBA account from the late 1800s and early 1900s list the species as a common breeder with populations declining from prairie habitat loss. The species was thought to regularly breed at Hayden Prairie in Howard County.

National Wildlife Refuge Survey: Three refuges responded to the survey: Port Louisa (Y), Union Slough (N), and Neal Smith (Y). Port Louisa indicated that up to six pairs have been confirmed on the Horseshoe Bend Unit with habitat to support up to 50 pairs available. Neal Smith estimated a population of 30-37 pairs and reported that the species was first observed in 1999. Staff at Neal Smith also reported that Chichaqua Wildlife Area near the refuge has suitable habitat, and Saylorville Reservoir has a population of Henslow's Sparrows.

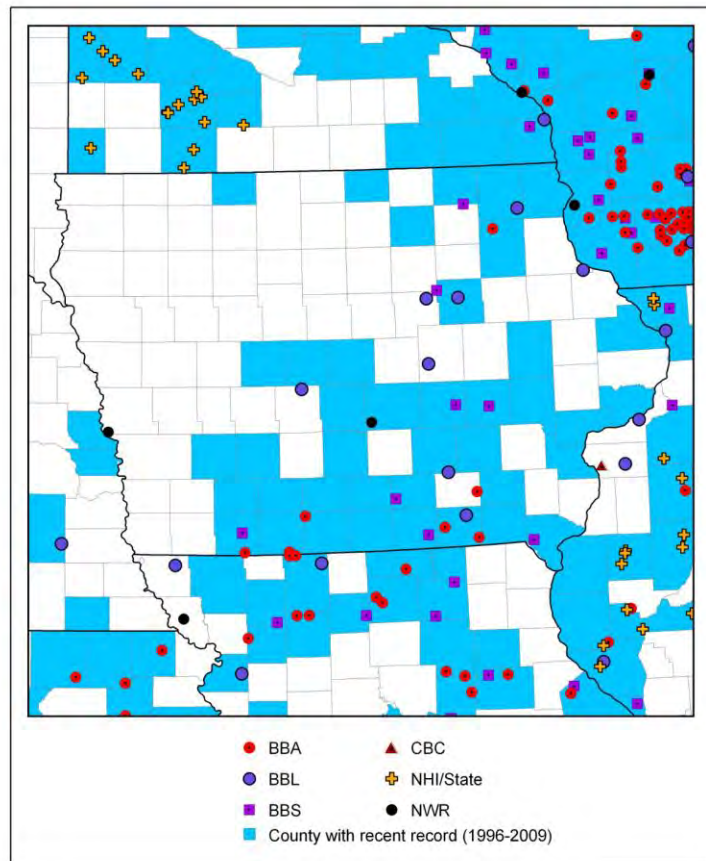
Birder Listserve Records: Cedar Hills Sand Prairie (Black Hawk), Indiagrass Hills Farm (Iowa), Kellerton Bird Conservation Area (Ringgold), Lacey-Keosauqua State Park (VanBuren), Medicine Creek Wildlife Area (Wayne), Neal Smith NWR (Jasper), Pleasant Creek State Recreation Area (Linn), Red Feather Prairie (Polk), Sedan Bottoms (Appanoose), and Shimek State Forest (Lee).

Research: During 1997, Koford (1999) detected Henslow's Sparrows throughout six southern Iowa counties (Taylor, Ringgold, Decatur, Davis, Van Buren, and Lee). Nearly all birds were using fields enrolled in CRP. A low to medium relative abundance of Henslow's Sparrows was predicted for the extreme northeastern part of Iowa based on modeling completed for the Prairie Hardwood Transition Bird Conservation Region – BCR 23 (Thogmartin et al. 2006). The use of conspecific calls to attract Henslow's Sparrows to suitable breeding habitat is being assessed in northwest Iowa (S. Lewis,

USFWS, pers. com. 2008). The effect of a fire-grazing management regime (patch burn grazing) on Henslow's Sparrow habitat use and nest success is being evaluated in southern Iowa and northern Missouri grasslands (S. Lewis, USFWS, pers. com. 2008).

Other: Kent and Dinsmore (1996) identify Cedar Falls (Black Hawk Co.), Hayden Prairie (Howard Co.), Volga Lake (Fayette Co.), and Lacey-Keosauqua State Park (Van Buren Co.) as sites with a consistent history of Henslow's Sparrows being present.

Summary: Henslow's Sparrow is an uncommon breeding bird in the state. Most counties with recent records come from the south-central part of the state.



Kansas Status

Bird Conservation Regions: 19, 22 **State Status:** Species in need of conservation

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: Yes, the species is a SGCN in the Eastern Tallgrass Prairie and the Central Mixed Grass Prairie Conservation Regions of the state. The Henslow's Sparrow ranked the highest in both regions. Strategies for managing native habitat and dealing with habitat fragmentation and loss are presented in the SWAP.

BBS: The Henslow's Sparrow has been recorded on 11 BBS routes in the state, with 10 routes recording individuals recently (1996-2005). All of the routes are located in the northeast part of the state. There is an increasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is +8.3 %/year and the short-term trend is +17.7 %/year (John Sauer, USGS, unpublished data 2007). Both trends do not include 0 in the 95% C.I.

BBA: (Busby and Zimmerman 2001) The Henslow's Sparrow was recorded as possible (nine), probable (24), and confirmed (seven) in 40 blocks out of 781 blocks surveyed during the Kansas BBA conducted from 1992-97. All records came from the eastern one-third of the state. Physiographic regions with records included the Glaciated Region, Osage Plains, and Flint Hills.

National Wildlife Refuge Survey: Refuges responding to the survey were Marais de Cygnes (Y) and Flint Hills (N). There is an estimated population of 10-20 pairs at Marais de Cygnes, and they also breed on adjacent private land.

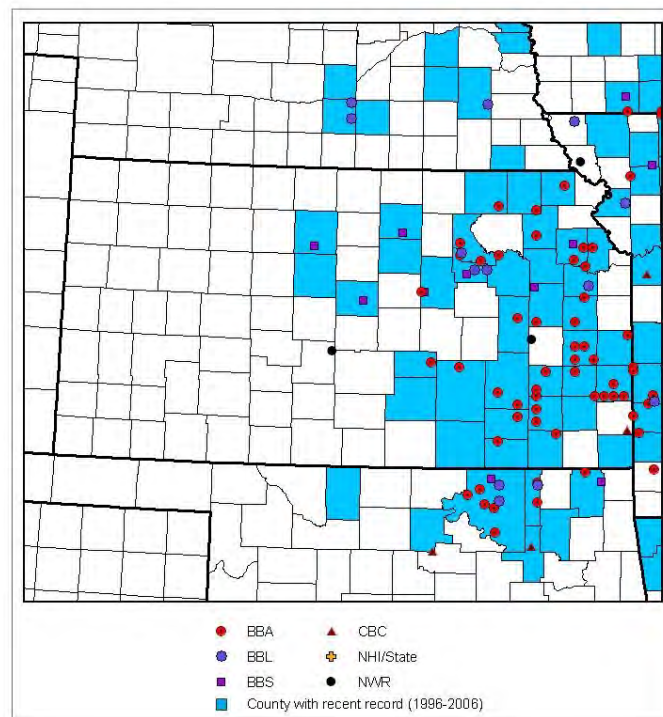
Birder Listserve Records: Fort Riley (Geary Co.), Konza Prairie (Riley Co.), and Marais de Cygne Wildlife Area (Linn Co.).

Research: A total of 57 Henslow's Sparrows was observed during a 1995 and 1996 study at Fort Riley located in northeastern Kansas (Cully and Michaels 2000). Jeff Keating (Fort Riley, pers. com. from Pruitt 1996) indicated that 188 singing males were recorded in surveys of unburned, unhayed tallgrass prairie on the base during 1994. Based on an extrapolation of the survey results to the total amount of available habitat, he estimated that as many as 2,000 singing males may have been present at Fort Riley. Zimmerman (1988) found Henslow's Sparrows in low densities in unburned watersheds on Konza Prairie Research Natural Area during 1981-86 with abundances reaching 2.6-6.2 birds/km of transect. Schulenberg et al. (1994) surveyed Henslow's Sparrow on burned and unburned tallgrass prairie tracts in Osage County, Kansas in 1993. Singing males were found only on unburned sites. A total of 25 singing males was distributed among four unburned tracts.

Other: Thompson and Ely (1992) indicate that the species is an "uncommon transient and very local summer resident in eastern Kansas and that nesting has been documented in Anderson, Geary, Morris, Riley, and Shawnee counties. Pruitt (1996) reported that

several million acres of potential habitat exists in Kansas, but many privately owned pastures are burned annually over a period of several years, which results in inadequate standing dead vegetation for Henslow's Sparrow. Similarly, grazing pressure for a reasonable economic return is not compatible with Henslow's Sparrow use. Plantings of native grasses on CRP fields have resulted in some additional habitat, but the degree to which this habitat has been used for nesting is unknown. Both the current and historic range of Henslow's Sparrow in Kansas is the eastern third of the state. Based on predicted pre-European vegetation, it is assumed that, historically, Henslow's Sparrow was probably one of the more common sparrows in eastern Kansas. The current population size is unknown, but limited field surveys indicate that the breeding population is stable. Available habitat is highly fragmented and scattered across the eastern third of Kansas. Pruitt (1996) reported that Henslow's Sparrow range may be extending westward based on observations of William Busby, Kansas Biological Survey. Busby found singing males at several sites in north-central Kansas.

Summary: Henslow's Sparrow is a local, uncommon breeding bird in eastern Kansas. The largest breeding populations are probably found at Konza Prairie and Fort Riley.



Kentucky Status

Bird Conservation Regions: 24, 28 **State Status:** Special Concern

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: Yes, the species will use appropriate habitat throughout the state. Conservation issues in the state include habitat degradation from haying, conversion to row crop agriculture, livestock grazing, development, reforestation, and fire suppression. Fallow fields and pastures provide most of the habitat in the state, along with reclaimed surface mines and the margins of airfields.

BBS: The Henslow's Sparrow has been recorded on 13 BBS routes in the state, with nine routes recording individuals recently (1996-2005). A majority of the routes are located in the central part of the state. There is an increasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is +6.4 %/year and the short-term trend is +6.4 %/year (John Sauer, USGS, unpublished data 2007). Both trends do not include 0 in the 95% C.I.

BBA: (Palmer-Ball 1996) The Henslow's Sparrow was recorded as possible (19), probable (12), and confirmed (three) in 34 blocks out of 732 surveyed during the Kentucky BBA conducted from 1985-91. All records were from the northern two-thirds of the state. Physiographic regions recording the species included the Blue Grass, Highland Rim, Shawnee Hills, and the Cumberland Plateau. The most records came from the Blue Grass. The main habitats in the state include fallow fields, pastures, reclaimed surface mines, the margins of airports, and other unmowed grassy habitats. The historic status of Henslow's Sparrow in Kentucky is poorly known. Prior to settlement, Henslow's Sparrow probably occurred at least locally in native prairies of the East Gulf Coastal Plain and Highland Rim. Documentation of the species presence in the presettlement prairies is lacking, but the prairies would have provided optimal habitat. The species was almost unknown in the state until the mid-1940's. Between 1946 and the early 1950's, the species was reported in the Louisville area and central parts of the state. Since then, Henslow's Sparrow has continued to be sporadically reported. Recently, there have been Henslow's Sparrow records to the south and west of former range, but it is uncertain whether this represents a range expansion or that these birds were previously overlooked.

National Wildlife Refuge Survey: None

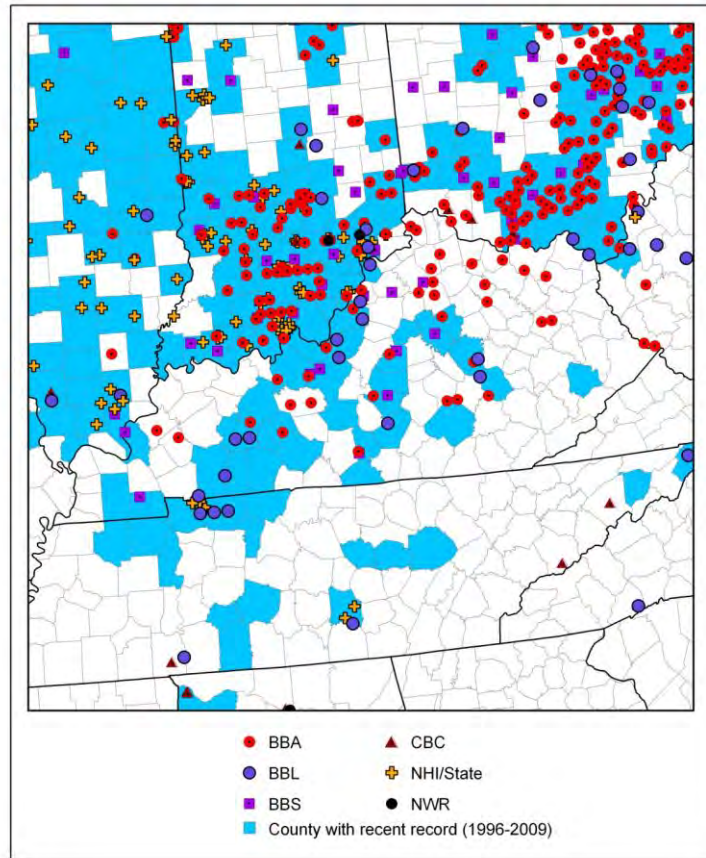
Birder Listserve Records: Peabody WMA (Muhlenberg and Ohio), Ano Strip Mines (Pulaski)

Research: During a 2000 study, eight pairs (1.04 pairs/ha) were present at Fort Knox, Mead Co.; 10 pairs (0.81 pairs/ha) at Green River Lake State Park, Taylor County; 12 pairs (0.83 pairs/ha) at Peabody WMA River Queen 1 Unit, Muhlenberg Co.; and 15 pairs (1.2 pairs/ha) at Peabody WMA River Queen 7 Unit, Muhlenberg Co (Monroe and Ritchison 2005). Researchers conducting a grassland bird study at Fort Campbell (on the

Kentucky-Tennessee border) located 113 Henslow's Sparrow nests during 1999-2003 (Giocomo 2005; Giocomo et al. 2008).

Other: Primarily found in north-central Kentucky with records also from the Cumberland Plateau, eastern Pennroyal, and Knobs (Mengel 1965).

Summary: Henslow's Sparrow breeds locally in suitable habitat throughout the state but is primarily found the north-central part of the state. More recent research has documented a population at Fort Campbell, on the Kentucky-Tennessee border.



Maryland Status

Bird Conservation Regions: 28, 29, 30 **State Status:** Threatened

Natural Heritage Rank: S1S2B

Species of Greatest Conservation Need: Yes, the plan outlines a variety of action items for managing grassland habitat and monitoring grassland bird populations in the state. Some actions include protecting large tracts of grassland; working with farming

community to implement beneficial agricultural practices; and encouraging management of grassland species on reclaimed mine lands.

BBS: The Henslow's Sparrow has been recorded on 12 BBS routes in the state, with two routes recording individuals recently (1996-2005). The routes are scattered throughout the state, and no route has recorded the species more than two years. There is a decreasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is -11.2 %/year and the short-term trend is -10.9 %/year (John Sauer, USGS, unpublished data 2007). The long-term trend does not include 0 in the 95% C.I., while the short-term trend does.

