

## **Avian Surveys at Effigy Mounds National Monument**

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## Summary

During the spring and summer of 2002, nesting bird surveys were conducted within Effigy Mounds National Monument with special attention to the newly acquired Heritage Addition. Point Count Surveys were conducted on eight days during the breeding season and additional information was collected during the breeding season as well as during the spring and fall migration. One hundred and twenty four bird species were observed – 82 during the point count surveys, 14 during the breeding season (but not during point counts), and an additional 28 during migration. Most frequently observed species were the American redstart, eastern wood-pewee, and song sparrow. Eight other species were also abundant. Eight species of special interest were observed during the breeding season (including the red-shouldered hawk, bald eagle, and cerulean warbler). As an example of the importance placed on habitat within Effigy Mounds NM, the park was recently dedicated as a Bird Conservation Area by the Iowa Department of Natural Resource Wildlife Diversity Section, and also listed as an Important Bird Area by the National Audubon Society.

## Acknowledgments

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## Introduction

In 1998 Congress passed the National Parks Omnibus Management Act in response to concerns about the condition of natural resources within the national parks. The act requires each park to gather baseline inventory data on pertinent natural resources, data that will provide a pivotal step toward establishing an effective monitoring program furthering the ability to effectively manage and protect park resources. The National Park Service (NPS) responded with the Natural Resource Challenge program, including the establishment of biome-based inventory and monitoring networks. The Heartland Network, as part of the NPS Inventory and Monitoring (I&M) program, has undertaken inventories of vascular plants and vertebrates within fifteen parks in eight Midwestern states.

Widespread declines in neotropical migrant, national, and local bird populations have prompted concerns about birds at Effigy Mounds NM. A bird survey in the park will provide baseline data on bird species composition, relative abundance, and habitat use. This inventory will provide a foundation for future avian population monitoring and will help the park better manage resources and predict potential impacts of management decisions on avian species. It will also provide managers with information about future research needs, such as fecundity surveys on species of concern, or other important questions.

The newly acquired 404.9 ha (1,000 ac) Heritage Addition/Furgeson tract of Effigy Mounds NM represents a significant addition of forested wetland and upland habitat to the facility. In order to provide information for use in park management decisions, we conducted bird surveys and documented the presence/absence of potential species of concern and collected baseline information on all bird species within the new acquisition.

The forested tracts within Effigy Mounds NM along the lower portion of the Yellow River and at the Sny Magill Unit provide a variety of habitats that usually have a high abundance and diversity of birds (Knutson et al 1996; Knutsen & Klaas 1997). Several species of endangered or threatened birds have been documented within the study area (Roosa 1977; Stravers 1984). However, floodplain forest vegetative communities are dynamic since they are affected by periodic episodes of flooding which affects avian populations. These changes could represent significant change in avian populations.

Observations should provide important baseline information on neotropical migrant bird species that nest within Effigy Mounds National Monument property, including the newly acquired Heritage Addition and other forested areas of the park which have yet to be inventoried. The inventory was conducted over a 13-month period with most of the information collected in the spring and summer of 2002 and follow-up information collected in 2003.

Objectives of this project were to document the species that nest within Effigy Mounds NM and the Heritage Addition. The minimum target was to document 90% of the bird species occurring within the area designated. To meet these objectives and support network goals we 1) conducted bird surveys and nest searches at various times throughout the calendar year, 2) conducted point count surveys of singing birds at 25 GPS locations during the nesting season,

3) provided a qualitative assessment of abundance of rare and unique species, and 4) provided ancillary habitat data such as vegetation type at specific locations.

## Study Area

Effigy Mounds National Monument is located in the non-glaciated area of northeastern Iowa (Figures 1&2). The Monument is divided into three units totaling 597.6 ha (1,476 ac). Sny Magill is located about 17.6 km (11 mi) south of the North and South units and is in the Mississippi River bottom and contains the largest extant concentration of Indian mounds (about 100) in the country.

The Monument lies in a geologically unique area of erosional topography drained by an intricate system of rivers and streams. The erosional forces have cut through a plain leaving high divides and precipitous bluffs above adjacent waterways.

Northeastern Iowa represents an environment of overlapping plant ecotypes. The eastern hardwood forests merging with the grasslands of the west have created a mosaic of forests, savannas, and prairie. Early survey records reveal that northeastern Iowa was a heavily forested region interspersed with oak savannas and prairie openings. The prairie openings penetrated into the forest area along ridge tops with smaller prairie openings found on south facing bluff edges maintained by shallow soil, higher temperatures and drier conditions. Today the steep hillsides are dominated by climax stands of maple-basswood and oak-hickory vegetation communities with small goat prairies found on drier sites.

Nearly 485.8 ha (1,200 ac) of the monument are forested by rapidly maturing stands of mixed hardwood species. Approximately 32.4 ha (80 ac) of old field openings are managed as recovering or restored prairie. An area of about 8.1 ha (20 ac) has been treated as part of an oak grove or savanna restoration project for the restoration of nearly 20.2 ha (50 ac) of oak savanna. About 100 acres of ponds and lakes are found within the floodplains of the Mississippi River, the Yellow River, and Sny Magill Creek.

Management efforts for the monument center on the protection and preservation of the burial mounds, control of exotic species, and restoration of the cultural landscape associated with the mound building era.

