

Project # 169

A PRELIMINARY SURVEY OF THE AQUATIC FAUNA OF THE CACHE RIVER IN
JOHNSON AND PULASKI COUNTIES, ILLINOIS

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INTRODUCTION

The Cache River with its associated wetlands is recognized as a valuable resource of extraordinary biological and ecological significance sheltering some of the finest remnants of Illinois' natural heritage (see, for example, Hutchison 1984). Unfortunately, there is a notable lack of published information concerning the fauna of the river and its wetlands. Such information is needed to prioritize specific areas for protection in order to meet the State's responsibility to maintain the biological diversity of this unique area. Faunal information also is necessary to define more accurately the various habitat types and their relationship to the sensitive hydrologic regime. These data, including species lists gathered from selected sites, will help guide proper management of existing natural areas and lend support for acquiring additional areas that are necessary to maintain the integrity of the Cache River and its wetlands for future generations.

METHODS

Seventeen study sites and six subsites (total number of sites surveyed = 23) were selected for surveying by the principal investigators (Drs. Brandon, Burr, and Phillippi), the Illinois Department of Conservation (Mr. Andy West), and the Natural Land Institute (Mr. Max Hutchison) and are depicted on Figure 1. An attempt was made to include areas disturbed by drainage modifications or by sedimentation resulting from adjacent agricultural activities. A list of the site numbers, site names, and locations is provided in Table 1. A photocopy of that portion of the U.S.G.S. 7.5 minute quadrangle map showing the specific location of the study site and subsite, and a detailed map of each site and subsite showing vegetation types, human-made structures, etc., are provided in each site description. Each site with the adjacent pools and wetlands was surveyed for macroinvertebrates, including crayfishes and mussels; fishes; amphibians; reptiles; and birds. Adjacent forests and fields were surveyed further for amphibians, reptiles, and birds. A list of terrestrial and aquatic vascular plants observed at each site is provided in each site description. Plant nomenclature follows that of Mohlenbrock (1986). Illinois Department of Conservation field cover sheet forms for each site are provided in Appendix 1.

Surveying and Collecting Methods for Fishes, Crayfishes, and Mussels

In order to evaluate systematically the existing fish fauna of the lower Cache River, qualitative methods were employed to procure as many species as possible. This was accomplished by a two- to four-person team of ichthyologists using a 3.0 m x 1.8 m minnow seine with 6 mm square mesh. A 6 m x 1.2 m bag seine with 12 mm square mesh was employed in open water zones free of vegetation. Each habitat (e.g., riffles, pools, raceways, swamp margins, etc.) was seined repeatedly until the process failed to yield additional species. Voucher specimens of all species collected were fixed in 10% formalin, sorted, identified using Smith (1979) and other literature, counted and measured in the laboratory, and stored in 70% ethanol. All vouchers have been deposited in the SIUC ichthyological collection. A list of fish species for each site is provided with the site description. A summary table (Table 2), including the species found during this survey and those recorded from previous surveys, is included.

