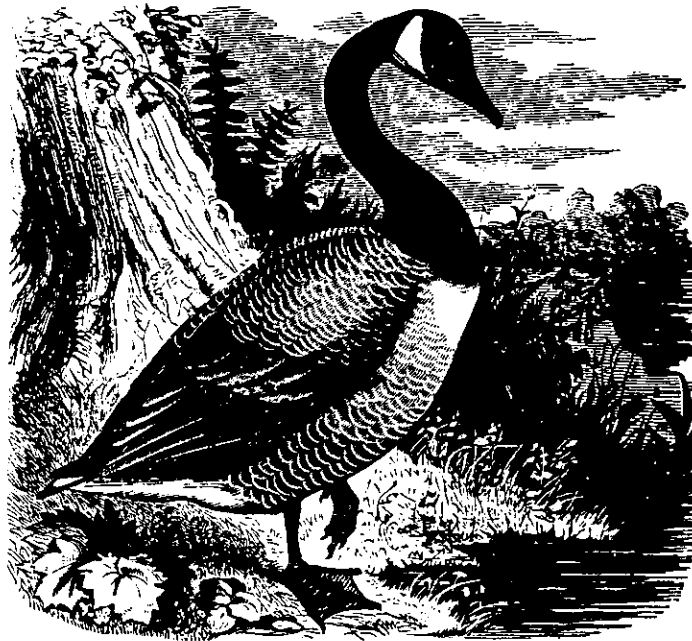


Breeding Bird Survey
of Snakeden Hollow State Fish and Wildlife Area,
Knox County, Illinois

Center for Biodiversity
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INTRODUCTION

Snakeden Hollow State Fish and Wildlife Area is currently managed for improvement of Canada Goose habitat but the site has the potential to provide habitat for numerous non-game bird species without detracting from goose management objectives. This study was undertaken to determine which bird species currently breed at Snakeden Hollow, and to estimate population sizes of the breeding species. Emphasis was on grassland and shrubland species because many species in these habitats are regionally declining (Askins, Herkert, Knopf), and much of the site is currently hayfields and successional fields that could be managed for grassland and/or shrubland birds.

STUDY SITE

Snakeden Hollow is located in Knox County, Illinois, approximately 14 miles northeast of Galesburg and 1 mile southeast of Victoria. The 2,500 acre site includes numerous ponds formed after surface mining operations. Most of the northern two-thirds of the site is used for hayfields or row crops under cooperative agreements with local farmers. Willows occur around many of the ponds and cattails occur in a few areas. The grassland areas are dominated by non-native plant species. Aside from some pale coneflower (*Echinacea pallida*) and goldenrod (*Solidago* sp.) in an otherwise sparsely vegetated area east of trail marker 3, and abundant stands of the weedy daisy fleabane (*Erigeron strigosus*), native plant species were generally absent from the grassland areas. Large populations of thistles (*Carduus* ?) and parsnip (*Pastinaca sativa*) are potential management problems. Some of the most common trees outside the wooded areas were willow (*Salix* sp.), box elder (*Acer negundo*), and black locust (*Robinia pseudoacacia*).

METHODS

Bird species occurrence and population sizes were estimated with point counts at 18 locations (Figure 1). The points were approximately 0.5 miles apart on the main trails. All birds seen or heard within 100m radius were recorded for 5 minutes at each point on June 18, 22, and 25, 1999. Presence/absence was also recorded for points 1-11 on 5 June. All surveys at Snakeden were conducted between 06:00 and 10:00. Note that point counts do not survey all species equally; diurnal species that advertise territories by singing are adequately surveyed, but counts for nocturnal species, waterbirds, shorebirds, and species with large home ranges may be underestimates.

To supplement the point counts, observations indicating breeding activity were recorded. These observations were used to assign each species one of the following breeding status levels: confirmed, probable, possible, or unlikely. The types of observations indicating breeding status were (in order of decreasing likelihood of breeding): nest with eggs or nestlings, parents with recently fledged young, adult bird carrying nesting material, food, or fecal sac, male and female in close proximity (pair), multiple males singing at one point count location, several birds (probably of both sexes), and one bird observed.

