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Avian Census of the  
FAP 310 (US 67 Jacksonville to Macomb) Project Area  
(Job No. P-96-006-93)

Center for Biodiversity  
Technical Report 1998 (4)

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## Table of Contents

List of Tables .....	iii
List of Figures .....	iv
Introduction .....	1
Endangered and Threatened birds of Morgan, Cass, Schuyler and McDonough Counties	1
Census Methods .....	2
Census Results .....	4
Discussion .....	7
Endangered and Threatened species .....	7
Illinois Watch List species .....	9
Beardstown Marsh .....	10
Meredosia Wildlife Refuge .....	10
Summary.....	10
Bibliography .....	11

**List of Tables**

<b>Table</b>		<b>Page</b>
1	Endangered and threatened species records .....	12
2	Endangered and threatened species breeding habitat .....	13
3	Description of census points .....	14
4	Duration of census seasons .....	15
5	List of avian species observed during the four season census .....	16
6	Breeding census results .....	17
7	Fall census results .....	20
8	Winter census results .....	22
9	Spring census results .....	23

**List of Figures**

<b>Figure</b>		<b>Page</b>
1	Approximate location of the FAP 310 corridor.	26
2	Endangered and threatened species records.	27
3	State Natural Areas and Nature Preserves.	28
4	Census points 1 to 3.	29
5	Census points 4 to 8.	30
6	Census points 9 to 10.	31
7	Census points 11 to 13.	32
8	Census points 14 to 18.	33
20	Census points 19 and 20	34

## Introduction

On 1 June 1995 the Illinois Department of Transportation (IDOT) requested a four season avian survey along the corridors proposed for a US 67 upgrade extending from Jacksonville to Macomb, Illinois (Figure 1). As requested, we focused on the A and E alternates between Jacksonville and Beardstown, and paid special attention to the Beardstown Marsh and Schuy-Rush Lake areas.

This report includes: 1. the results of our four season (fall, winter, spring and breeding seasons) censuses of birds in the project area conducted between May 1996 and April 1997, 2. the results of a search of records for the occurrence of endangered and threatened avian species in Morgan, Cass, Schuyler and McDonough counties, and 3. an assessment of the potential habitat that exists in the project area for these listed bird species. We also provide a map showing the State natural areas and preserves within 5 km of the project area (Figure 3).

### **Endangered and Threatened Birds of Morgan, Cass, Schuyler, and McDonough Counties**

We consulted four sources (the Illinois Natural Heritage Database, the Illinois Natural Heritage 1993-1996 rookeries report, the Illinois Fish and Wildlife Information System database, and the Illinois Breeding Bird Atlas) to establish whether any endangered or threatened bird species were likely to occur in the vicinity of the project area. We found 12 Illinois endangered bird species (one of which, the Bald Eagle, is also federally threatened), five Illinois threatened bird species, and three Illinois Watch List species that have been recorded in the five counties through which the project area passes in the recent past (see Table 1).

Eight of these species (four Illinois endangered and four Illinois threatened) have been recorded within 5 km of the corridor; five of these (three Illinois endangered and two Illinois threatened) have been recorded within 1 km (Table 1). Five of the endangered and threatened species recorded within 1 km of the corridor were observed at Beardstown Marsh; one species (Loggerhead Shrike, Illinois threatened) was recorded near Jacksonville at the southern end of the corridor (Figure 2).

We evaluated the potential for breeding habitat within the project area for all of the endangered and threatened species recorded in the four county area through which the corridor passes using historical records, aerial photographs and topographic maps. We then visited these areas and directly evaluated their potential as breeding habitat based on their physical and floral characteristics. Our habitat assessments (Table 2) are based on published breeding requirements for these species (e.g. Ehrlich et al. 1988; Bohlen 1989; Herkert 1992).

We found adequate to high quality breeding habitat for 5 endangered or threatened wetland bird species in the eastern half of the Beardstown Marsh (Table 2; Figure 7-G). Adequate breeding habitat for Loggerhead Shrikes (Illinois threatened) also exists throughout the southern third of the study area. We also found adequate breeding habitat for the Bell's Vireo (Illinois Watch List; Figure 7-H).

## Census Methods

We established census points in representative habitat types within the project area (Figures 4-9). Legal descriptions and a brief explanation of the habitat surrounding each census point are given in Table 3. We divided the year into four census seasons corresponding to major periods of the avian life cycle in the Midwest (Table 4). Because of the migratory habits of birds, each season typically has a different and distinctive complement of resident species. Each census point was visited twice per season. During these visits we used modified point-counts (Blondel et al., 1981) to determine community composition. We recorded all individuals seen or heard within a range of 50 meters (including birds seen flying over) during the 10 minute count periods. These timed counts provide measures of the structure of bird communities (number of individuals and number of species) within the various habitat types. Because we are interested in the presence and absence of bird species within the corridors, we also recorded all of our sightings of birds within the corridors outside of these 10 minute count periods.

We ranked the magnitude of concern (C in Tables 5-12) for each species in every season. For the breeding and winter seasons we used indices developed by *Partners in Flight*, a working group of North American avian ecologists (Thompson et al. 1992). Birds are scored on a scale from 1 (low concern) to 5 (extremely high concern). In constructing these indices the following factors were considered:



abundance, distribution, threats (e.g. habitat loss, demographic vulnerability, etc.) and population trend (Hunter et al. 1992).

*Partners in Flight* has yet to develop a similar index for birds during migration, therefore, we developed our own with the help of Dr. J. Herkert of the Illinois Endangered Species Protection Board and Dr. S. K. Robinson of the Center for Wildlife Ecology, Illinois Natural History Survey (INHS). Both Drs. Herkert and Robinson participated in the original *Partners in Flight* work. We used three parameters in formulating our migratory concern index: 1. population size in the Midwest (using the *Partners in Flight* abundance ranking), 2. population trend over the past ten years (using the *Partners in Flight* population trend estimates), and 3. the degree of migratory habitat specificity (i.e., how restrictive the habitat requirements of each species are during migration) as ranked by S. K. Robinson and D. A. Enstrom.

We provide these concern indices as a tool to help assess the relative importance of the various habitat types within the corridor to the avian community. Clearly, species formally classified as endangered or threatened are not the only ones that are subject to significant threats or which should be considered when assessing the value of a particular parcel of land. Areas which support many species of moderate concern may be very important to the local avifauna. Typically, endangered and threatened species receive concern scores of 3 or above. We define a *species of concern* as one that has a concern index value  $\geq 3$  (Thompson et al. 1992; Robinson and Enstrom, unpublished data). The threats to a given species may change with the season. This change is reflected in changes in the magnitude of concern scores (C in Tables 5-12) among seasons.

The number of species of concern present in a habitat provides a measure of the relative importance of that habitat to the avian community. We feel this measure is better than traditional measures of habitat quality such as 'diversity' or 'richness' (the total number of species found in an area) because it more accurately reflects the potential impact that the disturbance of a given parcel might have on those populations most at risk.

To date, *Partners in Flight* has focused its efforts on long distance migratory species. Concern scores are not available for non-migrants (e.g., chickadees and

some woodpeckers) or for migrant species that do not leave the United States during migration (e.g., sparrows and ducks).

We also noted the occurrence of Illinois Watch List species. This list is compiled by the Endangered Species Protection Board of Illinois and consists of three categories:

- 1) *Unknown status*. Species that are suspected to be declining but for which data are insufficient.
- 2) *Special concern*. Species that are known to be declining significantly in numbers but still have relatively large populations in Illinois.
- 3) *Extirpated*. Species that were once listed as Illinois endangered or threatened but have been extirpated from the state.

## **Census Results**

We recorded 1,092 individuals representing 107 species of 31 families during our four season census of the FAP 310 study area (Table 5).

### ***Breeding Census***

We recorded 227 individuals representing 51 species during the breeding season census conducted between 1 May and 30 June 1996 (Table 6).

A single Double-crested Cormorant (Illinois threatened) was observed foraging in the large pond to the right of US 67 south of Beardstown on 8 May 1997 (Figure 7-I). This bird was probably a transient; either a wandering unmated bird or a late migrant. The nearest known Double-crested Cormorant colonies are both over 50 km away from the Beardstown area: one on Clear Lake in northern Mason county on the Illinois River, and one on the Mississippi River in Calhoun county.

A single Golden-winged Warbler (Illinois Watch List) was seen at census point 9 (Figure 6-F) on 8 May 1997. This species is a relatively common migrant throughout Illinois during May. Golden-winged Warblers nest in early successional areas, but occur in a wide variety of habitats during their migration. This bird was seen in an area lacking Golden-winged Warbler breeding habitat.

A Bell's Vireo (Illinois Watch List) was observed in the corridor near point 11 (Figure 7-H) on 23 June 1997. This bird appeared to be defending a territory and may have been breeding.

We conducted a survey of the Beardstown Marsh in 1995 (5 June and 31 July). We played a tape of Illinois endangered and threatened marsh-nesting birds at several points (3) around the marsh in order to elicit a vocal response from secretive marsh-nesting birds. Two listed species (Least Bittern, Illinois endangered and King Rail, Illinois threatened) responded to these tapes on 5 June. These two species were probably breeding in the marsh.

A total of 18 species of concern were seen during the breeding census. We found the highest number of species of concern (seven) at census point 11 (Figure 7). We detected six species of concern at census point nine.

### ***Fall census***

We recorded 263 individuals of 40 species during the fall census conducted between 1 September and 1 November of 1996 (Table 7).

Several Great Egrets (Illinois threatened) were observed in a man-made lake along the Illinois River near the US 67 bridge (Figure 7-L) on 24 September. This species ranges widely after the breeding season (Bohlen 1989) and is common during the late summer and fall all along the Illinois River (Bohlen 1989). One Brown Creeper (IL threatened) was seen at point 9 (Figure 6) on 17 October 1996.

During our preliminary survey of the Beardstown area in the fall of 1995 we observed six Pied-billed Grebes (Illinois threatened) in the Beardstown marsh west of US 67 (Figure 7-I). There is not adequate breeding habitat for this species in this part of the marsh and these individuals were probably migrants.

