2018 Savaloja Grant Report

Minnesota Ornithologists Union

BREEDING BIRDS SURVEYS AT RESTORED AND NATIVE PRAIRIES IN DAKOTA AND WASHINGTON COUNTIES: A multi-year comparison

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INTRODUCTION

Grassland birds are among the most imperiled in North America, due in part to the severe loss of available habitat from urban and rural development. Since 2002, FMR has been working on prairie restoration and enhancement projects to restore this plant community and the wildlife that depend on it at targeted sites in the Twin Cities metropolitan area. While we have good information on the plant community establishment, we do not often have data on wildlife species that have come to use these restored site.

An important measure of success of a prairie restoration is evidence that prairie-dependent animals are using a site for raising young. Birds have long been used as indicators of habitat quality for many reasons. They are easy to identify and there are many people who are qualified to do so, standard survey protocols have been established, and there are a wealth of long-term data available. Birds may also be better suited than other animals to reflect vegetation changes because they have a multi-year lifespan and a tendency to return to the same breeding sites each year.

Although multiple factors influence various bird species populations, and their presence or absence alone does not define the quality of the habitat, birds can serve as one indicator of the success of a habitat restoration project. Whenever possible, we have conducted breeding bird surveys before and after restoration to document the change in species that use the site. Of particular interest are the Species of Greatest Conservation Need (SGCNs) – so designated by the Minnesota Department of Natural Resources due to significant declines in their populations. Many prairie bird species fall into this category and we specifically focus on those species in this study.

OBJECTIVES

The primary objective of this project was to obtain comparative data on breeding birds at restored and native prairie sites, in order to observe long-term trends.

METHODS

Six sites were selected, on private and public lands in Dakota County and southern Washington County, where FMR has on-going prairie restoration projects (Figure 1).

The Emrick site is a private property where 28-acres of cropland were restored to prairie in 2011.

There were three sites at the Hastings Sand Coulee Scientific and Natural Area (SNA). At the south unit an 18-acre cropland was converted to prairie and bird surveys were compared with adjacent native prairie remnant, about 45 acres. At the north unit, a 50 acre old field (brome grass dominated) was restored and compared with a similar sized native prairie remanant. Also

at the north unit, a 50-acre oak forest was surveyed before and after removal of impenetrable buckthorn.

The 3M Cottage Grove facility was a 150-acre grassland dominated by non-native grasses, shrubs and trees. Twenty acres were restored to native prairie, seeded in fall 2016.

The Wilmar site is private property where a 25-acre cropland was restored to prairie, seeded in fall 2009.

Bird surveys are specifically targeted for the breeding season (June for the majority of species) because that is the time when the birds are most wholly dependent on the habitat to meet all their needs of raising young. FMR has completed breeding bird surveys at most of the sites for several years, with the exception of Cottage Grove Ravine Park, which was initiated in 2018. Data are not included for that site. Data are also not included for Gores WMA, as there was only one prairie data point, which was not enough to detect meaningful changes.

Two breeding bird surveys were conducted annually at each site in June, using either standard point count or transect methodology. Surveys were completed between dawn and 9:30 a.m.

Points were located at least 250 m apart; all species seen or heard within 50 m were recorded for 8 minutes. Transects were 200 m long and 50 m radius. Surveys were 20 minutes. For both methods, species beyond 50 m were recorded separately. In general, only data within 50 m were included in the analysis of this survey. At most of the sites, beyond 50 m may have included forest or other habitat types. We wanted as much as possible to evaluate just the prairie portion of the sites.

