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AVIAN ECOLOGICAL INVESTIGATIONS:

HORSESHOE LAKE RECREATION AREA (MADISON COUNTY)

By

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Final Report (I)

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Table of Contents

	Page
Acknowledgements	iii
Introduction	1
Study Area	2
Methods of Survey	5
Habitat Types and Associated Species	8
Annotated List of Breeding Birds (includes estimated numbers of breeding pairs and management suggestions for individual species)	15
Management Recommendations for Habitat Types and Species Groups	31
Problems With and Benefits of the Investigation	34
Suggestions for Future Investigations	36
Literature Cited	38
Appendix I -- Distribution Maps of Breeding Birds (includes index)	40
Appendix II -- Maps Indicating Location of Census Stops	56
Appendix III -- Description and Location of Census Stops	61
Appendix IV -- IDOC Tabulation Sheets	66
Appendix V -- Photographs	69

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Introduction

The purpose of this study was to obtain, through standardized, systematic sampling, an estimate of abundance and distribution of breeding birds in the Kaskaskia River Fish & Wildlife Area. Surveys carried out during late May and throughout June of 1981 provided the majority of data. Several visits made during July and early August also supplied some relevant information. During the study period, 82 species of birds were observed and identified, of which 80 are considered to be breeding within, or have breeding season territories extending into, the Kaskaskia River Fish & Wildlife Area. Two species were tentatively determined to be late migrants.

This report includes estimates of the numbers of breeding pairs, management recommendations for the Kaskaskia River Fish & Wildlife Area with regard to preservation and protection of its avian fauna, and an evaluation of the investigation with suggestions for future surveys.

Although there are several lists available of bird species sighted along the lower Kaskaskia River (U.S. Army Corps of Engineers, 1975; Biotic Consultants, 1980, 1981) there have been no previous studies aimed at gathering qualitative and quantitative information on the breeding birds that occur within the Kaskaskia River Fish & Wildlife Area.

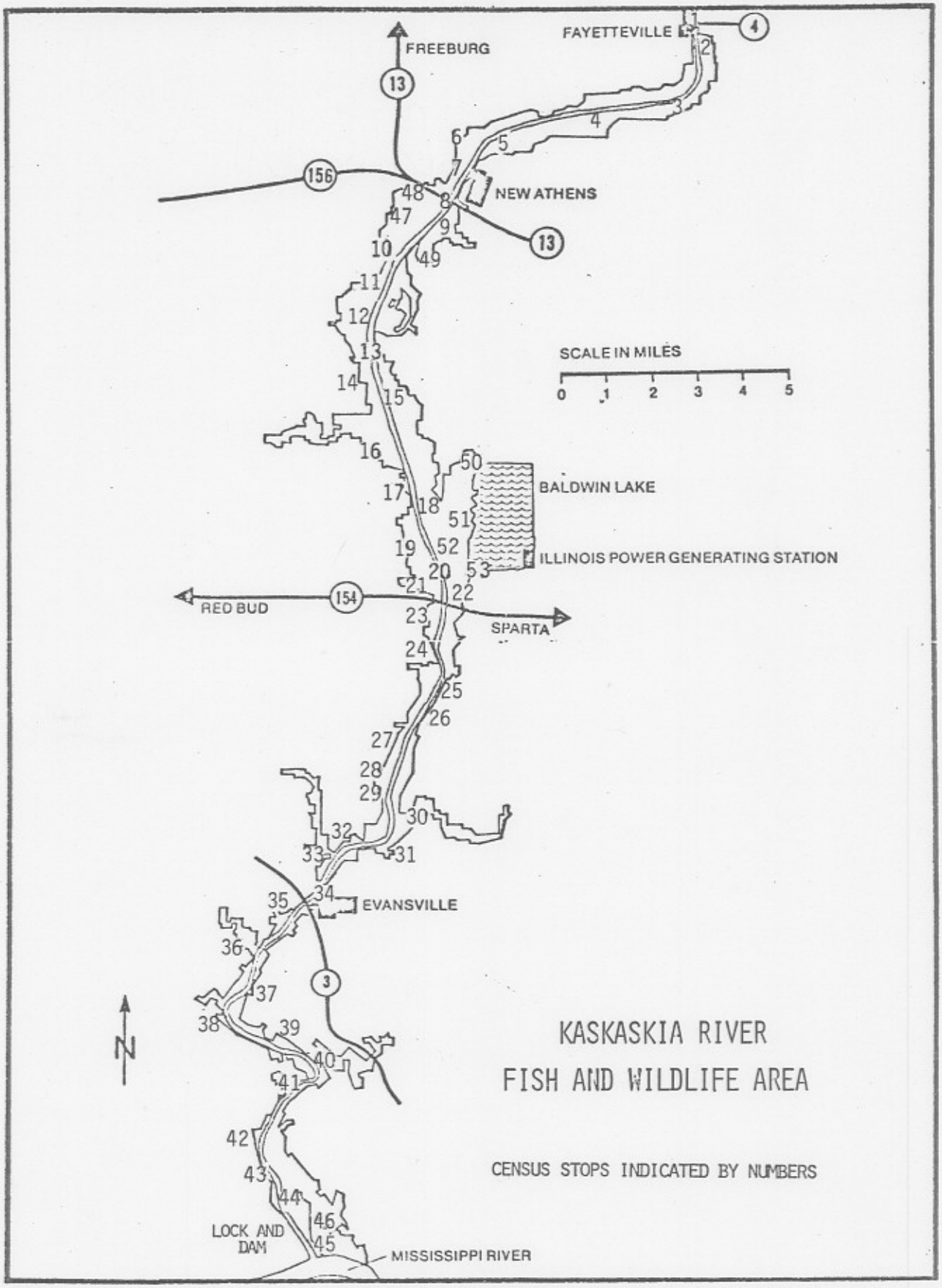
Study Area

The Kaskaskia River Fish & Wildlife Area (F&WA) lies within St. Clair, Monroe, and Randolph counties in southwestern Illinois. The landholdings managed by the Department of Conservation, composed of over 11,000 acres, include the Kaskaskia River and adjacent areas, from Fayetteville to where the river flows into the Mississippi River, as well as Baldwin Lake. A map to show the area and locations is given on page 4 (for more detailed maps refer to Appendix II).

The lower Kaskaskia River area has undergone extreme change since European settlement. Farming, mining, and urbanization resulted in the disappearance of large tracts of forested land. More recently, the U.S. Army Corps of Engineers straightened the lower river to accommodate barge traffic. The canalization shortened the original river below Fayetteville from 50 miles to 36 miles. The cutoff sections of the old channel have been plugged at the upstream end but left connected to the main channel at the downstream end. Dredge material has been deposited within extensive areas along the banks of the river.

As a result of the intensive land use by man, much of the area is simply a mosaic of habitat types which makes it difficult to find expanses of land dominated by a single habitat type. The problem is most obvious along the main river channel. In addition to dredge material placement (DMP) areas, other habitat types within the area include floodplain forest, upland forest, cropland, and abandoned farm fields. Aquatic habitats within the Fish & Wildlife Area include, besides the river and Baldwin Lake, numerous old channel oxbows, creeks, sloughs, and areas of dead standing trees referred to as flooded woods (Biotic Consultants, 1980). Aquatic areas isolated from the river and reservoir include old oxbow lakes, marshes, and buttonbush swamp.

During the survey period the Kaskaskia River area was subject to frequent heavy rains and some violent storms. The water remained at high levels throughout the month of June and certain floodplain forests were frequently inundated.



BASE MAP SOURCE: ILLINOIS DEPARTMENT OF CONSERVATION / DIVISION OF FORESTRY 25M-2-81

Methods of Survey

Forty-six census stops (sites) were selected along the 36 miles of river and associated creeks, old channel oxbows, and slough areas of the Kaskaskia River Fish & Wildlife Area (F&WA). An additional 6 census stops were chosen to cover habitats not adequately covered by the watercourse. Unless a census stop was indicated by a canal mile sign, or otherwise easily identifiable, each census stop was denoted by nailing a 4" x 4" red metal marker, to a tree, pole, or stake. In addition, a copper tag, with an imprint of the site number, was attached close to each red marker. Along the watercourse the markers were affixed to trees on the shore edge so as to be visible from the water.

Official surveys were carried out between 28 May and 27 June 1981. During this period all census stops were surveyed four times. Weather data was recorded before and after each survey. An official survey was carried out only on days of satisfactory weather conditions including good visibility, little or no precipitation, and light winds. If a steady drizzle, or a prolonged rain occurred during a survey, the survey was terminated and repeated in its entirety on a more satisfactory day. Each census survey (official survey) was initiated within the 15 minutes prior to sunrise, and completed before, or as close to, 10 a.m. as possible since bird activity significantly decreases after this time period.

Four days were required to complete one full survey of all 46 census stops of the watercourse. The sections of river covered by these four survey routes are as follows:

Survey Route I -- eight miles of river from Illinois Department of Conservation (IDOC) boat ramp at Fayetteville, to IDOC boat ramp near New Athens, includes census stops 1 through 9 (see map).

Survey Route II -- nine miles of river from IDOC boat ramp near New Athens, to IDOC river boat ramp southwest of Baldwin Reservoir, includes census stops 10 through 22.

Survey Route III -- nine miles of river from IDOC boat ramp southwest of Baldwin Reservoir, to IDOC boat ramp at Evansville, includes census stops 23 through 34.

Survey Route IV -- ten miles of river from IDOC boat ramp at Evansville, to Mississippi River, includes census stops 35 through 46.

In order to make a qualitative survey at the 6 census stops (47 through 53) of habitats not adequately covered by the watercourse, a land route was designed which was traveled by car. All these census stops were near or within easy walking distance of roads.

A canoe with a flat stern, powered by a 2 h.p. engine, was used to cover all routes on the river. A battery powered trolling motor was also brought along as an occasional backup. An assistant accompanied the observer in order to man the canoe and motor. Rate of travel between census stops averaged approximately 5 miles per hour.

Only the principal investigator counted and recorded birds. The watercourse routes were surveyed by recording all birds heard and seen while traveling between census stops and during 10-minute stops at each census site. For census sites 47 through 53, only birds heard and seen during the 10 minutes were counted and recorded. Birds seen while traveling between these sites were not included in the official survey. Both 7x35 and 7x50 binoculars were used to aid in identification of any birds seen. Peterson (1980) was used as a reference in the field.

Besides the data obtained from the 20 "official" survey days, information concerning breeding birds was gathered during preliminary reconnaissance of the area (initiated 20 May 1980), during daily surveys of census routes that had to be cancelled before completion (because of unsatisfactory weather), and

on visits following the completion of all "official" surveys. These additional trips included a number of daytime visits and two evening visits during July and early August of 1981 to confirm the presence of species not found during the official surveys and to augment data concerning species distribution. Areas surveyed included some considered to be relatively undisturbed or of remnant natural quality (Biotic Consultants, 1980). Rigid rules of censusing as outlined for the census stop routes were not adhered to during most of these "unofficial" surveys.

Habitat Types and Associated Species

The following descriptions of habitat types within the Kaskaskia River Fish & Wildlife Area list bird species associated with particular habitats. It should be understood that boundaries between habitat types are not necessarily clearcut and that transitional areas may support a greater number and variety of birds than their adjacent community types.

The nesting or breeding habitat of a species was considered to be the area where singing males or actual nesting was observed. It is more difficult to determine the preferred nesting or breeding habitat of nonsinging birds, birds whose nests were not seen, or birds which occur in similar numbers in a wide variety of habitats. In such instances field data was occasionally supplemented by reference to Harrison (1975), Hardin and Evans (1977), Graber, et al. (1972, 1977), and DeGraff, et al. (1980). The vegetation of the Kaskaskia River F&WA has recently been surveyed (Biotic Consultants, 1980, 1981).

Upland Forest

Tracts of upland forest within the F&WA are uncommon and primarily restricted to the upper slopes and terraces of the river and creeks. Common canopy species include hickory (*Carya* spp.) and white oak (*Quercus* spp.). Although not part of official survey routes, visits were made during the census period to the relatively undisturbed upland forest areas described by Biotic Consultants (1980). The four areas, Plum Creek Woods, Camp Creek Woods, Richland Creek Woods, and Sugar Maple Woods, were found to be similar in bird species composition to upland forest sites of the official survey.

Characteristic breeding birds of the upland forest community includes red-bellied woodpecker (scientific names for birds are given in the annotated species list), eastern wood pewee, blue jay, Carolina chickadee, tufted

titmouse, white-breasted nuthatch, wood thrush, blue-gray gnatcatcher, and yellow-throated vireo.

Floodplain Forest

Most of the wooded areas within the F&WA are bottomland forest occurring on the floodplain of the river. Few if any of these forests are undisturbed. Although a number of floodplain forest tracts exceed 100 acres in area, much of the forested land is fragmented and many tracts are relatively narrow zones localized along the banks of the main river channel, creeks, and old channel oxbows. Dominant canopy species include cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), and black willow (*Salix nigra*). Amount of understory coverage varies but dominant species are most often poison ivy (*Rhus radicans*) and trumpet-creeper (*Campsis radicans*).

Floodplain and upland forests of the F&WA share many of the same species of breeding birds although the latter is more diverse probably because of the habitat's wider distribution. Characteristic breeding birds of the floodplain forest community includes red-bellied woodpecker, great crested flycatcher, Carolina chickadee, white-breasted nuthatch, wood thrush, blue-gray gnatcatcher, and yellow-throated vireo; it is the primary breeding habitat for barred owl, red-shouldered hawk, pileated woodpecker, acadian flycatcher, eastern wood pewee, and Carolina wren.

Dredge Material Disposal (DMP) Sites

Dredge material has been deposited within extensive areas along the main channel. These DMP areas range in size from narrow belts adjacent to the new channel of only a few yards width to flats extending over one-quarter mile inland. The sections of DMP sites at the river margin are often composed of

dense stands of willow and silver maple saplings. The remaining and more inland areas of DMP sites are usually characterized by thick herbaceous growth with copses of shrub and scattered stands of willow, cottonwood, and silver maple, and can be considered successional field or savannah habitat.

The sapling stands and thickets along the river margin of DMP sites (and similar riparian communities) are used as nesting and feeding habitat by yellow-billed cuckoos, downy woodpeckers, eastern kingbirds, Carolina chickadees, gray catbirds, brown thrashers, white-eyed vireos, Bell's vireos, yellow warblers, common yellowthroats, American redstarts, red-winged blackbirds, orchard and northern orioles, common grackles, cardinals, indigo buntings, and American goldfinches. Additional species found occupying the inland sections of DMP sites include red-tailed hawk, bobwhite, killdeer, mourning dove, chimney swift, barn swallow, yellow-breasted chat, dickcissel, field sparrow and song sparrow.

Blue grosbeak and lark sparrow were found only within a particular DMP site located east of the main channel below Fayetteville. This DMP site is over one-half square mile in area and characterized by sandy soil.

Successional Fields

There are numerous abandoned fields scattered throughout the Kaskaskia River F&WA. These successional fields are characterized by thick herbaceous growth with the amount of shrub growth varying as to the age of the field.

Successional fields provide nesting and feeding habitat for bobwhites, mourning doves, brown thrashers, common yellowthroats, eastern meadowlarks, cardinals, indigo buntings, American goldfinches, and field sparrows.

Cropland

Agricultural fields, primarily consisting of corn and wheat, are a major habitat within and bordering the Kaskaskia River F&WA. Such areas principally provide feeding habitat for red-tailed hawks, bobwhites, mourning doves, chimney swifts, barn swallows, common crows, red-winged blackbirds, common grackles, brown-headed cowbirds, and American goldfinches. As well as feeding, species probably utilizing cropland for nesting includes eastern meadowlark and dickcissel. Where power lines occur in this habitat the lines are used as perches by many of the species mentioned above while red-headed woodpeckers use the poles in which to make nesting holes.

Developed Land

Besides several towns, there are numerous roadways, bridges, and summer cabins within and bordering the Kaskaskia River F&WA. The U.S. Army Corps of Engineers maintains the lock and dam located near the mouth and at canal mile 27 there is a barge loading dock.

House sparrows and starlings are usually abundant in all types of developed land. Both rock doves and house sparrows utilize the supporting structures of bridges for nesting sites. American kestrels are occasionally seen perched on power lines along roadways and railroad tracks. Other species found nesting and feeding in and around residential areas include American robin, common grackle, house wren, and cardinal.

Flooded Woods

Increased water levels maintained for the canal by the lock and dam have produced many areas of dead standing trees, or flooded woods (Biotic Consultants, 1980). Usually these habitats are associated with slough areas and creek mouths. Flooded woods are most common along the lower sections of the

river and are often quite extensive. They provide good habitat for cavity nesting species that do not require the protection or seclusion of less open areas. Cavity nesters commonly found in flooded woods include wood ducks, red-headed woodpeckers, common flickers, great crested flycatchers, and prothonotary warblers. Where this habitat occurs near residential areas and other types of developed land such cavity nesters as house sparrows and starlings are abundant. This habitat is probably important as nesting areas to tree swallows, purple martins, and house wrens although these species were found to be limited in both number and distribution. Flooded woods are also used for feeding and resting by great blue herons, mallards, downy woodpeckers, common grackles, and brown-headed cowbirds.

River, Old Channel Oxbows, Creeks, and Sloughs

In general the river and its associated old channel oxbows, creeks, and slough areas are devoid of aquatic vegetation although certain deep forest pools and isolated sections of the old channel may be blanketed with duckweed (*Lemna* sp.). The amount of cover along the borders varies depending upon the degree of past disturbance. From its mouth to near canal mile 30 the banks of the main channel have rip-rap shoring and the channel is maintained for barge traffic. This includes providing a 9-foot by 225-foot channel. The remaining 6 miles of river to Fayetteville was previously straightened and dredged but so far has not been recently maintained but this will probably soon change. The upper section of river is also characterized by sand bars but the high water levels during the study period kept such areas below water.

Above the open water birds such as chimney swifts, bank swallows, barn swallows, tree swallows, and purple martins feed. The near shore shallows are frequented by feeding great blue herons, green herons, yellow-crowned night

herons, mallards, and belted kingfishers. Common grackles are often seen foraging on the rip-rap shoring in addition to the occasional appearance of other passerines. Creeks, old channel oxbows, and slough areas provide resting and feeding habitat for herons and wood ducks. Where snags and dead standing trees are present along the creeks and old channel oxbows such species as red-headed woodpecker, great crested flycatcher, starling, house sparrow, and prothonotary warbler are frequently seen nesting or displaying.

Marshes

A number of old oxbow lakes and other backwater areas are in successional transition as silting in takes place. Some are covered in great part by the American lotus (*Nelumbo lutea*) while a few are more shallow and characterized by areas of dense growing sedges and grasses interspersed with open water. Such habitats are valuable in terms of providing nesting, feeding, and resting areas to wood ducks, green herons, and red-winged blackbirds.

Shrub Swamp

A single area was classified as a shallow buttonbush swamp. This site, known as Big Lake, was previously described as a *Polygonum* marsh (Biotic Consultants, 1980). Now buttonbush (*Cephalanthus occidentalis*) covers a major portion of the habitat. There are also scattered stands of young willows (*Salix* spp.) and occasional dead standing trees. Smartweed (*Polygonum* sp.) is still the dominant nonwoody plant.

Breeding birds found in the swamp and likely to be nesting include mourning dove, common flicker, red-winged blackbird, common yellowthroat, and prothonotary warbler. The forest edge bordering the swamp is frequented by ruby-throated hummingbirds, Carolina chickadees, and cardinals. Within the forest edge an American woodcock was flushed.

Baldwin Lake

Baldwin Lake is a 2,000-acre, manmade reservoir virtually devoid of aquatic vegetation and with a few poorly protected coves. Shore habitat consists primarily of large open fields. Released Canada geese nest mainly along the isolated eastern shore of the lake. Species feeding and/or resting in the habitat include great blue heron, mallard, chimney swift, and barn swallow.

Along the northern west shore of Baldwin Lake and adjacent to cropland are stretches of flat open fields composed mainly of grasses. These fields are periodically mowed. Sightings of grasshopper sparrows and horned larks within the F&WA were limited to this area. It is likely that both utilize the habitat for nesting along with killdeers and eastern meadowlarks. Red-winged blackbirds breed in temporarily inundated sections of the fields. Species also seen in the habitat, included Canada goose, mallard, eastern kingbird, barn swallow, house sparrow, and American goldfinch.

Annotated List of Breeding Birds

The following annotated list gives a preliminary account of the estimated abundance, distribution, occurrence, and habitat association of the birds found within the Kaskaskia River Fish & Wildlife Area based on investigations carried out during May and June of 1981. A species is considered of breeding status unless otherwise noted.

Terms used to indicate relative numbers of birds, modified from Steward and Robbins (1958) and Bohlen (1978), are defined as follows:

Abundant -- found in very large numbers in the right habitat.

Common -- found in large numbers; consistently seen during a survey day in right habitat.

Fairly Common -- found in moderate or fair numbers; seen less consistently than common but can be found in right habitat if looked for.

Uncommon -- found in rather small numbers; either missed or only a few sightings, at most, in any one day.

Rare -- during this survey, known only from a few sightings and only in very small numbers.

For the purpose of discussing distribution of birds, the Kaskaskia River Fish & Wildlife Area can be divided into the following general areas:

North -- Fayetteville to New Athens and Highway 13, includes 8 miles of river and adjacent areas (census stops 1 through 8).

North-central -- Highway 13 to Highway 154, includes 9 miles of river and adjacent areas exclusive of Baldwin Reservoir area (census stops 9 through 22, and 47 through 49).

South-central -- Highway 154 to Evansville and Highway 3, includes 9 miles of river and adjacent areas (census stops 23 through 34).

South -- Evansville and Highway 3 to Mississippi River, includes 10 miles of river and adjacent areas (census stops 34 through 46).

Baldwin Reservoir (synonymous with Baldwin Lake) -- reservoir and surrounding areas (census stops 50 through 53).

Estimates of the numbers of breeding pairs were based on actual census counts supplemented by additions that took into account for each species differences in behaviour, relative amount of preferred habitat not surveyed, density, distribution, and (particularly for larger species) territory size. For species which have males and females that are distinguishable in the field, either visually or vocally, single males, with few exceptions, were assumed to have mates. Where there is a greater chance of error in the estimate of pairs for a particular species, whether the given estimate be possibly low or high, it is so indicated.

Management recommendations are given for individual species whose estimated number of pairs was less than 50. Specific requirements for all species within the F&WA are not known and, in most instances, only basic guidelines of management, such as protection of preferred habitat, can be given. No bird species recorded on the Federal Endangered and Threatened List were found. Little blue heron, red-shouldered hawk, both tentative identifications, and Mississippi kite, are currently on the State Endangered and Threatened List and are reported here.

Common and scientific names are those approved by the American Ornithologists Union (A.O.U.) as presented by Bohlen (1978).

Great Blue Heron (*Ardea herodias*)

Uncommon. Most often seen in old channel oxbows, flooded woods, and creeks, that are bordered by floodplain forest. Two or three usually found together. Distributed throughout F&WA. No roosting or nesting sites were discovered for any members of the family Ardeidae and it is suggested that most of the individuals found have territories that extend beyond the F&WA boundaries.
Estimated Population: 6-15 pairs
Management Recommendations: Protect preferred habitat, if nesting areas are found, measures should be taken to prevent disturbances from humans by posting, fencing, or other means (Landin, 1979).

Green Heron (*Butorides striatus*)

Common. Found throughout F&WA along the river as well as in all types of backwaters. Associated shore vegetation most often floodplain forest or dense stands of saplings of DMP areas. One to as many as four birds seen at one time. Unlike the other herons, this species probably has numerous nesting sites within F&WA.
Estimated Population: >50 pairs

Little Blue Heron (*Florida caerulea*)

Rare. Only two tentative identifications, both of single individuals in flight along main watercourse: one on June 13 between census stops 26 and 27, and the other on June 18 at site 3.
Estimated Population: 1-5 pairs (?)
Management Recommendations: Same as prescribed for great blue heron.

Yellow-crowned Night Heron (*Nyctanassa violacea*)

Uncommon. Usually two to four birds seen together. Only seen along main watercourse near DMP areas. All were adults. Distributed throughout north-central section but local in south and south-central sections of F&WA.
Estimated Population: 1-5 pairs (low?)
Management Recommendations: Protect backwater areas. Follow suggestions prescribed for great blue heron.

