



**Breeding Bird Survey of Adams Homestead and Nature Preserve  
Spring and Summer 2008**

**Conducted for SD Game, Fish and Parks Wildlife Diversity Program**

**by  
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## **Introduction**

This report documents the results of a 2008 Breeding Bird Survey of Adams Homestead and Nature Preserve in southeastern South Dakota. The project was funded by a grant from the South Dakota Department of Game, Fish, and Parks, through the Wildlife Diversity Small Grants Program.

The purpose of the project was to compile and update information about the breeding status of birds at the Preserve. The project included a spring and summer survey of the Preserve and confirmation with Preserve staff of anecdotal sightings on the property.

The combined results of the field survey and Preserve staff interviews provide a current, comprehensive record of the breeding status of species at the Preserve. A total of 138 species was observed. Breeding status was verified for 69 species: 31 with Confirmed Breeding (CO) status, 15 with Probable Breeding (PR) status, and 23 with Possible Breeding (PO) status. Another 69 species were assigned Observed (O) status, with no breeding behavior witnessed. A listing of all species observed during the survey, categorized by breeding status, is found in Appendix A.

### **The Preserve**

Adams Homestead and Nature Preserve is a 1500-acre tract on the Missouri River floodplain in southeastern South Dakota, near North Sioux City. Habitats at the Preserve include wetland to cropland, grassland, forest fragments, and cottonwood forest woodland (See Figure 1). Forest fragment is the description chosen for the narrow strips of woodland around the perimeter of the cropland which have developed denser, taller, and more varied undergrowth from that of the large-tract cottonwood forest in the northwest section of the Preserve. According to the United States Geological Survey, the area is classified as Missouri Alluvial Plain and described as agricultural with an elevation of 1100-1200 feet. The tallgrass prairie which once covered the general area around the Preserve has been replaced by row crops. In addition, the river has been altered to control flooding. Mud Lake at the northern portion of the Preserve is the remaining section of an oxbow lake which once occurred in the area. The river's flow along the southern border of the Preserve is controlled by a steep bank of riprap. A water pump station for adjacent McCook Lake is on the south end of the Preserve.

Cottonwood, with tall, open canopy, is the most abundant tree found within the Preserve. Other species in the woodland include elm, ash, and box elder. Plum thickets, grapevine, willow, and other deciduous shrubs occur along the walking/biking paths traversing the property. Juniper trees occur in the cottonwood forest along the river, at the north end of the grassland, and along the walking paths. At the northern end of the Preserve, the woodland opens into a grassland area. Grassy areas also surround the entrance, intermix with cropland in interior areas, and run along the south edge next to the river. By mid-season, grasses were about four feet high.



**Figure 1. Digital Globe 2008 Tele Atlas image of Adams Homestead and Nature Preserve (Preserve is outlined in black).**

The Preserve is bordered by the Missouri River curving across the southern border and by suburban housing developments on the southwest and northeast (McCook Lake), with a larger urban area nearby (Dakota Dunes and Sioux City). This location makes it easily accessible and heavily used by cyclists and walkers, not uncommonly accompanied by dogs. The entrance to the Preserve has a Visitor Center (originally the barn for the homestead). Other buildings on the property include the homestead family farm house, log cabin, church and country school.

## **Project Need**

There are several reasons for conducting a formal survey of breeding birds at Adams Preserve:

1. No formal breeding bird survey had been previously conducted at the Preserve. Birders visiting the Preserve leave notes and photos at the office about sightings, which have complemented this survey effort. Furthermore,
2. Adams Homestead and Nature Preserve provides important habitat for several eastern species at the edge of their range in South Dakota. Among these are species such as Eastern Bluebirds, Baltimore and Orchard Orioles, Great-Crested Flycatcher, Scarlet Tanager, Red-bellied Woodpecker, and Bell's Vireo.

3. Additionally, the Preserve has the potential for breeding species which occur in limited numbers or in a restricted range in the state including American Woodcock, Cooper's Hawk, Long-Eared Owl, Ruby-throated Hummingbird, and Whip-poor-will. Finally, some species with declining numbers throughout their range were anticipated as potential breeding species: Wood Thrush, Yellow-throated Vireo, Willow Flycatcher, and Red-headed Woodpecker.

## Objectives

The project objectives were as follows:

1. To conduct a comprehensive field survey of breeding birds at Adams Preserve from late March through September 2008, to provide baseline data for monitoring changes in numbers and abundance of breeding species
2. To verify presence at Adams Preserve of species tracked by SD Game, Fish & Parks' Natural Heritage database
3. To compile a comprehensive list of breeding birds of Adams Nature Preserve from anecdotal accounts of area birders and park staff. To confirm with staff the sightings on the preserve that have been informally accumulating for the last several years as area birders report their sightings at the office on their way out of the preserve.
4. To provide SD Game, Fish and Parks Department information that would be helpful in planning future recreational uses of the property with sensitive bird species population locations and needs in mind.
5. To formally share results of the survey with interested groups of birders.