Three Black-crowned Night Herons (Illinois endangered) were also seen in the same part of the Beardstown marsh on the same visit (Figure 7-I). Sightings of this species during the fall are not indicative of breeding. Black-crowned Night Herons are found throughout the state during this period. Jeff Olson (INHS) also observed this species in the same area during the 1995 breeding season. However, we did not find any other evidence that this species breeds in the area, and the significance of this

observation is unclear. No quality breeding habitat for Night Herons exists anywhere in the project area.

Relatively few (9) species of concern were seen during the fall census. The highest count of species of concern occurred at points 13 and 20 (3).

### ***Winter census***

We recorded 153 individuals of 18 species during the winter census conducted between 15 November 1996 and 1 January 1997 (Table 8).

We observed a single Bald Eagle (Federally threatened; Illinois endangered) near the US 67 bridge over the Illinois River on 30 January 1997. In the winter of 1995 we conducted a survey of Bald Eagles between the towns of Meredosia and Beardstown. We observed 101 eagles during that survey. Most were found in the Meredosia Wildlife Refuge (Figure 3) but eagles were also found all along the river from the refuge to 1 km south of the existing US 67 bridge at Beardstown. One Illinois threatened species, the Brown creeper, was sighted at census points 1, 3, 5 and 9 (all in wooded habitat). It is likely that the Creeper over-winters in the area. No watch-list species or species of concern were observed during this census period.

### ***Spring Census***

We recorded 449 individuals representing 69 species during the spring census conducted between 15 March and 8 May 1997 (Table 9). All points yielded a diversity of migrant and resident species.

A single Sharp-shinned Hawk (Illinois endangered) was seen near census point 18 (Figure 8-M) on 4 April. There is no Sharp-shinned Hawk breeding habitat in the area. This species is a common migrant throughout Illinois during the spring and was likely a transient. A single Northern Harrier (Illinois endangered) was also observed near census point 13 (Figure 7) on 4 April. The Northern Harrier requires large grasslands both for breeding and foraging. There is no adequate breeding habitat in the area for this species. This species is also a fairly common migrant in Illinois and this individual was probably a transient.

A single Pied-billed Grebe (Illinois threatened) was seen near census point 2 (Figure 4-A) on 3 April. This bird was in a small wooded pond with no appropriate

breeding habitat. Pied-billed Grebes are common spring migrants throughout the state.

Seventeen species of concern were seen during the spring census. The largest numbers (six and five respectively) occurred at points 14 (in oak forest) and 12 (along the Beardstown marsh). The relatively high number of species of concern reflects the importance of the forests and woodlands in the Illinois River Valley as habitat for migrating songbirds.

## Discussion

### Endangered and Threatened Species

Eight Illinois endangered (one of which is also Federally threatened) or threatened bird species were observed during our censuses of the FAP 310 project area from 1995 through 1997. At least two other species which were not observed during our censuses, (Common Moorhen and Loggerhead Shrike, both Illinois threatened) probably breed in the vicinity of the corridor.

#### 1) **Pied-billed Grebe**, Illinois threatened

One Pied-billed Grebe was seen in the corridor during our censuses (Figure 4-A). This species is a relatively common migrant during the fall and spring. There is no adequate habitat at this site and this individual was clearly a migratory transient. Six Grebes were also observed in the western part of the Beardstown marsh in the fall of 1995 (Figure 7-I). The Beardstown marsh west of existing US 67 does not provide adequate breeding habitat for this species. In addition, this sighting was outside of the breeding season. These individuals were very likely migrants.

Suitable habitat for the Pied-billed Grebe is present in the Beardstown marsh east of existing US 67 (Figure 7-G). The entire Beardstown marsh area also provides excellent migratory habitat for this species.

#### 2) **Double-crested Cormorant**, Illinois threatened

A single Double-crested Cormorant was observed foraging near US 67 south of Beardstown (Figure 7-I). The nearest Double-crested Cormorant colony is over 50 km from the area and it is likely this bird was either an unmated transient or a late migrant.

**3) Least Bittern, Illinois endangered**

A single Least Bittern responded to taped playback in the eastern Beardstown marsh (Figure 7-G) on 5 June 1995. It is likely that the species was breeding in the area.

**4) Great Egret, Illinois threatened**

Several foraging Great Egrets were seen along the Illinois River near US 67 (Figure 7-L) on 24 September 1997. These birds were post-breeding transients. The closest Heron and Egret breeding colony is in the Meredosia Wildlife Refuge (Figure 5-E). No nests for either species was found at the Meredosia Refuge in 1996. Excellent foraging habitat is found for this species along the Illinois River and in the Beardstown marsh. There is little potential that the FAP 310 project will significantly affect Egret foraging habitat in the area. The highest potential for impact is at the Illinois River crossing.

**5) Black-crowned Night Heron, Illinois endangered**

Three Black-crowned Night Herons were seen in the Beardstown marsh west of US 67 in October of 1995 (Figure 7-I). Adequate breeding habitat for this species is not found in the area and this was well outside of the breeding season. These individuals were probably post breeding season transients or migrants.

**6) King Rail, Illinois threatened**

A single King Rail responded to taped playback in the eastern Beardstown marsh (Figure 7-G) on 5 June 1995. It is likely that this species breeds in the area.

**7) Common Moorhen, Illinois threatened**

Common Moorhens have been found breeding in the Beardstown marsh several times in the past five years (P. Ward, Morgan County Audubon, personal communication). The habitat in the eastern section of the Beardstown marsh (outside the project corridor, Figure 7-G) continues to provide excellent breeding habitat for this species.

**8) Bald Eagle, Federally threatened; Illinois endangered**

One Bald Eagle was seen in the corridor near the US 67 bridge over the Illinois River in the winter of 1997 (Figure 7-K). We also found many Bald Eagles along the river between Meredosia and Beardstown during an Eagle survey conducted in 1995.

This species winters in large numbers along the Illinois River every year and the Merodosa Wildlife Refuge (Figure 3) is home to dozens of Eagles every winter.

**9) Northern Harrier, Illinois endangered**

One Northern Harrier was observed in the corridor (Figure 7-J) on 4 April 1997. This bird was very likely a migrant. Harriers require large grasslands for breeding. This species has not been recorded breeding in the area in the recent past and breeding habitat for the species is not present in the area.

**9) Sharp-shinned Hawk, Illinois endangered**

One Sharp-shinned Hawk was observed in the corridor on 4 April 1997 (Figure 8-M). This bird was also very likely a migrant. Sharp-shinned Hawks require relatively large conifer forest patches for breeding. This species is one of the most common migrant hawk species in both the spring and the fall in Illinois.

**10) Brown Creeper, Illinois threatened**

Brown Creepers were seen in the corridor at multiple points during both the fall and winter censuses (Figure 4-B & C; Figure 5-D; Figure 6-F). We found no evidence that this species breeds in the corridor, however, Creepers probably over-winter in the area; especially in the Mauvaise Terre Creek area (Figure 4), where we found the majority of Brown Creepers during our censuses.

**11) Loggerhead Shrike, Illinois threatened**

No Loggerhead Shrikes were observed during our work in the corridor. However, this species has bred in the Jacksonville area several times in the recent past (Figure 2) and Shrike habitat is present in the southern part of the corridor.

### **Illinois Watch List Species**

**1) Bell's Vireo**

A Bell's Vireo, Illinois Watch List (special concern) species, was recorded south of census point 11 (Figure 7-H) in June of 1996. This individual was singing and may have been breeding in the area. Bell's Vireos nest in small trees and shrubs in early

successional habitats. The habitat around 7-H is capable of supporting nesting Bell's Vireos.

## **2) Golden-winged Warbler**

A Golden-winged Warbler, Illinois Watch List species (unknown status), was recorded at census point 10 on 8 May 1997 (Figure 6-F)). This species is not known to nest in the area (there are no breeding records from the counties through which the corridor passes) and the habitat around point 6-F is not typical of the breeding habitat for this species. Migrant Golden-winged Warblers occur throughout the state in the month of May and this individual was probably a transient.

### **Beardstown Marsh**

The Beardstown marsh lies close to the project corridor as it skirts the town of Beardstown, Illinois. This marsh is a significant area for waterbirds in central Illinois. Three endangered and two threatened species have bred in the eastern part of the marsh in the recent past (Table 1; Figure 7-G). We found direct evidence of breeding by two listed species (the King Rail, Illinois threatened, and the Least Bittern, Illinois endangered) on our visit in June of 1995. The marsh on both sides of US 67 also provides foraging and stop-over habitat for a large number of species of ducks, marsh nesting birds, Herons and Egrets, and shore birds.

### **Meredosia Wildlife Refuge**

The Meredosia Wildlife Refuge is home to a large number of birds (Figure 3). This area is an important migration stop-over area for thousands of migratory waterfowl every spring and fall. It is also a very important over-wintering area for Bald Eagles in Illinois.

The Refuge lies ~ 1.5 km from the project corridor.



## Summary

No endangered or threatened bird breeding habitat occurs in the FAP 310 project corridor. All of the endangered and threatened bird species observed in the corridor during our census work were migratory transients. No endangered or threatened species breed in the project corridor.

The corridor passes through over-wintering habitat for the Bald Eagle (Federally threatened and Illinois endangered) where it crosses the Illinois River. The corridor also passes through small patches of wooded habitat (Figure 4-B; Figure 6-F) used by the Illinois threatened Brown Creeper during the winter.

The Beardstown marsh lies close to the corridor and supports a variety of bird species, including several endangered and threatened species.

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**Table 1. Endangered, threatened, and Watch List bird records.** Data taken from the IDNR Heron and Egret Rookery Survey, the Illinois Natural Heritage Data Base, the Illinois Fish and Wildlife Information System, and the Illinois Breeding Bird Atlas. B = Brown County; C = Cass County; Mc = McDonough County; M = Morgan County; S = Schuyler County.