Vegetation within 100m of each point count locations was characterized in three ways. First, the proportion of the area composed of fields, trees, ponds, and rowcrops was estimated visually. Fields included hayfields or successional fields dominated by herbaceous vegetation < 2 m tall. Row crops included corn, sunflower, and wheat. Second, vegetation structure was measured with a Robel pole (Robel et al. 1970) at 4 randomly selected locations within grassland areas at each point. Each Robel measurement is a combination of vegetation height and density obtained by recording the lowest 10-cm interval visible from 1 m above ground and 2 m away from the pole. Four readings were taken for each randomly selected location, so that the measurement for each point count location is the average of 16 readings. Leaf litter was measured at the same points and is also the average of 16 values for each point count location. Finally, the number of trees (> 2 m) and shrubs (< 2 m) within the 100 m radius was counted (up to 50) at each point count location.

On 18 and 25 June Victoria Pheasant Habitat area was visited after the counts at Snakeden Hollow. Points counts were not conducted at Victoria because the visits were too late in the day to yield accurate counts. Instead, all birds seen and heard were recorded while walking a loop transect through the site.

RESULTS

A total of 66 species were observed (Table 1) including 10 grassland and 20 shrubland species (Table 2). No state or federal threatened or endangered species were recorded. All but three species are at least possible breeders, and 23 species are confirmed breeders (Table 2). The most abundant species were Red-winged Blackbird and Canada Goose, both of which were far more abundant than any other species. Among grassland species, Eastern Meadowlark was the most common, followed by Dickcissel, Killdeer, and Grasshopper Sparrow (Table 1). American Goldfinch, Song Sparrow, and Common Yellowthroat were the most common shrubland species, followed by Indigo Bunting, Willow Flycatcher, Northern Bobwhite, Field Sparrow, and Brown Thrasher.

The most important points for grassland species were points 1, 7, 8, 13, and 14 (Fig. 1). Each of these points had at least three grassland species within the 100 m point count radius (Table 3). In addition, point 15 was significant because it was the only point where Sedge Wrens were observed, and at least one individual was seen there at each survey date. This point had tall, dense vegetation in contrast to most other grassland sites which had shorter, sparser vegetation (Table 4).

Shrubland species were generally more common than grassland species throughout the site. On average, 8 of 18 points had twice as many shrubland than grassland species, while the converse was true for only 5 points (see previous paragraph; Table 3). Points 2-4, 6, and 9-12 had at least three shrubland species and points 2 and 6 were particularly important with at least 5 species each. A singing male Bell's Vireo was observed at point 11 on June 5 but not during any of the subsequent point counts. This bird may have been a migrant because its distinctive song is not likely to be missed.

Species notable for their absence at the site include Horned Lark and Yellow-headed Blackbird. Although appropriate habitat for Horned Lark occurs at Snakeden Hollow, this species is an early breeder and sings less in late June when these surveys were conducted. The abundance of cattails at points 4 and 5 and between 5 and 7, could provide suitable habitat for Yellow-headed Blackbird. The cattail marshes should be monitored for this species.

Notable species observed at Victoria Pheasant Area include the state endangered Henslow's Sparrow and the tallgrass prairie specialist Bobolink (Table 5). Dickcissel and Eastern Meadowlark were the other important grassland species observed. The visits to Victoria were at the worst time of day so other grassland species could be using the site.

MANAGEMENT RECOMMENDATIONS

The grassland areas at Snakeden Hollow are dominated by non-native plant species, and few species in general. If management for regionally declining grassland birds is an objective for the site, a greater diversity of native prairie species could be planted. In particular, Round-headed bush-clover is a favored perch for species such as Grasshopper sparrow and Dickcissel. A mix of plant species within a field, and different mixes in different fields will probably provide habitat for a greater diversity of birds by providing greater structural diversity. In addition, introduction of prescribed burns along with native vegetation will increase habitat diversity and control many species of non-native invasive plants.

The presence of Sedge wrens at one point at Snakeden, and Henslow's Sparrow and Bobolink at Victoria only a few miles away, suggest that these species will increase at Snakeden if a larger area of suitable habitat is available. However, the numerous ponds and the woody vegetation associated with them may limit colonization of the site by area sensitive species (Herkert 1994a). In that regard, Snakeden may have better potential as shrubland than as grassland habitat. The site already has significant populations of Willow Flycatcher and Yellow Warbler, both considered shrubland species of management concern (S. Robinson, personal communication). The willows around the ponds will be difficult to control without intensive effort and that effort may be better spent controlling autumn olive (*Eleagnus*), honeysuckle (*Lonicera*), and black locust that will quickly increase if the fields are not mowed or burned. The woodland areas at Snakeden are generally of low quality and do not contain any species of management concern (i.e. area sensitive or forest interior species), so they could be managed as shrubland by selective cutting and perhaps prescribed burns (Askins 1998).