BBA: (Robbins and Blom 1996) The Henslow's Sparrow was recorded as possible (eight), probable (10), and confirmed (one) in a total 14 blocks out of 1,296 surveyed in Maryland and the District of Columbia during the 1983-87 BBA project. Eleven of the blocks were located in the western panhandle, while the remaining three blocks were located in the southeast. The Henslow's Sparrow has been recorded as possible (eight), probable (10), and confirmed (four) in 22 blocks during the current atlas project conducted during 2002-06 (Walter Ellison, Maryland Ornithological Union, unpublished data 2007). All records from the current BBA project have come from the western panhandle. (*Note data from both BBA projects is included on the following map)

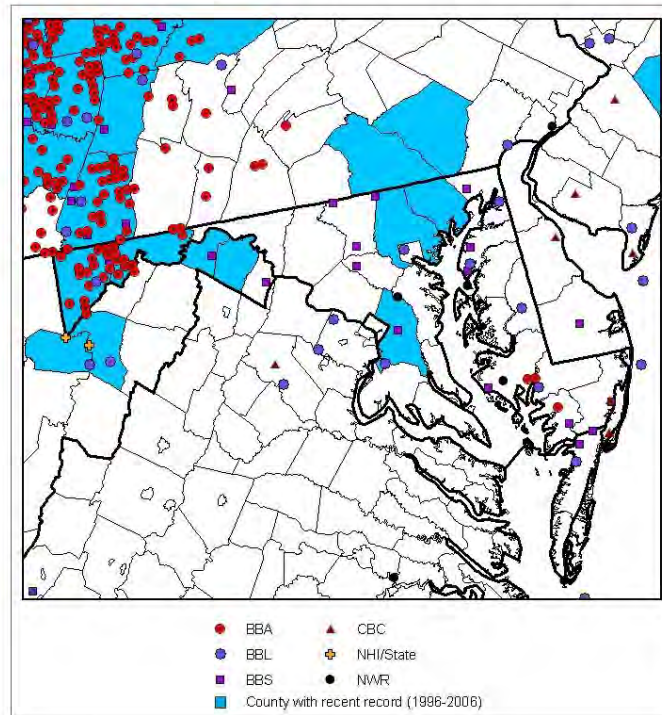
National Wildlife Refuge Survey: Surveys were returned from the Chesapeake Marshlands NWR Complex and Patuxent Research Refuge. Both indicated that the species is not present. The last record at Patuxent was from 1955.

Birder Listserve Records: Old Legislative Field Road near Frostburg (Allegany Co.), Pea Ridge Road (Garrett Co.).

Research: None

Other: Maiken Winter reported at the March 2007 Henslow's Sparrow Workshop that the Coastal Plain population has disappeared, and the western population is using reclaimed surface mines and associated hayfields (based on pers. com. from David Curson, Maryland Audubon Society). Pruitt (1996) reported that reclaimed surface mines in western Maryland may be the last stronghold for the species in the state.

Summary: Henslow's Sparrow breeds in the state with remaining populations found in the western part of the state.



Massachusetts Status

Bird Conservation Regions: 28, 30 **State Status:** Endangered

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, the species has probably been extirpated from the state through the loss of open grassland to urbanization and forest succession.

BBS: No records of Henslow's Sparrow.

BBA: (Petersen and Meservey 2004) The Henslow's Sparrow was recorded as probable in three blocks out of 969 surveyed during the Massachusetts BBA conducted from 1974-79. Two blocks were located in the northeast part of the state and one in the central part.

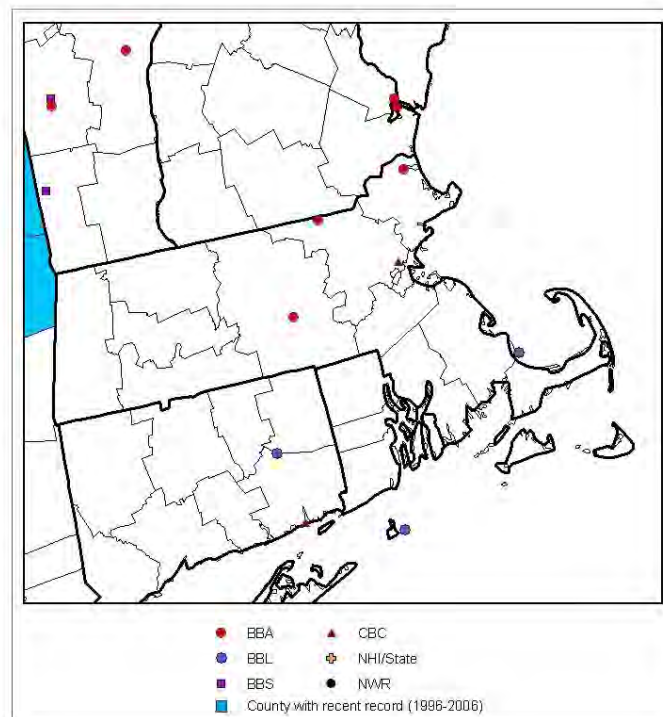
National Wildlife Refuge Survey: Monmoy, Great Meadows, Oxbow, Assabet River, Massasoit, Nomans Land Island, Nantucket, Silvio O. Conte, and Mashpee NWRs all indicated that the Henslow's Sparrow is not present.

Birder Listserve Records: None

Research: None

Other: The species was not recorded at 76 sites surveyed during a regional inventory of grassland birds in New England conducted from 1997-2000 (Jones et al. 2001). Pruitt (1996) reported that an estimated 150 pairs occurred in the state in the early 1900s and were found throughout the state during this period.

Summary: Henslow's Sparrow historically bred in the state, but has apparently withdrawn from its Massachusetts range.



Michigan Status

Bird Conservation Regions: 12, 23 **State Status:** Threatened

Natural Heritage Rank: S2S3B

Species of Greatest Conservation Need: Yes, clearing of forests allowed the expansion of the species into the state in the late 1800s. Current threats include conversion to agricultural lands, altered fire regimes, fragmentation of grassland habitat, grazing and mowing patterns, development, and nest predation.

BBS: The Henslow's Sparrow has been recorded on 32 BBS routes in the state, with nine routes recording individuals recently (1996-2005). A majority of the routes are spread throughout the southern two-thirds of the Lower Peninsula. The species has been recorded >12 years on two routes in the southwestern part of the state. There is a

decreasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is -9.9 %/year and the short-term trend is -6.8 %/year (John Sauer, USGS, unpublished data 2007). The long-term trend does not include 0 in the 95% C.I., while the short-term trend does.

BBA: (Brewer et al. 1991) The Henslow's Sparrow was recorded as possible (186), probable (70), and confirmed (17) in 273 blocks out of 6,120 blocks surveyed during the Michigan BBA conducted from 1983-1988. Blocks were spread throughout the Lower Peninsula and located in the extreme southern part of the Upper Peninsula bordering Wisconsin. Occurrence is irregular based on the availability of suitable habitat. In the current BBA project started in 2002, the species was recorded as possible (25), probable (seven), and confirmed (one) in 33 blocks (Bruce Peterjohn, USGS, unpublished data). All blocks where the species occurred during the current BBA are located in the Lower Peninsula.

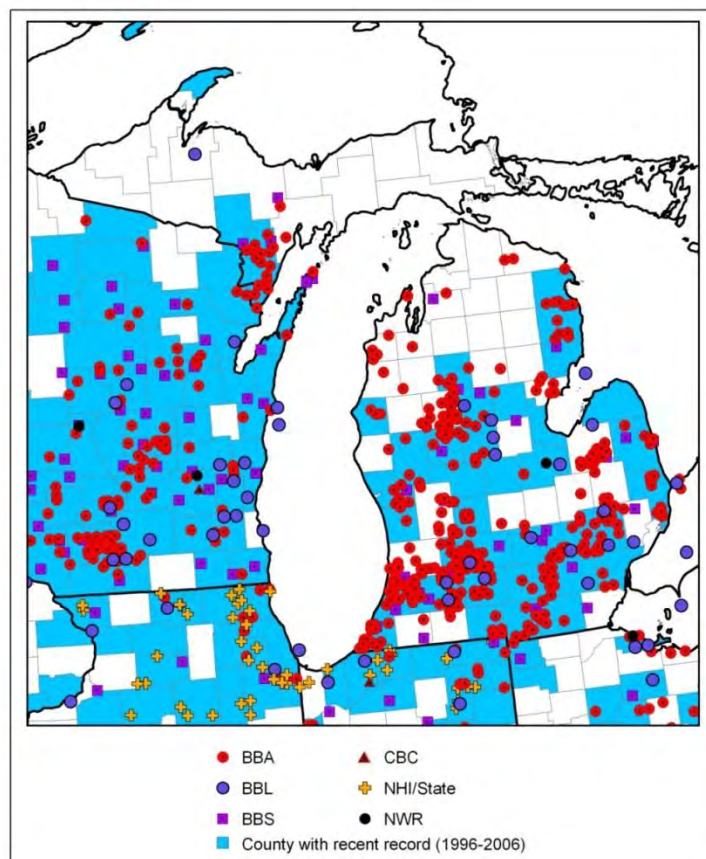
National Wildlife Refuge Survey: None

Birder Listserve Records: Numerous records from multiple locations were reported for Bay, Berrien, Lake, St. Clair, and Wayne counties.

Research: During 1997, Koford (1999) conducted surveys in Barry, Eaton, Calhoun, Mecosta, and Van Buren counties where there had been previous detections on Henslow's Sparrows. A total of 27 birds was detected at eight sites in Barry and Eaton counties during 1997. Koford (1999) noted that 103 Henslow's Sparrows were detected in a total of 16 counties during other survey work in Michigan in 1997.

Other: Henslow's Sparrows were considered uncommon in Michigan in the early 1900s; however, populations increased as forests were cleared with a northward expansion (Currier 2001). Currier (2001) reported that The Nature Conservancy identified an area near Marion, MI as being important for the species and that the species occurs on Allegan State Game Area. Pruitt (1996) reported that surveys by the Kalamazoo Nature Center around Kalamazoo have shown a large decline from approximately 1.81 birds/route in the 1970s to nearly no birds per route in the 1990s.

Summary: Henslow's Sparrow breeds in the state, but in low numbers.



Minnesota Status

Bird Conservation Regions: 11, 12, 23 **State Status:** Endangered

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, Henslow's Sparrows were identified as occurring in seven of the state's 25 ecological subsections. Management options to support grassland SGCN identified in the SWAP include: 1) support incentives that avoid conversion of grasslands into row crops; 2) manage against woody encroachment into grasslands; 3) avoid early season mowing; 4) use light to moderate rotational grazing; 5) prevent fragmentation; and 6) control invasive species.

BBS: The Henslow's Sparrow has been recorded on five BBS routes in the state, with four routes recording individuals recently (1996-2005). Four of the routes are located in the central portion of the state and one is located in the southeast. Three of the routes have recorded the species for the first time during 1996-2005. No trend information is available for Minnesota.

BBA: None; however, a BBA project was started in 2009. Survey work on the BBA will be completed in 2013. This effort will be important for determining the current distribution in the state.

National Wildlife Refuge Survey: Six NWRs or Wetland Management Districts (WMD) responded to the survey: Litchfield WMD (Y) Minnesota Valley NWR (Y); Morris WMD (Y), Rice Lake NWR (N), Upper Mississippi River NWR-Winona District (N), and Tamarack NWR (N). Staff at Litchfield WMD recorded one Henslow's Sparrow in 2006 while completing a BBS route in Stearns County. The species has been seen at the Black Dog and Rapids Lake Unit on Minnesota Valley NWR with an estimated population of 10 pairs on refuge lands. It was observed at Delehanty (LeSueur Co.), Hahn Lake WPA (Sibley Co.), and on private land near Erin Prairie WPA (Rice Co.) during grassland bird surveys in the Minnesota Valley WMD. The species was observed in 1996 on the Hegland WPA (Lac qui Parle Co.) in the Morris WMD along with other private land sites throughout the district. The Winona District of the Upper MS NWR reported that Frontenac State Park, which is 15 miles west of the refuge, has a small population.

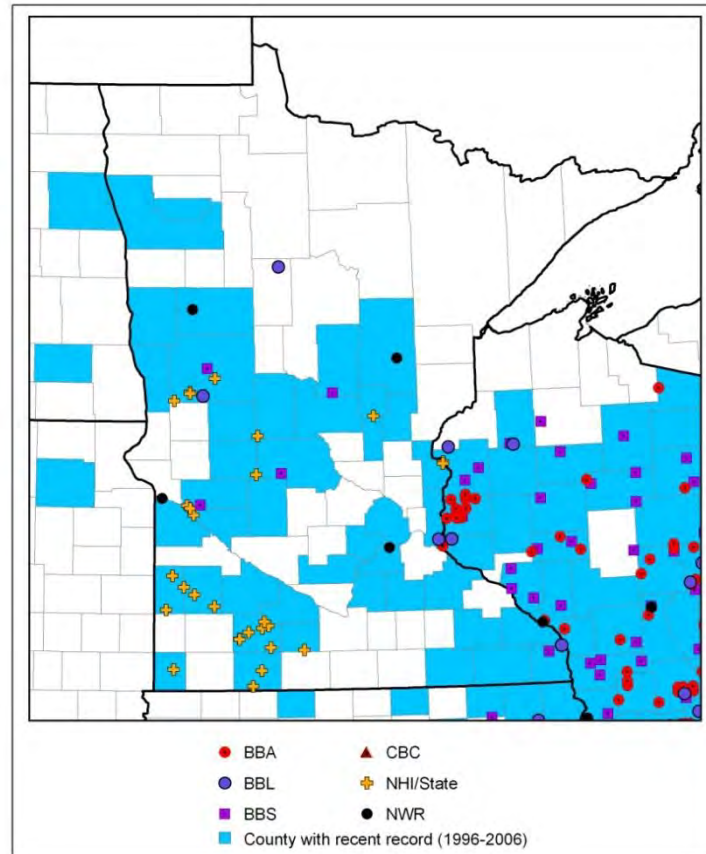
Birder Listserve Records: Sites with multiple records include Great River Bluffs State Park (Winona Co.), Buffalo River State Park (Clay Co.), Glendalough State Park (Ottertail Co.), Hamden Slough National Wildlife Refuge (Becker Co.). Numerous records have also been reported from several parks in the Minneapolis-St. Paul metropolitan area including Hyland, Murphy-Hanrehan, and Elm Creek Regional Parks, which are all part of the Three Rivers Park District.

Research: A study at Great River Bluffs State Park in southeastern Minnesota revealed a total of 17 breeding territories in 2007, with nesting behavior providing evidence of at least two successful nests (Faber 2007). Hanson (1994) surveyed 23 sites with historic records during 1987-89. Six of the sites had Henslow's Sparrows, with the highest count occurring at O.L. Kipp State Park (subsequently renamed Great River Bluffs State Park). During the study, five nests were found in the park.

Other: Steve Stucker (MN DNR, pers. com. 2008) reported that the Minnesota County Biological Survey conducted breeding bird surveys in 37 counties from 1998 through 2007 (Nine of the 37 were out of the Henslow's Sparrow range). A total of 469 grassland points were conducted in the 37 counties. Henslow's Sparrows were detected on 15 points counts with additional birds found outside of point counts. A total of 44 singing males were found at 27 sites in 13 counties. Henslow's Sparrows were detected in five out of 188 grassland patches surveyed in the 14-county Minnesota Valley Wetland Management District in southeastern Minnesota during 2003-04 (T. Cooper, USFWS, unpublished data 2007). Frontenac State Park has had several singing Henslow's Sparrows over the past five years or more (Shawn Fritcher, MN DNR, pers. com. 2007). The state is considering downgrading the species from state endangered to threatened due to the large number of recent records (Mark Cleveland, MN DNR, pers. com. 2007).

Surveys at Wild River State Park in east-central Minnesota show an increase from one singing male in 2003 to 6 in 2007 (D. Crawford, MN DNR, pers. com. 2007).

Summary: Henslow's Sparrows breed in the state. Recent observations indicate a range expansion in the state to the north and west.