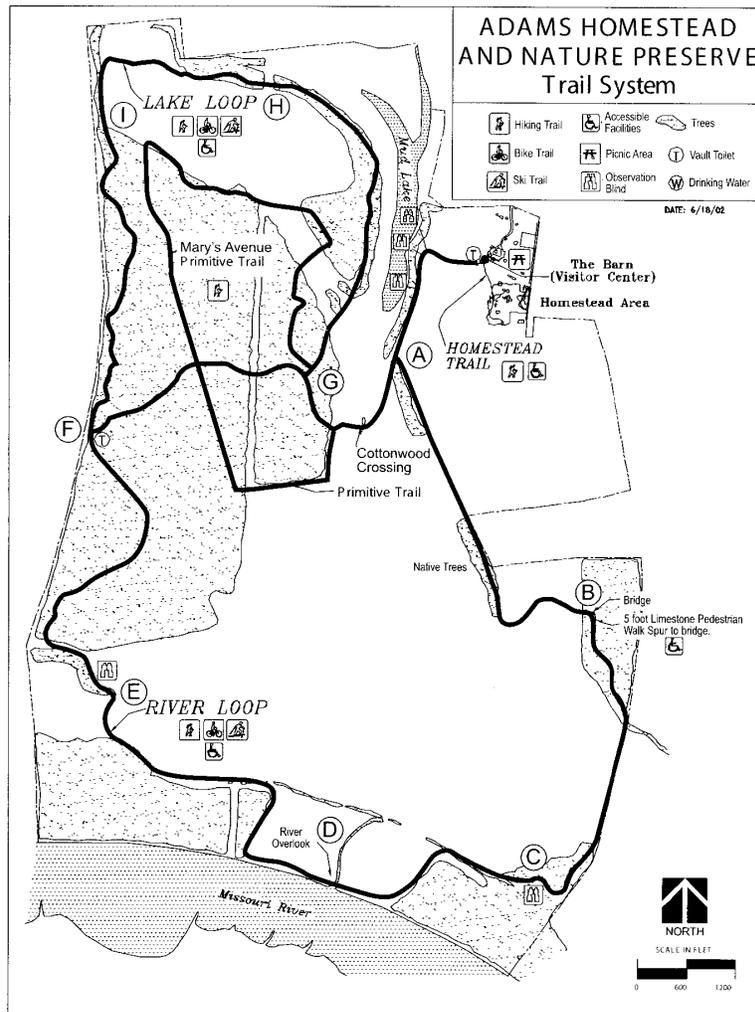
## Field Survey Methods

Aerial photos of The Adams Homestead and Nature Preserve were used to mark survey routes which provided access to different types of habitat on the preserve. Habitat types included woodland, forest fragment, wetland, non-native grassland, and cropland. We found that at the banks of the Missouri River there is no natural shore, as the entire edge of the preserve is steep rip-rapped banks. We also found no sandbars offshore from the preserve.

### Routes Established

Summer resident birds were surveyed to determine presence and relative abundance of breeding pairs. Two routes were monitored: the northern eight-mile route, primarily Lake Loop Trail, which encompasses the wetland known as Mud Lake, grassland, and mixed woodland, with plum thicket/willow hedgerows; and the southern six-mile route, primarily the River Loop Trail, which borders the Missouri River and includes cropland, woodland strips, a dense remnant cottonwood forest not accessed by any trails, and plum thicket/willow hedgerows.

Each route was walked approximately eight times, with a total of sixteen visits, beginning March 29, 2009 and continuing through September 13, 2008. Routes were walked at varying times of day, so that each was occasionally visited in early morning, late morning, afternoon, or evening. Sixteen visits were made to the park during the survey.



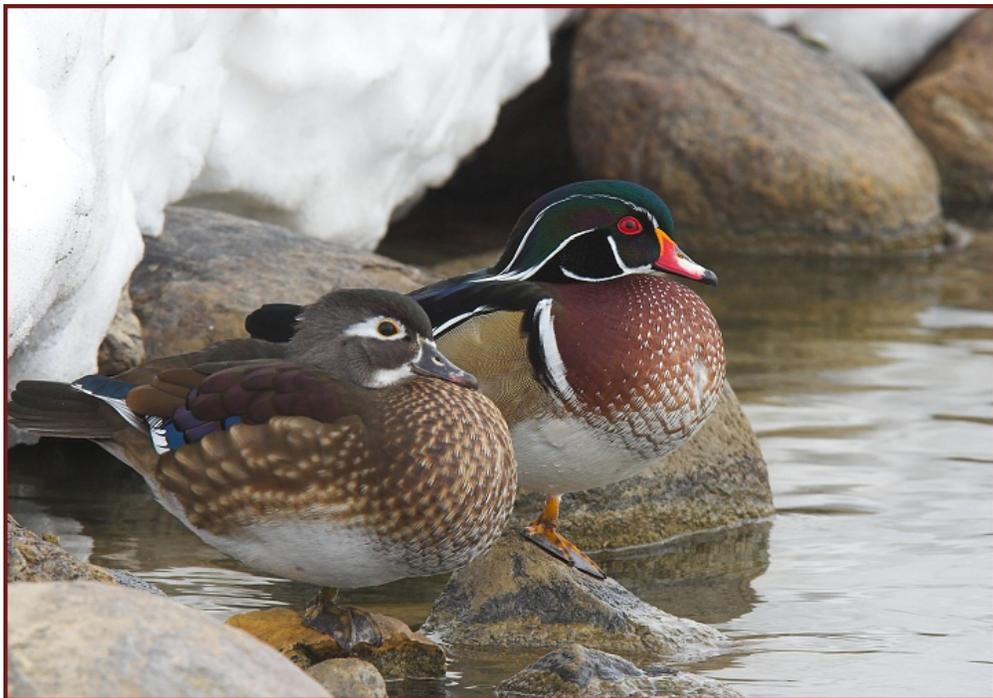
**Figure 2. Adams Preserve Trail System**



**Figure 3. Mixed deciduous and grassland on the Lake Loop Trail.**



**Figure 4: Mud Lake facing north.**



**Figure 5: Wood Duck (Photo courtesy of Doug Backlund)**



**Figure 6. Inner Woodland Lake Loop Trail**



**Figure 7. Red-bellied Woodpecker. (Photo courtesy of Doug Backlund)**



**Figure 8. Northern Lake Loop Trail grassland.**



**Figure 9: Lower woodland, grassland, and cropland along the Missouri River.**



**Figure 10. Restored prairie on the Preserve.**



**Figure 11. One of several blinds along the trail.**



**Figure 12. Forest fragment on the River Loop Trail, site of nesting Great Crested.**



**Figure 13. Great Crested Flycatcher  
(Photo courtesy of Doug Backlund).**

## Species of Particular Interest

The survey was intended to develop a formal record of species on the Preserve. Notes on evidence of breeding were made for all species; the general summer population was tabulated as encountered, and migrating species were recorded as observed.

