

Avian surveys at Herbert Hoover National Historic Site

¹Jon W. Stravers,
²Kelly J. Mckay, ²Thomas W. McClenahan

¹Research Coordinator,
National Audubon Society Upper Mississippi River Campaign
McGregor, Iowa

²Bioeco Research and Monitoring Center
Hampton, Illinois

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Heartland Network
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National Park Service
6424 W. Farm Rd. 182
Republic, MO 65738

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Summary

Herbert Hoover National Historic Site (NHS) was surveyed to determine current breeding bird species composition during mid-May and early-July of 2003 via unlimited radius point count surveys. A total of 54 bird species were observed including species of special interest such as grassland obligate species (sedge wren, dickcissel, grasshopper sparrow, Henslow's sparrow, boblink, and eastern meadowlark). Most frequently observed species were european starling, red-winged blackbird, common grackle, American goldfinch, house sparrow, northern cardinal, and the common yellowthroat. Species richness averaged 33.2 species per point with the highest species diversity occurring at Survey Point 4 (36 species) and the lowest at Survey Point 5 (20 species).

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Introduction

Congress passed the National Parks Omnibus Management Act in 1998 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 and abide by the National Park Service (NPS) mission statement.

The 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. Stemming from this challenge and a widespread concern regarding the status of bird populations at Herbert Hoover NHS, an inventory was deemed necessary to establish baseline data of bird resources within the park.

Due to a wide variety of habitats, the park may provide refuge for some species. Documented as one of the sampling sites for the Iowa Breeding Bird Atlas, the park has no inventory of breeding or resident species. A survey of prairie and special use areas of the park will provide baseline data on species composition and relative abundance of breeding migrant and resident species.

This inventory will provide a foundation for future avian population monitoring and will also help the park better manage resources and predict the possible impacts of management decisions on avian species (an important component of the National Environmental Policy Act (NEPA)). It will also provide managers with information about future research, such as fecundity surveys on species of concern, or other important questions.

Objectives of this project were to document the species that nest within Herbert Hoover NHS. The minimum target was to document 90% of the bird species expected to occur within the area designated. To meet these objectives and support network goals we 1) conducted point count surveys of singing birds at seven locations on four occasions, 2) collected data on birds observed between the interpoints during the nesting season of 2003, and 3) provided a qualitative assessment of abundance of rare and unique species.

Study Area

Herbert Hoover National Historic Site is located in east-central Iowa within the incorporated city of West Branch and adjacent to Interstate-80 (Figure 1). The 75.6 ha (186.8 ac) tract includes the historic buildings, the Presidential Library Museum, park facilities, and infrastructure. Additional resources include a tributary to the west branch of Wapsinonoc Creek, a 30.8 ha (76 ac) reconstructed tallgrass prairie, Village Green, picnic area, and open space. Approximately 21.1 ha (52 ac) are parkland grounds, landscape with sparse trees, shrubs, and grass; the remaining acreage is buildings and infrastructure.

The park commemorates the life of our 31st president, Herbert Hoover, and was designated a National Historic Site on August 12, 1965 with Congress stipulating in Public Law 89-119 (79Stat. 510) that the site purpose was “. . . to preserve in public ownership historically significant properties associated with the life of Herbert Hoover.” The National Historic Site preserves, protects, and interprets for present and future generations the natural and cultural resources associated with the life of Herbert Hoover in West Branch, Iowa.

The central focus of the park includes five acres of historic neighborhood; the Hoover grave site; more than 20.2 ha (50 ac) of mowed park landscape with picnic facilities; the NPS visitor center; and the National Archives and Records Administration Presidential Library/Museum.

The site is roughly rectangular with very irregular sides. Most of the cultural resources are located within the flood plain of the creek. The area is within the Southern-Iowa Drift Plain, where drainages cut a pattern of abruptly rolling countryside. Erosion and fracturing are constant problems in these friable clay/loess (Tama-Downs) soils. Streams that did not exist 150 years ago, such as the creek on site, have cut paths through areas that were once wetlands and seeps and are very susceptible to flash flooding or going dry during periods of drought.

Interstate-80 passes along the southern border and downtown West Branch shares the northern and eastern borders of the site. A working row-crop farm, belonging to the NPS, but on a life-time lease to a private farmer, lays on the western border. A buffer area separates the Gravesite from the Interstate to its south and farm to the west. This prairie buffer should “maintain the landscape adjacent to the Presidential Library and Gravesite in a manner appropriate to the memorial character of these areas.” The prairie covers upland areas and a portion of the flood plain.

