



Monitoring Birds in Rotationally Grazed Pasture

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Funding By:

The National Fish and Wildlife Foundation

Web Link:

<http://bit.ly/pfilivestock>

In a Nutshell

- Wild bird populations can thrive in properly managed working landscapes.
- Cattle activity changes grassland structure; creating areas with short and tall vegetation, which provides habitat that is less available in conservation areas.
- Rotationally grazed pastures have the capacity to support greater bird populations, for some species, than conservation areas that are not grazed.

Key findings

- Restored prairie in a conservation area supported 285 birds of 21 species.
- Rotationally grazed perennial pasture supported 553 birds of 22 species.
- Rotationally grazed perennial+annual pasture supported 524 birds of 28 species.
- Pastures better supported some birds that have conservation implications, than the restored prairie.

Project Timeline:
 May 2016 - September 2016

Background

Grassland bird populations in Iowa have been in decline due to the homogeneous landscape created by Iowa's predominant corn and soybean cropping system and the loss of conservation areas on private land. Grassland obligate bird species like the bobolink, dickcissel, grasshopper sparrow, Henslow's sparrow, and the eastern bluebird, all have declining population trends that have followed the conversion of nesting habitat to cropland (Marquardt, 2008). Pasture and hayfields are more attractive to some grassland birds than row crop fields, and studies have shown that conservation of birds and wildlife can be



Grace Baumgartner, student at Drake University, performs bird counts in Bruce Carney's rotationally grazed pastures.

facilitated in landscapes by introducing grazing disturbances at appropriate stocking densities (Marquardt, 2008 and Elmer, et al. 2012). Thus, the use of controlled grazing is a way to engage cattle producers in the process of ecosystem management in working landscapes (Vallentine, 2001).

For the last several years, Bruce Carney, a cattle grazer in Maxwell, IA has been observing diverse bird populations in his pastures. Bruce lives near Chichaqua Bottoms Greenbelt, a wetland and prairie conservation area, and wondered if his pastures provide adequate bird habitat, similar to that of the restored prairie area down the road. In addition, Bruce has pas-

tures comprised of perennial plant species, and pastures comprised of perennial plus annual plant species. The objectives of this project were to determine if 1) properly managed pasture can replicate the bird habitat of a restored prairie and 2) how pasture with perennial plus annual plant species effects bird populations.

Methods

PFI partnered with Drake University to conduct bird monitoring research. Student researchers conducted birds counts in three habitat types; a restored prairie (Chichaqua Bottoms), Bruce's perennial pastures, and Bruce's perennial pastures interseeded with annual species. By road,

Bruce's farm is located four miles from Chichaqua Bottoms Greenbelt. Flying distance is less than a mile.

Bird counts were conducted weekly between May 20 and September 22, 2016. Nine counts were taken each week (three in each habitat type). The counts were conducted over 18 consecutive weeks, for a total of 162 counts during the study. Counts recorded all bird sightings and bird calls during 10 minute intervals that took place between 7:00 and 10:30 a.m. After arriving to each plot, an acclimation period of 2 minutes was given before counts were started. The species of particular interest, which have conservation implications, are the bobolink, dickcissel, grasshopper sparrow, Henslow's sparrow, and the eastern bluebird.

Data were analyzed by Keith Summerville, Environmental Science professor at Drake University. Analysis used general linear models with a Poisson error distribution in PC SAS for Windows (v. 9.3). Significance was determined using pairwise comparisons of means between treatments with a Bonferroni correction. Because of limited replication of treatments, our tests were relatively low power ($\beta = 0.75$).

Results and Discussion

A total of 59 bird species were present in at least one of the three treatment areas. **Table 1** at the end of this report lists each species present, listed from most to least abundant. The five species in bold are the species of conservation interest.