Canada Goose (*Branta canadensis*)

Common around Baldwin Lake. A flock of over 160 birds was observed in grassy field west of lake. The presence of this species is due to the release of a large number of pinioned birds. Nests mainly along east shore of lake (IDOC, personal communication).
Estimated Population: >50 pairs

Mallard (*Anas platyrhynchos*)

Common along entire river, fairly common at Baldwin Reservoir. Although pairs were seen, no adults with young were found. Whether extensive breeding occurs within the F&WA, or only summer wandering, is uncertain.
Estimated Population: 16-50 pairs
Management Recommendations: Protect from disturbance during nesting season by reducing public access to selected backwater areas.

Wood Duck (*Aix sponsa*)

Common. As many as 18 individuals found inhabiting a single backwater marsh (census stop 48). Occurs in most creeks, oxbows of old channel, slough areas, and flooded woods throughout F&WA. Many adults with young were seen. June 3: hen with 9 downy young along river, site 26. June 5: hen with 5 downy young in slough west of main channel below Hwy 3 bridge; hen with 5 downy young at Camp Creek, site 36; and hen with 9 downy young in slough and flooded woods area near site 44. June 7: five downy young in old channel oxbow near site 23. June 8: hen with 6 young in pond, site 48. June 26: hen with 8 young in slough, site 39.
Estimated Population: >50 pairs

Turkey Vulture (*Cathartes aura*)

Uncommon in lower Kaskaskia River area along bluffs of Mississippi floodplain. Only a single observation of this species within F&WA boundaries: two birds seen soaring above upland forest of bluffs near Reilly Lake.
Estimated Population: 1-5 pairs
Management Recommendations: Preserve existing upland forest area along bluffs of Mississippi River.

Mississippi Kite (*Ictinia mississippiensis*)

Rare. Single sighting: four birds seen soaring above the old channel and DMP site near the mouth of the Kaskaskia River, June 27. All in adult plumage.
Estimated Population: 1-5 pairs
Management Recommendations: It is conceivable that the species nests in floodplain forest along Mississippi River within F&WA. Although it is able to tolerate occasional human disturbance (Parker and Ogden, 1979) for some assurance of continued return the habitat should be preserved.

Red-tailed Hawk (*Buteo jamaicensis*)

Fairly Common in north section and Baldwin Reservoir area. Uncommon elsewhere. Associated with open country, in particular, DMP sites. Often seen perched on transmission line poles. A pair seen several times between census stops 4 and 5.
Estimated Population: 1-5 pairs (low?)
Management Recommendations: Protect from hunting and preserve possible nesting sites including tall trees on edges of forests and in open areas (De Graff, et al., 1980).

Red-shouldered Hawk (*Buteo lineatus*)

Rare. Single sighting of a hawk tentatively identified as this species. The bird was seen flying through floodplain forest near Richland Creek (Site 16) on June 2.
Estimated Population: 1-5 pairs (?)
Management Recommendations: Preserve large tracts of floodplain forest, in particular, the area around the mouth of Richland Creek.

American Kestrel (*Falco sparverius*)

Rare to Uncommon. Local distribution, sightings limited to two areas: single bird seen sharing transmission line pole as a perch with a Red-tailed Hawk in north section near census stop 5 overlooking a DMP area, May 28; two separate sightings in vicinity of Hwy 154 bridge.
Estimated Population: 1-5 pairs (low?)
Management Recommendations: Initiate nest box program in preferred habitats.

Bobwhite (*Colinus virginianus*)

Common in DMP areas, cropland, and edge habitats throughout F&WA.
Estimated Population: >50 pairs

Killdeer (*Charadrius vociferus*)

Common around Baldwin Lake and open country near Evansville. Uncommon in DMP areas throughout rest of F&WA.
Estimated Population: 16-50 pairs
Management Recommendations: Continue maintenance of cropland and grass fields around Baldwin Lake but avoid mowing during nesting season.

American Woodcock (*Philohela minor*)

Rare. Only a single sighting: one bird seen in the wooded area bordering the south edge of a buttonbush swamp (census stop 49), June 27. Behavior and protective coloration may account for only one bird being found.
Estimated Population: 6-15 pairs (high?)
Management Recommendations: Preserve existing floodplain forests, particular protection should be given to area of sighting.

Spotted Sandpiper (*Actitis macularia*)

Migrant. Several sightings along main watercourse during May and first week of June. Single bird seen August 14 foraging on mud flat west shore of Baldwin Lake.

Black Tern (*Childonias niger*)

Migrant. Single sighting: group of more than 10 individuals seen flying low over main channel, heading upsteam, near Fayetteville on May 20.

Rock Dove (*Columbia livia*)

Common but local. This species is found nesting in large numbers on the supporting structures of many of the bridges that span the river.
Estimated Population: >50 pairs

Mourning Dove (*Zenaida macroura*)

Common in DMP areas, cropland, and edge habitats throughout F&WA.
Estimated Population: >50 pairs

Yellow-billed Cuckoo (*Coccyzus americanus*)

Common in floodplain and upland forests, edge habitats, and in DMP areas in the stands of saplings along the river bank. Distributed throughout F&WA.
Estimated Population: >50 pairs

Barred Owl (*Strix varia*)

Fairly Common in floodplain forest. Distributed throughout F&WA. Sightings include a pair seen on June 11 at census stop 9, and a pair seen on June 17 at census stop 39.
Estimated Population: 6-15 pairs
Management Recommendations: Preserve large tracts of floodplain forest.

Chimney Swift (*Chaetura pelagica*)

Common. Observed most often hawking for insects over water of main channel as well as over a wide range of terrestrial habitats from developed land to floodplain and upland forest. Distributed throughout F&WA.
Estimated Population: >50 pairs

Ruby-throated Hummingbird (*Archilochus colubris*)

Uncommon to Fairly Common along river bordered by floodplain forest, also found in DMP sites, flooded woods, upland forests, swamp, and successional fields. The abundance of Trumpet-creeper (*Campsis radicans*) throughout the F&WA would suggest higher numbers of this bird species than the sampling indicated. Distributed throughout F&WA.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Avoid actions which might cause decline in trumpet creeper populations.

Belted Kingfisher (*Megaceryle alcyon*)

Fairly Common. Found along main watercourse and old channel oxbows with shore vegetation ranging from sapling thickets of DMP sites to floodplain forests. Also seen in flooded woods. Distributed throughout F&WA.
Estimated Population: 16-50 pairs (high?)
Management Recommendations: Requires mud banks for nesting, avoid use of rip-rap shoring along river in north section of F&WA.

Common Flicker (*Colaptes auratus*)

Common in DMP areas, floodplain forest edge, and flooded woods. Distributed throughout F&WA.
Estimated Population: >50 pairs

Pileated Woodpecker (*Dryocopus pileatus*)

Fairly common in floodplain forests. Most often seen in north-central section of F&WA. Three birds seen flying together near census stop 41 on June 17 and again on June 26.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Preserve existing tracts of floodplain forest. Avoid removal of dead and dying trees.

Red-bellied Woodpecker (*Melanerpes carolinus*)

Common in both floodplain and upland forest areas. Found throughout F&WA.
Estimated Population: >50 pairs

Red-headed Woodpecker (*Melanerpes erythrocephalus*)

Common to Abundant in flooded woods and floodplain forest areas along creeks and old channel oxbows where dead and dying trees are available. Found throughout F&WA.
Estimated Population: >50 pairs

Hairy Woodpecker (*Picoides villosus*)

Uncommon. Associated with floodplain forest edge. Sightings in north and south-central sections of F&WA.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Avoid removal of dead and dying trees within preferred habitat.

Downy Woodpecker (*Picoides pubescens*)

Common in floodplain forest and edge habitats. Also occurs along river where there are dense stands of young trees in DMP areas and in flooded woods. Distributed throughout F&WA.
Estimated Population: >50 pairs

Eastern Kingbird (*Tyrannus tyrannus*)

Common along river edge of DMP sites. Most often seen in north section of F&WA.
Estimated Population: >50 pairs

Great Crested Flycatcher (*Myiarchus crinitus*)

Common in floodplain forests along old channel and in flooded woods. Often seen perching on snags overhanging water. Distributed throughout F&WA but most often found in the south and central sections.
Estimated Population: >50 pairs

Eastern Phoebe (*Sayornis phoebe*)

Uncommon. Associated with floodplain forest edge. Scattered sightings in all four sections along river.
Estimated Population: 16-50 pairs
Management Recommendations: Consider developing program to reduce cowbird numbers. May benefit from the maintenance of already existing open areas in forests occurring along ledges (DeGraff, et al., 1980).

Acadian Flycatcher (*Empidonax virescens*)

Common in floodplain forests along creeks and oxbows. Distribution throughout F&WA.
Estimated Population: >50 pairs

Eastern Wood Pewee (*Contopus virens*)

Common in both floodplain and upland forests. Found throughout F&WA.
Estimated Population: >50 pairs

Horned Lark (*Eremophila alpestris*)

Uncommon in F&WA but common in surrounding agricultural areas. Within F&WA found only in fields around Baldwin Lake.
Estimated Population: 6-15 pairs (low?)
Management Recommendations: Maintain grass field along shore of Baldwin Lake and adjacent cropland.

Tree Swallow (*Iridoprocne bicolor*)

Uncommon. Associated with open water of river and flooded woods. Small colony nesting in flooded woods of census stop 44 above dam, this site extends across F&WA border. Seen only in south and south-central areas of F&WA.
Estimated Population: 16-50 pairs
Management Recommendations: Ultimate decline of this species within F&WA when flooded woods disappear possibly slowed by nest box program.

Bank Swallow (*Riparia riparia*)

Uncommon. Distribution limited to north section of F&WA. Found a single colony composed of upwards of 26 individuals along dirt bank south of Fayetteville where river turns westward. This colony probably owes its existence to the absence of rip-rap along this stretch of the river. The birds would be in danger if techniques which have been used along banks downstream were continued in this area once redredging and canal maintenance resumes.
Estimated Population: 16-50 pairs
Management Recommendations: Avoid use of rip-rap shoring along northern section of river with special protection given to current nesting area.

Barn Swallow (*Hirundo rustica*)

Common. Often seek hawking for insects over river, Baldwin Lake, and DMP sites.
Estimated Population: >50 pairs

Purple Martin (*Progne subis*)

Fairly Common in north section of F&WA along river. Uncommon elsewhere. Probably nests in certain flooded woods.
Estimated Population: 16-50 pairs (high?)
Management Recommendations: Construct and correctly manage multi-compartment houses.

Blue Jay (*Cyanocitta cristata*)

Common in floodplain and upland forests as well as in edge habitats. Found most often in south and south-central sections of F&WA.
Estimated Population: >50 pairs

Common Crow (*Corvus brachyrhynchos*)

Common. Most often associated with open country as offered by DMP areas and cropland. Distributed throughout F&WA.
Estimated Population: >50 pairs

Carolina Chickadee (*Parus carolinensis*)

Common in both floodplain and upland forests as well as edge habitats and along river in sapling thickets of DMP areas. Found throughout F&WA.
Estimated Population: >50 pairs

Tufted Titmouse (*Parus bicolor*)

Common. Associated with floodplain and upland forests, and edge habitats. Distributed throughout F&WA.
Estimated Population: >50 pairs

White-breasted Nuthatch (*Sitta carolinensis*)

Fairly Common in both floodplain and upland forests. Distributed throughout F&WA.
Estimated Population: >50 pairs

House Wren (*Troglodytes aedon*)

Uncommon. Most often associated with residential areas. A pair of birds were using a cavity of a dead standing tree within a flooded forest area for a nesting site, census stop 44, June 26. Distributed mainly in south section of F&WA.
Estimated Population: 16-50 pairs
Management Recommendations: Initiate nest box program in areas of preferred habitat (Hardin and Evans, 1977).

Carolina Wren (*Thryothorus ludovicianus*)

Rare. Associated with floodplain forest. Only four sightings during entire survey period. Singing male seen at site 21 on June 2, and again on June 4. Singing male seen at census stop 47 on June 24. Pair seen on wooded slope (census stop 31) foraging near fallen tree, June 25.
Estimated Population: 6-15 pairs (low?)
Management Recommendations: Preserve wood piles and brushy undergrowth within preferred habitat to supply possible nesting sites (Hardin and Evans, 1977).

Mockingbird (*Mimus polyglottos*)

Rare within F&WA boundaries, surprisingly none were seen or heard during official surveys, August 14 one seen flying across field east shore of Baldwin Lake. The bird is fairly common in surrounding areas in edge habitats of uplands.
Estimated Population: 6-15 pairs
Management Recommendations: Provide plantings with a variety of edible fruits near edge habitats (DeGraff, et al., 1980).

Gray Catbird (*Dumetella carolinensis*)

Common along river edge in DMP areas. Found throughout F&WA.
Estimated Population: >50 pairs

Brown Thrasher (*Toxostoma rufum*)

Fairly Common. Associated with most DMP areas along entire river, and in successional fields around Baldwin Lake.
Estimated Population: >50 pairs

American Robin (*Turdus migratorius*)

Common in floodplain forest and residential areas. Distributed throughout F&WA.
Estimated Population: >50 pairs

Wood Thrush (*Hylocichla mustelina*)

Fairly Common in upland and floodplain forests. Distributed throughout F&WA.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Preserve large tracts of floodplain and upland forest.

Blue-gray Gnatcatcher (*Polioptila caerulea*)

Fairly Common to Common in floodplain and upland forests throughout F&WA.
Estimated Population: >50 pairs

Starling (*Sturnus vulgaris*)

Abundant in developed land and flooded woods or other backwater areas, with large numbers of dead or dying trees, that are closely associated with residential areas. Found throughout F&WA.
Estimated Population: >50 pairs

White-eyed Vireo (*Vireo griseus*)

Common along the river in DMP areas with stands of saplings and other edge habitats. Distributed throughout F&WA.
Estimated Population: >50 pairs

Bell's Vireo (*Vireo bellii*)

Common along the river in DMP areas in the north and north-central sections of the F&WA. Uncommon along rest of river.
Estimated Population: 16-50 pairs
Management Recommendations: Retard succession to maintain brush thickets in selected DMP areas.

Yellow-throated Vireo (*Vireo flavifrons*)

Fairly Common in both floodplain and upland forests. Distributed throughout F&WA.
Estimated Population: >50 pairs

Red-eyed Vireo (*Vireo olivaceus*)

Uncommon in floodplain forests. Found in the south and central sections of the F&WA.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Preserve existing floodplain forests.

Warbling Vireo (*Vireo gilvus*)

Fairly Common in edge habitats and stands of saplings in DMP areas. Found in all sections of the F&WA except the north-central area.
Estimated Population: >50 pairs

Prothonotary Warbler (*Protonotaria citrea*)

Common in flooded woods, creeks, slough areas, and old channel oxbows where there are a fair number of dead standing trees and snags along water's edge. Distributed throughout F&WA.
Estimated Population: >50 pairs

Yellow Warbler (*Dendroica petechia*)

Uncommon along river edge where there are thick stands of saplings. Found only in the north and north-central sections of F&WA.
Estimated Population: 16-50 pairs
Management Recommendations: Protect habitat. Consider developing program to decrease cowbird numbers (Harrison, 1975).

Common Yellowthroat (*Geothlypis trichas*)

Common in DMP areas, successional fields, and edge habitats throughout F&WA.
Estimated Population: >50 pairs

Yellow-breasted Chat (*Icteria virens*)

Common in DMP areas and edge habitats. Distributed throughout F&WA.
Estimated Population: >50 pairs

American Redstart (*Setophaga ruticilla*)

Uncommon to fairly common in floodplain forest edges and willow thickets along main water course and old channel oxbows in north and north-central sections of F&WA.
Estimated Population: 16-50 pairs
Management Recommendations: Preserve existing habitat.

House Sparrow (*Passer domesticus*)

Abundant. Associated with developed land and with flooded woods, creeks, and other backwaters that have numerous dead standing trees and snags in areas adjacent to developed land. Commonly nests on supporting structures of bridges. Found throughout F&WA.
Estimated Population: >50 pairs

Eastern Meadowlark (*Sturnella magna*)

Common in cropland and grass fields surrounding Baldwin Lake. Also occurs in fields around lock and dam and in certain DMP sites.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Maintain cropland and grass field in Baldwin Lake area.

Red-winged Blackbird (*Agelaius phoeniceus*)

Abundant in DMP areas along entire watercourse, as well as in swamps, marshes, and cropland. Distributed throughout F&WA.
Estimated Population: >50 pairs

Orchard Oriole (*Icterus spurius*)

Uncommon to Fairly Common. Associated with edge habitats and sapling stands along river near DMP sites. Found in south, south-central, and north sections of F&WA.
Estimated Population: 16-50 pairs
Management Recommendations: Avoid cutting of willow thickets along river.

Northern Oriole (*Icterus galbula*)

Uncommon to Fairly Common in forest edges along river. Found throughout F&WA except Baldwin Reservoir Area.
Estimated Population: 16-50 pairs
Management Recommendations: Avoid disturbance of existing floodplain forest along river margin.

Common Grackle (*Quiscalus quiscula*)

Abundant. Found in all habitat types throughout F&WA. Often seen foraging along river bank.
Estimated Population: >50 pairs

Brown-headed Cowbird (*Molothrus ater*)

Common. Associated most often with floodplain forest bordering backwater areas such as old channel oxbows. Found throughout F&WA.
Estimated Population: >50 pairs.

Scarlet Tanager (*Piranga olivacea*)

Rare. Single sighting during entire survey of a bird tentatively identified as a male of this species, June 7, seen along river in forest edge, south-central section of F&WA.
Estimated Population: 1-5 pairs (?)
Management Recommendations: Preserve existing forests.

Cardinal (*Cardinalis cardinalis*)

Common in all terrestrial habitats except cropland. Distributed throughout F&WA.
Estimated Population: >50 pairs

Blue Grosbeak (*Guiraca caerulea*)

Rare. Single sighting of a male in DMP area southeast of Fayetteville on August 4.
Estimated Population: 1-5 pairs
Management Recommendations: Protect DMP area from human disturbance during nesting season.

Indigo Bunting (*Passerina cyanea*)

Common in DMP areas and edge habitats throughout F&WA.
Estimated Population: >50 pairs

Dickcissel (*Spiza americana*)

Fairly Common to Common in cropland around Baldwin Lake and DMP sites of north section near Fayetteville.
Estimated Population: 16-50 pairs
Management Recommendations: Retard succession in selected areas of occurrence.

American Goldfinch (*Carduelis tristis*)

Common in DMP areas along entire river, and successional fields and cropland of Baldwin Lake area.
Estimated Population: >50 pairs

Rufous-sided Towhee (*Pipilo erythrophthalmus*)

Fairly Common in floodplain forest edge. Found throughout F&WA.
Estimated Population: >50 pairs

Grasshopper Sparrow (*Ammodramus savannarum*)

Uncommon in grass fields in Baldwin Lake area. Two sightings of this species, both were singing males, northwest shore of lake.
Estimated Population: 1-5 pairs
Management Recommendations: Maintain grass fields in area of occurrence but avoid mowing during nesting season.

Lark Sparrow (*Chondestes grammacus*)

Rare. Single sighting: pair seen in DMP area southeast of Fayetteville. This section of DMP has sandy soil and scattered trees.
Estimated Population: 1-5 pairs
Management Recommendations: Protect DMP site where species was sighted, methods should include preventing access by off-road vehicles.

Field Sparrow (*Spizella pusilla*)

Common in DMP areas throughout F&WA.
Estimated Population: >50 pairs

Song Sparrow (*Melospiza melodia*)

Fairly Common to Common in DMP areas in north section of F&WA. Uncommon elsewhere.
Estimated Population: 16-50 pairs (low?)
Management Recommendations: Retard succession in selected areas of preferred habitat.

Management Recommendations For Habitat Types and Species Groups

Management of the large and diverse Kaskaskia River Fish & Wildlife Area is a complex task. Management strategies for particular individual species of breeding birds may differ or actually conflict. It is thus suggested that, unless particular species have critically low breeding populations at present or in the foreseeable future, management aims deal with habitat types and species groups, particularly those uncommon outside of the F&WA boundaries. The protection or improvement of a given habitat type protects and benefits all species which use that habitat for breeding. Management suggestions follow:

1. All floodplain and upland forest should be protected from logging, clear-cutting, or other unnatural disturbance. The present fragmented condition of many forest areas stresses species of birds that require large tracts of forested land for successful breeding (Robbins, 1979). Such area-sensitive forest species not found during the survey but listed as southern Illinois summer residents (Bohlen, 1978) include northern parula (*Parula americana*), Kentucky warbler (*Oporornis formosus*), and hooded warbler (*Wilsonia citrina*). To augment existing forest habitats, reforestation should be allowed to occur in such a way as to provide corridors between existing forest areas (Robbins, 1979).
2. Consideration should be given to replacing sections of certain fields now under cultivation to serve game species with plantings to increase habitat utilization by nongame birds. Such nongame plantings should be made throughout the F&WA. Suggestions on specific plantings that improve habitats for many seed eating and insect eating birds of the Midwest are given by Robel and Browning (1981).

3. Reduce public access to and degree of use of several areas during the nesting season (May through early August). These areas should include the buttonbush swamp (site 49), DMP area east of channel below Fayetteville, selected marsh areas, and several of the old channel oxbows including the oxbow adjacent to New Athens Natural Area (Biotic Consultants, 1980).
4. Continue periodic mowing of grass field along northern west shore of Baldwin Lake in order to retard succession but avoid mowing during main part of nesting season. This action should maintain the population of grasshopper sparrows within the area as well as other ground-nesting species that use such habitats.
5. The variety and numbers of cavity nesters indicates the importance of the many snags, dying trees, and dead standing trees within the forests, along the waterways, and particularly in the flooded woods. Flooded woods obviously have a limited life span as a habitat type. The dead standing trees will all eventually fall as a result of continued decay with aid from wind storms. The fact that all the flooded woods are approximately the same age and thus have the same life expectancy suggests that breeding birds that are highly dependent upon such habitats will face population declines within the F&WA. Particularly susceptible species include tree swallow and purple martin. Other species that will decrease in numbers, such as the red-headed woodpecker, may still be able to maintain relatively large populations because of utilization of additional habitats for nesting.

There are no viable management recommendations other than establishing nest box programs and preventing snag and dead tree removal. These

methods can only slow the inevitable decline of species that depend on this specialized habitat for nesting.

6. Census surveys of breeding birds should be carried out in the future in order to monitor the populations involved, not as an end in itself, but to aid in the development of management programs to better preserve the diverse bird fauna of the area.

Problems With and Benefits of the Investigation

Most problems concerning this investigation were a result of the size, shape, and complexity of the Kaskaskia River Fish & Wildlife Area. The more pronounced problems are as follows:

1. The use of a gasoline powered motor for traveling between census stops of the water course has inherent weaknesses that decrease sampling accuracy. The motor noise probably frightens certain species into and drowns out the calls and songs of others. However, to cover the 36 miles of river, as well as additional sites within adjoining oxbows and creeks, a minimum of four times, the motor was required. The need being most evident when traveling against the strong current of creeks following recent storms.
2. The patchy distribution of habitat types creates difficulties in selecting census stops. The songs and calls heard are not always of those species within the chosen habitat.
3. It is difficult to determine the degree of error concerning the accuracy of estimating population numbers after sampling an area the size and complexity of the Kaskaskia River F&WA.
4. A species with a relatively small population, or with a localized distribution, within the study area, may be missed entirely when census surveys are carried out. Additional species found by me during visits after the "official" surveys were completed included blue grosbeak and lark sparrow. Both were found in a habitat type well represented in the survey sampling.

Benefits of the investigation include the following:

1. The study allows an evaluation of the effects of current land and river management practices on bird species composition and populations. Of particular interest and concern is the method of dredge disposal and the changes in avian fauna that occur.
2. The investigation provides for a more rational management plan for the entire area that takes into account the importance of both game and non-game species.
3. Information is provided concerning the present status of breeding birds, including endangered and threatened species, within Illinois. A better understanding of the requirements of certain species may result in better protection and thus insure their preservation.
4. The data gathered provides baseline information for future research.

Suggestions for Future Investigations

1. Future investigations should include several evening visits to the various habitat types in order to document the presence of certain crepuscular or nocturnal species, such as great horned owl (*Bubo virginianus*), whip-poor-will (*Caprimulgus vociferus*), and common nighthawk (*Chordeiles minor*), that may occur within the F&WA but were missed by the present survey.

