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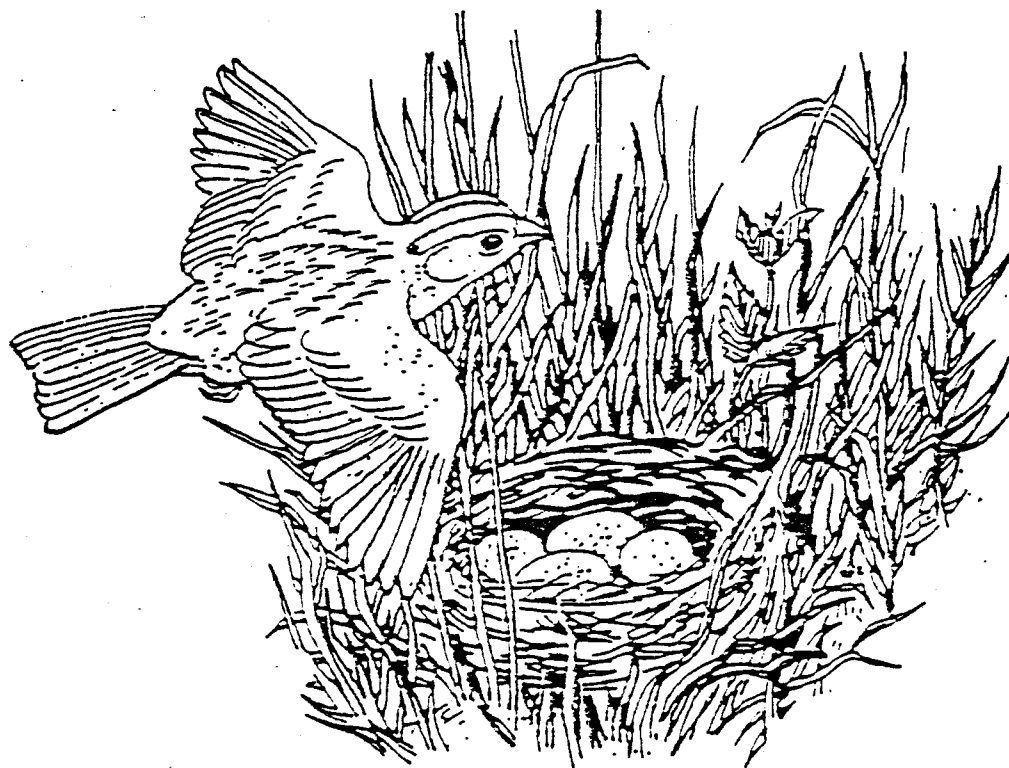
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1997 Upland Bird Survey of the  
Savanna Army Depot Activity,  
Carroll and Jo Daviess Counties, Illinois



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Illinois Department of Natural Resources  
June 1998



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## INTRODUCTION

### Location and Background

The Savanna Army Depot Activity (SVDA) is located in southwestern Jo Daviess and extreme northwestern Carroll counties, Illinois (Fig. 1). The 13,062-acre (5,327-hectare) SVDA contains approximately 7,000 acres (2,800 ha) of sand prairie and sand savanna/forest and 5,500 acres (2,200 ha) of Mississippi River backwater lakes and islands. The sand prairie-savanna portion is the largest example of this community type remaining in the State. It is because of the large size of this sand prairie that the SVDA hosts large populations of several, increasingly rare species of grassland birds.

On 1-2 June 1990, personnel with the Illinois Department of Conservation (now the Illinois Department of Natural Resources, IDNR) conducted a preliminary study of the abundance of birds in the upland portion of the SVDA. This survey recorded the number of bird species observed visually or audibly at 114 sample points established throughout the uplands; as a result, a total of 59 species of birds were identified. This preliminary survey in 1990 discovered an abundance of grassland birds that have shown dramatic declines in the Midwest to be present at SVDA. These initial findings precipitated the annual upland bird surveys which were initiated in 1994 and continued as part of the long-term monitoring of the grassland birds found here.

The SVDA was purchased by the U.S. Army in 1917 and has been used as a proof and test facility for artillery guns and howitzers and ammunition storage (U.S. Fish and Wildlife Service, USFWS 1996). SVDA is selected for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510 and will be closed by September 2000. Approximately, 9,083 acres (3,676 ha) of SVDA are proposed to be transferred to the National Wildlife Refuge System administered by the USFWS, Upper Mississippi River National Wildlife and Fish Refuge, Savanna District. The acreage proposed for addition will include about 6,000 acres (2,428 ha) of bottomland and about 3,083 acres (1,248 ha) of uplands. The U.S. Army Corps of Engineers has requested 460 acres (186 ha) and the Local Redevelopment Authority has requested 3,519 (1,424 ha) for economic development.

The IDNR will enter into cooperative agreement with USFWS to manage the uplands. The primary objective of this addition is to expand habitat for migratory birds (USFWS 1996). Secondary objectives include: the continued conservation of wetlands and prairie habitat for the benefit of all wildlife species; provide recreational activities; and environmental education (USFWS 1996).

### Natural Features

The upland portion of the SVDA lies at the southern edge of the "Driftless" area, within the Mississippi River Section of the Illinois and Mississippi River Sand Areas Natural Division, Figure 2 (Schwegman et al. 1973). This natural division is characterized by scrub oak forest and dry

sand prairie with several plants species found here being more typical of the short-grass prairies to the west of Illinois (Schwegman et al. 1973). The SVDA uplands occupy a 12-mile (20-km) long sand deposit along the east bank of the Mississippi River. The lowlands lie within the Upper Mississippi River Bottomland Natural Division. The entire SVDA complex was identified as a State-wide significant natural area by the Illinois Natural Areas Inventory (INAI #965) during the mid-1970's (White 1978).

The sand prairie and its vegetation at the SVDA were studied and described by Pepon (1909) and Gleason (1910). In 1991-92, the prairie vegetation at the SVDA again was sampled and described by Bowles (1993). Presently, the uplands support extensive sand prairie, with sand savanna in the northern portion of the site. Common grass species include little bluestem (Schizachyrium scoparium) and June grass (Koeleria macrantha), while black oak (Quercus velutina) is the dominant sand savanna tree (Bowles 1993). Scattered throughout the sand prairie are introduced (non-native) trees such as black locust (Robinia pseudoacacia).

### Endangered and Threatened Species

The SVDA provides habitat for at least 32 Illinois endangered or threatened plant and animal species, including one Federally threatened species (Bowles and Jones 1991 and 1995, Robertson et al. 1997, Natural Heritage Database). In addition, two new plant species for Illinois, purple rock cress (Arabis divaricarpa) and Whitlow grass (Draba nemorosa), were found at SVDA in 1996 (Robertson et al. 1997). Two former Category 2 Federal Candidate Species, Blanding's turtle (Emydoidea blandingii) and fameflower (Talinum rugospermum), are also known from the SVDA. The Federal Candidate Species Listing was abolished in 1996.

Among the bird species, the upland portion of the SVDA provides habitat for the upland sandpiper (Bartramia longicauda), loggerhead shrike (Lanius ludovicianus), northern harrier (Circus cyaneus), long-eared owl (Asio otus), short-eared owl (Asio flammeus), veery (Catharus fuscescens), and American bittern (Botaurus lentiginosus).

## METHODS

The avian survey was conducted between approximately 0530-1000 hours (CDT) on 18 June 1997. The survey was conducted on a non-rain, low wind (less than 12 mph (19 km/hr)) day. Incidental observations and reports of endangered and threatened species were also noted.

Two survey routes were established throughout the upland portion of the SVDA. A total of 55 survey points were established along these routes to include representative habitats. The North Group (Fig. 3) contained 29 points, while the South Group (Fig. 4) contained 26 points. Distances between adjacent survey points ranged from approximately 1575-1970 ft (480-600 m). To avoid multiple sampling of individual birds, only birds heard and/or seen within a maximum radius equal to one-half the distance to adjacent survey points were counted. All bird species



observed visually or audibly were recorded. Each point was surveyed for five minutes with a 3-minute subset; however, results from only the 5-minute survey are included in this report. Results were recorded on a standardized data form (Appendix 1). Bird species data were analyzed in three groups following those listed by Herkert et al. (1993), i.e. species characteristic of prairie, other grassland species, and non-grassland species. Unless otherwise noted, endangered, threatened, or uncommon bird species seen outside the 5-minute count period or while en route between survey points were noted but not included in the totals.

Survey participants included Ed Anderson, Randy Nýboer and Jeremiah Haas from the IDNR. Also participating in the survey were Jim Herkert of the Illinois Endangered Species Protection Board, Tom Lerczak of the Illinois Nature Preserves Commission and Rickie (Fullmer) Rachuy.