On average, 21 birds species were present in the restored prairie, 22 species in the perennial pasture and 28 species in the perennial+annual pasture (**Figure 1**). In total, 285 birds were counted in the restored prairie, 553 birds in the perennial pasture, and 524 birds in the perennial+annual pasture. **Figure 2** reports the total number of birds observed in each habitat type on a log scale. There was no significant difference in the number of unique bird species observed in each habitat type, but there was a significant difference in the total amount of birds between each habitat type. There were significantly more birds counted in both of Bruce's pastures than in the restored prairie.

Years ago Bruce started noticing bobolinks in his pastures, but never knew what they were or that they had any importance. He then started reading about them in conservation publications and Bruce said, "That's when I realized I must be doing something right." Bruce then became interested in knowing why the Bobolinks were visiting. "I thought, 'Why are they coming to my 300 acres when there are 10,000 acres in a wildlife conservation area a quarter of a mile away?'" recalled Bruce.

Figure 1

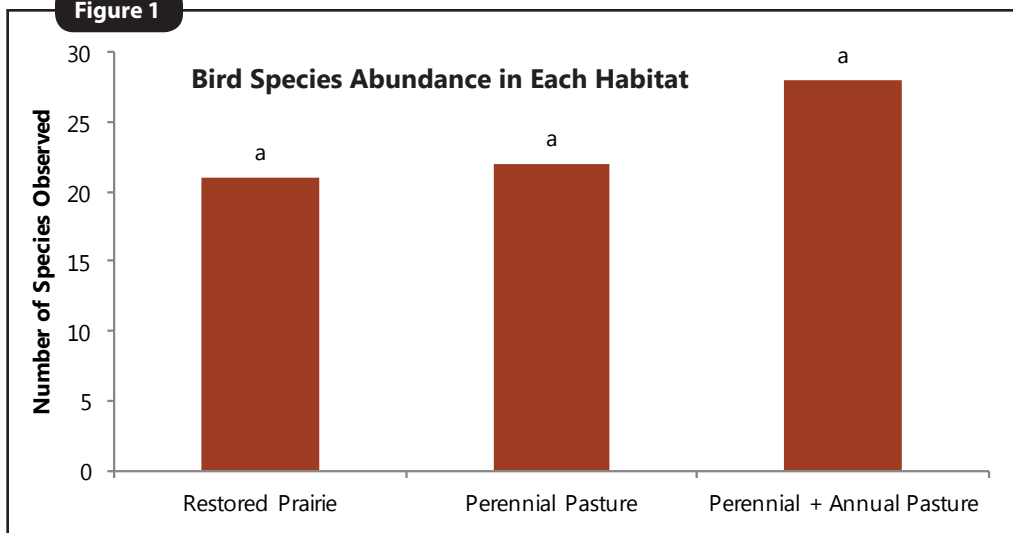


Figure 1. Number of different bird species observed in each habitat type. Columns labeled with the same letters are not significantly different. At $P > 0.10$, there was no significant difference in number of species between habitats.