## Methods

We established a network of 25 representative sample points (20 regular and 5 alternate) across the new Heritage Addition and other portions of the park (Figure 2) and conducted regular bird observations between mid-May and early-July of 2002. This included five points in the lower section of Yellow River within Effigy Property, twelve points within the Heritage Addition/Furgeson Tract, five upland points within the south unit of Effigy, and three points within the Sny Magill Unit of Effigy Mounds.

Points were spaced at least 250 meters apart and the point counts were conducted from dawn until 10:30 a.m. (Smith et al 1995). Twenty points were monitored three times, an additional three points were monitored twice, and two other points were monitored once. Observation periods were conducted for 5 minutes at each point and interpoint data was also collected as we moved between observation points. Observations were conducted only during times of suitable weather (Bibby et al. 1992).

Mayfield (1975), and we included observations on other birds collected in 2002 and 2003 during inventories of red-shouldered hawk (*Buteo lineatus*) nesting.

Sample point locations were recorded (NAD27 Conus) using a Garmin GPS 12 type of receiver and transferred directly to field forms.

Vegetational data was collected at each of the 25 GPS points within the study area. Information collected included canopy cover, canopy height, average dbh of trees within a 9 meter radius, and a summary of ground vegetation.

## Results

We observed a total of 124 bird species during this study including 82 species and a total of 1,724 individual birds during the breeding bird point count surveys (Table 1). An additional 14 species were observed during the breeding season within the Effigy Mounds study area that were not observed during the point counts (Table 2). And, another 28 species were observed on the study area during migration but not during the nesting season (Table 3).

Species of special interest that were observed included the Iowa listed endangered red-shouldered hawk, federally threatened bald eagle (*Haliaeetus leucocephalus*), and six species of special concern: acadian flycatcher (*Empidonax virescens*), veery (*Catharus fuscescens*), woodthrush (*Hylocichla mustelina*), cerulean warbler (*Dendroica cerulea*), worm-eating warbler (*Helmitheros veremivorus*), and northern parula (*Parula americana*). These species comprised 3.6% of the total birds observed.

Neotropical migrants made up 47.8% of the total birds observed. Most frequently observed species were American redstart (*Setophaga ruticilla*), eastern wood-pewee (*Contopus virens*), and song sparrow (*Melospiza melodia*); these three species made up 13.3% of the birds observed. Also abundant were indigo bunting (*Passerina cyanea*), blue-gray gnatcatcher (*Polioptila caerulea*), and common yellow-throat (*Geothlypis trichas*).

Of the 20 regular monitoring points, point #10 had the highest species diversity at 39 species (Table 5). This point is located at the edge of a hill adjacent to Yellow River where the old logging trail meets the river. Point #20 had the lowest species diversity (20 species). This point is located at the northeast corner of the Sny Magill Unit near the mounds at the edge of the forest along Johnson slough.

## Discussion

Species of special interest that were observed during the breeding season included Red-shouldered Hawk (listed as Endangered in Iowa), Bald Eagle (Federally Threatened), Acadian Flycatcher, Cerulean Warbler, Worm-eating Warbler, and Northern Parula (all considered Species of Special Concern).

It appears that Effigy Mounds NM supports significant populations of other important species such as red-head woodpecker (*Melanerpes erythrocephalus*), pileated woodpecker (*Dryocopus pileatus*), great-crested flycatcher (*Myiarchus crinitus*), Carolina wren (*Thryothorus ludovicianus*), and ovenbird (*Seiurus aurocapillus*). We also observed several species of interest during the spring and fall migration such as golden eagle (*Aquila chrysaetos*), sandhill crane (*Grus canadensis*), black-crowned night heron (*Nycticorax nycticorax*), osprey (*Pandion haliaetus*), and peregrine falcon (*Falco peregrinus*) as well as seven additional species of neotropical migrants (Table 4).

Although our observations during winter were limited, we did observe significant concentrations of wintering bald eagles in the North Unit, the South Unit and the Sny Magill Unit of Effigy Mounds NM.

From the observations conducted during 2002 it appears that Effigy Mounds NM contains some critical habitat for several species of birds that nest within this region. Bird densities, and especially species diversity are exceptional in comparison to much of the surrounding landscapes. Our observations included confirmation of several species that are relatively rare in other parts of this region. As an example of the importance placed on habitat within the monument, Effigy Mounds was recently dedicated as a Bird Conservation Area by the Iowa Department of Natural Resource Wildlife Diversity Section, and also listed as an Important Bird Area by the National Audubon Society.

In retrospect, we feel that we should have collected more information from the upland forest portion of the new Heritage Addition. The initial decision that limited our observations was due to time constraints since access to this particular portion of the study area is time consuming and difficult. However, we found bird diversity and densities were relatively high in these upland habitats that are adjacent to floodplain forests.

Red-shouldered hawks have maintained a relatively stable population within Effigy Mounds NM during the past 20 years (Stravers 1984, 1992). However, after the extensive logging along Yellow River during the past ten years, the nest site locations for red-shouldered hawks have changed somewhat.

Perhaps one of the most important aspects of this study relates to the conversion of much of the floodplain from wetland forest to Reed canary grass (*Phalaris arundinacea*). Our surveys for red-shouldered hawks within Effigy Mounds NM date back to 1983 and we have witnessed a rather abrupt and relatively quick conversion of a significant portion of this habitat from wetland forest to wetland savanna. In some sections it appears that the reed canary grass is dominating.

Conversion of wetland forest habitats to reed canary grass type savanna could have a significant impact on avian populations within Effigy Mounds NM. As agencies and land managers struggle to understand how to cope with these types of habitat changes, bird inventories such as this study can help to provide important baseline information.