In general the habitat at Victoria is better than any of the grassland areas at Snakeden Hollow, probably because of its relatively large size, lack of woody vegetation, and proximity to other grasslands (probably all hayfields). If Victoria is used for hay it may be best to cut only a portion each year. In order to minimize fragmentation of the site the haying units could be arranged so that each has at least one edge along the boundary and none are entirely in the middle. A gradual introduction of native plant species may attract additional grassland specialists. The Henslow's Sparrows should be monitored to determine if they use different areas of the site or remain in the same section year after year. They prefer habitat with standing dead vegetation, and if they do not colonize other portions of the site it may be necessary to extend the interval between haying (Herkert 1994b).

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Table 1. Birds observed at Snakeden Hollow State Fish and Wildlife Area. The column "5-Jun" lists the total number of birds seen during a preliminary visit. The remaining columns are based on three point counts conducted June 18, 22, and 25, 1999 and include in order: the total number of birds seen at all 18 points averaged among the three count dates, the number of points where each species was observed at least once, the average number of individuals observed at points where they were recorded at least once, the average number of individuals for all points combined, and the total estimated population size based on the previous column extrapolated over the entire site. 0* indicates that species was observed only beyond the 100m radius of the point counts. Scientific names of all species are listed in Table 2.

Species	5-Jun	#birds	#points	avg/pt	avg/allpt	est. pop.
Great Blue Heron	2	2	2	1.0	0.11	36
Great Egret	1	0	0	0.0	0.00	0
Green Heron	0	1	1	1.0	0.06	18
Turkey Vulture	2	0	0	0.0	0.00	0
Canada Goose	82	45	2	22.5	2.50	810
Wood Duck	2	4	2	2.0	0.22	72
Mallard	1	4	2	2.0	0.22	72
Red-tailed Hawk	1	2	2	1.0	0.11	36
Ring-necked Pheasant	4	3	3	1.0	0.17	54
Wild Turkey	0	0*	0	0.0	0.00	0
Northern Bobwhite	2	6	4	1.5	0.33	108
Killdeer	8	12	8	1.5	0.69	222
Spotted Sandpiper	0	0*	0	0.0	0.00	0
American Woodcock	0	1	1	1.0	0.06	19
Rock Dove	0	0*	0	0.0	0.00	0
Mourning Dove	6	6	5	1.2	0.33	108
Yellow-billed Cuckoo	0	1	1	1.0	0.06	18
Great Horned Owl	0	1	1	1.0	0.06	18
Chimney Swift	0	0*	0	0.0	0.00	0
Ruby-throated Hummingbird	0	0*	0	0.0	0.00	0
Belted Kingfisher	0	2	2	1.0	0.11	36
Red-headed Woodpecker	0	0*	0	0.0	0.00	0
Red-bellied Woodpecker	1	2	2	1.0	0.11	36
Downy Woodpecker	1	4	4	1.0	0.22	72
Northern Flicker	1	2	2	1.0	0.11	36
Eastern Pewee	1	2	1	1.5	0.08	27
Willow Flycatcher	2	6	5	1.2	0.33	108
Great Crested Flycatcher	1	0	0	0.0	0.00	0
Eastern Kingbird	4	11	7	1.5	0.58	189