Figure 2

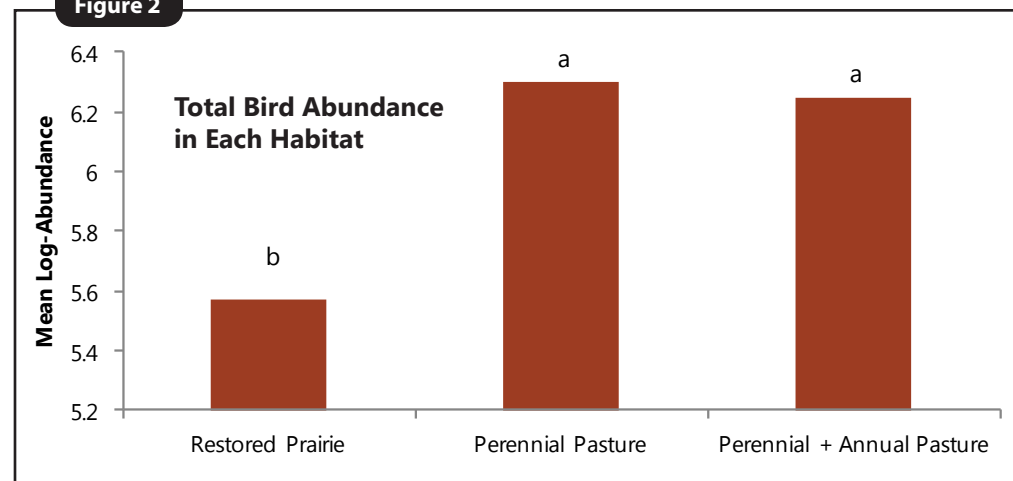


Figure 2. Total number of all bird species observed in each habitat type reported on a log scale. Columns labeled with different letters are significantly different. At $P < 0.05$, more birds were observed in the Perennial Pasture and Perennial+Annual Pasture than Restored Prairie.



Cattle graze a perennial pasture at Bruce Carney's farm on August 8, 2016.

Figures 3A, 3B and 3C display the abundance of the five bird species of interest observed in the three habitats over time. Bobolinks were not present in the prairie, but were found in both pastures. Dan Specht, a late PFI member and grazer was known for blending farming strategies with wildlife habitat restoration. Dan believed that “bobolinks were an indicator species for a healthy, working-farm grassland ecosystem.” Bobolinks are ground-nesting birds and seem to prefer grassland that has been grazed, over tall and dense vegetation (Love, 2015). Bobolinks preferred Bruce’s grazed pastures over the restored prairie that has never been grazed.

The dickcissel, a species that experienced a dramatic decline in the 1970’s, now has a more stable population in North America (Cornell, 2015). Out of the five species with conservation interest, it was the most prevalent in all three habitats. Only one eastern bluebird was spotted during the study and that was in the perennial+annual pasture (**Figure 3C**). Eastern Bluebirds build nests in natural cavities, commonly in dead trees, and have a population that has been increasing since the 1960’s (Cornell, 2015). The Henslow’s sparrow was most prevalent in perennial pasture (**Figure 3B**). Henslow’s sparrow populations have been in decline and are listed as “near threatened.” They are ground-nesting, grassland birds who have suffered from habitat loss (Cornell, 2015). The grasshopper sparrow was most prevalent in the perennial+annual pasture (**Figure 3C**). It is a ground-nester and forager, mostly eating grasshoppers, and prefers open grasslands (Cornell, 2015).

The results from this study showed that grazed pastures supported some bird populations just as well, or better than, a restored prairie area. “Both pastures supported larger population sizes of birds in general, as well as several species of conservation interest. This is because [non-grazed] prairies tend to lack the heterogeneous structure of grazed grasslands,” explained Keith Summerville. The difference between the bird populations in the habitat types come down to the cattle. “Cow activity does two things; changes vegetation structure and exposes more ground. Birds like short and tall grass mixtures, and exposed insects, which attracts insectivorous birds. Prairies are shown to support different groups of bird communities, and it’s important to remember that prairies and pastures complement one another to protect a larger population of birds than either habitat alone,” added Keith.

The results also showed there was no significant difference between the two pastures types, although the most birds were counted in the perennial pasture. “I think the annual species get so tall that it’s hard for the ground birds to forage in it,” mentioned Bruce.