We were also alert for potential breeding species with diminishing breeding ranges tracked by the Natural Heritage Program of SD GF&P and by Cornell Lab of Ornithology.

Potential Adams Preserve Breeding Species Tracked by South Dakota Natural Heritage Database:

American Woodcock	Least Bittern
Bald Eagle	Least Tern
Black Tern	Long-eared Owl
Black-and-white Warbler	Osprey
Black-crowned Night-Heron	Piping Plover
Blue-gray Gnatcatcher	Ruby-throated Hummingbird
Cerulean Warbler*	Scarlet Tanager
Cooper's Hawk*	Whip-poor-will
Great Blue Heron	Wood Thrush*
Green Heron	Yellow-throated Vireo*

\*Potential Adams Preserve breeding species also tracked by Cornell Lab of Ornithology

Species of high conservation concern nationally, tracked by Cornell Lab of Ornithology, include Eastern Wood-Pewee, Willow Flycatcher, Yellow-billed Cuckoo, and Red-headed Woodpecker.

## Data Collection

Data was collected as species were encountered along the routes. Data for each observation included species, breeding status (coded according to *South Dakota Breeding Bird Atlas, 1995*), habitat type, and number of individuals of each species observed. Recorded bird calls were used at night to document the presence of owls.

As background research for the survey, information was sought through birding field guides, topographic maps and aerial photos of the site, *Birds of South Dakota 3<sup>rd</sup> Edition*, *South Dakota Breeding Bird Atlas*, South Dakota Natural Heritage Database list of species tracked, Iowa Ornithologists' Union records for northwest Iowa counties, and Nebraska Ornithologists' Union records for Northeast Nebraska counties. In addition, we interviewed staff at Adams Preserve and reviewed the birders' notebook and photo scrapbook maintained at the Visitor Center to learn what species had been previously recorded as breeding at the survey site.

All birds seen and/or heard along each route were recorded. The total number of species was also counted, and the total number of individuals of each species was estimated for each route. Special efforts were made to search out a few anticipated species such as American Woodcock, Barred Owl, Blue-gray Gnatcatcher, Cerulean Warbler, Cooper's Hawk, Eastern Screech Owl, Long-eared Owl, Northern Bobwhite, Scarlet Tanager, Whip-poor-will, Wood Thrush, and Yellow-throated Vireo in specific habitats and/or at specific times of day or evening thought to be conducive to encountering these species. These species were targeted because they had been reported on the Preserve, are tracked by both SD Heritage Database and Cornell Lab, or have been known to breed in nearby State Parks, Newton Hills, and Union Grove.

Breeding behavior was recorded for each sighting, following standardized breeding bird survey codes (See Appendix A for the complete code). Estimates of breeding pairs were also recorded, following abundance estimate codes used by the *South Dakota Breeding Bird Atlas* Project 1988-1993 (See Appendix B). These standardized codes are used throughout the report. The four primary categories for breeding status are Confirmed (CO), Probable (PR), Possible (PO), and Observed (O). The three Breeding pair density estimate codes and categories used in this survey were 1= 1 pair, 2= 2 to 10 pairs, 3= 11-100 pairs.

## Results of Field Survey March 29 through September 13, 2008

The primary result of the project is a current and comprehensive listing of birds with confirmed (CO), probable (PR), or possible (PO) breeding status at Adams Homestead and Preserve. A secondary result is a list of total species observed in the park in the spring and summer of 2008.

### Breeding Status of Species Observed

One hundred thirty-eight species were observed at the Preserve during the survey. The behavior of 31 marked them as Confirmed Breeding (CO), 15 were marked as Probable Breeding (PR), 23 were marked as Possible Breeding (PO), and 69 species were marked as Observed (O), with no evidence of breeding.

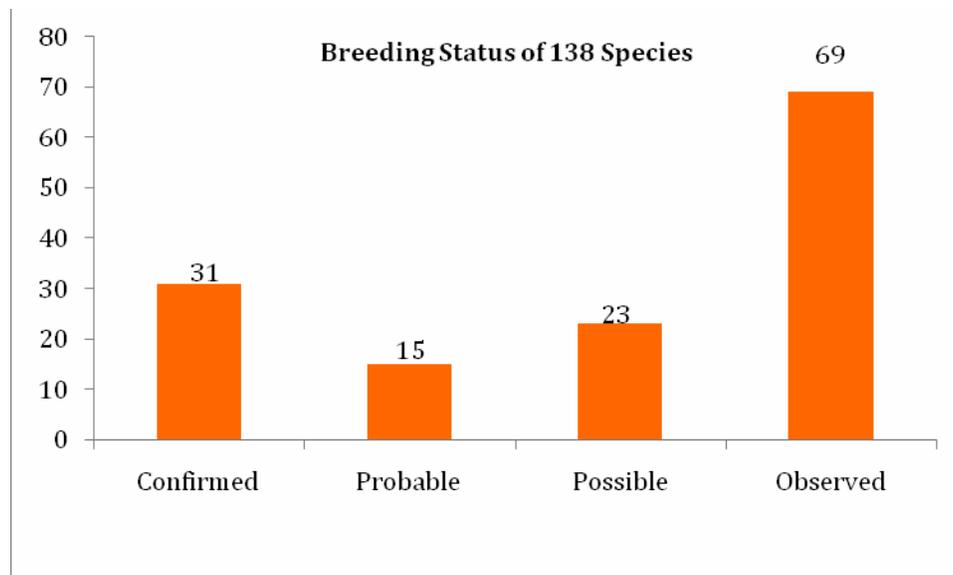


Figure 14. Breeding status by numbers of species.

### Abundance of Breeding Pairs

As we surveyed, we counted the number of birds for each species. This number helped us estimate the relative number of breeding pairs at the Preserve.

