

Carney Family Farms

Maxwell, IA





Trials

| Project Title | Year |
|--|-----------|
| Comparison of Stocker Gains from Grazing Different Forages | 2009 |
| Soil Quality Indicators Among Different Farming Systems | 2010 |
| Comparison of Steady State Water Infiltration Rates Among Farming Systems | 2010 |
| Monitoring Winter Cattle Diets | 2011 |
| Grazing Cover Crops on Corn Ground | 2014 |
| Improving Cool-Season Pastures with Interseeding Annuals and Grazing | 2014-2016 |
| Tile Water Monitoring | 2015-2016 |
| Demonstrating Economic and Soil Health Benefits of Grazing Cover Crops | 2015-2018 |
| Pasture Management and Carcass Quality | 2015-2018 |
| Monitoring Birds in Rotationally Grazed Pasture | 2016-2017 |

Monitoring Birds in Rotationally Grazed Pasture



Staff Contact:

Meghan Filbert - (515) 232-5661
meghan@practicalfarmers.org

Cooperators:

▪ Bruce Carney - Maxwell

Student Researchers:

▪ Grace Baumgartner - Drake University
▪ Conner Willis - Drake University

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.
- For some species, rotationally grazed pastures have the capacity to support greater bird population sizes compared to conservation areas that are not grazed.
- Prairies and pastures complement one another to protect a wider range of birds than either habitat alone.

Key findings

- Restored prairie in a conservation area supported 285 birds (21 species) in 2016 and 230 birds (25 species) in 2017.
- Rotationally grazed perennial pasture





Table 1**Bird Species Ranked From Most Abundant to Least Abundant in 2016**

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

Species of special interest in this study listed in bold.

Table 2**Bird Species Ranked From Most Abundant to Least Abundant in 2017**

| | | | | | |
|----|----------------------|----|----------------------|----|-------------------------|
| 1 | Cliff Swallow | 17 | American Robin | 33 | American Crow |
| 2 | European Starling | 18 | Sandhill Crane | 34 | Great Blue Heron |
| 3 | Brown-Headed Cowbird | 19 | Common Grackle | 35 | Baltimore Oriole |
| 4 | Dickcissel | 20 | Henslow's Sparrow | 36 | Song Sparrow |
| 5 | Eastern Meadowlark | 21 | Ring-Necked Pheasant | 37 | Yellow-Headed Blackbird |
| 6 | Red-Winged Blackbird | 22 | Savannah Sparrow | 38 | Bald Eagle |
| 7 | Barn Swallow | 23 | Tree Swallow | 39 | Blue Jay |
| 8 | Mourning Dove | 24 | Field Sparrow | 40 | Cedar Waxwing |
| 9 | American Goldfinch | 25 | House Wren | 41 | Northern Harrier |
| 10 | Bobolink | 26 | Mallard | 42 | Gray Catbird |
| 11 | Sedge Wren | 27 | Turkey Vulture | 43 | Red-Tailed Hawk |
| 12 | Grasshopper Sparrow | 28 | Eastern Kingbird | 44 | Rose-Breasted Grosbeak |
| 13 | Canada Goose | 29 | Vesper Sparrow | 45 | House Sparrow |
| 14 | Rock Pigeon | 30 | Gray Partridge | 46 | Lincoln's Sparrow |
| 15 | Common Yellowthroat | 31 | Le Conte's Sparrow | 47 | Northern Cardinal |
| 16 | Killdeer | 32 | Nelson's Sparrow | 48 | Orchard Oriole |

Species of special interest in this study listed in bold.