Missouri Status

Bird Conservation Regions: 22, 24, 26 **State Status:** Rare. Protected as a nongame species

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: No

BBS: The Henslow's Sparrow has been recorded on 17 BBS routes in the state, with 16 routes recording individuals recently (1996-2005). The routes are scattered throughout the northern three-quarters of the state. One route (Ohio) located in the west-central portion of the state has recorded the species 31 years. There is an increasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term

trend is +8.4 %/year and the short-term trend is +11.4 %/year (John Sauer, USGS, unpublished data 2007). Both trends do not include 0 in the 95% C.I.

BBA: (Jacobs and Wilson 1997). The Henslow's Sparrow was recorded as possible (11), probable (15), and confirmed (6) in 32 out of 1,207 blocks that were surveyed. The blocks were sparsely distributed in the northern and western portions of the state. Most records from southwestern Missouri came from publicly owned prairies, while records from northern Missouri were unexpectedly coming from private hayfields and CRP fields.

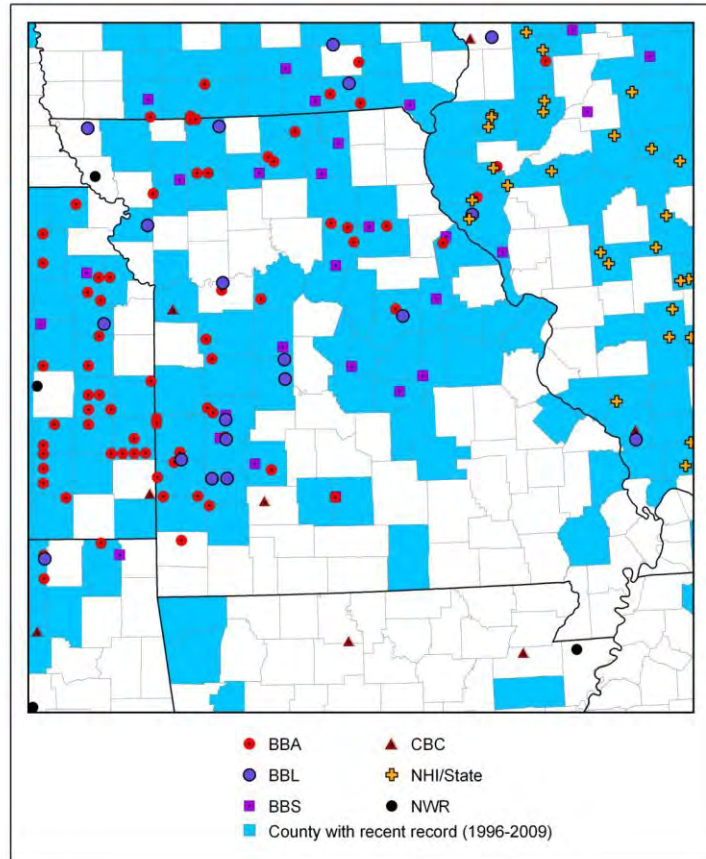
National Wildlife Refuge Survey: Mingo NWR indicated that it is using fescue/broomsedge grasslands on the Egypt Gate unit and may potentially use other areas.

Birder Listserve Records: University of Missouri Tucker Prairie (St. Clair Co.), Weldon Springs Conservation Area (St. Charles Co.), Hi-Lonesome Prairie (Benton Co.), Taberville Prairie (St. Clair Co.), Prairie State Park (Barton Co.).

Research: Swengel (1996) evaluated the response of Henslow's Sparrow to management on 42 southwestern Missouri prairies from 1992-95. He concluded that prairies managed primarily by haying had more Henslow's Sparrows than fire-managed prairies. He noted that Henslow's Sparrow populations in southwestern Missouri appeared to be stable (if not increasing) during the years he conducted his research. Results from a study of grassland bird use of CRP in north-central Missouri (Knox, Macon, and Linn counties) indicated that Henslow's Sparrow abundance was greater in CP1 grass plantings (0.5 birds/km of transect) than in CP2 switchgrass plantings (0.1 birds/km of transect) (McCoy et al. 2001). Winter and Faaborg (1999) found Henslow's Sparrow densities ranging from 5.56 to 9.10 males/10 ha over three years (1995-97) at 33 prairie fragments located in Vernon, Dade, and Barton counties in southwestern Missouri. Thirty-four out of 59 nests were successful (39.5% Mayfield and 57.6% apparent) in 13 prairie fragments on the same southwestern study area (Winter 1999). Ibarguen (2004) captured birds at Niawathe Prairie to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Pruitt (1996) reported that the species is widespread throughout southwestern Missouri where prairie preserves may support a population of 5,000-6,000 pairs.

Summary: Henslow's Sparrows breed in the state, and populations appear to be increasing.



Nebraska Status

Bird Conservation Regions: 11, 19, 22 **State Status:** None indicated

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, priority regions in the state for the Henslow's Sparrow are the Southeast Prairies and Sandstone Prairies. Key stresses to grassland habitat in these landscapes include: 1) alteration of natural disturbance; 2) spread of invasive species; 3) lack of awareness and knowledge about biological diversity; 4) conversion and fragmentation of natural habitats; and 5) loss of lands enrolled in conservation programs.

BBS: No records of Henslow's Sparrow.

BBA: (Mollhoff 2001) The Henslow's Sparrow was not recorded during the 1984-89 BBA project.

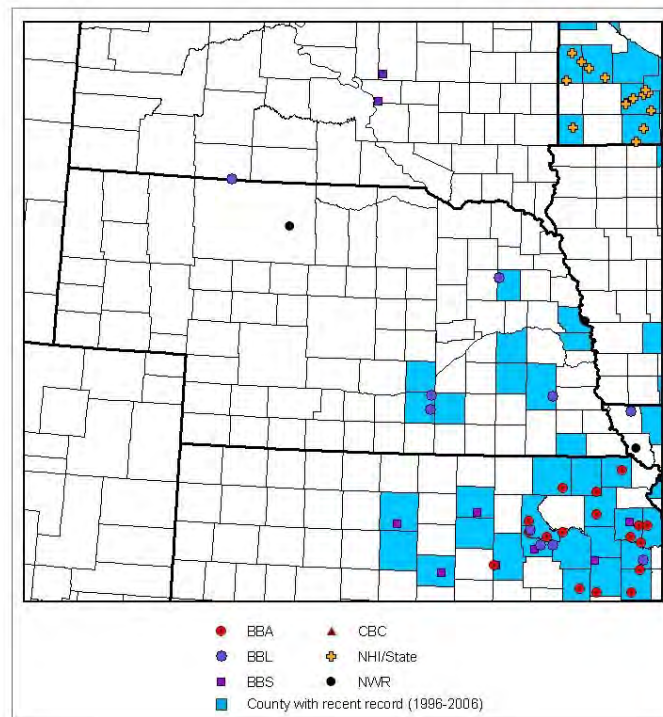
National Wildlife Refuge Survey: Crescent Lake NWR and North Platte NWR indicated that the species was not present on either refuge.

Birder Listserve Records: Burchard Lake State Wildlife Management Area (Pawnee Co.), Meadowlark Lake (Seward Co.), Boyer Chute National Wildlife Refuge (Washington Co.), Audubon Spring Creek Prairie (Lancaster Co.), and Harvard WPA (Clay Co.).

Research: None

Other: Silcock and Jorgensen (2006) assessed the status of Henslow’s Sparrow in southeast Nebraska during 2006. They found the species at five sites out of the 279 sites that were surveyed. They also reported that individuals have regularly occurred at: 1) Burchard Lake-Pawnee Prairie in Pawnee Co.; 2) Audubon’s Spring Creek Prairie in Lancaster Co.; 3) Whooping Crane Trust Properties in Hall Co.; 4) Boyer Chute NWR in Washington Co.; and 5) Stanton Co. Conservation Reserve Program grassland tracts. Sharpe et al. (2001) reported no documented breeding records from Nebraska.

Summary: The species breeds primarily in the southeastern part of the state, where it is uncommon.



New Hampshire Status

Bird Conservation Regions: 14, 30 **State Status:** Extinct

Natural Heritage Rank: SHB

Species of Greatest Conservation Need: No

BBS: No records of Henslow's Sparrow.

BBA: (Foss 1994). There were two possible records of Henslow's Sparrows from Strafford County in southeastern New Hampshire during the state's BBA conducted from 1981-86.

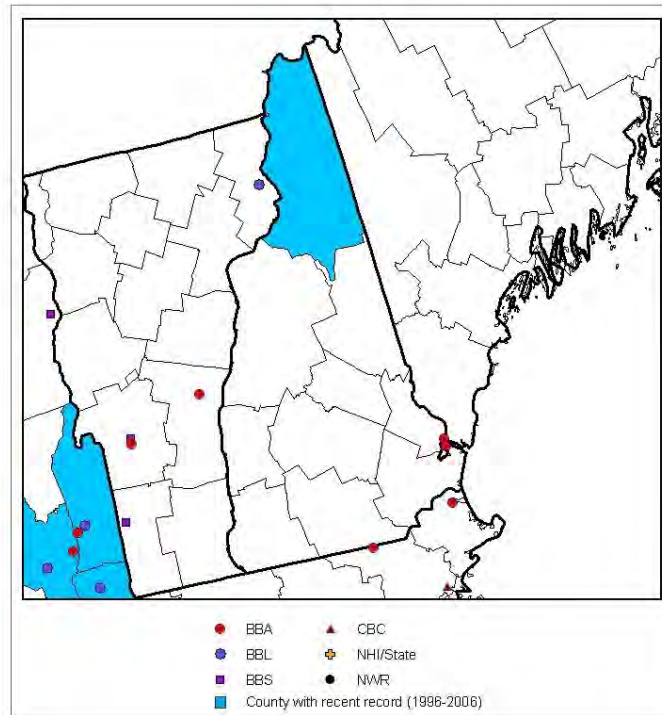
National Wildlife Refuge Survey: Not present at Silvio O. Conte NWR.

Birder Listserve Records: One record from August 2001 near the Whitefield Airport on the St. John's River was reported. This record was most likely from a migrating individual.

Research: None

Other: The species was not recorded at 90 sites surveyed during a regional inventory of grassland birds in New England conducted from 1997-2000 (Jones et al. 2001). Pruitt (1996) reported that some apparently suitable habitat remains but is unoccupied. New Hampshire Natural Heritage Inventory records indicated one record of a singing male in 1983. The bird was observed in a 1.6 ha old field but was present at the site for only about two weeks spanning late May to early June.

Summary: Henslow's Sparrows historically bred in the state but are now classified as extinct.



New Jersey Status

Bird Conservation Regions: 28, 29, 30 **State Status:** Endangered

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, priority landscapes in the state include Southern Piedmont, Northern Piedmont, Cohansey River, and Raritan Bay. The goal is to restore suitable habitat and populations within these landscapes.

BBS: No records of Henslow's Sparrow.

BBA: (Walsh 1999). The Henslow's Sparrow was recorded as possible (one) and confirmed (one) in two blocks out of roughly 800 surveyed during the New Jersey BBA conducted from 1994-1997. The possible record came from a block in the Kittatinay Valley Physiographic Region. The lone confirmed record came from Lakehurst Air Engineering Center (Ocean County) in the Pine Barrens Physiographic Region. The species is a rare and very local summer resident in the state. Henslow's Sparrow was a confirmed breeder in five blocks and recorded as probable in four blocks during the 1981-85 project (Smith 1992)

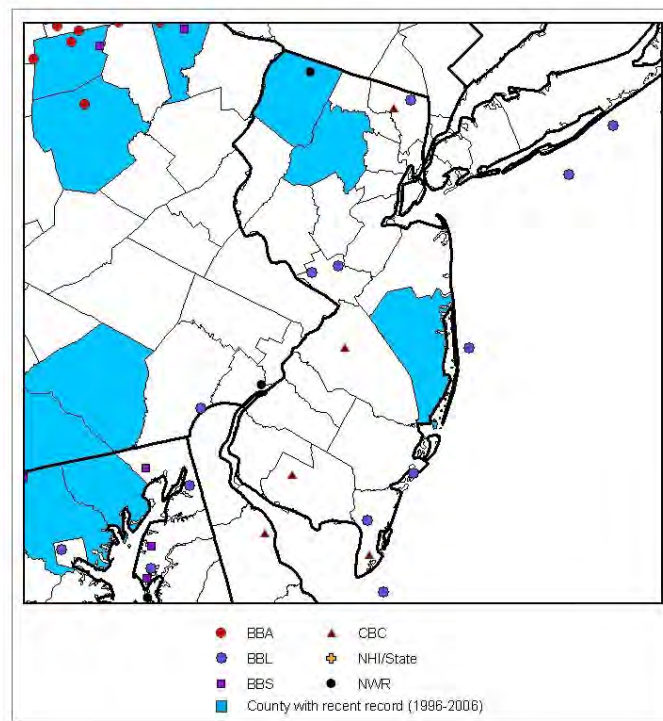
National Wildlife Refuge Survey: Edwin B. Forsythe and Great Swamp NWRs both reported that the species was not present on either refuge.

Birder Listserve Records: Willowood Arboretum (Morris Co.), Sandy Hook (Monmouth Co. migration records).

Research: None

Other: Maiken Winter reported at the March 2007 Henslow’s Sparrow Workshop that isolated, singing males are observed periodically in the state (based on pers. com. with Ken Rosenberg, Cornell Lab of Ornithology). Pruitt (1996) reported that there are breeding records from at least seven counties scattered throughout the state.

Summary: Henslow’s Sparrow breeds in the state but is uncommon.



New York Status

Bird Conservation Regions: 13, 14, 28, 30 **State Status:** Threatened

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: Yes, the historical distribution of the species is unknown. The current distribution includes the Great Lake, High Allegheny Plateau, Western Allegheny Plateau, and St. Lawrence-Lake Champlain Valley Ecoregions. Populations are declining in each region. The conservation of remaining grasslands of

substantial size is a priority strategy in the state. A map of core grassland areas in the state has been created.

BBS: The Henslow's Sparrow has been recorded on 42 BBS routes in the state, with only five routes recording individuals recently (1996-2005). Most of the routes, both historic and recent, are located in the western half of the state. There is a decreasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is -9.2 %/year and the short-term trend is -7.3 %/year (John Sauer, USGS, unpublished data 2007). The long-term trend does not include 0 in the 95% C.I., whereas the short-term trend does include 0.

BBA: (NYSDEC 2006; Andrele and Carroll 1988) The Henslow's Sparrow was recorded in 348 survey blocks (61 confirmed, 152 probable, and 135 possible) out of 5,323 blocks surveyed during the 1980-85 atlas project, with a large decline to only 70 survey blocks (9 confirmed, 48 probable, and 13 possible) during the 2000-05 atlas project. During both BBA projects, the highest density of blocks was located in the western and central parts of the state with scattered locations from the east-central portion of the state. (*Note only data from the first BBA (1980-85) are included on the following map)

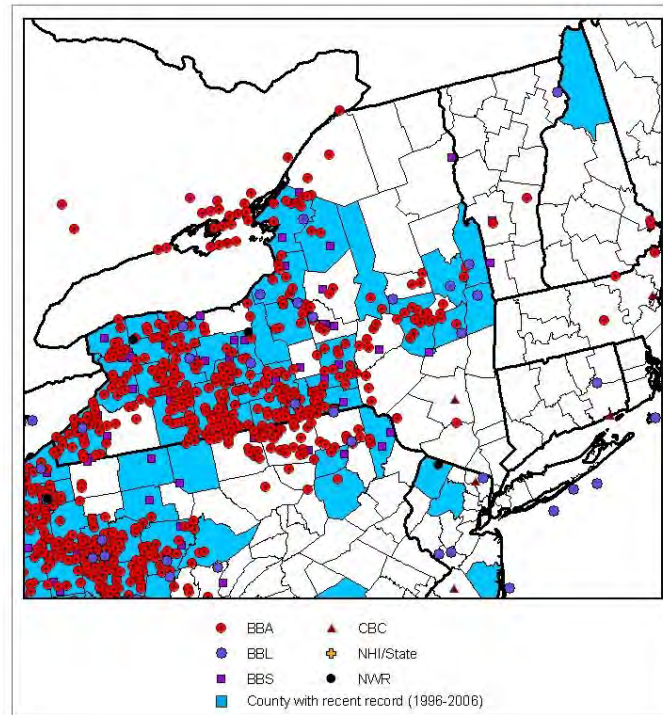
National Wildlife Refuge Survey: Surveys were returned for Montezuma (Y), Iroquois (Y), and Long Island NWR Complex (N). Areas near Montezuma NWR have breeding Henslow's Sparrows; however, grassland surveys have not been completed on the refuge since 2001. The species is an uncommon breeder at the I-fields and Q-fields at Iroquois NWR, with an estimated population of two pairs.