Species	Status	Breeding Location	Winter	Last date observed	Distance from project area
Pied-billed Grebe	IL-T	C, B*		1993	< 1 km
Great Egret	IL-T	C*		1991	< 5 km
Black-crowned Night Heron	IL-E	M		1989	> 5 km
American Bittern	IL-E	C*, M*		1979	< 1 km
Least Bittern	IL-E	C, S		1991	< 1 km
Upland Sandpiper	IL-E	C, M		1989	> 5 km
Sharp-shinned Hawk	IL-E	Mc*		1986	> 5 km
Red-shouldered Hawk	IL-E	S*, Mc*		1991	> 5 km
Bald Eagle	IL-E/US-T	C	C, M, S	1997	< 5 km
Northern Harrier	IL-E	B*, M*		1991	> 5 km
King Rail	IL-E	C		1982	> 5 km
Sora	I-WL	B		1989	> 5 km
Common Moorhen	IL-T	C		1996	< 1 km
Brown Creeper	IL-T	C*, S*		1982	> 5 km
Bewick's Wren	IL-E	M*, C*		1989	> 5 km
Loggerhead Shrike	IL-T	B*, C, Mc, M, S		1991	< 5 km
Bell's Vireo	IL-WL	C*, Mc, M		1990	> 5 km
Bobolink	IL-WL	Mc*, S		1990	> 5 km
Henslow's Sparrow	IL-E	B		1993	> 5 km
Yellow-headed Blackbird	IL-E	C		1978	< 1 km

IL-WL = Illinois Watch List, IL-T = Illinois threatened, IL-E = Illinois endangered, US-T = Federal threatened.

\* = Breeding not confirmed

Table 2. Endangered and threatened species breeding habitat.

Species	Required habitat type	Quality of habitat in project area	Location
Pied-billed Grebe ††	hemi-marsh	A	1
Great Egret ††	wooded marsh	N	
Black-crowned Night Heron ‡	wooded marsh	N	
American Bittern	upland boarding marsh	N	
Least Bittern ‡	hemi-marsh	A	1
Upland Sandpiper ‡	grassland	N	
Sharp-shinned Hawk ‡	pine forest	N	
Red-shouldered Hawk ‡	bottomland forest	N	
Bald Eagle ††, ‡	wooded lakes/rivers	N	
Northern Harrier ‡	grassland	N	
King rail †	hemi-marsh	A	1
Sora ◊	hemi-marsh	A	1
Common Moorhen †	hemi-marsh	A	1
Brown Creeper †	bottomland forest	N	
Bewick's Wren ‡	shrubland/suburban	N	
Loggerhead Shrike †	old fields/shrubland	A	Southern 1/3 of the project area
Bell's Vireo◊	old fields/shrubland	A	Figure (7-H)
Bobolink ◊	grasslands/hayfields	N	
Henslow's Sparrow ‡	grasslands/hayfields	N	
Yellow-headed Blackbird ‡	hemi-marsh	A	1

A = adequate breeding habitat present, M = marginal breeding habitat present, P = poor or inadequate breeding habitat present, N = breeding habitat absent (A / M indicates adequate to marginal) 1 = Beardstown marsh (red hatched area of Figure 7).

†† = Federal threatened; ‡ = Illinois endangered; † = Illinois threatened; ◊ = Illinois Watch List

Table 3. Description of census points.

Point	Habitat type	UTM / Zone 15	Legal description
1	Flood-plain forest.	4,405,100m N 729,100m E	Morgan Co., IL; T 15 N, R 11 W; Section 9, SW/4, NW/4, NE/4; Concord IL 7.5' series USGS topographic quadrangle.
2	Flood-plain forest.	4,404,925m N 729,100m E	Morgan Co., IL; T 15 N, R 11 W; Section 9, NW/4, NW/4, NE/4; Concord, IL 7.5' series USGS topographic quadrangle.
3	Oak/hickory upland forest.	4,404,200m N 728,300m E	Morgan Co., IL; T 15 N, R 11 W; Section 9, NW/4, NW/4, SW/4; Concord, IL 7.5' series USGS topographic quadrangle.
4	Successional woodland	4,410,750m N 713,350m E	Morgan Co., IL; T 16 N, R 13 W; Section 24, SE/4, NE/4, SE/4; Meredosia, IL 7.5' series USGS topographic quadrangle.
5	Oak/hickory upland forest.	4,417,050m N 713,150mE	Cass Co., IL; T 17 N, R 13 W; Section 36, NW/4, SE/4, SE/4; Cooperstown, IL 7.5' series USGS topographic quadrangle.
6	Oak/hickory upland forest.	4,419,200m N 714,200mE	Cass Co., IL; T 17 N, R 12 W; Section 30, NW/4, NE/4, Arenzville West, IL 7.5' series USGS topographic quadrangle.
7	Oak/hickory upland forest.	4,419,400m N 714,100m E	Cass Co., IL; T 17 N, R 12 W; Section 30, SE/4, SW/4, NW/4; Arenzville West, IL 7.5' series USGS topographic quadrangle.
8	Oak/hickory upland forest.	4,426,100m N 715,550m E	Cass Co., IL; T 17 N, R 12 W; Section 5, NE/4, SE/4, NW/4; Arenzville West, IL 7.5' series USGS topographic quadrangle.
9	Upland forest	4,416,800m N 729,525m E	Morgan Co., IL; T 16 N, R 11 W; Section 6, NW/4, SE/4, NE/4; Chapin, IL 7.5' series USGS topographic quadrangle.
10	Upland forest	4,416,425m N 723,500m E	Morgan Co., IL; T 16 N, R 11 W; Section 6, SW/4, SE/4, NE/4; Chapin, IL 7.5' series USGS topograph quadrangle.
11	Disturbed sand prairie.	4,427,525m N 720,700m E	Cass Co., IL; T 18 N, R 2 W; Section 35, SE/4, SW/4, NE/4; Arenzville West, IL 7.5' series USGS topographic quadrangle.
12	Open water marsh with American Lotus	4,430,100m N 718,100mE	Cass Co., IL; T 18 N, R 2 W; Section 22, NW/4, SW/4, SW/4; Arenzville West, IL 7.5' series USGS topographic quadrangle.
13	Riparian shrub land; emergent vegetation	4,430,475m N 717,750m E	Cass Co., IL; T 18 N, R 2 W; Section 21, NW/4, NE/4, SE/4; Arenzville West, IL 7.5' series USGS topographic quadrangle .
14	Oak/hickory upland ; steep sloped ravine	4,436,150m N 714,200m E	Schuyler Co., IL; T 1 N, R 1 W; Section 23, SE/4, SW/4, NW/4; Beardstown, IL 7.5' series USGS topographic quadrangle.
15	Oak/hickory upland; ridge top	4,436,300m N 714,400m E	Schuyler Co., IL; T 1 N, R 1 W; Section 23, SE/4, SW/4, NW/4; Beardstown, IL 7.5' series USGS topographic quadrangle.
16	Oak/hickory upland; along ravine	4,437,600m N 711,850m E	Schuyler Co., IL; T 1 N, R 1 W; Section 16, NE/4, NW/4, SE/4; Rushville South, IL 7.5' series USGS topographic quadrangle.

**Table 3. Description of census points. (Continued)**

<b>Point</b>	<b>Habitat type</b>	<b>UTM / Zone 15</b>	<b>Legal description</b>
<b>17</b>	Oak/hickory upland; along ravine.	4,440,100m N 709,300m E	Schuyler Co., IL; T 1 N, R 1 W; Section 5, SE/4, SW/4, SW/4; Rushville South, IL 7.5' series USGS topographic quadrangle.
<b>18</b>	Oak/hickory upland; along ravine	4,440,250m N 709,425m E	Schuyler Co., IL; T 1 N, R 1 W; Section 5, NE/4, SW/4, SW/4; Rushville South, IL 7.5' series USGS topographic quadrangle.
<b>19</b>	Upland forest; along ravine	4,457,250m N 704,700m E	Schuyler Co., IL; T 3 N, R 2 W; Section 14, SE/4, SE/4, NW/4; Rushville North, IL 7.5' series USGS topographic quadrangle.
<b>20</b>	Oak/hickory upland; along ravine	4,458,350m N 704,650m E	Schuyler Co., IL; T 3 N, R 2 W; Section 11, NE/4, SE/4, SW/4; Industry, IL 7.5' series USGS topographic quadrangle.

**Table 4. Duration of census seasons.**

<b>Season</b>	<b>Dates</b>
Winter	1 December to 28 February
Spring	1 March to 30 April
Breeding	1 May to 31 August
Fall	1 September to 30 November

Table 5. List of avian species observed during the four season census.