2. Attempts should be made to relocate certain census stop sites listed as mixed habitats (see Appendix III) to areas not near places of pronounced habitat change.

3. Because of the need for motorized travel when performing surveys of the water routes there are options open to future investigations depending upon whether or not emphasis is given to the sampling between census stops. The more feasible choices include the following:

   A) Increase boat speed between census sites to 8-10 mph. This speed would allow either the addition of census stops along each route yet still allow a single survey of the entire river within a four day period. If the number of census stops were retained then the river could be covered once in three days. Both methods increase sampling error between sites. The second suggestion, although saving days, does not take advantage of the locations of easily accessible boat ramps.

   B) Retain what quality there is in the censusing between stops by maintaining boat speed at 4-6 mph. This method, which was the one used, would still allow the addition of several more census sites to Route I if investigations are carried out in the future.

4. In addition to regular survey, short transects, consisting of several census stops, should be designed for particular areas that are rather unique and can be covered by foot. These transects should be covered at least twice during the survey period, two or more could be surveyed in a single morning. Particular areas to be considered are New Athens Natural Area (Biotic Consultants, 1980), floodplain forest area along the Mississippi River below the mouth of the Kaskaskia River, DMP site east of channel below Fayetteville, and buttonbush swamp (site 49).

5. Contract period should begin earlier, 1 May rather than 16 May. This would allow more time for a preliminary reconnaissance of area and avoid delays of actual survey during latter part of month due to inclement weather or other difficulties.

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Appendix I -- Distribution Maps of Breeding Birds

The following pages contain distribution maps for the 80 species of birds considered to be breeding within, or having breeding season territories that extend into, the Kaskaskia River Fish & Wildlife Area. The map for each species is a "spot" distribution map on which each plotted symbol indicates a locality where contact with the species, either by sight or sound, occurred in surveys carried out during the late spring and in the summer of 1981.

Solid dots represent localities where contacts were made during official surveys.

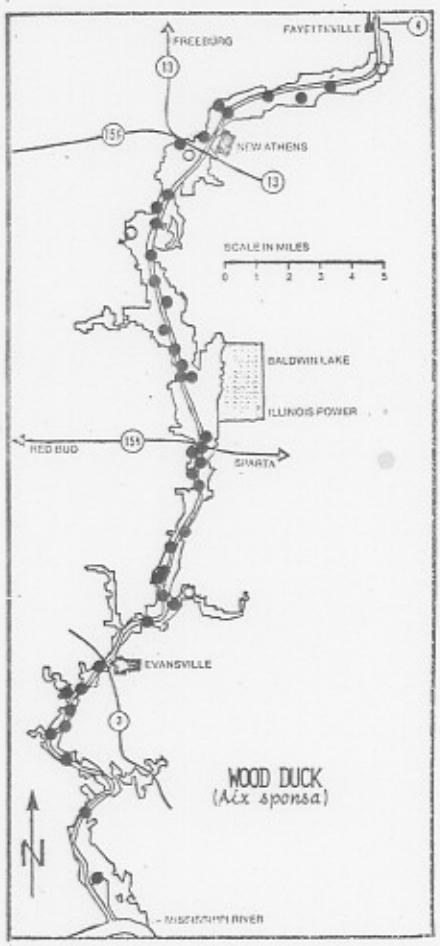
Open circles represent localities where contacts were made during "unofficial" surveys (refer to Methods of Survey).

If either of the two symbols is surrounded by a large circle it indicates a tentative identification.

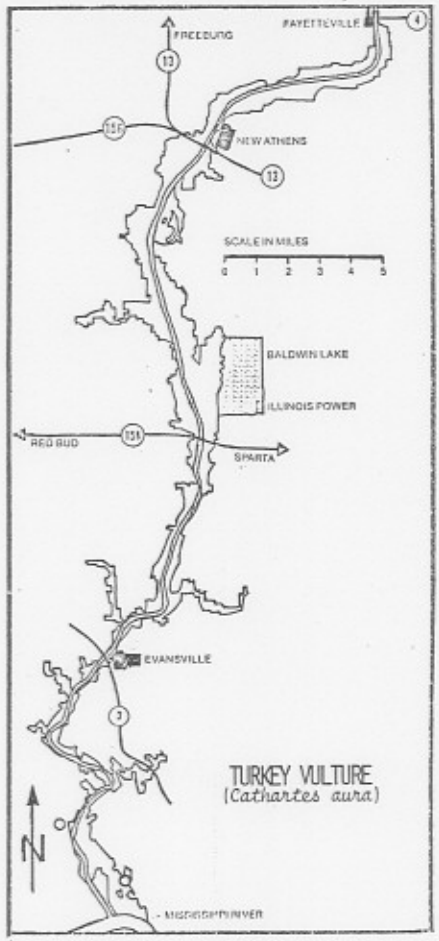
Note: No attempt was made to indicate number of birds or frequency of contacts at any one locality.

Map Index

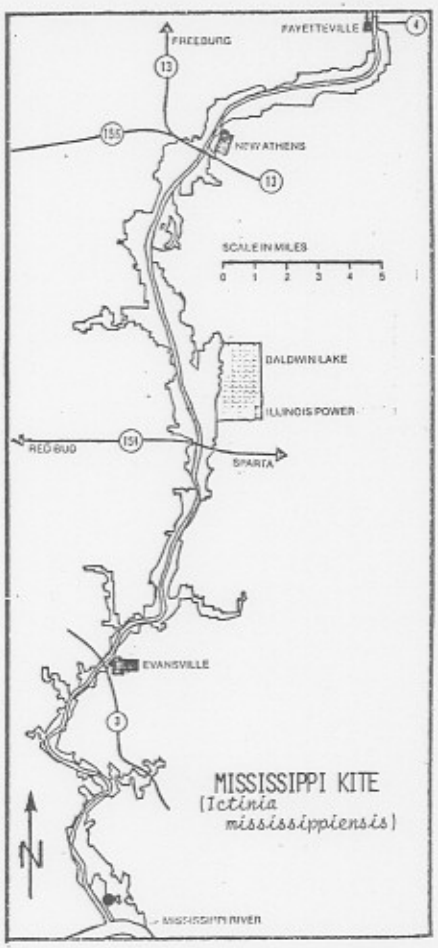
page	
42	Great Blue Heron Green Heron Little Blue Heron Yellow-crowned Night Heron Canada Goose Mallard
43	Wood Duck Turkey Vulture Mississippi Kite Red-tailed Hawk Red-shouldered Hawk American Kestrel
44	Bobwhite Killdeer American Woodcock Rock Dove Mourning Dove Yellow-billed Cuckoo
45	Barred Owl Chimney Swift Ruby-throated Hummingbird Belted Kingfisher Common Flicker Pileated Woodpecker
46	Red-bellied Woodpecker Red-headed Woodpecker Hairy Woodpecker Downy Woodpecker Eastern Kingbird Great Crested Flycatcher
47	Eastern Phoebe Acadian Flycatcher Eastern Wood Pewee Horned Lark Tree Swallow Bank Swallow
48	Barn Swallow Purple Martin Blue Jay Common Crow Carolina Chickadee Tufted Titmouse
49	White-breasted Nuthatch House Wren Carolina Wren Mockingbird Gray Catbird Brown Thrasher
50	American Robin Wood Thrush Blue-gray Gnatcatcher Starling White-eyed Vireo Bell's Vireo
51	Yellow-throated Vireo Red-eyed Vireo Warbling Vireo Prothonotary Warbler Yellow Warbler Common Yellowthroat
52	Yellow-breasted Chat American Redstart House Sparrow Eastern Meadowlark Red-winged Blackbird Orchard Oriole
53	Northern Oriole Common Grackle Brown-headed Cowbird Scarlet Tanager Cardinal Blue Grosbeak
54	Indigo Bunting Dickcissel American Goldfinch Grasshopper Sparrow Lark Sparrow
55	Field Sparrow Song Sparrow



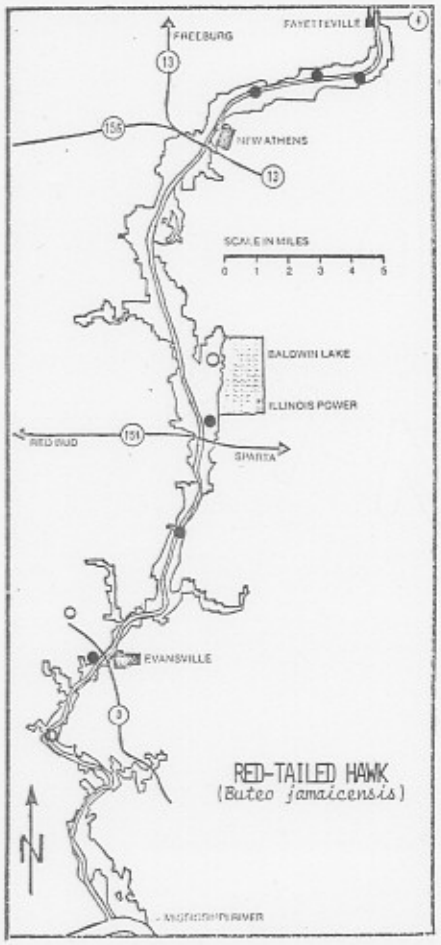
WOOD DUCK
(*Aix sponsa*)



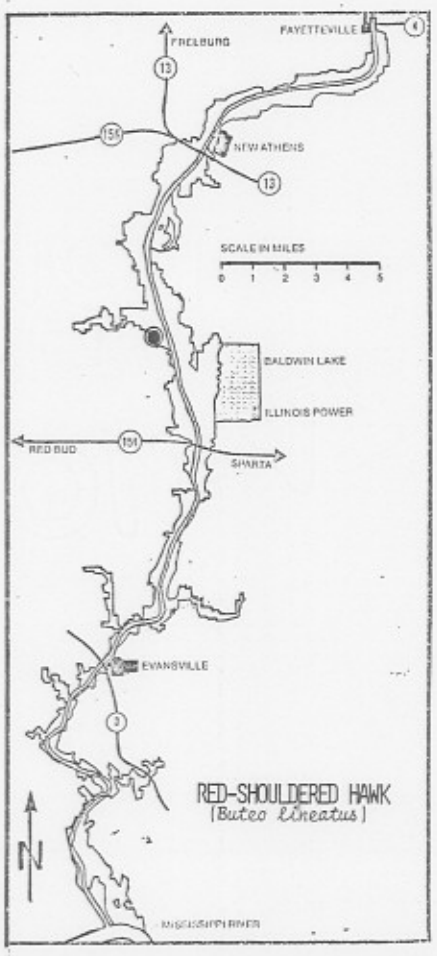
TURKEY VULTURE
(*Cathartes aura*)



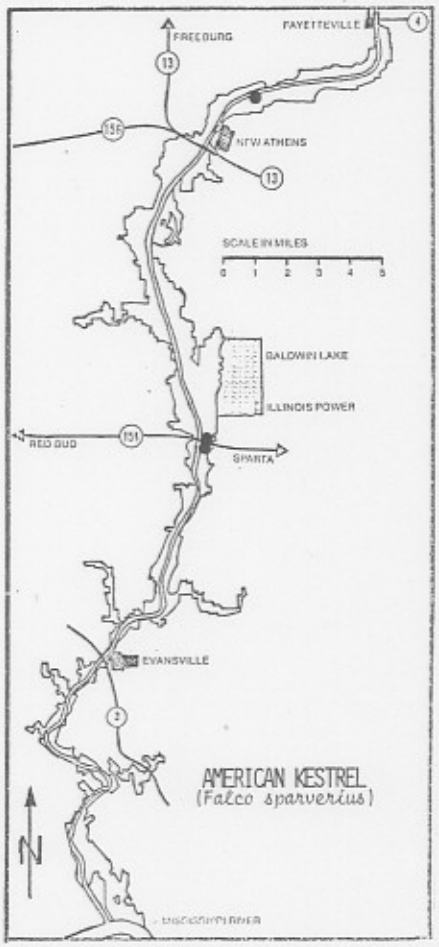
MISSISSIPPI KITE
(*Ictinia mississippiensis*)



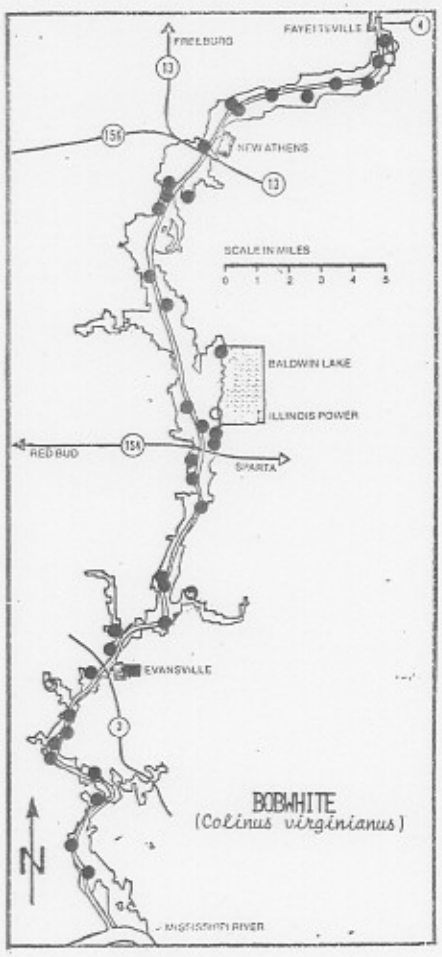
RED-TAILED HAWK
(*Buteo jamaicensis*)



RED-SHOULDERED HAWK
(*Buteo lineatus*)



AMERICAN KESTREL
(*Falco sparverius*)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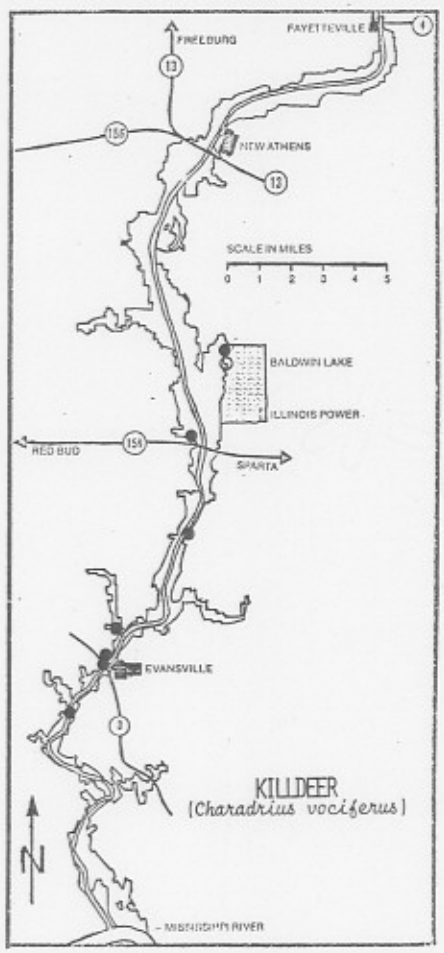
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
BOBWHITE
(Colinus virginianus)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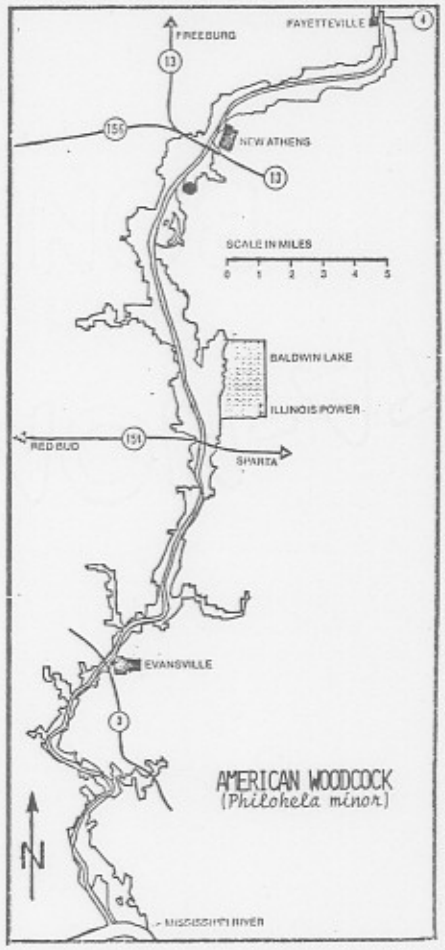
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
KILLDEER
(Charadrius vociferus)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SCALE IN MILES
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BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
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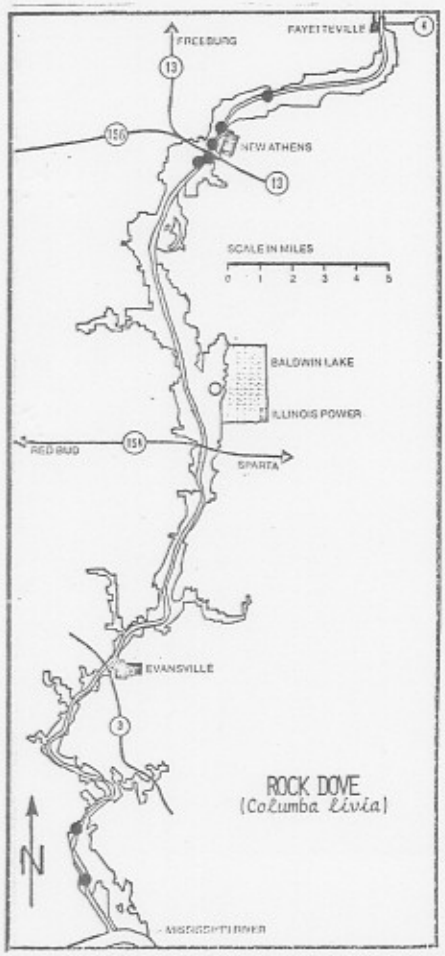
MISSISSIPPI RIVER
N
AMERICAN WOODCOCK
(Philohela minor)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SCALE IN MILES
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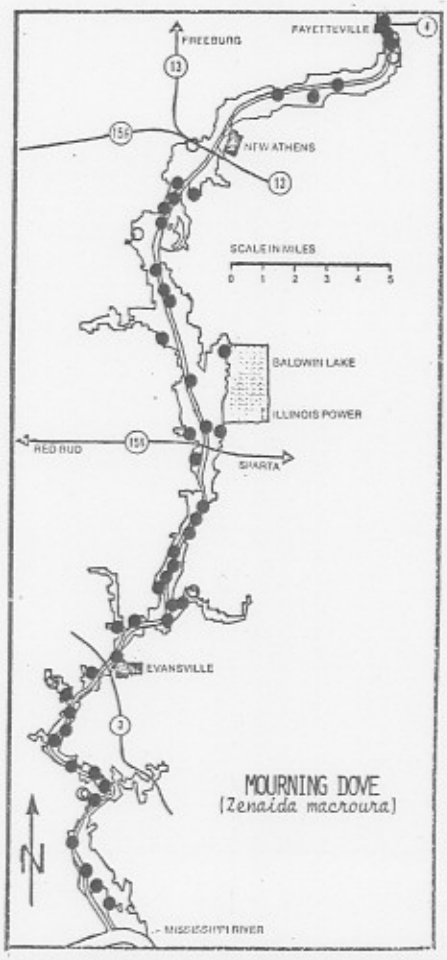
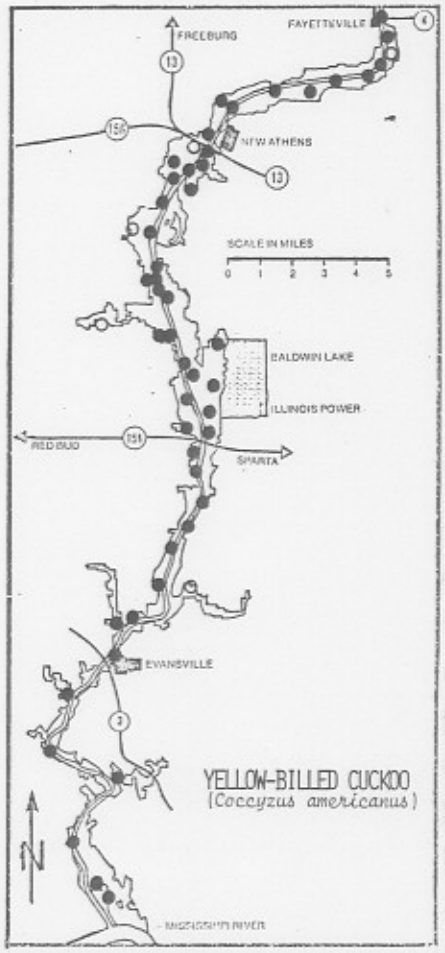
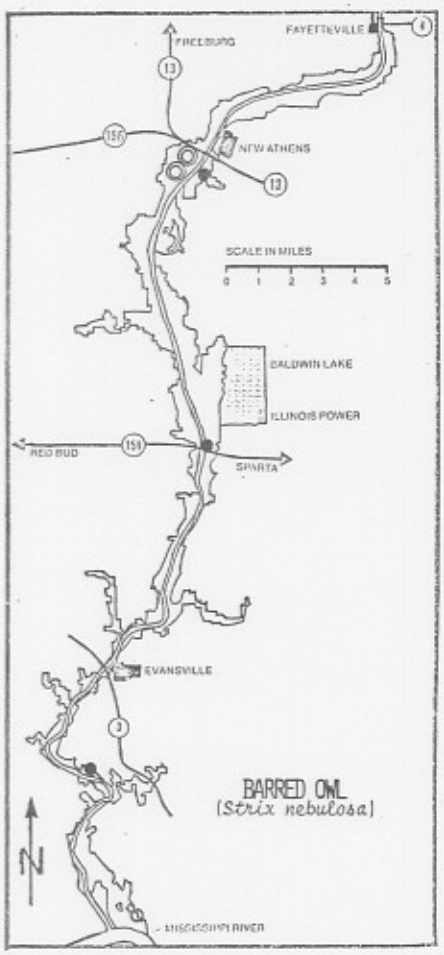
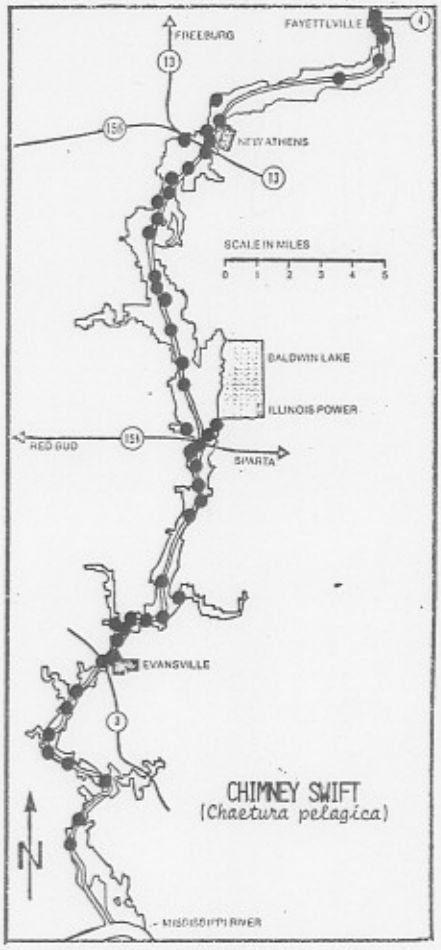
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
ROCK DOVE
(Columba livia)


FREEBURG
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
MOURNING DOVE
(Zenaida macroura)

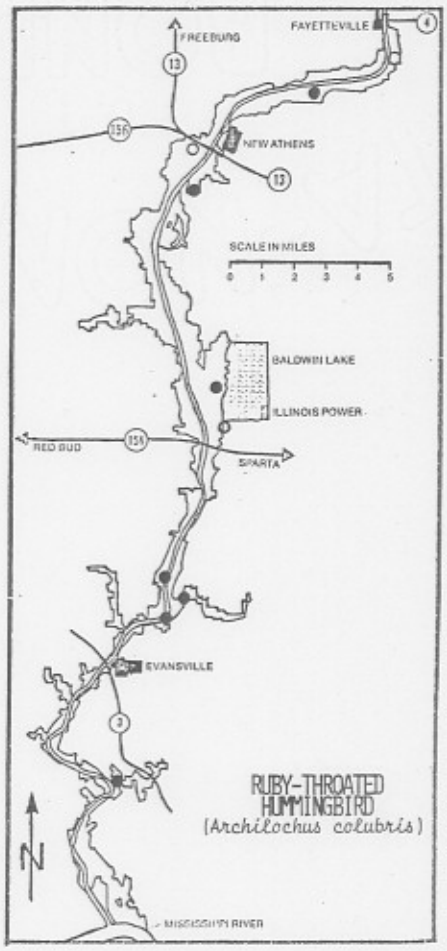

FREEBURG
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
YELLOW-BILLED CUCKOO
(Coccyzus americanus)



