

Henslow's Sparrow Conservation Action Plan Workshop Summary



March 7-8, 2007

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Table of Contents

1. Executive summary	1
2. Workshop background and objectives.....	2
3. Breeding range presentations.....	3
4. Wintering range presentations	11
5. Population objectives discussion	15
6. Breeding range discussion	17
7. Wintering range discussion.....	19
8. Priority conservation actions and moving forward.....	21
9. Final thoughts	22
10. Appendix A. – Workshop participants and working group membership	23
11. Appendix B. – Suggested focal species plan outline.....	24



1. Executive Summary

The Henslow's Sparrow Conservation Action Plan Workshop was held March 7-8, 2007 at the Minnesota Valley National Wildlife Refuge in Bloomington, Minnesota. Twenty-two people, representing the United States Geological Survey (USGS), state conservation agencies, universities, non-governmental organizations, and various programs within the U.S. Fish and Wildlife Service (USFWS), attended the workshop (Appendix A).

The purpose of the workshop was to receive input from concerned stakeholders for developing a comprehensive *Henslow's Sparrow Conservation Action Plan*. A plan is being developed as part of a new program called the "Focal Species Strategy for Migratory Birds". This strategy was initiated as a way to better measure the U.S. Fish and Wildlife Service's success in achieving its bird conservation priorities and mandates by linking conservation activities to measurable outcomes. 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 (*Ammodramus henslowii*) which is a Partners in Flight (PIF) watch list species (Rich et al. 2004) and a state endangered species in many states across its breeding range.

The first day of the workshop began with background information on why the workshop was organized and was followed by listing the workshop objectives. Researchers and biologists from both the breeding and wintering range then made presentations that included information on population status, recent studies, threats, and other related information. The remainder of the first day was spent discussing what the population objectives should be for the plan, research and monitoring priorities, and conservation strategies on both the breeding and wintering range. Participants then listed what they felt were the "top three conservation actions" for advancing Henslow's Sparrow conservation. Tom Will, workshop facilitator, summarized the responses and ranked them based on the number of respondents who listed similar actions.

Day two started with a summary of the "top three conservation actions" from day one. High priority breeding ground action items included: 1) maintaining support for the Conservation Reserve Program (CRP); 2) assessing the use of habitat protected under different programs; and 3) developing best management practices (BMP) for CRP grasslands. High priority items for the wintering grounds included: 1) better delineating winter distribution; 2) increasing the use of prescribed burning to maintain longleaf pine savanna; and 3) further investigating connectivity between wintering and breeding grounds. The actions were further discussed and expanded upon during the remainder of the workshop.

At the conclusion of the workshop, working groups were formed for the breeding and wintering range. The working groups will refine the actions identified at the workshop. Once a draft plan is completed (\approx June 2007) it will be shared with workshop participants and others to review and provide comments for inclusion in the final plan. The tentative completion date for the plan is October 2007.

Information contained in this summary is a record of the workshop proceedings and will be used as a resource for future development of the *Henslow's Sparrow Conservation Action Plan*. Special thanks go to the presenters at the workshop, Tom Will for facilitating the workshop, Diane Granfors for taking notes during the workshop, and Paul Champlin and Jim Herkert for reviewing this summary. If you have any questions regarding the summary or any comments, please forward them to tom_cooper@fws.gov. Thanks to all who participated in the workshop!

2. Workshop Background and Objectives

The workshop began by having participants introduce themselves and giving background information on why they attended the workshop. Tom Cooper, Region 3 USFWS Migratory Birds, gave a brief background about the Henslow's Sparrow range (Figure 1), apparent expansion in the southwest part of their breeding range, and population trends based on BBS data. Next, an overview was presented about the USFWS's *Focal Species Strategy for Migratory Birds*. More details on the strategy can be found at <<http://www.fws.gov/migratorybirds/FocalSpecies/Presentations.htm>>. The proposed format of what should be included in focal species conservation action plans was then presented (Appendix B). Workshop objectives were covered to conclude the introduction.

Henslow's Sparrow Workshop Objectives:

- Develop measurable population objectives for assessing the success of conservation actions
- Identify gaps in knowledge and coordinate future research on Henslow's Sparrows
- Identify key areas for conservation and management
- Prioritize future conservation and management strategies
- Develop the framework for a comprehensive Henslow's Sparrow Conservation Action Plan

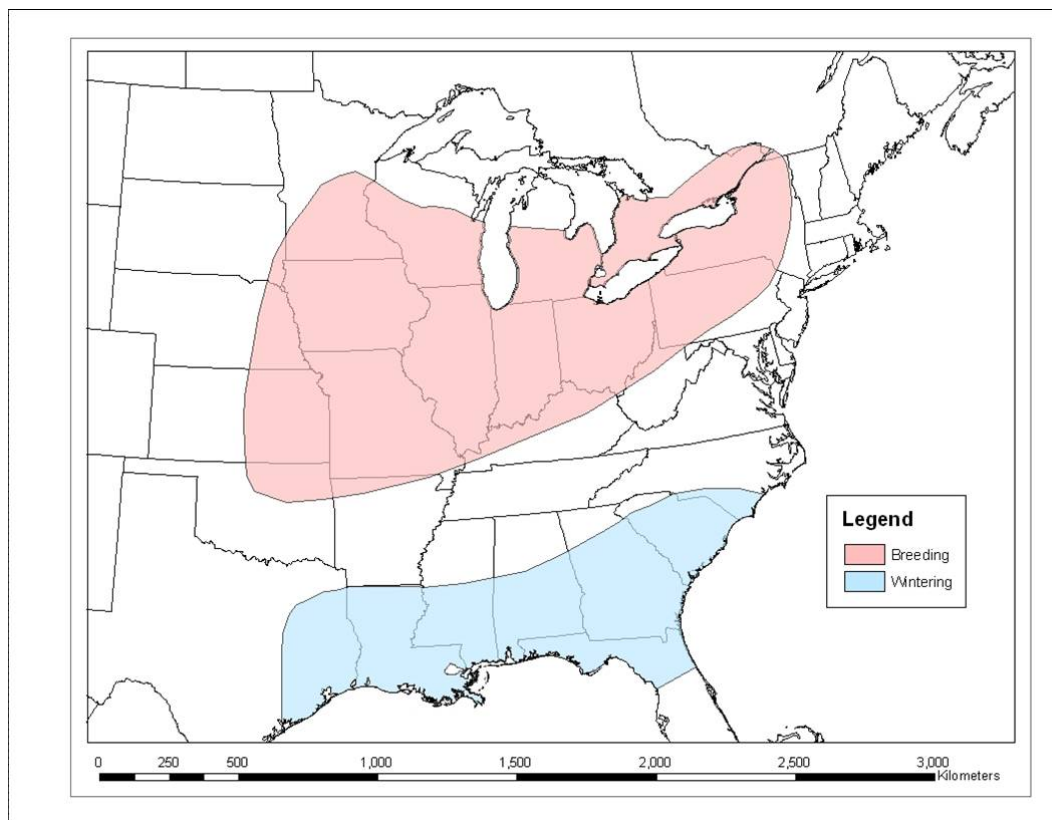


Figure 1. Breeding and wintering range for the Henslow's Sparrow.

3. Breeding Range Presentations

Eight presentations focusing on breeding Henslow's Sparrows were included on the agenda. Jim Herkert started the session with a general overview on the status of Henslow's Sparrows on the breeding range and in Illinois. His presentation was followed by a series of presentations from across the Henslow's Sparrow breeding range. These presentations focused primarily on regional topics including status, grassland bird studies, and habitat threats in each region. The breeding ground session concluded with Wayne Thogmartin presenting a spatially explicit model he developed predicting Henslow's Sparrow abundance for BCR 23 (Prairie Hardwood Transition) and how the model could be used to identify conservation opportunities. Each presentation is summarized below including selected figures or tables from the presentations.

Breeding Ecology of the Henslow's Sparrow: What We Know and Where We Need to Go – Jim Herkert, *The Nature Conservancy*

- Henslow's Sparrows are listed as threatened, endangered, or special concern in 16 states and have experienced a range-wide negative population trend (-8.04 %/year) from 1966 to 1989 based on Breeding Bird Survey (BBS) data analysis with a positive population trend (+4.07 %/year) from 1990 to 2005 (Figure 2). The Christmas Bird Count (CBC) and the Illinois Spring Bird Count (SBC) have also shown similar increases in recent years (Figure 2).
- Data have shown that population trends are associated with local Conservation Reserve Program enrollment both in Illinois (Herkert in press) and range-wide (Herkert in review). Research by Harroff (2001) in southern Illinois has confirmed that Henslow's Sparrows are common in CRP grasslands with 21 of 32 study sites being occupied. There is an estimated population of 12,378 Henslow's in 12 southern Illinois county based on a density of 0.191 birds/ha and 64,806 ha of CRP in those counties.
- The daily survival rate for Henslow's Sparrows in the Midwest (Herkert et al. 2003), was ≈ 0.95 (N = 82) and the daily predation rate tended to be higher in smaller fields.
- Studies in Illinois have shown that Henslow's are using less preferred habitat (i.e. recently burned, grazed, or mowed sites) more in recent years than in the past. It is thought this is a result of the growing population forcing birds to use less ideal habitat. "CRP got them out of the bottleneck and they are now showing up in all types of cover throughout the state".