The National Historic Site originally the reconstructed prairie of the prairie buffer to five species of native grasses (big bluestem, *Andropogon gerardii*; switchgrass, *Panicum virgatum*; Indian grass, *Sorghastrum nutans*; little bluestem, *A. scoparium*; and side oats grama, *Bouteloua curtipendula*) in spring of 1971 (Robinson). Managers added forbs in 1976, and made subsequent additions of forbs and Canada wild rye (*Elymus canadensis*) in 1992 and 1994. In 1997, a savanna was created on the southeast ridge of the prairie. This savanna was intended to further buffer the Gravesite from development along the Interstate. A nut tree grove was planted in spring of 2000 as another eventual savanna area immediately south and west of the Gravesite.

Surrounding landscape and land uses provide a potential source of exotic weeds and invasive plants

for the prairie and creek bed. Agricultural runoff enters the prairie along three drainages on the western border. Some of the most extensive invasions of exotic plants occur along these drainages and the flood plain to the creek. Fencerows and mowed areas of the park are planted to Kentucky bluegrass (*Poa pretensis*), fescue (*Festuca spp.*), and smooth brome grass (*Bromus inermis*). Reed canary grass (*Phalaris arundinacea*) and various woody plants, including escaped ornamentals from the cultural area of the site, have invaded the prairie. The watershed above the site consists of agricultural land, residential areas, a golf course, and abandoned agricultural land being developed for commercial and residential purposes.

The reconstructed prairie represents one of the largest protected prairies in the vicinity. Only about 2,024.3 ha (5,000 ac) of tallgrass prairie are currently protected in the public domain in Iowa. The expansive mowed area mimics savanna conditions and attracts birds associated with the oak-hickory savanna. No threatened or endangered species have been identified on site, but the site provides a significant island of habitat for native plants, neo-tropical migrant birds, and numerous other species in a highly developed agricultural landscape.

Materials and Methods

Herbert Hoover NHS was surveyed to determine current nesting species composition on four occasions during mid-May and early-July of 2003 via unlimited radius point count surveys (Smith et al 1995). Interpoint data was also collected as observers moved between observation points.

A network of seven representative points were established within the park (Figure 2). Points were spaced at least 250 meters apart. Each primary point was recorded (NAD83) using a Garmin GPS 12 type Global Positioning System (GPS) portable hand-held unit.

Point count surveys were conducted from dawn until 10:30 a.m. for ten minutes at each point (Smith et al 1995). Observations were conducted only during times of suitable weather – not during constant precipitation and not on days when the wind exceeded more than 15 mph (Mayfield 1975; Bibby et al. 1992).

Results

A total of 50 bird species were observed at point count locations (Table 1). Another four were observed at interpoints (ruby-throated hummingbird, *Archilochus colubris*; double-crested cormorant, *Phalacrocorax auritus*; field sparrow, *Spizella pusilla*; northern bobwhite, *Colinus virginianus*). The number of species and number of birds varied by location and survey period (Tables 2-7).

The most frequently observed species were European starling (*Sturnus vulgaris*), red-winged blackbird (*Agelaius phoeniceus*), common grackle (*Quiscalus quiscula*), American goldfinch (*Carduelis tristis*), house sparrow (*Passer domesticus*), northern cardinal (*Cardinalis cardinalis*), and the common yellowthroat (*Geothlypis trichas*) (Table 8). The only raptor observed during the course of this study was a single American kestrel (*Falco sparverius*).

Species of special interest that were observed included grassland obligate species sedge wren (*Cistothorus platensis*), dickcissel (*Spiza americana*), grasshopper sparrow (*Ammodramus savannarum*), Henslow's sparrow (*Ammodramus henslowii*), boblink (*Dolichonyx oryzivorus*), and eastern meadowlark (*Sturnella magna*).

Species richness averaged 33.2 species per point (Table 8). The highest species diversity occurred at Point 4 where 36 species were recorded. The lowest occurred at Point 5 where 20 species were recorded.

Discussion

This report provides the basic baseline data for bird populations within Herbert Hoover NHS with special emphasis on the reconstructed prairie. Although this represents a relatively small tract of prairie habitat, it is nevertheless important habitat.

From the observations conducted during 2003 it appears that Herbert Hoover NHS contains some critical habitat for several species of birds that nest within this region. Species of special interest that were observed during the breeding season included the grassland obligate species sedge wren, dickcissel, grasshopper sparrow, Henslow's sparrow, boblink, and eastern meadowlark.

Conclusion

We feel that the grasslands within Herbert Hoover NHS are an excellent example of midwestern tall grass prairie habitat. When feasible, grasslands could be expanded which could attract some of the other grassland species that require larger tracts of native grasslands, such as the northern harrier.