Family / Species	Family / Species	Family / Species
<b>Podicipedidae</b> Pied-billed Grebe †	<b>Tyrannidae</b> Eastern Wood-Pewee	Tennessee Warbler
<b>Phalacrocoracidae</b> Double-crested Cormorant †	Least Flycatcher	Nashville Warbler
<b>Ardeidae</b> Great Egret †	Acadian Flycatcher	Northern Parula
Green Heron	Eastern Phoebe	Black-and-white Warbler
<b>Anatidae</b> Canada Goose	Great Crested Flycatcher	Blackburnian Warbler
Wood Duck	Eastern Kingbird	Chestnut-sided Warbler
Mallard	<b>Alaudidae</b> Horned Lark	Magnolia Warbler
Blue-winged Teal	<b>Hirundinidae</b> Tree Swallow	Yellow-rumped Warbler
Green-winged Teal	Barn Swallow	Black-throated Green Warbler
Northern Shoveler	<b>Corvidae</b> Blue Jay	Bay-breasted Warbler
<b>Cathartidae</b> Turkey Vulture	American Crow	Blackpoll Warbler
<b>Accipitridae</b> Bald Eagle ††; ‡	<b>Paridae</b> Black-capped Chickadee	Palm Warbler
Northern Harrier ‡	Eastern Tufted Titmouse	Kentucky Warbler
Sharp-shinned Hawk ‡	<b>Sittidae</b> White-breasted Nuthatch	Wilson's Warbler
Cooper's Hawk	<b>Certhiidae</b> Brown Creeper †	Ovenbird
Red-tailed Hawk	<b>Troglodytidae</b> House Wren	Louisiana Waterthrush
American Kestrel	Carolina Wren	Common Yellowthroat
<b>Phasianidae</b> Wild Turkey	<b>Mucicapidae</b> Golden-crowned Kinglet	Scarlet Tanager
Northern Bobwhite	Ruby-crowned Kinglet	Summer Tanager
<b>Rallidae</b> American Coot	Blue-gray Gnatcatcher	Northern Cardinal
<b>Charadriidae</b> Killdeer	Eastern Bluebird	Rose-breasted Grosbeak
<b>Columbidae</b> Mourning Dove	Swainson's Thrush	Indigo Bunting
<b>Cuculidae</b> Yellow-billed Cuckoo	Wood Thrush	Dickcissel
<b>Apodidae</b> Chimney Swift	American Robin	Eastern Towhee
<b>Trochilidae</b> Ruby-throated Hummingbird	<b>Mimidae</b> Gray Catbird	American Tree Sparrow
<b>Alcedinidae</b> Belted Kingfisher	Brown Thrasher	Chipping Sparrow
<b>Picidae</b> Red-headed Woodpecker	<b>Bombycillidae</b> Cedar Waxwing	Field Sparrow
Red-bellied Woodpecker	<b>Sturnidae</b> European Starling ♂	Lark Sparrow
Downy Woodpecker	<b>Vireonidae</b> Yellow-throated Vireo	Grasshopper Sparrow
Hairy Woodpecker	Bell's Vireo ◊	Song Sparrow
Northern Flicker	Warbling Vireo	White-throated Sparrow
Pileated Woodpecker	Red-eyed Vireo	White-crowned Sparrow
	<b>Emberizidae</b> Golden-winged Warbler ◊	Dark-eyed Junco
		Red-winged Blackbird
		Eastern Meadowlark
		Common Grackle
		Brown-headed Cowbird
		Baltimore Oriole
		<b>Fringillidae</b> House Finch
		American Goldfinch
		<b>Passeridae</b> House Sparrow ♂
		Eurasian Tree Sparrow ♂

†† = Federally Threatened, ‡ = Illinois Endangered, † = Illinois Threatened, ◊ = Illinois Watch List, = Introduced Species

**Table 6. Breeding season results.** The values represent the highest of number of birds recorded during the two censuses conducted at each census point. Counts for each point are presented as well as the total count for each species. The "C" is a measure of the level of concern for each species (Thompson et al. 1992).

Species	Census Point																				Total	C
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Great Blue Heron																					3	
Northern Bobwhite											1										1	
Mourning Dove				1																	2	1
Yellow-billed Cuckoo *		2																			7	3
Ruby-throated Hummingbird		1			1	1															2	2
Red-bellied Woodpecker	2	1	1	1	1	1				1											14	
Downy Woodpecker	1	2			1	1				1											8	
Hairy Woodpecker																	1				1	
Northern Flicker																		1			1	1
Pileated Woodpecker										1	1										2	
Eastern Wood-Pewee			1							1											4	2
Acadian Flycatcher *	2	1																			3	3
Great Crested Flycatcher *	1	2								2											9	3
Eastern Kingbird											1										1	2
Blue Jay	1							2	1	2	4	2	2	1							22	
American Crow			1					2													3	
Black-capped Chickadee				1						1											5	
Eastern Tufted Titmouse	1	1								1											6	
White-breasted Nuthatch	1		1							1	1	1									5	
Carolina Wren	1	1								1											5	
Blue-gray Gnatcatcher *										1											1	3
Wood Thrush *				1						1											3	4
American Robin											1	1	1								7	1
Gray Catbird *														1							1	3
Cedar Waxwing																	1				1	2

Table 6. Breeding season results. (Continued)

Species	Census Point																				Total	C	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
European Starling		1																			1		
Red-eyed Vireo		1				1	1		1	2					2		2	1	1	1	1	13	2
Bell's Vireo ♀										1												1	
Warbling Vireo									1			1									2	2	2
Tennessee Warbler														1							1	1	1
Nashville Warbler																		1	1			2	
Blackpoll Warbler													1								1	2	
Ovenbird *						1	1														2	2	3
Louisiana Waterthrush *																					1	1	4
Common Yellowthroat			1						1												2	2	2
Scarlet Tanager *									1											1		2	3
Northern Cardinal	1		2	1		1		1		1				1	1	1	1	1	1		1	13	
Rose-breasted Grosbeak*					1				1						1		1				1	5	3
Indigo Bunting		1		2	2	1	1	3			2				2	1	1	1	1	1	2	20	2
Dickcissel *											1											1	4
Eastern Towhee *			1	1	1														1			4	3
Chipping Sparrow				1										1								2	2
Field Sparrow				1																		1	1
Lark Sparrow *											1											1	3
Grasshopper Sparrow *											1											1	4
Song Sparrow *								1												1		2	3



Table 6. Breeding season results. (Continued)

Species	Census Point																				Total	C
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Eastern Meadowlark *											1										1	3
Common Grackle							1	1			1						1	1			5	
Brown-headed Cowbird						1		1	1	1		1			1			1	1	1	11	1
Baltimore Oriole *				1			1	2	2	1	1			2	1				1	1	13	3
American Goldfinch											1										1	2
Number of individuals	11	14	8	13	10	14	10	13	20	15	14	1	5	9	15	4	18	13	10	10	227	
Number of species	9	11	7	11	9	12	6	7	18	12	13	1	4	8	13	4	14	13	10	9	51	
Illinois watch-list											1										1	
Species of concern	2	3	1	3	4	2	2	2	6	3	7			2	3		3	2	3	3	18	

◇ = Illinois watch-list; \* = species of concern



Table 7. Fall census results. (Continued)

Species	Census Point																				Total	C
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Yellow-rumped Warbler		4	1				1		1	5	1						1			2	16	
Black-throated Green Warbler																	1				1	2.5
Blackburnian Warbler																				1	1	2
Pine Warbler									1												1	1
Bay-breasted Warbler *																				1	1	3
Blackpoll Warbler				1																	1	2.5
Black-and-white Warbler																				1	1	2.5
Common Yellowthroat *													1								1	3
Wilson's Warbler *																				1	1	3
Northern Cardinal		1	1	2		1	1	1	1	1			1		1		2	1			14	3
Indigo Bunting *													4								4	3
Song Sparrow													1								1	1
White-throated Sparrow							3						3		2						8	1
Red-winged Blackbird													50								50	1
<b>Number of individuals</b>	5	18	9	7	13	7	10	10	12	15	7	6	72	11	10	8	8	17	3	15	263	
<b>Number of species</b>	5	9	8	5	8	5	8	7	10	9	5	4	11	9	6	5	5	8	3	12	40	
<b>Illinois threatened</b>									1												1	
<b>Species of concern</b>		2			1			1	1				3			1		1		3	11	

† = Illinois threatened; \* = species of concern

**Table 8. Winter census results.** The values represent the highest of number of birds recorded during the two censuses conducted at each census point. Counts for each point are presented as well as the total count for each species. The "C" is a measure of the level of concern for each species (Thompson et al. 1992).

Species	Census Point																				Total	C
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Mourning Dove															1						1	1
Red-bellied Woodpecker	2	2			3		1	1	3								1	2	1	1	1	17
Downy Woodpecker	2	1		1	1	1	1	2					1			1			1	2	15	
Hairy Woodpecker			1																		1	
Northern Flicker								1										1			2	1
Blue Jay	2		1		1	1							1	2				2	5	1	16	
American Crow		2		1				1	1												5	
Black-capped Chickadee	1	5	1	4	1		2			2		3						1	1		21	
Eastern Tufted Titmouse	1	2				1	1	1								2					8	
White-breasted Nuthatch	1	2		2	2			2	1											1	11	
Brown Creeper †	1		5		1				3												10	
Golden-crowned Kinglet			5				1			1											7	2
European Starling			1																		1	
Northern Cardinal								2			4	5	1					1			13	
Song Sparrow											1	3					2				6	1
Dark-eyed Junco		1									4	3				2					10	
American Goldfinch								1													1	
House Sparrow			5		3																8	
Number of Individuals	10	15	19	8	12	3	3	6	12	8	9	0	11	6	3	1	7	7	8	5	153	
Number of species	8	7	7	4	7	3	3	5	7	5	3	0	3	4	2	1	4	5	4	4	18	
Illinois threatened	1		1		1				1												1	

† = Illinois threatened

**Table 9. Spring census results.** The values represent the highest of number of birds recorded during the two censuses conducted at each census point. Counts for each point are presented as well as the total count for each species. The "C" is a measure of the level of concern for each species (Thompson et al. 1992).