## Conclusion

It is the authors opinion that Effigy Mounds National Monument contains some critical habitat for several species of birds that nest within this region, including several species that are relatively rare. Because Effigy Mounds NM was recently dedicated as a Bird Conservation Area by the Iowa Department of Natural Resources Wildlife Diversity Section, and also listed as an Important Bird Area by the National Audubon Society, we may be able to develop some partnership potentials in an effort to continue to document bird populations within this important habitat.

While the observations conducted during 2002 and 2003 provide some important information concerning avian populations within Effigy Mounds NM, we feel this study represents what could be a suitable start. We feel more work is needed, including monitoring some of the portions of the monument property that were not included in our observations in 2002. Perhaps most importantly, continued bird inventories could provide important baseline and continuing information for changing habitats within the floodplain, such as the conversion of wetland forests to reed canary grass.

We also feel that Effigy Mounds NM represents critical habitat for many migrating and wintering birds. Future studies should include additional observations conducted during the migration and winter periods. Additional observations should be conducted in the upland forest portions of the new Heritage Addition as well.

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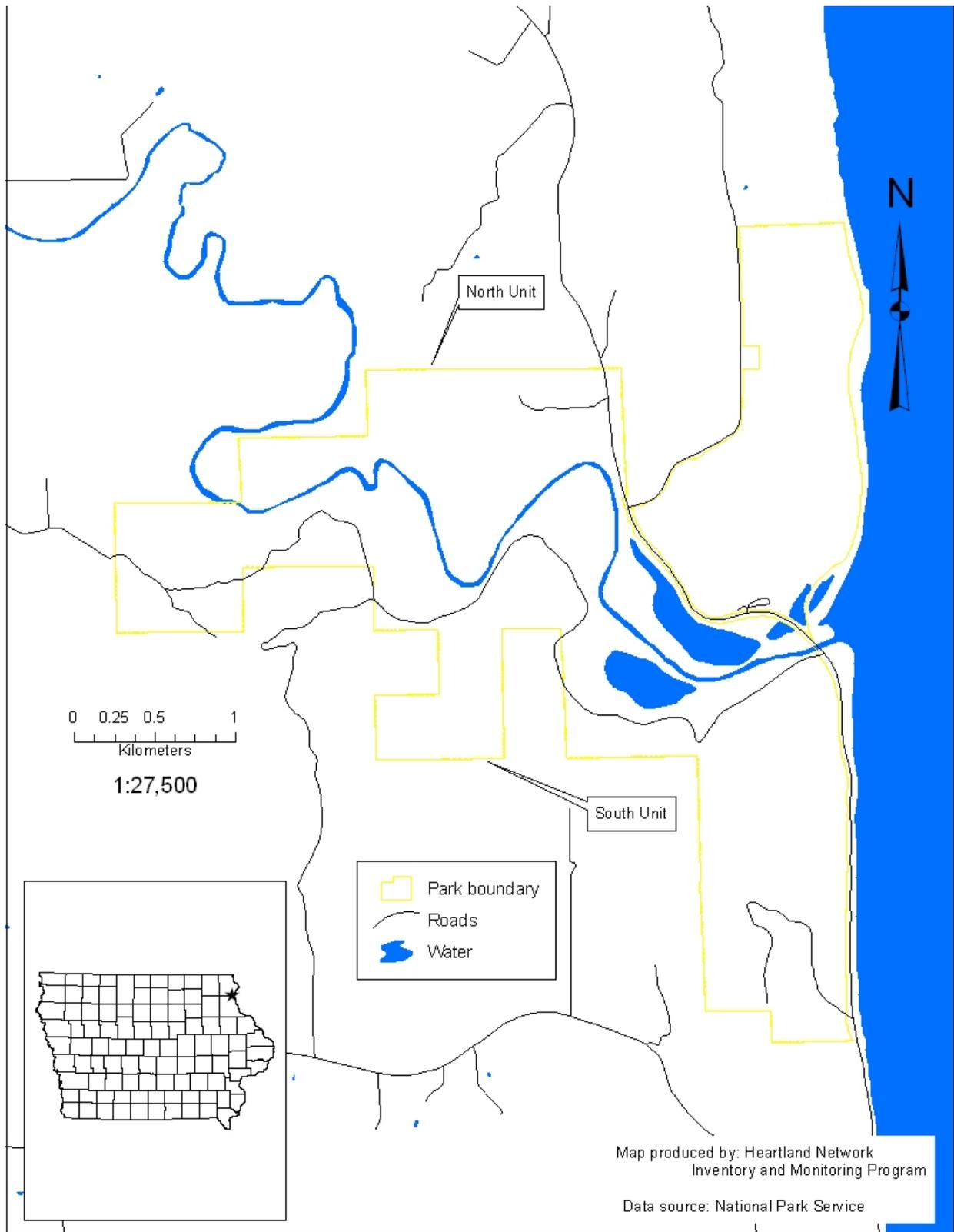


Figure 1. Location of Effigy Mounds NM-North and South Units.

