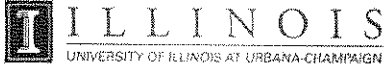


Illinois Natural History Survey

INSTITUTE OF NATURAL RESOURCE SUSTAINABILITY



ILLINOIS NATURAL HISTORY SURVEY

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**The Plover Project:
Key stopovers, abundance, and habitat associations
of American golden-plovers in Illinois**

2010 Report for Illinois Wildlife Preservation Fund Contract Number 10-021W.

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Illinois Natural History Survey Technical Report 2010 (54)



ILLINOIS
NATURAL
HISTORY
SURVEY

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INTRODUCTION

The “Grand Prairie” region of eastern Illinois was once defined by continuous expanses of grassland, dotted with marshes and wet meadows. Migrant shorebirds flocked to the wetlands and open places maintained by fire and bison. Although the landscape is now dominated by row-crop agriculture, some shorebird species still rely on this region for critical stopover habitat. Among them are the American golden-plovers (*Pluvialis dominica*) that pass through by the thousands during their transcontinental flight from wintering to breeding grounds. In many years the region supports a substantial portion of the hemispheric population (Morrison et al. 2001b).

Plovers flock to the wide open farm fields of the Midwest to rest, forage, and molt before heading northward to the Arctic. For decades, local birders have documented large groups congregating in row-crop fields, but beyond these scattered reports, surprisingly little is known about the magnitude of stopover across the region, the importance of specific areas to migrant plovers, or the types of habitat specifically selected.

Just as the plow, tractor, and drainage tile radically changed the Grand Prairie landscape of the 20th century, genetic engineering, ethanol production, and wind turbines are changing it once again. These changes bring new challenges for the American golden-plover, whose population has been declining steadily in recent decades (Johnson and Connors 1996, Gratto-Trevor 1998, Morrison et al. 2001a).

To address this need and train students in avian research, the University of Illinois student chapter of The Wildlife Society initiated “The Plover Project”. In 2007 and 2008, we partnered with Eastern Illinois University wildlife students to conduct a roadside survey for plovers. In 2007, we examined the dispersion of plovers across the region by conducting a stratified, random sample of 240 sites, observing a total of 2,204 plovers in 9 sites (O’Neal and Alessi 2008). Flocks were not evenly dispersed throughout the region, but appeared to be spatially associated with one another, with 6 of the 9 observations occurring in pairs of adjacent sites.

Based on our findings regarding the dispersion of plovers, we switched in 2008 to a spatially-focused approach to achieve a more consistent estimate of minimum abundance in the region, a maximum sample of the habitats selected by plovers, and a better learning experience for student volunteers.

At the same time we became aware of the immense amount of wind turbine siting and construction that was occurring across the region. Although these facilities have the potential to provide alternative energy, they bring a substantial change to the landscape. Turbines, access roads, altered drainage, and constant blade motion may reduce the habitability of an area to plovers. Although displacement from an agricultural area might seem insignificant in light of the immense amount available, it could be important if it occurs in specific staging areas that plovers rely on each year. Documenting abundance of plovers at staging areas, and delineating critical areas, can help developers when siting wind facilities to minimize potential wildlife conflicts (National Wind Coordinating Collaborative 2010). The empirical data on critical habitat areas for migrant American golden-plovers is woefully incomplete. Our sampling method provided an efficient and effective method of identifying perennial hotspots for plovers that can be considered during wind facility siting and construction.

With the help of local birders and biologists, we identified 10 key sites as potential perennial stopovers (Figure 1). In 2008, we surveyed all 10 townships during a 24-hour blitz at the peak of migration on April 19th, 2008. In addition to plover abundance, observers also documented key habitat characteristics of both occupied and unoccupied sites. The spring migration of 2008 was unusual for golden-plovers. Of our 10 sites, only 4 held any plovers on the April 19th survey. Most plovers stopped short at the southern portion of the stopover region, with ninety-eight percent of all the observed plovers at similar latitudes in 3 study areas. In spite of the odd migration, we still recorded 11,655 plovers (O’Neal and Alessi 2008).

Our 2008 data suggested plovers may rely on discrete hotspots for critical stopover habitat. However, the plover migration of 2008 was a unique one, and replication was necessary to determine the consistency of site use among multiple years and to identify any additional important hotspots that may have gone unused due to the anomalous migration. A second year of surveys was coordinated to help address the long-term relevance of these hotspots to plover migration and determine if there was empirical support for their conservation in light of the rapid growth of wind facilities, rural housing developments, and intensified agriculture.

This project has been extremely successful in providing aspiring biologists with real world experiences in bird research and conservation. In 2007 and 2008, more than forty students have participated. Each one has had the opportunity to learn the pleasures and challenges of rigorous fieldwork, the natural history of plovers, and the skills involved in developing, executing, and interpreting bird research. This project has been a great teaching tool for aspiring young biologists in Illinois. In 2009, we sought to continue and expand these opportunities.