Species	Census Point																				Total	C
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Double-crested Cormorant†											1										1	
Great Blue Heron											1										1	
Canada Goose											9				1						10	
Wood Duck											6										6	
Green-winged Teal											2										2	
Mallard											1	2									3	
Blue-winged Teal											20										20	
Northern Shoveler											22										22	
Northern Harrier ‡											1										1	
American Kestrel											1										1	1
Northern Bobwhite											1										8	9
American Coot											70										70	
Mourning Dove	1					1		1		1	2				1						7	1
Red-headed Woodpecker	2					1															3	
Red-bellied Woodpecker	2	1	2		2	3	1	1	1											2	15	
Downy Woodpecker	1		1		1		1		1						1					1	7	
Hairy Woodpecker										1											1	
Northern Flicker *	1		1		1	1			1				1						1		7	3
Eastern Wood-Pewee *													1								1	3
Least Flycatcher *													1								1	3
Eastern Phoebe *													1								2	3
Great Crested Flycatcher *														1							1	2
Horned Lark											1										1	1.5
Tree Swallow *											2										2	3
Blue Jay				1	2	2	2	4	1	4				3						3	1	24
American Crow				1				1													1	3
Black-capped Chickadee	1	2		1	1		1			2					2					1	11	

Table 9. Spring census results. (Continued)

Species	Census Point																				Total	C
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Eastern Tufted Titmouse		2				1	1							1			2	1		8		
White-breasted Nuthatch	1				1									1			1	1		5		
Carolina Wren			1				1	1												3		
House Wren		2	1		1					1								1	1	6		
Ruby-crowned Kinglet							1										1	1	1	4		
Blue-gray Gnatcatcher				1																1		
Eastern Bluebird *					1															1		
Swainson's Thrush								1										1		2		
Wood Thrush									1						1					2		
American Robin	1	1	4	1	1	1	2		1	1			1	1	1		1		3	20		
Gray Catbird										1										2		
Brown Thrasher	1					1	1												2	5		
European Starling	1	1																	1	3		
Yellow-throated Vireo							1										1			2		
Red-eyed Vireo																		1		1		
Golden-winged Warbler ♀; *										1										1		
Nashville Warbler *	1	2		1	1			1	1			1		1					2	12		
Northern Parula								1										1		3		
Yellow-rumped Warbler			1	1		3	4					1	2	1	1		1		1	16		
Black-throated Green Warbler			2		1															3		
Blackburnian Warbler						1														1		
Palm Warbler								1		1		2								4		
Blackpoll Warbler			1																	1		
Black-and-white Warbler							1	1						1						3		
Ovenbird	1		1											1			1			4		
Louisiana Waterthrush *															1					1		
Kentucky Warbler *	1																			1		
Common Yellowthroat *											1	1				1				3		

Table 9. Spring census results. (Continued)

Species	Census Point																				Total	C
	1	2	3	4	5	7	6	8	9	10	11	12	13	14	16	15	17	18	19	20		
Scarlet Tanager								1						1						1	3	2
Northern Cardinal	1	2	1			1	2	2	1	1				1		1		2	2		17	
Rose-breasted Grosbeak *		1	1		2		2	1	2		3			1			1	1	1		16	3.5
Indigo Bunting *				1	2			1							1				2		7	3
Eastern Towhee						1	1											1			3	2
Song Sparrow										1		1									2	1
White-throated Sparrow		1		2																	3	
White-crowned Sparrow										1											1	
Red-winged Blackbird										5	1										6	
Eastern Meadowlark										1											1	1
Common Grackle											5										5	
Brown-headed Cowbird	1	1	3	1	2	1	3	1	1	1				2	1	1	1		2		20	1
Northern Oriole	1			1		1	1	1	1	1				1	3				2		12	2.5
American Goldfinch											2								1		3	2.5
Number of individuals	18	17	23	10	21	23	19	13	18	15	21	147	4	19	11	5	10	15	33	7	449	
Number of species	16	12	16	9	16	15	13	10	16	11	14	16	3	17	8	5	9	12	18	6	69	
Illinois threatened												1									1	
Illinois watch-list										1											1	
Species of concern	3	3	3	2	4	2		3	4	1	4	5		6	1	2	1	2	3	1	17	

† = Illinois threatened; ∅ = Illinois watch-list; \* = Species of concern

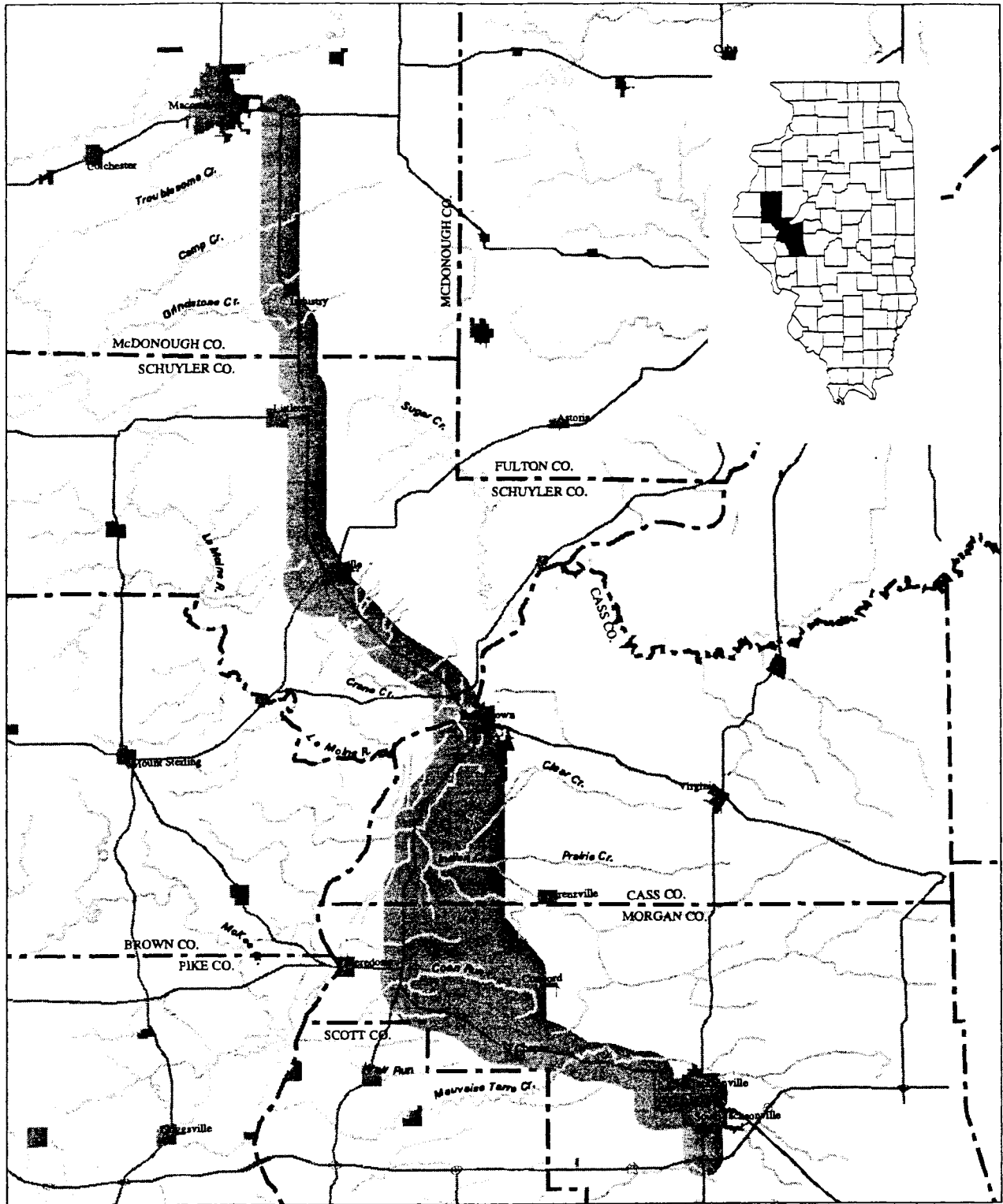
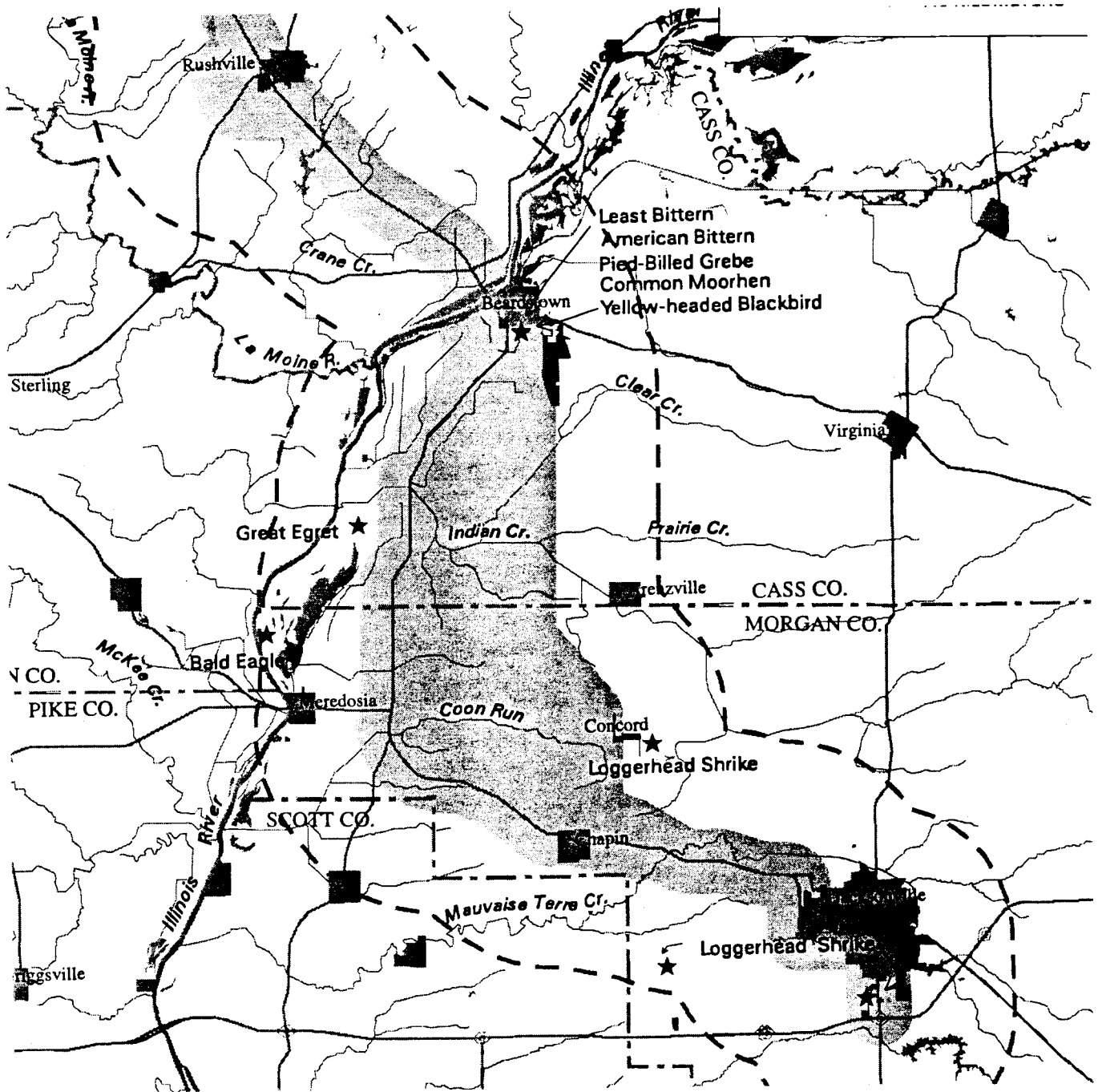
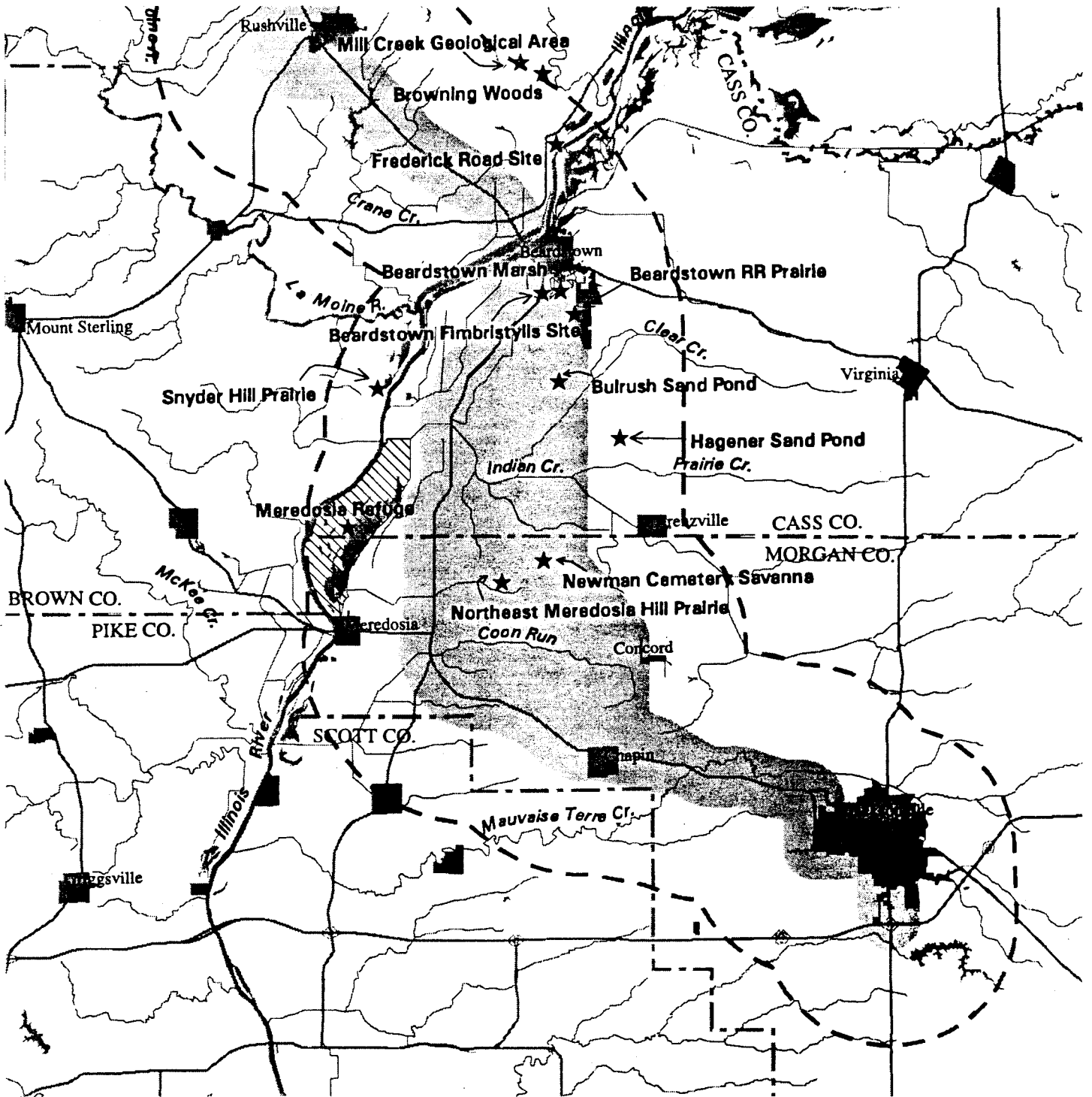