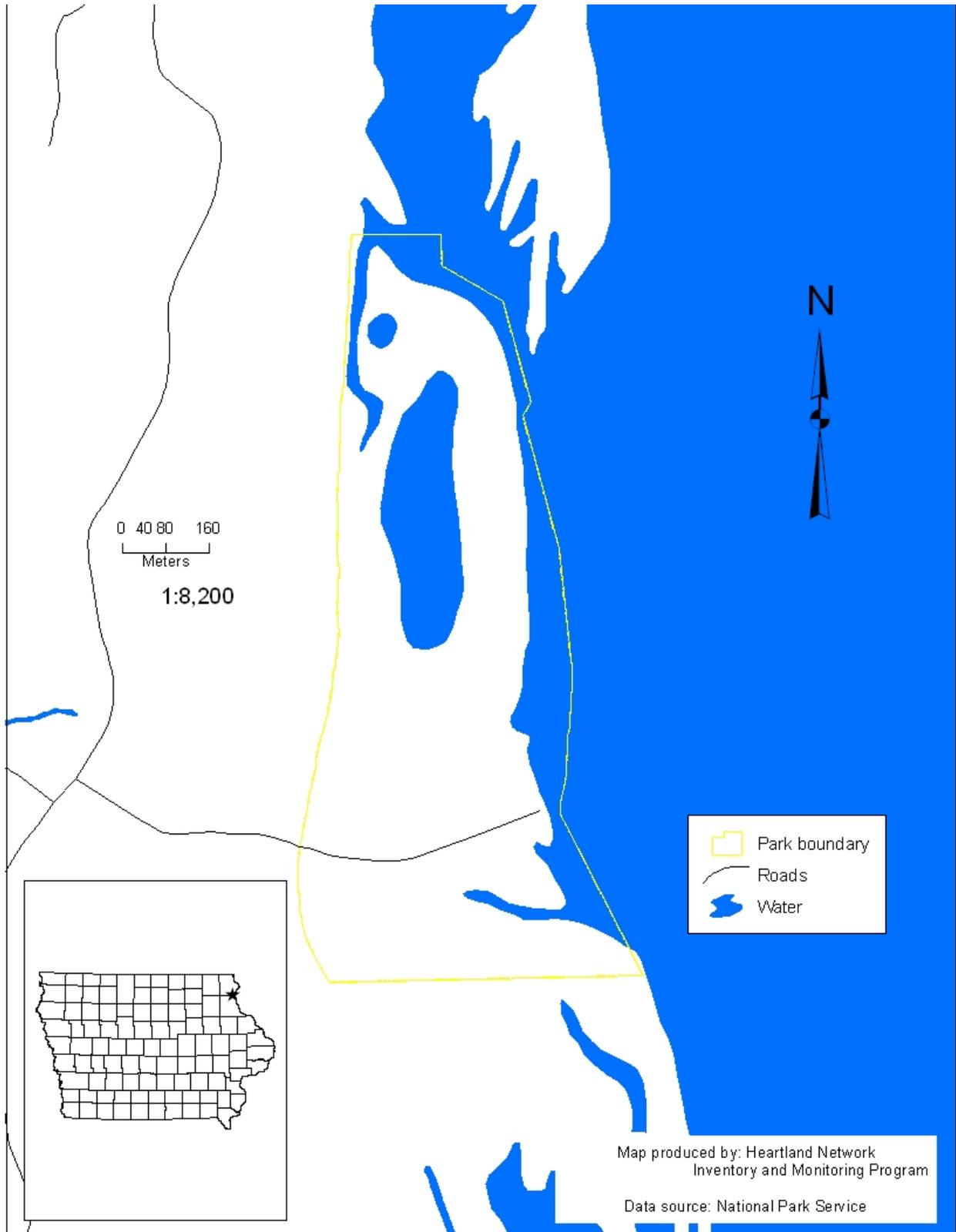


Figure 2. Location of Effigy Mounds NM-Sny Magill Unit.