From these observations, it appears that the perscribed burn rotation of the grassland habitats within Herbert Hoover NHS has been effective and should be maintained.

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Herbert Hoover National Historic Site

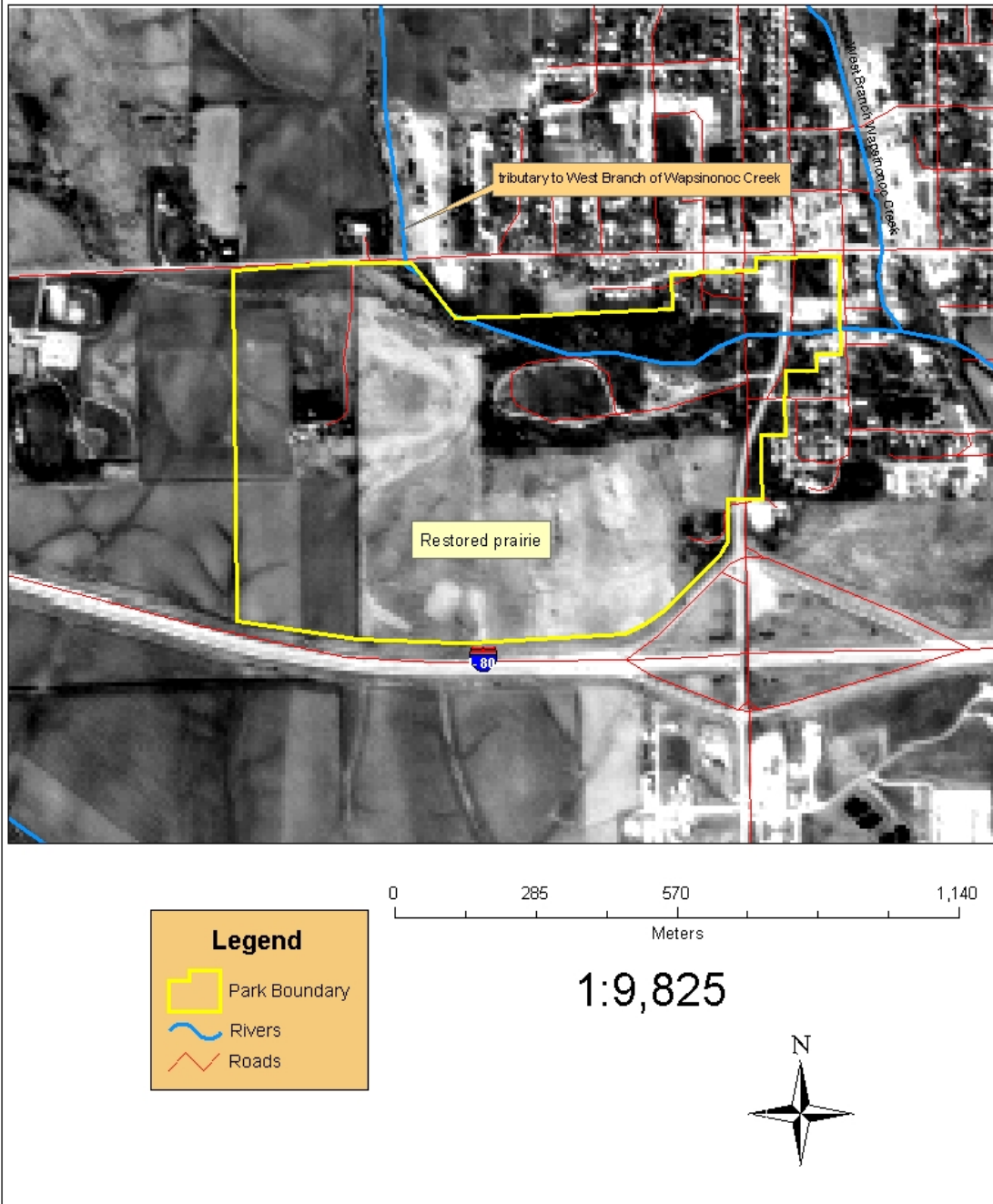


Figure 1. Location of Herbert Hoover NHS.