Figure 1. FAP 310 corridor. The corridor is highlighted in gray.

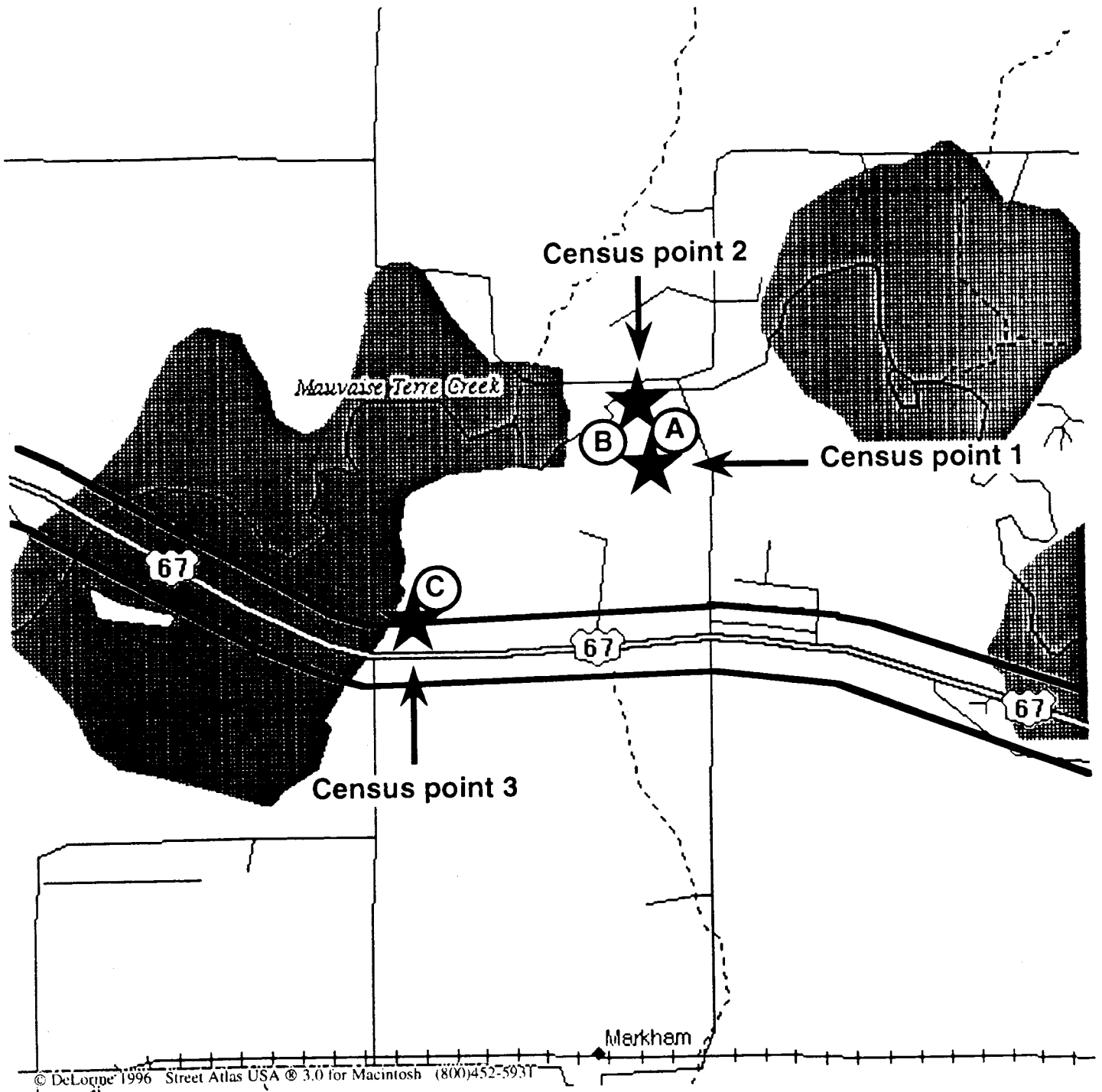




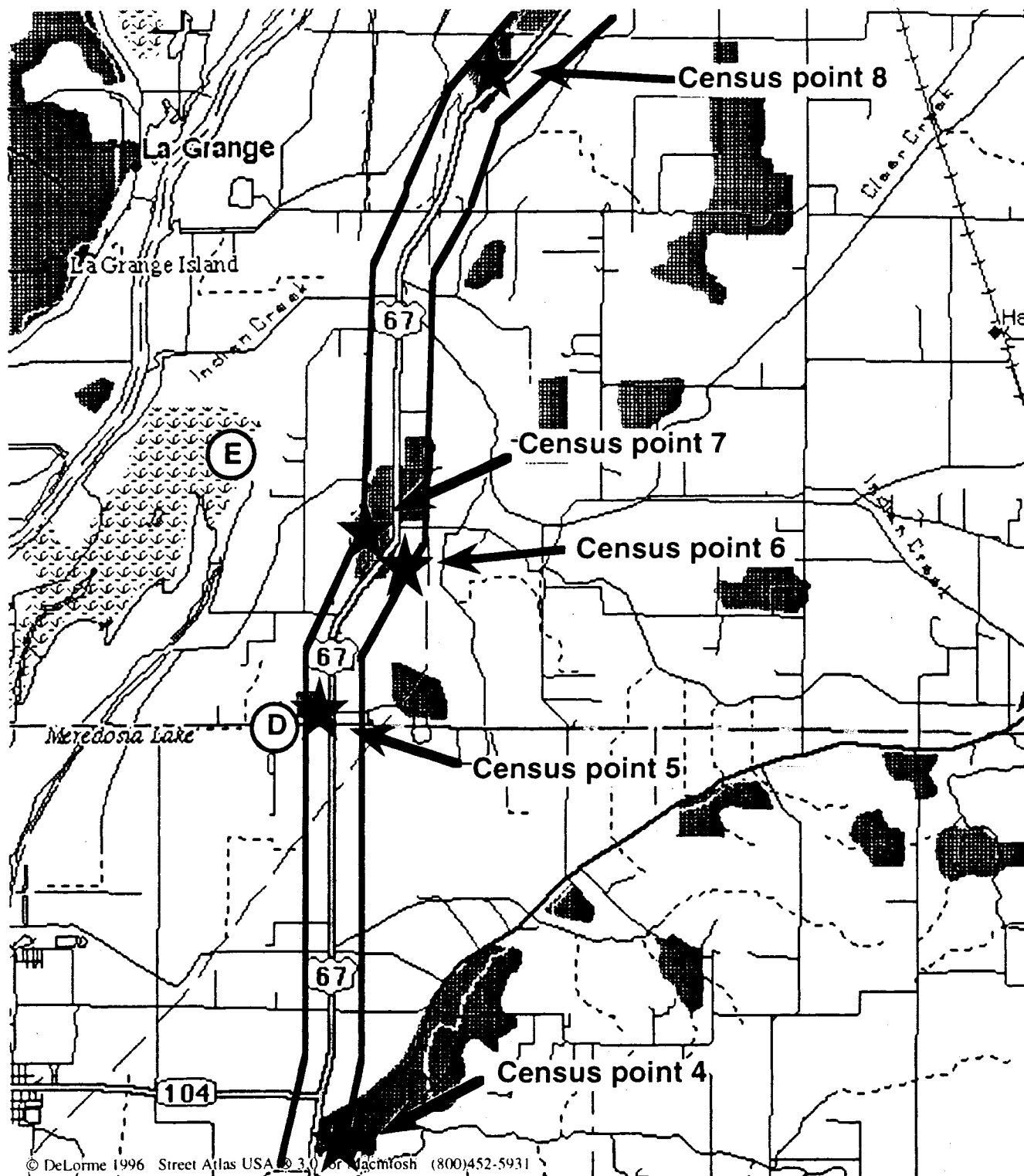
**Figure 2. Endangered and threatened species records. Morgan, Cass, Schuyler, and McDonough counties. All records are from the Illinois Natural Heritage Database.**



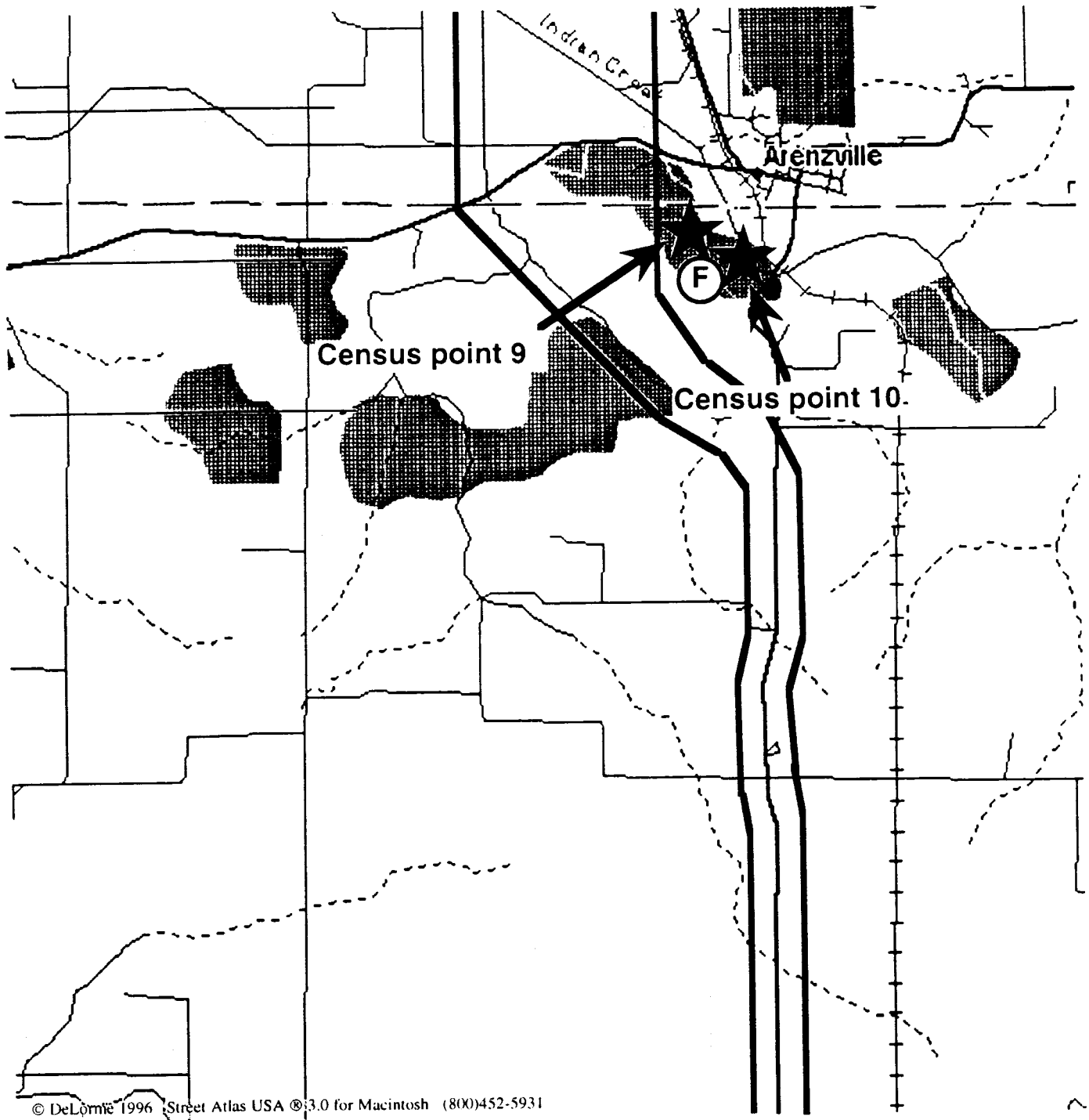
**Figure 3.** Location of state natural areas and preserves. Stars and hatched areas indicate state natural areas and preserves. A five km buffer around the corridor is indicated by a dashed line.