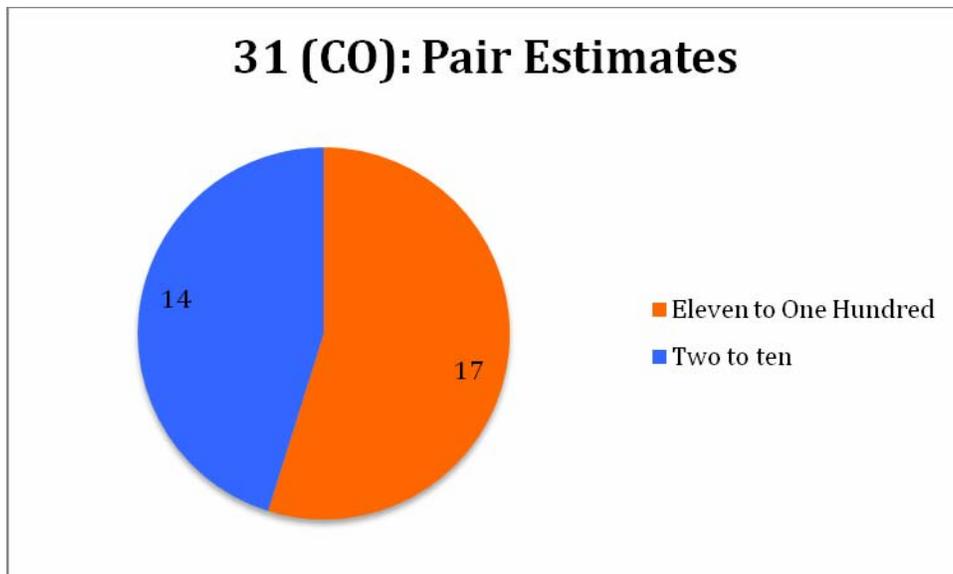
Estimates of the numbers of breeding pairs of the 69 species with Confirmed, Probable, and Possible breeding status were as follows: 25 species had estimates of 11 to 100 pairs (Abundance Code 3), 36 species had estimates of 2 to 10 pairs (Abundance Code 2), and 8 species were assigned an estimate of 1 breeding pair on the preserve (Abundance Code 1).



**Figure 15. Breeding Pair estimates for 69 species with affirmed breeding status.**

#### **Confirmed Breeding (CO) Species**

We identified 31 Confirmed Breeding (CO) species. Of these, 17 were estimated at the Abundance 3 level (11 to 100 breeding pairs), and 14 were estimated at Abundance 2 level (2 to 10 breeding pairs).



**Figure 16. Breeding pair estimates for 31 Confirmed Breeding species.**

*Species (CO): 11 to 100 Breeding Pairs*

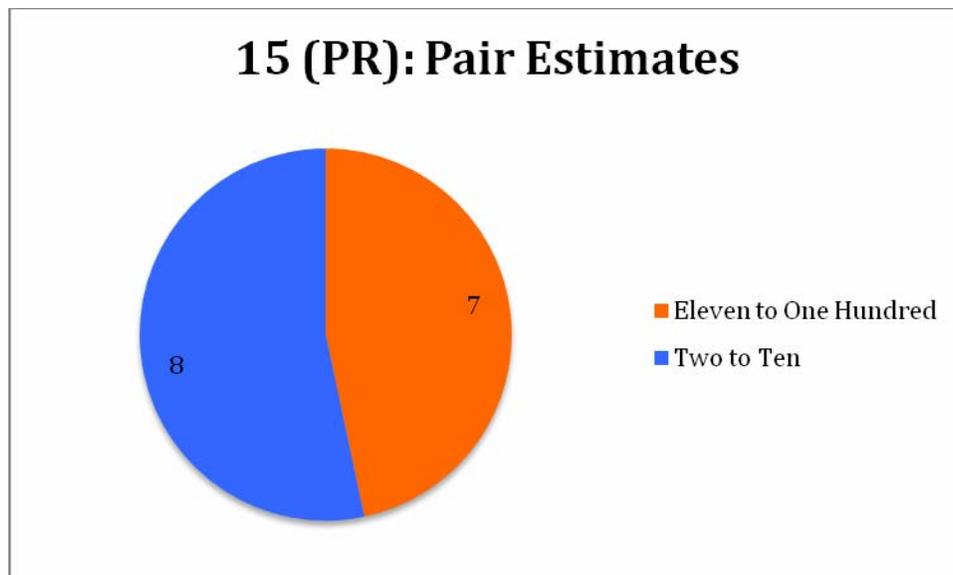
- American Robin
- Baltimore Oriole
- Bell's Vireo
- Black-capped Chickadee
- Blue Jay
- Brown Thrasher
- Downy Woodpecker
- Eastern Kingbird
- European Starling
- House Wren
- Lark Sparrow
- Mourning Dove
- Northern Flicker
- Orchard Oriole
- Rose-breasted Grosbeak
- Warbling Vireo
- White-breasted Nuthatch

*Species (CO): 2 to 10 Breeding Pairs*

- Barn Swallow
- Canada Goose
- Eastern Bluebird
- Eastern Wood-Pewee
- Gray Catbird
- Great Blue Heron
- Great Crested Flycatcher
- House Sparrow
- Mallard
- Red-bellied Woodpecker
- Red-Headed Woodpecker
- Turkey Vulture
- Wild Turkey
- Wood Duck

**Probable Breeding (PR) Species**

We identified 15 Probable Breeding (PR) species. Of these, 7 were estimated at the Abundance 3 level (11 to 100 breeding pairs), and 8 were estimated at Abundance 2 (2 to 10 breeding pairs).