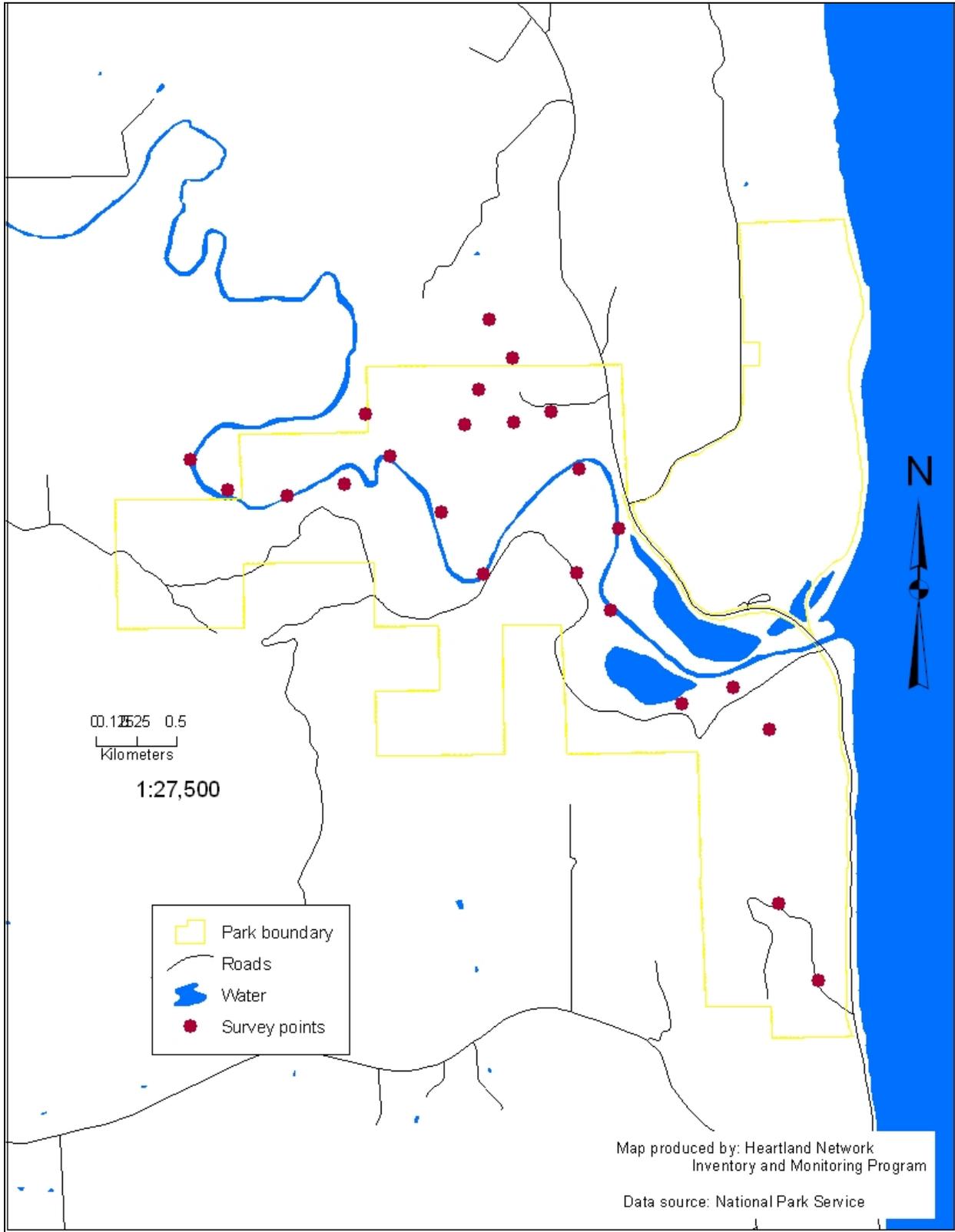


Figure 3. Location of bird survey points at Effigy Mounds NM-North and South Units.

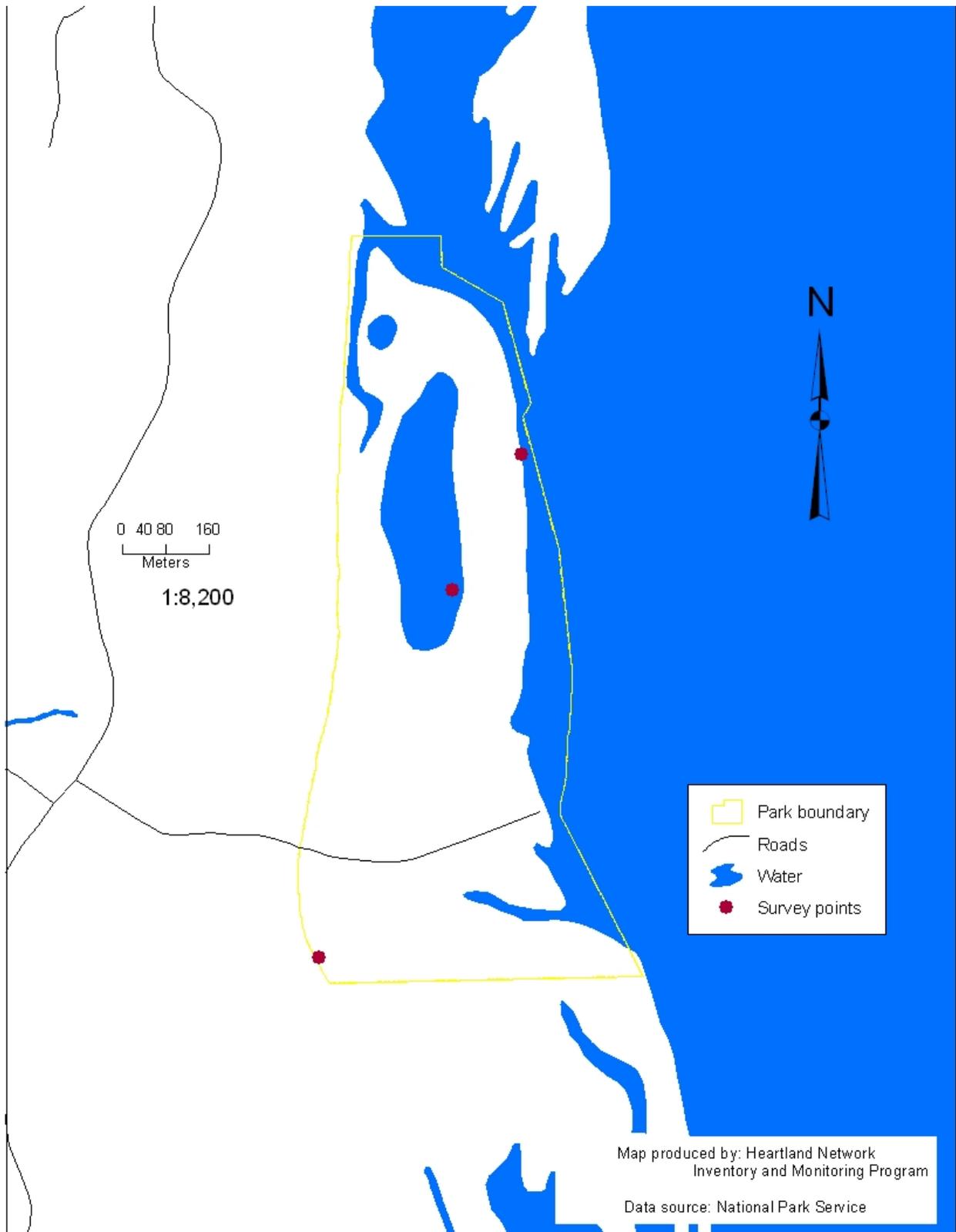


Figure 4. Location of bird survey points at Effigy Mounds NM-Sny Magill Unit.