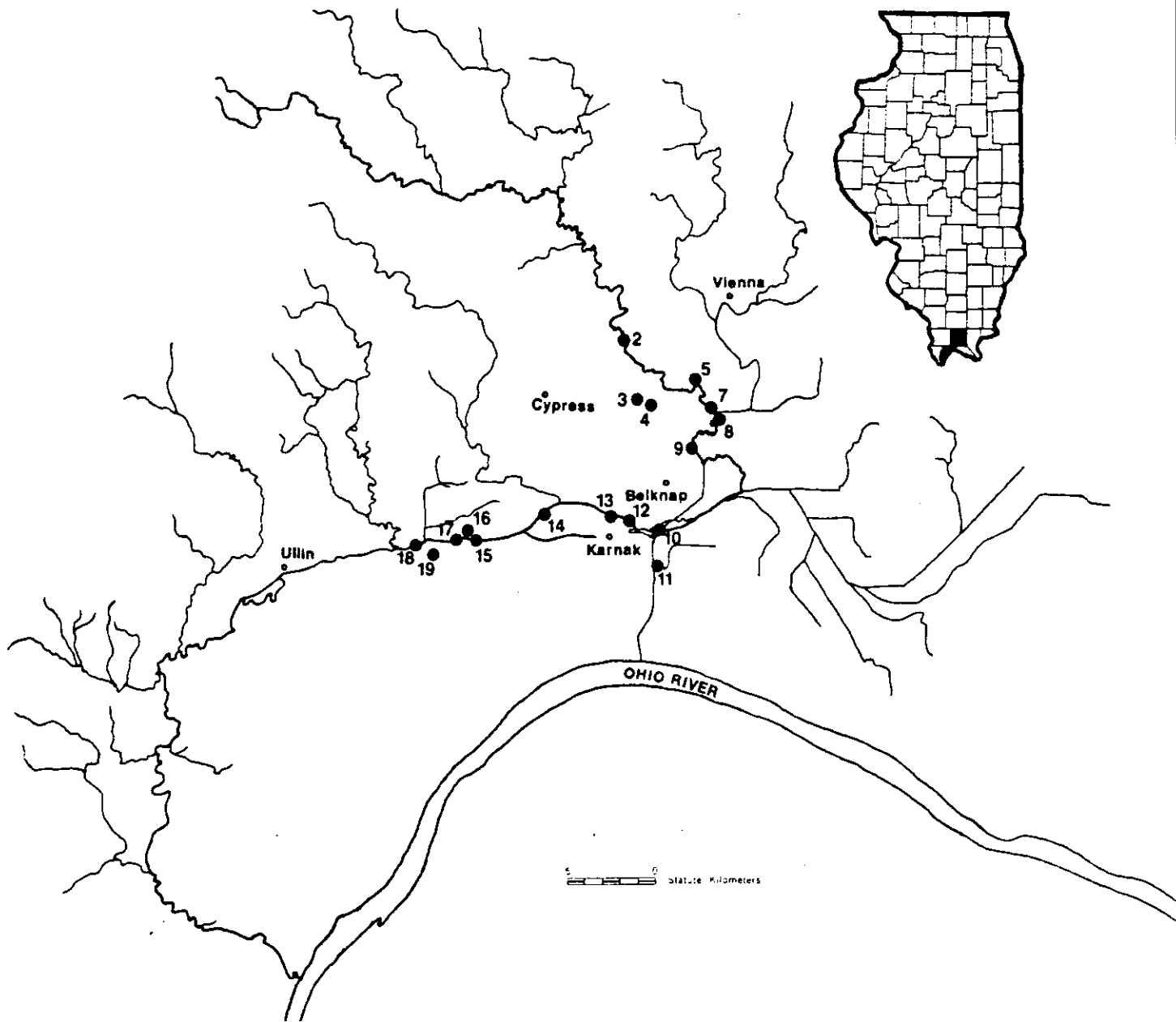


Figure 1. Map showing the study sites along the Cache River in Johnson and Pulaski counties, Illinois.

Table 1. A listing of the numbers, names, and specific locations of the 23 study sites and subsites.

<u>SITE NUMBER</u>	<u>SITE NAME</u>	<u>LOCATION</u>
2	One Horse Bridge	Johnson County; 3.7 km SSW of West Vienna at bridge crossing the Cache River; T13S R2E Sec 10
3	Snake Hole	Johnson County; 7.7 km N of Karnak and 4 km E of Cypress; T13S R2E Sec 22
4a	Orange Spring	Johnson County; 3 km NW of Belknap; T13S R2E Sec 35
4b	Little Black Slough and Hairy Hill	Johnson County; 3.2 km NW of Belknap; T13S R2E Sec 26 and 35
5	Wildcat Bluff and Watson Pond	Johnson County; 5.2 km SW of Vienna S from IDOC Wildlife Bluff parking lot; T13S R2E Sec 24 and T13S R3E Sec 19
7a	Heron Pond Swamp	Johnson County; 6.5 km SSW of Vienna from IDOC parking lot; T13S R3E Sec 30
7b	Cache River at Heron Pond	Johnson County; 6.5 km SSW of Vienna from IDOC parking lot; T13S R3E Sec 30
8a	Cache River at Heron Pond Bridge	Johnson County; 4.2 km NNE of Belknap from IDOC parking lot; T13S R3E Sec 30
8b	Heron Pond Slough	Johnson County; 4 km NNE of Belknap from IDOC parking lot; T13S R3E Sec 30
9a	Cache River at Forman Trestle	Johnson County; 1.7 km NNE of Belknap; T13S R3E Sec 31 and T14S R3E Sec 6
9b	Bird Spring	Johnson County; 2 km NNE of Belknap; T13S R3E Sec 31 and T13S R2E Sec 36
10	Flood control channel flowing east into Post Creek Cutoff	Pulaski County; 2 km ENE of Karnak and 0.5 km N of Illinois Route 169; T14S R2E Sec 14
11	Post Creek Cutoff	Pulaski County; 4 km SE of Karnak; T14S R2E Sec 35