## RESULTS

### General

A total of 64 bird species were observed during the survey period in the approximate 6,128 acres (2,480 ha) of upland at the SVDA that were censused (Table 1).

Seventeen grassland and 47 non-grassland bird species were observed during the survey (Table 1). Of the grassland birds, two prairie species, western meadowlarks (*Sturnella neglecta*) and grasshopper sparrows (*Ammodramus savannarum*) were the most common species observed. Field sparrows (*Spizella arborea*), mourning doves (*Zenaida macroura*) eastern meadowlarks (*Sturnella magna*), vesper sparrows (*Pooecetes gramineus*), and red-winged blackbirds (*Agelaius phoeniceus*) were the next most common grassland bird species observed. The bobolink (*Dolichonyx oryzivorus*), a characteristic prairie species, was recorded for the first time at SVDA in 1996 at survey point E1 but was not detected in 1997.

Of special note is the 'overall' abundance of the characteristic prairie species in the upland portion of the SVDA (Table 1). For example, the western meadowlark, grasshopper sparrow, and eastern meadowlark were among the ten most abundant species. The western meadowlark and grasshopper sparrow were the two most common species encountered during the survey.

For comparative purposes, the 1994, 1995, 1996, and 1997 data as indicated for characteristic prairie and other grassland bird species found at SVDA are included in Tables 2 and 3. NOTE: surveys were conducted on three dates in 1994; however to allow comparison, the data from only the 14 June survey are included in Tables 2 and 3. From 1994-97, 24 grassland bird species have been documented in the upland portion of the SVDA (Table 3). Grasshopper sparrows and western meadowlarks were the most common species encountered during each year (Table 3). Except for the bobolink, northern harrier, blue-winged teal, and swamp sparrow, all of the grassland species observed have been confirmed nesting at the SVDA and most of the other upland birds observed during the surveys also probably nest at the SVDA.

The presence of 52 non-grassland bird species, since 1994, in the uplands is meaningful since this category of birds includes species, such as European starlings (*Sturnus vulgaris*), American crows (*Corvus brachyrhynchos*), common grackles (*Quiscalus quisicula*), blue jays (*Cyanocitta cristata*), and house wrens (*Troglodytes aedon*), which are potential nest predators, nest parasites, and competitors particularly of forest birds but also of grassland birds. No doubt, the impact of such species on the bird fauna of the SVDA is important since these are also some of the more common bird species on the uplands. For example, the European starling was one of the most abundant species reported in 1997 (Table 1). Cavity nesting species at the SVDA such as the eastern bluebird (*Sialia sialis*) may be especially impacted by European starlings.

In 1997, a total of 19 bird species were observed at survey point A4 which was located at a designated wildlife viewing area overlooking Prim's Pond, a shallow, spring-fed pond (Table 4, Fig. 3). The pond attracts migrating waterfowl and other wetland bird species. Two species, i.e., great crested flycatcher (*Myiarchus crinitus*) and the eastern wood peewee (*Contopus virens*) were observed at this location for the first time during the survey in 1997.

A total of 20 species of birds were observed in or near forested habitat at Survey Points F7-F9 in 1997 (Table 5). One species, warbling vireo (*Vireo gilvus*) was observed at these locations for the first time during the survey in 1997.

A total of 105 species of birds have now been documented in the upland portion of the SVDA (Table 6). There have been reports from reliable sources of blue grosbeaks (*Guiraca caerulea*) being observed during the breeding season from the uplands at SVDA in recent years. In 1997, the species was observed for the first time during the survey at survey point G1. Blue grosbeaks are most numerous in sandy areas in central Illinois and poor soil areas in southern Illinois (Bohlen 1989).

It is not possible to determine grazing effects on bird species abundance since only nine survey points (E5, F7-12, G1, and H1) were located in ungrazed or partially grazed habitats. Of these points, F7-9, were in the more forested north end of SVDA. Also, data were collected from survey points with relatively large boundaries which included grazed habitat at survey points E5, F12, and G1. Of special note, for the first time in 1996, grazing was not allowed in the area around survey point F11 to benefit grassland birds, specifically upland sandpipers. Although upland sandpipers had been observed in this area in past years, they had not been recorded during the survey periods. It is of interest then that two upland sandpipers were recorded for the first time at survey point F11 in 1996 (Anderson et al. 1996). Upland sandpipers were not observed at F11 in 1997.

#### Endangered and Threatened Species

Among the 105 species of birds documented in the upland portion of the SVDA during 1990-97 (Table 6), 10 species were listed as endangered or threatened in Illinois. Two of these listed species (upland sandpiper and loggerhead shrike) were observed at SVDA in 1997. The Cooper's

hawk was removed from the Illinois endangered species list in 1997 due to increasing numbers throughout the state.

A total of 7 upland sandpipers, an Illinois endangered species, were recorded at survey points B1, B2, B3, E13, F2, G4 and J3 during the 1997 survey (Tables 1-2, Fig. 5,6). Upland sandpipers were recorded for the first time at survey points and B2, E13, G4, and J3 in 1997. During the 1994-96 surveys (Anderson et al. 1996), all but three upland sandpipers were observed in the North Group (i.e. Areas A, B, C, and F). Upland sandpipers have been observed at survey points A2, A3, A5, A9, A10, B1, B2, B3, B5, C1, E13, F1, F2, F3, F11, and J3.

Only one loggerhead shrike was observed during the 1997 survey at survey point E2 (Fig. 7); however, several were observed at previously known sites and other survey points in Area E prior to the survey. Totals of 3 and 4 loggerhead shrikes were observed in Area E during the 1994 and 1995 surveys, respectively (Table 2). Loggerhead shrikes have been observed at survey points E1, E2, E3, E5, E6, E8, E9, E12, and E13 (Anderson et al. 1995). The loggerhead shrike is listed as an Illinois threatened species due to its low numbers and loss of suitable habitat across its range.

## DISCUSSION

### General

During the 18 June 1997 survey, a total of 64 species of birds were identified in the upland portion of the SVDA; this is comparable to the totals of 64, 61, and 69 species observed during the 14 June 1994, 13 June 1995, and 13 June 1996 surveys, respectively (Anderson et al. 1996) and the 59 species observed during the 1-2 June 1990 survey (IDNR, unpublished data). However, during the 1995 survey, three survey points (F7-F9) which were in forested habitat, and two other survey points (F10, C2) were not included. Also, the 1990 survey was conducted 11-13 days earlier than survey dates in recent years. So, a direct comparison between years cannot be made.

Sixteen grassland and 43 non-grassland bird species were recorded in 1990 and 23 grassland and 68 non-grassland species observed during the combined survey periods of 1994-96 (Anderson et al. 1996). These are comparable to the 17 grassland and 47 non-grassland species observed in 1997. Differences in numbers of species between the survey periods appears to be due to the earlier survey date in 1994 which recorded numerous migrants and the combined survey efforts of 1994-1996.

Similar numbers and species of characteristic prairie and other grassland birds were observed during the 1990 and 1994-97 surveys. The presence or absence of the less common prairie species, e.g. Savannah sparrow (*Passerculus sandwichensis*), northern harrier, and bobolink, and other grassland species such as loggerhead shrike, is expected given the limitations of a one-day survey. These and other uncommon bird species were likely to be present at SVDA on the survey

date but were undetected. For example, loggerhead shrikes were observed at the SVDA just prior to the survey date in 1996, but were not observed during the survey period. Also, some variation in numbers and abundances of species is expected given fluctuating seasonal weather patterns and bird population levels and yearly changes in vegetation structure.

While it was not possible to determine grazing effects on bird species abundance with the current sampling design and the limited number of years of data, recent efforts by the SVDA to restrict grazing from the northeastern edge of the SVDA should benefit some grassland species in these areas. Upland sandpipers may benefit initially from the removal of grazing, however they are frequently most abundant on grasslands that have been disturbed by grazing or mowing (e.g. Buhnerkempe and Westemeier 1988, Glass 1991, Graber and Graber 1963, Skinner et al. 1984). Upland sandpipers prefer short grass prairies or grasslands, and landscapes with open vista (Herkert 1991, White 1983). Therefore, additional management (e.g. prescribed burning) may be needed to maintain suitable habitat for this species.

### Endangered and Threatened Species

Some grassland species found at the SVDA such as upland sandpiper, loggerhead shrike, long-eared and short-eared owls, and northern harrier have been driven to precariously low population levels in Illinois and, as noted, are listed as State endangered or threatened species (Herkert 1992). Habitat preferences and general management recommendations for these species were provided previously by Anderson et al. (1995).