Table 1. Comparison of relative abundance of birds observed at Effigy Mounds NM during 2002.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Inter Point</b>	<b>Point</b>	<b>Total</b>
Acadian Flycatcher*	<i>Empidonax virescens</i>	14	20	34
American Crow	<i>Corvus brachyrhynchos</i>	10	38	48
American Goldfinch	<i>Carduelis tristis</i>	19	42	61
American Redstart	<i>Setophaga ruticilla</i>	24	59	83
American Robin	<i>Turdus migratorius</i>	18	38	56
American Woodcock	<i>Scolopax minor</i>	1	-	1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	5	1	6
Baltimore Oriole	<i>Icterus galbula</i>	9	24	33
Barn Swallow	<i>Hirundo rustica</i>	1	-	1
Barred Owl	<i>Strix varia</i>	1	2	3
Belted Kingfisher	<i>Ceryle alcyon</i>	7	2	9
Black & white Warbler	<i>Mniotilta varia</i>	2	1	3
Black-capped Chickadee	<i>Poecile atricapilla</i>	9	29	38
Blue Jay	<i>Cyanocitta cristata</i>	8	16	24
Blue-winged Warbler*	<i>Vermivora pinus</i>	3	1	4
Brown Creeper	<i>Certhia Americana</i>	1	6	7
Brown-headed Cowbird	<i>Molothrus ater</i>	7	31	38
Carolina Wren	<i>Thryothorus ludovicianus</i>	1	-	1
Cedar Waxwing	<i>Bombycilla cedrorum</i>	4	5	9
Cerulean Warbler*	<i>Dendroica cerulean</i>	9	7	16
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	1	-	1
Chimney Swift	<i>Chaetura pelagica</i>	1	3	4
Chipping Sparrow	<i>Spizella passerine</i>	8	2	10
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	6	-	6
Common Grackle	<i>Quiscalus quiscula</i>	9	11	20
Common Yellowthroat	<i>Geothlypis trichas</i>	17	37	54
Dbl.-crested Cormorant	<i>Phalacrocorax auritus</i>	-	1	1
Downy woodpecker	<i>Picoides pubescens</i>	10	25	35
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	15	13	28
Eastern Bluebird	<i>Sialia sialis</i>	3	7	10
Eastern Phoebe	<i>Sayornis phoebe</i>	8	9	17
Eastern Wood-Pewee	<i>Contopus virens</i>	17	58	75
European Starling	<i>Sturnus vulgaris</i>	1	2	3
Field Sparrow	<i>Spizella pusilla</i>	4	-	4
Glue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	15	40	55
Gray Catbird	<i>Dumetella carolinensis</i>	6	6	12
Great Blue Heron	<i>Ardea herodias</i>	4	8	12
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	13	32	45

Table 1. Comparison of relative abundance of birds observed at Effigy Mounds NM during 2002 (cont.).

<b>Common Name</b>	<b>Scientific Name</b>	<b>Inter Point</b>	<b>Point</b>	<b>Total</b>
Great Egret	<i>Ardea alba</i>	1	-	1
Great Horned Owl	<i>Bubo virginianus</i>	1	-	1
Hairy Woodpecker	<i>Picoides villosus</i>	6	9	15
House Finch	<i>Carpodacus mexicanus</i>	-	1	1
House Sparrow	<i>Passer domesticus</i>	1	-	1
House Wren	<i>Troglodytes aedon</i>	11	33	44
Indigo Bunting	<i>Passerina cyanea</i>	20	44	64
Kentucky Warbler	<i>Oporornis formosus</i>	3	4	7
Mourning Dove	<i>Zenaida macroura</i>	3	5	8
N. Rough winged Swallow	<i>Stelgidopteryx serripennis</i>	14	6	20
Northern Cardinal	<i>Cardinalis cardinalis</i>	7	28	35
Northern Flicker	<i>Colaptes auratus</i>	5	9	14
Northern Parula*	<i>Parula Americana</i>	2	-	2
Ovenbird	<i>Seiurus aurocapillus</i>	9	10	19
Pileated Woodpecker	<i>Dryocopus pileatus</i>	6	20	26
Prothonotary Warbler	<i>Protonotaria citrea</i>	8	15	23
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	8	38	46
Red-eyed Vireo	<i>Vireo olivaceus</i>	11	38	49
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	5	10	15
Red-shouldered Hawk*	<i>Buteo lineatus</i>	2	2	4
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1	3	4
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	8	10	18
Rock Dove	<i>Columba livia</i>	1	-	1
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	12	25	37
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	1	3	4
Scarlet Tanager	<i>Piranga olivacea</i>	14	26	40
Sedge Wren	<i>Cistothorus platensis</i>	1	-	1
Song Sparrow	<i>Melospiza melodia</i>	22	49	71
Spotted Sandpiper	<i>Actitis macularia</i>	-	1	1
Tree Swallow	<i>Tachycineta bicolor</i>	4	5	9
Tufted Titmouse	<i>Baeolophus bicolor</i>	4	14	18
Turkey Vulture	<i>Cathartes aura</i>	10	9	19
Unknown bird	Unknown bird	-	1	1
Veery	<i>Catharus fuscescens</i>	2	2	4
Warbling Vireo	<i>Vireo gilvus</i>	12	29	41
White-breasted Nuthatch	<i>Sitta carolinensis</i>	11	38	49

Table 1. Comparison of relative abundance of birds observed at Effigy Mounds NM during 2002 (cont.).