Birder Listserve Records: Tonawanda Creek Road near Lockport (Niagara Co.), Nation's Road Area near Avon (Livingston Co.), William Street Field near radio station tower (Erie Co.), Carlton Hill Area (Wyoming Co.), Ft. Edwards Grassland Area (Washington Co.), Green Acres Road near Clarence (Erie Co.), and Goodrich Road near Sharon Springs (Schoharie Co.).

Research: New York was the only state where the species was detected during a regional inventory of grassland birds in New England and New York conducted from 1997-2000 (Jones et al. 2001). During the survey, 214 birds were detected in 15 counties from three regions: Finger Lakes (present at 28% of sites), eastern New York (present at 1% of sites), and St. Lawrence Plains (present at 7% of sites). A study of bird use of hayfields in Madison and Tompkins counties found that Henslow's Sparrow abundance increased with the age of hayfield (Bollinger 1995). Saratoga National Historic Park supported 11-15 territorial males during the 1995 breeding season (Mazur 1996). Ibargüen (2004) captured birds at Fort Drum in order to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Pruitt (1996) noted that declines in the state's Henslow's Sparrow populations began in the 1950's.

Summary: Henslow's Sparrow breeds primarily in the western part of the state. Populations appear to be declining in the state.



North Carolina Status

Bird Conservation Regions: 27, 28, 29 **State Status:** No status

Natural Heritage Rank: S2 (breeding), S1 (nonbreeding)

BBS: Henslow's Sparrows have been recorded on six BBS routes in the eastern part of the state. There have been no recent (1996-2005) records from BBS routes in the state.

BBA: (1988-92). Data are not available.

CBC: Henslow's Sparrows have been recorded in nine CBC Survey circles in the state, with three circles (Brevard, Pee Dee NWR, and Pettigrew State Park) recording individuals recently (1997-2006). All but one circle are located in the eastern half of the state. Trend data are not available.

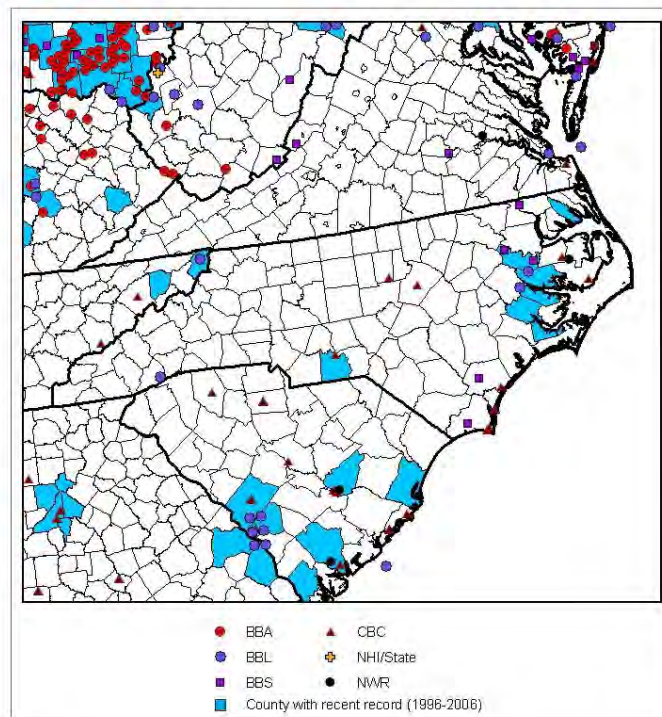
National Wildlife Refuge Survey: Staff from Pocosin Lakes NWR indicated the surveys were conducted during the summer of 2001 and winter of 2002. No Henslow's Sparrows were observed during either survey.

Birder Listserve Records: None

Research: In 1984, potential breeding sites in the Coastal Plain were searched, and Henslow's Sparrows were found at 12 sites (Lynch and LeGrand 1985).

Other: Pruitt reported that during 1983-94, the North Carolina Natural Heritage Program has logged records of Henslow's Sparrow at 24 sites (ranging from 1-64 singing Henslow's Sparrows per site). The two largest known breeding populations are at Voice of America antenna fields (Pruitt 1996). These sites are described as cleared pocosins which are now maintained (by burning and mowing) in grasses, sedges, forbs, and low saplings. Both of these sites have supported breeding populations of Henslow's Sparrow since 1984. Counts were conducted at Voice of America Site A (1,200+ ha) in 1984 (20 birds), 1993 (17 birds), and 1994 (64 birds). Counts were conducted at Voice of America Site B (800+ ha) in 1984 (6 birds), 1993 (40 birds), and 1994 (48 birds). These were considered minimal counts. The future of these populations is uncertain; there was a proposal to allow grazing at these sites in 1996.

Summary: North Carolina supports small breeding and wintering populations of Henslow's Sparrow.



Ohio Status

Bird Conservation Regions: 13, 22, 28 **State Status:** Species of Special Concern

Natural Heritage Rank: S4B

Species of Greatest Conservation Need: Yes, Ohio has developed a State-listed Tactical Plan for the species. The Henslow's Sparrow is a priority species for the Paint Creek, Killdeer Plains/Big Island, and LaSuAn Focus Area Plans.

BBS: The Henslow's Sparrow has been recorded on 36 BBS routes in the state, with 13 routes recording individuals recently (1996-2005). Routes recording the species are located throughout the state. Most routes with a consistent history of recording the bird (> 10 years) are located in the east-central part of the state. There is a decreasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is -2.7 %/year and the short-term trend is -1.9 %/year (John Sauer, USGS, unpublished data 2007). Both trends include 0 in the 95% C.I.

BBA: (Peterjohn and Rice 1991). The Henslow's Sparrow was recorded in 144 priority blocks, 22 special areas, and 12 other locations (178 total blocks out of 1,095 surveyed during the Ohio BBA conducted from 1982-87). Breeding status was identified as possible in 21 blocks, probable in 96 blocks, and confirmed in 61 blocks. A majority of the records came from the southern and eastern portions of the state, with few records from the heavily farmed western and central part of the state. Large colonies of 20-100+ males were located in the Unglaciated Plateau and Glaciated Plateau physiographic regions. The species regularly occurs in reclaimed strip mines. The species has been recorded in 51 blocks (11 possible, 34 probable, and 6 confirmed) in the ongoing second atlas project taking place from 2006 through 2010 (Ohio Ornithological Society 2007).

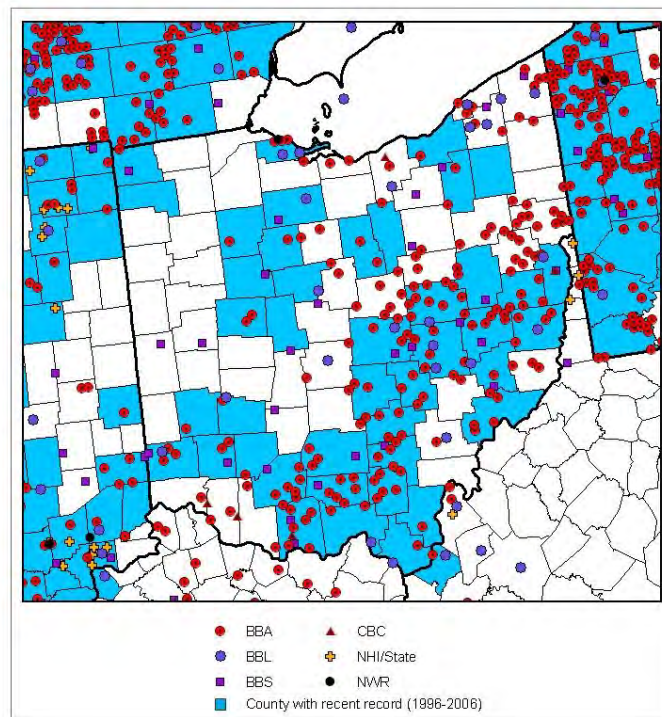
National Wildlife Refuge Survey: None

Birder Listserve Records: Voice of America Park (Butler Co.) and Woodbury Wildlife Area (Coshocton Co.).

Research: Swanson (1996) reported that six fields occupied in southwestern Ohio averaged 12 hectares in size. Ingold et al. (2009) banded 114 individuals on reclaimed strip mines in Muskingum, Guernsey, and Noble counties in southeastern Ohio. Kofford (1999) counted 444 sparrows while conducting road-side surveys in 12 southeastern Ohio counties during 1997. Almost all birds were using reclaimed strip mines. Ibargüen (2004) captured birds at 5 sites (Wright Patterson Air Force Base and Tri-Valley, Woodbury, Crown City, and Egypt Valley Wildlife Areas) in Ohio in order to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Historic records (1924-33) from the northeast corner of Blendon Township, Franklin County indicated individuals were present during two out of 10 years that surveys were conducted (Hicks 1935). Peterjohn (1989) reported that the largest colonies were composed of 50-100 singing males in fields near Point Creek Reservoir (Highland and Ross Counties), Salt Fork Reservoir (Guerney County), and East Fork Reservoir (Clermont County). Based on references from Peterjohn and Rice 1991 and Peterjohn 1989, the first Ohio specimen of Henslow's Sparrow was collected in 1872, and the species was observed sporadically during the 1890's. It was not regularly reported until the 1920's. Henslow's Sparrow range and populations in Ohio expanded during the 1920's and 1930's. The population peaked in central and northern Ohio during the 1930's. Loss of suitable habitat as a result of intensive agricultural practices led to declines through the 1950's in northern and central Ohio, where the species has been largely eliminated. During the same period, the species expanded its range into southern and unglaciated counties, taking advantage of successional habitats in abandoned farmlands. Pruitt (1996) reported that CRP grasslands may be an important habitat source in the state.

Summary: Henslow's Sparrows are an uncommon breeding bird in the state and primarily use reclaimed strip mines or fields enrolled in CRP.



Oklahoma Status

Bird Conservation Regions: 21, 22, 24, 25 **State Status:** No Status

Natural Heritage Rank: S2B

Species of Greatest Conservation Need: Yes, the species is a priority species in the Ozark, Ouachita/Arkansas Valley/Western Gulf Mid-Coastal Plain, and Tallgrass Regions. Low populations exist in each region, and population trends are unknown.

BBS: The Henslow's Sparrow has been recorded on two BBS routes in the state, with one route recording individuals recently (1996-2005). Both routes are located in northeastern Oklahoma with the route with recent records located in Osage County. Trend data are not available.

BBA: (Reinking 2004) The Henslow's Sparrow was recorded as possible (five) or probable (three) in 8 blocks during the 1997-2001 Oklahoma BBA project. All blocks were located in the northeastern part of the state in Osage, Washington, and Craig Counties.

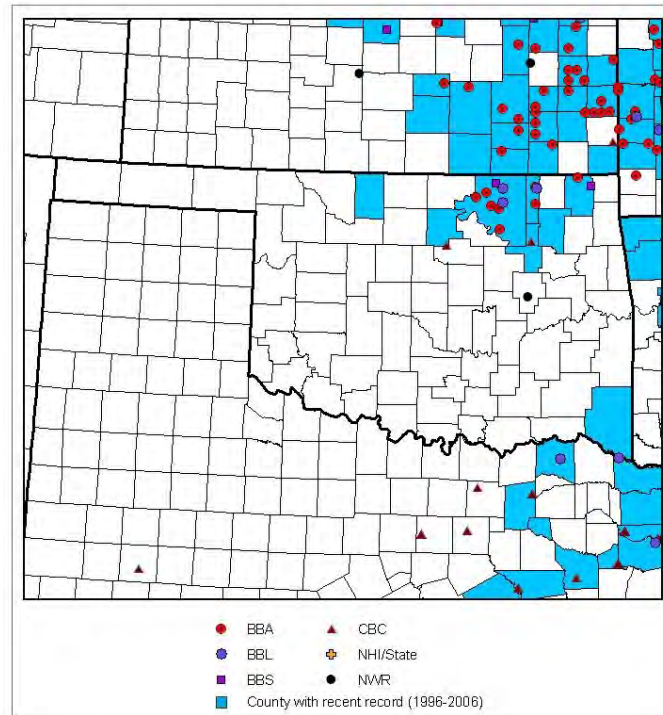
National Wildlife Refuge Survey: None

Birder Listserve Records: None

Research: During a five-year study starting in 1992, researchers from the Sutton Avian Research Center identified an estimated breeding population of 3,000 singing males on The Nature Conservancy's Tallgrass Prairie Preserve in Osage County (Reinking et al. 2000). During the study, 24 nests were found, and 10 of the nests were successful.

Other: Baumgartner and Baumgartner (1992) cite numerous historic records, mainly during migrational periods. The first confirmed nesting record in Oklahoma came from Washington County in 1987 (Reinking and Hendricks 1993; Sutton Avian Research Center 1998). Pruitt (1996) reported that the recent records of Henslow's Sparrows in Oklahoma may be due to better habitat conditions in the state or may be related to birds from other areas being forced into the Osage Hills region due to habitat loss in other areas to the northeast of Oklahoma. Verser (1990) reported breeding-season sightings in Rogers and Tulsa Counties. Pruitt (1996) also reported breeding season records for Henslow's Sparrow in 1993 from two locations in Tulsa County.

Summary: Henslow's Sparrows are a relatively recent breeding bird within the state. Populations appear to be growing in the northeastern part of the state.



Pennsylvania Status

Bird Conservation Regions: 13, 28, 29

State Status: Protected

Natural Heritage Rank: S4B

Species of Greatest Conservation Need: Yes, reclaimed strip mines provide valuable habitat in the state. Pennsylvania has an estimated 8.9% of the global breeding population. They are a High-level Concern Species due to population declines and potential threats.

BBS: The Henslow's Sparrow has been recorded on 35 BBS routes in the state, with 12 routes recording individuals recently (1996-2005). Routes are located primarily in the western half of the state, and a few routes were located in the northeast. There is a decreasing population trend both long-term (1966-2006) and short-term (1997-2006) in the state. The long-term trend is -3.6 %/year and the short-term trend is -3.2 %/year (John Sauer, USGS, unpublished data 2007). The long-term trend does not include 0 in the 95% C.I., while the short-term trend does include 0.