### Conclusions

Few ecosystems have experienced the degree of loss and alteration that native grasslands have (Samson and Knopf 1994). The loss of grassland habitat in Illinois has been even greater than the loss of forest habitat, with much less than 1% of the State's original 21 million acres of prairie remaining (Schwegman 1983). Consequently, grassland birds in Illinois have drastically decreased in numbers (Herkert 1991) and are in serious decline throughout the Midwest. Several of the region's fastest declining bird species are associated with grassland habitats including loggerhead shrike, grasshopper sparrow, and western meadowlark (Herkert 1995). The grasshopper sparrow, the region's second fastest declining bird species, was the most abundant bird species recorded on the upland portions of SVDA during each of the surveys from 1994-96 and the second most abundant during the 1997 survey.

As evidenced by this and previous studies, the upland portion of the SVDA provides significant foraging, roosting, and nesting habitat for large populations of a number of these increasingly rare grassland species. Wilds (1995) listed 20 grassland-associated non-game migratory bird species of concern in the north-central United States (Appendix 2). This list was compiled from the U.S. Fish and Wildlife Service list of Migratory Non-game Birds of Management Concern in the United States and other sources. From 1994-1997, at least 14 of these 20 bird species have been recorded at SVDA (Appendix 2). And as noted, several of these grassland bird species of

concern are common in the extensive sand prairie and other grassland habitats at the SVDA. In addition, another of those identified species, the common barn-owl (*Tyto alba*), has been observed at Hanover Bluff Nature Preserve just east of SVDA (Natural Heritage Database). This Illinois endangered species may forage and/or nest at the SVDA. Surveys conducted at night would be beneficial in identifying the presence of this and other species of owls at SVDA.

The approximate 7,000 acres (2,800 ha) of sand prairie-savanna at SVDA is the largest remaining example of this community type in Illinois. Due to the extant populations of area-sensitive grassland birds and this large block of grassland habitat, the uplands at SVDA fit the criteria for what could be a Midwest upland bird reserve. Proposed preservation of 3,083 acres (1,248 ha) of uplands containing native sand prairies and other mid-short grasslands at the SVDA by the USFWS would compliment the newly protected tallgrass prairie and grasslands at Midewin Tallgrass Prairie. Preservation and proper management of these two distinct areas would significantly enhance the conservation of grassland bird species in Illinois and the Midwest.

Approximately 3,519 acres (2,424 ha) at SVDA have been identified for potential development, including housing, industrial, distribution, mixed use, open space, and recreational/cultural uses. A portion of the eastern edge of SVDA has been proposed for industrial development that could include large-footprint, light and medium industrial buildings and a prison. Aside from direct loss of habitat, the effects of such developments and associated disturbances such as intensive, mass lighting on nearby resident bird populations is not known. For that reason, monitoring of grassland bird populations at SVDA should include studies to determine what affect, if any, development within the edge of the existing core grassland area may have.

#### Management Recommendations

A complete discussion of management recommendations was provided previously by Anderson et al. (1995). However, the primary recommendations are reiterated below:

- 1) The upland portions of the SVDA contain a regionally significant grassland bird resource that should be protected and carefully managed.
- 2) Management at the SVDA should focus on providing structurally diverse grassland habitat in order to more fully benefit grassland birds.
- 3) Management at the SVDA should include the use of prescribed fire.
- 4) Management at the SVDA should also focus on reducing edge, and eliminating and controlling woody encroachment.
- 5) Management of the grasslands at SVDA should be developed and implemented in an 'ecosystem' approach (i.e. manage the entire uplands as a natural community of sand prairie-savanna).

6) Management at the SVDA should include regular monitoring of grassland bird populations. Monitoring should include studies to determine the effects of development, management, recreation, and other uses on grassland bird populations.

### **ACKNOWLEDGEMENTS**

We are grateful to the Savanna Army Depot Activity particularly Arlen Dahlman (Chief, Installation Support Division) and Bob Speaker for their continued cooperation in this ongoing survey and for their interest in the natural resources, particularly the Illinois endangered and threatened species of the SVDA.

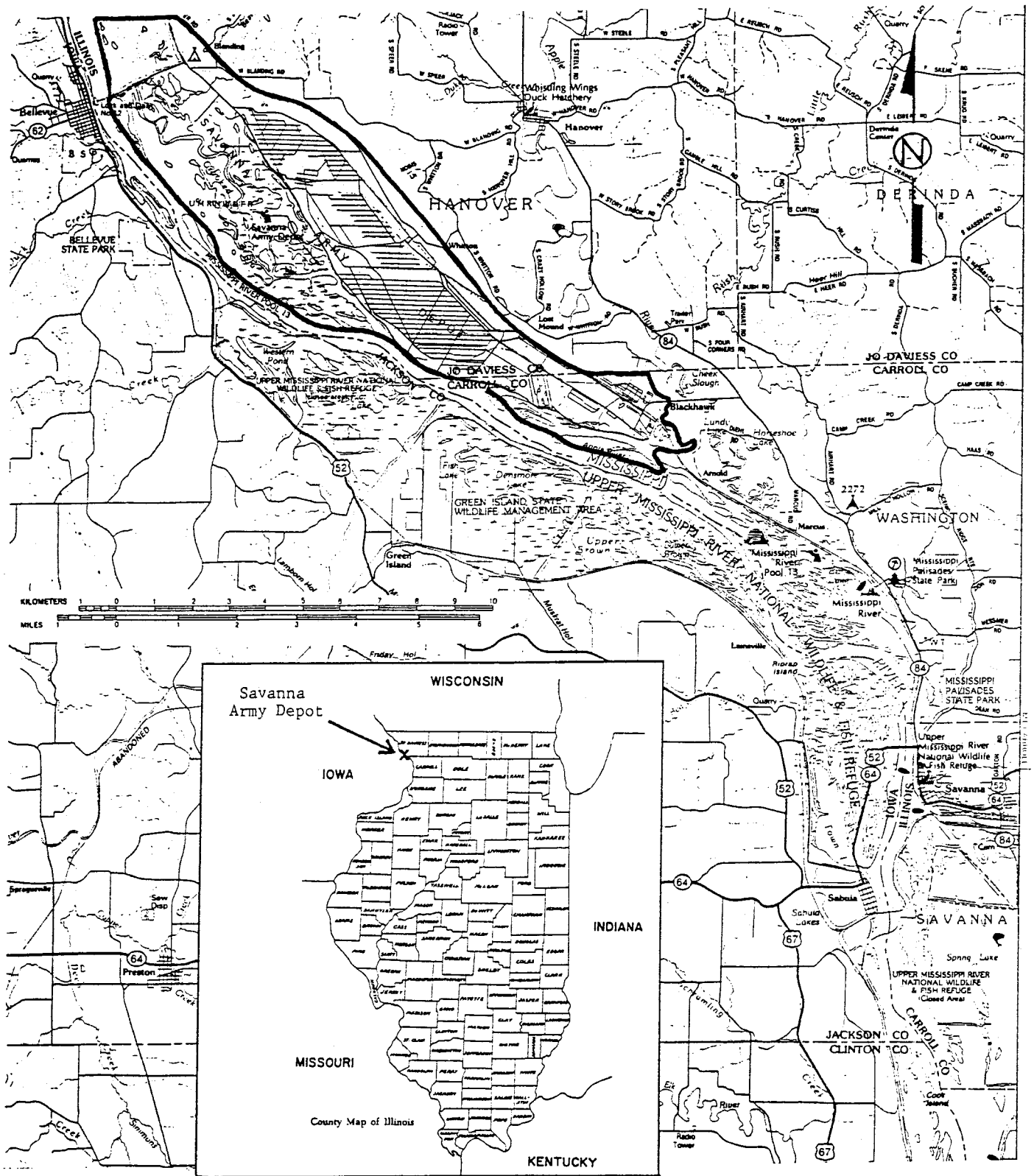
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Figure 1. Location of the Savanna Army Depot Activity, Carroll and Jo Daviess counties, Illinois.