<u>SITE NUMBER</u>	<u>SITE NAME</u>	<u>LOCATION</u>
12a	Cache River at Karnak Trestle	Johnson and Pulaski Counties; 1 km NE of Karnak; T14S R2E Sec 15
12b	Cypress Creek	Johnson County; 1.5 km NE of Karnak; T14S R2E Sec 11 and 14
13	Porter Bottoms	Johnson and Pulaski Counties; 2 km NW of Karnak and 1.5 km N of Illinois Route 169; T14S R2E Sec 9 and 10
14	Cache River at Illinois Route 37	Pulaski County; 1.5 km S of White Hill; T14S R2E Sec 8
15	Short Reach	Pulaski County; 2.5 km SE of Perks; T14S R1E Sec 14
16	Eagle Pond	Pulaski County; 2 km SE of Perks; T14S R1E Sec 14
17a	Long Reach	Pulaski County; 2 km SSE of Perks; T14S R1E Sec 14
17b	Cache River at Perks Bridge	Pulaski County; 2 km S of Perks; T14S R1E Sec 14 and 15
18	Cache River at Cache Chapel Road	Pulaski County; 4 km SW of Perks; T14S R1E Sec 21
19	Limekiln Spring and Slough	Pulaski County; 3.2 km SSW of Perks; T14S R1E Sec 22

TOTAL NUMBER OF SITES = 23

Because of the diversity of habitats occupied by crayfishes, several collecting techniques were used depending upon the specific habitats present at the site: in open-water habitats, minnow seines were used; in vegetation-choked habitats, dip-nets and bag seines. Species that spend considerable time in their burrows were obtained by removing the "chimney" and digging them out by hand or by shovel. Specimens were identified using Page (1985) and other literature and have been deposited at the Illinois Natural History Survey. Crayfish species collected during this survey are listed with other macroinvertebrates in each site description and in the summary table for macroinvertebrates (Table 3).

Live mussels along with fresh dead and/or relic shells were hand-picked from shallow water and from shorelines. Mussels were also captured while seining. Because of the limited clarity in swamp areas, mussels were also hand-picked from the mud and detritus obtained by dip nets and seines. Specimens were identified using Parmalee (1967), Starrett (1971), Buchanan (1980), Oesch (1984), and Cummings (1986), and are deposited at the Illinois Natural History Survey. Mussel species collected during this survey are listed with other macroinvertebrates in each site description and in the summary table for macroinvertebrates (Table 3).

Surveying and Collecting Methods for Amphibians and Reptiles

A two-person team of herpetologists systematically searched all potential habitats at each site using a variety of techniques. Walking through adjacent woodlands, along the roads, around the ponds, and along the streams at each site yielded most of the species. Amphibians also were collected by seine and dip net. In addition to searching for amphibians and reptiles in open habitats, superficial cover was also examined (e.g., rocks, logs, boards, sheet metal, damp leaf litter, etc.). Specific habitats of secretive species were examined using minor habitat disruptions (e.g., turning rocks along stream edges, etc.). Listening for vocalizations of frogs and toads yielded several species.

Species were identified either in the field or in the laboratory using Smith (1961) and other appropriate literature. Only those specimens providing an unusual and significant record were preserved. Those vouchers have been deposited in the herpetological collection of the SIUC Department of Zoology or the Illinois Natural History Survey. A list of amphibian and reptile species collected during this survey as well as from previous surveys is provided in each site description. A summary table (Table 4) of species found during this survey and those recorded by previous surveys is included.