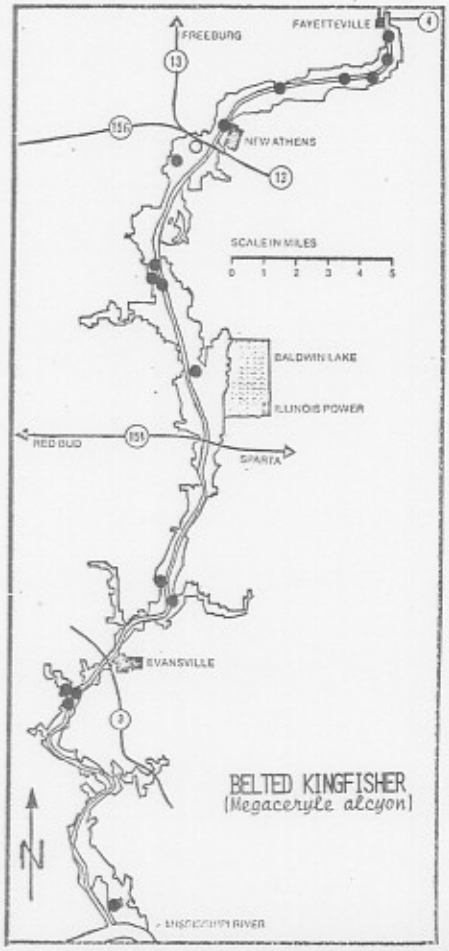
BARRED OWL
(*Strix nebulosa*)



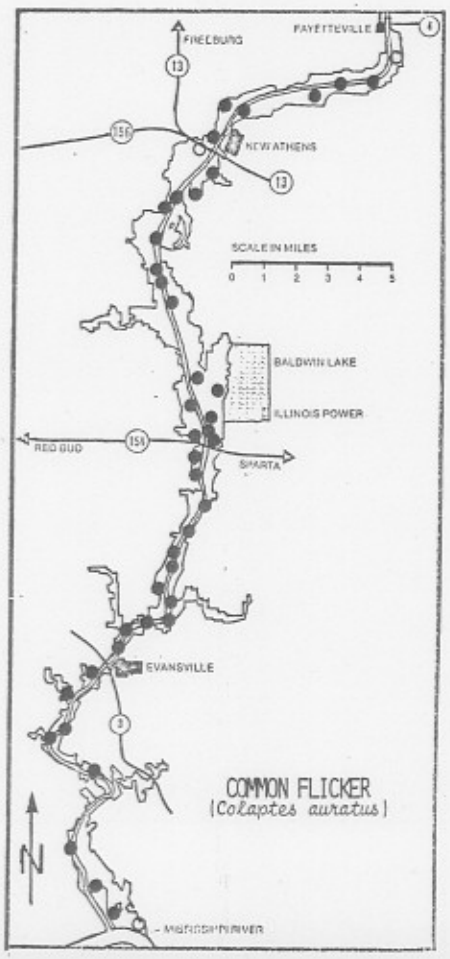
CHIMNEY SWIFT
(*Chaetura pelagica*)



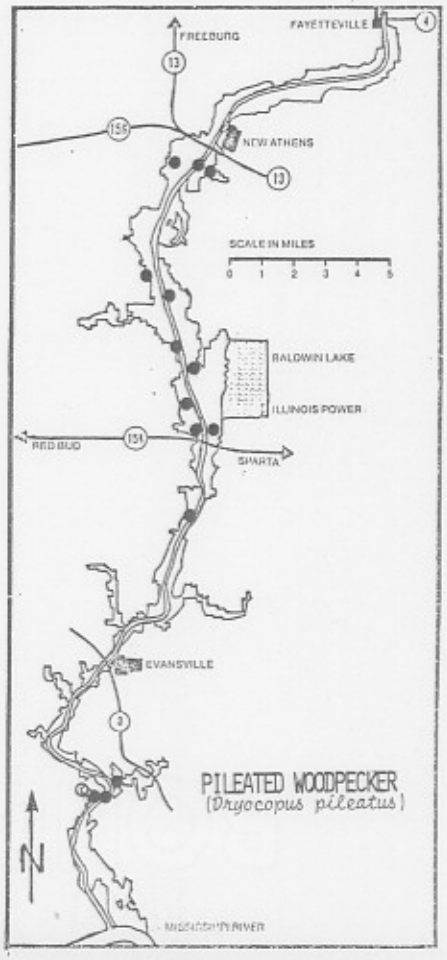
RUBY-THROATED
HUMMINGBIRD
(*Archilochus colubris*)



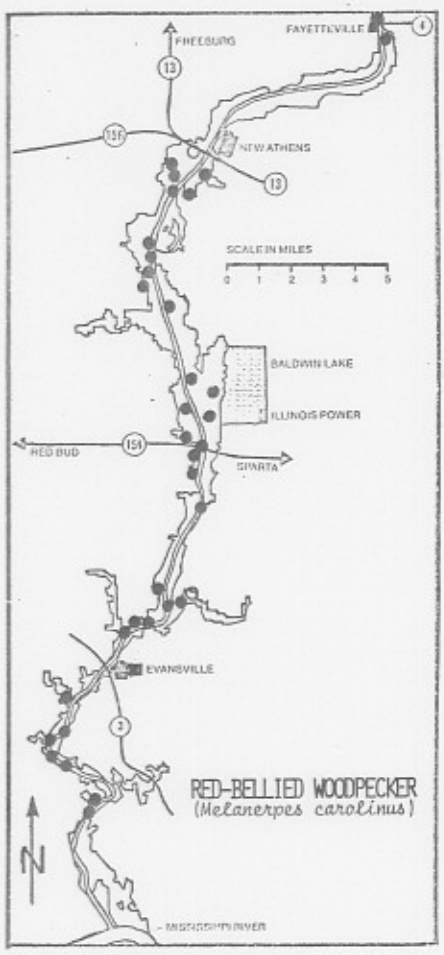
BELTED KINGFISHER
(*Megaceryle alcyon*)



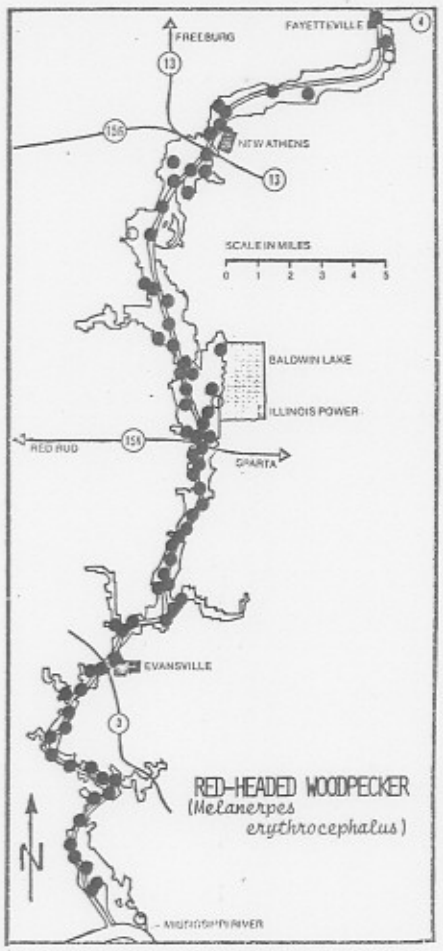
COMMON FLICKER
(*Colaptes auratus*)



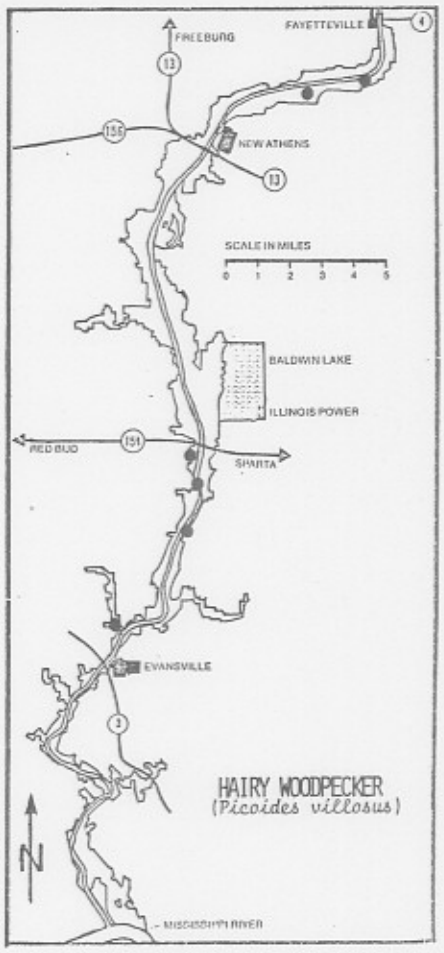
PILEATED WOODPECKER
(*Dryocopus pileatus*)



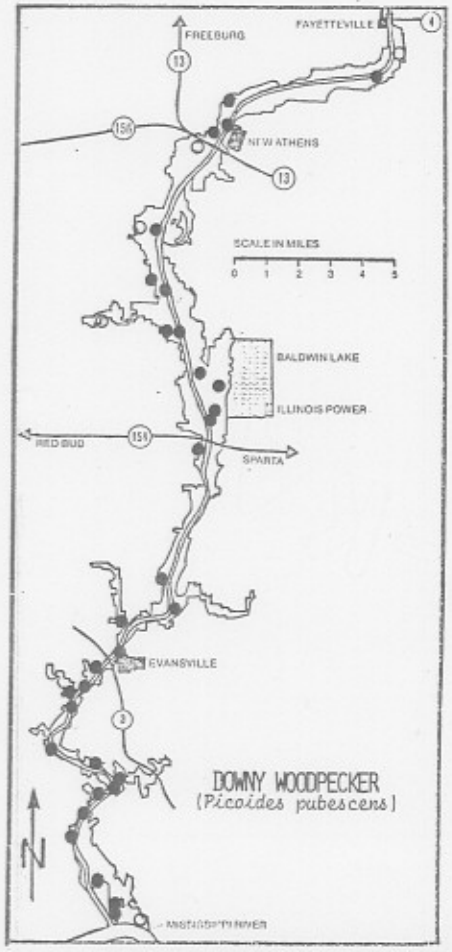
RED-BELLIED WOODPECKER
(*Melanerpes carolinus*)



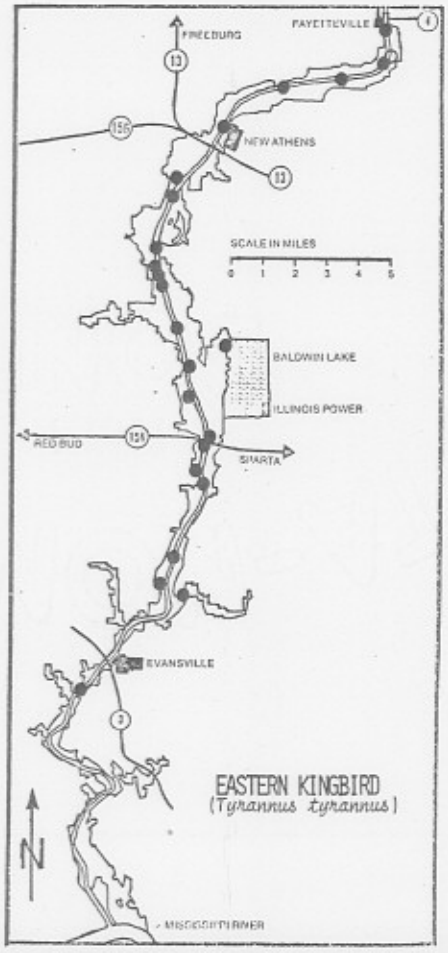
RED-HEADED WOODPECKER
(*Melanerpes erythrocephalus*)



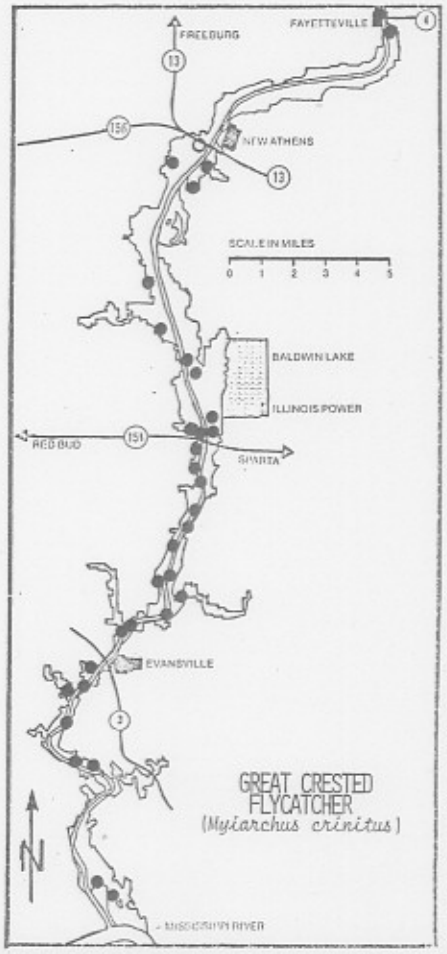
HAIRY WOODPECKER
(*Picoides villosus*)



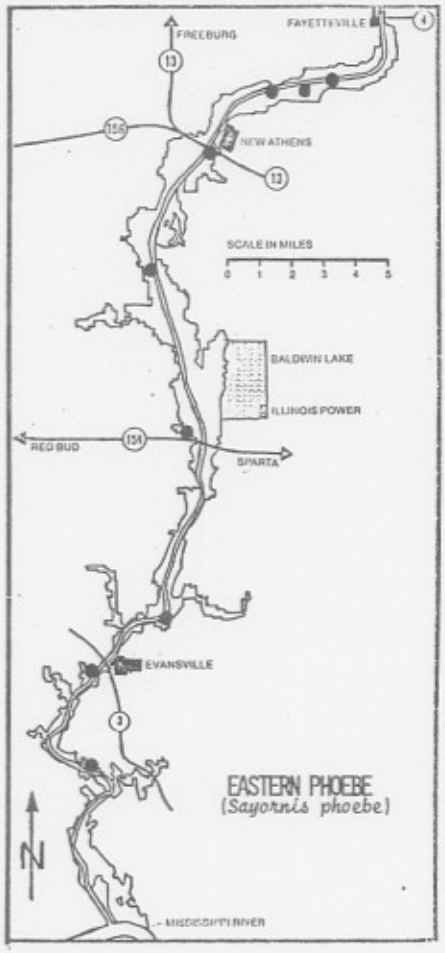
DOWNY WOODPECKER
(*Picoides pubescens*)

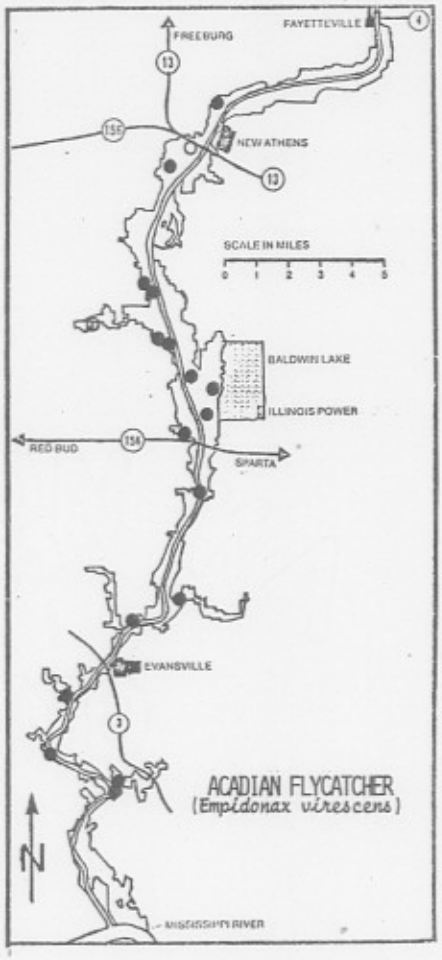


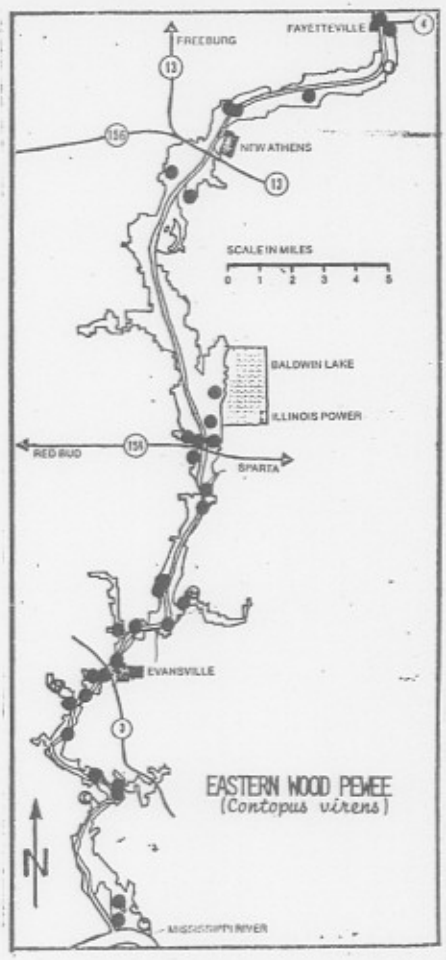
EASTERN KINGBIRD
(*Tyrannus tyrannus*)



GREAT CRESTED FLYCATCHER
(*Myiarchus crinitus*)


FREEBURG
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
EASTERN PHOEBE
(Sayornis phoebe)


FREEBURG
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
ACADIAN FLYCATCHER
(Empidonax virescens)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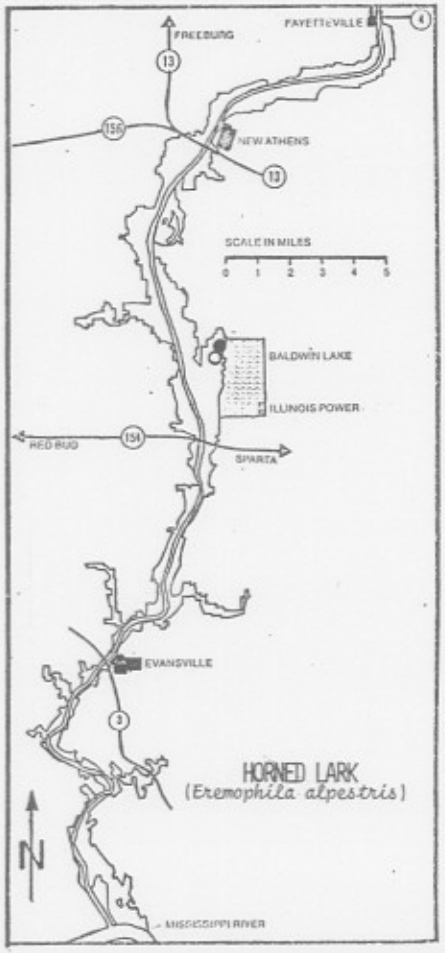
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
EASTERN WOOD PEWEE
(Contopus virens)


FREEBURG
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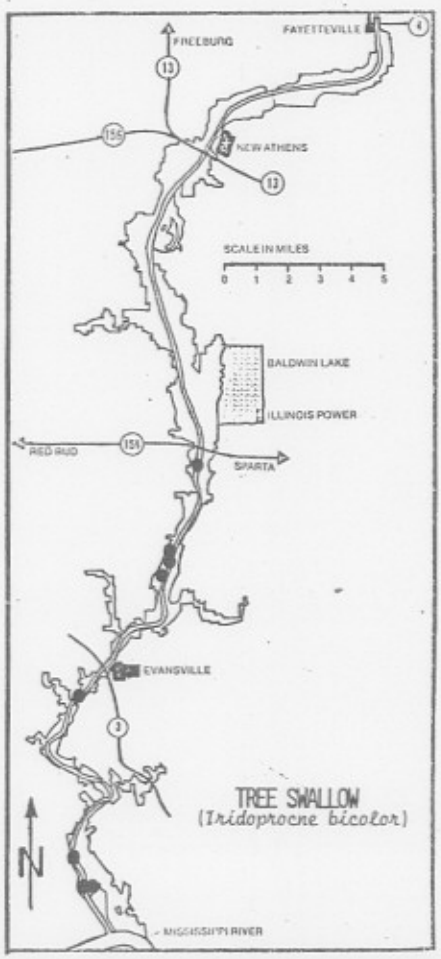
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
HORNED LARK
(Eremophila alpestris)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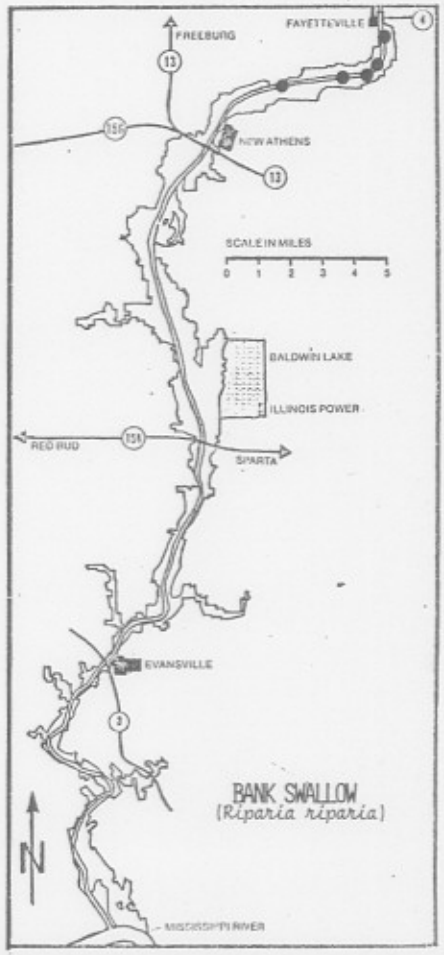
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
TREE SWALLOW
(Iridoprocne bicolor)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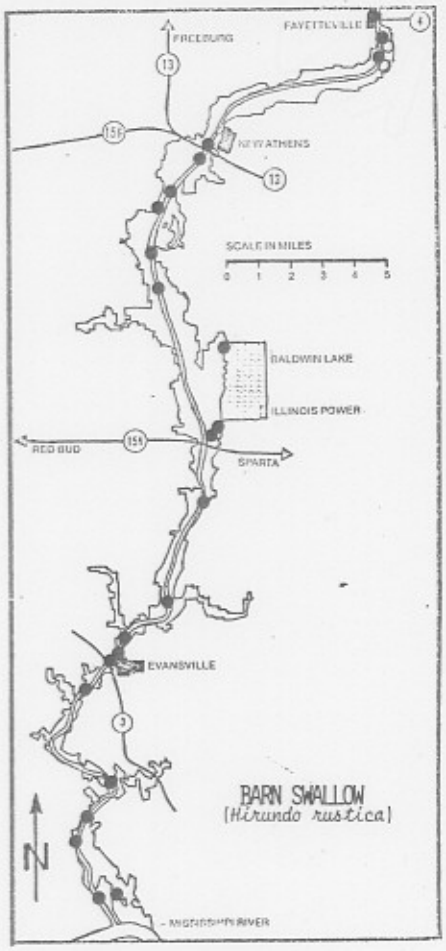
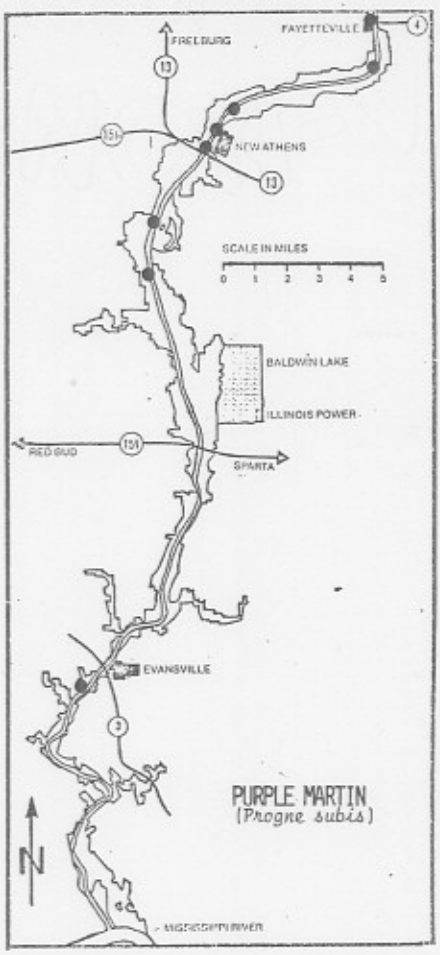
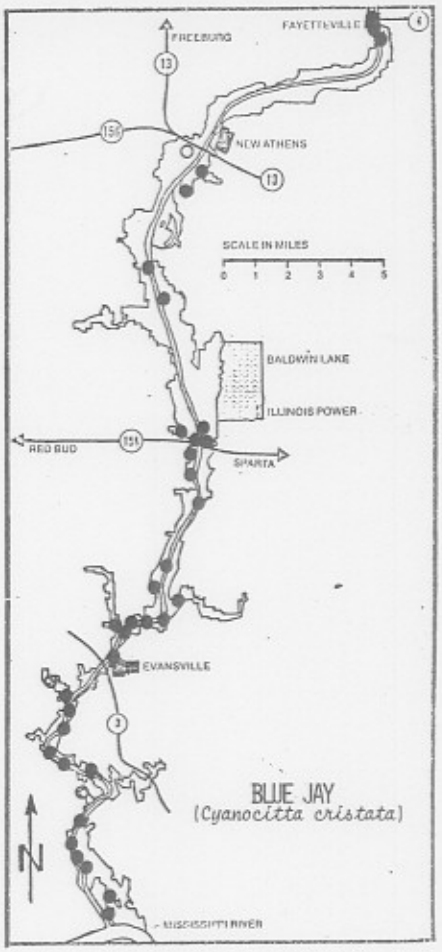
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
MISSISSIPPI RIVER
N
BANK SWALLOW
(Riparia riparia)