**Figure 2. Natural Division of Illinois.**

- 1** Wisconsin Driftless Division
- 2** Rock River Hill Country Division
  - a Freeport Section
  - b Oregon Section
- 3** Northeastern Morainal Division
  - a Morainal Section
  - b Lake Michigan Dunes Section
  - c Chicago Lake Plain Section
  - d Winnebago Drift Section
- 4** Grand Prairie Division
  - a Grand Prairie Section
  - b Springfield Section
  - c Western Section
  - d Green River Lowland Section
  - e Kankakee Sand Area Section
- 5** Upper Mississippi River and Illinois River Bottomlands Division
  - a Illinois River Section
  - b Mississippi River Section
- 6** Illinois River and Mississippi River Sand Areas Division
  - a Illinois River Section
  - b Mississippi River Section
- 7** Western Forest-Prairie Division
  - a Galesburg Section
  - b Carlinville Section
- 8** Middle Mississippi Border Division
  - a Glaciated Section
  - b Driftless Section
- 9** Southern Till Plain Division
  - a Effingham Plain Section
  - b Mt Vernon Hill Country Section
- 10** Wabash Border Division
  - a Bottomlands Section
  - b Southern Uplands Section
  - c Vermilion River Section
- 11** Ozark Division
  - a Northern Section
  - b Central Section
  - c Southern Section
- 12** Lower Mississippi River Bottomlands Division
  - a Northern Section
  - b Southern Section
- 13** Shawnee Hills Division
  - a Greater Shawnee Hills Section
  - b Lesser Shawnee Hills Section
- 14** Coastal Plain Division
  - a Cretaceous Hills Section
  - b Bottomlands Section



Figure 3. Locations of the upland avian survey points in the North Group at the Savanna Army Depot Activity.

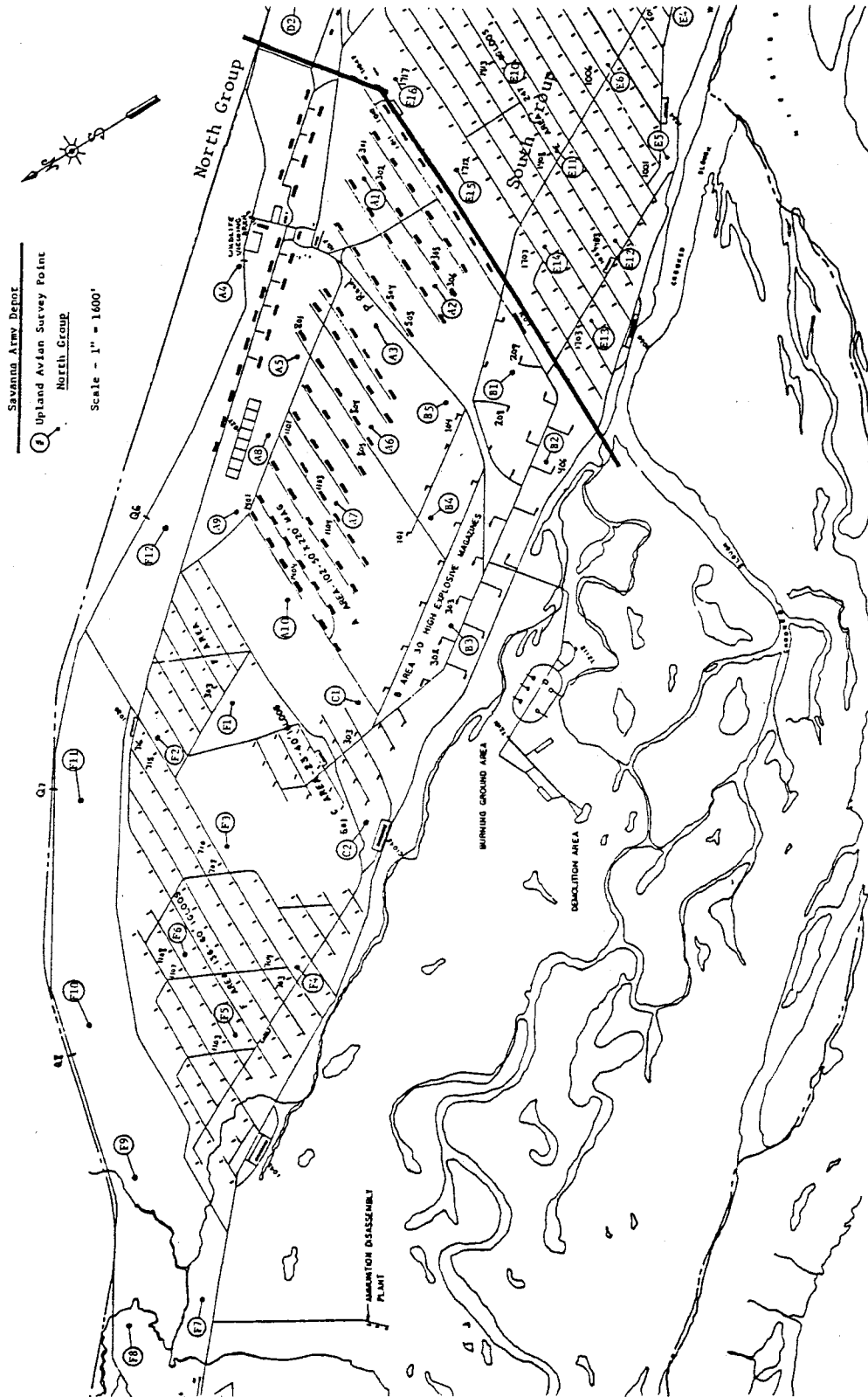


Figure 4. Locations of the upland avian survey points in the South Group at the Savannah Army Depot Activity.

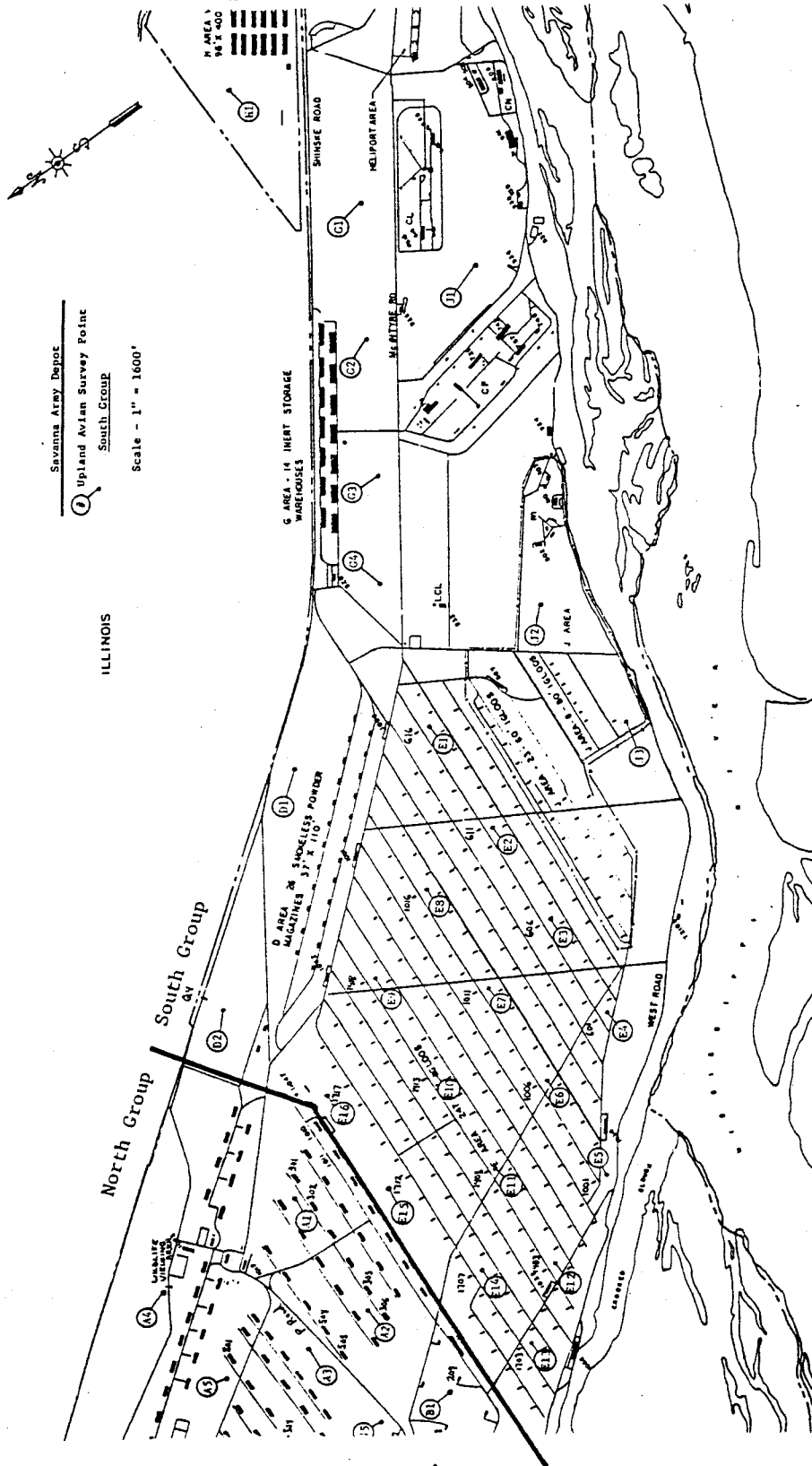


Figure 5. Locations of upland sandpipers in the north group at the Savanna Army Depot Activity; 18 June 1997.