Bird Monitoring

Figure 1

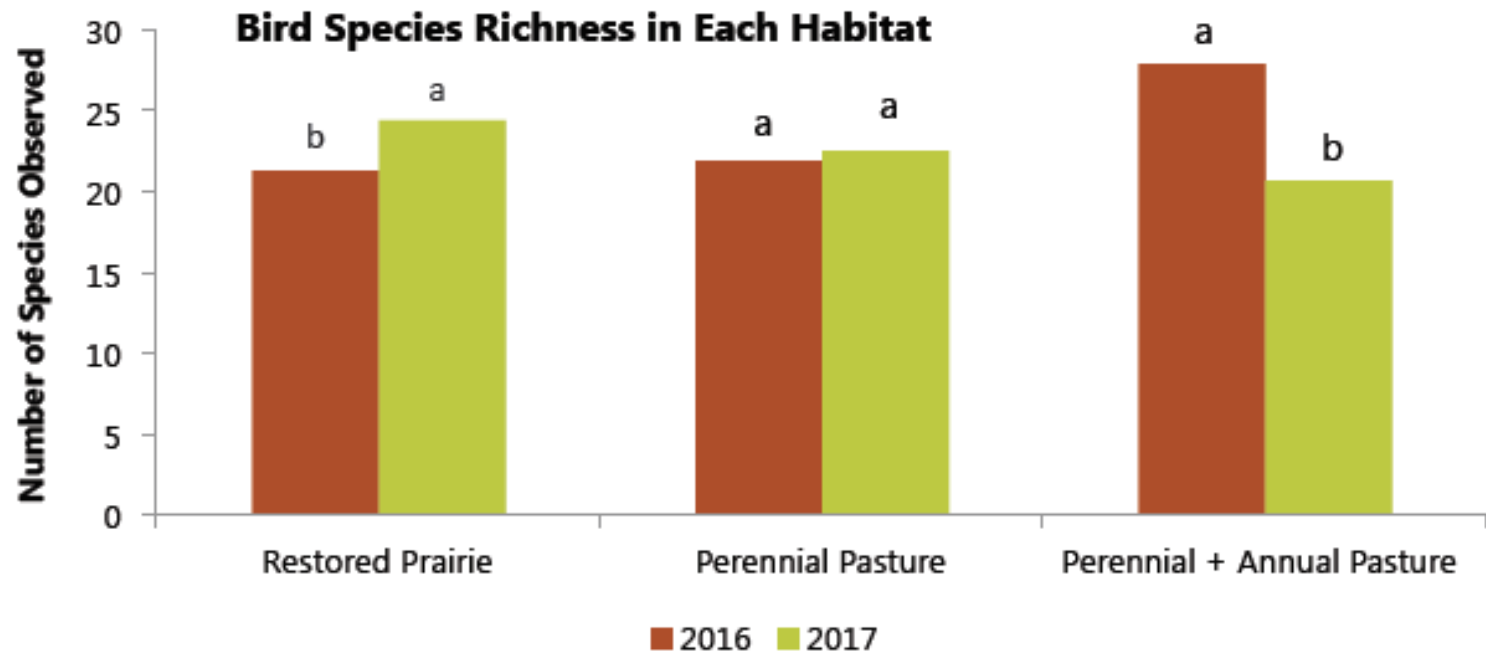


Figure 1. Number of different bird species observed in each habitat type each year. By habitat, columns labeled with different letters are significantly different. At $P < 0.10$, the Restored Prairie had significantly more diverse species than the year prior and the Perennial + Annual Pasture had significantly less diverse species than the year prior.



