

State Wildlife Grants Program Final Report



Henslow's
sparrow
captured for
banding

Project Title: Henslow's Sparrow Habitat Management and Monitoring at Great River Bluffs State Park

Project Period : March 1, 2004 – December 31, 2005

Henslow's Sparrow Population Monitoring:

Henslow's sparrow populations were estimated in the 2 old fields indicated on the attached map. Recordings of male vocalizations were used to locate singing males and estimate territories. A total of 14 territories were documented during the 2004 nesting season and 27 territories during the 2005 nesting season (see attached map). The bird located in the territory west of the park office was only observed once each year so this territory is likely not persistent. This territory had not been utilized in recent years and appears to be marginal habitat. Several other territories during the 2005 nesting season were not persistent with birds occupying areas on only 1-2 occasions (Faber, R.A. 2005).

Nest searching efforts were unsuccessful in locating a nest, even though almost 100 man-hours were spent searching during the study. Modified flushing poles were pushed through the vegetation in front of observers. Numerous flushes were encountered in many territories, but no indications of a nest were ever observed. We realize the difficulty in locating grassland bird nests and made very meticulous efforts in the searching. We searched extensively on the leading and trailing edge of the pole out to 15 feet with no success. In the future, we are going to observe behavioral cues from a blind to try to locate nests.

Banding efforts were successful with 4 birds banded during July and August 2004 and 3 birds banded during July and August of 2005. An interesting observation was that 2 birds were banded in the same territory (on successive days) suggesting the possibility of a male/female pair on that territory (Faber, R.A. 2004). No recaptures or returned bands have been documented.

Summary of Henslow's sparrow population monitoring results during 2004 & 2005					
Year	# of territories		# of birds banded	Nest searching results	
	Contact Stat.	Headquarters		# nests located	Man-hours searching
2004	4	10	4	0	45
2005	9	18	3	0	48

Vegetation Measurements:

Vegetation characteristics were measured to better understand the vegetative structure that Henslow's sparrows are using at the park. Vegetation height, vegetation density (visual obstruction), and litter depth were collected from occupied fields. The same data were collected on various prairie remnants and restorations to compare the structure of the vegetation at these sites. The Daubemire plot data were only partially completed due to inconsistent data collection among technicians. This data was not used in comparisons of occupied territories and other sites. The mean values for these data are summarized in the following table.

Summary of vegetation data collected in occupied territories and comparison sites (reported as the mean value from multiple sample points).					
Vegetation Variable	Occupied Fertilized	Occupied Unfertilized	Occupied No treatment	Restored Prairie	Remnant Prairie
Veg. Density (vom)	14.4	10.9	12.2	13.5	12.0
Veg. Height (in.)	23.4	23.2	25.3	25.0	25.3
Litter Depth (cm)	3.6	3.4	2.5	3.7	2.5

No statistical analyses were completed on these data. The purpose of the vegetation measurements was to help guide decisions regarding possible seed mix combinations.

Habitat Restoration:

This project included a 26-hectare restoration site that almost doubled the size of existing Henslow's sparrow habitat in the park. The restoration area is adjacent to the existing old fields so from a landscape perspective, it increases patch size and continuity of grassland habitat (see attached map). The goal of the restoration was to reconstruct native prairie communities that closely matched habitat characteristics which Henslow's sparrow prefer at Great River Bluffs State Park. In order to do this we used the above vegetation measurements and observations to develop a seed mix that uses native plant materials to mimic the structural characteristics of the vegetation that Henslow's sparrow are using at the park. For example, Henslow's sparrows prefer dense vegetation with a well-

developed litter layer. We adjusted the seed mix to favor dense cover by increasing rates of species that will provide stands of dense residual vegetation. We also increased rates of species that would serve as perches. The following table summarizes the seed mix used for the restoration. We also hand harvested approximately 75 pounds of mixed native forb seed from within the park to contour plant the microhabitats of the restoration site.

Common Name:	Scientific Name:	lbs./acre	Total lbs.
GRASSES			
Big Bluestem	Andropogon gerardi	1.2	72
Sideoats Grama	Bouteloua curtipendula	1.5	90
Canada Wildrye	Elymus canadensis	0.6	36
Slender Wheatgrass	Elymus trachycaulus	1.5	90
Little Bluestem	Schizachyrium scoparium	1.6	96
Indian Grass	Sorghastrum nutans	1.5	90
Kalm's Brome	Bromus kalmii	0.7	42
Prairie Dropseed	Sporobolus heterolepis	0.5	30
Porcupine Grass	Stipa spartea	0.3	18
FORBS			
Butterfly Milkweed	Asclepias tuberosa	0.07	4.2
Sky Blue Aster	Aster Azureus	0.02	1.2
Prairie Coreopsis	Coreopsis palmata	0.06	3.6
Purple Prairie Clover	Dalea purpureum	0.1	6
Round-headed Bushclover	Lespedeza capitata	0.06	3.6
Rough Blazing Star	Liatris aspera	0.07	4.2
Bergamont	Monarda fistulosa	0.05	3
Black-eyed Susan	Rudbeckia hirta	0.06	3.6
Stiff Goldenrod	Solidago rigida	0.05	3
Heartleaf Alexanders	Zizia aptera	0.05	3
Showy Tick Trefoil	Desmodium canadense	0.02	1.2
Showy Sunflower	Helianthus laetiflorus	0.05	3
Grey-headed Coneflower	Ratibida pinnata	0.06	3.6
Compass Plant	Silphium laciniatum	0.17	10.2
Showy Goldenrod	Solidago speciosa	0.06	3.6
Leadplant	Amorpha canescens	0.06	3.6
Whorled Milkweed	Asclepias verticillata	0.02	1.2
Flowering Spurge	Euphorbia corollata	0.02	1.2
Smooth Blue Aster	Aster laevis	0.03	1.8
Oxeye Sunflower	Heliopsis helianthoides	0.07	4.2
Hoary Vervain	Verbena stricta	0.02	1.2
Grey Goldenrod	Solidago nemoralis	0.02	1.2
White Prairie Clover	Dalea candida	0.06	3.6
White Indigo	Baptisia alba (leucantha)	0.02	1.2
Heath Aster	Aster ericoides	0.01	0.6
Aromatic Aster	Aster oblongifolius	0.02	1.2
Dwarf Blazing Star	Liatris cylindracea	0.02	1.2