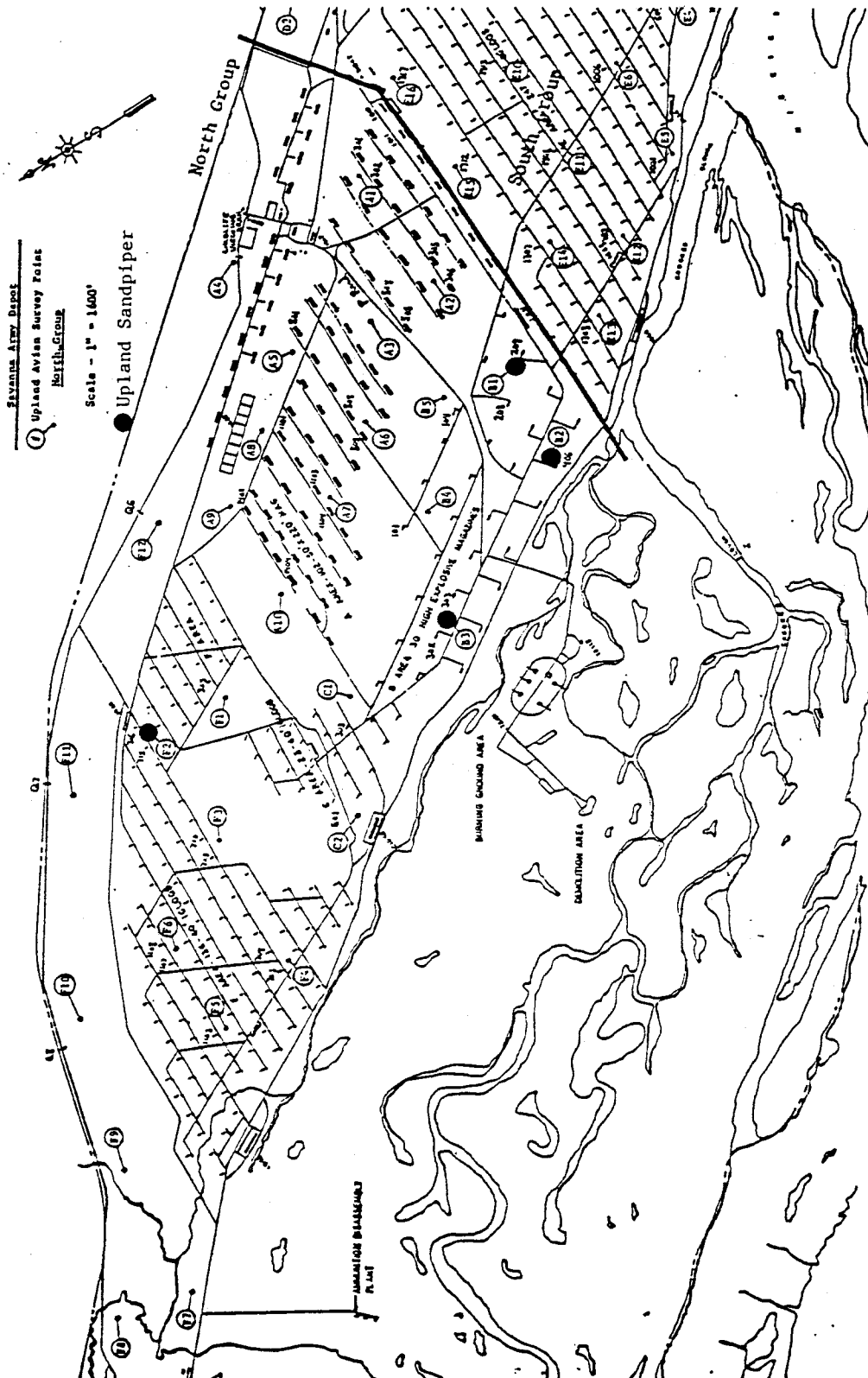


Figure 6. Locations of upland sandpipers in the south group at the Savanna Army Depot Activity; 18 June 1997.

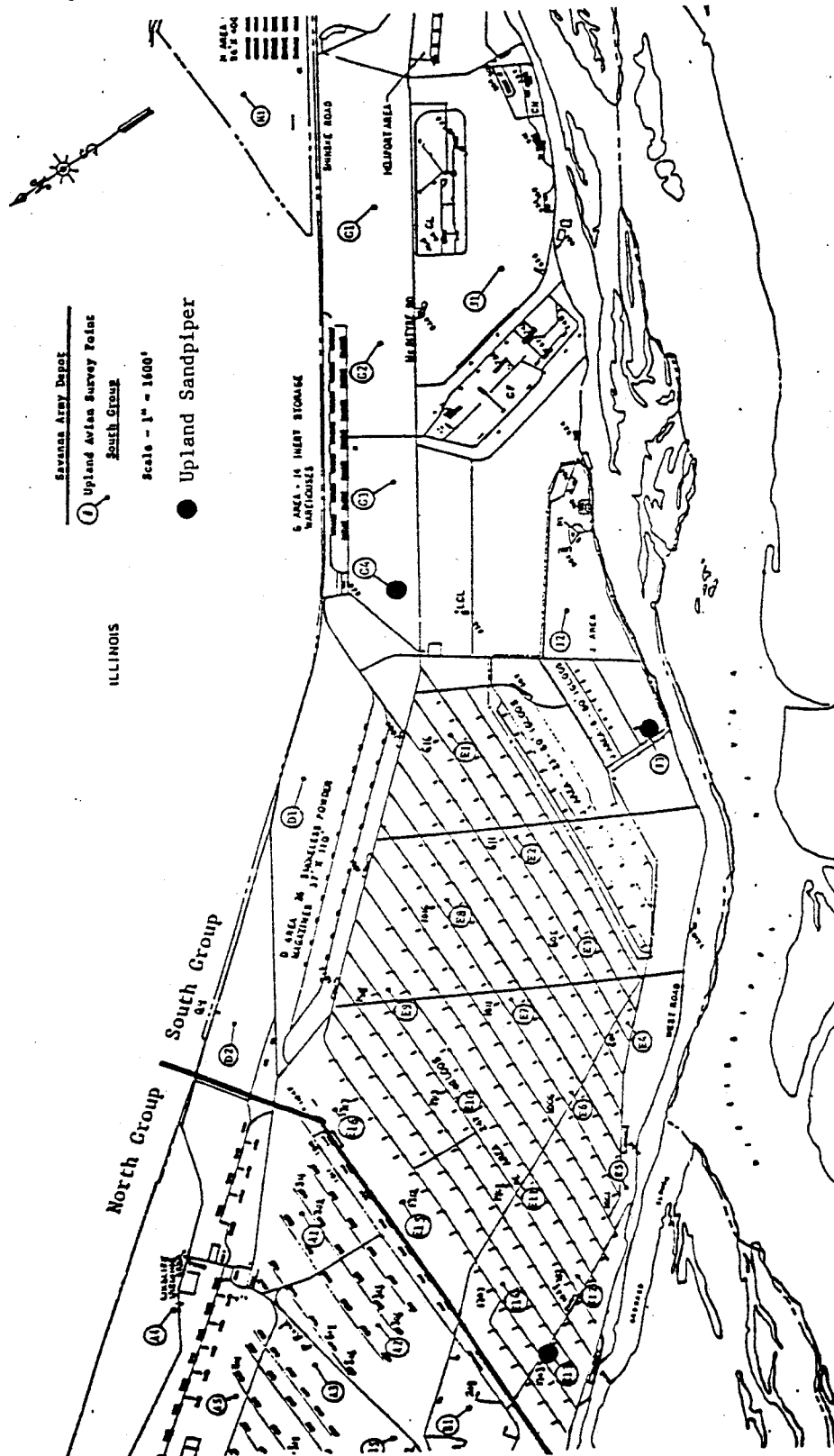


Figure 7. Location of loggerhead shrikes at the Savanna Army Depot Activity; 18 June 1997.