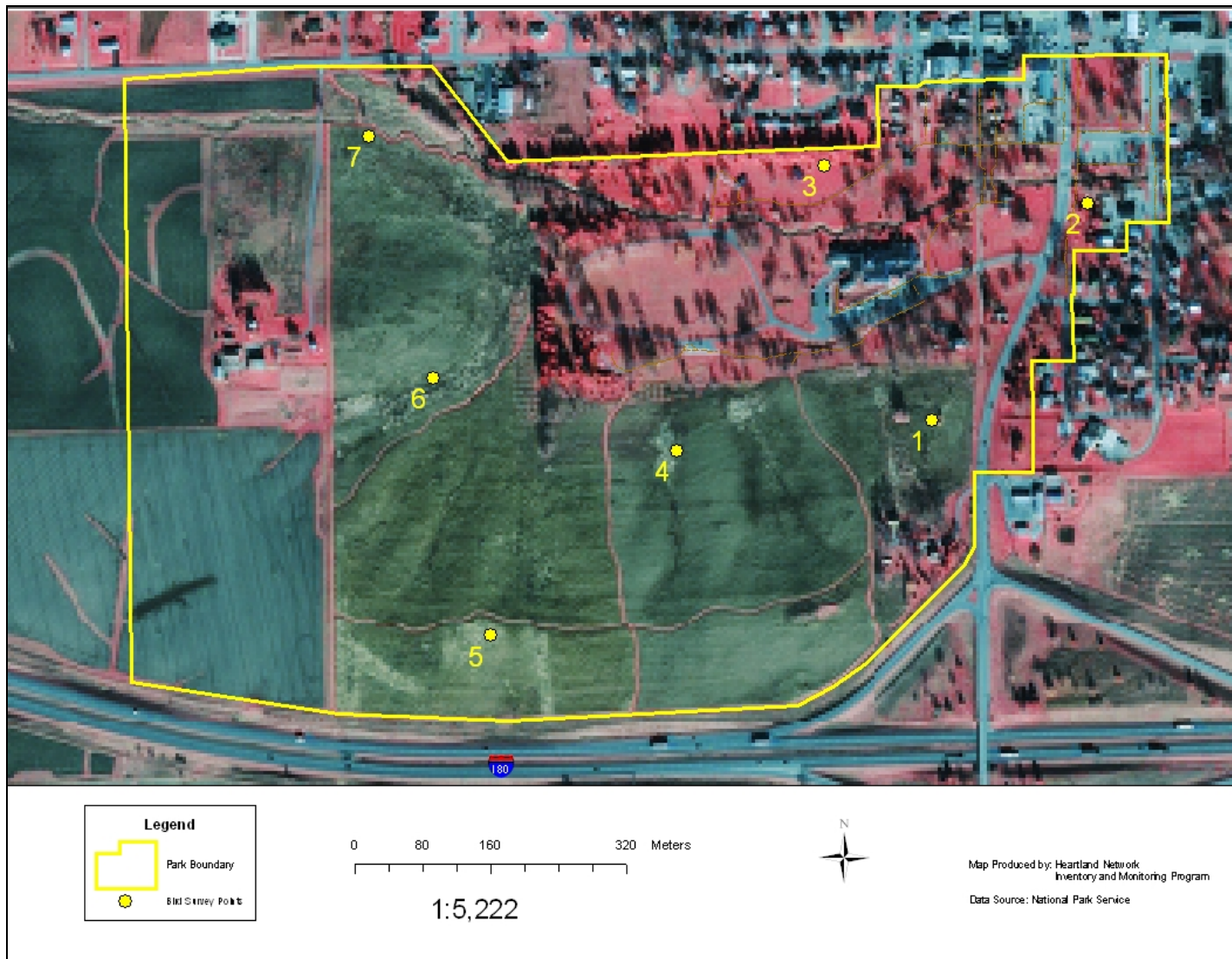


Figure 2. Location of bird survey points at Herbert Hoover NHS.

Table 1. List of birds observed at point counts during the 2003 breeding season.