Bird Monitoring

Figure 2

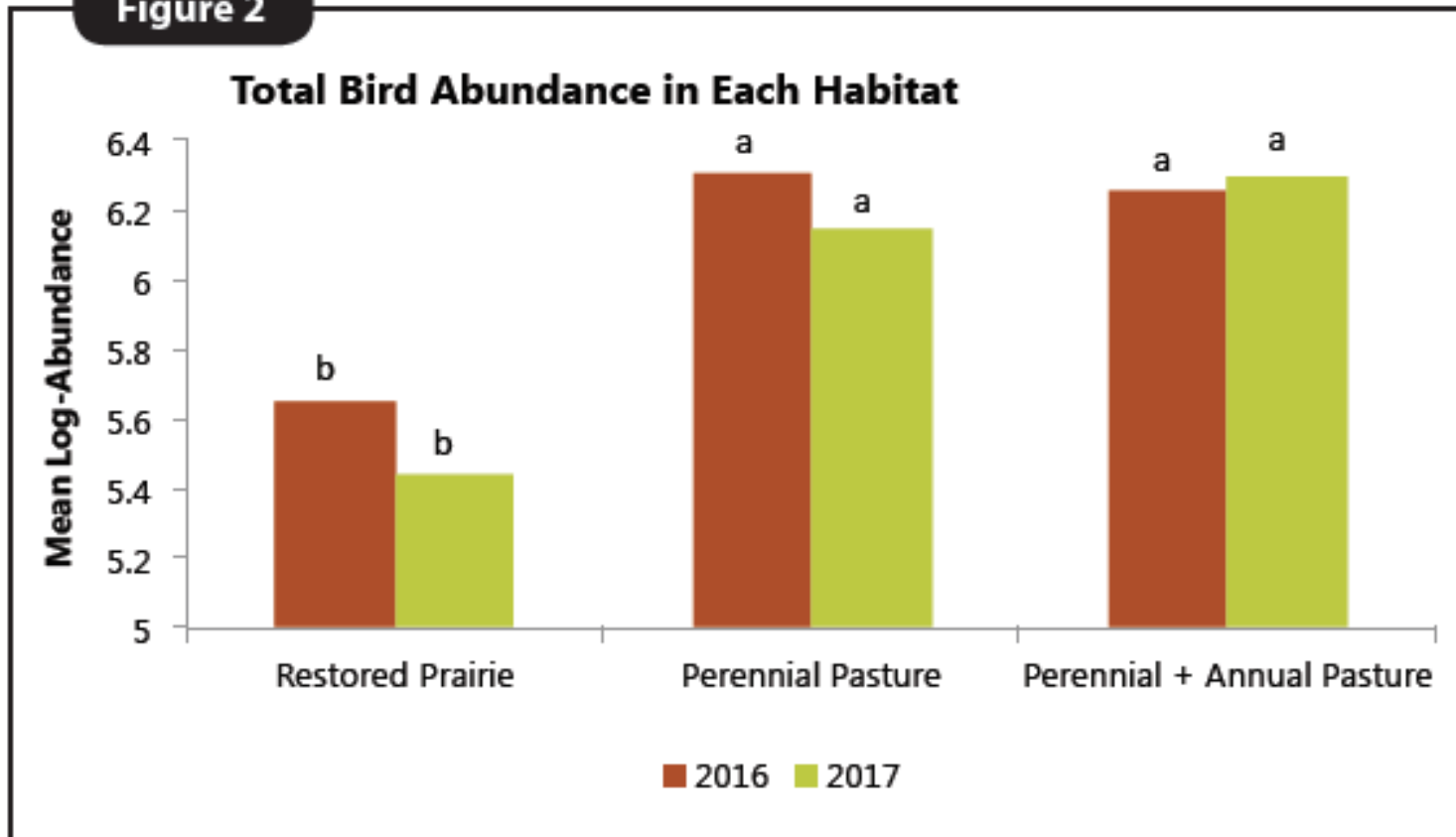
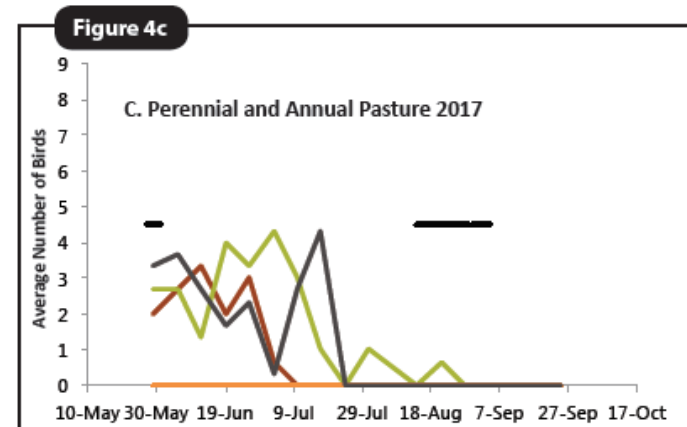
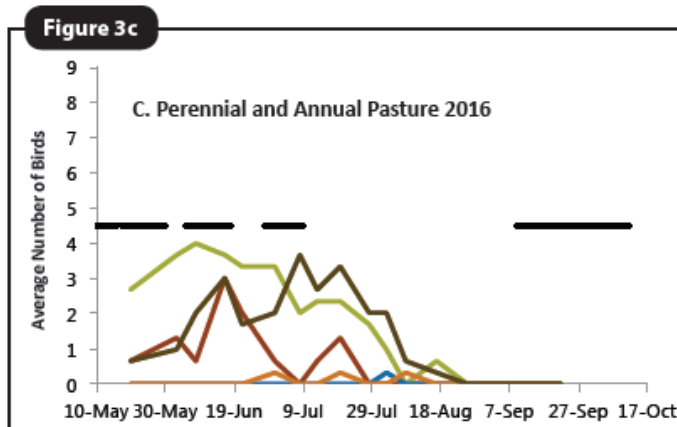