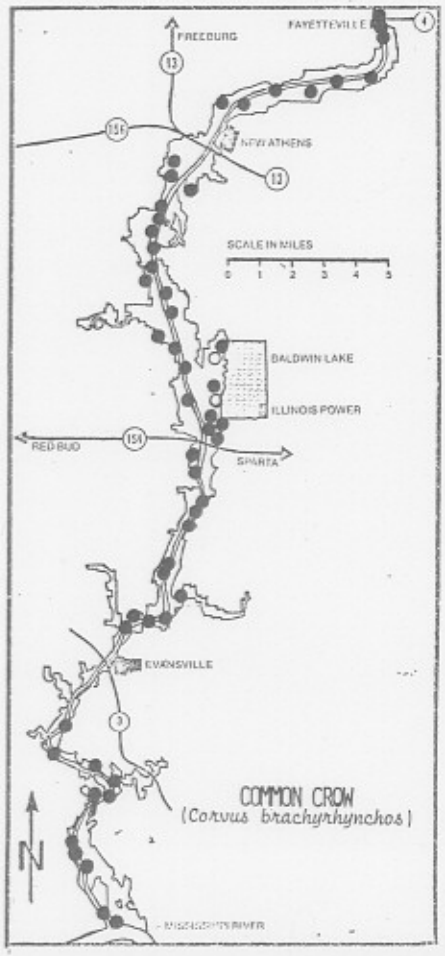
BARN SWALLOW
(*Hirundo rustica*)



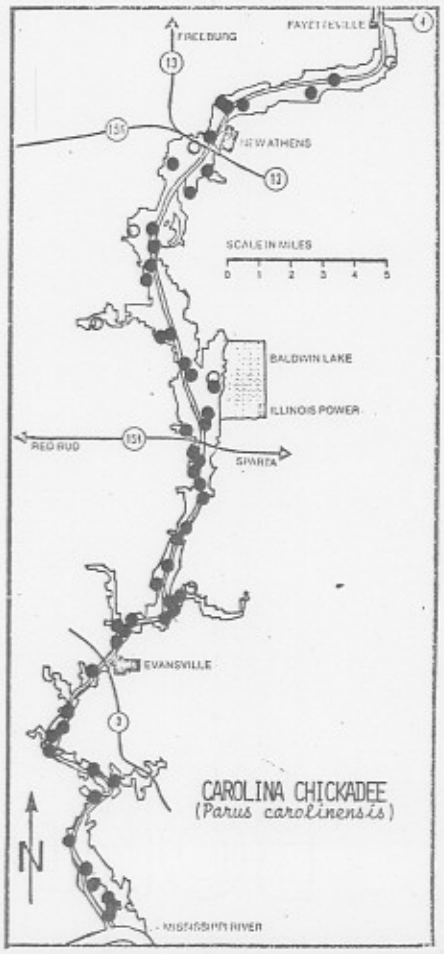
PURPLE MARTIN
(*Progne subis*)



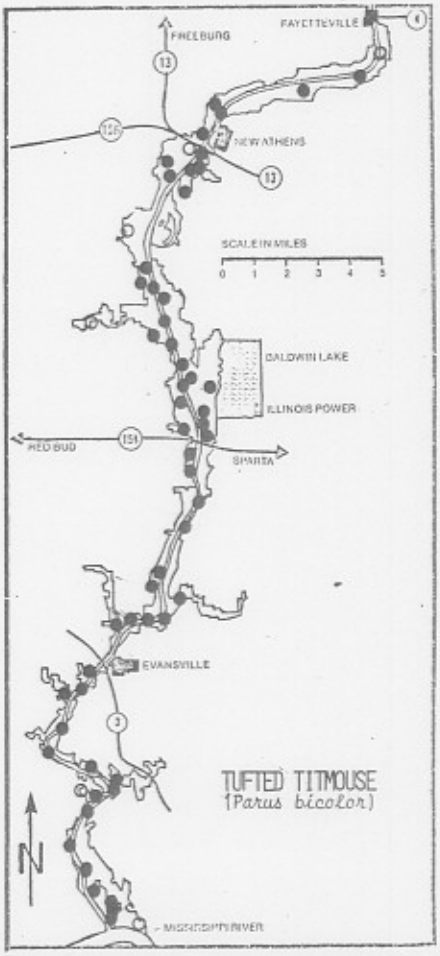
BLUE JAY
(*Cyanocitta cristata*)



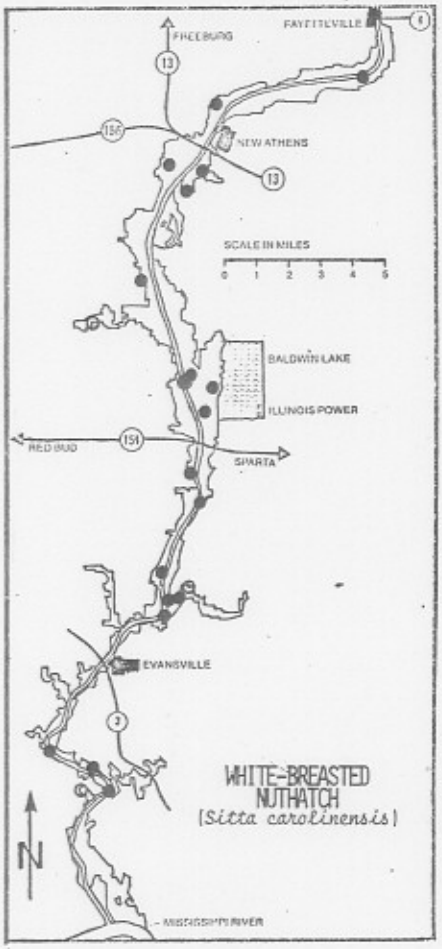
COMMON CROW
(*Corvus brachyrhynchos*)



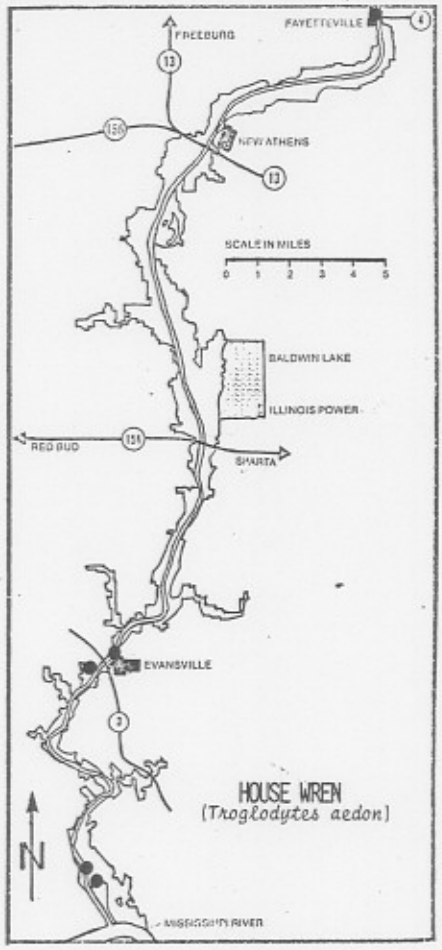
CAROLINA CHICKADEE
(*Parus carolinensis*)



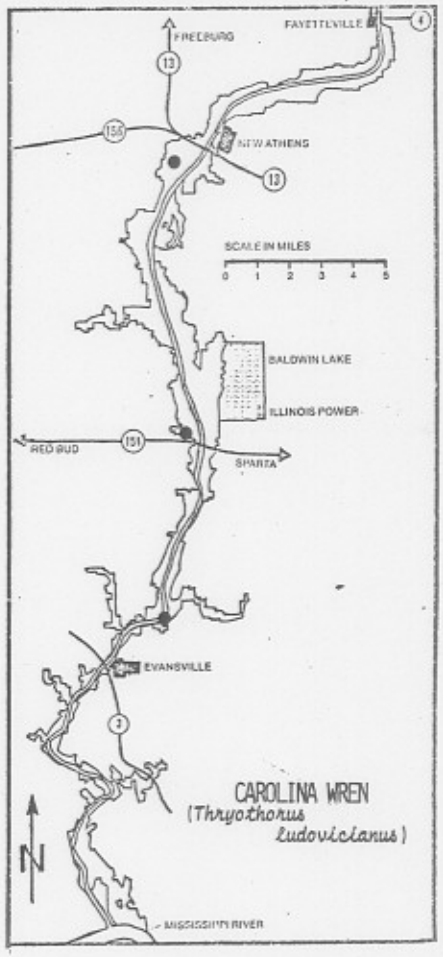
TUFTED TITMOUSE
(*Parus bicolor*)



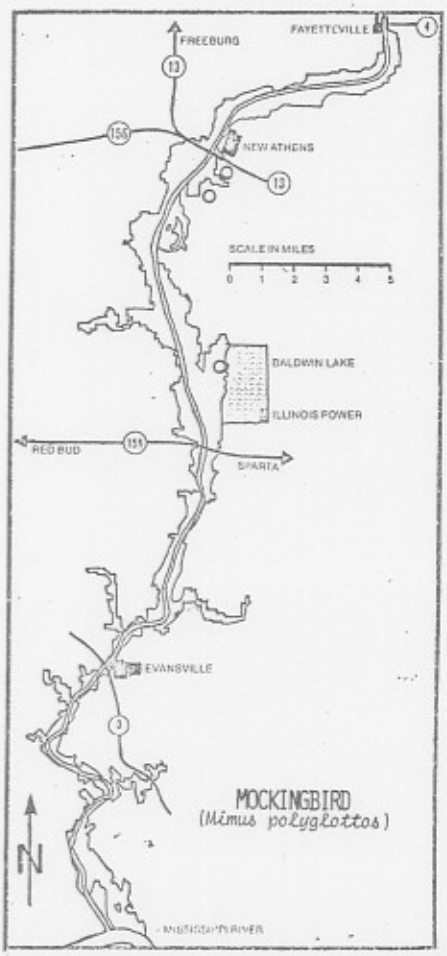
WHITE-BREASTED NUTHATCH
(*Sitta carolinensis*)



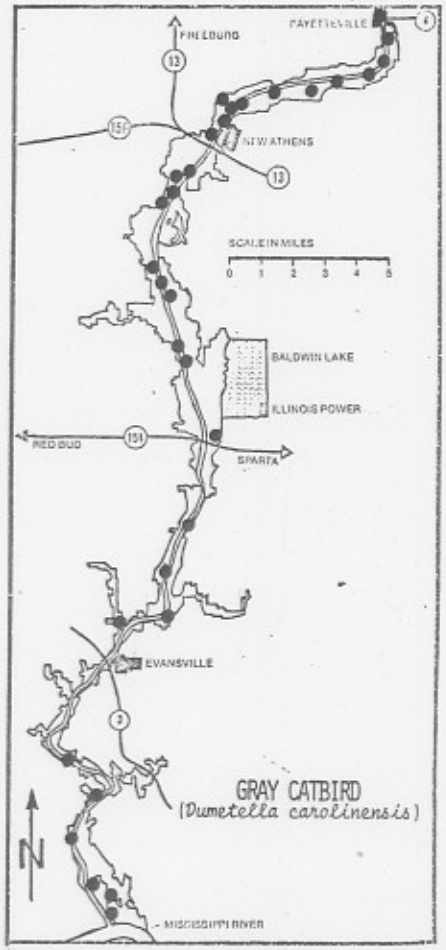
HOUSE WREN
(*Troglodytes aedon*)



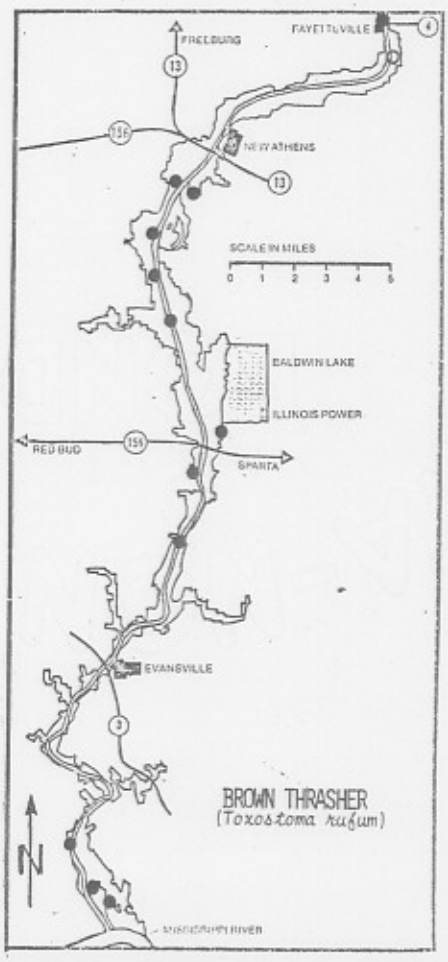
CAROLINA WREN
(*Thryothorus ludovicianus*)



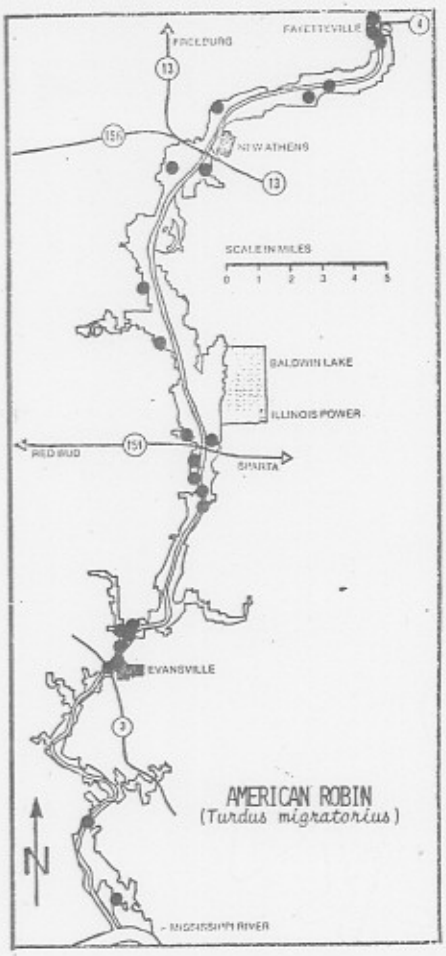
MOCKINGBIRD
(*Mimus polyglottos*)



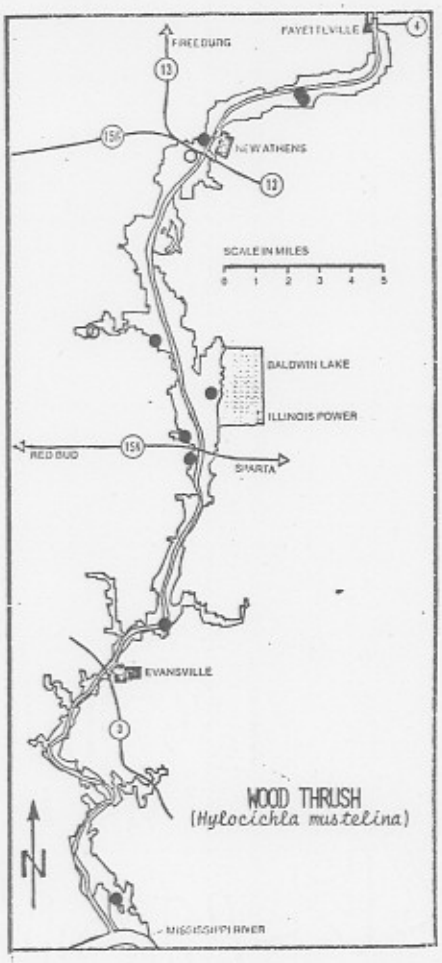
GRAY CATBIRD
(*Dumetella carolinensis*)



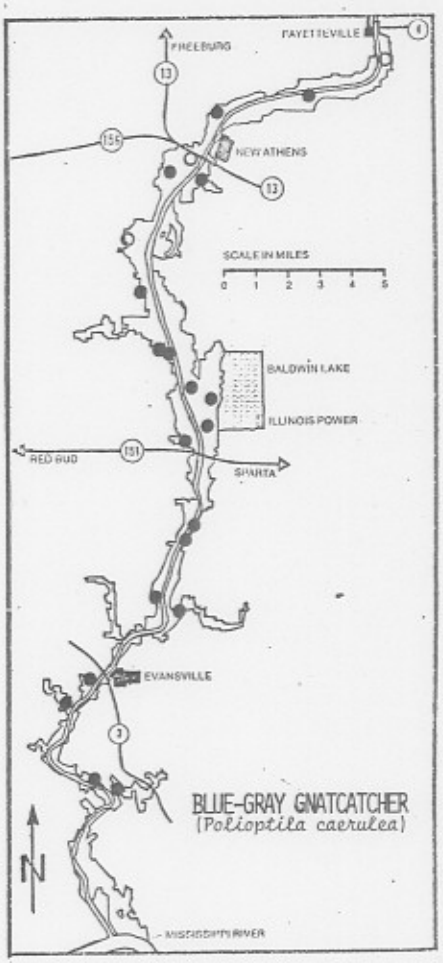
BROWN THRASHER
(*Toxostoma rufum*)



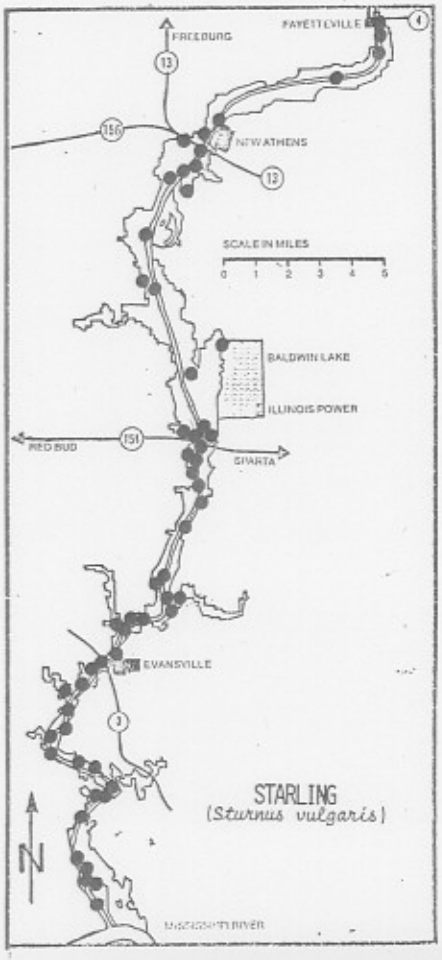
AMERICAN ROBIN
(*Turdus migratorius*)



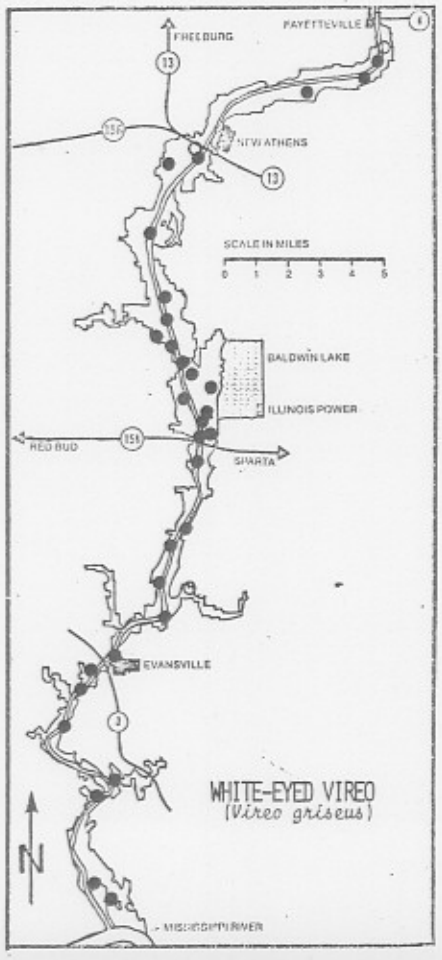
WOOD THRUSH
(*Hylocichla mustelina*)



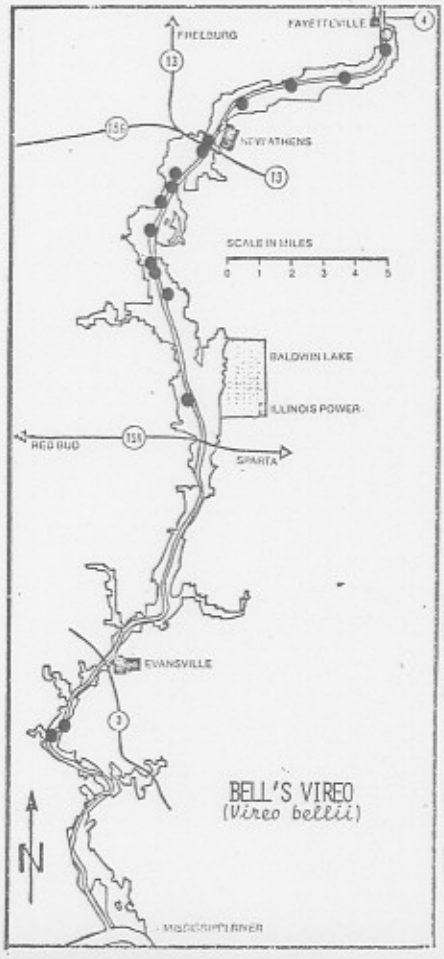
BLUE-GRAY GNATCATCHER
(*Polioptila caerulea*)



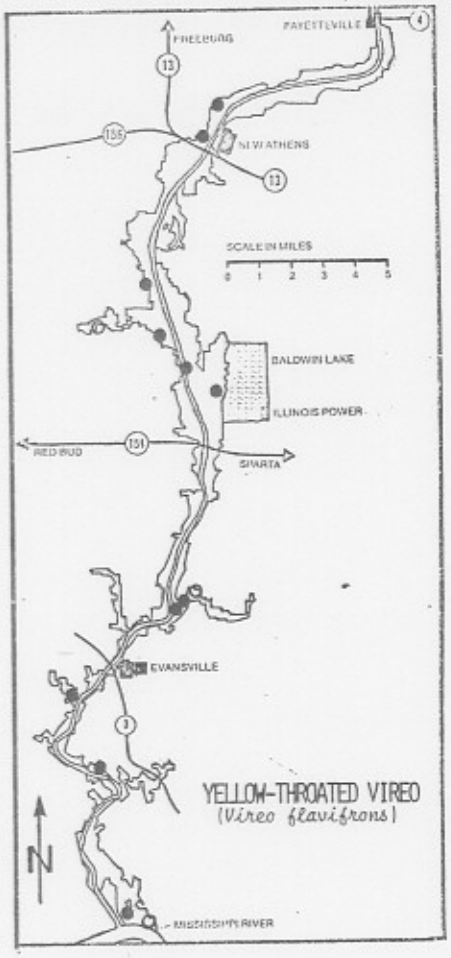
STARLING
(*Sturnus vulgaris*)