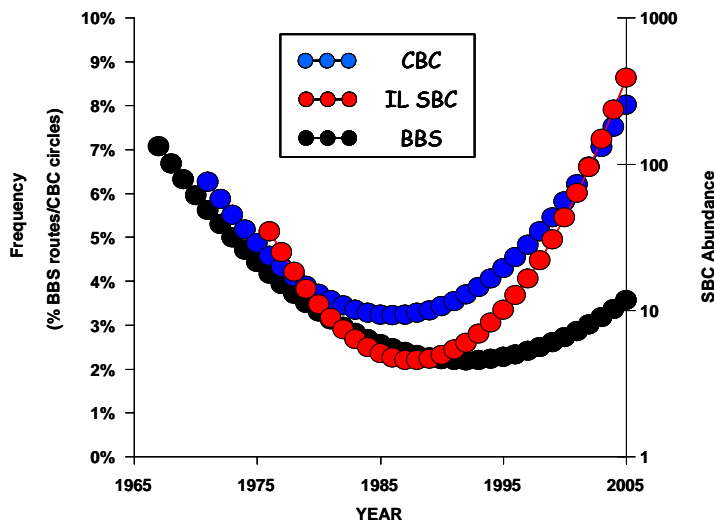


Figure 2. Population trends for Henslow's Sparrows based on data from the Christmas Bird Count (CBC), the Illinois Spring Bird Count (SBC), and the Breeding Bird Survey (BBS) (from Herkert presentation).

Henslow's Sparrow in the Northeastern United States: Are they worth protecting? – *Maiken Winter, Cornell University*

- Populations are steeply declining throughout the northeast except in Pennsylvania where they are common on reclaimed strip mine grasslands. They are classified as extinct in 6 states (CT, DE, MA, NH, RI, and VT), endangered in one state (NJ), and threatened in three states (MD, NY, VA). They are poorly monitored throughout the region.
- Potential causes for population declines include: 1) earlier and more frequent mowing of hayland; 2) habitat loss from development and agriculture; 3) succession of agricultural lands to shrubland/forest. A future threat to remnant coastal populations may be sea-level rise as predicted by climate change models.
- There still may be a window of opportunity to protect existing populations with increased conservation, management, and education.
- No states in the region are specifically managing for Henslow's Sparrows. However, there is a general interest from some states to increase monitoring and conservation efforts.
- The main needs for Henslow's Sparrow Conservation in the Northeast are: 1) focused monitoring to identify core populations; 2) increased management with a focus on reclaimed mine sites which receive little management after grass is established; 3) land acquisition of abandoned agricultural fields; 4) raise public awareness of declining Henslow's Sparrow populations in the NE; and 5) promote incentives that reward farmers for using management practices that benefit Henslow's Sparrows.

Henslow's Sparrows on Big Oaks National Wildlife Refuge, IN – *Joe Robb, Big Oaks National Wildlife Refuge*

- The refuge is approximately 50,000 acres in size and was formerly used as an ordnance testing facility known as the Jefferson Proving Grounds. The refuge contains a mosaic of woodlands, wetlands, and grasslands.
- The mean estimated density of Henslow's Sparrows on available grassland habitat was estimated to be 0.91 territories/ha using spot mapping techniques.
- Available HESP habitat on the refuge has declined from around 1,900 ha in 1995 to about 700 ha in 2005. The decline has resulted from woody vegetation invasion of grasslands. The estimated population on the refuge has declined in response to grassland habitat loss (Figure 3).
- Prescribed burning is being used to control woody vegetation ($\approx 10,000$ acre/year); however, it is difficult to get ahead of the encroachment. Mechanical treatment is not an option in many areas of the refuge because of unexploded ordnances. Some aerial herbicide applications have been used. Henslow's Sparrow densities were greatest the year following spring prescribed burning (~ 13 - 16 months after fire) which differs from other studies showing increases a few years after burning.
- Based on roadside transects conducted from 1995-2005, the density of singing males per hectare have ranged from 0.33 (1995) to 0.55 (1998). There has been a declining trend from 2003-2005 with an estimated density of 0.40 in 2005. Densities were greater in large grassland tracts (>50 ha) than in medium (10-50 ha) and small (<10 ha) tracts.
- Nesting studies conducted from 1998-2001 showed a Mayfield nesting success of 22%. Litter depth at nesting sites (mean = 15.8 cm) was greater than ($p < 0.001$) non-use sites (mean = 8.5 cm); while standing dead vegetation height at nesting sites (mean = 88.3 cm) was greater than ($p = 0.001$) than non-

use sites (mean = 77.0 cm). Nest height at successful nests (mean = 4.91 cm) was lower than ($p = 0.01$) failed nests (mean = 4.91 cm); while litter depth at successful nests (14.03 cm) was lower than ($p < 0.001$) at failed nests (mean = 17.98 cm).

- A simple source/sink analysis indicated that Big Oaks NWR was a source population for Henslow's Sparrows.

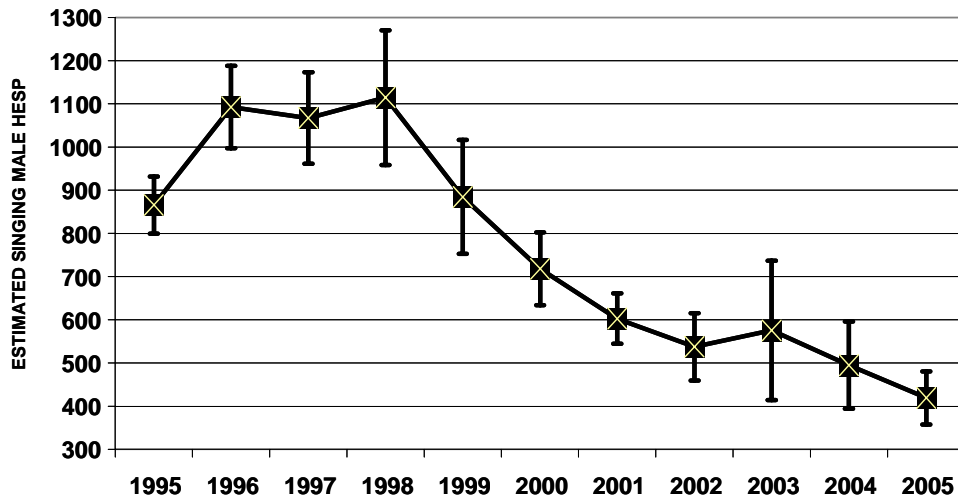


Figure 3. Number of singing male Henslow's Sparrows and 95% CI's estimated from roadside transects and extrapolated by the amount of habitat estimated by a GIS on Big Oaks NWR, IN, 1995-2005. Estimated number was corrected for detectability (from Robb presentation).

Henslow's Sparrow research in Kentucky and Tennessee – *Jim Giocomo, University of Tennessee*

- Productivity modeling based on data (nesting success and young per successful nest) from study sites in Tennessee and Kentucky have shown that Henslow's Sparrow populations seem stable (i.e., $\lambda=1$).
- Henslow's Sparrows seem to be expanding their range in Kentucky and Tennessee (may be just that we are noticing them more than in the past).
- Modeling indicated that grassland mowing could dramatically decrease productivity and any mowing should be done after July 15th to minimize impact on nesting Henslow's Sparrows.
- There is great interest for managing native grasslands in Tennessee and Kentucky to benefit grassland birds.
- A spatially explicit map showing the results of a landscape analysis for potential grassland bird conservation potential was presented (Figure 4). The map can be used as a tool to identify priority landscapes for grassland birds.
- Recommend using federal lands (i.e. military installations and national wildlife refuges) as core areas for grassland conservation efforts on private lands. Determined that there were 45 military installations in the eastern U.S. that show potential for grassland bird conservation.

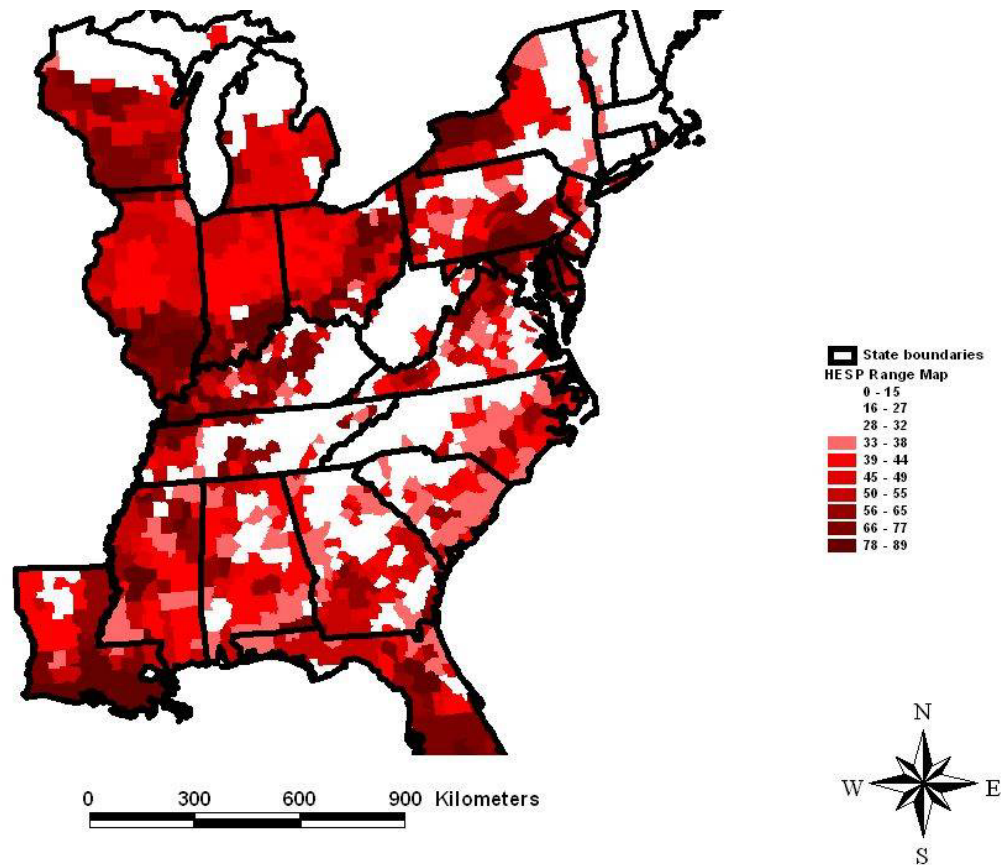


Figure 4. Overall score for grassland bird conservation potential in the eastern United States (from Giacomo presentation).