Code	Common Name	Scientific Name	Classification
AMCR	American Crow	<i>Corvus brachyrhynchos</i>	Resident
AMGO	American Goldfinch	<i>Carduelis tristis</i>	N. American Migrant
MAKE	American Kestrel	<i>Falco sparverius</i>	Resident
AMRO	American Robin	<i>Turdus migratorius</i>	N. American Migrant
BAOR	Baltimore Oriole	<i>Icterus galbula</i>	Neotropical Migrant
BASW	Barn Swallow	<i>Hirundo rustica</i>	Neotropical Migrant
BCCH	Black-capped Chickadee	<i>Poecile atricapillus</i>	Resident
BLJA	Blue Jay	<i>Cyanocitta cristata</i>	Resident
BOBO	Bobolink	<i>Dolichonyx oryzivorus</i>	Neotropical Migrant
BRTH	Brown Thrasher	<i>Toxostoma rufum</i>	N. American Migrant
BHCO	Brown-headed Cowbird	<i>Molothrus ater</i>	N. American Migrant
CAGO	Canada Goose	<i>Branta Canadensis</i>	N. American Migrant
CEWA	Cedar Waxwing	<i>Bombycilla cedrorum</i>	N. American Migrant
CHSW	Chimney Swift	<i>Chaetura pelagica</i>	Neotropical Migrant
CHSP	Chipping Sparrow	<i>Spizella passerine</i>	Neotropical Migrant
CLSW	Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Neotropical Migrant
COGR	Common Grackle	<i>Quiscalus quiscula</i>	N. American Migrant
COYE	Common Yellowthroat	<i>Geothlypis trichas</i>	Neotropical Migrant
DICK	Dickcissel	<i>Spiza Americana</i>	Neotropical Migrant
DCCO	Double-crested Cormorant	<i>Phalacrocorax auritus</i>	N. American Migrant
DOWO	Downy Woodpecker	<i>Picoides pubescens</i>	Resident
EAME	Eastern Meadowlark	<i>Sturnella magna</i>	N. American
EAKI	Eastern Kingbird	<i>Tyrannus tyrannus</i>	Neotropical Migrant
EWPE	Eastern Wood-Pewee	<i>Contopus virens</i>	Neotropical Migrant
EUST	European Starling	<i>Sturnus vulgaris</i>	Resident
FISP	Field Sparrow	<i>Spizella pusilla</i>	N. American Migrant
GRSP	Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Neotropical Migrant
GRCA	Gray Catbird	<i>Dumetella carolinensis</i>	Neotropical Migrant
GBHE	Great Blue Heron	<i>Ardea herodias</i>	N. American Migrant
GCFL	Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Neotropical Migrant
HESP	Henslow's Sparrow	<i>Ammodramus henslowii</i>	N. American
HOFI	House Finch	<i>Carpodacus mexicanus</i>	Resident
HOSP	House Sparrow	<i>Passer domesticus</i>	Resident
HOWR	House Wren	<i>Troglodytes aedon</i>	Neotropical Migrant
INBU	Indigo Bunting	<i>Passerina cyanea</i>	Neotropical Migrant

KILL	Killdeer	Charadrius vociferous	N. American Migrant
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Table 1. List of birds observed at point counts during the 2003 breeding season (cont.)

Code	Common Name	Scientific Name	Classification
MALL	Mallard	Anas platyrhynchos	N. American Migrant
MODO	Mourning Dove	Zenaida macroura	N. American Migrant
NOBO	Northern Bobwhite	Colinus virginianus	Resident
NOCA	Northern Cardinal	Cardinalis cardinalis	Resident
NOFL	Northern Flicker	Colaptes auratus	N. American Migrant
NRSW	Northern Rough-winged Swallow	Stelgidopteryx serripennis	Neotropical Migrant
PUMA	Purple Martin	Progne subis	Neotropical Migrant
RBWO	Red-bellied Woodpecker	Melanerpes carolinus	Resident
REVI	Red-eyed Vireo	Vireo olivaceus	Neotropical Migrant
RWBL	Red-winged Blackbird	Agelaius phoeniceus	N. American Migrant
RNPH	Ring-necked Pheasant	Phasianus colchicus	Resident
RODO	Rock Dove	Columba livia	Resident
RTHU	Ruby-throated Hummingbird	Archilochus colubris	Neotropical Migrant
SEWR	Sedge Wren	Cistothorus platensis	N. American Migrant
SOSP	Song Sparrow	Melospiza melodia	N. American Migrant
TRSW	Tree Swallow	Tachycineta bicolor	N. American Migrant
WAVI	Warbling Vireo	Vireo gilvus	Neotropical Migrant
YEWA	Yellow Warbler	Dendroica petechia	Neotropical Migrant

Table 2. Total birds observed at all survey points for all surveys.