Table 1. continued

Species	5-Jun	#birds	#points	avg/pt	avg/allpt	est. pop.
Bell's Vireo	1	0	0	0.0	0.00	0
Warbling Vireo	6	12	10	1.2	0.68	219
Blue Jay	12	8	4	2.0	0.44	144
American Crow	7	0	0	0.0	0.00	0
Tree Swallow	0	8	2	3.8	0.42	135
N. Rough-winged Swallow	0	0*	0	0.0	0.00	0
Barn Swallow	6	0	0	0.0	0.00	0
Black-capped Chickadee	2	6	4	1.4	0.31	99
White-breasted Nuthatch	0	0*	0	0.0	0.00	0
House Wren	7	7	6	1.1	0.36	117
Sedge Wren	0	2	1	2.0	0.07	24
Blue-gray Gnatcatcher	1	1	1	1.0	0.06	18
Eastern Bluebird	0	1	1	1.0	0.06	18
American Robin	11	16	12	1.3	0.89	288
Gray Catbird	1	2	2	1.0	0.11	36
Brown Thrasher	4	5	5	1.0	0.28	90
European Starling	0	2	1	2.0	0.11	36
Cedar Waxwing	0	2	1	2.0	0.11	36
Yellow Warbler	3	4	3	1.2	0.20	66
Common Yellowthroat	5	14	13	1.1	0.79	255
Eastern Towhee	1	1	1	1.0	0.06	18
Field Sparrow	2	6	6	1.0	0.33	108
Vesper Sparrow	0	1	1	1.0	0.06	19
Grasshopper Sparrow	2	8	6	1.4	0.46	150
Song Sparrow	5	15	11	1.3	0.81	261
Northern Cardinal	5	10	6	1.6	0.53	171
Rose-breasted Grosbeak	2	3	2	1.3	0.14	45
Indigo Bunting	3	8	8	1.0	0.46	150
Dickcissel	7	16	10	1.6	0.91	294
Red-winged Blackbird	27	105	18	5.8	5.81	1884
Eastern Meadowlark	6	29	16	1.8	1.62	525
Common Grackle	7	15	8	1.9	0.83	270
Brown-headed Cowbird	23	29	12	2.4	1.59	516
Orchard Oriole	2	3	3	1.0	0.17	54
Baltimore Oriole	5	3	2	1.3	0.15	48
American Goldfinch	8	16	8	2.0	0.89	288
House Sparrow	5	6	1	6.3	0.35	114

Table 2. Breeding status of birds at Snakeden Hollow. Status codes in order of decreasing likelihood of breeding are Co (confirmed), Pr (probable), Po (possible), and Un (unlikely). Observation lists the highest category of breeding behavior that supports the breeding status designation. Habitats are modified from Herkert (1995) and include grassland (G), shrubland (S), forest and woodland (F), wetlands (W), and open, urban, and other (O).

Common name	Scientific name	habitat	status	Observation
Great Blue Heron	<i>Ardea herodias</i>	W	Un	several birds
Great Egret	<i>Ardea alba</i>	W	Un	one bird
Green Heron	<i>Butorides virescens</i>	W	Po	several birds
Turkey Vulture	<i>Cathartes aura</i>	O	Po	several birds
Canada Goose	<i>Branta canadensis</i>	W	Co	fledglings
Wood Duck	<i>Aix sponsa</i>	W	Co	fledglings
Mallard	<i>Anas platyrhynchos</i>	W	Co	fledglings
Red-tailed Hawk	<i>Buteo jamaicensis</i>	O	Pr	immature
Ring-necked Pheasant	<i>Phasianus colchicus</i>	G	Pr	multiple males
Wild Turkey	<i>Meleagris gallopavo</i>	F	Pr	multiple males
Northern Bobwhite	<i>Colinus virginianus</i>	S	Co	fledglings
Killdeer	<i>Charadrius vociferus</i>	G	Co	fledglings
Spotted Sandpiper	<i>Actitis macularia</i>	W	Un	one bird
American Woodcock	<i>Scolopax minor</i>	W	Po	one bird
Rock Dove	<i>Columba livia</i>	O	Po	one bird
Mourning Dove	<i>Zenaida macroura</i>	S	Co	fledglings
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	S	Pr	multiple males
Great Horned Owl	<i>Bubo virginianus</i>	F	Po	one bird
Chimney Swift	<i>Chaetura pelagica</i>	O	Po	several birds
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	F	Po	one bird
Belted Kingfisher	<i>Ceryle alcyon</i>	W	Po	several birds
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S	Po	one bird
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	F	Pr	pair
Downy Woodpecker	<i>Picoides pubescens</i>	F	Pr	pair
Northern Flicker	<i>Colaptes auratus</i>	F	Pr	pair
Eastern Pewee	<i>Contopus virens</i>	F	Pr	several birds
Willow Flycatcher	<i>Empidonax traillii</i>	S	Pr	multiple males
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	F	Po	one bird
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S	Co	nest
Bell's Vireo	<i>Vireo belli</i>	S	Po	one bird
Warbling Vireo	<i>Vireo gilvus</i>	F	Co	nest material
Blue Jay	<i>Cyanocitta cristata</i>	F	Co	fledglings
American Crow	<i>Corvus brachyrhynchos</i>	F	Co	fledglings
Tree Swallow	<i>Tachycineta bicolor</i>	O	Co	fledglings
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	O	Po	one bird