Figure 3a

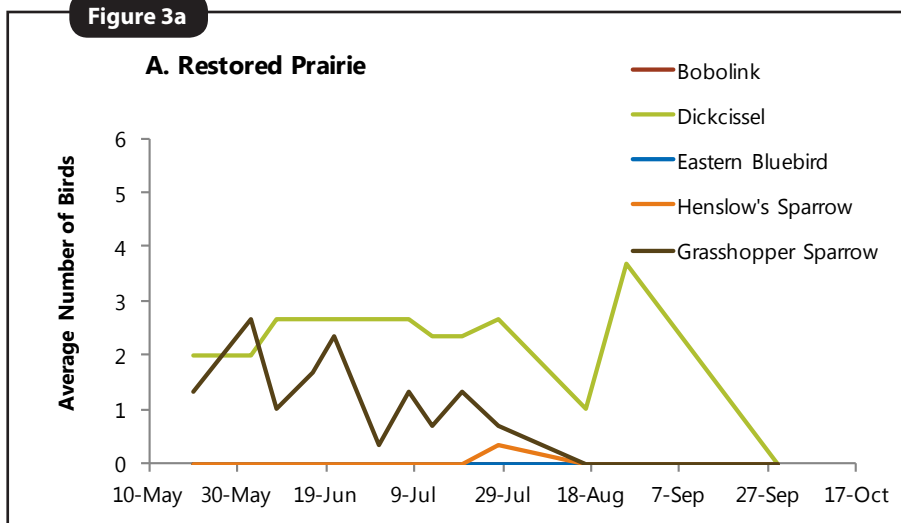


Figure 3b

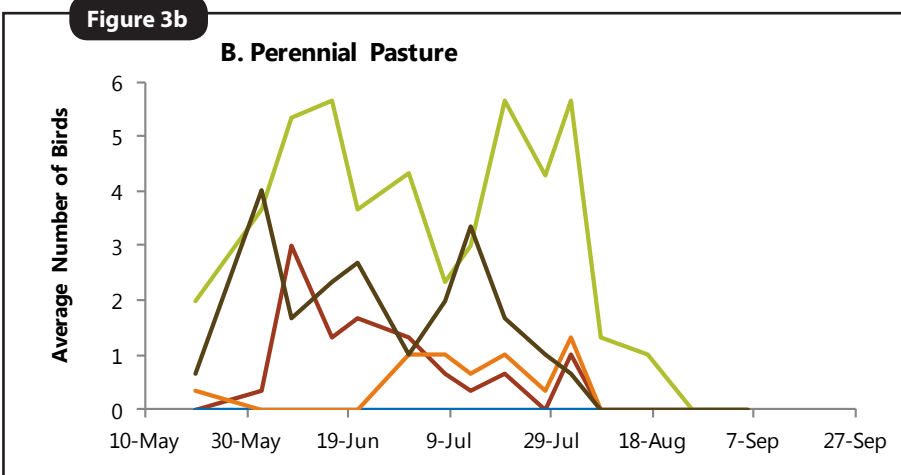


Figure 3c

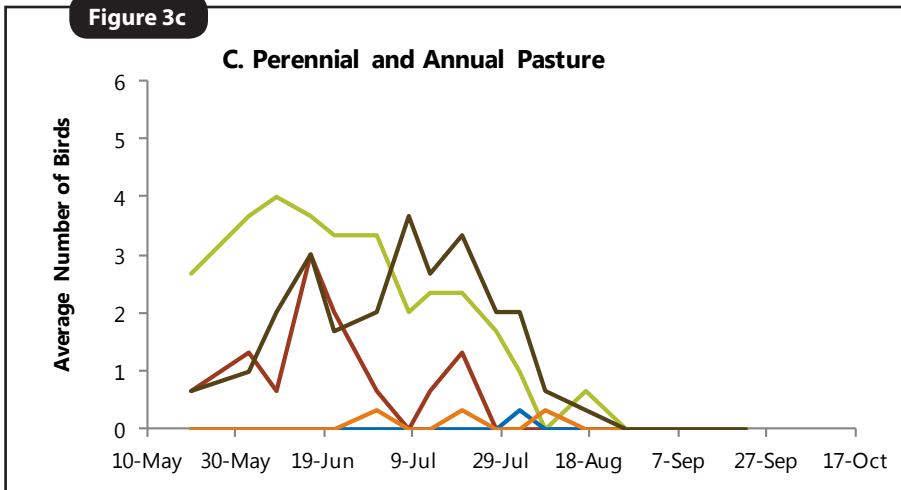


Figure 3. Average bird abundance, for the five species of conservation interest, in **A.** Restored Prairie, **B.** Perennial Pasture, **C.** Perennial and Annual Pasture.