Prairie Alum Root	<i>Heuchera richardsonii</i>	0.005	0.3
New Jersey Tea	<i>Ceanothus americanus</i>	0.02	1.2

Restoration of the site included the following practices:

Site Preparation: 1) an early spring (2004) prescribed fire to remove thatch and stimulate vegetation growth, 2) herbicide treatment with Roundup to kill perennial vegetation (June 2004), 3) a late summer follow-up prescribed burn to remove the dead vegetation and further extinguish the seedbed (late-Aug 2004), 4) an additional fall spot treatment with Roundup/2-4-D to kill remaining Canada thistle and other undesirable species (Oct 2004), and 5) cutting and stump treating young box elder and elm trees (1-3 inch DBH) to prep the site for planting.



Burning the restoration site in spring of 2004

Seed Mix Development: We developed the seed mix as outlined above. We also harvested seed throughout the season to increase diversity, supplement rates of certain species, and maintain genetic and ecotype sources in the seed mix.

Seeding: We no-till drilled the entire restoration site with a Truax drill. The hand-harvested seed was used to contour plant the many microhabitats within the site. We also sprayed the site with RoundUp the day following planting to kill existing weedy vegetation and minimize competition for seedlings.



No-till drilling
native seed mix

Post-seeding Management: The restoration area was mowed twice in most areas. Some areas of lesser weed competition were mowed only once and some areas of greater competition were mowed 3 times. A follow-up burn may be completed in 2006 and then the restoration will be managed with longer fire intervals to allow for litter accumulation and increased residual vegetation. No more than about $\frac{1}{4}$ of the unit will be burned in any year.

Germination and establishment of native vegetation was successful. Timely rain helped provide for the good germination rates. Weed competition was severe in a few areas. The dry, shallow soils found over most of the site allow for great prairie establishment conditions, but growth rates are somewhat slower.

Habitat Management in Occupied Old Fields:

In addition to the restoration, a number of other habitat management projects were completed. Working with a long-time researcher of Henslow's sparrow in the park, we developed a list and map of priority areas for brush cutting and tree girdling or removal to maintain the open grassland character of the occupied old fields. Approximately 320 man-hours of labor were invested in: 1) 'thinning' green ash plantations and regeneration, 2) reducing patch size of grey dogwood and sumac patches, 3) removing exotic species (such as honeysuckle), and 3) girdling some larger trees that were invading the grassland. All work was completed in late fall, winter, or early spring to avoid disturbance when the birds were at the park.



Late-summer burn (2005) conducted in occupied old fields to kill brush and stimulate plant growth for increased litter accumulation and residual vegetation in succeeding years

Project Summary:

Henslow's sparrows have been fairly reliable breeding season occupants of Great River Bluffs State Park in the past 20 years. Density estimates (defined from number of territorial males) have bounced around, but are usually between 10 - 18 territorial males each year. This project provided: 1) 2 intensive years of singing male data, 2) nest searching and banding data, 3) vegetation structural data used to development restoration plans, 4) habitat management improvements in the occupied old fields, and 5) doubled the size of grassland habitat at Great River Bluffs State Park by restoring close to 60 acres of native prairie vegetation. There are numerous research questions we would still like to investigate. Nesting success and reproductive capability of the population at Great River Bluffs is one of the top priorities. Since we know the sparrows are consistently defending territories, we need to determine if and how much reproduction is occurring. We also need to develop burn and management plans that are consistent with Henslow's sparrow habitat needs. Follow-up monitoring for Henslow's sparrow usage of the restored prairie will take place in 3-5 years when sufficient litter and residual vegetation have accumulated.

Literature Cited:

- Faber, R.A. 2004. Henslow's sparrow (*Ammodramous henslowi*) activity at Great River Bluffs State Park, 2004. Unpublished report submitted to MN Dept. of Natural Resources, Division of Parks.
- Faber, R.A. 2005. A brief report on Henslow's sparrow studies at Great River Bluffs State Park during the 2005 field season through 30 June. Unpublished report submitted to MN Dept. of Natural Resources, Division of Parks.

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Attachments:

Map illustrating old field locations in relation to the restoration. Map also indicates approximate locations of territories in 2004.