BBA: (Brauning 1992) The Henslow's Sparrow was recorded as possible (134), probable (178), and confirmed (52) in 364 blocks out of 4,928 blocks surveyed during the Pennsylvania BBA conducted from 1983-89. All records came from the western and northeastern part of the state. In the Ohio River Basin, roughly half the birds were found

using reclaimed strip mine sites. The BBA project demonstrated that Henslow's Sparrow was more widespread in Pennsylvania than previously suspected. Several atlas volunteers noted that territories in western Pennsylvania were more likely to be used year after year than those in the eastern counties. During the ongoing second BBA project (2004-2008), the species has been recorded in 141 blocks to date (44 possible, 75 probable, and 22 confirmed) (Carnegie Museum of Natural History 2007). The distribution is similar to the distribution of the first BBA. (Note: only data from the first BBA are included on the following map)

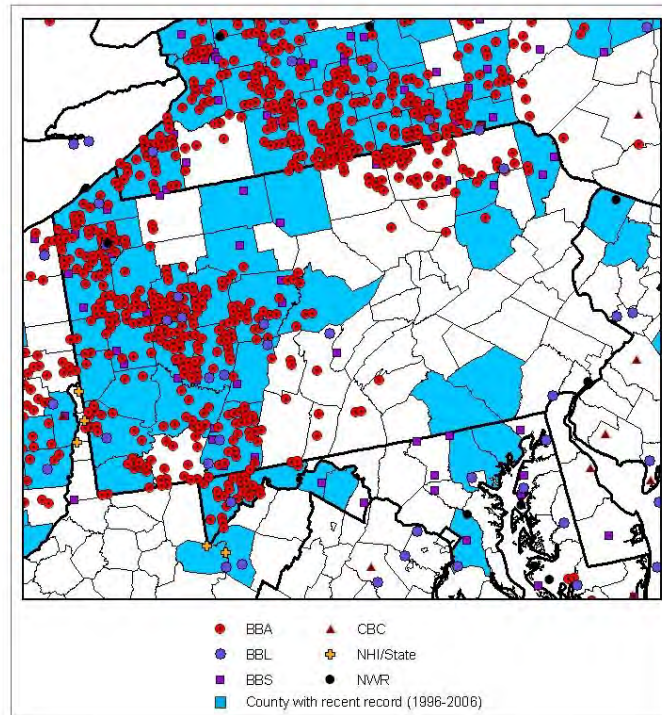
National Wildlife Refuge Survey: There are records of the Henslow's Sparrow from Erie NWR but not John Heinz NWR. The species is uncommon on Erie NWR with a record of one singing male from the SL2 Unit on the refuge.

Birder Listserve Records: State Game Lands #285 (Beaver Co.), Curllsville Strip Mines (Clarion), Curwensville Reclaimed Mines (Clearfield Co.), numerous other records from other reclaimed strip mine sites throughout western Pennsylvania.

Research: Henslow's Sparrows were detected on five Pennsylvania Grassland Breeding Bird Survey routes, with a total of 55 Henslow's Sparrows being recorded on 26 stops along the routes (Brauning 1993). Researchers estimated that there are an estimated 35,373 ha of suitable reclaimed surface mine grassland habitat in nine western Pennsylvania counties (Armstrong, Butler, Cambria, Clarion, Clearfield, Indiana, Jefferson, Somerset, and Venango) with an estimated population of 4,884 singing males (Mattice et al. 2005). The population may be as high as 11,000 individuals if the probability of availability for detection is taken into account (Diefenbach et al. 2007). Ibargüen (2004) captured birds in Clarion County in order to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Pruitt (1996) reported that Henslow's Sparrows may not have been native to Pennsylvania prior to settlement, with no definite breeding records existing until 1913. It was reported in scattered colonies throughout the state, but primarily in the western portions of the state, through the mid-1900's. Henslow's Sparrows are mostly found in association with reclaimed strip mines in Armstrong, southern Clarion, Indiana, and Venango counties, with densities reaching one territorial male per 2 acres (McWilliams and Brauning 1999). Maiken Winter reported at the 2007 Henslow's Sparrow Workshop that populations seem to be stable or increasing in certain areas and are most associated with reclaimed surface mine grassland or adjacent fields (based on pers. com. with Mike Lazone). She cautioned that many of the reclaimed mine sites are presently reverting to shrubland and forest.

Summary: Henslow's Sparrow breed in the state, with most populations being associated with reclaimed surface mine grasslands.



Rhode Island

Bird Conservation Regions: 30 **State Status:** State Historical (Extirpated)

Natural Heritage Rank: SXB

Species of Greatest Conservation Need: No

BBS: No records of Henslow's Sparrow.

BBA: (Enser 1992). No records of Henslow's Sparrow during the 1982-86 BBA.

National Wildlife Refuge Survey: Henslow's Sparrows have never been detected within the Rhode Island National Wildlife Refuge Complex.

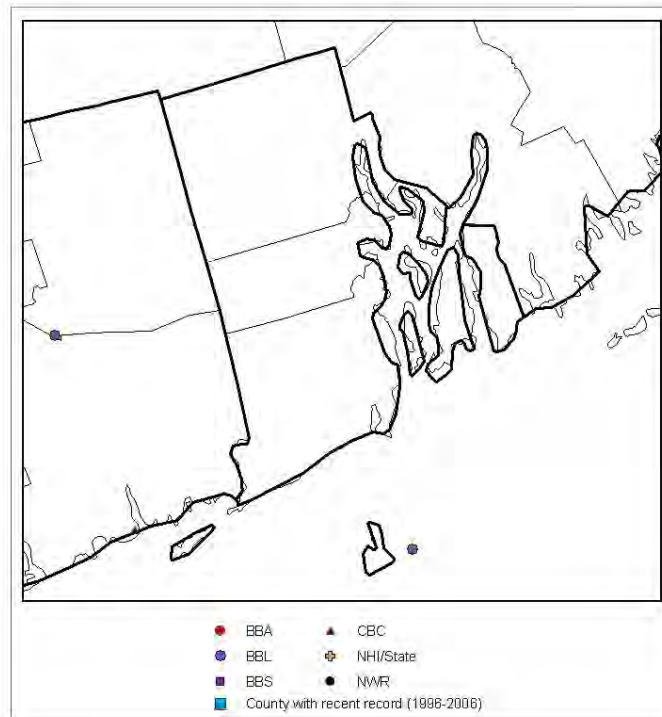
Birder List Serve Records: None

Research: None

Other: The species was not recorded at 40 sites surveyed during a regional inventory of grassland birds in New England conducted from 1997-2000 (Jones et al. 2001). Pruitt (1996) reported that the species was uncommon but regular in South County for at least 40 years, reaching its highest population in the late 1930's or early 1940's in both South

and Newport Counties. Numbers dropped sharply in the mid-1940's. Potato farming increased dramatically on the South County coastal plain after the early 1940's and has been suggested as a potential cause for the decline, either through direct habitat destruction or indirectly through use of DDT.

Summary: Henslow's Sparrows historically bred in the state but are now considered extirpated.



South Dakota Status

Bird Conservation Regions: 11 **State Status:** None

Natural Heritage Rank: SNR

Species of Greatest Conservation Need: No

BBS: Two routes in the state have recorded the species with no records from recent (1996-2005) surveys. Data are inadequate to estimate a state trend.

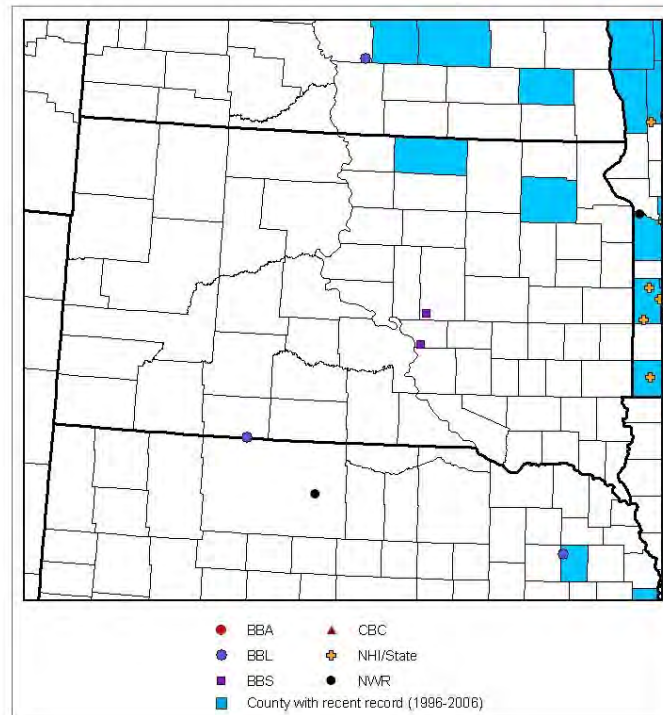
BBA: (Peterson 1995). No Henslow's Sparrows were recorded during the 1988-1993 BBA in the state.

National Wildlife Refuge Survey: Responses were received from Sand Lake NWR (N), Waubay NWR and WMD (Y), Huron WMD (N), and Madison WMD (Y). The species has been observed in Day County in the Waubay WMD; however, breeding records are few. The species is a casual migrant and summer resident in the Madison WMD.

Birder Listserve Records: Scattered records from the eastern part of the state with one record of a nest found in a CRP field in McPherson County in 2001.

Other: The South Dakota Ornithologist's Union (1991) considered Henslow's Sparrow a casual summer visitor in the eastern quarter of the state; they noted four summer records for the period 1882-1984. Tallman et al. (2002) report one nesting record from McPherson County and note three additional breeding season records from Day and Sandborn counties.

Summary: South Dakota is on the western edge of the Henslow's Sparrows breeding range. It is a "casual summer visitor" in the state.



Tennessee Status

Bird Conservation Regions: 24, 27, 28 **State Status:** Need of Management

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, physiographic regions of importance include the Interior Low Plateau and the Cumberland Plateau and Mountains. Sources of stress for the species are development, fire suppression, incompatible grazing/pasture management, and incompatible row crop agriculture practices.

BBS: The species has not been recorded on a BBS route in the state.

BBA: (Nicholson 1997) The Henslow's Sparrow was not recorded during the BBA project conducted from 1986-91. The most recent observation reported in the BBA account was from Cheatham Dam, Cheatham County. Bob Ford (USFWS pers. com. 2007) reported that populations of the species have expanded in the state since the completion of the BBA (see specific sites in Research section below).

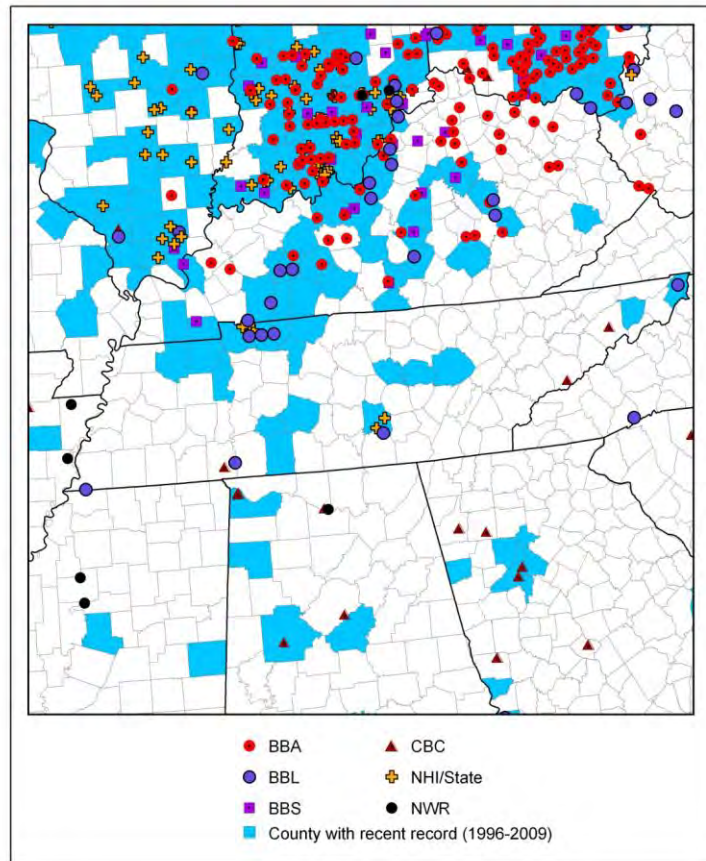
National Wildlife Refuge Survey: The Tennessee NWR reported that the species uses the refuge during migration.

Birder Listserve Records: Fort Campbell (Montgomery Co.)

Research: At the March 2007 Henslow's Sparrow Workshop, Jim Giocomo, based on research completed through the University of Tennessee, reported that there are approximately 300 pairs in the state distributed among eight locations in the state: 1) Land Between Lakes (Stewart Co.); 2) Fort Campbell (Montgomery Co.); 3) a private hunt club (Cumberland and White Co.); 4) CRP fields (Henry and Benton Co.); 5) private fields (Lawrence, Lewis, and Maury Co.); 6) Bark Camp Barren (Coffee Co.); 7) Arnold Air Force Base (Coffee Co.); and 8) a private field (Washington Co.). He also reported that populations appear to be stable demographically and there is great interest in managing native grasslands. Researchers conducting a grassland bird study at Fort Campbell (on the Kentucky-Tennessee border) located 113 Henslow's Sparrow nests during 1999-2003 (Giocomo 2005; Giocomo et al. 2008).

Other: None

Summary: Breeding populations appear to be expanding in the state.



Vermont Status

Bird Conservation Regions: 13, 14 **State Status:** Endangered

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, may possibly be extirpated from the state. Historical records come from the southern half of the state. High priority strategies include habitat restoration, technical assistance, and protected area management.

BBS: The species has been recorded on two routes (Bennington and Rutland Counties) in the state with no recent records (1995-2006). Data are inadequate to estimate a state trend.

BBA: (Laughlin and Kibbe 1985) The Henslow's Sparrow was recorded as possible (one) and probable (one) in two blocks during the 1976-81 BBA project. The probable record came from Rutland County and the possible record was from Windsor County. The species has not been recorded during the current 2003-07 BBA project. Historical nesting records are from the southern half of the state.

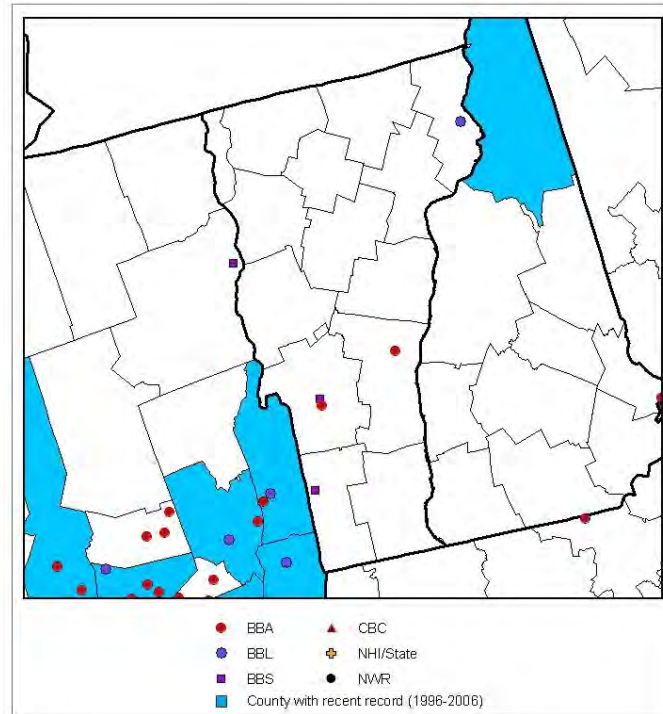
National Wildlife Refuge Survey: The species does not occur at Missisquoi NWR or Silvio O. Conte NWR.

Birder Listserve Records: None

Research: None

Other: The species was not recorded at 109 sites surveyed during a regional inventory of grassland birds in New England conducted from 1997-2000 (Jones et al. 2001). Pruitt (1996) reported that in 1992 the Vermont Nongame and Natural Heritage Program, The Nature Conservancy, and Vermont Institute of Natural Science conducted a survey for breeding Henslow's Sparrows in the Champlain Lowlands. No Henslow's Sparrows were heard or observed. Ellison (1992 and references therein) reported that the earliest record of Henslow's Sparrow in Vermont was a nesting record in 1883. It was listed as a rare summer resident in one historic account and specific records were scarce in the early 1900's. The species increased in abundance in Vermont during the 1930's. The widest distribution of the species was from 1948-54 when it was reported in 16 towns. The last reported nesting was in 1953. The four most recent observations of Henslow's Sparrow in Vermont (1975-86) involved late-arriving, single, singing males briefly present in suitable habitat.