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
American Crow	1	3	3	4	1			12
American Goldfinch	14	2	9	25	8	14	15	87
American Robin	17	34	14	15		11	24	115
Baltimore Oriole	2	3		1		2	3	11
Barn Swallow	3	3	6	7	9	27	6	61
Black-capped Chickadee	1							1
Brown-headed Cowbird	9	6	9	6	1	9	11	51
Blue Jay	2	5	2	6		4	2	21
Bobolink				1	1	1		3
Brown Thrasher	2							2
Canada Goose		30	5	50			23	108
Cedar Waxwing	11	6	5	5				27
Chipping Sparrow	7	10	14	2		1	6	40
Chimney Swift	9	22	19	2	2	6	10	70
Cliff Swallow	2			3		5	45	55
Common Grackle	25	29	55	45	47	43	40	284
Common Yellowthroat	9	1	1	15	12	19	5	62
Dickcissel	1			4	15	10	5	35
Downy Woodpecker			1					1
Eastern Kingbird				1		1	2	4
Eastern Meadowlark				3	7	11	13	34
European Starling	154	73	203	16	3	17	36	502
Eastern Wood-Pewee			1		1			2
Great Blue Heron				1				1
Great Crested Flycatcher	1		1					2
Gray Catbird	4	9	13	3	1		1	31
Grasshopper Sparrow	1			3	2			6
Henslow's Sparrow				2				2
House Finch	1	3						4
House Sparrow	8	21	36				14	79
House Wren		5	10			3	2	20
Indigo Bunting	7		4	3	1	2	2	19
Killdeer			1	2				3
American Kestrel							1	1
Mallard			1	2				3
Mourning Dove	6	9	12	4	1	4	5	41
Northern Cardinal	14	19	22	7		7	4	73
Northern Flicker	1	1	1	1			1	5
N. Rough-winged Swallow		2						2
Purple Martin				1		1		2
Red-bellied Woodpecker			1					1

Table 2. Total birds observed at all survey points for all surveys (cont.).

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
Red-eyed Vireo				1				1
Ring-necked Pheasant	4		2	7	3	4	6	26
Rock Dove					4	2		6
Red-winged Blackbird	31	1	3	63	59	78	76	311
Sedge Wren						1		1
Song Sparrow	1		5	4	1	7	13	31
Tree Swallow						1	17	18
Warbling Vireo			1	1				2
Yellow Warbler	1			1				2

Table 3. List of birds found at each survey point for survey period one.

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
American Crow	1	3	1	1	1			7
American Goldfinch	5		3	9	4	5	7	33
American Robin	4	7	5	4		5	8	33
Baltimore Oriole		1						1
Barn Swallow	3			1	1	3	1	9
Brown-headed Cowbird	2	2		2		4	2	12
Blue Jay	1		2	3		1		7
Bobolink					1			1
Canada Goose		30		50			23	103
Cedar Waxwing	8	4	2	1				15
Chipping Sparrow	2	4	4	2			1	13
Chimney Swift	2	4	8	1			6	21
Cliff Swallow						4	14	18
Common Grackle	6	10	12	6	1	9	13	57
Common Yellowthroat	4		1	4	4	5	1	19
Dickcissel					3	2		5
Eastern Kingbird							1	1
Eastern Meadowlark				1	2	2	2	7
European Starling	11	10	24	4	1	2	4	56
Eastern Wood-Pewee					1			1
Gray Catbird	1	1	2	2	1		1	8
Grasshopper Sparrow					1			1
House Sparrow		8	5				1	14
House Wren		1	2			2		5
Indigo Bunting	1				1			2
Mallard			1					1
Mourning Dove	3	4	4	2			3	16
Northern Cardinal	2	5	6	2			1	16
Red-eyed Vireo				1				1
Ring-necked Pheasant	3		1	3	1	2	1	11
Red-winged Blackbird	9		1	11	6	8	10	45
Sedge Wren						1		1
Song Sparrow	1			1		2	4	8
Tree Swallow							1	1
Yellow Warbler	1							1

Table 4. List of birds found at each survey point for survey period two.

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
American Goldfinch	4		3	6	2	1	3	19
American Robin		5	3	2		1	5	16
Baltimore Oriole		1						1
Barn Swallow		1			2	3		6
Brown-headed Cowbird		2	2	1	1	2	1	9
Blue Jay		1		2				3
Chipping Sparrow			7			1	3	11
Chimney Swift		7	2					9
Cliff Swallow							9	9
Common Grackle	7	10		12	16	15	9	69
Common Yellowthroat	1			4	4	3	2	14
Dickcissel				2	4	2	2	10
Eastern Meadowlark					1	3	4	8
European Starling	2	13	7	1	1	9		33
Great Blue Heron				1				1
Great Crested Flycatcher			1					1
Gray Catbird		1	3	1				5
Grasshopper Sparrow				2				2
House Finch		1						1
House Sparrow	4	3	6				4	17
House Wren		1	2			1	1	5
Indigo Bunting	1		3	1		1	1	7
Killdeer				1				1
Mourning Dove	1	2	3		1	2		9
Northern Cardinal	2	6	3			2	2	15
Northern Flicker		1	1					2
Purple Martin						1		1
Ring-necked Pheasant	1			1	1	2	4	9
Rock Dove						2		2
Red-winged Blackbird	3		1	13	11	19	18	65
Song Sparrow			2				2	4
Tree Swallow							2	2
Warbling Vireo			1					1

Table 5. List of birds found at each survey point for survey period three.