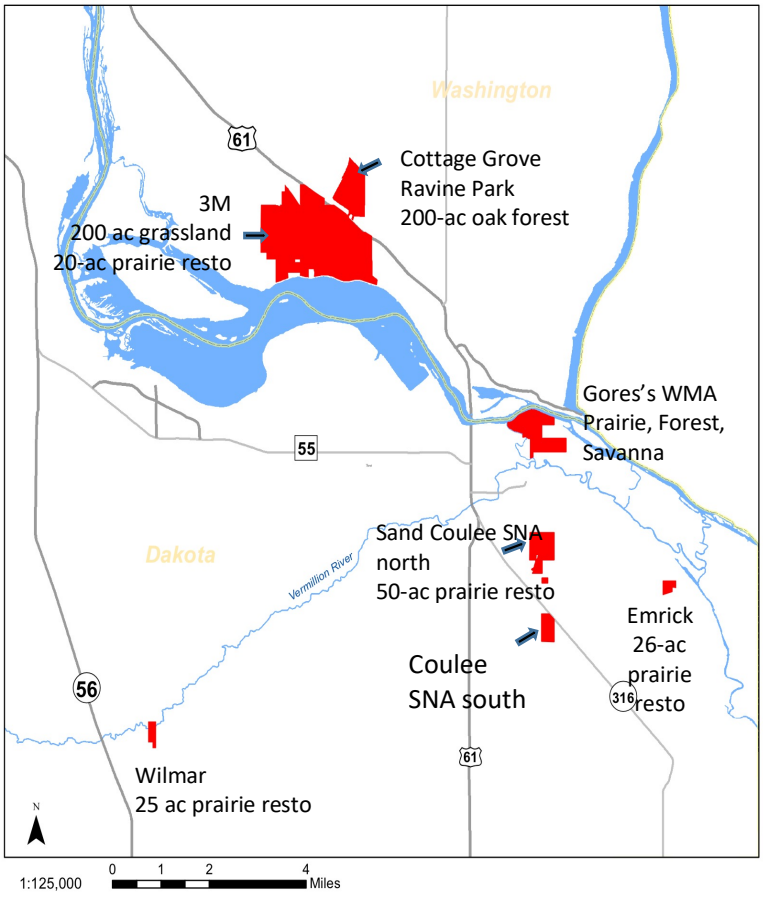


Figure 1. *Survey sites.*

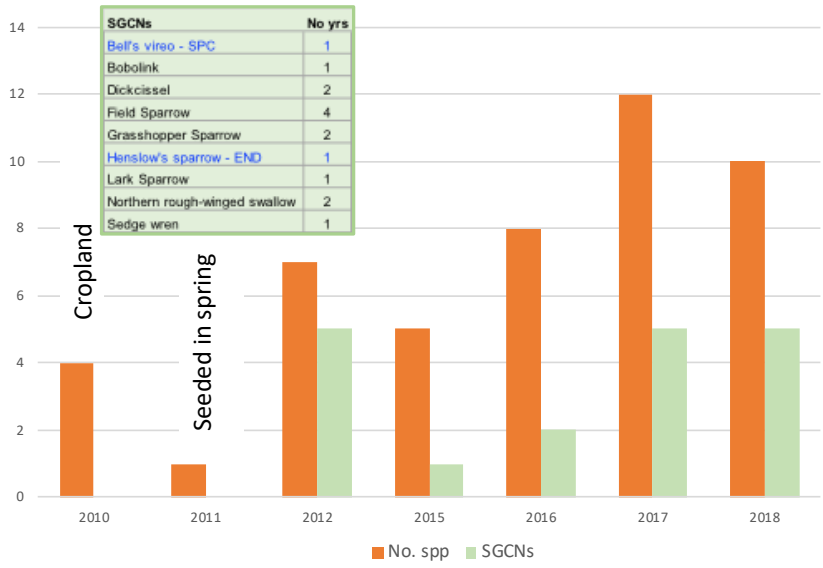
RESULTS

The surveys have provided good indicators of recent successes. All of the sites showed an increase of SGCNs, ranging from 18 to 400 percent increases, and representing as many as 13 SGCNs species at one site. The state-endangered Henslow's sparrow was found at four sites, where it had not been recorded before. Two of those sites (Sand Coulee SNA South and Emrick) were former agricultural fields. Loggerhead shrike was found at two sites, though it likely had been present at one of those sites before. Bell's vireo, a special concern species, was found at three sites, two of which were former cropland.

Although only 28 acres in size, averaging just 8 bird species each year within the prairie, over half the birds dectected in some years have been SGCNs, and the small site has harbored an endangered species and a special concern species (Figure 2). It demonstrates that even small prairie restoration can provide valuable habitat for prairie-dependent birds.