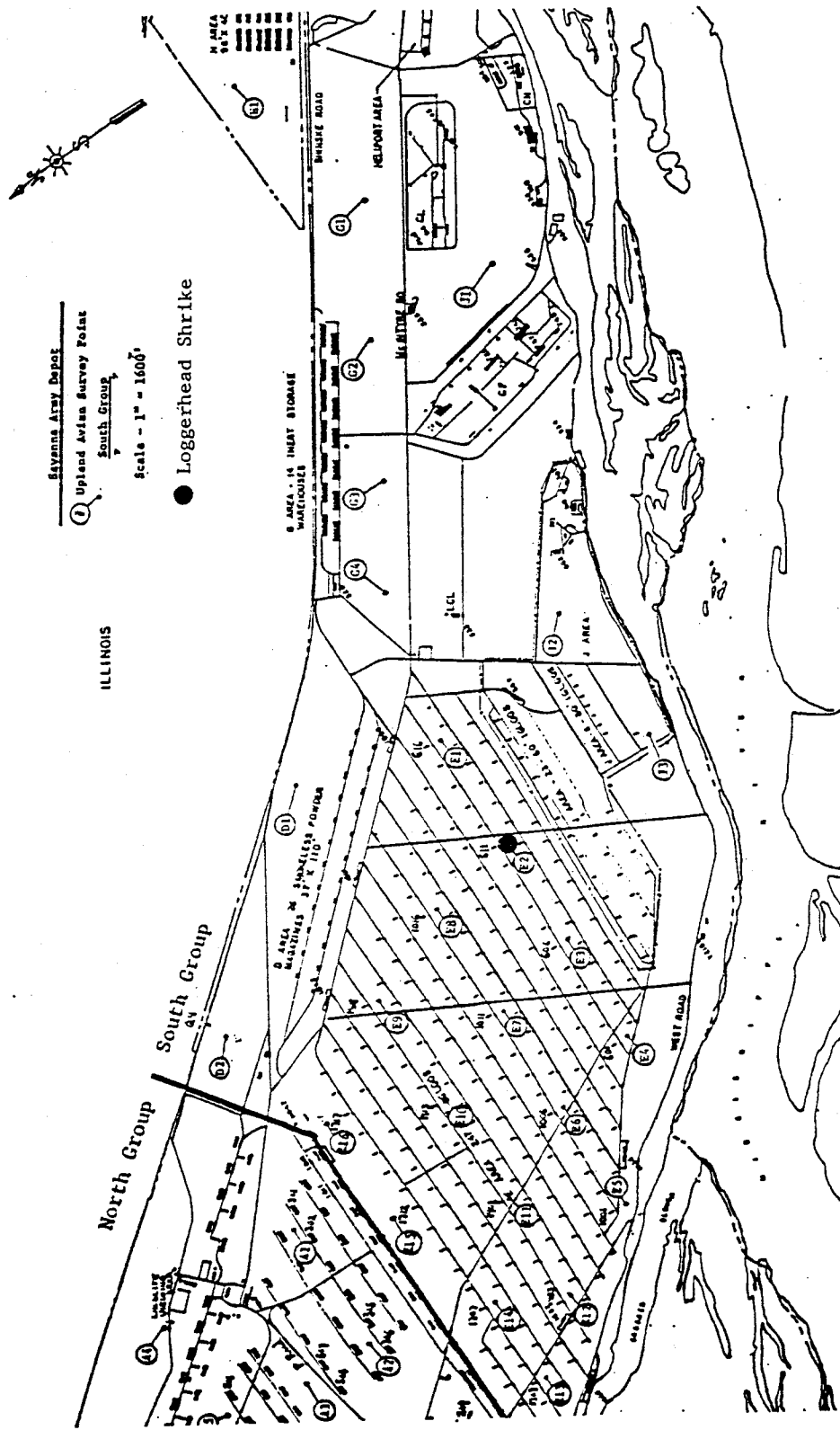


Table 1. Summary of Upland bird survey data at Savanna Army Depot Activity, Carroll and Jo Daviess Counties, Illinois; 18 June 1997.

	AREA SAMPLED										Totals
	A	B	C	D	E	F	G	H	J	J	
APPROXIMATE ACRES IN AREA	1620	670	120	170	2200	750	95	180	323	6128	
NUMBER OF SAMPLE POINTS	10	5	2	2	16	12	4	1	3	55	
GRASSLAND BIRDS - CHARACTERISTIC PRAIRIE SPECIES											
Western Meadowlark	28	11	4	7	59	6	6	2	2	125	
Grasshopper Sparrow	13	14	4	4	47	9	3	1	4	99	
Eastern Meadowlark	2	3	3	0	11	3	2	1	5	30	
Vesper Sparrow	1	1	3	0	4	3	9	1	3	25	
Horned Lark	0	1	1	1	14	0	1	0	1	19	
Upland Sandpiper <sup>E</sup>	0	3	0	0	1	1	1	0	1	7	
GRASSLAND BIRDS - OTHER GRASSLAND SPECIES											
Field Sparrow	7	7	2	0	19	14	7	1	7	64	
Mourning Dove	10	4	0	0	13	7	1	2	3	40	
Red-winged Blackbird	3	1	0	3	5	12	1	0	0	25	
Lark Sparrow	2	7	2	0	3	6	1	0	2	23	



Table 1. (Continued)

	AREA SAMPLED										Totals
	A	B	C	D	E	F	G	H	J	J	
<b>GRASSLAND BIRDS - OTHER GRASSLAND SPECIES</b>											
American Goldfinch	2	4	0	1	4	6	1	2	1	1	21
Killdeer	4	2	1	0	3	4	0	0	0	0	14
Song Sparrow	1	1	0	1	0	4	0	0	0	0	7
Common Nighthawk	0	0	0	0	3	0	2	0	0	0	5
Common Yellowthroat	0	0	0	1	0	3	0	0	0	0	4
Mallard	1	0	0	0	0	0	0	0	0	0	1
Loggerhead Shrike <sup>T</sup>	0	0	0	0	1	0	0	0	0	0	1
<b>NON-GRASSLAND BIRDS</b>											
Blue Jay	7	12	1	1	1	16	0	0	0	1	39
Turkey Vulture	1	0	0	17	0	0	14	1	0	0	33
Chipping Sparrow	3	3	3	0	11	10	0	0	0	3	33
American Crow	6	0	2	1	11	7	4	0	0	0	31
House Wren	8	3	0	0	0	11	6	0	0	2	30
European Starling	13	0	0	0	15	2	0	0	0	0	30
Brown-headed Cowbird	3	1	0	0	7	10	2	0	0	4	27
Baltimore Oriole	1	2	2	0	1	12	2	0	0	1	21

Table 1. (Continued)

	AREA SAMPLED										Totals	
	A	B	C	D	E	F	G	H	J			
NON - GRASSLAND BIRDS												
American Robin	1	1	2	0	3	8	1	0	2	18		
Northern Mockingbird	7	1	1	0	5	4	0	0	0	18		
Great Blue Heron	2	1	1	0	11	1	1	0	0	17		
Brown Thrasher	3	4	0	0	4	3	2	0	0	16		
Common Grackle	10	0	0	0	3	1	0	0	0	14		
Eastern Bluebird	2	0	0	1	2	1	4	0	2	12		
Great-Crested Flycatcher	3	1	1	0	0	4	1	0	1	11		
Red-tailed Hawk	6	0	0	0	1	3	1	0	0	11		
Eastern Kingbird	3	2	0	0	1	3	1	0	0	10		
Tree Swallow	2	5	0	0	0	1	1	0	0	9		
American Kestrel	5	0	0	0	2	0	1	0	0	8		
Northern Cardinal	1	1	1	1	2	0	2	0	0	8		
Rose-breasted Grosbeak	0	0	0	0	0	4	0	0	3	7		
Northern Flicker	0	0	0	0	3	4	0	0	0	7		
Chimney Swift	4	0	0	0	1	1	0	0	0	6		
Barn Swallow	1	0	0	1	0	0	2	1	1	6		
Cedar Waxwing	0	0	0	0	0	5	0	0	0	5		
Eastern Towhee	0	0	0	0	0	5	0	0	0	5		

Table 1. (Continued)