Some herpetological nomenclature used herein differs from the conventional. The name changes, and documentation for them, are as follows (the name used herein followed by the name in general use): Pseudacris crucifer = Hyla crucifer (Hedges 1986); Pseudacris feriarum feriarum = P. triseriata feriarum (Hedges 1986); Trachemys scripta elegans = Pseudemys scripta elegans (Seidel and Smith 1986); and Heterodon platirhinos = H. platyrhinos (Platt 1985).

Surveying and Collecting Methods for Aquatic and Semi-aquatic
Macroinvertebrates

Both qualitative and quantitative systematic sampling methods were used in order to collect as many macroinvertebrate species as possible. For quantitative samples, a Surber sampler was used at the sites on the Cache River proper where current velocity was relatively high (sites 8 and 9a). All other sites were located in situations with low velocity and were sampled with dip nets. Each quantitative sample consisted of either two dip nets (3-5 minutes each) or two Surber samples (2-4 minutes each). For qualitative sampling, dip net samples from shorelines were searched and hand-picked in the field for less common taxa. Macroinvertebrates collected during seining were also saved. All material collected was fixed in 10% formalin. Samples were sorted, identified to the lowest possible taxonomic level, and stored in 70% ethanol in the laboratory. Taxonomic references included Pennak (1978), Brigham et al. (1982), Merritt and Cummins (1984), and others. All specimens have been deposited in the SIUC Department of Zoology.

A list of aquatic and semi-aquatic macroinvertebrate taxa for each site is provided in the site description. A summary table for all macroinvertebrate taxa found during this survey is provided in Table 3. For further information on the general aquatic macroinvertebrate community composition of the Cache River basin see Brigham (1978). To aid in the analysis of macroinvertebrate community diversity the Simpson dominance (1) and Shannon diversity base 10 (H') indices were used. For an explanation of the utility of each index see Brower and Zar (1984). Appendix 2 provides a computer listing of the calculated values of those indices and those of others.

The following terms were used to describe the macroinvertebrate community at each site:

<u>Term used</u>	<u># of taxa</u>	<u># of individuals</u>	<u>H'</u>	<u>1</u>
low	21 - 26	212 - 527	0.170 - 0.612	0.109 - 0.298
moderate	33 - 42	805 - 1111	0.651 - 0.834	0.398 - 0.525
high	46 - 66	1499 - 2735	0.898 - 1.131	0.880

Surveying Methods for Birds

At each site an experienced bird-watcher recorded the species that were seen or heard. A list of bird species for each site is provided in the site description. A summary table for all bird species found during this survey and their relative abundance is provided in Table 5. For additional bird species in the vicinity of site 14, Cache River at Illinois Route 37, see Kromer et al. (1983). Bird nomenclature follows that of the American Ornithologists' Union (1983).

Table 2. Fish species collected at the specific study sites or in the general vicinity in the Cache River valley (X). Vouchered specimens taken in other studies are denoted by '*'. General literature records for the valley are in column G.

TAXON	SITE NUMBER																	G						
	2	3	4a	4b	5	7a	7b	8a	8b	9a	9b	10	11	12a	12b	13	14		15	16	17a	17b	18	19
Class Osteichthyes																								
Family Lepisosteidae																								
<u>Lepisosteus oculatus</u> (Spotted gar)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-
<u>Lepisosteus platostomus</u> (Shortnose gar)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-
Family Amiidae																								
<u>Amia calva</u> (Bowfin)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	X	-	X
Family Clupeidae																								
<u>Dorosoma cepedianum</u> (Gizzard shad)	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	*	-	X	-	-	-	X	-	X
Family Hiodontidae																								
<u>Hiodon tergisus</u> (Mooneye)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
Family Umbridae																								
<u>Umbrina limi</u> (Central mudminnow)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
Family Esocidae																								
<u>Esox americanus</u> (Crass pickerel)	-	X	-	-	-	X	X	-	-	X	-	-	-	-	X	-	*	X	-	-	-	-	-	X