Table 2. continued

Common name	Scientific name	habitat	status	Observation
Barn Swallow	<i>Hirundo rustica</i>	O	Co	nest
Black-capped Chickadee	<i>Poecile atricapillus</i>	F	Pr	several birds
White-breasted Nuthatch	<i>Sitta carolinensis</i>	F	Po	one bird
House Wren	<i>Troglodytes aedon</i>	S	Co	nest
Sedge Wren	<i>Cistothorus platensis</i>	G	Pr	multiple males
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	F	Pr	multiple males
Eastern Bluebird	<i>Sialia sialis</i>	S	Po	several birds
American Robin	<i>Turdus migratorius</i>	F	Co	nest
Gray Catbird	<i>Dumetella carolinensis</i>	S	Pr	multiple males
Brown Thrasher	<i>Toxostoma rufum</i>	S	Co	carrying food
European Starling	<i>Sturnus vulgaris</i>	O	Co	nest
Cedar Waxwing	<i>Bombycilla cedrorum</i>	F	Po	several birds
Yellow Warbler	<i>Dendroica petechia</i>	S	Pr	multiple males
Common Yellowthroat	<i>Geothlypis trichas</i>	S	Pr	pairs
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	S	Pr	pair
Field Sparrow	<i>Spizella pusilla</i>	S	Pr	multiple males
Vesper Sparrow	<i>Pooecetes gramineus</i>	G	Po	one bird
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	G	Co	carrying food
Song Sparrow	<i>Melospiza melodia</i>	S	Co	nest material
Northern Cardinal	<i>Cardinalis cardinalis</i>	S	Pr	pairs
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	F	Pr	pair
Indigo Bunting	<i>Passerina cyanea</i>	S	Pr	pairs
Dickcissel	<i>Spiza americana</i>	G	Pr	multiple males
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	W	Co	carrying food
Eastern Meadowlark	<i>Sturnella magna</i>	G	Co	nest
Common Grackle	<i>Quiscalus quiscula</i>	O	Co	carrying fecal sac
Brown-headed Cowbird	<i>Molothrus ater</i>	G	Pr	multiple pairs
Orchard Oriole	<i>Icterus spurius</i>	S	Pr	pairs
Baltimore Oriole	<i>Icterus galbula</i>	F	Co	nest
American Goldfinch	<i>Carduelis tristis</i>	S	Co	nest material
House Sparrow	<i>Passer domesticus</i>	O	Co	fledglings

Table 3. Number of species (#spp) and individuals (#birds) averaged among the three count dates for each point. Subsequent columns have the number of species (sp) and individuals (in) for the following habitats: grassland (G), shrubland (S), forest and woodland (F), wetlands (W), and other (O). Habitat designations for each species are listed in Table 2.

Point	#spp	#birds	#Gsp	#Gin	#Ssp	#Sin	#Fsp	#Fin	#Wsp	#Win	#Osp	#Oin
1	6.67	16.00	3.67	4.67	1.33	1.67	0.67	0.67	1.00	9.00	0.00	0.00
2	10.67	28.00	1.67	3.33	5.33	5.33	1.33	1.67	1.00	10.67	1.33	7.00
3	7.67	12.00	0.33	0.67	3.67	4.67	3.00	3.33	0.67	3.33	0.00	0.00
4	9.33	21.33	1.67	4.00	3.67	3.67	2.33	3.00	1.33	10.00	0.33	0.67
5	7.67	33.33	2.00	4.67	2.33	3.67	1.67	1.67	1.33	22.00	0.33	1.33
6	10.00	19.00	1.00	1.67	5.00	7.00	2.67	4.33	1.00	5.67	0.33	0.33
7	8.33	17.33	4.67	9.33	2.00	2.00	0.33	0.33	1.00	5.00	0.33	0.67
8	7.33	15.00	3.33	6.33	0.33	0.33	2.00	2.33	1.33	5.00	0.33	1.00
9	9.00	14.00	1.00	1.00	3.33	4.33	3.33	5.67	0.67	1.33	0.67	1.67
10	7.00	12.67	1.67	3.67	4.00	4.33	0.00	0.00	0.67	4.00	0.67	0.67
11	7.33	15.33	1.33	1.67	3.67	7.00	0.67	1.33	1.67	5.33	0.00	0.00
12	9.00	11.33	0.67	0.67	4.00	4.67	4.00	5.33	0.33	0.67	0.00	0.00
13	5.33	15.33	3.33	10.00	0.67	1.00	0.00	0.00	1.00	4.00	0.33	0.33
14	5.67	16.00	3.00	5.00	0.00	0.00	0.33	0.33	1.67	8.33	0.67	2.33
15	5.33	11.00	2.67	4.00	1.67	1.67	0.00	0.00	1.00	5.33	0.00	0.00
16	6.67	14.00	1.67	3.67	1.67	2.00	1.33	1.67	1.67	6.33	0.33	0.33
17	6.67	13.00	2.00	3.00	2.67	3.00	1.00	1.00	1.00	6.00	0.00	0.00
18	3.67	6.00	1.33	1.33	1.00	1.33	0.00	0.00	1.00	3.00	0.33	0.33