	AREA SAMPLED										Totals
	A	B	C	D	E	F	G	H	J	Totals	
NON - GRASSLAND BIRDS											
Warbling Vireo	0	1	0	0	0	3	0	0	0	0	4
Red-bellied Woodpecker	0	1	1	0	0	2	0	0	0	0	4
Northern Rough-winged Swallow	0	0	0	0	0	0	2	0	1	1	3
American Redstart	0	0	0	0	0	3	0	0	0	0	3
Orchard Oriole	0	0	0	0	1	0	0	0	2	3	3
House Finch	0	2	0	0	0	0	0	0	0	0	2
Tufted Titmouse	1	0	0	0	0	1	0	0	0	0	2
Eastern Wood Peewee	1	0	0	0	0	1	0	0	0	0	2
Black-capped Chickadee	0	0	0	0	0	2	0	0	0	0	2
House Finch	0	2	0	0	0	0	0	0	0	0	2
Indigo Bunting	0	0	0	0	1	0	1	0	0	0	2
Gray Catbird	0	0	0	0	0	2	0	0	0	0	2
Canada Goose	2	0	0	0	0	0	0	0	0	0	2
Wood Thrush	0	1	0	0	0	1	0	0	0	0	2
Ruby-throated Hummingbird	0	1	0	0	0	0	0	0	0	0	1
Yellow Warbler	0	0	0	0	0	1	0	0	0	0	1
Blue-gray Gnatcatcher	0	0	0	0	1	0	0	0	0	0	1

Table 1. (Continued)

	AREA SAMPLED										Totals	
	A	B	C	D	E	F	G	H	J			
NON - GRASSLAND BIRDS												
Red-headed Woodpecker	0	0	0	0	0	1	0	0	0	0	1	
Kentucky Warbler	0	0	0	0	0	1	0	0	0	0	1	
White-breasted Nuthatch	0	0	0	0	0	1	0	0	0	0	1	
Blue Grosbeak	0	0	0	0	0	0	1	0	0	0	1	

<sup>E</sup> - Indicates Illinois endangered species.

<sup>T</sup> - Indicates Illinois threatened species.

Table 2. Summary of upland bird survey data for characteristic prairie grassland bird species and loggerhead shrikes at the Savanna Army Depot Activity, Carroll and Jo Daviess counties, Illinois; 14 June 1994, 13 June 1995, 13 June 1996, and 18 June 1997.

	AREA SAMPLED																			
	A				B				C				D				E			
APPROX. ACRES IN AREA	1620				670				120				170				2200			
SURVEY YEAR	94	95	96	97	94	95	96	97	94	95	96	97	94	95	96	97	94	95	96	97
NO. SAMPLE POINTS	10	10	10	10	5	5	5	5	2	1	2	2	2	2	2	2	16	16	16	16
<b>GRASSLAND BIRDS - CHARACTERISTIC PRAIRIE SPECIES</b>																				
Grasshopper Sparrow	35	38	31	13	23	38	22	14	10	9	9	4	8	4	7	4	33	38	47	47
Western Meadowlark	35	59	39	28	21	42	21	11	4	8	9	4	2	2	4	7	39	45	56	59
Eastern Meadowlark	8	8	7	2	1	2	3	3	4	0	1	0	0	0	0	0	12	15	18	11
Horned Lark	2	9	0	0	6	5	2	1	0	9	0	1	0	0	0	1	8	4	5	14
Dickcissel	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	9	2	0
Vesper Sparrow	0	0	0	1	0	0	1	1	0	0	0	3	1	1	0	0	0	2	7	4
Upland Sandpiper <sup>E</sup>	3	1	1	0	0	0	1	3	0	0	0	0	0	0	0	0	2	1	0	1
Savannah Sparrow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Harrier <sup>E</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bobolink	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Loggerhead Shrike <sup>T</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	X	1

Table 2. (Continued)

	AREA SAMPLED															
	F				G				H				J			
APROX. ACRES IN AREA	750				95				180				323			
SURVEY YEAR	94	95	96	97	94	95	96	97	94	95	96	97	94	95	96	97
NO. OF SAMPLE POINTS	12	8	12	12	4	4	4	4	1	1	1	1	3	3	3	3
NO. POINTS SAMPLED	12	8	12	12	4	4	4	4	1	1	1	1	3	3	3	3
Grasshopper Sparrow	21	17	22	9	8	9	8	3	1	2	1	1	4	5	5	4
Western Meadowlark	3	3	10	6	5	6	8	6	2	1	0	2	0	0	0	2
Eastern Meadowlark	4	5	2	3	4	2	4	9	0	1	2	1	3	3	5	5
Horned Lark	0	0	0	0	2	2	4	1	0	0	0	0	0	0	0	1
Dickcissel	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0
Vesper Sparrow	2	3	0	3	0	2	0	9	0	0	1	1	0	1	0	3
<b>Upland Sandpiper</b> <sup>E</sup>	0	1	4	1	0	0	0	1	0	0	0	0	0	0	0	1
Savannah Sparrow	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Northern Harrier</b> <sup>E</sup>	0	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0
Bobolink	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Loggerhead Shrike</b> <sup>T</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

<sup>E</sup> - Indicates Illinois endangered species.

<sup>T</sup> - Indicates Illinois threatened species.

X - One northern harrier was observed during the 13 June 1995 survey but was recorded after the 5-minute count period. Several loggerhead shrikes were observed in E Area in 1996; however, none were observed during the 13 June survey.

Table 3. Total numbers of characteristic prairie and other grassland bird species observed during upland bird surveys at the Savannah Army Depot Activity; 14 June 1994, 13 June 1995, 13 June 1996, and 18 June 1997.

SURVEY YEAR	Subtotals			Totals
	1994	1995	1996	
NUMBER OF SAMPLE POINTS	55	50	55	55
<b>GRASSLAND BIRDS - CHARACTERISTIC PRAIRIE SPECIES</b>				
Grasshopper Sparrow	143	160	152	99
Western Meadowlark	111	166	147	125
Eastern Meadowlark	36	36	42	30
Horned Lark	18	29	11	19
Dickcissel	7	12	4	0
Vesper Sparrow	3	9	9	25
<b>Upland Sandpiper<sup>E</sup></b>	5	3	6	7
Savannah Sparrow	3	0	0	0
<b>Northern Harrier<sup>E</sup></b>	0	X	0	0
Bobolink	0	0	1	0

Table 3. (Continued)

GRASSLAND BIRDS - OTHER GRASSLAND SPECIES

Field Sparrow	51	87	43	64	245
Mourning Dove	28	62	41	40	171
Lark Sparrow	42	21	29	23	115
Red-winged Blackbird	24	7	19	25	75
American Goldfinch	8	4	18	21	51
Killdeer	14	12	7	14	47
Song Sparrow	10	7	7	7	31
Common Nighthawk	5	2	6	5	18
Common Yellowthroat	4	2	6	4	16
<b>Loggerhead Shrike</b> <sup>T</sup>	3	4	X	1	8
Mallard	0	1	2	1	4
Blue-winged Teal	2	0	0	0	2
Northern Bobwhite	1	0	0	0	1
Swamp Sparrow	X	0	0	0	X

<sup>E</sup> - Indicates Illinois endangered species.

<sup>T</sup> - Indicates Illinois threatened species.



X Notes: One northern harrier was observed during the 13 June 1995 survey but was recorded after the 5-minute count period. Several loggerhead shrikes were observed in 1996; however, none were observed during the 13 June survey. One swamp sparrow was observed in 1994 during the 19 May survey; however, none were observed during the 14 June survey.

Table 4. List of bird species observed at survey point A4 (Prim's Pond - Wildlife Viewing Area), Savanna Army Depot Activity: 20 April - 9 September 1994, 13 June 1995, 13 June 1996, and 18 June 1997.

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Pied-billed Grebe <sup>T</sup>	Pileated woodpecker
Great Blue Heron	Eastern Kingbird *
Great Egret <sup>T</sup>	Great-crested Flycatcher **
Green-backed Heron	Eastern Wood Peewee **
Canada Goose *	Tree Swallow *
Wood duck	Barn Swallow *
Green-winged Teal	Blue Jay
Mallard *	American Crow
Blue-winged Teal	House Wren *
Northern Shoveler	Eastern Bluebird *
Common Merganser	American Robin
Turkey Vulture *	Northern Mockingbird
American Coot	European Starling *
Killdeer *	Common Yellowthroat
Greater Yellowlegs	Chipping Sparrow
Lesser Yellowlegs	Field Sparrow
Solitary Sandpiper	Grasshopper Sparrow *
Semipalmated Sandpiper	Song Sparrow *
Least Sandpiper	Red-winged Blackbird *
Rock Dove	Eastern Meadowlark *
Mourning Dove	Western Meadowlark *
Chimney Swift	Common Grackle *
Red-headed Woodpecker	Brown-headed Cowbird
Red-bellied Woodpecker	Baltimore Oriole
Northern Flicker	American Goldfinch *

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<sup>T</sup> - Indicates Illinois threatened species.