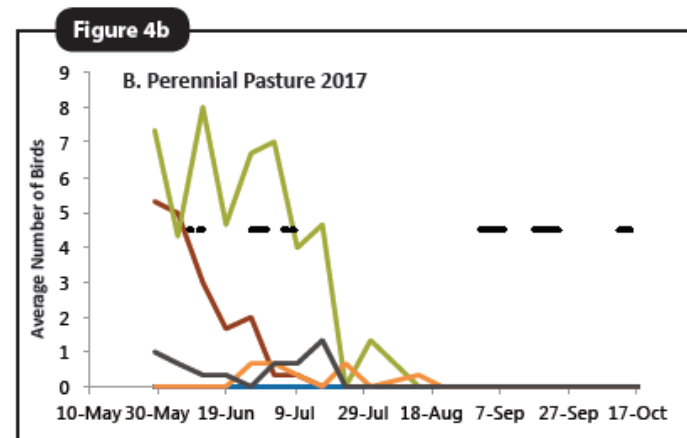
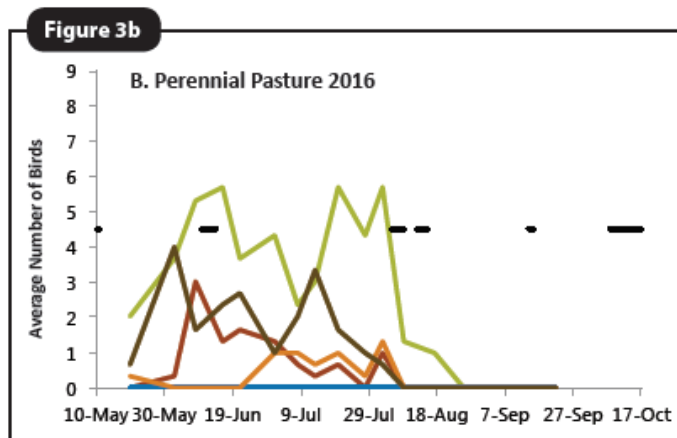
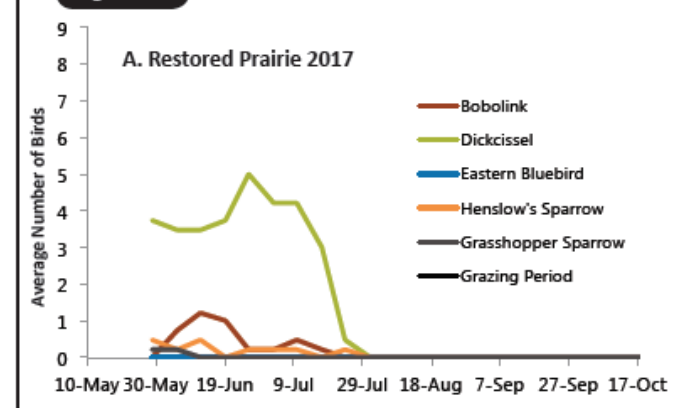
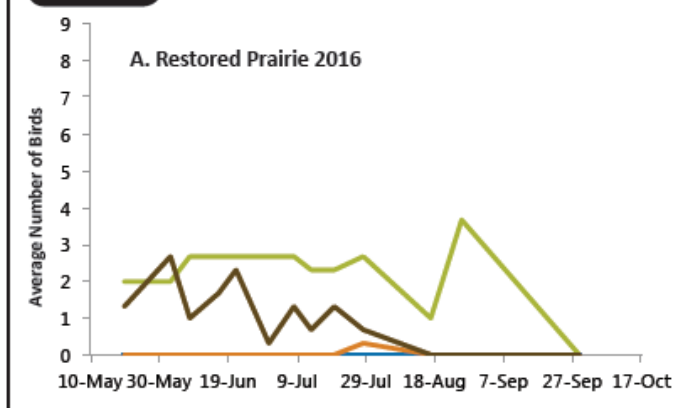