Wisconsin’s Henslow’s Sparrow update: status, trends, and threats – David Sample, Wisconsin Department of Natural Resources

- Henslow’s sparrows are found in all but the northern ¼ of the state with the highest population found in the southwest part of the state which coincides with where the most CRP is enrolled.
- Studies in Wisconsin have shown that breeding pair densities vary among grass types (Table 1).
- In a study looking at the affect of woody edges on grassland birds, singing male densities were lower near woody edges than interior grassland sites prior to tree removal. After tree removal, densities were similar.
- Mayfield nest success for 15 nests found from 2001-2004 was 17.1%, while nest success for 17 nests found during 2005-2006 was 50.0%. Video cameras revealed that snakes were the most common nest predator followed by Thirteen-lined Ground Squirrels.
- 133 Henslow’s Sparrows were banded during 2001-2006. There have only been 2 reported returns.
- The biggest threat facing Henslow’s Sparrows in Wisconsin is the loss of CRP grasslands. Wisconsin could lose \approx 116,000 acres (47,000 ha) of CRP Henslow’s habitat by 2010 which could equate to losing habitat for 12,500 to 25,000 Henslow’s sparrows at 50% and 100% occupancy, respectively.
- The recent Corn ethanol boom may result in additional withdrawals from CRP which could cause a further population decline in Wisconsin.

- Other threats in Wisconsin include increased fragmentation by development and CRP mid-contract management creating unfavorable conditions.

Table 1. Henslow’s sparrow densities (pairs/hectare) found in different grassland types in southern Wisconsin, 1985-1989 (from Sample presentation).

Habitat	Density (pairs/ha)	Habitat	Density (pairs/ha)
DNR poor switchgrass	1.00	Reed canary	0.09
DNR mixed warm season grass	0.65	CRP – weedy cool season	0.09
DNR/FWS cool season	0.46	Alfalfa	0.08
DNR dense switchgrass	0.25	Upland Pasture	0.04
Retired pasture	0.17	CRP cool season	0.04

Recent grassland bird studies and how they relate to HESP management in the western part of their breeding range – Rolf Koford, USGS, Iowa Cooperative Research Unit

- Potentially important information to keep in mind when evaluating bird habitat use includes: 1) Habitat (local) selection, effects on density, reproductive success; 2) Patch (e.g., size, shape, edge type) effects; 3) Landscape (e.g., amount of grass, trees) effects; 4) Interactions between patch size and landscape variables; 5) Population density, survival, reproduction (mean, variability); 6) Population trends; and 7) detectability and other issues related to monitoring.
- Some research questions that need to be examined are: 1) How consistent are effects among years, regions, and species?; 2) At which habitat scale—local, patch, or landscape—do grassland birds respond most consistently?; 3) Is the response to patch size dependent on landscape composition?; and 4) Do the same factors influence a species’ density and its reproductive success?
- Results from grassland bird study in southeastern North Dakota and northwestern Minnesota (Winter et al. 2006) included: 1) Density responses to patch size were not consistent among years, regions, or species; 2) Landscape-scale variability in density was greater, and more consistent, than patch-scale variability; 3) Landscape effects (shrubs & trees) did not vary between small and large patches; and 4) Different factors influenced species’ densities and reproductive success.
- One hypothesis for habitat selection by area sensitive grassland birds is that they respond to habitat on a landscape scale. If area sensitive species are thought to respond to landscapes then you would expect preferred landscapes to have higher densities. Higher densities may result in more competition for available habitat causing more birds to use marginal habitat. Conversely, birds would respond to patch size in lower quality landscapes. Data for Bobolinks supports this hypothesis. They responded to patch size in low to moderate grass landscapes, in not in high grassland landscapes (figure 5).
- Daily detectability patterns for Henslow’s Sparrows varied between study sites but the generally the highest detectability occurred in the morning and evening for both singing males and song counts.

- Some other large subpopulations of Henslow's Sparrows not identified in previous presentations include: 1) >400 individuals occur at Fort Riley Military Reservation (Kansas); 2) A cluster of prairies in SW Missouri; 3) TNC Tallgrass Prairie Preserve (NE Oklahoma); and 4) Reclaimed mine lands in SE Ohio.

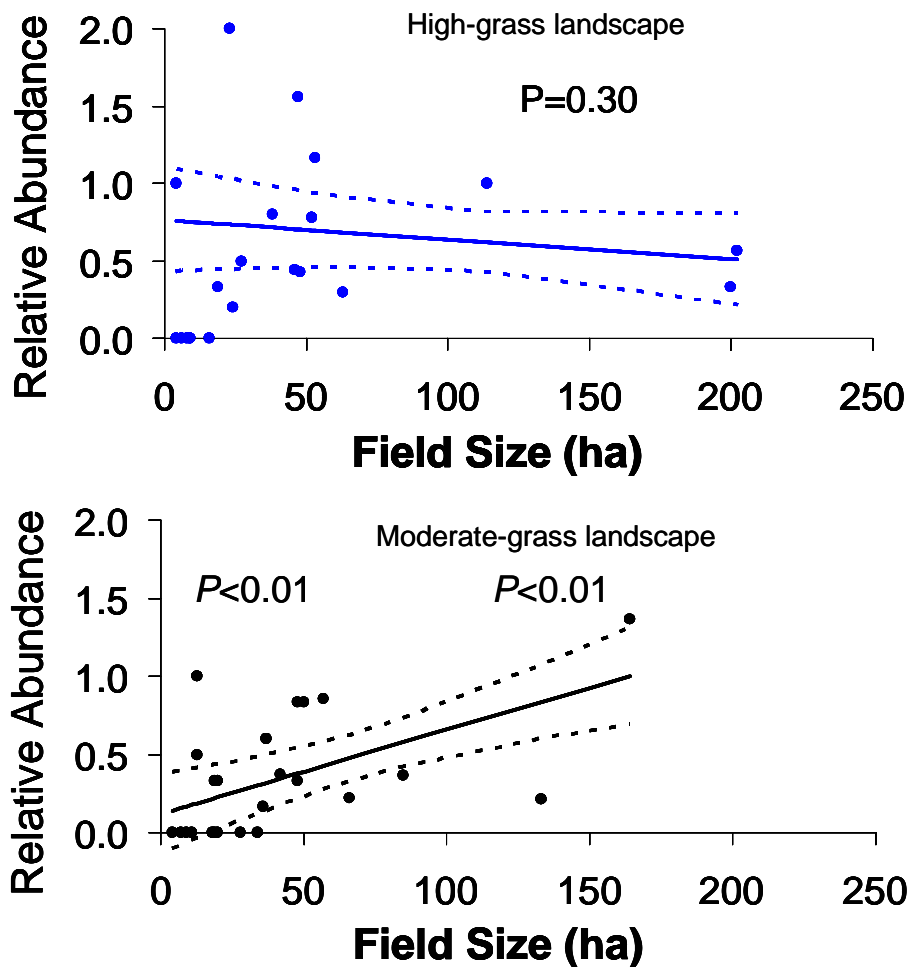


Figure 5. Relative abundance of Bobolinks in relation to patch size in high-grass and moderate-grass landscapes (from Koford presentation).

Henslow's Sparrow in Nebraska – Joel Jorgensen, Nebraska Game and Parks Commission

- Between 1920 and 1985 there was only one record for Henslow's Sparrows in Nebraska. Since 1985, there has been an increase in the state but they are still rare. Nesting has been confirmed in the state. The current range, based on recent records, is believed to be the southeastern portion of the state (Figure 6).
- More extensive inventories were conducted in the southeast part of the state in 2006. Out of 49 suitable sites surveyed in 2006, only 5 contained Henslow's Sparrows with breeding probably occurring at 2 of those sites.
- Impressions from the 2006 survey are that: 1) they are not common or widespread in SE Nebraska; 2) most CRP appeared to be unsuitable possibly due to drought conditions; and 3) they were associated with ridge tops and hillsides on sites where they were found.

- Future economic development from ethanol may threaten grassland habitat in the state.

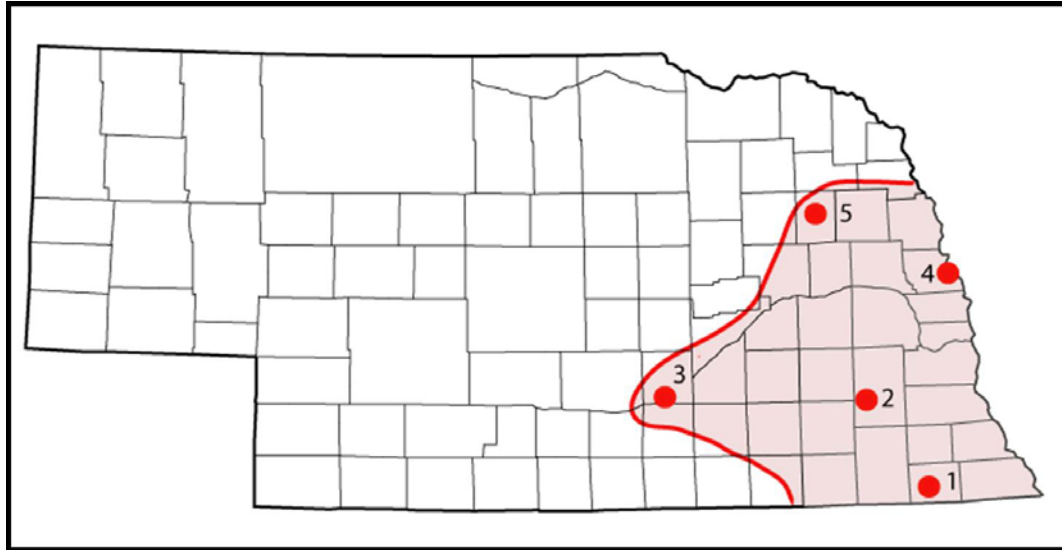


Figure 6. Current range of Henslow's Sparrow in Nebraska based on recent records (from Jorgensen presentation).