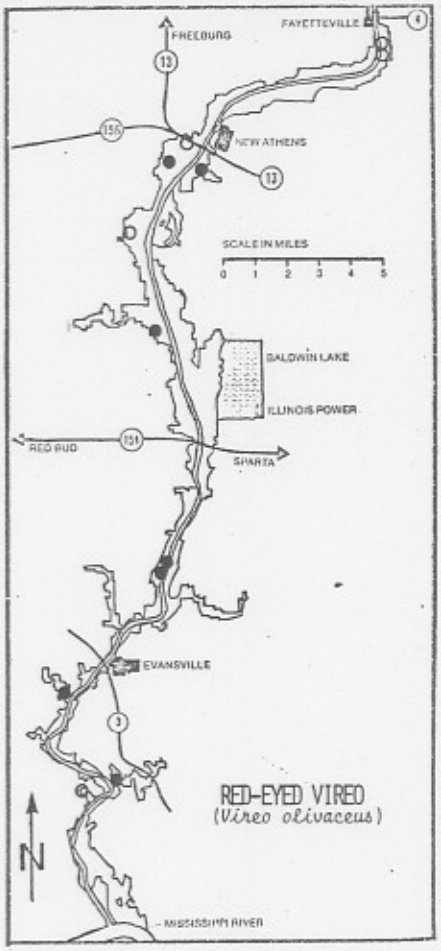
WHITE-EYED VIREO
(*Vireo griseus*)



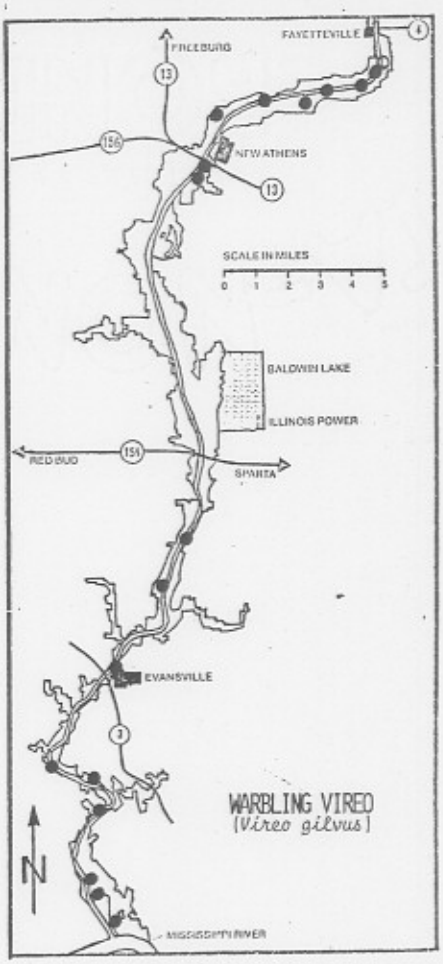
BELL'S VIREO
(*Vireo bellii*)



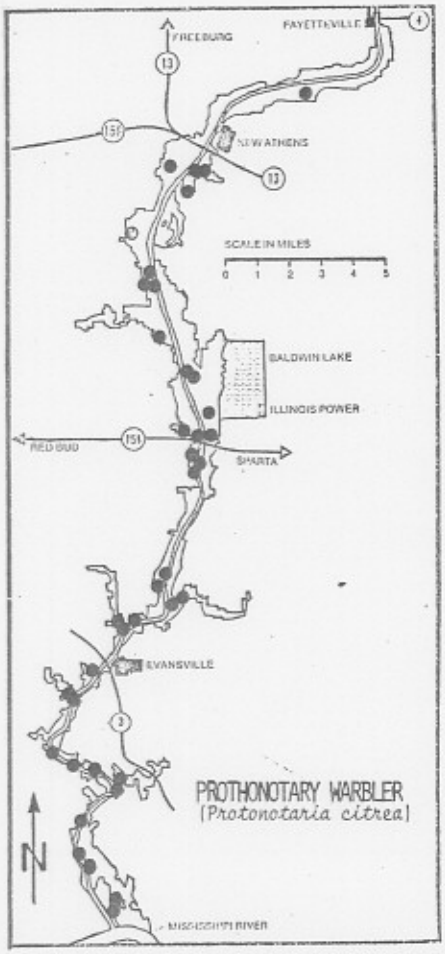
YELLOW-THROATED VIREO
(*Vireo flavifrons*)



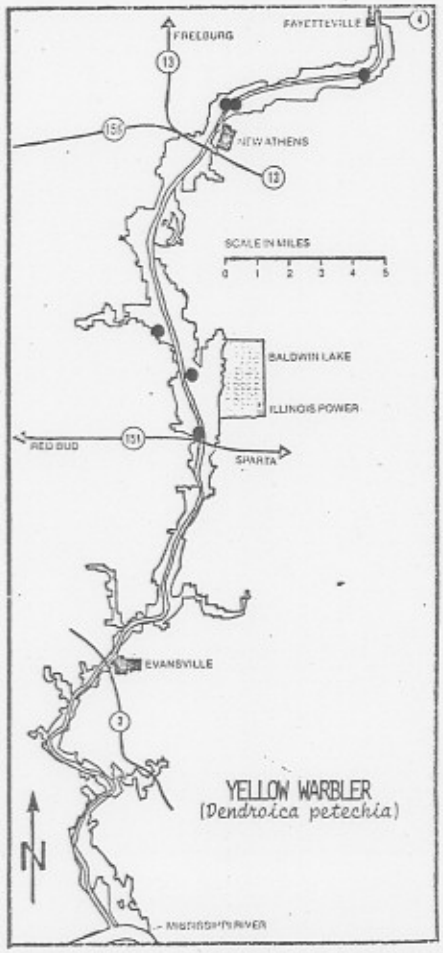
RED-EYED VIREO
(*Vireo olivaceus*)



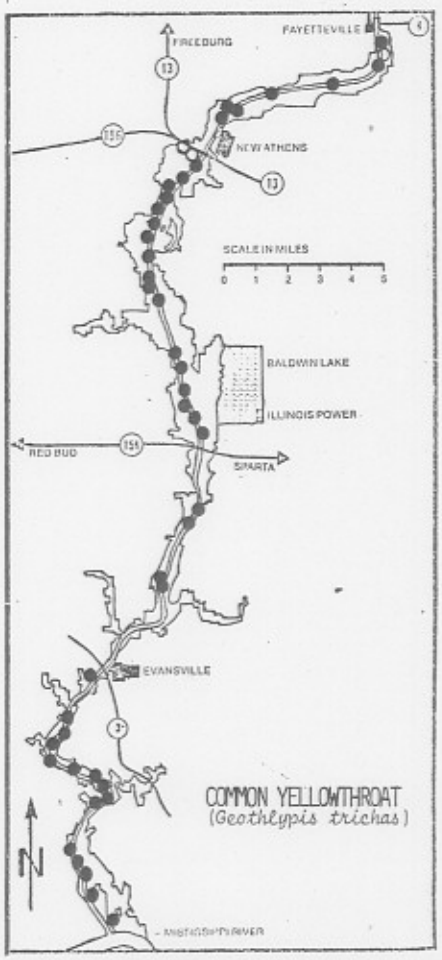
WARBLING VIREO
(*Vireo gilvus*)



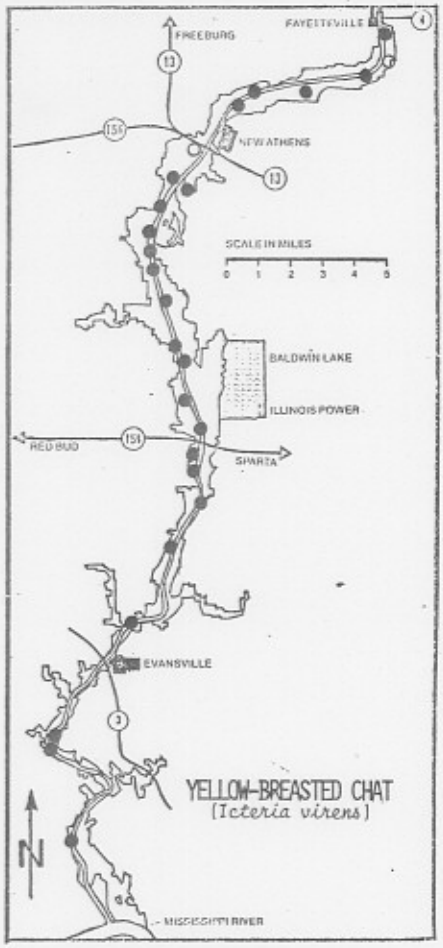
PROTHONOTARY WARBLER
(*Protonotaria citrea*)



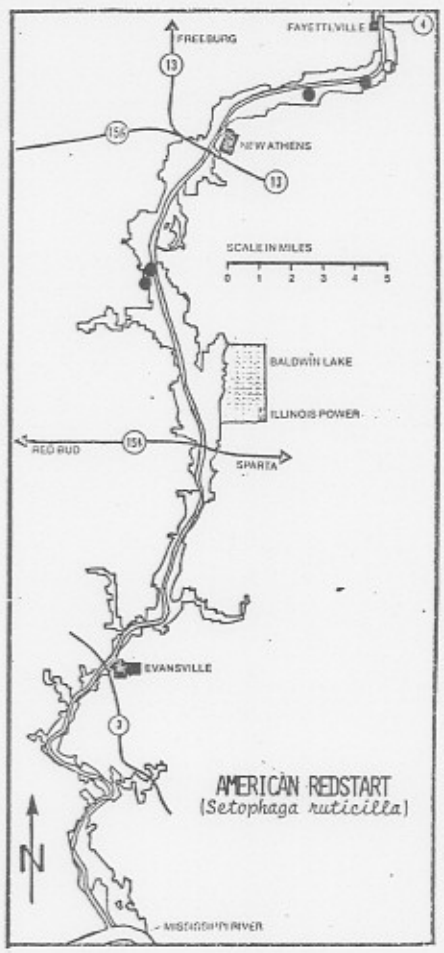
YELLOW WARBLER
(*Dendroica petechia*)



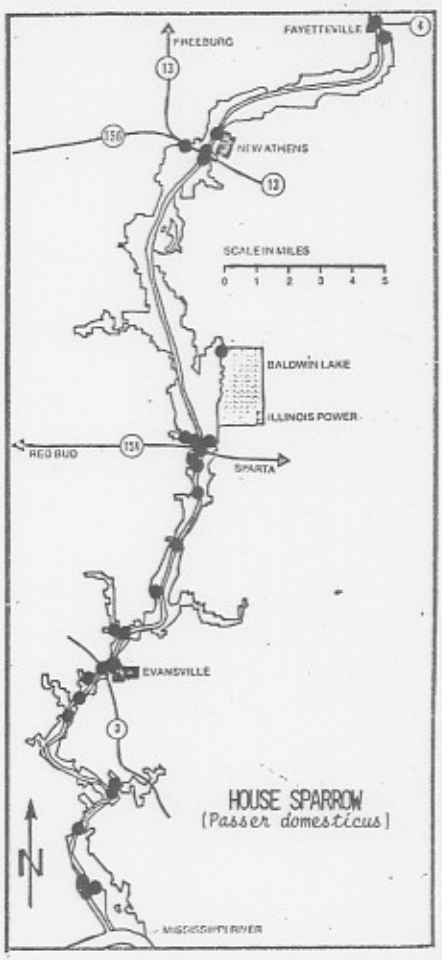
COMMON YELLOWTHROAT
(*Geothlypis trichas*)



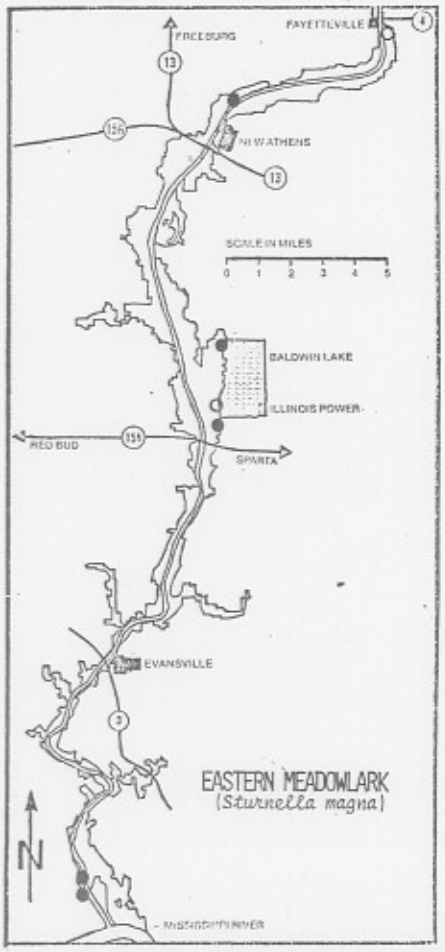
YELLOW-BREASTED CHAT
(*Icteria virens*)



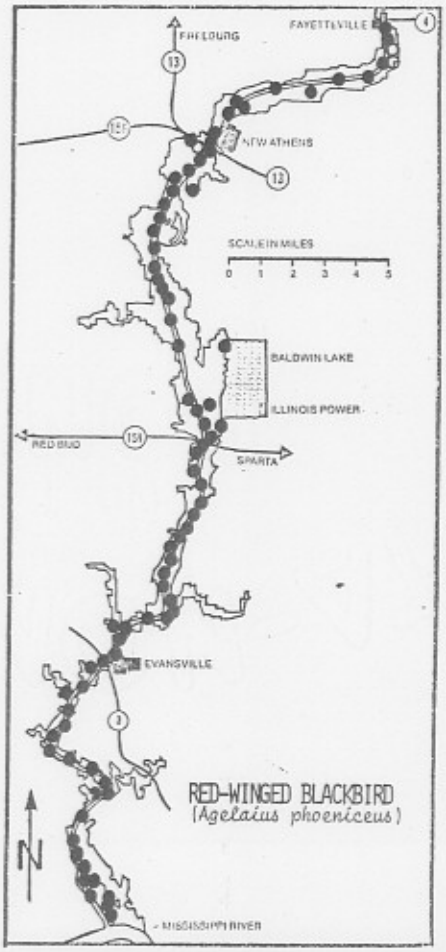
AMERICAN REDSTART
(*Setophaga ruticilla*)



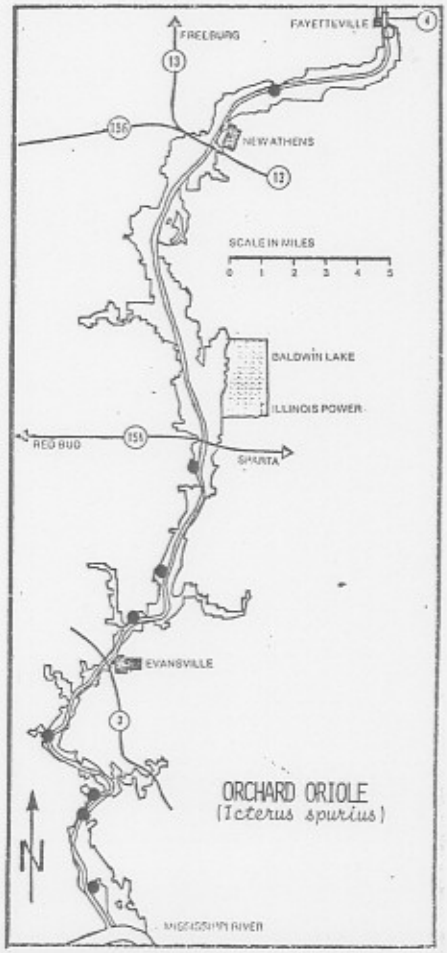
HOUSE SPARROW
(*Passer domesticus*)



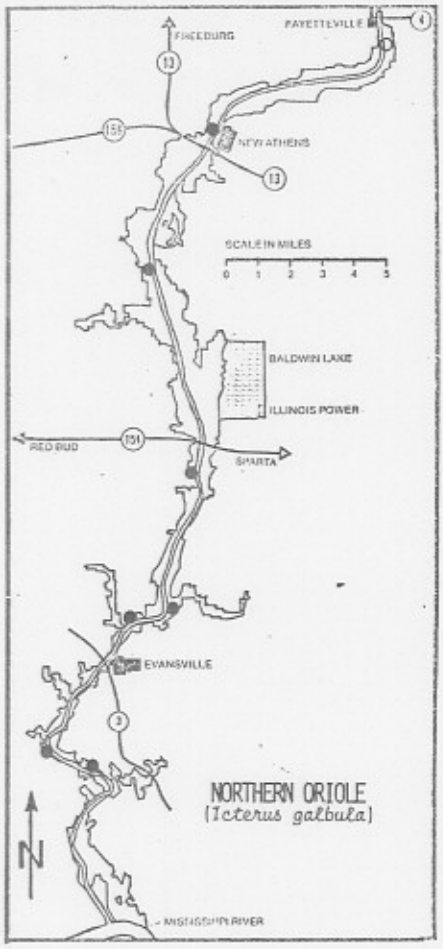
EASTERN MEADOWLARK
(*Sturnella magna*)



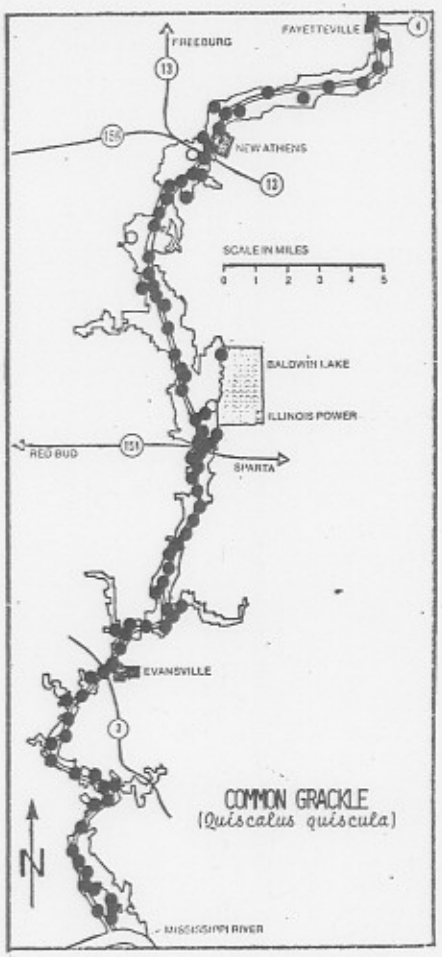
RED-WINGED BLACKBIRD
(*Agelaius phoeniceus*)



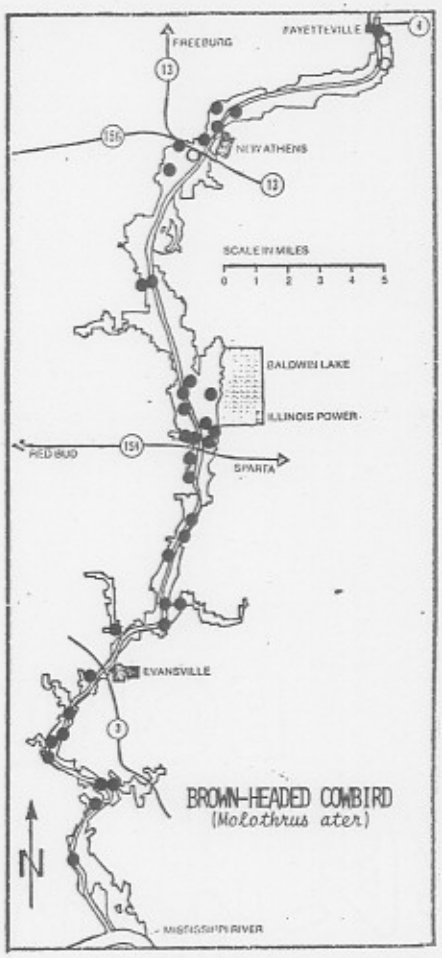
ORCHARD ORIOLE
(*Icterus spurius*)



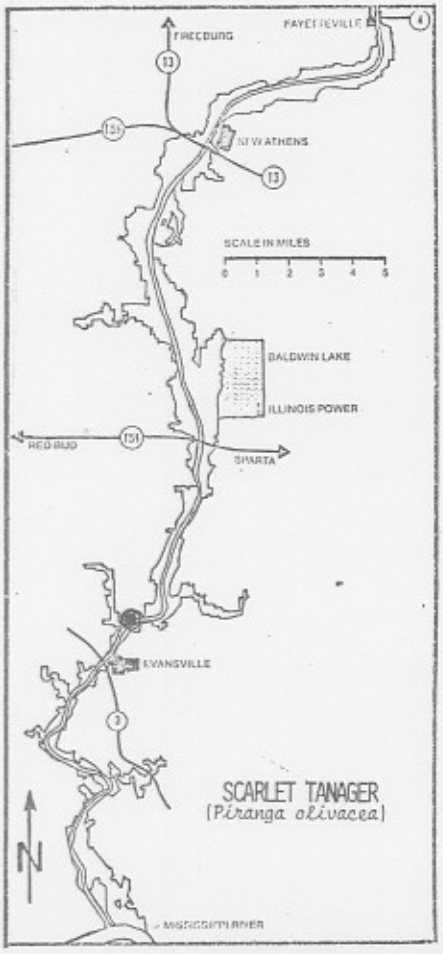
NORTHERN ORIOLE
(*Icterus galbula*)



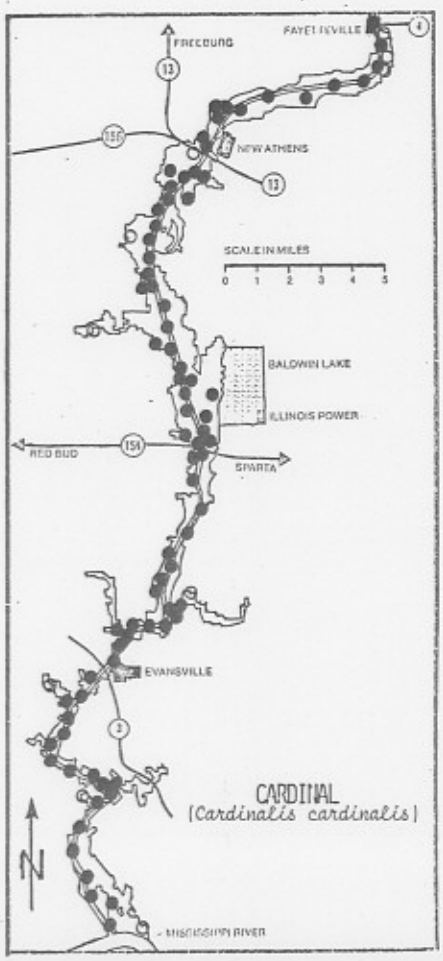
COMMON GRACKLE
(*Quiscalus quiscula*)



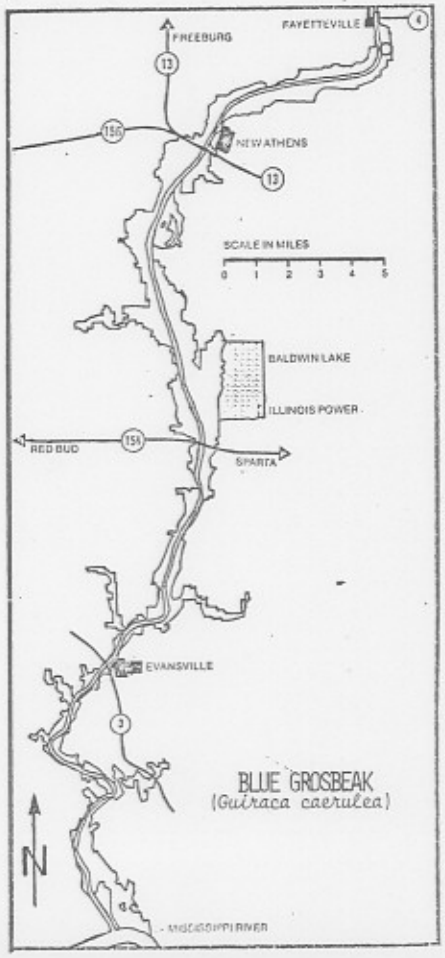
BROWN-HEADED COWBIRD
(*Molothrus ater*)