\* - Indicates species observed in 1997.

\*\* - Indicates species observed at this location for the first time in 1997.

Table 5. List of species observed in or near forested upland habitat at survey points F7-F9, Savanna Army Depot Activity; 19 May, 14 and 29 June 1994, 13 June 1996, and 18 June 1997.

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American bittern <sup>E</sup>	Gray Catbird *
Wood Duck	Cedar Waxwing
Mallard	European Starling
American Kestrel	Red-eyed Vireo
Mourning Dove	Warbling Vireo **
Barred Owl	Tennessee Warbler
Red-headed Woodpecker	Yellow Warbler *
Red-bellied Woodpecker *	Yellow-rumped Warbler
Downy Woodpecker	American Redstart *
Northern Flicker	Ovenbird
Eastern Wood Peewee *	Kentucky Warbler *
Eastern Phoebe	Common Yellowthroat *
Great Crested Flycatcher *	Northern Cardinal
Tree Swallow *	Rose-breasted Grosbeak *
Blue Jay *	Indigo Bunting
American Crow *	Song Sparrow *
Black-capped Chickadee *	Swamp Sparrow
Tufted Titmouse *	White-throated Sparrow
House Wren	Red-winged Blackbird *
Eastern Bluebird	Common Grackle
Wood Thrush *	Brown-headed Cowbird *
American Robin	Baltimore Oriole *
	American Goldfinch

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E - Indicates Illinois endangered species.

\* - Indicates species observed in 1997.

\*\* - Indicates species observed at one or more of these points for the first time in 1997.

Table 6. Complete list of bird species documented in the upland portion of the Savanna Army Depot, Carroll and Jo Daviess counties, Illinois; 1990-1997.

<u>Common Name</u>	<u>Scientific Name</u>
<b>American Bittern</b> <sup>E</sup>	<b>Botaurus lentiginosus</b>
American Coot	Fulica americana
American Crow	Corvus brachyrhynchos
American Goldfinch	Carduelis tristis
American Kestrel	Falco sparverius
American Redstart	Setophaga ruticilla
American Robin	Turdus migratorius
Baltimore Oriole	Icterus galbula
Bank Swallow	Riparia riparia
Barn Swallow	Hirundo rustica
Barred Owl	Strix varia
Black-capped Chickadee	Parus atricapillus
Blue Jay	Cyanocitta cristata
Blue Grosbeak	Guiraca caerulea
Blue-winged Teal	Anas discors
Bobolink	Dolichonyx oryzivorus
Brown-headed Cowbird	Molothrus ater
Brown Thrasher	Toxostoma rufum
Canada Goose	Branta canadensis
Cedar Waxwing	Bombycilla cedrorum
Chimney Swift	Chaetura pelagica
Chipping Sparrow	Spizella passerina
Common Grackle	Quiscalus quiscula
Common Merganser	Mergus merganser
Common Nighthawk	Chordeiles minor
Common Yellowthroat	Geothlypis trichas
Cooper's Hawk	Accipiter cooperii
Dickcissel	Spiza americana
<b>Double-crested Cormorant</b> <sup>T</sup>	<b>Phalacrocorax auritus</b>
Downy Woodpecker	Picoides pubescens
Eastern Bluebird	Sialia sialis
Eastern Kingbird	Tyrannus tyrannus
Eastern Meadowlark	Sturnella magna
Eastern Pewee	Contopus virens
Eastern Phoebe	Sayornis phoebe
European Starling	Sturnus vulgaris
Field Sparrow	Spizella pusilla
Grasshopper Sparrow	Ammodramus savannarum

Table 6. (continued)

<u>Common Name</u>	<u>Scientific Name</u>
Gray Catbird	<i>Dumetella carolinensis</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
<b>Great Egret</b> <sup>T</sup>	<b><i>Casmerodius albus</i></b>
Great Horned Owl	<i>Bubo virginianus</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Green-backed Heron	<i>Butorides striatus</i>
Green-winged Teal	<i>Anas crecca</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Horned Lark	<i>Eremophila alpestris</i>
House Finch	<i>Carpodacus mexicanus</i>
House Sparrow	<i>Passer domesticus</i>
House Wren	<i>Troglodytes aedon</i>
Indigo Bunting	<i>Passerina cyanea</i>
Kentucky Warbler	<i>Oporornis formosus</i>
Killdeer	<i>Charadrius vociferus</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Least Sandpiper	<i>Calidris minutilla</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
<b>Loggerhead Shrike</b> <sup>T</sup>	<b><i>Lanius ludovicianus</i></b>
<b>Long-eared Owl</b> <sup>E</sup>	<b><i>Asio otus</i></b>
Mallard	<i>Anas platyrhynchos</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Bobwhite	<i>Colinus virginianus</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Northern Flicker	<i>Colaptes auratus</i>
<b>Northern Harrier</b> <sup>E</sup>	<b><i>Circus cyaneus</i></b>
Northern Mockingbird	<i>Mimus polyglottos</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Northern Shoveler	<i>Anas clypeata</i>
Orchard Oriole	<i>Icterus spurius</i>
Ovenbird	<i>Seiurus aurocapillus</i>
<b>Pied-billed Grebe</b> <sup>T</sup>	<b><i>Podilymbus podiceps</i></b>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>

Table 6. (continued)

<u>Common Name</u>	<u>Scientific Name</u>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Rock Dove	<i>Columba livia</i>
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Ruby-throated Hummingbird	<i>Archilochus colubris</i>
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Scarlet Tanager	<i>Piranga olivacea</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>
<b>Short-eared Owl<sup>E</sup></b>	<b><i>Asio flammeus</i></b>
Solitary Sandpiper	<i>Tringa solitaria</i>
Song Sparrow	<i>Melospiza melodia</i>
Swamp Sparrow	<i>Melospiza georgiana</i>
Tennessee Warbler	<i>Vermivora peregrina</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Tufted Titmouse	<i>Parus bicolor</i>
Turkey Vulture	<i>Cathartes aura</i>
<b>Upland Sandpiper<sup>E</sup></b>	<b><i>Bartramia longicauda</i></b>
<b>Veery<sup>T</sup></b>	<b><i>Catharus fuscescens</i></b>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Warbling Vireo	<i>Vireo gilvus</i>
Western Meadowlark	<i>Sturnella neglecta</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>
Wild Turkey	<i>Meleagris gallopavo</i>
Wood Duck	<i>Aix sponsa</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>
Yellow-rumped Warbler	<i>Dendroica coronata</i>
Yellow Warbler	<i>Dendroica petechia</i>

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Nomenclature follows Bohlen (1989).

<sup>E</sup> - Indicates Illinois Endangered Species.

<sup>T</sup> - Indicates Illinois Threatened Species.



Appendix 2. Grassland - associated non-game migratory bird species of concern in north-central United States (from Wilds 1995 \*), and those species found at the Savanna Army Depot Activity (SVDA), Carroll and Jo Daviess Counties, Illinois; 1994 - 1997.

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**Species found at SVDA**

American Bittern <sup>E \*\*</sup>  
 Bobolink  
 Dickcissel  
 Eastern Meadowlark  
 Field Sparrow \*\*\*  
 Grasshopper Sparrow  
 Lark Sparrow  
 Loggerhead Shrike <sup>T \*\*\*</sup>  
 Northern Harrier <sup>E \*\*</sup>  
 Savannah Sparrow  
 Short-eared Owl <sup>E</sup>  
 Upland Sandpiper <sup>E</sup>  
 Vesper Sparrow  
 Western Meadowlark

**Species not found at SVDA**

Baird's Sparrow  
 Bell's Vireo \*\*\*  
 Burrowing Owl  
 Common Barn-Owl <sup>E</sup>  
 Henslow's Sparrow <sup>E</sup>  
 Sedge Wren \*\*

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\* Compiled from: U.S. Fish and Wildlife Service list of Migratory Birds of Management Concern in the United States (1995 draft list); Breeding Bird Survey data (1966-94 trends for USFWS Region 3); Partner in Flight list of neotropical migrant landbirds of concern (except species that are doing well rangewide but are state-listed because they are peripherals).

\*\* Uses grasslands associated with wetlands.

\*\*\* Uses grasslands with scattered shrubs.

E - Indicates Illinois endangered species.

T - Indicates Illinois threatened species.

Notes: Bohlen (1989) lists Baird's sparrow as a hypothetical species for Illinois and the burrowing owl as a rare vagrant to Illinois. The common barn-owl has been observed at Hanover Bluff Nature Preserve just east of SVDA (Natural Heritage Database). This species may forage and/or nest at SVDA.