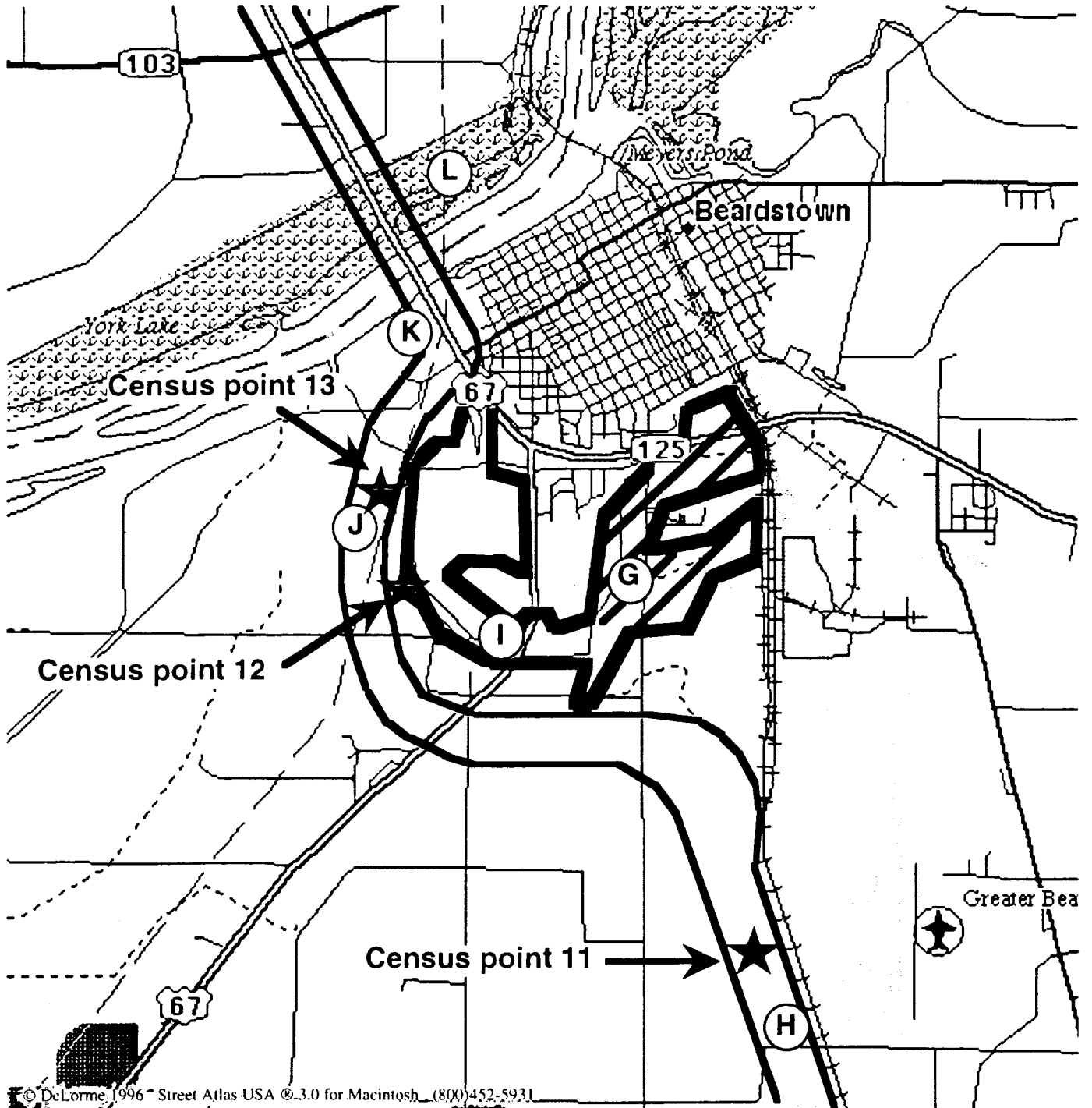
**Figure 4. Census points 1-3.** The proposed corridor is outlined in gray. Stars mark census points. "A" indicates the location of a Pied-billed Grebe (IL threatened) sighting (3 April, 1997); "B" indicates the location of a Brown Creeper (IL threatened) sighting (30 January, 1997); "C" indicates the location two additional Brown Creeper sightings (30 January, 1997 and 20 February, 1997).