Table 2 continued

TAXON	SITE NUMBER																	G								
	2	3	4a	4b	5	7a	7b	8a	8b	9a	9b	10	11	12a	12b	13	14		15	16	17a	17b	18	19		
<u>Notropis volucellus</u> (Mimic shiner)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X		
<u>Notropis whipplei</u> (Steelcolor shiner)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X		
<u>Phenacobius mirabilis</u> (Suckermouth minnow)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-		
<u>Pimephales notatus</u> (Bluntnose minnow)	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	X		
<u>Pimephales promelas</u> (Fathead minnow)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<u>Pimephales vigilax</u> (Bullhead minnow)	X	-	-	-	-	-	X	X	-	X	X	-	-	-	-	-	-	-	-	*	-	X	-	-		
<u>Semotilus atromaculatus</u> (Creek chub)	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Family Catostomidae																										
<u>Carpiodes carpio</u> (River carpsucker)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	X	
<u>Catostomus commersoni</u> (White sucker)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Erimyzon oblongus</u> (Creek chubsucker)	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
<u>Ictiobus bubalus</u> (Smallmouth buffalo)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	
<u>Ictiobus cyprinellus</u> (Bigmouth buffalo)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
<u>Ictiobus niger</u> (Black buffalo)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Minytrema melanops</u> (Spotted sucker)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	
<u>Hoxostoma erythrum</u> (Golden redbreast)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
Family Ictaluridae																										
<u>Ictalurus melas</u> (Black bullhead)	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	*	-	-	-	-	X	-	-	-	-	
<u>Ictalurus natalis</u> (Yellow bullhead)	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Ictalurus nebulosus</u> (Brown bullhead)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	

Table 2 continued

TAXON	SITE NUMBER																			G					
	2	3	4a	4b	5	7a	7b	8a	8b	9a	9b	10	11	12a	12b	13	14	15	16		17a	17b	18	19	
<u>Ictalurus punctatus</u> (Channel catfish)	-	-	-	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Noturus gyrinus</u> (Tadpole madtom)	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	*	-	X	-	
<u>Noturus miurus</u> (Bridled madtom)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
<u>Noturus nocturnus</u> (Freckled madtom)	-	-	-	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Plodiectis olivaris</u> (Flathead catfish)	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Family Amblyopsidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
<u>Chologaster agassizi</u> (Spring cavefish)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Family Aphredoderidae	-	X	-	-	X	X	X	-	-	-	-	-	-	-	-	*	-	X	-	-	*	-	X	-	
<u>Aphredoderus sayanus</u> (Pirate perch)	-	X	-	-	X	X	X	-	-	-	-	-	-	-	-	*	-	X	-	-	*	-	X	-	
Family Cyprinodontidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
<u>Fundulus notatus</u> (Blackstripe topminnow)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Fundulus olivaceus</u> (Blackspotted topminnow)	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	X	X	
Family Poeciliidae	X	X	-	X	-	-	X	X	-	X	X	X	X	X	X	-	X	*	-	-	-	X	X	X	-
<u>Gambusia affinis</u> (Mosquitofish)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Family Atherinidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	
<u>Labidesthes sicculus</u> (Brook silverside)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	
Family Cottidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Cottus caroliniae</u> (Banded sculpin)	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	

Table 2 continued

TAXON	SITE NUMBER																										
	2	3	4a	4b	5	7a	7b	8a	8b	9a	9b	10	11	12a	12b	13	14	15	16	17a	17b	18	19	C			
Family Percichthyidae																											
<u>Morone chrysope</u> (White bass)																										X	
Family Centrarchidae																											
<u>Ambloplites rupestris</u> (Rock bass)																											X
<u>Centrarchus macropterus</u> (Flier)		X	X			*								X		X	X				X						X
<u>Etheostoma zonatum</u> (Banded pygmy sunfish)		X	*	X	X											*					*						X
<u>Lepomis cyanellus</u> (Green sunfish)			X	X		X	*	X							*												X
<u>Lepomis gibbosus</u> (Pumpkinseed)																											
<u>Lepomis gulosus</u> (Warmouth)		X					*							X		*		X				X	X	X			
<u>Lepomis humilis</u> (Orangespotted sunfish)		X															X	X	X	X	X	X	X	X			
<u>Lepomis macrochirus</u> (Bluegill)													X				X	X	X	X	X	X	X	X			
<u>Lepomis megalotis</u> (Longear sunfish)		X					X	X					X									X	X	X			
<u>Lepomis microlophus</u> (Redear sunfish)																											X
<u>Lepomis punctatus</u> (Spotted sunfish)																						*					
<u>Lepomis symmetricus</u> (Rantam sunfish)																											X
<u>Micropterus punctulatus</u> (Spotted bass)																									X		
<u>Micropterus salmoides</u> (Largemouth bass)																			X	X	X	X	X	X			
<u>Pomoxis annularis</u> (White crappie)		X															*			X	X	X	X	X			
<u>Pomoxis nigromaculatus</u> (Black crappie)		X					X							X				X	X	X	X	X	X	X			