Figure 2. Total number of all bird species observed in each habitat type reported on a log scale. For each habitat type, columns labeled with different letters are significantly different. At $P < 0.05$, more birds were observed in the Perennial Pasture and Perennial + Annual Pasture than Restored Prairie,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



Figures 3 and 4. 2016 and 2017 average bird abundance, for the five species of conservation interest, in A. restored prairie, B. perennial pasture, C. perennial + annual pasture. Cattle grazing periods in the pastures are designated by horizontal black lines.



Bird Monitoring

Key findings

- Restored prairie in a conservation area supported 285 birds (21 species) in 2016 and 230 birds (25 species) in 2017.
- Rotationally grazed perennial pasture supported 553 birds (22 species) in 2016 and 468 birds (23 species) in 2017.
- Rotationally grazed perennial + annual pasture supported 524 birds (28 species) and supported 545 birds (21 species) in 2017.
- Pastures better supported some birds that are considered in decline than the restored prairie.

Project Timeline:

May 2016 - September 2016

May 2017 - September 2017

“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.” – Bruce Carney

- Prairies and pastures complement one another to protect a larger population of birds than either habitat alone
- Agriculture and conservation can co-exist



Soil Health and Economics of Grazing Cover Crop

Objective:

- To demonstrate ways to integrate multiple species of cover crops and cattle grazing into a corn and soybean enterprises
- To quantify soil health benefits and long-term economic value of those benefits to the crop/grazing system.

Methods

- Plant diverse cover crop mix

red clover - hairy vetch - cereal rye - spring barley - mustard - turnip

- Contract graze neighbor's crop field

keep grazing records

- Soil health tests in control & treatment fields

PLFA

Total Living Microbial Biomass, Phospholipid Fatty Acid (PLFA) ng/g
Functional Group Diversity Index

| | 2015 | 2016 | 2017 |
|------------------|---------------|----------------|---------------|
| Treatment | 844.26 | 1434.67 | 900.36 |
| Control | 988.92 | 899.28 | 418.59 |

| Total Biomass | Diversity | Rating |
|---------------|------------|------------------------|
| < 500 | < 1.0 | Very Poor |
| 500+ - 1000 | 1.0+ - 1.1 | Poor |
| 1000+ - 1500 | 1.1+ - 1.2 | Slightly Below Average |
| 1500+ - 2500 | 1.2+ - 1.3 | Average |
| 2500+ - 3000 | 1.3+ - 1.4 | Slightly Above Average |
| 3000+ - 3500 | 1.4+ - 1.5 | Good |
| 3500+ - 4000 | 1.5+ - 1.6 | Very Good |
| > 4000 | > 1.6 | Excellent |

Fall & Spring Grazing



November 12, 2016

Fall Grazing:

Nov. 9 - 18: 55 finishers

Dec. 4 - 12: with 53 feeders

Dec. 17 – 24: with 53 feeders



April 12, 2017

Spring Grazing:

Apr. 3 - Apr. 10: 100 cow-calf pairs & heifers

Apr. 22 - Apr. 29: 120 cow-calf pairs

Apr. 12 - May 7: 50 feeders & 150 cow-calf pairs

Value of Cover Crop Forage

- 2015-2016 = \$1,535 @ \$80/ton
= \$3,185 @ \$100/ton
- 2016-2017 = \$2,921 @ \$80/ton
= \$6,061 @ \$100/ton

What I've learned

- Make your cover crop as important as your cash crop
- Use shorter season hybrids
- Use the right chemicals for grazing
- Plant cover crops earlier
- Location of crop field from cows - need sacrifice area?
- Water/fence/insurance
- Multispecies cover crop vs. single species
- Use winter kill cover crop if you don't graze in spring
- Full season cover crop – add grazing for a full year

SOIL HEALTH PRINCIPLES

1. Keep the soil covered
2. Minimize soil disturbance
3. Increase crop diversity
4. Keep living roots in the soil
5. Integrate livestock

www.nrcs.usda.gov

Benefits of Animal Impact on Row Crop Fields

- Recycle nutrients for next cash crop
- Not removing nutrients; 90% deposited back
- More readily available form
- Help with residue breakdown in cold weather
- Add biology; microbes & bacteria
- Break up capping
- Help with water infiltration
- Deposit manure where it's needed
- Potential to increase crop yields
- Turbo charge soil health = higher land values
- Organic matter