Summary: Henslow's Sparrows historically bred in the state.



Virginia Status

Bird Conservation Regions: 27, 28, 29 **State Status:** Threatened

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, the species occurs in both the Coastal Plain and Piedmont physiographic regions. The plan contains a map of likely high marsh habitat in the Coastal Plain.

BBS: The species has been recorded on three routes in the state, with no recent records (1995-2006). The most recent records come from 1992 and 1993 on the Chincoteague West Route located in Accomack County. Data are inadequate to estimate a state trend.

BBA: None

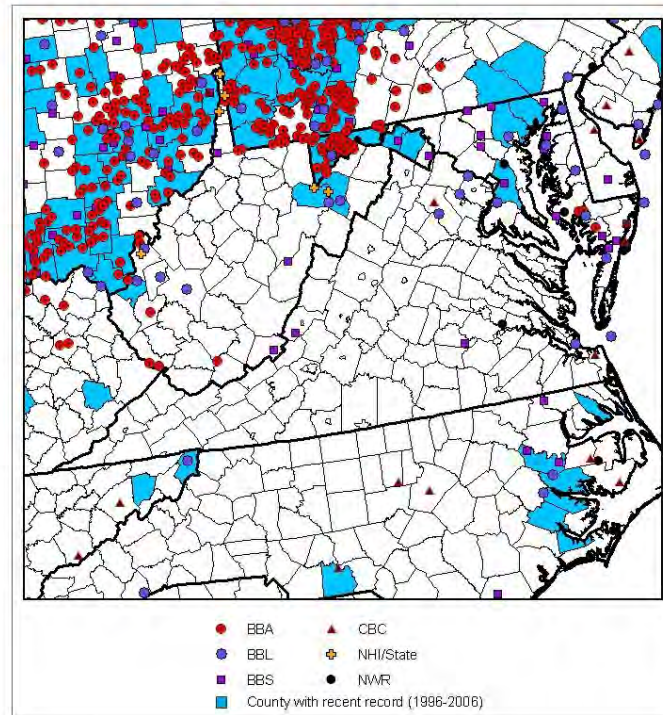
National Wildlife Refuge Survey: Refuges reporting were Chincoteague (Y), Great Dismal Swamp (N), Nansemond (N), Plum Tree Island (Y), Fisherman Island (N), Eastern Shore of Virginia (N), Back Bay (Y), and the Potomac River NWR Complex (N). Chincoteague NWR indicated the species has been observed during migration. Bryan Watts, College of William and Mary, believes it may occur at Plum Tree Island NWR, where future surveys are planned. Back Bay NWR has recorded the species during the winter and migration in the vicinity of the refuge headquarters. Most records come from migratory or wintering periods.

Birder Listserve Records: A few records primarily from migratory periods.

Research: None

Other: Maiken Winter reported at the 2007 Henslow's Sparrow Workshop that it was common in the 1950s and sporadic by the 1990s. The largest population may be on Department of Defense lands in Radford with 10-15 pairs (based on pers. com. with Mike Wilson). Brindza (1987 and references therein) reported that Henslow's Sparrow was formerly a transient and summer resident throughout most of Virginia, being rare in the mountains and valleys but increasing eastward. Since the 1940s, the species has experienced severe declines and is now rare-to-uncommon throughout Virginia. Current known breeding is restricted to small populations in four northeastern counties.

Summary: Henslow's Sparrows breed in the state in low numbers.



West Virginia Status

Bird Conservation Regions: 28 **State Status:** Rare/Species of Concern

Natural Heritage Rank: S1B

Species of Greatest Conservation Need: Yes, there are recent records from the Cheat, Upper Ohio Valley, and Tug Fork Watersheds and historic records from the Upper New and North Branch Watersheds. The biggest threats in the state are habitat loss, management conflicts, and invasive species. Surveys are needed to better determine the status of grassland birds in the state. Known sites with Henslow's Sparrows need to be monitored.

BBS: The species has been recorded on six routes in the state, with one recent record (1995-2006). The most recent record occurred in 2000 and was from the Shanghai Route in Morgan and Berkeley Counties located in northeastern West Virginia. Trend data are not available.

BBA: (Bucklew and Hall 1994) The Henslow's Sparrow was recorded as possible (four), probable (three), or confirmed (two) in a total of nine blocks out of 676 blocks surveyed in the state during the 1984 -89 project. All records were from the western part of the state.

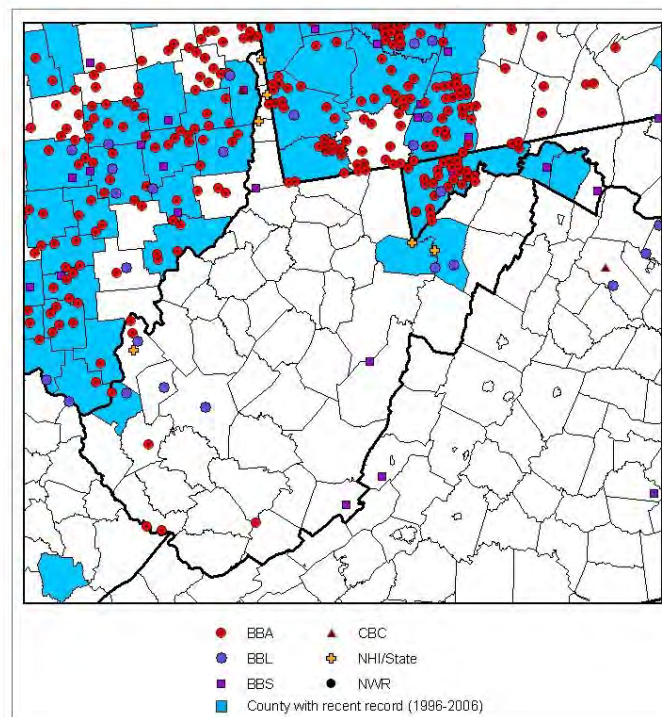
National Wildlife Refuge Survey: The species breeds on Canaan Valley NWR within the Beall and Reichle Tract grasslands. Nestlings have been observed on the refuge, and there is an estimated population of six pairs on the refuge. Henslow's Sparrows are not present at Ohio Rivers Islands National Wildlife Refuge.

Birder Listserve Records: None

Research: None

Other: Pruitt (1996) reported that Henslow's Sparrows were not known in West Virginia until 1935, when one was collected in Preston County in October. A few scattered nesting colonies were located in the next few years. The highest populations of Henslow's Sparrow in West Virginia occurred during the 1950-60s, but they declined greatly in the 1970s. Henslow's Sparrows may be locally common in some years, but populations do not persist (generally due to habitat becoming unsuitable).

Summary: Henslow's Sparrows breed in low numbers in the state.



Wisconsin Status

Bird Conservation Regions: 12, 23 **State Status:** Threatened

Natural Heritage Rank: S3B

Species of Greatest Conservation Need: Yes, the species has a high probability of occurring in the appropriate habitat in the southern two-thirds of the state. Landscapes with the greatest value to the species are the Central Sand Hills, Central Sand Plains, Southeast Glacial Plains, Southern Lake Michigan Coastal, Southwest Savanna, Western Coulee and Ridges, and Western Prairie. Conservation actions include: 1) maintaining idle grasslands; 2) limiting grazing on important habitat; 3) continuing agricultural set-aside programs; and 4) working with government agencies to protect grassland habitat from development.

BBS: The Henslow's Sparrow has been recorded on 59 BBS routes in the state, with 25 routes recording individuals recently (1996-2005). The routes are distributed throughout the southern three-quarters of the state with most routes recording the species \geq seven years located in the southern half of the state. There is a decreasing long-term population trend (1966-2006) and an increasing short-term trend (1997-2006). The long-term trend is -1.6 %/year and the short-term trend is +6.6 %/year (John Sauer, USGS, unpublished data 2007). Both trends include 0 in the 95% C.I.

BBA: (Cutright et al. 2006) The Henslow's Sparrow was recorded as possible (15), probable (57), and confirmed (24) in a total 96 quads out of 1,132 quads surveyed in the state during the 1995 through 2000 project. They were also observed in an additional 23 non-priority quads (six possible, 15 probable, and two possible). Records were distributed throughout the southern three-quarters of the state with the highest density coming from the southwestern and central parts.

National Wildlife Refuge Survey: The species occurs within the St. Croix WMD and at Horicon NWR but does not occur at Whittlesey Creek NWR. Singing males were recorded during 1999 at seven Waterfowl Production Areas (Betterly, Bierbauer, Flatters, Kerber, St. Croix, Ten Mile, and Three Lakes). No surveys have been conducted since 1999. At Horicon, the species is found on the MDR and Bud Cook Units, with an estimated population of six pairs on the refuge.

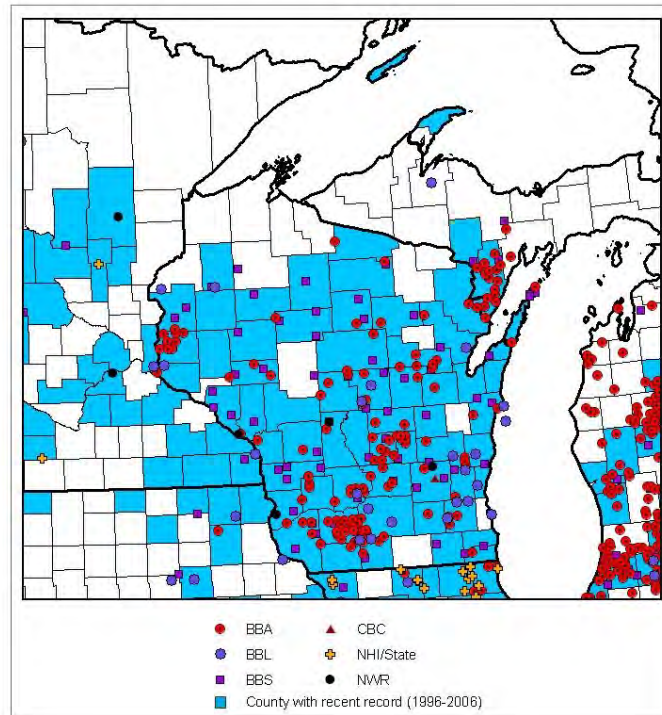
Birder Listserve Records: Yellowstone Lake State Park (Lafayette Co.), Thousand Rocks Prairie at Governor Dodge State Park (Iowa Co.), Brooklyn Wildlife Management Area (Dane Co.), TNC's Spring Green Nature Preserve (Sauk Co.), Marbleseed Prairie (Green Co.). Inconsistent records come from numerous sites in Dane Co.

Research: Guzy (2005) detected the species in remnant prairie, pasture, CRP, and hayfield habitats in western Dane, eastern Iowa, and northern Green counties during 2001-2003 grassland surveys. He estimated densities ranging from 0.04-0.51 birds/ha in

surveyed habitats. A high relative abundance for Henslow's Sparrows was predicted for southwestern Wisconsin based on modeling completed for the Prairie Hardwood Transition Bird Conservation Region (Thogmartin et al. 2006). Sample (1989) detected Henslow's Sparrows in 11 different habitats located in southern Wisconsin during surveys conducted during 1985-87. Habitats with the highest mean number of pairs from the Sample (1989) study were poor switch grass fields (2.0 pairs), mixed warm season grasses (1.3 pairs), and cool season grass (0.9 pairs). Murray et al. (2008) detected 0.07 individuals per route during a 2003-2005 grassland bird study in southwestern Wisconsin. Iburgüen (2004) captured birds at Buena Vista Grassland to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Pruitt (1996) reported that the historic range of Henslow's Sparrow in Wisconsin is poorly known. There are no reliable data on the range prior to major settlement by Europeans (i.e. roughly before 1850), although it is probable that Henslow's Sparrow was common in prairie, wet meadow, and savanna habitats in the south, central, and western parts of the state. Robbins (1991) noted that the normal range of Henslow's Sparrow in Wisconsin covers about the southern four-fifths of the state, but nowhere in the state can the bird be called common, or even fairly common. Sites that Pruitt (1996) lists as having > 10 pairs include: White River Marsh Complex (Green Lake Co.), Governor Dodge State Park (Iowa Co.), Bong State Recreation Area (Kenosha Co.), Buena Vista Prairie Chicken Management Area (Portage Co.), Grand River Marsh State Wildlife Area (Marquette and Green Lake Counties), scattered tracts in Jackson Co., and scattered tracts on state-owned and/or federally managed properties in Columbia Co.

Summary: The Henslow's Sparrows is an uncommon to locally common breeding bird in the state.



Canada Status

Bird Conservation Regions: 13 **Status:** Endangered

Natural Heritage Rank: S2B

Species of Greatest Conservation Need: NA

BBS: The species has been recorded on seven BBS routes in Ontario, with only one route (015) having recent (1995-2006) records. Route 015 is located north of Lake Ontario in southern Ontario. Data are inadequate to estimate population trends.

BBA: (1981-85). During the Ontario BBA it was found in only 38 (2%) of 1,824 squares in southern Ontario, and in only three (8%) of those was breeding confirmed.

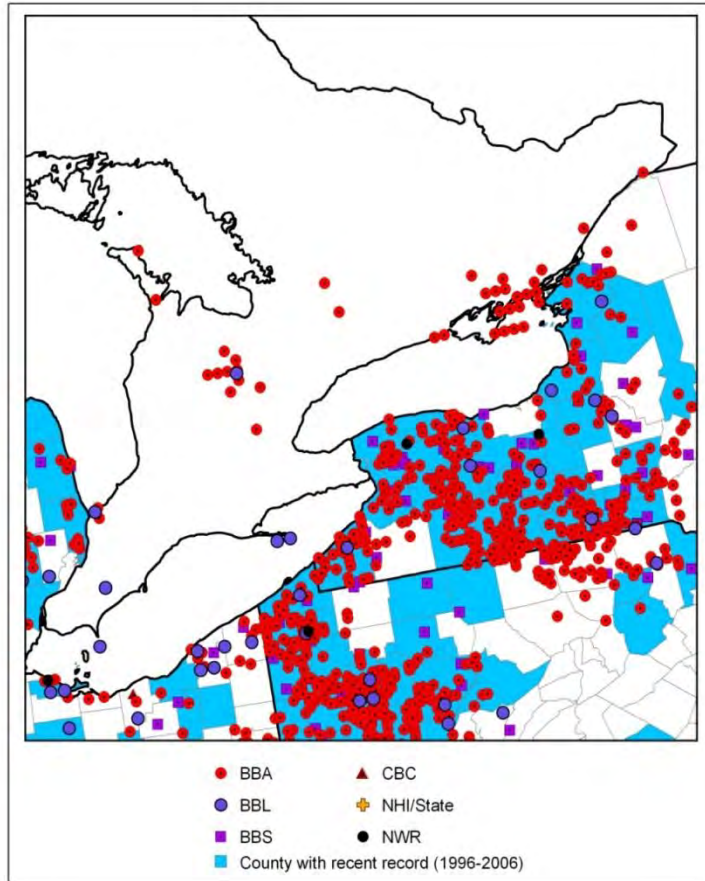
(Reference Austen 1994, Austen et. al. 1995, Enright 1995a and references therein). It is not known if Henslow's Sparrow bred in Ontario prior to settlement and the concomitant clearing of forests. However, presettlement prairies were extensive in southwestern Ontario. Henslow's Sparrow was first reported in Ontario in 1898. The species has been known to breed in Ontario and southwestern Quebec; since the 1960s breeding has been restricted to Ontario. The species population and range within Ontario has decreased within the last 30-40 years. It was estimated that fewer than 50 pairs bred in Ontario in any given year during 1981-85, and the numbers have declined since that

period. Surveys in 1992 and 1993 found one singing male in each year. The species was formally registered under the Ontario Endangered Species Act in May, 1994 to give the species and its habitat legal protection.