<b>Common Name</b>	<b>Scientific Name</b>	<b>Inter Point</b>	<b>Point</b>	<b>Total</b>
Wild Turkey	<i>Meleagris gallopavo</i>	2	2	4
Willow Flycatcher	<i>Empidonax traillii</i>	-	2	2
Wood Duck	<i>Aix sponsa</i>	6	7	13
Wood Thrush	<i>Hylocichla mustelina</i>	7	21	28
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	1	-	1
Yellow Warbler	<i>Dendroica petechia</i>	3	6	9
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	10	28	38
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	2	4	6
Yellow-throated Vireo	<i>Vireo flavifrons</i>	9	34	43

Table 2. List of birds seen at Effigy Mounds NM study area during the 2002 breeding season.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Classification</b>
Acadian Flycatcher*	<i>Empidonax virescens</i>	Neotropical Migrant
American Crow	<i>Corvus brachyrhynchos</i>	Resident
American Goldfinch	<i>Carduelis tristis</i>	North American Migrant
American Redstart	<i>Setophaga ruticilla</i>	Neotropical Migrant
American Robin	<i>Turdus migratorius</i>	North American Migrant
American Woodcock	<i>Scolopax minor</i>	North American Migrant
Bald Eagle*	<i>Haliaeetus leucocephalus</i>	North American Migrant
Baltimore Oriole	<i>Icterus galbula</i>	Neotropical Migrant
Barn Swallow	<i>Hirundo rustica</i>	Neotropical Migrant
Barred Owl	<i>Strix varia</i>	Resident
Belted Kingfisher	<i>Ceryle alcyon</i>	North American Migrant
Black & white Warbler	<i>Mniotilta varia</i>	Neotropical Migrant
Black-capped Chickadee	<i>Poecile atricapilla</i>	Resident
Blue Jay	<i>Cyanocitta cristata</i>	Resident
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	Neotropical Migrant
Blue-winged Warbler*	<i>Vermivora pinus</i>	Neotropical Migrant
Brown Creeper	<i>Certhia americana</i>	North American Migrant
Brown-headed Cowbird	<i>Molothrus ater</i>	North American Migrant
Carolina Wren	<i>Thryothorus ludovicianus</i>	Resident
Cedar Waxwing	<i>Bombycilla cedrorum</i>	North American Migrant
Cerulean Warbler*	<i>Dendroica cerulea</i>	Neotropical Migrant
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	Neotropical Migrant
Chimney Swift	<i>Chaetura pelagica</i>	Neotropical Migrant
Chipping Sparrow	<i>Spizella passerina</i>	Neotropical Migrant
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Neotropical Migrant
Common Grackle	<i>Quiscalus quiscula</i>	North American Migrant
Common Yellowthroat	<i>Geothlypis trichas</i>	Neotropical Migrant
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	North American Migrant
Downy Woodpecker	<i>Picoides pubescens</i>	Resident
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	North American Migrant
Eastern Bluebird	<i>Sialia sialis</i>	North American

		Migrant
Eastern Phoebe	<i>Sayornis phoebe</i>	North American Migrant
Eastern Wood-Pewee	<i>Contopus virens</i>	Neotropical Migrant
European Starling	<i>Sturnus vulgaris</i>	Resident
Field Sparrow	<i>Spizella pusilla</i>	North American Migrant
Gray Catbird	<i>Dumetella carolinensis</i>	Neotropical Migrant
Great Blue Heron	<i>Ardea herodias</i>	North American Migrant
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Neotropical Migrant
Great Egret	<i>Ardea alba</i>	North American Migrant
Great Horned Owl	<i>Bubo virginianus</i>	Resident
Hairy Woodpecker	<i>Picoides villosus</i>	Resident
House Finch	<i>Carpodacus mexicanus</i>	Resident

Table 2. List of birds seen at Effigy Mounds NM study area during the 2002 breeding season (cont.).

<b>Common Name</b>	<b>Scientific Name</b>	<b>Classification</b>
House Sparrow	<i>Passer domesticus</i>	Resident
House Wren	<i>Troglodytes aedon</i>	Neotropical Migrant
Indigo Bunting	<i>Passerina cyanea</i>	Neotropical Migrant
Kentucky Warbler	<i>Oporornis formosus</i>	Neotropical Migrant
Mourning Dove	<i>Zenaidura macroura</i>	North American Migrant
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Neotropical Migrant
Northern Cardinal	<i>Cardinalis cardinalis</i>	Resident
Northern Flicker	<i>Colaptes auratus</i>	North American Migrant
Northern Parula*	<i>Parula americana</i>	Neotropical Migrant
Ovenbird	<i>Seiurus aurocapillus</i>	Neotropical Migrant
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Resident
Prothonotary Warbler*	<i>Protonotaria citrea</i>	Neotropical Migrant
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Resident
Red-eyed Vireo	<i>Vireo olivaceus</i>	Neotropical Migrant
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	North American Migrant
Red-shouldered Hawk*	<i>Buteo lineatus</i>	North American Migrant
Red-tailed Hawk	<i>Buteo jamaicensis</i>	North American Migrant
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	North American Migrant
Rock Dove	<i>Columba livia</i>	Resident

Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Neotropical Migrant
Ruby-throated Hummingbird	<i>Archiloochus colubris</i>	Neotropical Migrant
Scarlet Tanager	<i>Piranga olivacea</i>	Neotropical Migrant
Sedge Wren	<i>Cistothorus platensis</i>	North American Migrant
Song Sparrow	<i>Melospiza melodia</i>	North American Migrant
Spotted Sandpiper	<i>Actitis macularia</i>	Neotropical Migrant
Tree Swallow	<i>Tachycineta bicolor</i>	North American Migrant
Tufted Titmouse	<i>Baeolophus bicolor</i>	Resident
Turkey Vulture	<i>Carthartes aura</i>	Neotropical Migrant
Veery	<i>Catharus fuscescens</i>	Neotropical Migrant
Warbling Vireo	<i>Vireo gilvus</i>	Neotropical Migrant
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Resident
Wild Turkey	<i>Meleagris gallopavo</i>	Resident
Willow Flycatcher*	<i>Empidonax trailii</i>	Neotropical Migrant
Wood Duck	<i>Aix sponsa</i>	North American Migrant
Wood Thrush	<i>Hylocichla mustelina</i>	Neotropical Migrant
Worm-eating Warbler*	<i>Helmitheros veremivorus</i>	Neotropical Migrant
Yellow Warbler	<i>Dendroica petechia</i>	Neotropical Migrant
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	North American Migrant
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Neotropical Migrant
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Neotropical Migrant

\*endangered, threatened, or on the National Audubon Society's List of Declining Species.

Table 3. Species that were observed during the breeding season within the study area but not recorded on the point count surveys.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Classification</b>
Brown Thrasher	<i>Toxostoma rufum</i>	North American Migrant
Canada Goose	<i>Branta canadensis</i>	North American Migrant
Common Nighthawk	<i>Chordeiles minor</i>	Neotropical Migrant
Common Snipe	<i>Gallinago gallinago</i>	North American Migrant
Cooper's Hawk	<i>Accipiter cooperii</i>	North American Migrant
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Neotropical Migrant
Eastern Screech-owl	<i>Otus asio</i>	Resident
Green Heron	<i>Butorides virescens</i>	North American Migrant
Hooded Merganser	<i>Lophodytes cucullatus</i>	North American Migrant
Killdeer	<i>Charadrius vociferus</i>	North American Migrant
Mallard	<i>Anas platyrhynchos</i>	North American Migrant
Sora	<i>Porzana carolina</i>	North American Migrant
Swamp Sparrow	<i>Melospiza georgiana</i>	North American Migrant
Whip-poor-will	<i>Caprimulgus vociferus</i>	Neotropical Migrant

Table 4. Species observed within the Effigy Mounds NM study area but only during migration and not during the nesting season point counts.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Classification</b>
American Wigeon	<i>Anas americana</i>	North American Migrant
Black-crowned Night Heron *	<i>Nycticorax nycticorax</i>	North American Migrant
Black-throated Green Warbler	<i>Dendroica virens</i>	Neotropical Migrant
Blue-winged Teal	<i>Anas discors</i>	Neotropical Migrant
Broad-winged Hawk	<i>Buteo platypterus</i>	Neotropical Migrant
Bufflehead	<i>Bucephala albeola</i>	North American Migrant
Common Goldeneye	<i>Bucephala clangula</i>	North American Migrant
Common Merganser	<i>Mergus merganser</i>	North American Migrant
Common Tern	<i>Sterna hirundo</i>	North American Migrant
Golden Eagle *	<i>Aquila chrysaetos</i>	North American Migrant
Green-winged Teal	<i>Anas crecca</i>	North American Migrant
Hermit Thrush	<i>Catharus guttatus</i>	Neotropical Migrant
Lesser Scaup	<i>Aythya affinis</i>	North American Migrant
Nashville Warbler	<i>Vermivora ruficapilla</i>	Neotropical Migrant
Northern Shoveler	<i>Anas clypeata</i>	North American Migrant
Orange-crowned Warbler	<i>Vermivora celata</i>	Neotropical Migrant
Osprey	<i>Pandion haliaetus</i>	Neotropical Migrant
Peregrine Falcon	<i>Falco peregrinus</i>	Neotropical Migrant
Ring-billed Gull	<i>Larus delawarensis</i>	North American Migrant
Ring-necked Duck	<i>Aythya collaris</i>	North American Migrant
Ruby-crowned Kinglet	<i>Regulus calendula</i>	North American Migrant
Sandhill Crane *	<i>Grus canadensis</i>	North American Migrant
Sharp-shinned Hawk	<i>Accipiter striatus</i>	North American Migrant
Solitary Sandpiper	<i>Tringa solitaria</i>	Neotropical Migrant
Tennessee Warbler	<i>Vermivora peregrina</i>	Neotropical Migrant
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	North American Migrant
White-throated Sparrow	<i>Zonotrichia albicollis</i>	North American Migrant
Yellow-rumped Warbler	<i>Dendroica coronata</i>	North American Migrant