Table 2 continued

TAXON	SITE NUMBER																								
	2	3	4a	4b	5	7a	7b	8a	8b	9a	9b	10	11	12a	12b	13	14	15	16	17a	17b	18	19	0	
Family Percidae																									
<u>Etheostoma asprigene</u> (Mud darter)																X	X					X	X		
<u>Etheostoma chlorosomum</u> (Bluntnose darter)																X		X				X	X	X	
<u>Etheostoma flabellare</u> (Fan-tail darter)																									
<u>Etheostoma gracile</u> (Slough darter)	X	X	X			X	X								X	X	X					X		X	
<u>Etheostoma kennicottii</u> (Stripetail darter)																									X
<u>Etheostoma nigrum</u> (Johnny darter)																									X
<u>Etheostoma proellare</u> (Cypress darter)																									X
<u>Etheostoma spectabile</u> (Orangethroat darter)																									X
<u>Etheostoma squamiceps</u> (Spottail darter)																									X
<u>Percina caprodes</u> (Logperch)								X																	
<u>Percina maculata</u> (Blackside darter)																									X
<u>Percina phoxocephala</u> (Slenderhead darter)																									X
<u>Percina sciera</u> (Dusky darter)																									
Family Sciaenidae																									
<u>Aplodinotus grunniens</u> (Freshwater drum)																									
Total Number Of Species At The Site:	9	10	4	5	3	8	20	12	1	5	0	2	6	6	2	16	9	8	4	3	30	13	24		

Total Number of Species Known from the sites: 46

TOTAL NUMBER OF SPECIES KNOWN (excluding Lepomis gibbosus) FROM THE BASIN: 86

Table 3 continued

TAXON	SITE NUMBER																TOTAL # OF SITES							
	2	3	4a	4b	5	7a	7b	8a	9a	9b	10	11	12a	13	14	15		16	17	18	19 ^a	19 ^t		
Family Piscicolidae																X							1	
<u>Myzobdella moorei</u>																X								
Order Gnathobdellidae				X																				1
Family Hirudinidae																								2
<u>Haemopis kingi</u>					X																			
<u>Macrobdella decora</u>																								
Order Pharyngobdellida								X						X										5
Family Erpobdellida										X														
<u>Dina microstoma</u>																								
Phylum Arthropoda																								
Class Arachnida																								
Order Araneae																								
Family Pisauridae																								1
<u>Dolomedes scriptus</u>	X																							4
<u>Dolomedes triton</u>															X	X	X							
Order Acarina																								
Family Arrenuridae						X											X	X						4
<u>Arrenurus sp.</u>																								
Family Eylaidae																								
<u>Eylais sp.</u>																								1
Class Crustacea																								
Order Isopoda																								
Family Aeellidae										X	X	X	X	X	X	X	X	X						15
<u>Aeellus sp.</u>										X	X	X	X	X	X	X	X	X						10
<u>Lirceus sp.</u>			X																					
Order Amphipoda																								
Family Gammaridae																								
<u>Crangonyx sp.</u>		X	X						X	X	X	X	X	X	X	X	X	X						11
<u>Gammarus sp.</u>									X	X	X	X	X	X	X	X	X	X						5
Family Talitridae																								
<u>Hyalella azteca</u>		X				X							X	X	X	X	X	X						11