Spatial models and their application to Henslow's Sparrow Conservation – *Wayne Thogmartin, USGS Upper Midwest Environmental Science Center*

- Outlined the Five Elements Process for designing optimal landscapes to meet bird conservation objectives (Will et al. 2005). The five elements are: 1) Landscape Characterization and Assessment; 2) Bird Population Response Modeling; 3) Conservation Opportunities Assessment; 4) Optimal Landscape Design; and 5) Monitoring and Evaluation.
- Items to consider during model development are: 1) Models can be developed for single species or suites of priority species; 2) Models should be sensitive to scale; and 3) Good models should create a connection between management and science.
- A hierarchical Bayesian spatial count model was developed for Henslow's Sparrow using BBS data for Bird Conservation Region 23 (Prairie Hardwood Transition). Observer, temporal, and environmental effects along with other sources of variation were built into the model.
- Variables entering into the final model included: 1) Area weighted grass; 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 model predicted the highest abundance of Henslow's Sparrows in southwestern Wisconsin and low abundances in both Minnesota and Michigan (Figure 7).
- Given a fully characterized landscape and biota, conservation next depends upon who owns and manages the land. This step helps identify who the various partners and constituents are for conserving species. Results for BCR 23 indicated that $\approx 1.1\%$ of the predicted population occurs on protected lands managed for wildlife through state and federal land management agencies.
- The extinction risk of Henslow's sparrows was also modeled. The probability of a 90% decline within a century was calculated from the 41-yr time series (1966-2006) of reconstructed continental population

size. Analysis indicated that there was a 40% probability of 90% decline within a century which is less than baseline risk of extinction (57% from a randomized time series). Extinction risk was further modeled under three future population trend scenarios: 1) maintain an increasing population trend similar to the past 15 years, 2) a decreasing population trend similar to the long-term negative trend; and 3) a stable population trend (Figure 8).

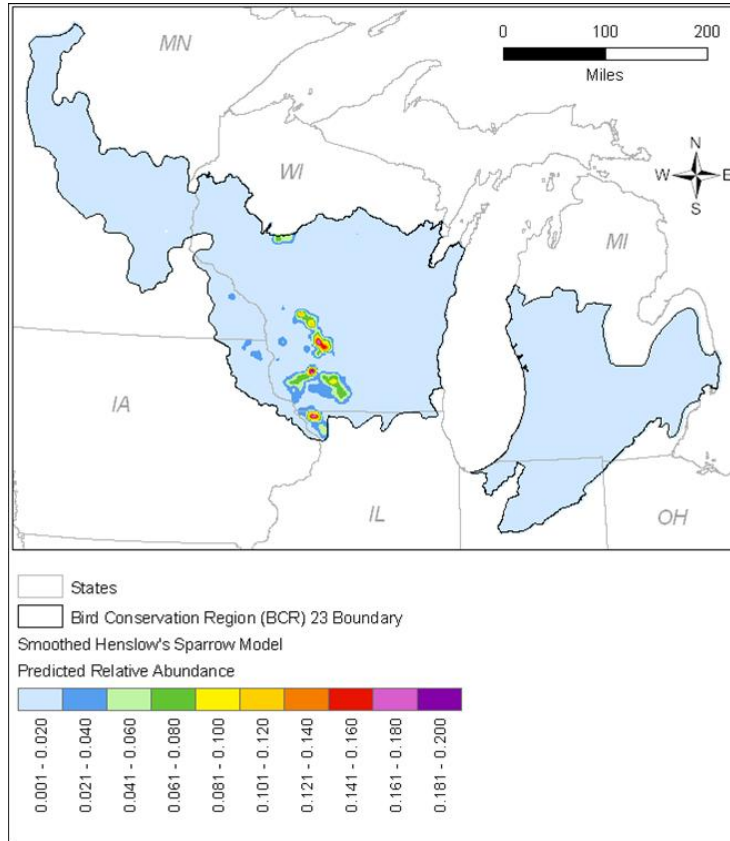


Figure 7. The predicted abundance of Henslow's Sparrows in Bird Conservation Region 23 (Prairie Hardwood Transition) as estimated using hierarchical Bayesian modeling procedures (from Thogmartin presentation).

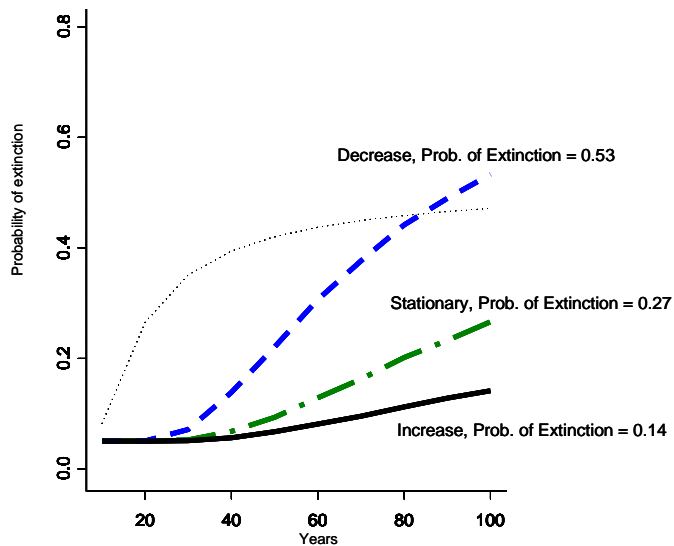


Figure 8. Probability of extinction for Henslow's Sparrows under three potential population trends (from Thogmartin presentation).

4. Wintering Range Presentations

Three presentations focusing on wintering Henslow’s Sparrows were included in this session. The presentations were from across the non-breeding range and focused on studies conducted in South Carolina, Mississippi, and Louisiana. Each presentation is summarized below including selected figures from the presentations.

Winter Ecology of Henslow’s Sparrow in Mississippi – Mark Woodrey, Mississippi State University

- Conducted a study to quantify the use of coastal pine savanna as wintering habitat for grassland birds on the Mississippi Sandhill Crane National Wildlife Refuge (NWR) and Grand Bay NWR.
- Other objectives of the study were to identify specific habitat needs of wintering grassland birds and determine the effects of habitat management on wintering grassland birds.
- Henslow’s Sparrows were among the most common grassland bird species detected during surveys.
- Densities were highest on sites the winter after a growing season burn (year 0) and decreased each subsequent year. The natural fire cycle in southern winter areas was probably every 2-3 years.
- Stable isotope studies indicated the western portion of the wintering range included more breeding regions than did the eastern portion of the wintering range (Figure 9). Overall, the various parts of the wintering range receive migrants from multiple regions of the breeding range. No evidence for any clear linkages between breeding and wintering regions emerged.

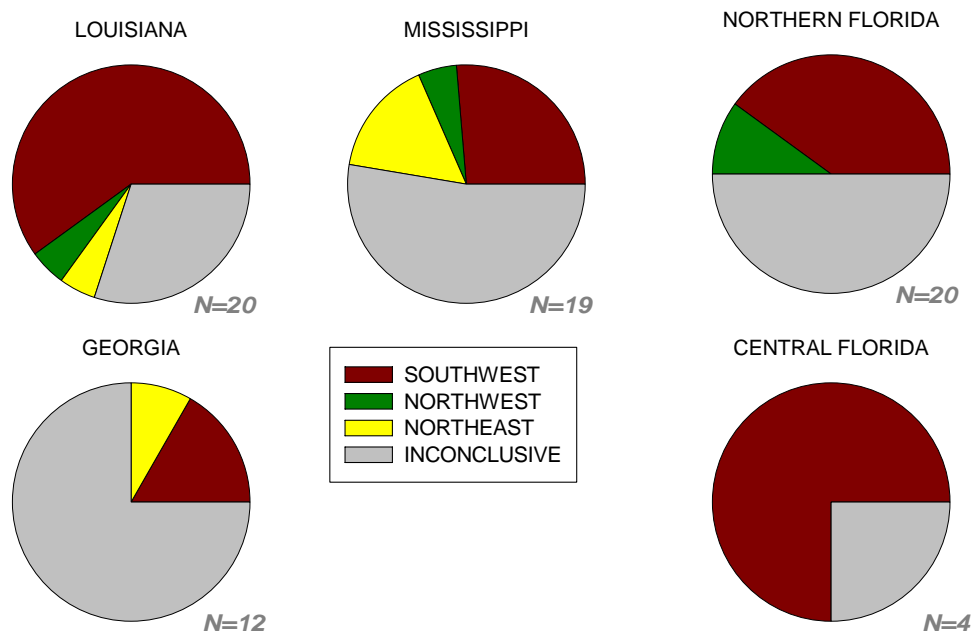


Figure 9. Origin of Henslow’s Sparrows wintering in different regions of the southeastern United States with Southwest = KS, MO, SE IA, NE; Northwest = MN, WI, MI, NE IA; and Northeast = PA, NY (from Woodrey presentation).