American golden-plovers are unique visitors to the working lands of Illinois. Their future in this part of the world depends on an increased attention to their unique natural history and habitat needs. The Plover Project was developed to address this great need.

METHODS

In 2009, we recruited student volunteers from the University of Illinois and Ball State University to conduct fieldwork, along with veteran birders and biologists who served as crew leaders and mentors for the students. Student volunteers were trained on shorebird identification, optics, and data recording. We organized students and mentors into 10 field crews, and assigned each crew to one of the 10 townships identified as potential hotspots in 2008 (Figure 1). In 2008, we randomly assigned thirty points within each township at the midpoint of east-west section roads, with each point divided into four quadrants. We re-surveyed these same points in 2009 to maintain continuity between years. All 10 townships were surveyed during a 24-hour blitz at the peak of migration on April 25, 2009. Volunteers conducted 5-minute, unlimited-radius, point counts at each site, recording the number of plovers observed. Observers also documented all plovers detected en route between observation points. We rotated observers between point counts to reduce systematic observer bias. By summing counts from all 30 points in each of the 10 townships, we estimated the minimum plover abundance for the entire region. We identified hotspots by examining total abundance for each township relative to Audubon Important Bird Area (IBA) criteria (>2,000 plovers).

We recorded habitat characteristics of both occupied and unoccupied quadrants, including ground cover (bare ground, tilled corn, soybean stubble, corn stubble, other), moisture level (dry, moist, standing water), and distance between flocks and the nearest road. We also examined geospatial variables for these sites related to soil type and topography. All of these data were archived for future analysis in which we will use key covariates to construct discrete sets of competing models to explain variation in plover site selection.

RESULTS

Objective 1: Engage wildlife undergraduate students in field research

Eight undergraduates participated for the first time in the 2009 plover survey. For many, this was their first experience in avian field research. These 8 undergraduates were partnered with 12 mentors (graduate students, birders from the community). All of the volunteers received classroom and field training in several key techniques (identification, field optics, data recording, and navigation).

Objective 2: Determine minimum abundance of American golden-plovers in the region

Project volunteers surveyed 300 distinct locations among 10 different townships (Figure 1). Plovers were documented in 7 of the 10 townships (Table 1). Based on these counts, we estimated that at least 14,488 plovers used this region during the 2009 spring migration.

Objective 3: Document key plover stopover areas**Objective 4: Define the spatial and temporal extent of hotspots**

The 2008 plover survey recorded substantial plover use (>3,000 each) in 3 Illinois survey townships (E, F, and G; Figure 1). The one-day survey in 2009 did not capture this magnitude of use for township E and F, but these areas did support some meaningful amounts of use (observers did later record >4,000 plovers in township F). Township G, which supported 4,083 plovers in 2008, once again hosted large numbers (5,887 plovers). We also documented biologically significant numbers of plovers (5,978) in the Indiana Audubon's American golden-plover Important Bird Area (Township I).

According to the data collected in our 2008 and 2009 surveys, Township E, F, and G qualified as Audubon IBAs (>2,000 shorebirds at any one time). In May of 2009, I submitted IBA nominations to the Audubon state board. In 2010, the board evaluated the data and officially declared these 3 areas as IBAs (Figure 2). This conservation designation has already proved useful for the planning of wind facilities in the region.

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TABLES and FIGURES

Table 1. Number of American golden-plovers observed in each of the 10 survey townships (Figure 1) on April 25, 2009 and the total number among all sites.

Township	American golden-plovers
B	0
C	0
D	0
E	239
F	701
G	5,887
H	88
I	5,978
J	1,275
L	320
TOTAL	14,488

Figure 1. Townships surveyed for American golden-plovers on April 25, 2009 and their corresponding letter designations