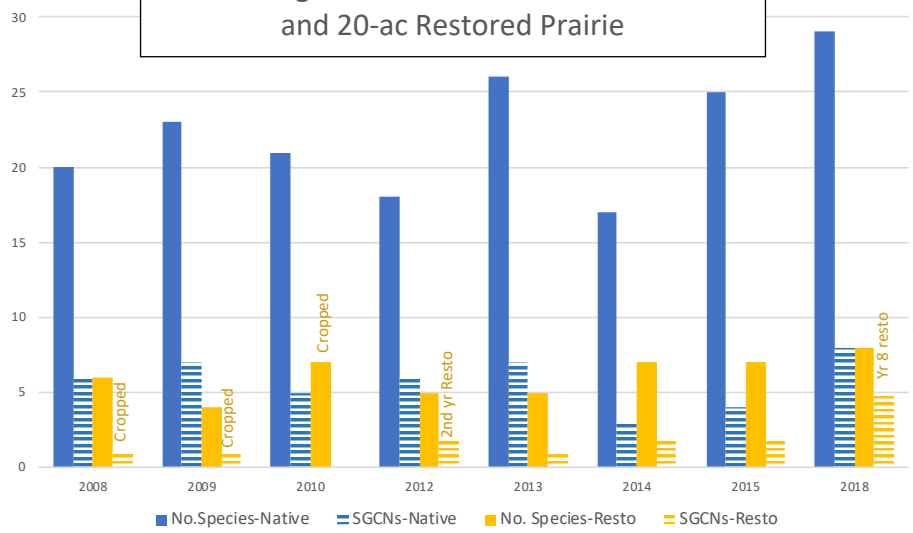
Figure 2. Emrick Property

Breeding birds at 28-acre prairie restoration



The 20-acre restoration at the Hastings Sand Coulee SNA South increased from 8 species per year average as cropland, to 13 species after restoration (Figure 3). SGCNs increased by 260%, from less than one species average per year as cropland to 2.5 after restoration. The adjacent native prairie population was stable, with slight annual fluctuations in species richness and SGCNs.

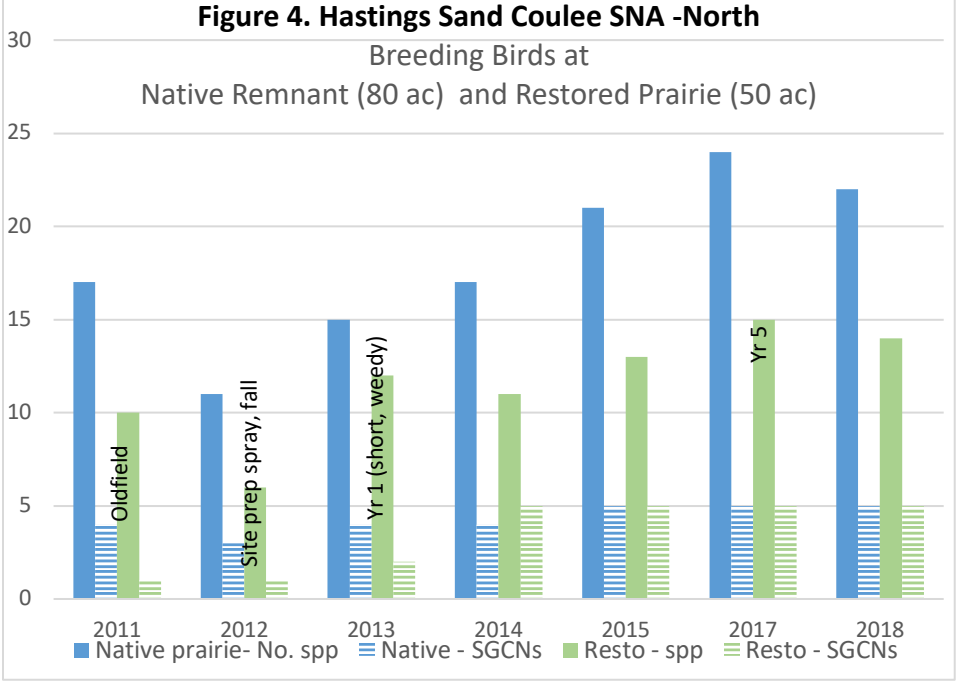
Figure 3. Hastings Sand Coulee SNA -south
Breeding Birds at 60-ac Native Remnant and 20-ac Restored Prairie



SGCNs	Native	Resto
Black-billed cuckoo	1	
Black tern	1	
Brown Thrasher	7	
Dickcissel	3	2
Eastern meadowlark	7	1
Field Sparrow	8	1
Grasshopper Sparrow	8	4
Henslow's sparrow - END	1	2
Lark Sparrow	6	4
Loggerhead shrike - END	3	
Northern harrier	1	
No rough-winged swallow	1	
Total	12	6

At the North unit of the Sand Coulee SNA, SCGNs in the restored prairie clearly increased over the initial brome grassland condition, even exceeding the number of SGCNs in the native prairie in some years, with somewhat different species (Figure 4). Species richness and SGCNs in the native prairie also seemed to increase, possibly due to the increase in overall habitat provided by the adjacent restored prairie.