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
American Crow			1	2				3
American Goldfinch	2	2		6	2	3	4	19
American Robin	4	7	3	5		2	5	26
Baltimore Oriole						1	1	2
Barn Swallow		2	3	3		6	4	18
Brown-headed Cowbird	6	2	6	2		2	5	23
Blue Jay		1				1	1	3
Boblink				1		1		2
Brown Thrasher	1							1
Canada Goose			5					5
Cedar Waxwing			1	4				5
Chipping Sparrow	4	2	3					9
Chimney Swift	2	3	6				3	14
Cliff Swallow						1	9	10
Common Grackle	5	3	31	10	12	4	12	77
Common Yellowthroat	2			4	2	5	1	14
Dickcissel				1	4	2	2	9
Eastern Kingbird						1	1	2
Eastern Meadowlark				1	3	4	3	11
European Starling	135	41	164	7		6	30	383
Gray Catbird	2	4	3					9
House Finch		1						1
House Sparrow	4	3	8				4	19
House Wren		3	4				1	8
Indigo Bunting	3			1		1	1	6
Mallard				2				2
Mourning Dove		2	4			1		7
Northern Cardinal	6	4	7	4		4		25
Northern Flicker				1			1	2
Red-bellied Woodpecker			1					1
Ring-necked Pheasant			1	1	1		1	4
Red-winged Blackbird	11	1		14	13	27	32	98
Song Sparrow				1	1	3	4	9
Tree Swallow							11	11
Warbling Vireo				1				1
Yellow Warbler				1				1

Table 6. List of birds found at each survey point for survey period four.

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
American Crow			1	2				3
American Goldfinch	2	2		6	2	3	4	19
American Robin	4	7	3	5		2	5	26
Baltimore Oriole						1	1	2
Barn Swallow		2	3	3		6	4	18
Brown-headed Cowbird	6	2	6	2		2	5	23
Blue Jay		1				1	1	3
Boblink				1		1		2
Brown Thrasher	1							1
Canada Goose			5					5
Cedar Waxwing			1	4				5
Chipping Sparrow	4	2	3					9
Chimney Swift	2	3	6				3	14
Cliff Swallow						1	9	10
Common Grackle	5	3	31	10	12	4	12	77
Common Yellowthroat	2			4	2	5	1	14
Dickcissel				1	4	2	2	9
Eastern Kingbird						1	1	2
Eastern Meadowlark				1	3	4	3	11
European Starling	135	41	164	7		6	30	383
Gray Catbird	2	4	3					9
House Finch		1						1
House Sparrow	4	3	8				4	19
House Wren		3	4				1	8
Indigo Bunting	3			1		1	1	6
Mallard				2				2
Mourning Dove		2	4			1		7
Northern Cardinal	6	4	7	4		4		25
Northern Flicker				1			1	2
Red-bellied Woodpecker			1					1
Ring-necked Pheasant			1	1	1		1	4
Red-winged Blackbird	11	1		14	13	27	32	98
Song Sparrow				1	1	3	4	9
Tree Swallow							11	11
Warbling Vireo				1				1
Yellow Warbler				1				1

Table 7. Total number of birds observed during the bird surveys (includes point and interpoint data).

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
American Crow	6	3	7	8	1		7	32
American Goldfinch	23	2	10	27	11	19	23	115
American Robin	26	36	20	20		12	45	159
Baltimore Oriole	3	3		2		2	3	13
Barn Swallow	5	3	6	11	9	27	7	68
Black-capped Chickadee	2							2
Brown-headed Cowbird	17	6	13	7	4	10	16	73
Blue Jay	5	5	3	10	1	4	5	33
Boblink				3	3	1		7
Brown Thrasher	2			1		1		4
Canada Goose		30	5	50			23	108
Cedar Waxwing	21	6	5	5			5	42
Chipping Sparrow	11	11	16	3		2	11	54
Chimney Swift	12	22	23	8	2	6	15	88
Cliff Swallow	2			5		6	45	58
Common Grackle	43	38	58	67	47	50	54	357
Common Yellowthroat	11	1	1	17	14	23	7	74
Double-crested Cormorant			2					2
Dickcissel	2			5	16	13	5	41
Downy Woodpecker			1	1				2
Eastern Kingbird	1			1		1	4	7
Eastern Meadowlark	1			5	8	11	16	41
European Starling	193	82	309	17	8	27	63	699
Eastern Wood-Pewee			1	2	1		3	7
Field Sparrow					2			2
Great Blue Heron				1		1		2
Great Crested Flycatcher	1		1	1				3
Gray Catbird	6	10	18	7	1		7	49
Grasshopper Sparrow	1			4	2			7
Henslow's Sparrow				2				2
House Finch	2	3					1	6
House Sparrow	18	26	40	4		10	30	128
House Wren	1	5	12	2		3	14	37
Indigo Bunting	9	1	4	3	1	2	13	33
Killdeer			1	2				3
American Kestrel							1	1
Mallard	3		1	2				6
Mourning Dove	11	9	13	5	1	4	8	51
Northern Bobwhite							1	1

Table 7. Total number of birds observed during the bird surveys (cont.).