Table 3 continued

TAXON	SITE NUMBER																	TOTAL # OF SITES				
	2	3	4a	4b	5	7a	7b	8a	9a	9b	10	11	12a	13	14	15	16		17	18	19*	19†
Order Decapoda																						
Family Cambaridae																						
immatures																						
Cambarellus sp.		X			X									X	X	X	X					4
Cambarellus puer		X											X	X	X	X	X					3
Cambarellus shufeldtii		X											X	X	X	X	X					2
Cambarus sp.							X															9
Cambarus diogenes								X					X	X	X	X	X					1
Cambarus tenebrosus									X													4
Fallicambarus fodiens										X												1
Fallicambarus fodiens																						1
Orconectes sp.																						1
Orconectes illinoensis																						3
Procambarus acutus										X												6
Procambarus clarkii		X			X	X	X				X			X	X	X	X					12
Procambarus vioeviridis		X					X															2
Procambarus vioeviridis								X														13
Family Palaemonidae																						
Palaemonetes kadiakensis		X	X				X				X			X	X	X	X	X	X	X	X	
Class Insecta																						
Order Ephemeroptera																						
Family Baetidae																						
Baetis sp.											X	X			X				X			4
Baetis intercalaris								X	X													2
Baetis pygmaeus									X													1
Cloeon sp.		X									X						X					3
Cloeon rubopictum													X									1
Family Caenidae																						
Caenis sp.		X						X				X			X	X	X	X				9
Family Ephemeridae																						
Hexagenia limbata													X						X			2
Family Heptageniidae																						
Stenacron interpunctatum												X							X			5
Stenacron pallidum																			X			1
Family Siphonuridae																						
Siphonurus alternatus																			X			1

Table 3 continued

TAXON	SITE NUMBER																TOTAL # OF SITES						
	2	3	4a	4b	5	7a	7b	8a	8b	9a	9b	10	11	12a	13	14		15	16	17	18	19	19
Family Unionidae																							3
<u>Anodonta grandis</u>										X													1
<u>Arcidens confragosus</u>										X													2
<u>Corbicula leana</u>										X													1
<u>Leamigona complanta</u>										X													2
<u>Leptodes fragilis</u>										X													1
<u>Ligumia subrostrata</u>	X																						1
<u>Megalomias nervosa</u>																							1
<u>Potamilus alatus</u>										X													1
<u>Quadrula sp.</u>										X													1
<u>Tritogonia verrucosa</u>										X													1
<u>Truncilla truncata</u>										X													1
Total Number of Species at the Site:	21	66	2	26	42	55	15	37	26	7	33	46	54	40	40	39	49	56	49	36	42		

Total Number of Species at the Site:

TOTAL NUMBER OF TAXA FROM OUR SURVEY: 230

19* is Limekiln Slough.

19* is Limekiln Spring.

Table 4 continued

TAXON	SITE NUMBER																					
	2	3	4b	5	7	8a	8b	9a	9b	10	11	12a	12b	13	14	15	16	17a	17b	18	19	G
<u>Elaphe obsoleta spilooides</u> (Gray Rat Snake)	-	-	-	-	X	-	-	X	-	-	-	-	-	-	X	-	-	-	-	X	-	X*
<u>Virginia valeriae elegans</u> (Western Earth Snake)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	*
Family Crotalidae																						
<u>Agkistrodon contortrix mokasen</u> (Northern Copperhead)	-	-	-	-	-	* ²	* ²	*	-	-	-	-	-	-	-	-	-	-	-	-	-	*
<u>Agkistrodon piscivorus leucostoma</u> (Western Cottonmouth)	-	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
<u>Crotalus horridus</u> (Timber Rattlesnake)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
Total Number of Species at the Site:	5	6	10	12	16	5	8	9	16	4	4	2	3	6	3	5	9	4	4	7	11	52
TOTAL NUMBER OF SPECIES FROM OUR SURVEY:	35																					
TOTAL NUMBER OF SPECIES KNOWN FROM THE BASIN:	52																					

¹ Questionable record (Klimstra and Hutchison 1965) because habitat appears unsuitable.

² Could have been at either 8a or 8b (Klimstra and Hutchison 1965).

³ State endangered species.