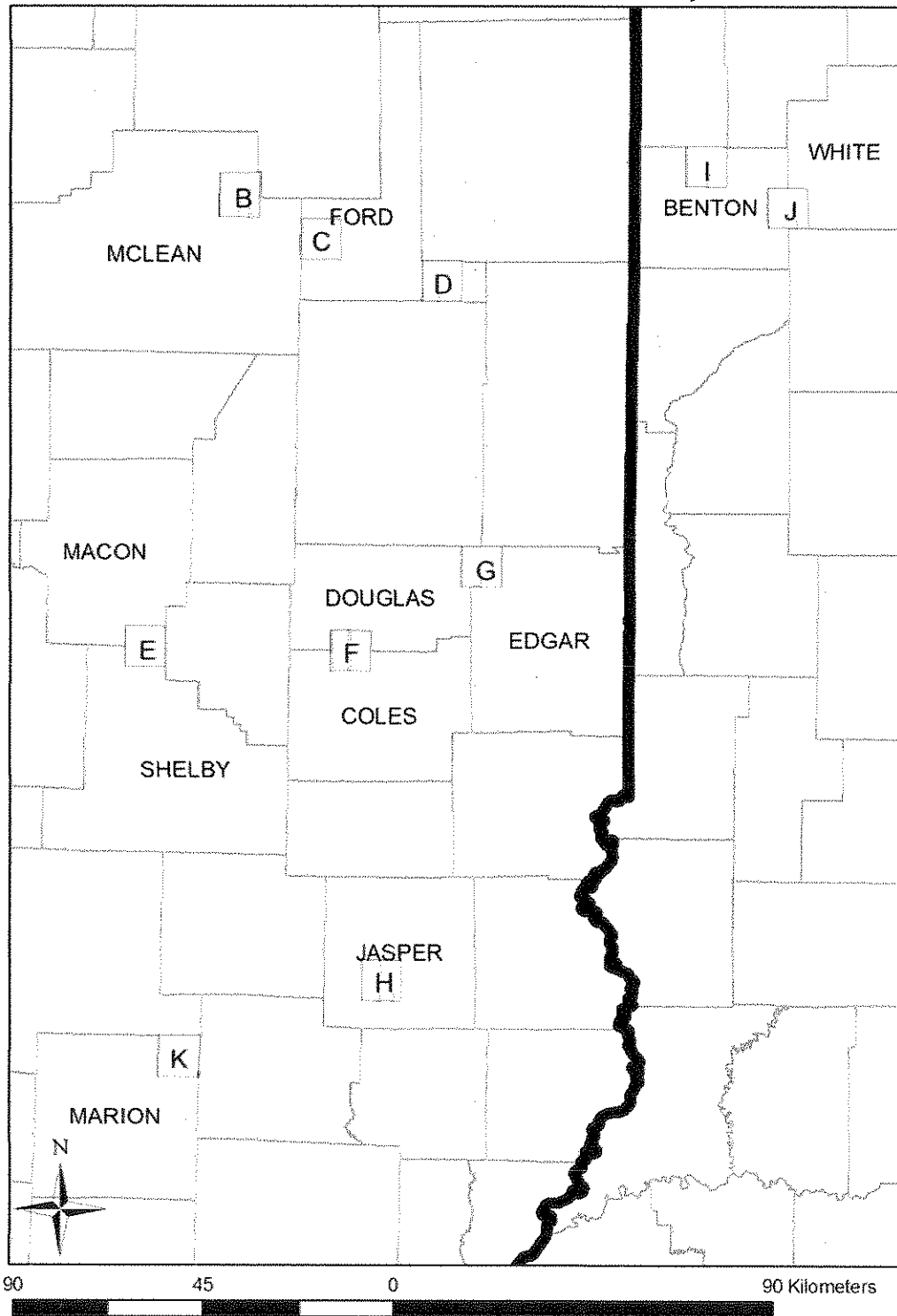


Figure 2. American golden-plover Audubon Important Bird Areas based on "The Plover Project's" 2008 and 2009 survey data.



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Said publisher further certifies that the date of the first paper containing the said notice was on the first date hereinabove set forth and that the date of the last paper continuing the said notice was on the last date hereinabove set forth.

Illinois Natural History Survey Awarded Wildlife Preservation Funds

The Illinois Natural History Survey, a division of the University of Illinois, is pleased to announce the awarding of grants administered by the Illinois Department of Natural Resources from funding of the Wildlife Preservation Fund to the Illinois Wildlife Preservation Fund. A check-off notation on the attached returns...

Conservation
The Illinois Wildlife Preservation Fund awards grants to support research and education in those publications are those of the author(s) and do not necessarily reflect the views of the Illinois Department of Natural Resources.

FY10 Illinois Wildlife Preservation Fund Awards

- Phillips, D. Burrows and stable of the eastern woodcock in Illinois - \$2,000.00
- Adrian Park, Paul County, Illinois - \$2,000.00
- Griffith, M. The River Project: Key recoveries, abundance, and habitat associations of American Golden-cowbirds in Illinois - \$1,000.00
- Walt, D. Evidence of human-induced effects on macroinvertebrate and fish community structure in Illinois forest streams - \$1,000.00
- Drelich, M. S. Baker: Survey of the eastern meadowlark in Illinois for Year 10 - \$1,000.00
- Hansen, G. The effects of bottomland forest conversion on the breeding bird community in the Central Illinois region - \$1,000.00
- Thompson, J. R. Cummings: Status of the freshwater snail Family Planorbidae in Illinois - \$500.00
- Ward, M. Reproductive success of Greater Prairie-Chicken in northwestern Illinois - \$1,000.00
- Wright, D. God's commandments, business and the environment: A study of environmental stewardship in northwestern Illinois - \$1,000.00

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