Ecology of Henslow's Sparrow in Southeastern Louisiana – *Phil Stouffer, Louisiana State University*

- The wintering range of Henslow's Sparrows closely matches the historic range of Long Leaf Pine (figure 10).
- Previous work indicated that fire increases bird density with the highest densities occurring the winter following a growing season burn (figure 11). More studies were conducted to determine why fire increases density.
- Birds have high site fidelity during a wintering season but not between years. There are post migration movements and birds do not settle into home range until December.
- Captive bird studies indicated that pyrophytic seeds were among the most preferred foods for Henslow's Sparrows.
- The best predictor of Henslow's sparrow density was found to be habitat structure, not seed type.
- Survival varied more between years than between treatment sites (sites burned < 1 year ago and those burned 1-2 years ago).
- Feather growth rates and body condition were similar between study sites (sites burned < 1 year ago and those burned 1-2 years ago).
- One reason why survival and fitness may not differ between year-0 and year-1 sites may be that home ranges overlap in year-0 savannas, thus reducing body condition and survival.

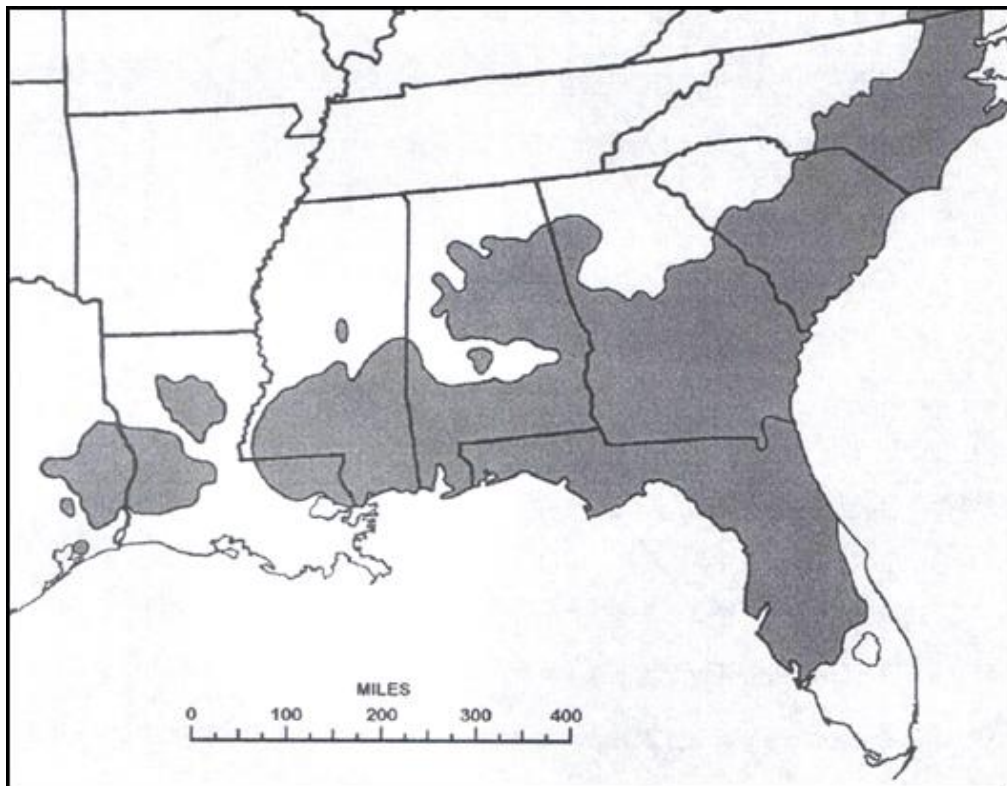


Figure 10. Historic range of Longleaf Pine in the southeastern United States (from Stouffer presentation).

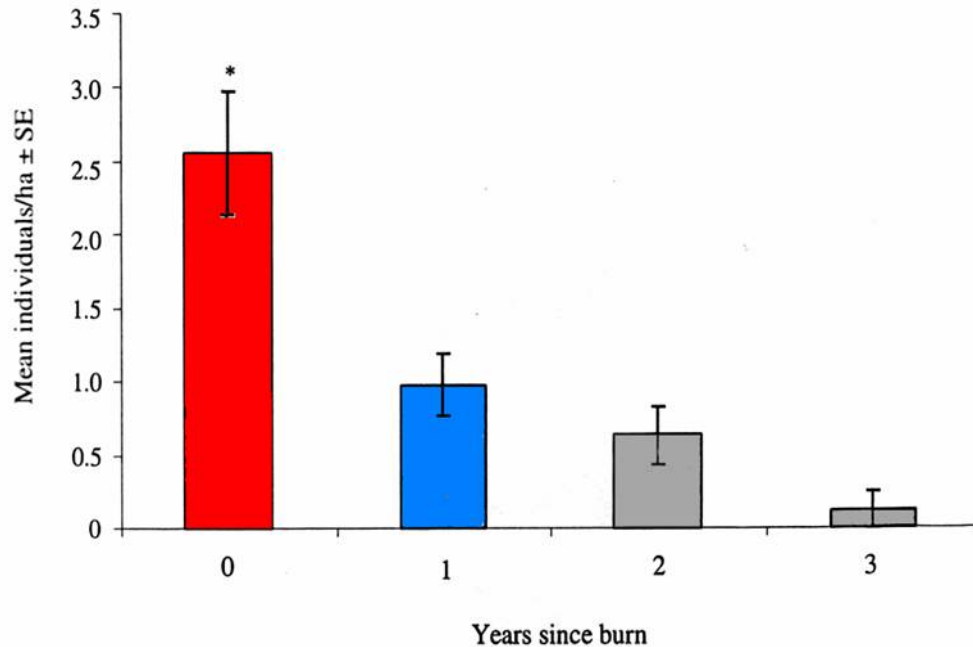


Figure 11. The density of Henslow’s Sparrows in relation to the year since last burn (from Stouffer presentation).

Winter habitat selection and landscape specificity of Henslow’s Sparrows on the South Carolina Upper Coastal Plain - Paul J. Champlin, John C. Kilgo, J. Drew Lanham and Victor B. Shelburne

- Little is known about Henslow's Sparrows on the Atlantic coastal plain.
- Henslow's Sparrows used the margins of intact, grassy Carolina bays more than any other habitats surveyed. Bays were only available for a single season due to a severe drought, though in their ancestral condition (embedded in longleaf pine savanna) were perhaps key habitat components for this species (Figure 13).
- Telemetry of Henslow's Sparrows in relatively uniform grasslands along transmission line right of ways (ROWs) suggested that birds were occupying small-scale sites based on edaphic and topographic characteristics, and were doing so relatively predictably both within and among years while expanses of seemingly suitable habitat went unused.
- Results of landscape ecosystem classification analysis show that within xeric ROWs, Henslow's Sparrows centered activity within meso and micro-scale depressions (nutrient and water accumulation) on relatively exposed plateaus (Figure 12).
- Core-use to no-use gradients occur in relation to habitat gradients from higher productivity including deeper organic matter accumulation (higher nutrient retention), denser and shallower clay accumulation (higher water accumulation and) and denser vegetation. These gradients occur on the scale of tens of meters.

- Evidence from both breeding and wintering grounds suggests that Henslow's Sparrows are highly site specific. Identification of edaphic and topographic features that are driving the quality of these sites may provide a better idea of actual habitat availability and may be critical to the long-term management of habitats selected by this species.

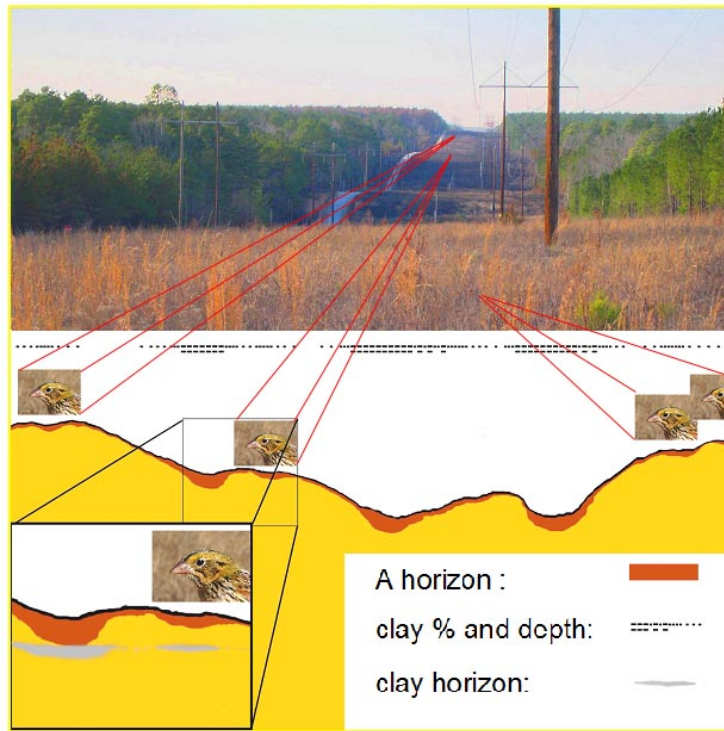


Figure 12. Cross section of a transmission line ROW depicting Henslow's Sparrow core use sites in relation to edaphic and topographic characteristics that are known to drive vegetation and xeric to mesic gradients. Sites of deepest A horizon depth and percent clay supported C3 plant communities, dominated by woody species compared to the xeric C4 grassland environments of the upland plateaus (from Champlin presentation).