Conclusion and Next Steps

This data shows that a properly managed, pasture-based grazing operation can provide habitat for a diverse set of birds and support large bird populations, effectively serving a similar purpose to the conservation prairie area nearby. It's important to note that stocking densities and frequency of cattle rotation are critical components of a properly managed system. "I learned that you don't have to have thousands of acres to conserve wildlife. At first, I assumed Chichaqua would have more birds than my farm, but it really comes down to management. Smaller parcels of land, managed properly, can create favorable habitats and support birds," stated Bruce.

The conversion of row crop land into grassland is an important step in creating a working landscape that can provide wildlife habitat along with agriculture practices that generate profit. This project will continue in spring and summer 2017, and a compiled report will be written with two year's worth of bird monitoring data. Grazing management data will also be incorporated into the future report.

Table 1

Bird Species Ranked From Most Abundant to Least Abundant

1	Brown-Headed Cowbird	31	Rusty Blackbird
2	Cliff Swallow	32	Common Grackle
3	Dickcissel	33	Red-Headed Woodpecker
4	Red-Winged Blackbird	34	House Finch
5	European Starling	35	House Sparrow
6	Barn Swallow	36	Gray Catbird
7	Eastern Meadowlark	37	Chipping Sparrow
8	Grasshopper Sparrow	38	Mallard
9	Sedge Wren	39	American Kestrel
10	Canada Goose	40	Vesper Sparrow
11	Common Yellowthroat	41	Yellow-Throated Vireo
12	Bobolink	42	Broad-Winged Hawk
13	Mourning Dove	43	Eastern Wood Pewee
14	Killdeer	44	Northern Cardinal
15	American Goldfinch	45	Great Blue Heron
16	Northern Mockingbird	46	American Tree Sparrow
17	Tree Swallow	47	Bald Eagle
18	Eastern Kingbird	48	Lark Sparrow
19	American Robin	49	Sandhill Crane
20	Henslow's Sparrow	50	Fox Sparrow
21	Field Sparrow	51	Great-Crested Flycatcher
22	Ring-Necked Pheasant	52	Nelson's Sparrow
23	Turkey Vulture	53	Yellow-Headed Blackbird
24	Rock Pigeon	54	Baltimore Oriole
25	Warbling Vireo	55	Bank Swallow
26	American Crow	56	Cedar Waxwing
27	Song Sparrow	57	Eastern Bluebird
28	Gray Partridge	58	Lincoln's Sparrow
29	Le Conte's Sparrow	59	Red-Tailed Hawk
30	Northern Flicker		

Species of special interest in this study listed in **bold**.



Bobolinks on a northeast Iowa pasture on May 12, 2016.

References

- Cornell, 2015. All About Birds. The Cornell Lab of Ornithology. www.allaboutbirds.org
- Elmer, A., Lane, J., Summerville, K. S., & Lown, L. 2012. Does Low-Density Grazing Affect Butterfly (Lepidoptera) Colonization of a Previously Flooded Tallgrass Prairie Reconstruction? *The Michigan Entomological Society*, p. 69-78.
- Love, O. 2015. Songbirds sing virtue of sustainability. *The Gazette*. Retrieved from <http://www.thegazette.com/subject/sports/outdoors/songbirds-sing-virtue-of-sustainability-20150609> (accessed Nov. 22, 2016).
- Marquardt, R. D. 2008. Grassland bird abundance and nesting in short-duration rotationally grazed pastures in southwest Iowa. M.S. Thesis. Iowa State University. Ames, IA. URL (accessed Month Day, 2016).
- Vallentine, J. F. 2001. *Grazing management*. Academic Press, Inc., New York. p. 673.

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