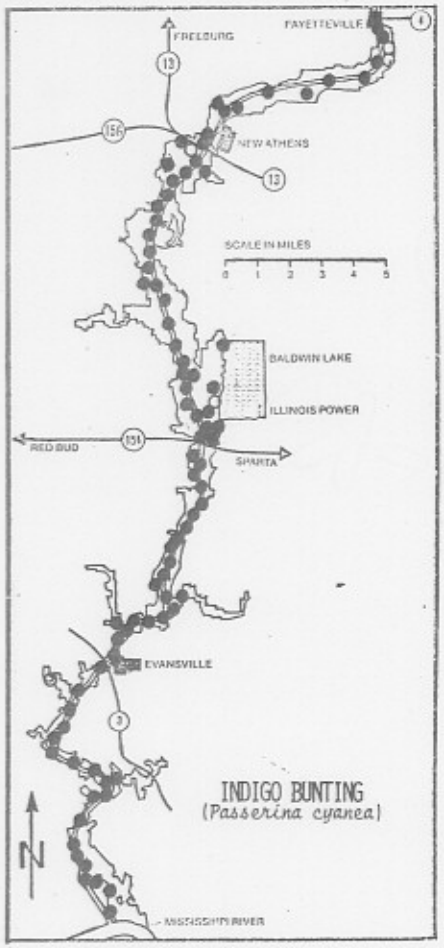
SCARLET TANAGER
(*Piranga olivacea*)



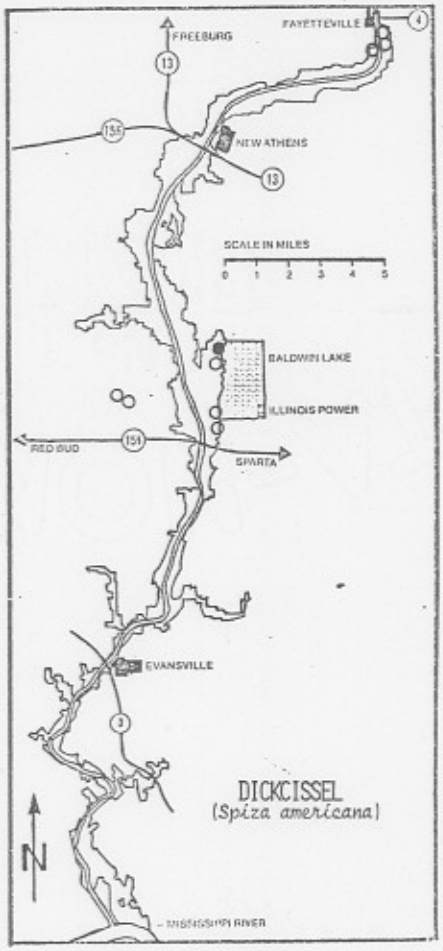
CARDINAL
(*Cardinalis cardinalis*)



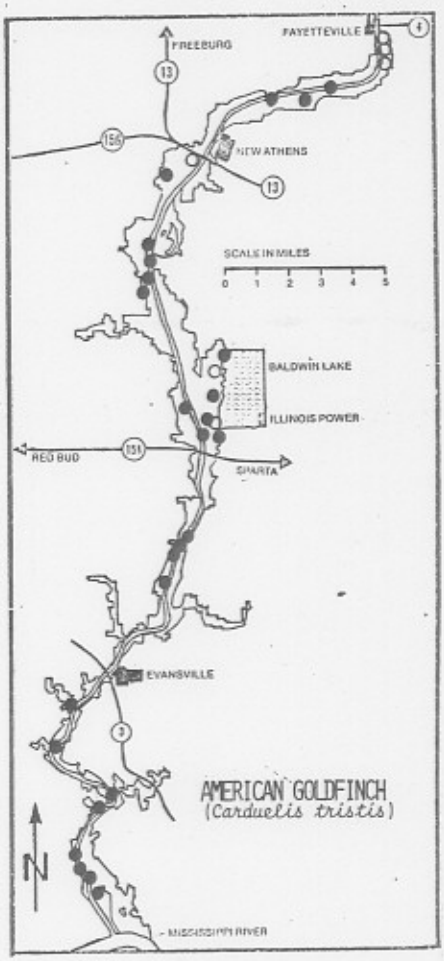
BLUE GROSBEAK
(*Guiraca caerulea*)



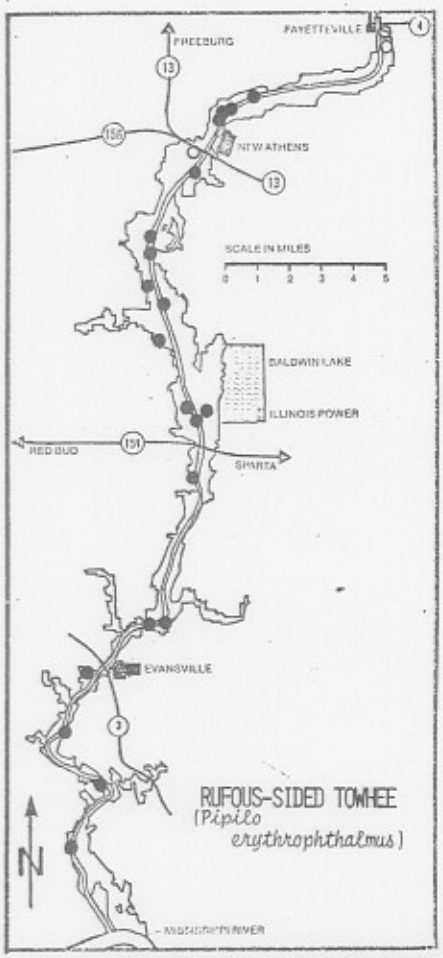
INDIGO BUNTING
(*Passerina cyanea*)



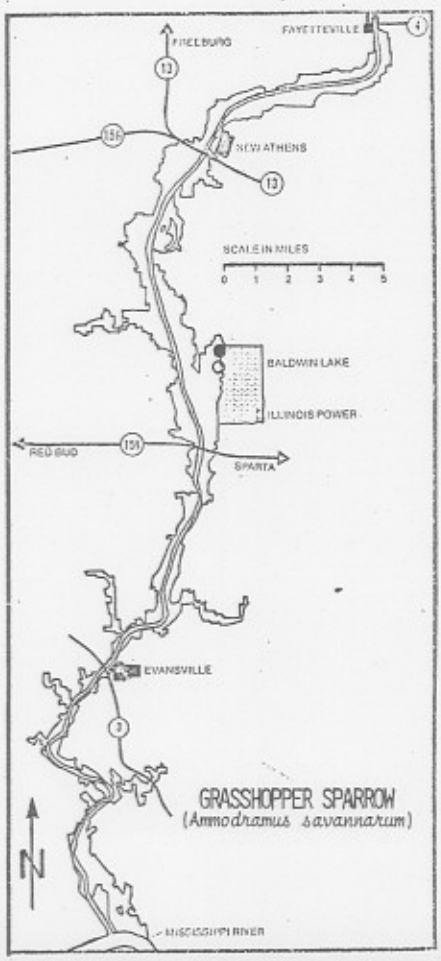
DICKCISSEL
(*Spiza americana*)



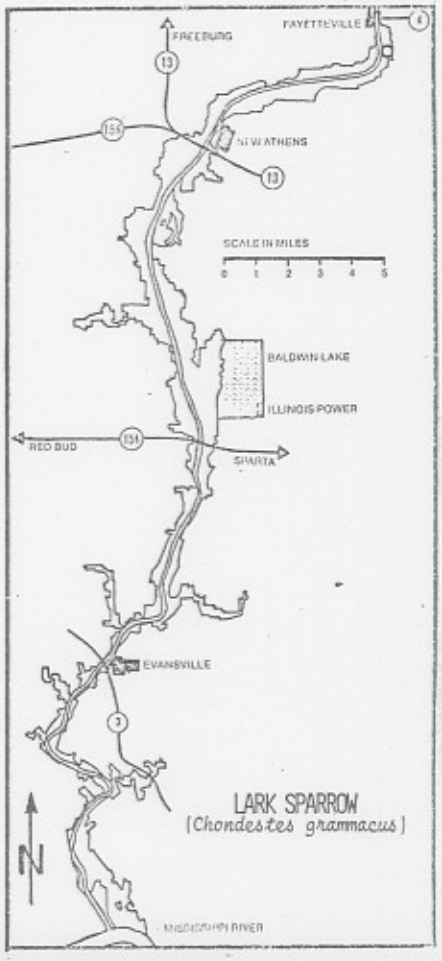
AMERICAN GOLDFINCH
(*Carduelis tristis*)



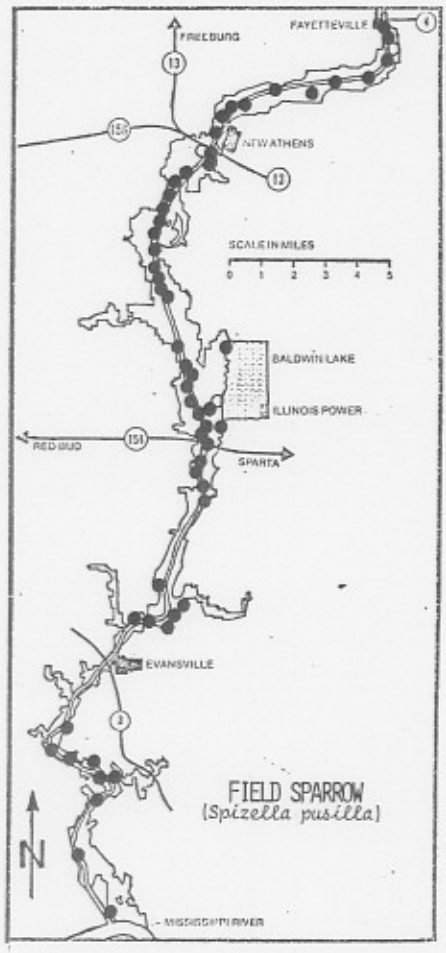
RUFOUS-SIDED TOWHEE
(*Pipilo erythrophthalmus*)

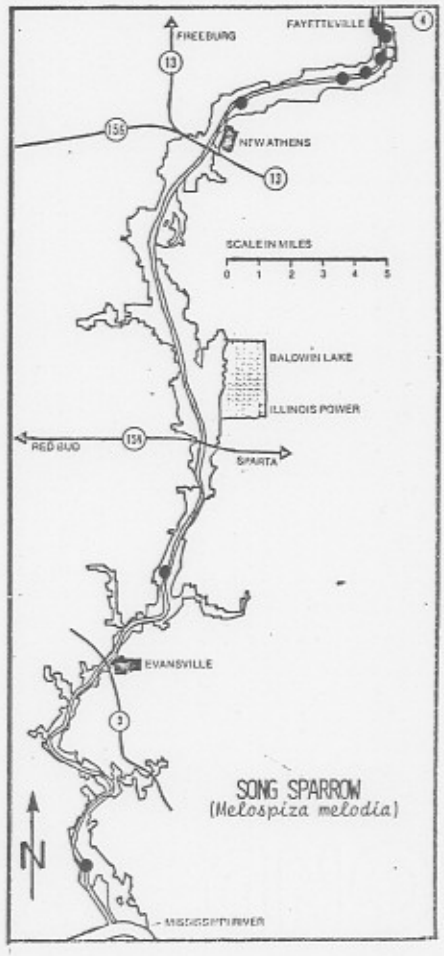


GRASSHOPPER SPARROW
(*Ammodramus savannarum*)



LARK SPARROW
(*Chondestes grammacus*)


FREEBURG
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
FIELD SPARROW
(Spizella pusilla)
N


FREEBURG
FAYETTEVILLE
NEW ATHENS
SCALE IN MILES
0 1 2 3 4 5
BALDWIN LAKE
ILLINOIS POWER
RED BUD
SPARTA
EVANSVILLE
SONG SPARROW
(Melospiza melodia)
N

Appendix II -- Maps Indicating Location of Census Stops

Map A: census stops 1 through 10,
and 47 through 49.

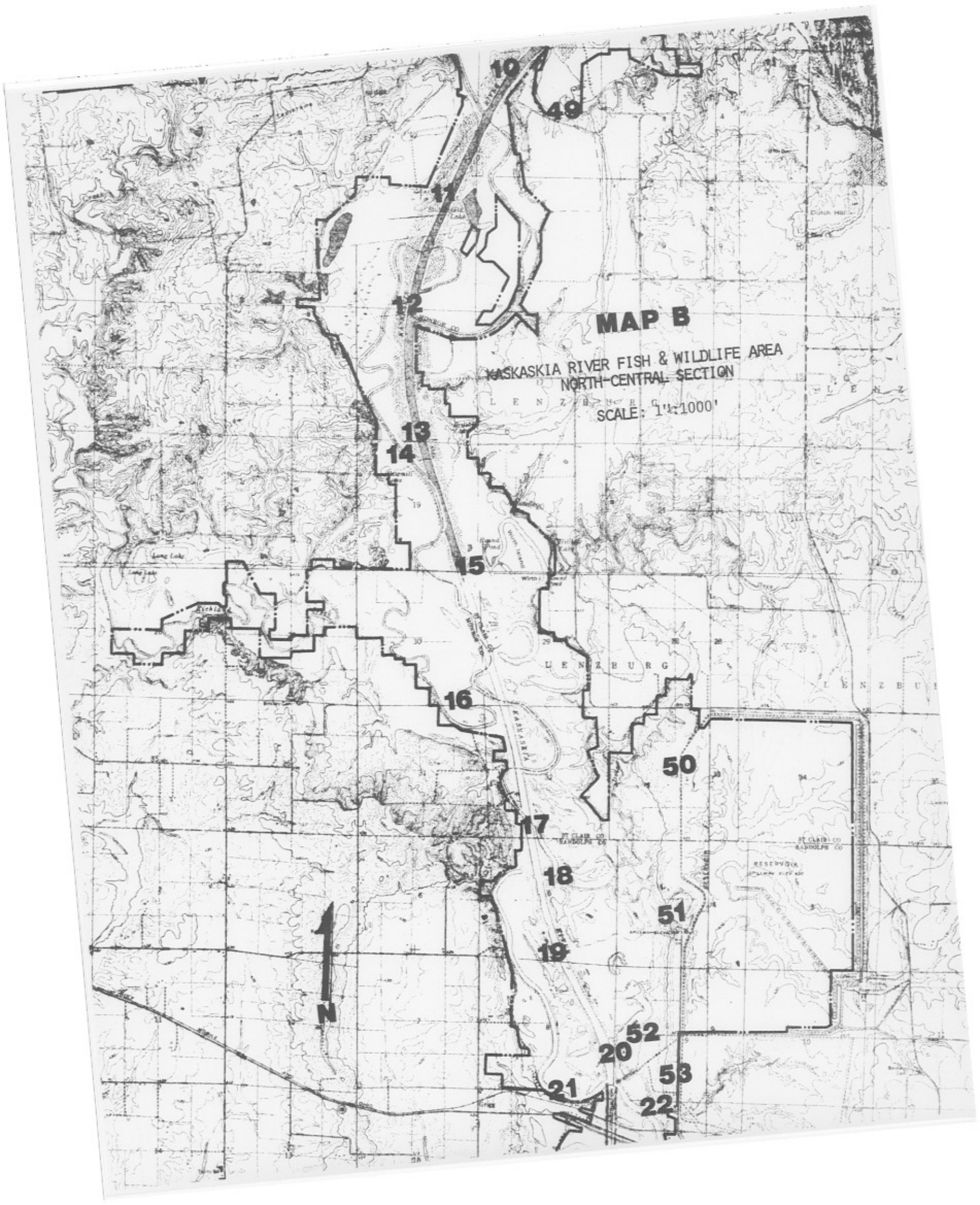
Map B: census stops 10 through 22,
and 49 through 53.

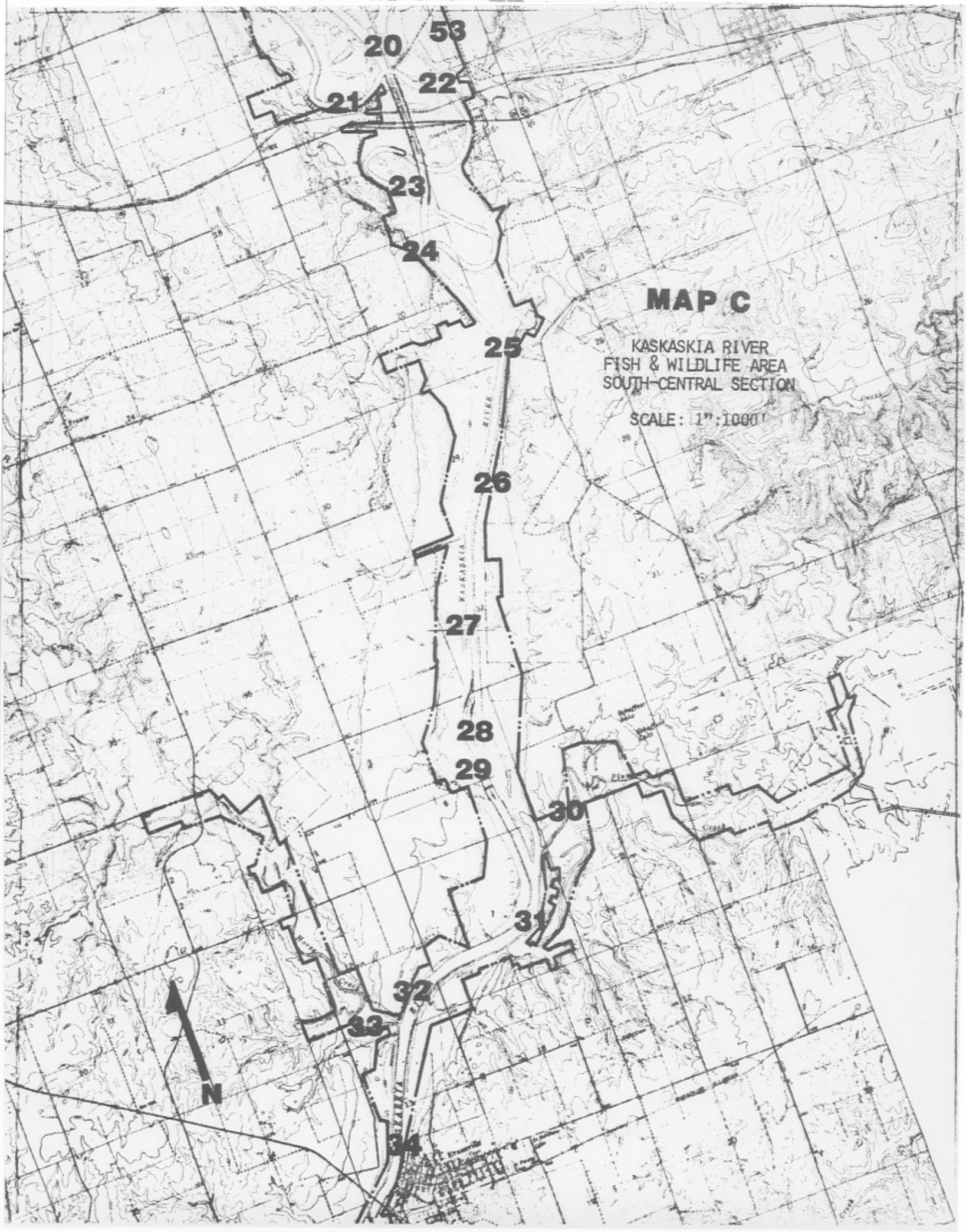
Map C: census stops 20 through 34,
and 53.

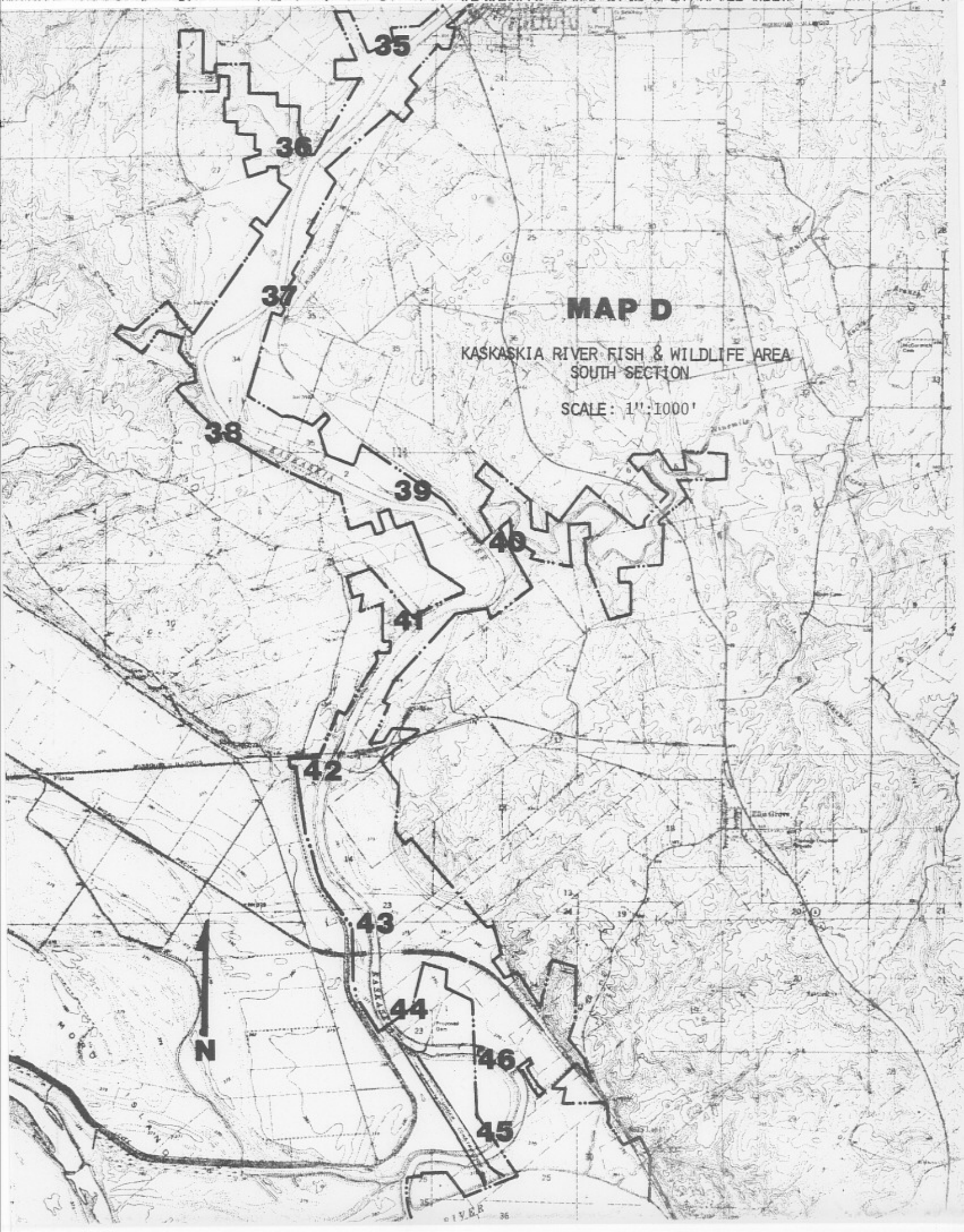
Map D: census stops 35 through 46.

Base Map Source: Illinois Department of Conservation

MAP A
KASKASKIA RIVER FISH & WILDLIFE AREA
NORTH SECTION
SCALE: 1":1000'
1
2
3
4
5
6
7
8
9
10
47
48
49
N


MAP B
KASKASKIA RIVER FISH & WILDLIFE AREA
NORTH-CENTRAL SECTION
SCALE: 1"=1000'
N
10
11
12
13
14
15
16
17
18
19
20
21
22
49
50
51
52
53
LENZBURG
RESERVOIR


MAP C
KASKASKIA RIVER
FISH & WILDLIFE AREA
SOUTH-CENTRAL SECTION
SCALE: 1":1000'
20
53
22
21
23
24
25
26
27
28
29
30
31
32
33
34
N


MAP D
KASKASKIA RIVER FISH & WILDLIFE AREA
SOUTH SECTION
SCALE: 1":1000'
35
36
37
38
39
40
41
42
43
44
45
46
N

Appendix III -- Descriptions and Locations of Census Stops

SITE 1: Developed land; village residential, boat ramp parking lot, and small wheat field. Adjacent area includes floodplain forest.
Location: IDOC boat ramp and parking lot, Fayetteville (St. Clair Co., 38°21'N, Mascoutah Quadrangle, USGS).