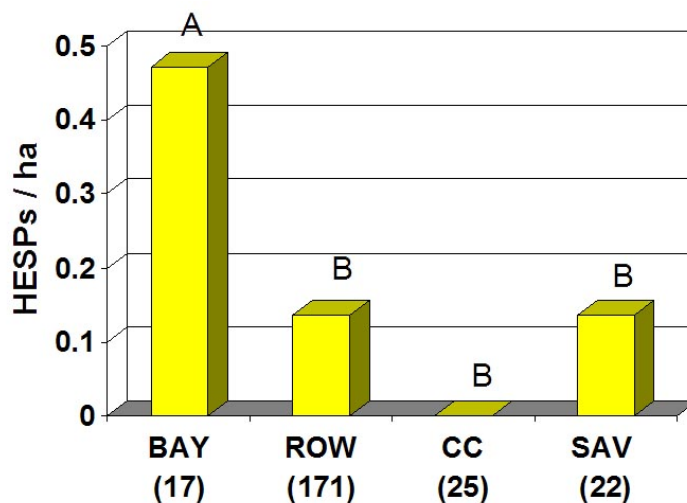


Figure 13. Density of Henslow's Sparrows among four early succession habitats of the South Carolina coastal plain (Carolina bay wetland, transmission line right of way, regenerating clear cut, and pine savanna) (from Champlin presentation).

5. Population Objectives Discussion

The population objective session started off by examining the current Henslow's Sparrow population status and how it relates to population goals in the Partners in Flight (PIF) Landbird Conservation Plan. **The draft population objective that came out of the workshop was to maintain a stable or increasing range-wide population trend and a stable or expanding distribution based on a current distribution map for Henslow's Sparrows.**

- Henslow's Sparrows experienced a declining population trend of -8.04 %/year from 1966-1989 which was the steepest decline detected by the Breeding Bird Survey for any songbird in North America. There has been a recent increasing trend of 4.07 %/year from 1990-2005. We still need to keep in mind that the long-term trend is still negative, even though the shorter term trend is positive.
- Henslow's Sparrows were probably at relatively high population levels in 1966 when the BBS survey was started. This was likely due to a previous federal farmland retirement program, the Soil Bank Program, which was established in 1956. The Soil Bank enrolled 28.7 million acres in the peak year, 1960, using contracts for up to 10 years. Nearly all Soil Bank contracts had expired by 1969, which coincides with the start of the Henslow's sparrow population decline. Populations did not begin to recover until the late 1980's which coincides to the start of the Conservation Reserve Program.
- The Partners in Flight (PIF) North American Landbird Conservation Plan reported an estimated population of 79,000 Henslow's Sparrows in 1995 based on BBS data analysis. The population goal in the plan is to increase the population by 100% to 158,000 (Rich et al. 2004). Tom Will indicated that the general population goal using the PIF strategy is to restore population's to 1966 levels. PIF felt this was an achievable goal due to only 35 years of habitat loss.
- The estimated population in 2006 was \approx 191,000 based on Wayne Thogmartin's interpolated time series analysis presented at the workshop (Figure 14). Yearly estimates were derived using the annual indices of relative abundance from the BBS and the formula developed for estimating populations for PIF.
- We discussed whether there should be population goals for subspecies. Available genetic information does not warrant the establishment of subspecies goals at this time. Prior to European settlement there may have been discrete populations in coastal grasslands and in the Midwest prairies that met with deforestation after settlement.
- The 2006 population estimate is 2.4 times the 1995 estimate of 79,000 and exceeds the population goal established by PIF. However, the population may still be vulnerable because the recent population recovery appears to be tied to short-term conservation programs (i.e. CRP) that face an uncertain future.
- Herkert presented a model of what management actions could be taken based on population levels during his presentation (Figure 15). Based on the evidence presented, participants generally agreed that the 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.
- Rather than having a given population size for a goal, participants felt a better goal would be to maintain a stable or increasing range-wide population trend as measured by the BBS which is the best available survey for assessing population goals.
- There was a general consensus that we are probably at the peak amount of grass we can get on the landscape for the foreseeable future. Increasing, or even just maintaining, the current population may be difficult especially with the potential loss of CRP grasslands due to expiring contracts and/or high corn prices driving more land into production. Can the current population be maintained with non-CRP lands?

- 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 Bird Conservation Regions (BCR) or states). The group agreed that the plan should establish a range-wide goal and that states or BCR working groups should be responsible for establishing regional population goals through their own planning processes such as State Wildlife Action Plans. Many of the state plans already identify where the best management opportunities are for grassland birds including Henslow's Sparrows. Henslow's Sparrows are listed as a species of greatest conservation need in 30 state wildlife action plans.
- Henslow's Sparrows are classified as a state threatened or endangered species in 16 states. Recent population increases have prompted some states (Illinois and Minnesota) to consider downlisting their status. Many participants felt that downlisting would be premature because of current habitat threats from the projected loss of CRP. Following the PIF approach, a species that faces extreme habitat loss threats should not be down graded even if the current population is stable. Habitat vulnerability is key to a species status.
- Several participants thought there should also be a distributional component to the population objective based on the current distribution. A county level map should be included in the plan that shows current distribution based on multiple sources compiled while doing a status assessment (BBS, Refuge Surveys, Birder Listserves, ebird, CBC, etc). There was agreement that the current distribution should be maintained with the understanding that population levels will fluctuate regionally in response to a variety of factors. Passerine bird populations tend to be highly variable regardless of species. Climate change, forest succession on grassland sites (especially in NE), changes in farm programs/economics, and other big changes may make it difficult to maintain a specified distribution.
- The group did not think the population objective should be tied to habitat objectives. They felt this was the job of the Joint Ventures to model the quantity of habitat required to meet population objectives.

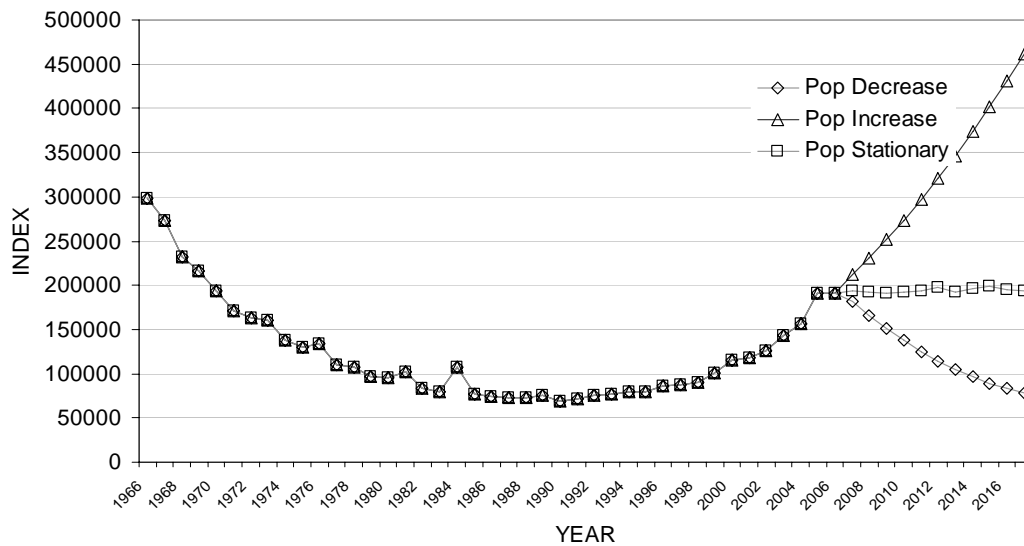


Figure 14. Interpolated time series showing the estimated Henslow's Sparrow population with 95% confidence intervals based on BBS data and estimated future populations under stable, increasing, and decreasing population trends (from Thogmartin presentation).

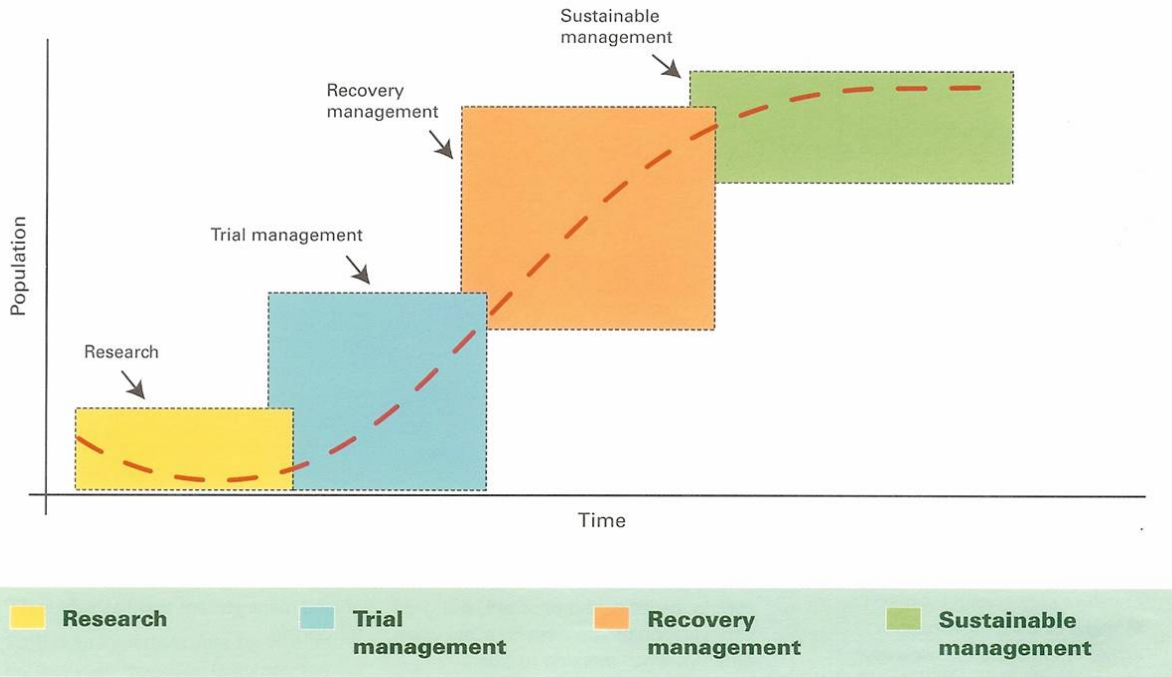


Figure 15. A model showing recommended management actions based on different population levels (from the Royal Society for the Protection of Birds, included in Herkert presentation).