**Figure 17. Breeding pair estimates for 15 Probable Breeding pairs.**

*Species (PR): 11 to 100 Breeding Pairs*

- American Goldfinch
- American Woodcock
- Brown-headed Cowbird

*Species (PR): 2 to 10 Breeding Pairs*

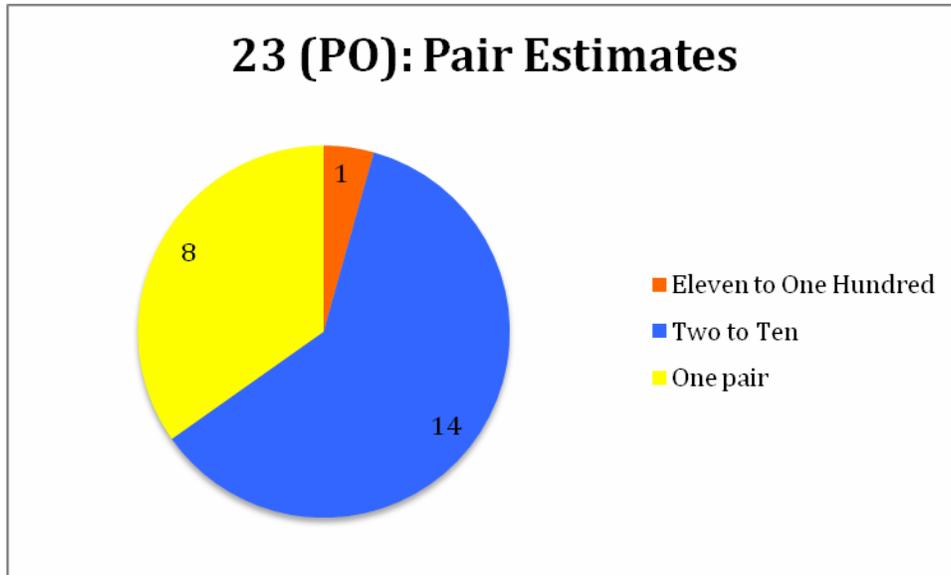
- Blue-winged Teal
- Cedar Waxwing
- Common Grackle

Field Sparrow  
 Indigo Bunting  
 Northern Cardinal  
 Red-winged Blackbird

Common Yellowthroat  
 Dickcissel  
 Ring-necked Pheasant  
 Tree Swallow  
 Yellow-billed Cuckoo

**Possible Breeding (PO) Species**

We identified 23 Possible Breeding (PO) species. Of these, 1 was estimated at Abundance 3 level (11 to 100 pairs), 14 at Abundance 2 (2 to 10 pairs), and 8 were estimated at Abundance 1 level (1 pair).



**Figure 18. Breeding pair estimates for 23 Possible Breeding pairs.**

*Species (PO): 11 to 100 Pairs*  
 Eastern Towhee

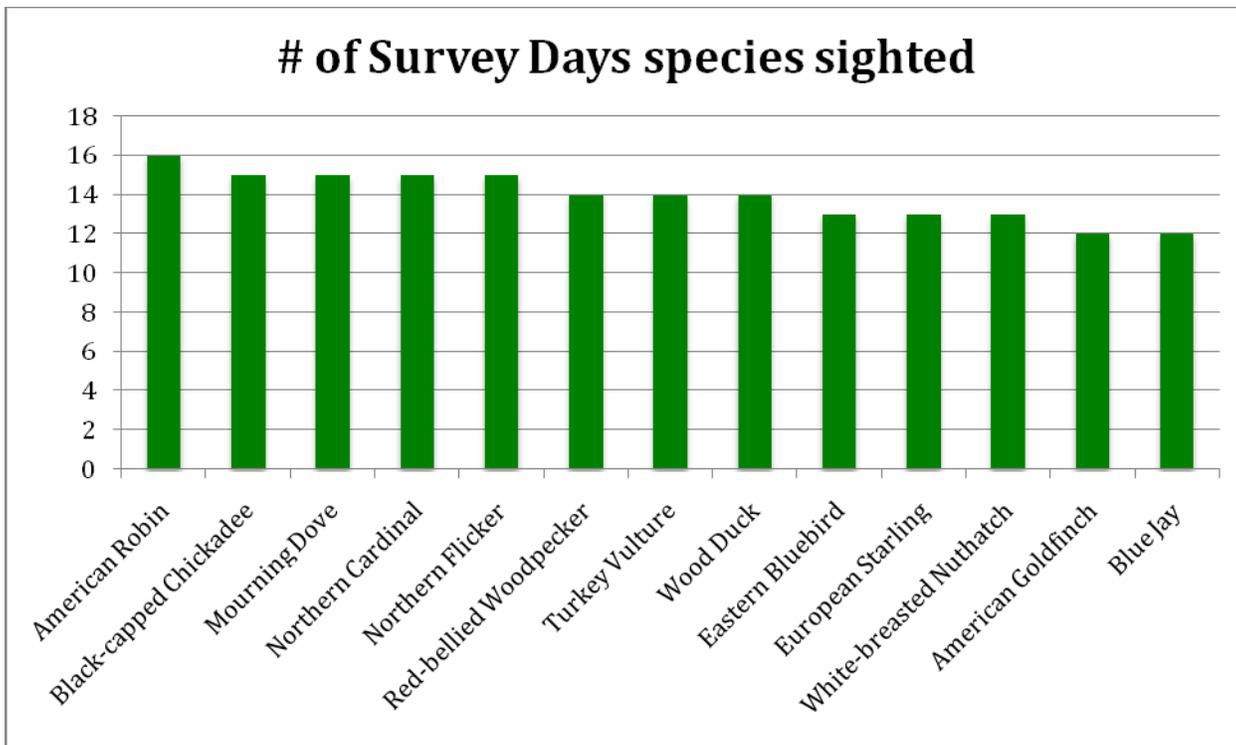
*Species (PO): 2 to 10 Pairs*  
 American Coot  
 American Redstart  
 Chipping Sparrow  
 Eastern Phoebe  
 Green Heron  
 Hairy Woodpecker  
 Killdeer  
 Northern Bobwhite  
 N. Rough-winged Swallow  
 Sedge Wren  
 Sora  
 Western Meadowlark  
 Wood Thrush  
 Yellow Warbler