Research/monitoring: (From Pruitt 1996) A 1992 survey for Henslow's Sparrow in suitable habitat in Ontario revealed only one singing male. No Henslow's Sparrows were located at 18 formerly occupied sites surveyed in 1992. Due to the limited success of the 1992 survey, efforts in 1993 were concentrated in areas with the greatest likelihood of Henslow's Sparrow being present and where there was potential for Henslow's Sparrow management. The only site where Henslow's Sparrows (presumably one pair) were found in 1993 was at the site occupied in 1992 (Knapton 1993, Austen et al. 1995). The Ontario Birds at Risk Newsletter (Federation of Ontario Naturalists 1994) reported that 1994 surveys of fallow agricultural fields within Haldimand-Norfolk Regional Municipality and historic sites in Prince Edward County yielded limited suitable habitat and no Henslow's Sparrows. Three singing males were located independent of the survey in an old field in the Peterborough area. The newsletter also reported that there would be no formal survey for Henslow's Sparrow in 1995, but that records would be kept on any observations reported. Enright (1995a) prepared a draft habitat management plan for Henslow's Sparrow in Ontario. Enright (1995b) reported on the status of recovery efforts.

Other: (From Pruitt 1996) Henslow's Sparrow has been found in abandoned fields, ungrazed or lightly grazed pasture, fallow hayfields, grassy swales, and wet meadows. Long-term land use changes have resulted in the loss of native grasslands and suitable secondary grasslands. However, some sites in Ontario still have apparently suitable habitat for Henslow's Sparrow, but the birds no longer utilize this habitat. This suggests that factors, in addition to habitat loss, are also influencing Henslow's Sparrow populations.

Summary: The species breeds in small numbers in the southern part of Ontario.



Wintering Range

Alabama Status

Bird Conservation Regions: 24, 27, 28, 29 **State Status:** Highest Concern

Natural Heritage Rank: S2N

Species of Greatest Conservation Need: Yes, important habitats to wintering Henslow's Sparrows in the state are Dry Longleaf Pine Forest; Glades and Prairies; Bogs and Seepage Communities; and Wet Pine Savanna and Flatwoods. The SWAP lists conservation actions for each of these habitats as well as priority areas to implement conservation actions for each of the habitats.

CBC: Henslow's Sparrows have been recorded on 10 CBC Survey circles in the state, with four circles recording individuals recently (1997-2006). Six of the circles were located in coastal areas, while the other 4 were located at inland locations. It has been recorded a total of 20 years in the Gulf Shores Circle. Trend data are not available.

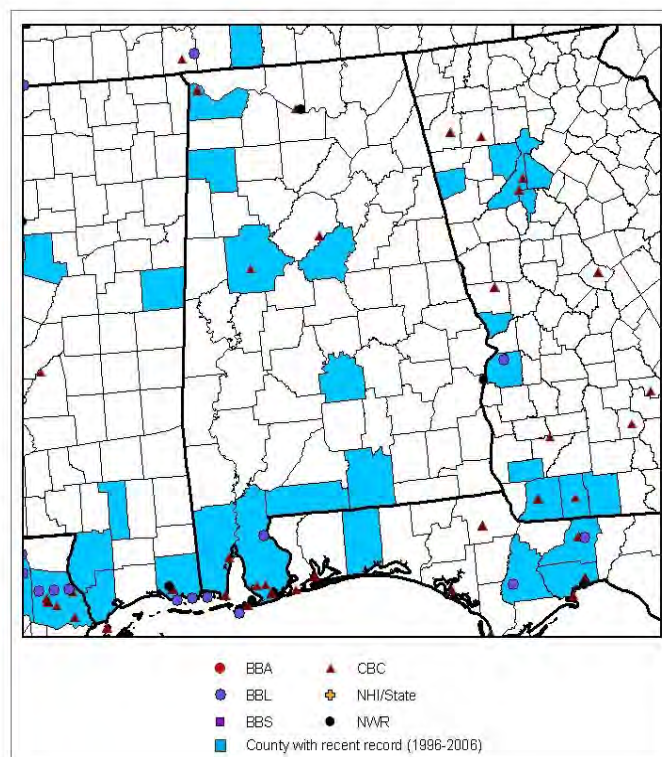
Birder Listserve Records: Numerous wintering records are reported from many counties in southern Alabama including Baldwin, Covington, Escambia, and Mobile counties. There are sporadic migration records throughout northern and central Alabama. Sites with multiple birder records over the past ten years include the Gulf Shores "Bogs" in Baldwin County and Dauphin Island in Mobile County.

National Wildlife Refuge Survey: Bon Secour refuge reported the species does not occur on the refuge.

Research: A total of 52 Henslow's Sparrows were banded during 1995 and 1996 on International Paper Company property in Baldwin County (Plentovich et al. 1998). Henslow's Sparrows were found on 21 of 47 pitcher plant bogs surveyed in the Conecuh National Forest in Alabama and the Blackwater River State Forest in Florida (Tucker and Robinson 2003).

Other: Destruction and development of Alabama's coastal marshes and conversion of naturally occurring longleaf pine/wiregrass communities to other types may also adversely affect the species (Mirarchi 1986). Folkerts (1982) noted that pitcher plant bogs are being altered and destroyed at an accelerating rate.

Summary: Henslow's Sparrow winters throughout the southern part of the state.



Arkansas Status

Bird Conservation Regions: 24, 25, 26 **State Status:** Inventory Element

Natural Heritage Rank: S1B, S2N

Species of Greatest Conservation Need: Yes, it is primarily a winter visitor, but more recent records indicate some breeding in the northern part of the state. Optimal habitats in the state are the Arkansas Valley Prairie and Woodland; Southeastern Great Plains Tallgrass Prairie, and the West Gulf Coastal Plain Saline Glade. The SWAP identifies threats, data gaps, conservation actions, and monitoring strategies for the species.

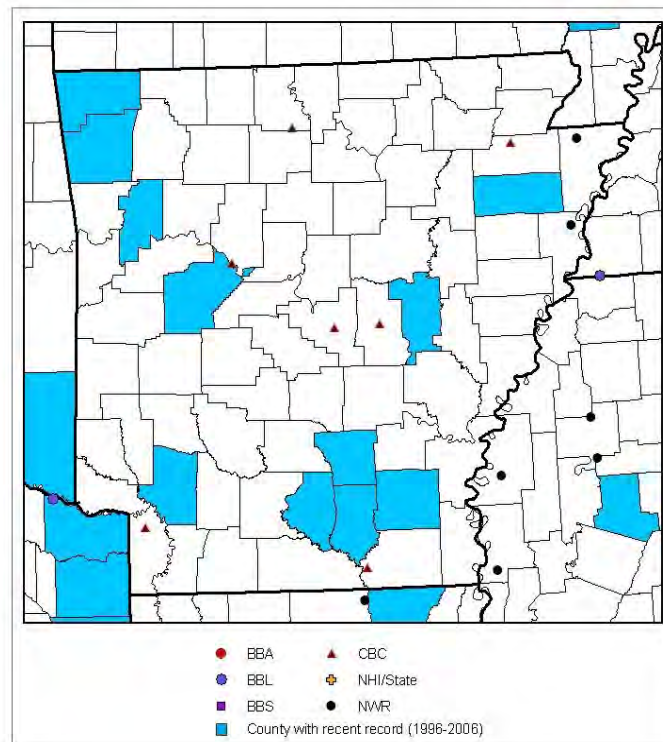
CBC: Henslow’s Sparrows have been recorded on seven CBC Survey circles in the state, with one circle (Jonesboro Circle) recording individuals recently (1997-2006). No circle has recorded the species more than once. Trend data are not available.

National Wildlife Refuge Survey: Wapanocca NWR reported the species occurs on the refuge during migration.

Research: Holimon et al. (2008) detected 73 Henslow’s Sparrows in 29 saline soil barrens in southern Arkansas during 2006. The mean density for all sites surveyed was 1.43 individuals/ha.

Other: Small breeding populations are becoming established in suitable habitat in the northern part of the state. Sites with recent breeding season records over multiple years as reported by the Arkansas Audubon Society (unpublished data 2007) and by Holimon et al. (2004) include: Pea Ridge National Military Park (Benton Co.), Flanagan Prairie Natural Area (Franklin Co.), and Clabber Creek/Wilson Springs Prairie (Washington Co.). Sites with winter records include: Warren Prairie Natural Area (Bradley and Drew Co.) and a pasture in Hampton area (Calhoun Co.). Pruitt (1996) reported that a small number of Henslow's Sparrows winter in two areas in southern Arkansas (Warren Prairie Natural Area in Bradley/Drew counties and Kingsland Prairie in Cleveland County).

Summary: Recent evidence suggests the potential for small wintering and breeding populations of Henslow's Sparrow in the state.



Florida Status

Bird Conservation Regions: 27, 31 **State Status:** None

Natural Heritage Rank: SNR

Species of Greatest Conservation Need: Yes, important habitat consists of natural pineland, which has an overall poor and declining condition within the state. Analysis indicates that 30% of remaining pineland habitat is protected. Some threats include:

conversion to agriculture, development, incompatible forestry practices, invasive species, and altered fire regimes.

CBC: Henslow's Sparrows have been recorded on 40 CBC Survey circles in the state, with 18 circles recording individuals recently (1997-2006). The circles are distributed throughout the state with circles having the most observations coming from the northern part of the state. Analysis of CBC data, from 1959-1988, indicated a decreasing trend of -0.5 %/year (-1.3 to 0.4 95% C.I., n = 24) (Sauer et al. 1996).

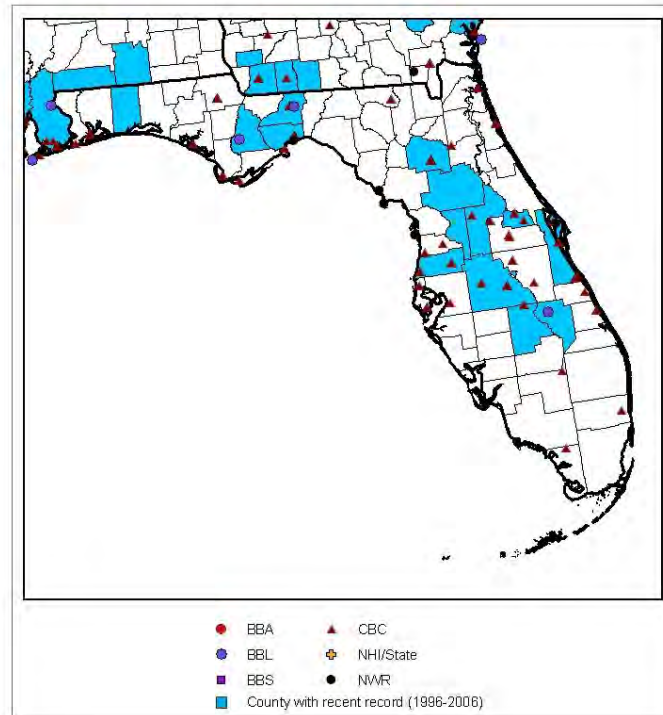
National Wildlife Refuge Survey: Five refuges (Chassahowitzka, Merritt Island, St. Johns, St. Vincent, and Ten Thousand Islands) indicated the species does not occur, but it has been detected at St. Marks NWR. The species is present in longleaf pine-wiregrass savannas on the refuge and in power line right-of-ways around St. Marks NWR.

Birder Listserve Records: Sites with multiple birder records over the past ten years include St. Marks NWR in Wakulla County, Apalachicola National Forest in Liberty County, and the Okaloosa County Landfill near Ft. Walton Beach.

Research: Henslow's Sparrows were found on 21 of 47 pitcher plant bogs surveyed in the Conecuh National Forest in Alabama and the Blackwater River State Forest in Florida (Tucker and Robinson 2003). Iburguen (2004) captured birds at Apalachicola National Forest and Three Lakes Conservation Area to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Stevenson and Anderson (1994) listed Henslow's Sparrow as a secretive and apparently rare winter resident of Florida. Robertson and Woolfenden (1992) consider the Henslow's Sparrow probably fairly common in northern Florida. Avon Park Air Force Range has a small wintering population, with 5 individuals banded at the site (Mitchell 1998). Tyndall Air Force Base has potential wintering habitat (Mitchell 1998).

Summary: Henslow's Sparrow winters throughout the northern two-thirds of the state.



Georgia Status

Bird Conservation Regions: 27, 28, 29 **State Status:** Rare

Natural Heritage Rank: S3N

Species of Greatest Conservation Need: Yes, the species is present in wet pine savanna and flatwoods habitats within the Coastal Plain and Piedmont Regions of the state. Basic research and surveys are the conservation emphasis for the species at this time.

CBC: Henslow's Sparrows have been recorded on 16 CBC Survey circles in the state, with six circles recording individuals recently (1997-2006). The circles are distributed throughout the state with the circles having the most observations coming from the coastal region of the state. Two routes have recorded the species ≥ 10 years (Sapelo Island – 19 years and St. Catherine's Island – 11 years). Trend data are not available.

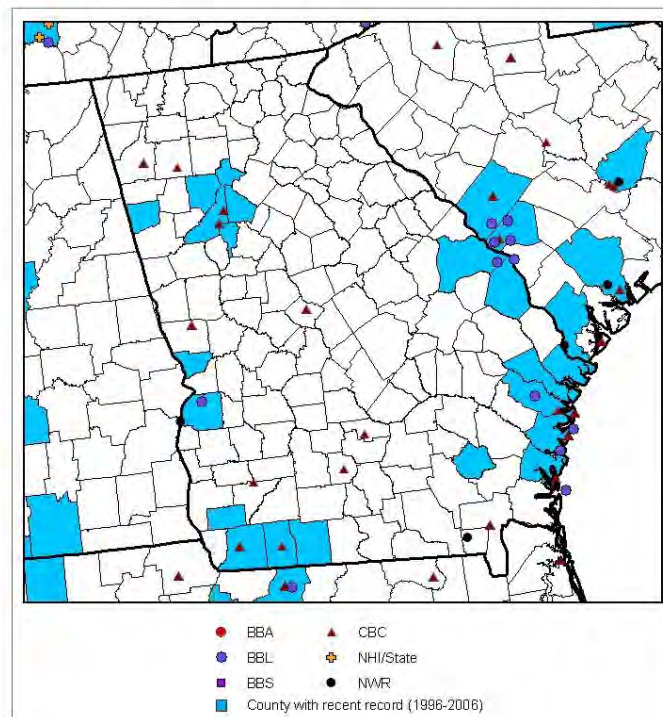
National Wildlife Refuge Survey: None

Birder Listserve Records: Sites with multiple birder records over the past ten years include Paulk's Pasture Wildlife Management Area (Glynn/McIntosh Co.), the Cochran Shoal Unit of the Chattahoochee River National Recreational Area (Cobb Co.) (mostly during migration), and Birdsong Nature Center (Grady Co.).

Research: Ibargüen (2004) captured birds in McIntosh and Glynn counties to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Wintering individuals have been observed at Fort Stewart (Mitchell 1998). Pruitt (1996) reported a record in the Natural Heritage Database from Glynn County. Pruitt (1996) reported that Henslow's Sparrows are often found in power line right-of-ways in areas of former flatwoods, now surrounded by pine plantations. They are mainly found in these types of habitat in late fall, during their migration southward. The power lines may provide the best remaining habitat in Georgia, given the lack of maintained natural habitats in coastal areas.

Summary: Henslow's Sparrow winters in the state.



Louisiana Status

Bird Conservation Regions: 25, 26, 27, 37 **State Status:** No Status

Natural Heritage Rank: S3N

Species of Greatest Conservation Need: Yes, important habitat in the state includes Western Longleaf Pine Savannah, Western Hillside Seepage Bog, Eastern Upland Longleaf Pine Forest, and Eastern Longleaf Pine Savannah. Fire suppression is a major threat to these habitats, and implementing prescribed fire is an important strategy to maintain quality habitat. The SWAP identifies threats to these habitats and strategies for the protection and management of the species.