6. Breeding Range Discussion

Discussion related to Farm Bill programs, ethanol, and biomass

- The main conservation issue identified for the breeding grounds was the importance of Farm Bill conservation programs (primarily CRP) to the recovery of Henslow’s Sparrows. Losing significant acres of CRP habitat would likely 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.
- An increased demand for corn due to the recent ethanol boom has increased corn prices. As such, grassland habitat could be converted to corn production and lands currently enrolled in CRP may not be reenrolled so they can be croppped. The consequences of the current ethanol boom and other energy programs (i.e. biomass production) on grassland bird habitat should be evaluated. The ethanol fad is evolving too quickly to predict where it will go, but participants felt that we need to be actively involved and understand the potential consequences for grassland birds.
- We need to examine how the loss of CRP could affect Henslow’s Sparrows. For example, researchers could estimate what percentage of the population relies on CRP grasslands or how populations would respond to different landscape scenarios with varying amounts of habitat. Information from these exercises could then be shared with policy makers and USDA officials as they make decisions about future farm programs.
- The importance of CRP to Henslow’s Sparrows and other grassland wildlife needs to be publicized. Herkert has two publications (one approved and one in review) that correlate increasing Henslow’s Sparrow population trends in Illinois and range-wide with local CRP enrollment. In addition, the Agriculture and Wildlife Working Group of the Teddy Roosevelt Conservation Partnership recently released a report entitled “Growing Conservation in the Farm Bill”

(<http://www.trcp.org/documents/2007farmbillreport.pdf>) which outlines the importance of farm bill programs to wildlife conservation.

- If CRP grasslands are lost, we may have to intensify management on remaining grasslands to increase densities in order to maintain the current population. Some tracts may be so small that increased management may not result in higher densities due to the area sensitivity of Henslow's Sparrows. We also need to keep in mind that CRP is a short-term program and we cannot put "all of our conservation eggs into the CRP basket". Thus, a two-tiered range-wide approach, with and without CRP, is needed for long-term Henslow's Sparrow management.
- Ethanol does not appear to be a threat to habitat in the Northeast part of the breeding range, as such, it may be prudent to protect existing habitat in the Northeast.
- There is a need to examine the potential of cellulosic biomass fields to provide habitat for grassland birds. The grassland bird community needs to be proactively involved with cellulosic biofuel researchers to examine the effects of biomass production on grassland birds (i.e. with David Tillman at the University of Minnesota). Best management practices (BMP) can then be developed for the industry recommending how biomass fields are planted and harvested. Researchers at the University of Minnesota are currently planning a biomass/wildlife workshop scheduled for the summer of 2007.

Discussion related to reclaimed strip mine habitat in the Northeast

- Strip mine habitats hold considerable numbers of Henslow's Sparrow in the northeast part of range especially in Indiana, Ohio, and Pennsylvania
- Strip mine habitats could hold more birds if managed for Henslow's Sparrows. Little management is done on these sites after they are reclaimed.
- Many reclaimed strip mine grasslands are located in areas that were historically forested. They were seeded back to grass because establishing trees was often unsuccessful and/or expensive. New techniques are making it easier and more successful to reforest sites. We need to prioritize what areas are important to maintain for grassland birds and what areas should be reforested to benefit forest birds of concern (i.e. Cerulean Warbler).
- Reclaimed strip mine sites in Indiana are currently being sold off with some sites being developed. In general many reclaimed strip mine sites are vulnerable to conversion.

Discussion related to habitat use and breeding distribution

- Studies have indicated that ideal Henslow's sparrow habitat consists of large blocks of tall, dense cover with a thick litter layer. Studies indicate no preference between warm season and cool season grasslands. A good source of habitat management recommendations can be found at <http://www.npwrc.usgs.gov/resource/literatr/grasbird/hesp/hesp.htm>.
- A popular belief supported by data has been that Henslow's Sparrows avoid recently burned areas. This paradigm is being questioned by recent work showing birds are using recently burned sites. Increased use may be caused by birds in areas with increasing populations being forced to use lower quality habitat. We need to develop region specific recommendations for fire frequency.
- There was some discussion of how well the BBS monitors Henslow's Sparrows. Additional surveys may be useful for identifying areas being used but not currently sampled by the BBS. More intensive surveys would be especially useful in the expanding portion of their range. Additional surveys would be expensive and time consuming.
- "Core Areas" to focus protection, restoration, and management need to be identified especially with the current threats to the CRP program. As part of this process, a range-wide status assessment is currently

being completed for Henslow's Sparrows. A county level map of Henslow's Sparrow occurrence will be included in the assessment. The map will be based on locations from state natural heritage databases, the bird banding lab, birder listserves, ebird, a NWR survey, NWR bird lists, the BBS, and research studies.

- The amount of quality habitat on public land needs to be increased through more management especially if current CRP habitat is lost. However, Grassland management should not be applied the same across the breeding range. "One size does not fit all". As such, Regional workshops for public land managers covering BMPs for grassland birds should be held. Workshops should focus on management for the entire suite of grassland birds in the region the workshop is being held.
- Woody encroachment into grassland sites is big issue on the breeding grounds. Studies have shown that Henslow's Sparrows avoid woody edges. Habitat management for Henslow's Sparrows should focus on maintaining open grasslands with little woody encroachment. Removing woody vegetation can be difficult once it becomes established.
- We need to have better estimates of productivity/nest success in CRP versus Non-CRP habitat. Conducting such studies would be very expensive and there would be a lot of uncontrolled variation due to predation and a variety of other factors.
- Climate change may alter breeding distribution. We may want to model response to predicted climate change.
- Develop best management practice (BMP) guidelines for mid-contract management of CRP
- Increase the number of trained wildlife professionals in Natural Resource Conservation Service (NRCS) and Farm Service Agency (FSA) offices through creative partnerships.

7. Wintering Range Discussion

Participants generally felt that the current population of Henslow's Sparrows was not being limited by any wintering ground issues. The current winter habitat has sustained the population growth experienced on the breeding grounds. Birds at high densities do not appear to be suffering based on Stouffers work in Louisiana.

Discussion related to longleaf pine habitat and prescribed burning

- The main conservation issue on the wintering grounds is that fire needs to be put back onto the landscape to create/maintain Henslow's Sparrow wintering habitat (longleaf pine savanna). Burned longleaf pine areas have a very high plant species diversity that is lost if you don't burn. At minimum the current level of burning needs to be maintained. Need to be careful not to include all pine areas (esp. xeric systems such as Sandhills NWR, piedmont NWR etc.), but only those where this kind of work has been done (coastal plain savanna). Certainly burning is vital to the ecosystem in those areas, but frequency is the difference.
- There is a shortage of qualified burn bosses (RXB1) needed to supervise complex growing season burns on public lands in the wintering range. We need to encourage agencies (USFWS, U.S. Forest Service, state agencies, etc.) to increase the number of RXB1 bosses able to complete complex growing season burns.
- The burns most beneficial to Henslow's Sparrows are growing season burns. Many fuel models exist for the behavior of dormant season burns, however, knowledge of growing season burns is lacking. More research is needed to understand the effects and behavior of growing season fires. Additionally, growing season fires do the best job of controlling gallberry which can crowd out desirable grasses.

- Local government agencies and the public are often not supportive of prescribed burning in the south for environmental, health, or other reasons. Changes in particulate matter regulations could make it more difficult to burn. The U.S. Forest Service often has a difficult time burning because of multiple use management requirements.
- Increased public education through various media outlets is needed to inform about the benefits of burning for ecosystem health and wildlife management. Also need outreach to developers building communities next to wildlife areas. The developers need to let people buying the lots know about burning and why it is done.
- Mowing can be used as a surrogate for burning in some situations, but usually is of limited value because sites are too wet. Excessive disturbance from mowing equipment could allow for the establishment of cogon grass. Cogon grass is an aggressive exotic that displaces native vegetation. In Mississippi, the Department of Transportation is hosing down mowing equipment to prevent the spread of cogon grass.
- Most wintering birds are probably using public lands because that is where a majority of the remaining large patches of longleaf pine savanna are located. In addition, most prescribed burning occurs on public land.
- Private landowners are starting to realize that they can make money from longleaf pine so there may be an opportunity to work with them to restore or manage habitat for Henslow's Sparrows and other grassland birds. Many quail hunting preserves are interested in restoring or managing longleaf pine.
- Planting longleaf pine is a conservation practice (CP3A) under the Conservation Reserve Program, however, sites tend to be planted in densities that are too high and the plantings are often not managed with fire. There are 219,710 acres enrolled in CP3A as of February 2007.
- We need to determine the current distribution of longleaf pine and identify areas (public and private) to target for increased management.
- A non-profit called the Longleaf Alliance has been working to restore longleaf pine throughout the historic range in the southeastern United States.