SITE 2: DMP site.
Location: 1/2 mi S of Hwy 15 bridge, E bank (St. Clair Co., 38°22'N, New Athens Quadrangle, USGS).

SITE 3: DMP Site.
Location: E bank, marker at entrance of old channel oxbow 500 ft upstream from Little Mud Creek (St. Clair Co., 38°21'N, New Athens East Quadrangle, USGS).

SITE 4: Floodplain forest, adjacent area includes DMP area.
Location: Old channel oxbow S of main channel, marker 1/8 mi within oxbow on E bank (St. Clair Co., 38°21'N, 89°50'W, New Athens East Quadrangle, USGS).

SITE 5: DMP site.
Location: S bank main channel (St. Clair Co., 38°21'N, 89°52'W, New Athens East Quadrangle, USGS).

SITE 6: Floodplain forest.
Location: 1/4 mi up Silver Creek, marker on N creek bank (St. Clair Co., 38°20'30"N, New Athens West Quadrangle, USGS).

SITE 7: Floodplain forest, adjacent area includes DMP area.
Location: Creek 1/2 mi upstream from Hwy 13 bridge. Creek comes into main channel from W, marker is 100 ft up creek on N bank (St. Clair Co., 38°19'30"N, New Athens West Quadrangle, USGS).

SITE 8: Developed land; includes Hwy 13 bridge, adjacent areas include gravel road, DMP area, and floodplain forest.
Location: Immediately S of Hwy 13 bridge, E bank (St. Clair Co., 38°19'N, New Athens West Quadrangle, USGS).

SITE 9: Floodplain forest, adjacent area includes DMP area.
Location: Marker within old channel oxbow containing New Athen's IDOC boat ramp. Marker 1/2 mi in from main channel on oxbow NW bank (St. Clair Co., 38°18'30"N, New Athens West Quadrangle, USGS).

SITE 10: DMP site.
Location: Canal Mile Mark 27.0, W bank (Monroe Co., 38°18'N, New Athens West Quadrangle, USGS).

SITE 11: DMP site.
Location: Canal Mile Mark 26.0, W bank (Monroe Co., 38°17'30"N, New Athens West Quadrangle, USGS).

SITE 12: DMP site.
Location: Canal Mile Mark 25.0, W bank (St. Clair Co., 38°17'N, New Athens West Quadrangle, USGS).

SITE 13: DMP site.
Location: Canal Mile Mark 24.0, W bank (St. Clair Co., 38°16'N, New Athens West Quadrangle, USGS).

SITE 14: Floodplain Forest, adjacent area includes DMP area.
Location: Old channel S of Canal Mile Mark 24.0, W of main channel. Site marker is 1/8 mi up old channel on W bank (St. Clair Co., Monroe Co., 38°16'N, New Athens West Quadrangle, USGS).

SITE 15: DMP Area, adjacent area includes floodplain forest.
Location: Canal Mile Mark 23.0, E bank (St. Clair Co., 38°15'N, New Athens West Quadrangle, USGS).

SITE 16: Floodplain Forest.
Location: 1/8 mi up Richland Creek, site marker on N bank of creek. Richland Creek feeds into an old channel oxbow which enters main channel at Canal Mile Mark 22.0 (Monroe Co., 38°14'N, Red Bud Quadrangle, USGS).

SITE 17: DMP Area, adjacent inland area includes floodplain forest.
Location: Canal Mile Mark 21.0, E bank (St. Clair Co., 38°13'30"N, Red Bud Quadrangle, USGS).

SITE 18: Flooded Woods, adjacent areas include floodplain forest and DMP area.
Location: Flooded woods where Doza Creek feeds into old channel oxbow. Oxbow is E of main channel, 1/2 mi S of Canal Mile Mark 21.0 (Randolph Co., 38°13'N, Red Bud Quadrangle, USGS).

SITE 19: DMP Area, adjacent inland area includes floodplain forest.
Location: Canal Mile Mark 20.0, W bank (Randolph Co., 38°12'30"N, Red Bud Quadrangle, USGS).

SITE 20: DMP Area, adjacent inland areas include successional field.
Location: Canal Mile Mark 19.2, E bank (Randolph Co., 38°12'N, Red Bud Quadrangle, USGS).

SITE 21: Floodplain Forest, adjacent area includes small cabins within forest on nearby terrace.
Location: Old channel W of main channel below Canal Mile Mark 19.2. Site marker is 1/3 mi up old channel on N bank (Randolph Co., 38°11'30"N, Red Bud Quadrangle, USGS).

SITE 22: Flooded Woods, adjacent area includes floodplain forest and developed land consisting of boat ramp, parking lot, and railroad tracks.
Location: Flooded forest NW of IDOC boat ramp within old channel (Randolph Co., 38°11'30"N, Red Bud Quadrangle, USGS).

SITE 23: Floodplain Forest, adjacent area includes dredge material disposal area.
Location: Old channel 1/2 mi S of Hwy 154 bridge, W of main channel. Site marker 1/8 mi in old channel on N bank (Randolph Co., 38°11'N, 89°43'30"W, Red Bud Quadrangle, USGS).

SITE 24: Upland Forest, river terrace, adjacent inland area includes cropland; DMP area on opposite shore of river.
Location: Canal Mile Mark 17.7, W bank (Randolph Co., 38°10'30"N, Red Bud Quadrangle, USGS).

SITE 25: Mixed Habitat consisting of successional field, upland forest, and homesite; DMP area on opposite shore of river.
Location: Canal Mile Mark 16.9, E bank (Randolph Co., 38°10'N, Red Bud Quadrangle, USGS).

SITE 26: DMP Area.
Location: Canal Mile Mark 16.0, E bank (Randolph Co., 38°09'N, Red Bud Quadrangle, USGS).

SITE 27: DMP Area, adjacent area includes floodplain forest.
Location: Canal Mile Mark 15.0, W bank (Randolph Co., 38°08'N, Red Bud Quadrangle, USGS).

SITE 28: DMP Area.
Location: Canal Mile Mark 14.2 on island, W bank of main channel (Randolph Co., 38°07'45"N, Red Bud Quadrangle, USGS).

SITE 29: Flooded Woods, adjacent area includes floodplain forest and DMP area.
Location: 1/2 mi S of Canal Mile Mark 14.2, E of main channel (Randolph Co., 38°07'30"N, Evansville Quadrangle, USGS).

SITE 30: Floodplain Forest, adjacent area includes upland forest and cropland.
Location: 1/4 mi up Plum Creek (Randolph Co., 38°07'N, Evansville Quadrangle, USGS).

SITE 31: Floodplain Forest on bank slope, highly disturbed. Adjacent area includes successional field on terrace.
Location: Canal Mile Mark 12.9, E bank (Randolph Co., 38°06'30"N, 89°54'30"W, Evansville Quadrangle, USGS).

SITE 32: Upland Forest on bank slope and terrace.
Location: Canal Mile Mark 12.0, E bank (Randolph Co., 38°06'30"N, Evansville Quadrangle, USGS).

SITE 33: Mixed Habitat consisting of floodplain forest, cropland, and successional field.
Location: 1/8 mi up Horse Creek (Randolph Co., 38°06'30"N, 89°56'W, Evansville Quadrangle, USGS).

SITE 34: Developed Land, includes village residential, boat ramp parking lot.
Location: IDOC boat ramp, Evansville (Randolph Co., 38°05'30"N, Evansville Quadrangle, USGS).

SITE 35: Mixed Habitat consisting of flooded woods, floodplain forest, and successional field.
Location: Slough 1/2 S of Hwy 3 bridge, W side of main channel (Randolph Co., 38°05'N, Evansville Quadrangle, USGS).

SITE 36: Floodplain Forest.
Location: 1/8 mi up Camp Creek, marker on N bank of creek (Randolph Co., 38°04'30"N, Evansville Quadrangle, USGS).

SITE 37: Mixed Habitat, floodplain forest changing to upland forest on bank slope and terrace.
Location: Canal Mile Mark 8.1, E bank (Randolph Co., 38°03'30"N, Evansville Quadrangle, USGS).

SITE 38: Mixed Habitat, consisting of floodplain forest changing to upland forest bank slope and terrace.
Location: Canal Mile Mark 7.0, W bank (Randolph Co., 38°03'N, Evansville Quadrangle, USGS).

SITE 39: Floodplain Forest with woods, adjacent area includes successional field and DMP area.
Location: Slough area NE of main channel, "slow no wake" sign at entrance of slough. Site marker 1/8 mi into slough (Randolph Co., 38°02'30"N, Evansville Quadrangle, USGS).

SITE 40: Floodplain Forest, adjacent area includes upland forest and successional field.
Location: 1/4 mi up Ninemile Creek (Randolph Co., 38°02'N, Evansville Quadrangle, USGS).

SITE 41: Mixed Habitat consisting of floodplain forest and cornfield.
Location: Canal Mile Mark 4.0, W bank (Randolph Co., 38°02'N, Evansville Quadrangle, USGS).

SITE 42: Mixed Habitat consisting of floodplain forest and DMP area.
Location: Canal Mile Mark 3.0, W bank (Randolph Co., 38°01'N, Evansville Quadrangle, USGS).

SITE 43: Mixed Habitat consisting of floodplain forest and DMP area.
Location: Canal Mile Mark 2.0, E bank (Randolph Co., 38°01'N, Evansville Quadrangle, USGS).

SITE 44: Mixed Habitat consisting of flooded woods and DMP area.
Location: Slough area above dam, E side of main channel (Randolph Co., 38°59'30"N, Kaskaskia Quadrangle, USGS).

SITE 45: DMP Area, adjacent area includes floodplain forest.
Location: Old channel below lock. Site marker 1/8 mi E of main channel on N bank of old channel (Randolph Co., 38°59'N, Kaskaskia Quadrangle, USGS).

SITE 46: DMP Area, adjacent area includes floodplain forest.
Location: Old channel below lock. Site marker 3/4 mi into old channel on SW bank (Randolph Co., 38°59'N, Kaskaskia Quadrangle, USGS).

SITE 47: Floodplain Forest.
Location: This site is within New Athens Natural Area (Biotic Consultants, 1980) along the old oxbow channel. Access by land is by trail which begins at the end of a private road. (St. Clair Co., 38°19'N, New Athens West Quadrangle, USGS).

SITE 48: Marsh, adjacent area includes floodplain forest and highway.
Location: Marsh S side of Hwy 13, 3/4 mi NW of Hwy 13 bridge (St. Clair Co., 38°19'30"N, New Athens West Quadrangle, USGS).

SITE 49: Buttonbush Swamp, adjacent areas include floodplain forest and marsh.
Location: Known as Big Lake (IDOC personal communication) and *Polygonum* Marsh (Biotic Consultants, 1980). Site marker is on S edge of swamp. A paved road hugs the wooded S side of the habitat (St. Clair Co., 38°18'N, New Athens West Quadrangle, USGS).

SITE 50: Baldwin Lake including grass field, adjacent area consists of wheatfield, and IDOC boat ramp parking lot.
Location: Waterfowl survey stand on NW shore of Baldwin Lake (St. Clair Co., 38°13'30"N, Red Bud Quadrangle, USGS).

SITE 51: Upland Forest with small creek running thru, adjacent area includes cropland and successional field.
Location: Site marker 200 ft SE of red barn (Randolph Co., 38°12'30"N, Red Bud Quadrangle, USGS).

SITE 52: Dry Lake, shore consists of floodplain forest, marsh, and successional field.
Location: SW of Baldwin Lake, site marker is near end of dirt road on E shore of Dry Lake (Randolph Co., 38°12'N, Red Bud Quadrangle, USGS).

SITE 53: Cropland, wheatfield off gravel road, nearby area includes successional field.
Location: Site marker on telephone pole off gravel road 1/4 mi S of SE corner of Baldwin Lake (Randolph Co., 38°12'N, Red Bud Quadrangle, USGS).

Appendix IV -- IDOC Tabulation Sheets

Observer: Leo G. Nico

Address: Dept. Biological Sciences

So. Illinois University

AVIAN ECOLOGICAL INVESTIGATIONS

TABULATION SHEET

Site: Kaskaskia River F&WA

Year: 1981

Page 1 of 2 (for this year)

Species (in A.O.U.* order)	Total Number of Different** TRANSECT LEGS Species	Total Number of Different** CENSUS STOPS Recorded	Species Present in Additional Habitats@	Estimated# Population	Habitat Preferences
Great Blue Heron	3	3	0	6-15 pairs	oxbows, flooded woods,
Green Heron Heron	21	13	4	>50 pairs	river, creeks, etc.
Little Blue Heron	1	1	0	1-5 pairs	river
Yellow-cr. Night Heron	7	3	0	1-5 pairs	river, sloughs
Canada Goose	0	0	0+	>50 pairs	lake, cropland
Mallard	17	10	1	16-50 pairs	river, lake
Wood Duck	25	16	1	>50 pairs	creeks, slough, marsh, et
Turkey Vulture	0	0	0+	1-5 pairs	bluffs
Mississippi Kite	1	0	0	1-5 pairs	floodplain forest, etc.
Red-tailed Hawk	4	1	1	1-5 pairs	open country
Red-shouldered Hawk	0	1	0	1-5 pairs	floodplain forest
American Kestrel	3	0	0	1-5 pairs	open country
Bobwhite	10	24	3	>50 pairs	DMP area, cropland, etc.
Killdeer	3	3	1	16-50 pairs	lake, DMP area, etc.
American Woodcock	0	0	1	6-15 pairs	floodplain forest
Spotted Sandpiper	1	0	0	migrant	river, lake mud flat
Black Tern	0	0	0+	migrant	river
Rock Dove	6	1	0	>50 pairs	developed land
Mourning Dove	13	31	3	>50 pairs	DMP area, cropland, etc.
Yellow-billed Cuckoo	12	39	5	>50 pairs	forest, edge, etc.
Barred Owl	1	2	0	6-15 pairs	floodplain forest
Chimney Swift	27	21	2	>50 pairs	variable
Ruby-thr. Hummingbird	0	5	2	16-50 pairs	variable
Belted Kingfisher	9	7	1	16-50 pairs	river, oxbows
Common Flicker	11	28	3	>50 pairs	DMP areas, etc.
Pileated Woodpecker	6	8	1	16-50 pairs	floodplain forest
Red-bellied Woodpecker	9	21	4	>50 pairs	forest
Red-headed Woodpecker	32	41	5	>50 pairs	flooded woods
Hairy Woodpecker	1	5	0	16-50 pairs	floodplain forest edge
Downy Woodpecker	9	21	2	>50 pairs	floodplain forest, etc.
Eastern Kingbird	16	5	1	>50 pairs	DMP area
Great Crested Flycatcher	8	22	3	>50 pairs	floodplain forest, etc.
Eastern Phoebe	2	7	0	16-50 pairs	floodplain forest edge
Acadian Flycatcher	7	9	2	>50 pairs	floodplain forest
Eastern Wood Pewee	7	21	4	>50 pairs	forest
Horned Lark	0	0	1	6-15 pairs	cropland
Tree Swallow	5	3	0	16-50 pairs	flooded woods
Bank Swallow	3	2	0	16-50 pairs	river bank
Barn Swallow	13	8	2	>50 pairs	river, lake, etc.
Purple Martin	4	3	0	16-50 pairs	river, flooded woods
Blue Jay	10	25	1	>50 pairs	forest, edge
Common Crow	14	33	6	>50 pairs	open country

* A.O.U. = American Ornithologists' Union

** Indicate the total number of different Transect Legs and Census Stops the species was recorded; five Transect Sets would have about 50 Census Stops and 55 Transect Legs.

@ If the species occurred in 6 of the "Additional" Census Stops established by the observer for qualitative sampling, enter the number 6 in this column.

\# Use one of the following categories for this column: 1-5 prs; 6-15 prs; 16-50 prs; or > 50 prs.

\+ Species presence confirmed by "unofficial" survey(s) (refer to methods of survey).

Observer: Leo G. Nico

Address: Dept. Biological Sciences
So. Illinois University

AVIAN ECOLOGICAL INVESTIGATIONS

TABULATION SHEET

Site: Kaskaskia River F&WA

Year: 1981

Species (in A.O.U.* order)	Total Number of Different** TRANSECT LEGS Species	CENSUS STOPS Recorded	Species Present in Additional Habitats@	Estimated# Population	Habitat Preferences
Carolina Chickadee	20	33	4	>50 pairs	forest
Tufted Titmouse	11	40	4	>50 pairs	forest, forest edge
White-breasted Nuthatch	3	13	4	>50 pairs	forest
House Wren	0	4	0	6-15 pairs	residential
Carolina Wren	0	2	1	6-15 pairs	floodplain forest
Mockingbird	0	0	0+	6-15 pairs	upland edges
Gray Catbird	10	22	0	>50 pairs	riparian DMP area
Brown Thrasher	3	7	2	>50 pairs	successional field etc.
American Robin	8	15	1	>50 pairs	floodplain forest etc.
Wood Thrush	2	6	1	16-50 pairs	forest
Blue-gray Gnatcatcher	3	13	3	>50 pairs	forest
Starling	29	27	3	>50 pairs	developed land, etc.
White-eyed Vireo	7	21	3	>50 pairs	riparian, edge
Bell's Vireo	8	8	0	16-50 pairs	DMP areas
Yellow-throated Vireo	1	9	1	>50 pairs	forest
Red-eyed Vireo	1	5	1	16-50 pairs	floodplain forest
Warbling Vireo	4	13	0	>50 pairs	DMP areas, edge
Prothonotary Warbler	18	22	3	>50 pairs	flooded woods etc.
Yellow Warbler	2	4	0	16-50 pairs	riparian
Common Yellowthroat	23	20	2	>50 pairs	DMP area etc.
Yellow-breasted Chat	4	19	1	>50 pairs	edge, etc.
American Redstart	0	4	0	16-50 pairs	floodplain forest, etc.
House Sparrow	19	12	2	>50 pairs	developed land, etc.
Eastern Meadowlark	3	0	2	16-50 pairs	cropland, grass field
Red-winged Blackbird	42	36	5	>50 pairs	riparian, etc.
Orchard Oriole	3	5	0	16-50 pairs	edge
Northern Oriole	2	5	0	16-50 pairs	floodplain forest edge
Common Grackle	43	41	4	>50 pairs	variable
Brown-headed Cowbird	11	20	5	>50 pairs	floodplain forest edge
Scarlet Tanager	0	1	0	1-5 pairs	forest
Cardinal	33	44	4	>50 pairs	variable
Blue Grosbeak	0	0	0+	1-5 pairs	DMP area
Indigo Bunting	44	41	6	>50 pairs	DMP area, edge, etc.
Dickcissel	0	0	1	16-50 pairs	cropland, DMP area
American Goldfinch	7	14	5	>50 pairs	DMP area, etc.
Rufous-sided Towhee	8	11	1	>50 pairs	floodplain forest edge
Grasshopper Sparrow	0	0	1	1-5 pairs	grass field
Lark Sparrow	0	0	0+	1-5 pairs	DMP area
Field Sparrow	25	28	3	>50 pairs	DMP area, etc.
Song Sparrow	3	5	0	>50 pairs	DMP area

* A.O.U. = American Ornithologists' Union

** Indicate the total number of different Transect Legs and Census Stops the species was recorded; five Transect Sets would have about 50 Census Stops and 55 Transect Legs.

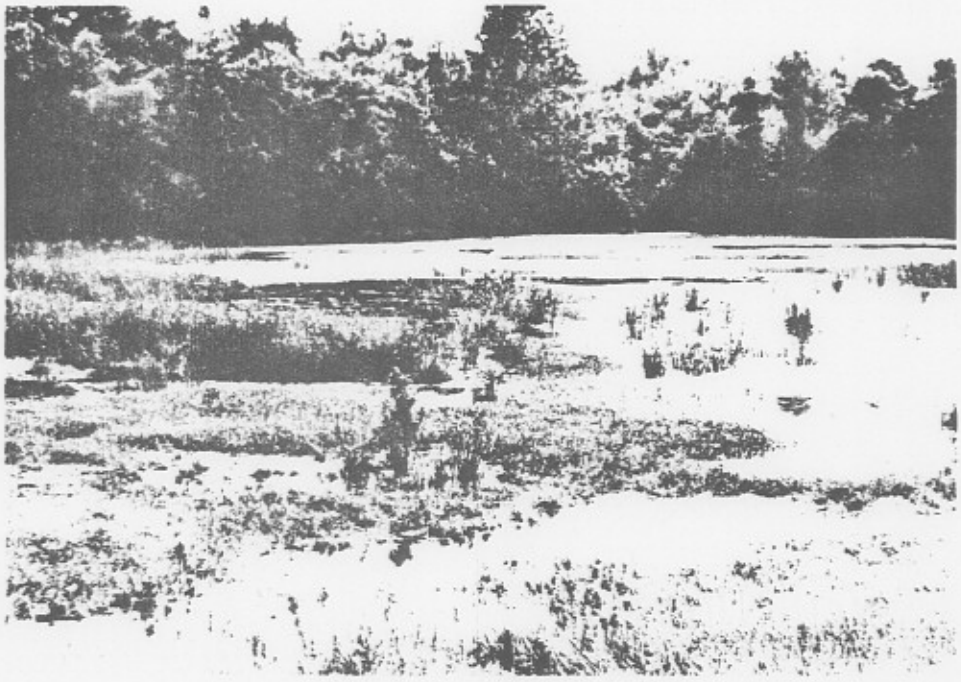
@ If the species occurred in 6 of the "Additional" Census Stops established by the observer for qualitative sampling, enter the number 6 in this column.

\# Use one of the following categories for this column: 1-5 prs; 6-15 prs; 16-50 prs; or > 50 prs.

\+ Species presence confirmed by "unofficial" survey(s) (refer to methods of survey).

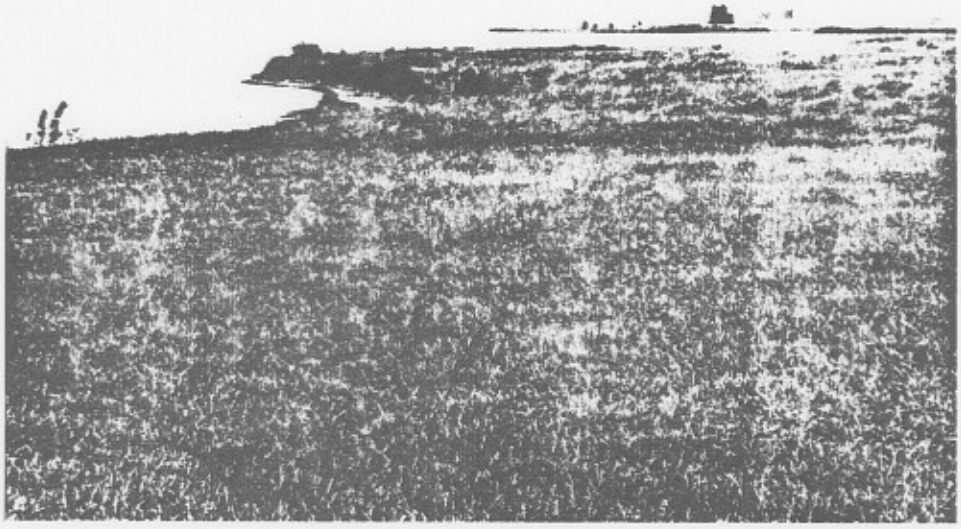
Appendix V -- Photographs

Typical flooded woods (site 22). The dead standing trees attract many cavity nesters including wood ducks, red-headed woodpeckers, and prothonotary warblers.



This marsh (site 48) was found to be inhabited by numerous wood ducks and red-winged blackbirds.

Sightings of two species, blue grosbeak and lark sparrow, were limited to this dredge material placement area located southeast of Fayetteville.



The grass field (site 50) along the northern west shore of Baldwin Lake was inhabited by ground nesters including horned larks, eastern meadowlarks, and grasshopper sparrows.