Table 4. Vegetation characteristics at 18 point count locations at Snakeden Hollow Wildlife Area. All variables were measured within 100 m of the point. Robel is the average of 16 readings that combine vegetation height and density (see methods). Litter depth is also an average of 16 readings at each point. Robel and litter only apply to grassland areas. Shrubs and trees are the number of woody plants < 2 m and > 2 m, respectively. Finally, the percentage of each 100m radius area covered by fields, trees, ponds, and rowcrops was estimated visually. Fields included hayfields or other areas dominated by herbaceous vegetation < 2 m tall. Row crops included corn (point 3), sunflower (points 1, 9 12) and wheat (point 2).

Point	Robel	Litter	shrubs	trees	%field	%trees	%pond	%crop	%other
1	6.08	1.17	5	15	80	10	0	10	0
2	5.75	1.33	> 50	> 50	50	20	0	30	0
3	3.75	1.00	15	30	40	15	0	40	5 road
4	1.00	0.00	> 50	15	30	30	30	0	10 cattails
5	1.88	0.81	24	22	60	10	20	0	10 cattails
6	3.17	1.58	> 50	> 50	50	10	20	0	0
7	3.38	0.31	3	2	80	0	20	0	0
8	3.08	0.83	> 50	8	60	30	10	0	0
9	3.29	2.75	> 50	> 50	40	30	10	20	0
10	3.88	1.69	> 50	30	60	10	30	0	0
11	3.25	0.50	> 50	> 50	60	30	10	0	0
12	1.00	0.00	27	> 50	20	50	0	30	0
13	4.42	0.33	6	> 50	70	15	15	0	0
14	2.08	1.00	6	4	80	30	5	0	0
15	6.13	1.50	4	1	100	0	0	0	0
16	2.88	0.45	9	25	65	20	15	0	0
17	2.67	2.75	18	28	75	10	15	0	0
18	3.08	0.25	5	2	50	0	50	0	0

Table 5. Birds observed at Victoria Pheasant Habitat Area, Knox County, on June 18 and 25, 1999. Data are the number of different individuals seen or heard while walking a loop transect through the site between 10:00 and 13:00.

Common Name	Scientific Name	18 June	25- June
Mallard	<i>Anas platyrhynchos</i>	4	0
Ring-necked Pheasant	<i>Phasianus colchicus</i>	2	1
Northern Bobwhite	<i>Colinus virginianus</i>	1	1
Killdeer	<i>Charadrius vociferus</i>	2	3
Mourning Dove	<i>Zenaida macroura</i>	6	8
Tree Swallow	<i>Tachycineta bicolor</i>	2	2
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	0	2
Barn Swallow	<i>Hirundo rustica</i>	2	3
Common Yellowthroat	<i>Geothlypis trichas</i>	2	1
Henslow's Sparrow	<i>Ammodramus henslowi</i>	2	1
Song Sparrow	<i>Melospiza melodia</i>	2	4
Dickcissel	<i>Spiza americana</i>	10	12
Bobolink	<i>Dolichonyx oryzivorus</i>	0	1
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	20	25
Eastern Meadowlark	<i>Sturnella magna</i>	10	11
Common Grackle	<i>Quiscalus quiscula</i>	2	2
Brown-headed Cowbird	<i>Molothrus ater</i>	5	2
American Goldfinch	<i>Carduelis tristis</i>	4	2
House Sparrow	<i>Passer domesticus</i>	2	0