Common Name	Survey Point							Total
	1	2	3	4	5	6	7	
Northern Cardinal	22	21	25	11	1	7	19	106
Northern Flicker	1	1	2	1			4	9
N. Rough-winged Swallow	1	2					1	4
Purple Martin				1	1	1		3
Red-bellied Woodpecker			1					1
Red-eyed Vireo				1				1
Ring-necked Pheasant	4		3	7	7	5	7	33
Rock Dove					4	2		6
Ruby-throated Hummingbird				1				1
Red-winged Blackbird	39	1	3	65	66	80	82	336
Sedge Wren						1		1
Song Sparrow	2		5	5	1	10	16	39
Tree Swallow	1		1	1		1	19	23
Warbling Vireo			1	1			1	3
Yellow Warbler	1			1		1		3

Table 8. Total number of birds observed at the interpoints and the seven points, number of points birds were observed at, and the percent of point birds were observed.

Common Name	Interpoint	Point	Total	Point Counts	
				# Points observed (all periods)	%
American Crow	20	12	32	9	32.1
American Goldfinch	28	87	115	23	82.1
American Kestrel		1	1	1	3.6
American Robin	44	115	159	23	82.1
Baltimore Oriole	2	11	13	9	32.1
Barn Swallow	7	61	68	18	64.3
Black-capped Chickadee	1	1	2	1	3.6
Blue Jay	12	21	33	14	50.0
Boblink	4	3	7	3	10.7
Brown Thrasher	2	2	4	2	7.1
Brown-headed Cowbird	22	51	73	22	78.6
Canada Goose		108	108	4	14.3
Cedar Waxwing	15	27	42	9	32.1
Chimney Swift	18	70	88	18	64.3
Chipping Sparrow	14	40	54	14	50.0
Cliff Swallow	3	55	58	8	28.6
Common Grackle	73	284	357	27	96.4
Common Yellowthroat	12	62	74	22	78.6
Dickcissel	6	35	41	15	53.6
Double-crested Cormorant	2	0	2	0	
Downy Woodpecker	1	1	2	1	3.6
Eastern Meadowlark	7	34	41	15	53.6
Eastern Kingbird	3	4	7	4	14.3
Eastern Wood-Pewee	5	2	7	2	7.1
European Starling	197	502	699	25	89.3
Field Sparrow	2	0	2	0	
Grasshopper Sparrow	1	6	7	5	17.9
Gray Catbird	18	31	49	15	53.6
Great Blue Heron	1	1	2	1	3.6
Great Crested Flycatcher	1	2	3	2	7.1
Henslow's Sparrow		2	2	1	3.6
House Finch	2	4	6	4	14.3
House Sparrow	49	79	128	14	50.0

Table 8. Total number of birds observed at the interpoints and the seven points, number of points

birds were observed at, and the percent of point birds were observed (cont.).

Common Name	Interpoint	Point	Total	Point Counts	
				# Points observed (all periods)	%
House Wren	17	20	37	11	39.3
Indigo Bunting	14	19	33	14	50.0
Killdeer		3	3	3	10.7
Mallard	3	3	6	2	7.1
Mourning Dove	10	41	51	19	67.9
Northern Bobwhite	1	0	1	0	
Northern Cardinal	33	73	106	21	75.0
Northern Flicker	4	5	9	5	17.9
Northern Rough-winged Swallow	2	2	4	1	3.6
Purple Martin	1	2	3	2	7.1
Red-bellied Woodpecker		1	1	1	3.6
Red-eyed Vireo		1	1	1	3.6
Red-winged Blackbird	25	311	336	24	85.7
Ring-necked Pheasant	7	26	33	16	57.1
Rock Dove		6	6	2	7.1
Ruby-throated Hummingbird	1	0	1	0	
Sedge Wren		1	1	1	3.6
Song Sparrow	8	31	39	14	50.0
Tree Swallow	5	18	23	5	17.9
Warbling Vireo	1	2	3	2	7.1
Yellow Warbler	1	2	3	2	7.1
Grand Total	705	2281	2986		