*Species (PO): 1 Pair*  
 American Crow  
 American Kestrel  
 Belted Kingfisher  
 Cooper’s Hawk  
 Great Horned Owl  
 Marsh Wren  
 Northern Harrier  
 Red-tailed Hawk

**Species observed greatest number of survey days.**

Some species were observed in several different habitats and throughout the Preserve. While their individual numbers were not necessarily high, they were observed on most days of the survey. For instance, American Robins were seen every day (16) of the survey. Black-capped Chickadees were seen every day but one. Robins were very numerous while Black-capped Chickadees were very few. The list of species seen on at least nine survey days, in descending order is as follows:

<u>Survey Days</u>	<u>Species</u>	<u>Survey Days</u>	<u>Species</u>	<u>Survey Days</u>	<u>Species</u>
16	American Robin	12	Downy Woodpecker	10	Red-winged Blackbird
15	Black-capped Chickadee	12	Mallard	10	Ring-necked Pheasant
15	Mourning Dove	11	Eastern Kingbird	10	Rose-breasted Grosbeak
15	Northern Cardinal	11	Red-headed Woodpecker	10	Tree Swallow
15	Northern Flicker	10	Baltimore Oriole	10	Warbling Vireo
14	Red-bellied Woodpecker	10	Barn Swallow	9	Blue-winged Teal
14	Turkey Vulture	10	Brown-headed Cowbird	9	Brown Thrasher
14	Wood Duck	10	Canada Goose	9	Common Yellowthroat
13	Eastern Bluebird	10	Eastern Towhee	9	Great Blue Heron
13	European Starling	10	Field Sparrow	9	Lark Sparrow
13	White-breasted Nuthatch	10	Gray Catbird	9	Orchard Oriole
12	American Goldfinch	10	House Wren	9	Red-tailed Hawk
12	Blue Jay				



**Figure 19. Species observed on the most number of days.**

## Species with highest count on a single day

### Single-day

<i>Count</i>	<i>Species</i>	<i>Observation dates</i>
65	American Robin	April 6
55	Starlings	Sept. 13
38	Empidonax species	May 22
37	Tree Swallow	May 11
30	Canada Geese	Sept. 13
25	American Goldfinch	June 30
25	Wood Duck	July 21
25	Red-winged Blackbird	April 18
25	House Wren	June 30
21	Orchard Oriole	July 21
20	Northern Flicker	April 6
19	Eastern Kingbird	Aug. 17
17	Baltimore Oriole	May 26
17	Field Sparrow	May 26
15	Purple Martin	Aug. 6
15	Yellow Warblers	May 22
13	Brown Thrasher	May 26
15	Lark Sparrow	May 26
13	Red-headed Woodpecker	Aug. 17 (including 4 fledglings)
9	Red-bellied Woodpecker	May 22

The most wide-ranging species across Adams Preserve are found in at least four of the five habitats. Through the survey season, most were identified as Confirmed Breeding. Interestingly, Lincoln's Sparrows, on their way through in migration seemed indiscriminate about their landing spot on the days they were observed in April and May.

### *All five habitats:*

Eastern Kingbird (CO)  
Northern Flicker (CO)

### *Four of five habitats:*

American Goldfinch (PR)  
American Robin (CO)  
Baltimore Oriole (CO)  
Barn Swallow (CO)  
Black-capped Chickadee (CO)  
Brown Thrasher (CO)  
Field Sparrow (PR)  
Lincoln's Sparrow (O)  
Mourning Dove (CO)  
Northern Cardinal (PR)  
Wild Turkey (CO)

## Results Regarding Species Tracked by Natural Heritage Database and Cornell Lab of Ornithology

Of the 20 species tracked by the Natural Heritage Database that are potential breeders at Adams Preserve, we observed nine over the course of the survey. Breeding status was assigned to five species as follows:

<i>Confirmed Breeding</i>	<i>Probable Breeding</i>	<i>Possible Breeding</i>
Great Blue Heron	American Woodcock	Green Heron Cooper's Hawk Wood Thrush

With regard to these species, we confirmed breeding of Great Blue Heron with a July 21 observation of fledgling(s) and parents on Mud Lake.

We assigned probable breeding status to American Woodcock, which was observed 4 times: March 29 evening, several heard conducting their aerial breeding flight; April 18 evening, six peenting; April 6 day, flushed woodcock at the start of the upper woodland trail; June 9 day, flushed woodcock in the upper woodland. Because of the large number of males conducting courtship displays, American Woodcock was assigned Abundance Code 2 (2-10 breeding pairs).

We assigned possible breeding status to Green Heron, which was observed June 9 and July 21 at Mud Lake and in the trees beside the lake. Abundance code 3 (1 breeding pair) was assigned. Cooper's Hawk was observed five times during the survey; a young Cooper's was heard calling at the edge of the woods July 9, and an immature was observed on September 13. Wood Thrush was observed during the field survey one time (July 9) and heard three times (May 26, July 9, and July 21). The observations were on the southern trail along the Missouri River forest fragment where the understory cover was dense. We coded abundance at 2 (1-11 pairs).

Of the species of national conservation concern tracked by Cornell Lab, we observed all four of the species. Breeding status was confirmed for Red-headed Woodpecker and Eastern Wood-Pewee, and we assigned probable breeding status to Yellow-billed Cuckoo. Willow Flycatcher was observed during migration.