Figure 4. Hastings Sand Coulee SNA -North
Breeding Birds at
Native Remnant (80 ac) and Restored Prairie (50 ac)

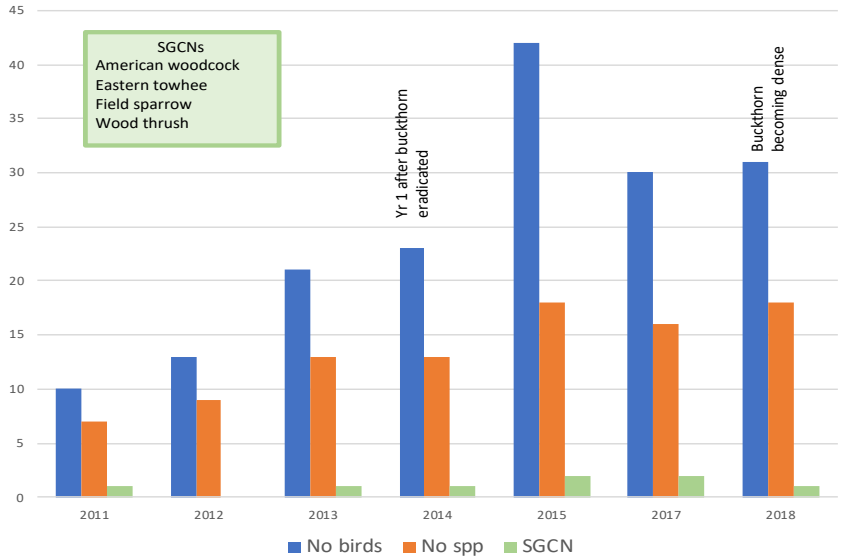


	No. of yrs	
SGCNS	Native	Resto
American Kestrel	1	
Bell's vireo- SPC		1
Brown thrasher	5	
Dickcissel		3
Eastern meadowlark		1
Eastern Towhee	4	
Field Sparrow	7	6
Grasshopper sparrow	6	4
Henslow's sparrow - END		4
Lark Sparrow	6	3
Northern Rough-winged Swallow	1	2
Total	7	8

At the wooded portion of the Sand Coulee SNA north unit there was a modest increase in species richness and SGCNs as this buckthorn-infested woodland was restored (Figure 5). The numbers dropped off in 2018, possibly correlating to the increase in buckthorn as it regenerated.

Figure 5. Hastings Sand Coulee SNA-North

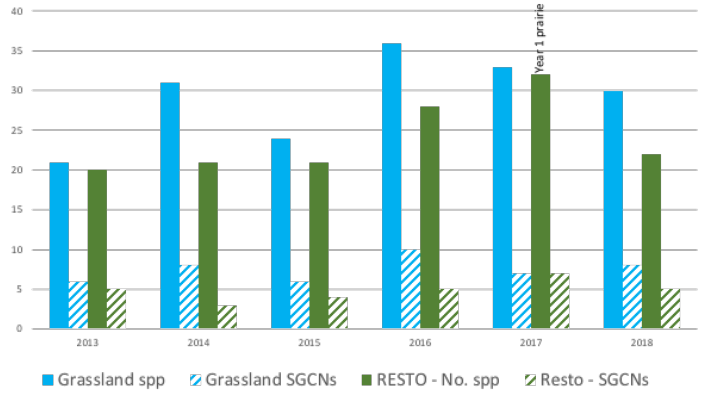
Breeding Birds at Oak Woodland Restoration (50 ac)



The 3M site had the highest number of SGCNs (13 spp), many of which were found at the site every year (Figure 6). The restoration was too new to see any clear pattern of species richness, but the site overall had the highest richness of any grassland/prairie site.