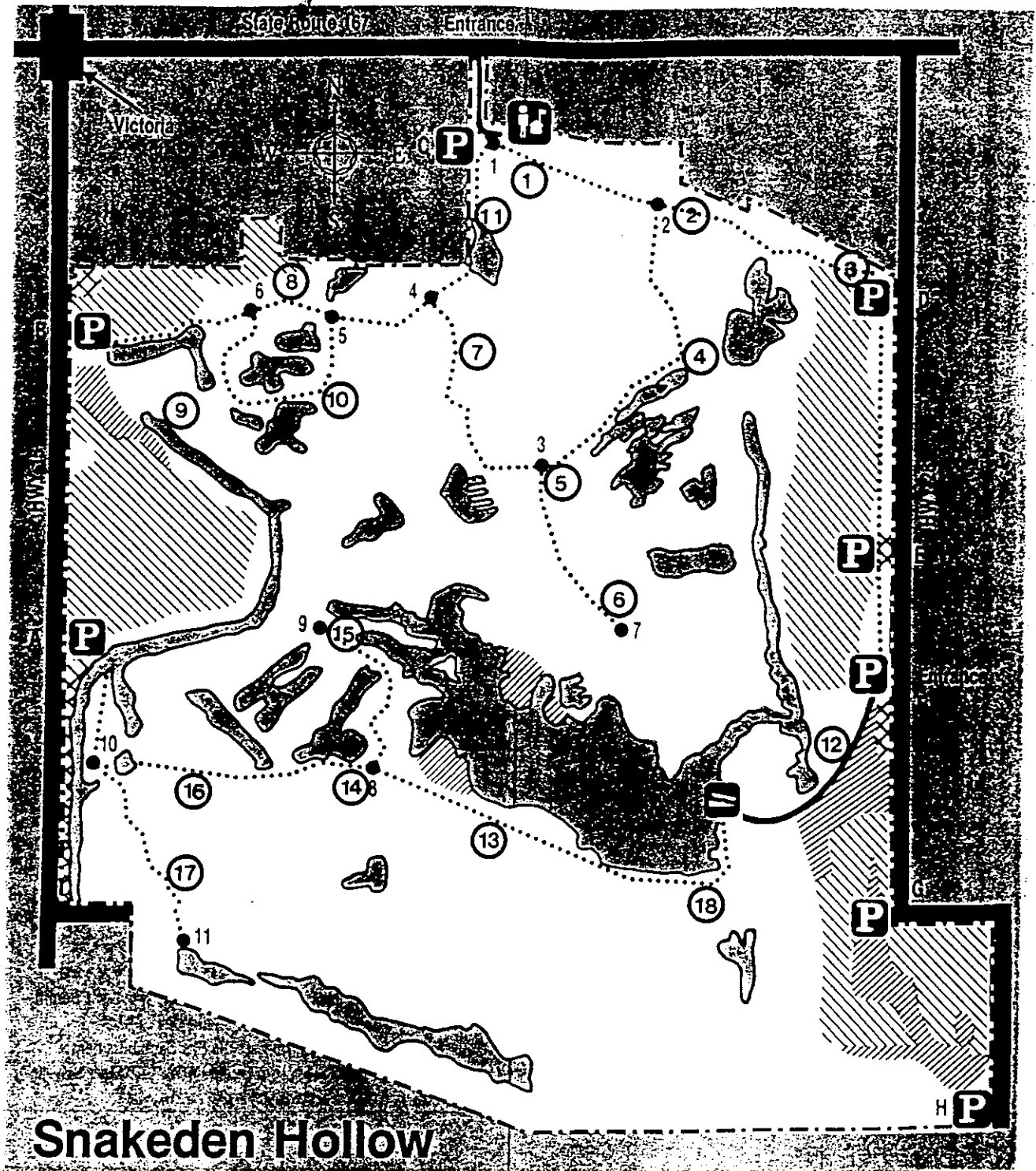


Figure 1. Map of Snakeden Hollow State Fish and Wildlife Area showing point count locations (circled numbers), trails (dotted lines), numbered signposts (numbers), agricultural fields (top left to bottom right lines), wooded areas (narrowly spaced diagonal lines), and ponds (shaded areas).