### **Species Observed and Anticipated to Breed in the Preserve but No Evidence of Breeding Noted**

Black-crowned Night-Heron	Blue Grosbeak
Blue-gray Gnatcatcher	Least Flycatcher
Pied-billed Grebe	Red-eyed Vireo
Song Sparrow	Willow Flycatcher

### **Species Anticipated but Not Observed**

Species which are known to breed in the surrounding areas or only several miles away but were not observed included these:

Barred Owl	Black-billed Cuckoo	Cerulean Warbler
Eastern Screech Owl	Least Bittern	Least Tern
Long-eared Owl	Ovenbird	Piping Plover
Ruby-throated Hummingbird	Scarlet Tanager	Whip-poor-will
Yellow-bellied Sapsucker	Yellow-throated vireo	

## **Notes from Preserve's Records**

Preserve staff members keep records of species which have been reported both on the Preserve and in the surrounding area. Photographs at the Visitor Center of birds found on the Preserve include Long-eared Owl, Great-horned Owl, Ruby-throated Hummingbird, as well as many expected species such as Eastern Bluebird, Baltimore and Orchard Oriole, and American Robin.

Northern Bobwhite has been breeding on Adams Preserve for many years, according to staff reports. On several occasions during the survey, staff reported seeing Northern Bobwhite at various locations on the Preserve, including the edge of grassy areas in the southwest corner by the river and in the northern grassland along the Upper Loop Trail. Staff reported that a family of woodcocks was seen on a trail several years ago. We observed woodcocks three times and heard their courtship displays on at least two separate evenings.

No Whip-poor-will calls were heard on three separate evening visits. One staff member who lives across the river in Nebraska reported that he has heard whip-poor-wills in previous years on the Nebraska side of the river. During the May 22 survey day, an observer showed us a photograph of a Scarlet Tanager, taken the previous day on the east side of the woodland trail. However, we were unable to document any presence of Scarlet Tanagers anywhere on the Preserve or confirm his account. An area of junipers where Long-eared Owls have been photographed at the Preserve in the past was searched, but none were located either in that area or other potential areas of dense junipers on the Preserve. As this species is somewhat nomadic, and there are many juniper clumps around the edges of the Preserve, it is possible that Long-eared Owls are still present.

## **Field Survey 2008: Observations**

The data collected during the field survey lead to a few observations.

The relatively even elevation at Adams (1100-1200 ft. above sea level) may be a factor accounting for the difference in species found in the Preserve and species commonly found at nearby Newton Hills and Union Grove State Parks. Both Union Grove and Newton Hills have more rolling terrain and variation in elevation, as well as eastern woodland rather than floodplain habitat. The oak and basswood eastern woodland also has denser understory than the floodplain cottonwood/ash woodland.

Two of the most interesting species discovered were the Northern Bobwhite and American Woodcock. Bobwhite was heard on several occasions, and is reported by GF&P staff to occur in several parts of the Preserve, including the southwest corner of the River Loop Trail at the grassland/woodland edge and on the Lake Loop Trail at the edge of the north grassland. Although we heard Bobwhite in the cottonwoods (May 11 and June 30), in the riparian zone on the southern route (June 9), and on the bank across the river (August 17), we were never able to observe them. American Woodcock was seen and heard on several dates, in active courtship display during the evening, and flushed out of the cottonwoods a couple of times during the day. The GF&P staff has reported seeing families of Woodcock on the inner loop trail in the cottonwoods.

Common and abundant species included American Robin, Starling, House Wren, Cowbird, and Wild Turkey.

Mud Lake provides habitat for several breeding pairs of Wood Duck, Mallard, and Canada Geese, as well as breeding Great Blue Heron and possible breeder, Green Heron. The lake was covered with algae throughout much of the breeding season and does not appear to support breeding Marsh Wren, Yellow Warbler, Song Sparrow, or Swamp Sparrow.

Woodpecker species, particularly Red-Bellied Woodpecker, Red-Headed Woodpecker, and Northern Flicker were common on the majority of survey days and occurred in relatively high numbers. All three species were estimated at Abundance Code 2 (2-10 breeding pairs). Hairy Woodpecker and Downy Woodpecker were less frequently observed and occurred in fewer numbers.

Bell's Vireos occurred in hedgerow thickets on both the northern and southern routes, and Warbling Vireos were found throughout the Preserve in thickets and woodlands. Red-eyed Vireo, common breeding species at Newton Hills State Park, was observed only twice, and Yellow-throated Vireo, often observed at Newton Hills, was not observed at Adams Preserve.

Large numbers of Baltimore and Orchard Oriole occur in the park (Abundance Code 1: 11 to 100 breeding pairs) Bluebirds also occurred in substantial numbers and were observed on almost every survey day in several areas of the Preserve. On April 6, Bluebirds were observed on the nest and carrying food. On May 26, we observed altricial young and on June 9, fledged young. On June 30, we observed Bluebirds on the nest, and on July 31, there were fledged young. Observations without breeding behavior occurred on May 11 and 22, July 9, 22 and August 6 and 17.

Lark Sparrows and Field Sparrows were the most abundant sparrow species within the park. Lark sparrows were observed 8 times on both routes at the edges of the woodland and in both grassland areas. Song Sparrows and Swamp Sparrows were curiously absent except in migration, and Grasshopper Sparrow was never observed in spite of the appearance of suitable grassland habitat. Sedge Wrens were singing late in the season on three survey days: 2 July 22; 5 August 6; 5 August 17. Dickcissels were also common and seen and heard singing on 7 survey days.

Shorebirds (except for Killdeer) were not found on the Preserve, but there were no areas with good mud shore habitat this season. Initially, we expected that Mud Lake and the sandbars along the Missouri might attract shorebirds. Preserve Staff reports that in years of low water, Mud Lake becomes excellent shorebird habitat.

Several migrating species were interesting finds. Empidonax flycatchers were observed during the migration window, but we were unable to confirm any evidence of breeding. None were singing and thus, in all but a couple of instances, we were unable to verify with certainty the exact species. Since both Willow and Least are known to breed in eastern South Dakota, breeding confirmation might be documented in the future. Acadian is also a possibility in this extreme southeastern part of the state.