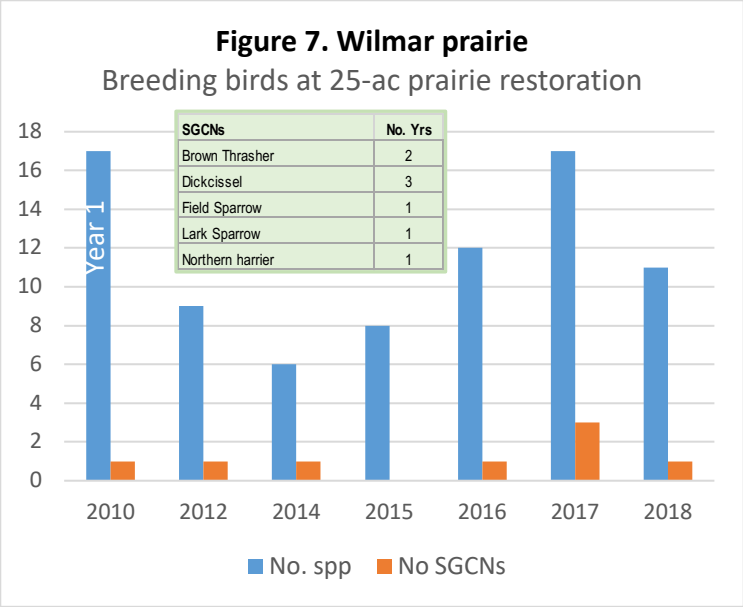
Figure 6. 3M Cottage Grove

Breeding birds at 200-ac Grassland



		Number of years observed		
	SGCNs	**South**	**Mid**	**North**
	American kestrel	1	2	
SPC	Bell's vireo		5	2
	Bobolink	5	1	1
	Brown Thrasher	6	6	4
	Chimney swift	1		
	Dickcissel	3	3	1
	Eastern meadowlark	6	6	6
	Field Sparrow	6	6	6
	Grasshopper Sparrow	6	6	1
E	Henslow's sparrow		1	
E	Loggerhead Shrike		1	
	No Rough-Winged Swallow	6	5	5
	Sedge wren		1	3
		9	**12**	**9**

Although SGCNs were sparse at the Wilmar site, the restoration had higher species richness (Figure 7) than the similar-sized Emrick site, possibly due to the proximity of a nearby restored prairie and the Vermillion River. The temporary decline in species richness seemed to correlate with an increase in young tree cover at the prairie (removed in 2016). We do not have data from the years prior to restoration, so data start with the year it was seeded.



For all of the prairie sites for which we have data prior to restoration, we have seen a clear increase in species richness in the years following restoration (Figure 8). Multi-year data were averaged for the years before and after restoration (data from the first year of new prairie restoration were not included). The number of SGCNs species also increased at every site, up to four times what it had been prior to restoration.

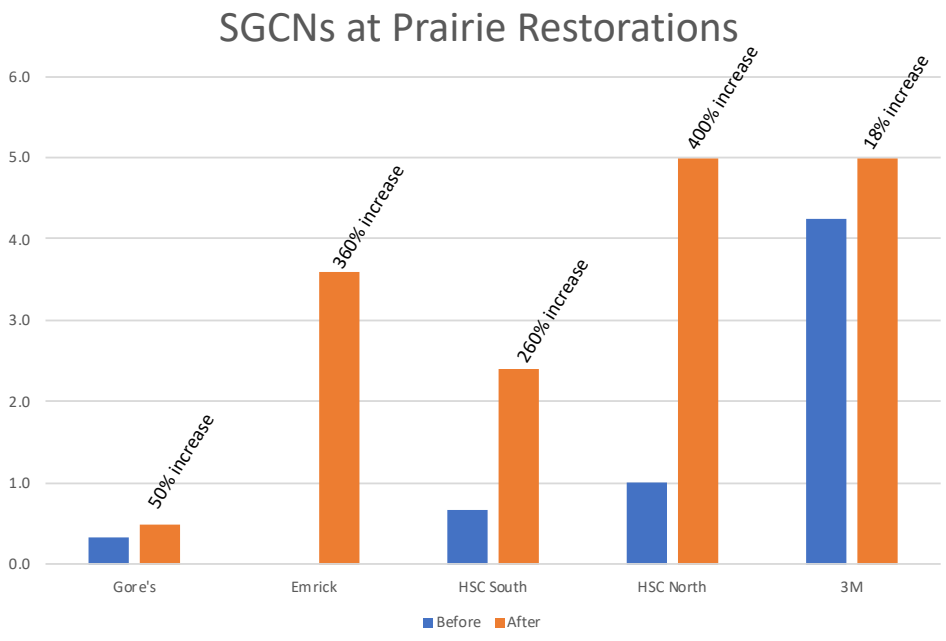


Figure 8. *SGCNs before and after prairie restoration*

CONCLUSIONS

While the primary objective for this project was simply to gather data as part of a longer-term project, because most of our sites now have several years of data the information from 2018 helps us to see clear trends at our prairie restoration sites.

The data indicate that:

- Species richness of prairie birds increases as prairie vegetation is established after either cropland or old field.
- Numbers of SGCNs species likewise increase considerably.
- Native remnant prairies may benefit from adjacent prairie restorations, with increased species richness and SGCNs.
- Even relatively small sites (e.g. 25 acres) demonstrate important value for prairie-dependent bird species, including endangered species.
- On-going habitat management seems to be important; sites where woody plant cover increased showed declines in prairie bird species.

While these data provide good preliminary evidence that FMRs prairie restoration projects are successful in providing habitat for prairie-dependent bird species, additional research is needed to evaluate nest success and determine actual population effects. Additional data analysis of bird guilds or other parameters could also be done to better understand more specific habitat niches that are being utilized and potential gaps.

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