Discussion related to breeding/wintering ground connectivity and winter range distribution

- More studies are needed to examine the connectivity between breeding and wintering areas. Studies using stable isotopes have been inconclusive but new techniques may provide better information in the future. Increased emphasis on banding breeding birds would allow us to determine where birds are wintering. A lot of effort would have to be expended to get a large sample of birds banded on the breeding grounds.
- We should keep in mind that if the breeding distribution changes it may alter the wintering distribution. Establishing breeding/wintering links would help sort out if range change on breeding grounds is creating a range change on wintering grounds. This could help target conservation efforts and diagnose future problems. Chris Eberly indicated that more money for habitat management on military lands may be available if you could link breeding and wintering area use on military lands.
- The northern extent of the wintering range needs to be better delineated. Wintering range participants indicated that densities tend to decrease as you move inland. Stouffer is currently conducting work in northern Louisiana. Related to this, more information is needed on the site fidelity, survival, and densities on peripheral wintering areas. As with breeding grounds, climate change may alter the wintering distribution.

- There are no range-wide surveys on wintering grounds that reflect the trend experienced on the breeding grounds. A monitoring program is needed to better measure wintering population size and distribution. The Christmas Bird Count (CBC) provides some information but overall is not very useful. Wintering ground attendees felt that declining grassland bird populations have increased the awareness of these birds which has resulted in increased occurrence on CBC surveys. One method may be to conduct winter bird atlas projects in southern states. Louisiana recently started a 3-year winter atlas project.
- Developing an expert opinion winter model would help identify key areas to evaluate for Henslow’s Sparrow use.
- Most of the discussion about wintering grounds focused on Henslow’s Sparrow use of longleaf pine habitat. More work is needed to identify other habitats used by wintering birds.
- Champlin’s study in South Carolina and anecdotal evidence throughout the south indicate that power line corridors especially in low wet areas provide winter habitat (so long as those low, wet areas remain in grassland physiognomic cover type).
- Henslow’s sparrows are difficult to survey during winter because they are not vocalizing and difficult to identify. There have been mixed results using callback surveys.

8. Priority Conservation Actions and Moving Forward

At the conclusion of the first day, workshop participants were asked to write down what they felt were their top three conservation actions for advancing Henslow’s Sparrow conservation. They were asked to base their recommendations on their existing knowledge of the species, the day’s presentations, and the discussion at the workshop. Tom Will summarized this exercise by combining similar responses into classes and ranking them based on the number of cards containing similar “next steps” (Table 1). Actions are categorized for the breeding grounds (B), wintering grounds (W), or both (BW). The list was reviewed with participants to start the second morning of the workshop. Action items were further discussed after they were reviewed. The workshop ended with the formation of working groups to further develop and refine the identified action items. Working groups were established for the breeding range and wintering range (see Appendix A for working group membership).

Table 2. Top conservation actions identified from participant responses.

num	Class	B/W*	TOP CONSERVATION ACTIONS
11	Maintain CRP	B	Maintain current levels and promote new enrollments of HESP-friendly CRP. Continue to influence Farm Bill to provide perennial, relatively undisturbed grassland on the landscape.
10	Atlas	BW	Assess current population (distribution and abundance) with respect to habitat, CRP/non-CRP, and ownership (federal, state, private, etc.). Determine core population centers.
4	BMP for CRP	B	Evaluate region-specific appropriate management practices for HESP in CRP and other grasslands. Manage existing habitats that support HESP to ensure long-term survival on these.
3	Demographic research	B	Determine productivity in different cover types (i.e., nesting success, recruitment). Determine nest success relative to patch size, edge, and landscape features. Estimate annual survival probabilities (from wintering or breeding populations).

3	Maintain fire	W	Increase the amount/extent of prescribed fire across the Southeast. (Efforts should focus on growing season burns on a ≤ 3 year rotation.)
2	assess/promote winter habitat	W	Define and encourage retention of important wintering habitat.
2	evaluate/promote longleaf savanna	W	Evaluate effects of pine savanna restoration on HESP/grassland bird communities. Encourage federal/state programs to increase acreage in long-leaf pine savanna.
2	Connectivity	BW	Determine connectivity and C3/C4 trophic level relationships of breeding and wintering areas.
2	HESP-friendly biofuel	B	Focus bio-fuel efforts on native species that provide habitat for HESP & other grassland species (including non-birds). Encourage HESP-friendly biofuel development.
2	Monitor trends	B	Develop better monitoring program -- possibly designate specific sites in each state in range for long-term monitoring. Improve monitoring in areas in which distribution is not well understood.
1	BMP for non-CRP	B	Identify important non-CRP HESP breeding areas. Implement management plans that consider needs of HESP (and other co-occurring species).
1	compile ethanol impacts	B	Assemble information on impacts of herbaceous cellulosic ethanol on HESP. Develop issue paper on topic for DOE that shows HESP use of native grasses vs. other habitat types.
1	Habitat requirements	BW	Increase knowledge of habitat requirements.
1	Modeling	B	Conduct landscape analysis for Northeast breeding populations to determine where to focus efforts.
2	increase funding	B	Improve funding to all federal, state, and local agencies for habitat management at key HESP breeding areas.
1	Range	BW	Understand range-shifts (as a result of global climate change).

* B = Breeding; W = Winter; and BW = Both

9. Final Thoughts

Henslow's Sparrow continental populations are currently in relatively good shape based on available survey evidence. However, regional concerns still exist particularly in the Northeast and Wisconsin where populations have continued to decline despite the recent range-wide increasing trend. Evidence suggests that recent population increases were probably related to the creation of breeding habitat through Farm Bill programs such as CRP. The apparent reliance on CRP is also why the future status of this 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. As such, conservation of Henslow's Sparrows should use a two-tiered approach that stresses the importance of Farm Bill conservation programs to current populations while also identifying opportunities for long-term protection, restoration, and management of permanently protected habitat on areas such as national wildlife refuges, state wildlife area, and military bases.

Wintering ground work should not be ignored even though available evidence suggests that emphasis should be placed on breeding ground conservation. The importance of managing longleaf pine winter habitat with prescribed burning is evident. In addition, wintering distribution and habitat selection needs to be examined more closely and better delineated. Knowing which areas and habitats are important will help protect key areas and prioritize the use of limited prescribed burning resources to benefit the species.

10. Appendix A. Participants attending the Henslow's Sparrow Workshop

Last	First	Working Group*	Affiliation	Region/state	Email Address
Champlin	Paul	Winter**	Clemson University	South Carolina	pchampl@CLEMSON.EDU
Cleveland	Mark	Breed	Minnesota DNR	Minnesota	mark.cleveland@dnr.state.mn.us
Cooper	Tom	Both	FWS - R3 Mig. Birds	Region 3 - MN	tom_cooper@fws.gov
Eberly	Chris	Both	Dept. of Defense - PIF	Virginia	ceberly@dodpif.org
Faber	Ray	Breed	St. Mary's University	Minnesota	RFABER@smumn.edu
Fritcher	Sean	Breed	Minnesota DNR	Minnesota	sean.fritcher@dnr.state.mn.us
Giocomo	Jim	Breed	University of Tennessee	Tennessee	jgiocomo@utk.edu
Granfors	Diane	Breed	FWS - HAPET	Region 3 - MN	diane_granfors@fws.gov
Herkert	Jim	Breed**	The Nature Conservancy	Illinois	jherkert@TNC.ORG
Johnson	Doug	Breed	USGS-Northern Prairie	Minnesota	Douglas_H_Johnson@usgs.gov
Jorgensen	Joel	Breed	NE Game and Parks	Nebraska	joel.jorgensen@ngpc.ne.gov
Koford	Rolf	Breed	Iowa Coop Unit	Iowa	rkoford@iastate.edu
Ribic	Chris	Breed	Wisconsin Coop Unit	Wisconsin	caribic@facstaff.wisc.edu
Robb	Joe	Both	USFWS - Big Oaks NWR	Indiana	joe_robb@fws.gov
Sample	David	Breed	Wisconsin DNR	Wisconsin	David.Sample@Wisconsin.gov
Stouffer	Phil	Winter	Louisiana State University	Louisiana	pstouffer@lsu.edu
Suleiman	Gibran	Breed	US Army-Fort Riley	Kansas	gibran.suleiman@us.army.mil
Thogmartin	Wayne	Breed	USGS-Upper Miss.	Wisconsin	wthogmartin@usgs.gov
Will	Tom	Breed	FWS - Mig. Birds	Region 3 - MN	tom_will@fws.gov
Winter	Maiken	Breed	Cornell University	New York	mw267@cornell.edu
Woodrey	Mark	Winter	Mississippi State University	Mississippi	msw103@ra.msstate.edu
Endrizzi	Deane	Breed	FWS - R3 Mig. Birds	Minnesota	deanne_endrizzi@fws.gov

* Working group membership (** = Chairperson)

11. Appendix B. Suggested Focal Species Plan Outline

- I. Executive Summary**
- II. Introduction**
 - A. Rationale for selection
 - B. Other species for which FS can serve as an indicator
- III. Description of Target Population**
 - A. Range and distribution
 - B. Spatial extent of conservation plan
- III. Population Status**
 - A. Status and trend
 - B. Legal or priority status
 - C. Known or suspected limiting factors
- V. Natural History Overview**
- VI. Focal Species Population Objectives**
 - A. How to measure
 - B. Time frame for achieving
- VI. Conservation Strategy**
 - A. Priority regions
 - B. Management treatments
 - C. Resources available
- VIII. Information Needs**
 - A. Adequacy of existing monitoring programs
 - B. Research Priorities
- IX. Priority Action Items**
 - A. Determine relative priority of action toward attainment of objectives
 - B. Estimated operational and staff costs to implement priority actions
 - C. Assign tasks to key Service or partner leads to implement priority actions
 - D. Determine timeline to accomplish priority actions
 - E. Evaluating Migratory Bird Program accomplishments (format, how often, who?)
- IX. Literature Cited or References**