Short-eared Owl was flushed from the northern trail junipers and grassland on April 6. Osprey was observed March 29, April 6 (carrying fish), April 18, and May 11. GF&P staff reported that Osprey nests down the river east of the Preserve boundaries. Kestrel was observed on April 6, May 26, and September 13. There is also a chance that Turkey Vulture may be nesting on or near the Preserve. Turkey Vulture was observed March 29; April 5, 6, and 19; May 11 26; June 9 and 30; July 9, 21, and 22; August 6 and 17; and September 13, frequently roosting in one particular dead tree in an open grassland area next to a dense woodland. A juvenile was observed on July 9, establishing confirmed breeding (CO) of this species.

A number of expected species were not observed. Although Whip-poor-wills have been reported singing directly across from the Preserve on the Missouri River, Nebraska side, we were unable to find any evidence of the species. The Missouri side across from the Preserve is not disturbed and has a more natural edge and shore than the South Dakota shore. The Adams Preserve shore is highly disturbed with pilings, rocks, and a pumping station for the nearby town of McCook Lake, which edges the Preserve. According to GF&P staff, Whip-poor-wills were expected and had been reported in previous years. Eastern Screech Owl was not found even though habitat would seem to be appropriate.

A few other anticipated species occur in slightly different habitat than Adams Preserve provides. According to *Birds of North America* online, Yellow-bellied Sapsucker is found in riparian woodland *upland* forests rather than bottomland floodplain forest. Ovenbird, Scarlet Tanager, and Yellow-throated Vireo are more commonly associated with eastern deciduous woodland than riparian floodplain.

Long-term effects on the habitat of the Preserve include natural changes in cottonwood forest habitat and the impact of increasing numbers of visitors. Also, if the proposed Hyperion oil refinery is approved and built in Union County, visitor traffic may be dramatically increased.

## Conclusions

1. A number of species listed as probable breeders (PR) and possible breeders (PO) may breed in the park and could be confirmed as more birders report breeding behavior at Adams Preserve.
2. The suburban and urban areas within such close proximity of the Preserve contribute to high disturbance. Additionally, many walkers and bicyclists who use the trails are accompanied by dogs, which are frequently not on a leash. This level of disturbance may negatively affect some species of birds and discourage breeding.
3. The environmental impact of the proposed refinery in nearby Union County is unknown. Baseline data on species and populations may assist in tracking interruption of breeding and possible species decline.
4. This survey highlights species such as Northern Bobwhite, Bell's Vireo, and Orchard Oriole. The absence of Scarlet Tanager, Blue-gray Gnatcatcher, Ovenbird, Black-billed Cuckoo, Yellow-bellied Sapsucker, and Whip-poor-will, however, underscores the importance of preserving scarce eastern deciduous forest fragments in South Dakota.

## References

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## Appendix A

### Standardized Breeding Behavior Criteria Codes

Status	Codes	Breeding behavior
Observed (O)	O	Species (male or female) <b>observed</b> during its breeding season, but no evidence of breeding. Not in suitable nesting habitat. Such as: vultures, raptors, or colonial nesting species not at the nesting colony.
Possible (PO)	?	Species (male or female) observed in <b>suitable habitat</b> during its breeding season.
	X	<b>Singing male</b> present in suitable habitat during its breeding season.
Probable (PR)	M	<b>Multiple</b> males (e.g., seven) of a single species singing within a block in a single visit during their breeding season.
	P	<b>Pair</b> observed in suitable nesting habitat during its breeding season.
	S	Permanent territory presumed through <b>song</b> at same location on at least 2 occasions 7 or more days apart.
	T	Permanent <b>territory</b> presumed through defense of territory (chasing of individuals of same species).
	C	<b>Courtship</b> behavior, or copulation.
	N	Visiting probable <b>nest</b> site
	A	<b>Agitated</b> behavior or <b>anxiety</b> calls from adult.
	B	Nest <b>building</b> by wrens; hole excavation by woodpeckers.
Confirmed (CO)	CN	<b>Carrying nesting</b> materials--sticks, grass, hair, etc.
	NB	<b>Nest building</b> by all excepts wrens and woodpeckers.
	PE	<b>Physiological evidence</b> based on bird in the hand: highly vascularized, edematous incubation/brood patch, or egg in oviduct.
	DD	<b>Distraction Display</b> or injury feigning.
	UN	<b>Used nests</b> or eggshells found. Caution: these must be carefully identified to be accepted.
	PY	<b>Precocial young.</b> Flightless young of precocial species restricted to the natal area by limited mobility or dependence on adult.
	FL	Recently <b>fledged</b> young incapable of sustained flight, restricted to the natal area by limited mobility or dependence on adult.
	ON	<b>Occupied nest:</b> Adults entering or leaving a nest site in circumstances indicating an occupied nest. Used for nests too high or enclosed to view the contents.
	CF	<b>Carrying food:</b> adult carrying food for the young.
	FY	Adult <b>feeding</b> recently fledged young.
	FS	Adult carrying <b>fecal sac</b> .
	NE	<b>Nest with eggs.*</b>
	NY	<b>Nest with young.*</b>

\*Presence of cowbird eggs or young is confirmation of both cowbird and host species.

Source: *The South Dakota Breeding Bird Atlas, 1988-1993*

**Appendix B**  
**Breeding Pair Abundance Estimate Codes**

The method chosen for determining abundance estimates for this survey was taken from the *South Dakota Breeding Bird Atlas, 1988-1993*. That project, in turn, took its method from the Ontario Breeding Bird Atlas Project. This method greatly simplifies the task of estimating numbers by ignoring total species population estimates and limiting the numerical abundance estimates to five broad categories (in powers of 10) of total breeding pairs, as shown below.

<b>Estimate Code</b>	<b>Estimate of breeding pairs</b>
1	1 pair
2	2 to 10 pairs
3	11-100 pairs
4	101-1000 pairs
5	1000 pairs