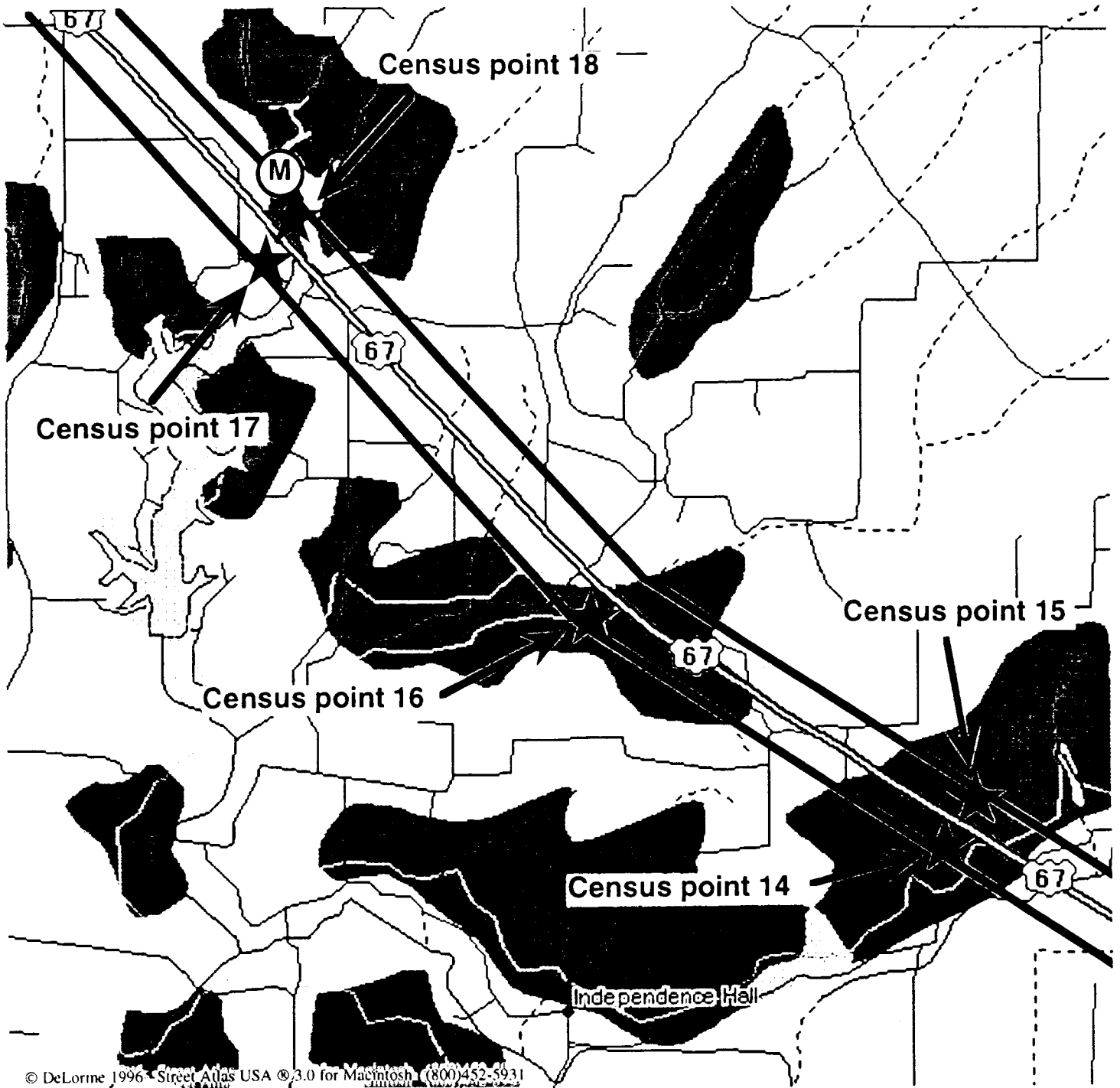
**Figure 5. Census points 4-8.** The proposed corridor is outlined in gray. Stars mark census points. "D" indicates the location of a Brown Creeper (IL threatened) sighting (20 February, 1997); "E" indicates the position of a Heron Rookery confirmed as active during the breeding season of 1995.



**Figure 6. Census points 9 and 10.** The proposed corridor is outlined in gray. Stars mark census points. "F" indicates the location of two Brown Creeper (IL threatened) sightings (17 October, 1996 and 20 February, 1997) and of a Golden-winged Warbler (IL watch-list) sighting (8 May, 1997).

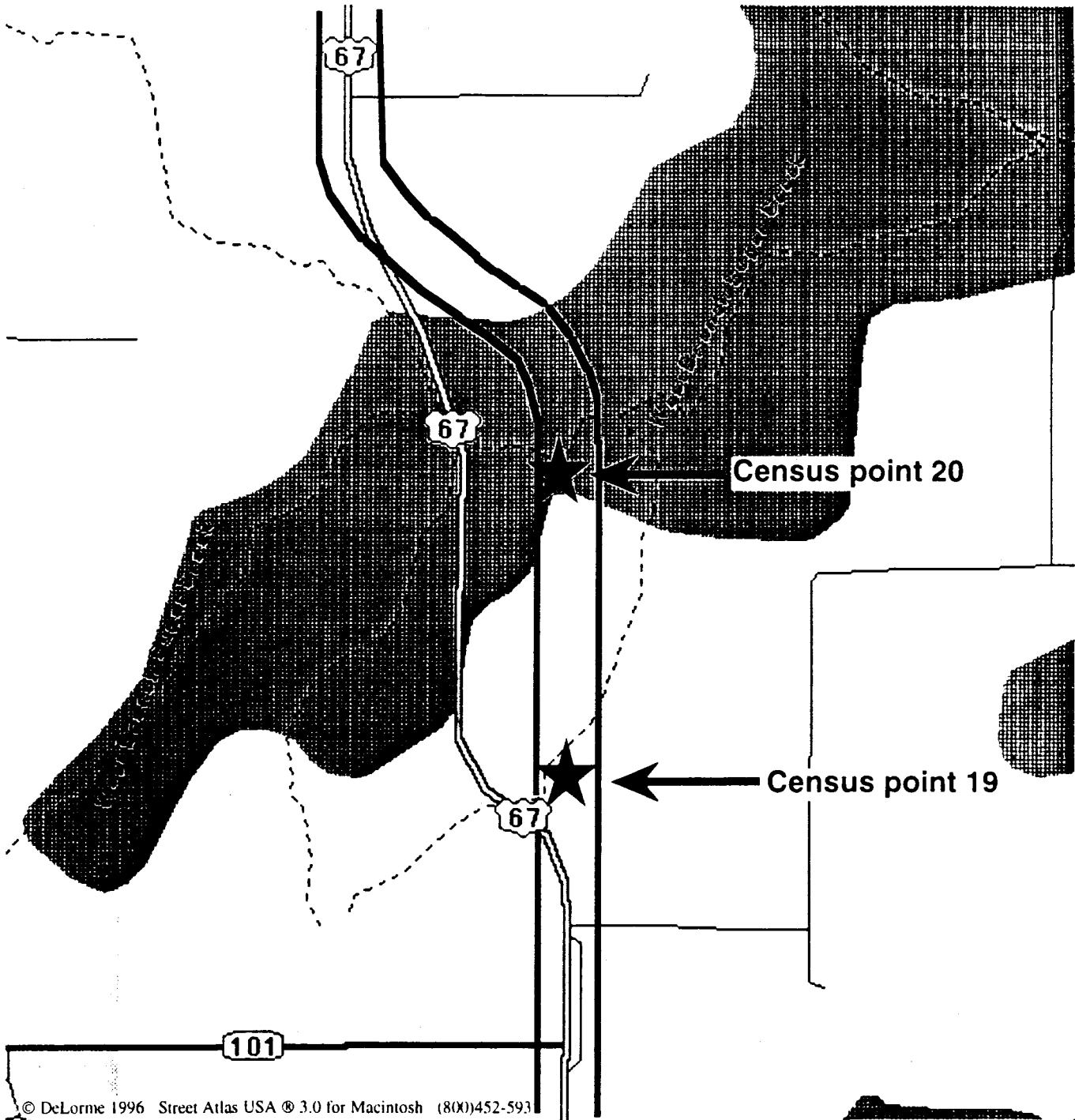


**Figure 7. Census points 11-13.** The proposed corridor is outlined in gray. Stars mark census points. The Beardstown Marsh is outlined in blue. Red hatching within the marsh ("G") indicates suitable habitat for marsh-nesting birds. "H" indicates the location of Bell's Vireos (IL watch-list) sightings, 23 June 1996; "I" indicates the location of a Double-crested Cormorant (IL threatened) sighting (8 May, 1997); "J" indicates the location of a Northern Harrier (IL endangered) sighting (4 April, 1997); "K" indicates the location of the Bald Eagle (US threatened IL endangered) sighting, 30 January, 1997; "L" indicates the location of the Great Egret (IL threatened) sighting, 24 September, 1997.



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**Figure 8. Census points 14-18.** The proposed corridor is outlined in gray. Stars mark census points. "M" indicates the location of a Sharp-shinned Hawk (IL endangered) sighting (4 April 1997).



**Figure 9. Census points 19 and 20.** The proposed corridor is outlined in gray. Stars mark census points.