CBC: Henslow's Sparrows have been recorded on 27 CBC Survey circles in the state, with 15 circles recording individuals recently (1997-2006). The circles are distributed throughout the state with circles having the most consistent history coming from St. Tammany, Orleans, and St. Bernard Parishes. Trend data are not available.

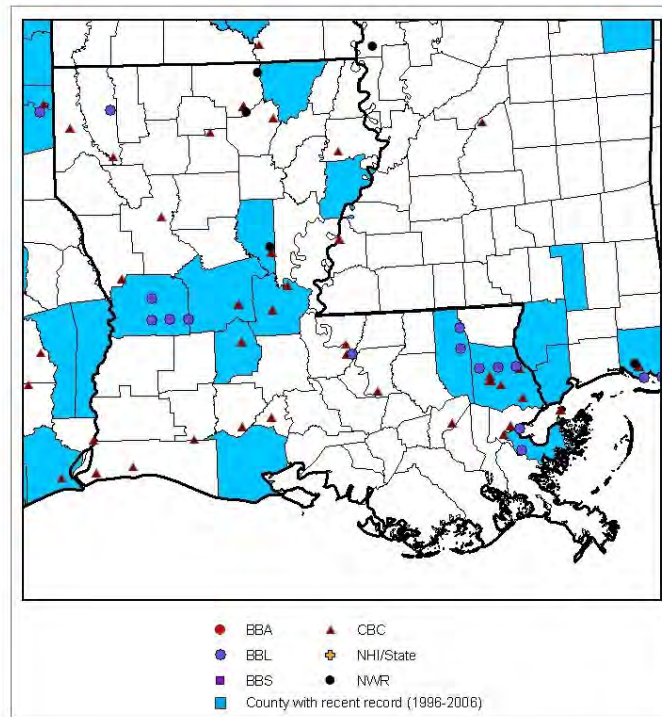
National Wildlife Refuge Survey: Wintering birds occur at D'Arbonne, Upper Ouachita, and Black Bayou NWRs. It is seen irregularly, in low numbers on these refuges in powerline right-of-ways, open fields, and burned pine stands.

Birder Listserve Records: None

Research: Researchers at Fort Polk and Kisatchie National Forest in Vernon Parish detected individuals on 58% of the transects surveyed during winter surveys in 1996 and 1997 (Carrie et al. 2002). A total of 135 Henslow's Sparrows was detected during a two-year (2001-02) study in St. Tammany and Tangipahoa Parishes (Bechtoldt and Stouffer 2005). Specific study sites used by Bechtoldt and Stouffer (2005) study included Lake Ramsay WMA, Camp Whispering Pines, Abita Flatwoods Preserve, and Lake Ramsay WMA. Johnson et al. (2009) noted that birds began arriving in October in southeastern Louisiana and left their study area by the end of mid-April. Ibargüen (2004) captured birds at Fort Polk to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Large wintering populations are found on Fort Polk (Mitchell 1998). Pruitt (1996) reported there is a suspected loss of habitat to residential and commercial development north of Lake Pontchartrain and elsewhere in the state. The ongoing conversion of pine savannas and open pine forests to pine plantations also results in loss of suitable winter habitat. Pruitt (1996) reported there is a suspected loss of habitat to residential and commercial development north of Lake Pontchartrain and elsewhere in the state. The ongoing conversion of pine savannas and open pine forests to pine plantations also results in loss of suitable winter habitat.

Summary: Henslow's Sparrows winter throughout the state.



Mississippi Status

Bird Conservation Regions: 26, 27 **State Status:** No Status

Natural Heritage Rank: S3N

Species of Greatest Conservation Need: Yes, important habitats in the state include Wet Pine Savannas/Flatwoods ($\approx 80,000$ acres) and Pitcher Plant Bogs ($\approx 10,000$ acres). High threats to these habitats include altered fire regimes, invasive species, incompatible forestry practices, development, and groundwater/surface water withdrawal.

CBC: Henslow's Sparrows have been recorded on four CBC Survey circles in the state, with two circles recording individuals recently (1997-2006). All circles are located in the southern half of the state, with only one circle recording individuals during more than 10 years (Jackson County Circle – 13 years). Trend data are not available.

Birder Listserve Records: Sites where birders have reported the species over multiple years include the Crosby Arboretum (Pearl River Co.), DeSoto National Forest (Forrest Co.), Mississippi Sandhill Crane NWR (Jackson Co.).

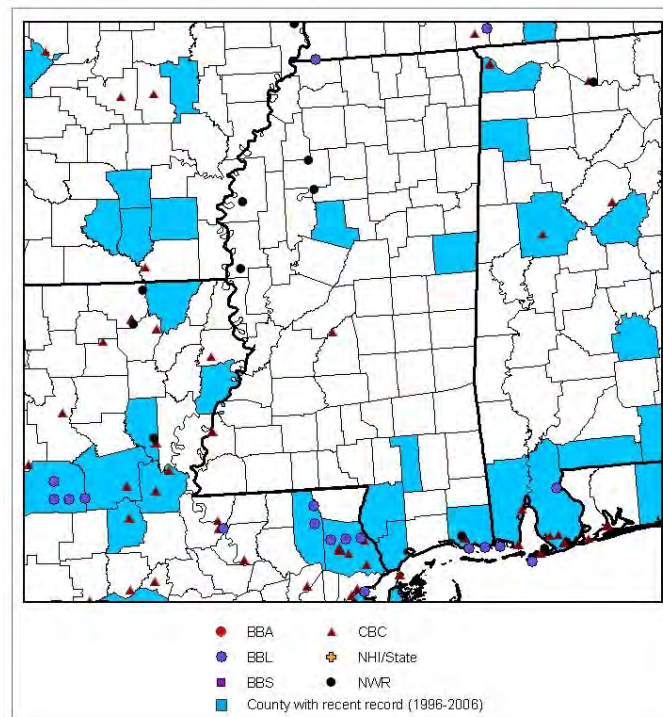
National Wildlife Refuge Survey: Wintering individuals occur on Mississippi Sandhill Crane and Noxubee NWRs, and they are not present on Dahomey, Tallahatchie, and

Coldwater River NWRs. Wintering estimates at Mississippi Sandhill Crane NWR range from 10,000-12,000 individuals based on Mark Woodrey's work on the refuge. A small number of birds (\leq five) have been observed on one field at Noxubee NWR.

Research: A total of 94 Henslow's Sparrows were radio tracked as part of a survival study at Mississippi Sandhill Crane NWR during the winters of 2001 and 2002 (Thatcher et al. 2006). Management for cranes appears to be suitable for maintaining habitat for wintering Henslow's Sparrows. Iburgüen (2004) captured birds at Mississippi Sandhill Crane NWR to collect feather samples for stable isotope research assessing linkages between breeding and wintering locations.

Other: Pruitt (1996) reported that wintering Henslow's Sparrows have been found primarily in broomsedge and wiregrass communities and associated weedy and shrubby areas. Wet or boggy sites appear to be most suitable.

Summary: Henslow's Sparrows winter in the state primarily in coastal areas.



South Carolina Status

Bird Conservation Regions: 27, 28, 29 **State Status:** Species of Concern

Natural Heritage Rank: SZN

Species of Greatest Conservation Need: Yes, high priority conservation actions that will benefit the Henslow's Sparrow include developing outreach programs that inform the public about the importance of prescribed burning, developing partnerships that provide landowner assistance for habitat management on private property, and providing information about management of priority species to those parties responsible for public land management.

CBC: Henslow's Sparrows have been recorded on 10 CBC Survey circles in the state, with six circles recording individuals recently (1997-2006). The circles are distributed throughout the state with no circle recording the species more than 10 years over the history of the survey. Trend data are not available.

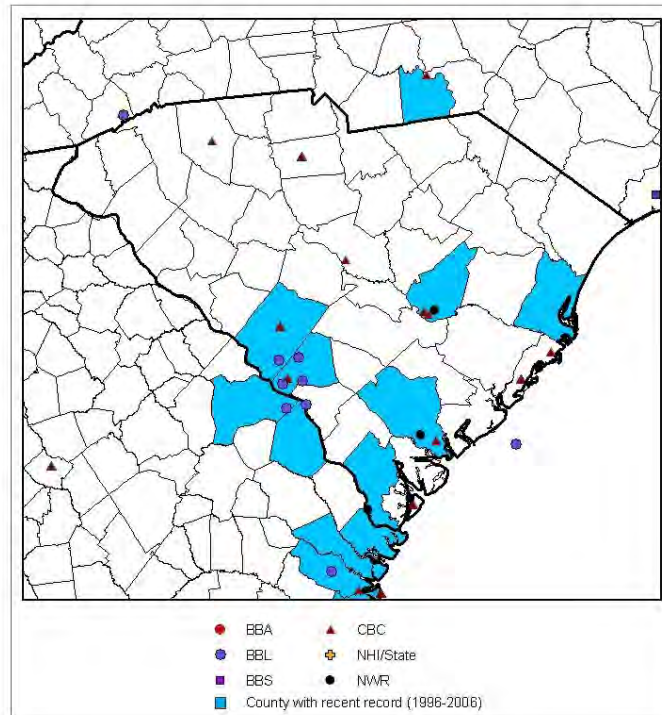
National Wildlife Refuge Survey: Wintering individuals have been observed in wet abandoned portions of upland fields on the Edisto and Combahee River Units on Ace Basin NWR. No estimate for the number wintering there is available.

Birder Listserve Records: Huntington Beach State Park (Georgetown Co.)

Research: Approximately 150 individuals were encountered during a study of Henslow's Sparrows wintering habitat use at the Department of Energy's Savannah River Site in Allendale and Aiken Counties (Paul Champlin, Clemson University, pers. com. 2007). Birds were detected in power line right-of-ways, pine savanna, clear cuts, and grassy Carolina bays, with the highest density occurring in grassy Carolina bays.

Other: Pruitt (1996) reported that prime winter habitat (pine savannas and mature longleaf pine forests with wiregrass-dominated groundcover) has greatly decreased in South Carolina. Secondary anthropogenic habitats (moist broomsedge fields with minimal woody invasion) have also greatly declined. Phinizy Swamp Nature Park in Richmond County has had a few records of Henslow's Sparrows (Paul Champlin, Clemson University, pers. com. 2007). Pruitt reported that over 100 specimens were collected from the Lower Coastal Plain of South Carolina between 1884-1927. Post and Gauthreaux (1989) noted that Henslow's Sparrows summered in Greenville County for several years in the late 1940's; however no nests were documented.

Summary: Henslow's Sparrow winters in the state.



Texas Status

Bird Conservation Regions: 20, 21, 25, 36, 37 **State Status:** Special Concern

Natural Heritage Rank: S2S3N, SXB

Species of Greatest Conservation Need: Yes, wintering ecoregions include the Pineywoods, Cross Timbers and Prairies, and Gulf Coast Prairies and Marshes. Problems facing the species include improper livestock grazing, development, invasive species, and fire suppression among others. The SWAP contains conservation actions to address these problems.

CBC: Henslow's Sparrows have been recorded on 44 CBC Survey circles in the state, with 27 circles recording individuals recently (1997-2006). The circles are distributed throughout the eastern and coastal portions of the state. Individuals have been recorded on three circles ≥ 18 years (Freeport – 21 years, Houston – 18 years, and Nacogdoches – 21 years). Analysis of CBC data, from 1959-1988, indicated a decreasing trend of -0.2 %/year (-1.0 to 0.7 95% C.I., $n = 24$) (Sauer et al. 1996).

National Wildlife Refuge Survey: Wintering birds occur at Aransas, Attwater Prairie Chicken, Trinity River NWRs, but not at Balcones Canyonlands or Anahuac NWRs. Aransas NWR staff reported occasional records over the past 20 years. Suitable habitat exists on Attwater Prairie Chicken NWR, but the species has not been reported from the

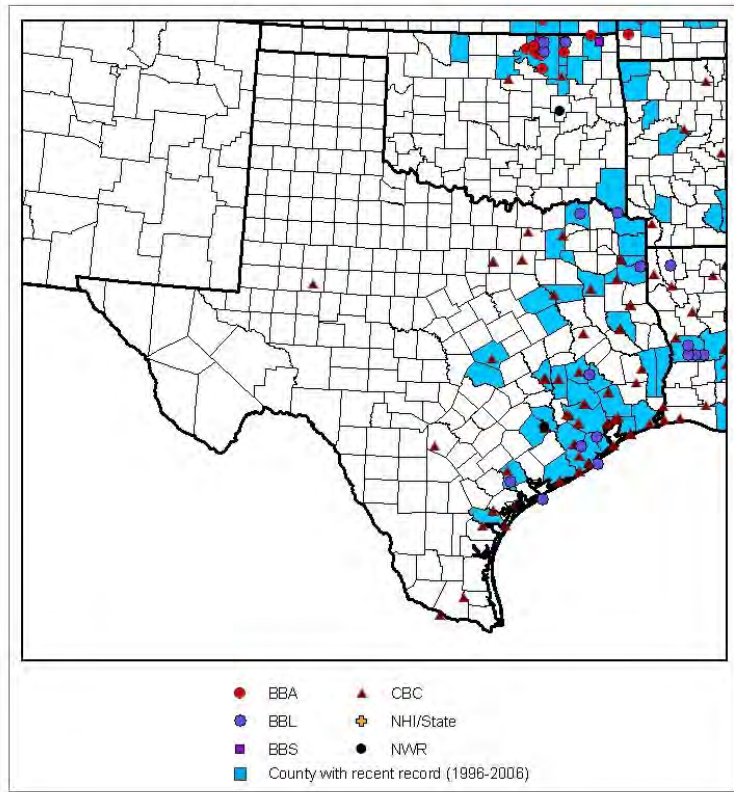
refuge for several years. The species is found on fallow hay fields on the Corral and Die Units of Trinity River NWR; however, lack of a fire program has resulted in hay fields becoming overgrown, and populations have declined as a result.

Birder Listserve Records: Sites with multiple records include Brazos Bend State Park (Fort Bend Co.), Attwater Prairie Chicken NWR (Colorado Co.), Dallas Audubon Sanctuary (Rains Co.), High Island Boy Scout Woods (Galveston Co.), Lick Creek Park (Brazos Co.), and Gibbons Creek Reservoir (Grimes Co.).

Research: None

Other: Pruitt (1996) reported that a disjunct breeding population formerly bred at two sites in Texas. The first colony, discovered at Deer Park (Harris Co.), had up to 21 singing males in approximately one square mile when it was found in 1952. The second colony was located in Houston and consisted of 62 adults and nine young when it was found in 1973 (Arnold 1983). There were no birds at this site in 1982. Both colonies are now extirpated. Pruitt (1996) indicated that suitable habitat was surveyed on the upper Texas coast in 1983; one singing male was heard but researchers found no other evidence of breeding in Texas. Surveys during the winter of 1998-99 documented 60 individuals at 31 sites in 22 eastern Texas counties (Shackelford and Brooks 1999). Root (1988) noted that the greatest winter abundance of Henslow's Sparrow on CBC routes regularly occurred at Galveston Bay, Texas (averaging 0.1 birds/party hour). Pruitt (1996) reported that wintering Henslow's Sparrows utilize wet meadows, wet prairies, and weedy fields of broomsedge, bluestem, and scattered young pines. These habitats are ephemeral in coastal and east Texas depending on rainfall and forestry management practices.

Summary: Henslow's Sparrow is a rare but regular winter resident in the East Texas Piney woods (pine savanna) and the Gulf Coast prairies (wet open meadows). The species formerly bred in the state.



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Appendix A. Participants attending the Henslow's Sparrow Workshop

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Note: State Wildlife Action Plans can be accessed by at <http://www.wildlifeactionplan.org/>

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