Table 5 continued

TAXON	SITE NUMBER AND ABUNDANCE																		RA
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Family Picidae																			
<u>Melanerpes erythrocephalus</u> (Red-headed Woodpecker)	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-	-	-	-	
<u>Melanerpes carolinus</u> (Red-bellied Woodpecker)	-	-	-	-	-	X	-	X	-	-	-	-	-	X	X	-	X	-	
<u>Picoides pubescens</u> (Downy Woodpecker)	X	-	X	X	X	X	X	X	-	-	X	X	-	X	X	X	-	-	
<u>Picoides villosus</u> (Hairy Woodpecker)	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	
<u>Dryocopus pileatus</u> (Pileated Woodpecker)	-	-	-	-	-	X	X	-	-	-	-	X	-	X	-	-	-	-	
Family Tyrannidae																			
<u>Contopus virens</u> (Eastern Wood-Pewee)	-	-	X	X	X	X	X	-	-	-	X	X	X	-	X	-	X	X	
<u>Empidonax virescens</u> (Acadian Flycatcher)	-	X	-	X	X	X	X	-	-	-	X	-	X	-	X	-	X	X	
<u>Empidonax minimus</u> (Least Flycatcher)	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	
<u>Sayornis phoebe</u> (Eastern Phoebe)	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	
<u>Myiarchus crinitus</u> (Great Crested Flycatcher)	X	X	X	-	X	X	X	X	-	-	X	-	X	X	-	X	X	X	
<u>Tyrannus tyrannus</u> (Eastern Kingbird)	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	
Family Hirundinidae																			
<u>Tachycineta bicolor</u> (Tree Swallow)	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	X	-	-	
<u>Stelgidopteryx serripennis</u> (Northern Rough-winged Swallow)	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	
<u>Hirundo rustica</u> (Barn Swallow)	X	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	

Table 5 continued

TAXON	SITE NUMBER AND ABUNDANCE																		
	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	RA	
<u>Geothlypis trichas</u> (Common Yellowthroat)	X	-	-	-	-	-	X	X	X	X	-	-	X	X	X	X	X	4	
<u>Icteria virens</u> (Yellow-breasted Chat)	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	2	
<u>Cardinalis cardinalis</u> (Northern Cardinal)	X	X	X	X	X	X	X	X	X	-	-	X	X	X	X	X	X	3	
<u>Passerina cyanea</u> (Indigo Bunting)	X	X	X	-	X	X	X	-	-	-	X	X	X	X	X	X	X	4	
<u>Spiza americana</u> (Dickcissel)	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	2	
<u>Pipilo erythrophthalmus</u> (Rufous-sided Towhee)	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	2	
<u>Spizella pusilla</u> (Field Sparrow)	X	-	X	-	-	-	X	X	-	-	-	-	-	-	-	X	-	2	
<u>Ammodramus savenarum</u> (Grasshopper Sparrow)	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
<u>Melospiza melodia</u> (Song Sparrow)	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	2	
<u>Agelaius phoeniceus</u> (Red-winged Blackbird)	X	-	X	X	-	-	X	X	X	X	X	-	X	X	X	X	X	4	
<u>Sturnella magna</u> (Eastern Meadowlark)	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	2	
<u>Quiscalus quiscula</u> (Common Grackle)	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	3	
<u>Molothrus ater</u> (Brown-headed Cowbird)	-	X	X	-	-	-	-	X	X	X	-	X	X	X	X	X	X	3	

Table 5 continued

TAXON	SITE NUMBER AND ABUNDANCE																			RA
	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19			
Family Fringillidae																				
<u>Carduelis tristis</u> (American Goldfinch)	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	X	X	-	2	
<u>Passer domesticus</u> (House Sparrow)	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	3	
Total Number of Species at the Site	18	14	20	10	26	18	24	19	11	27	13	22	19	19	27	21	28			

TOTAL NUMBER OF SPECIES FROM OUR SURVEY: 80

Other birds seen in the general vicinity and their relative abundance: Progne subis (Purple Martin - 2), Mimus polyglottos (Northern Mockingbird - 2), Lanius ludovicianus (Loggerhead Shrike - 2), Sturnus vulgaris (European Starling - 3), Piranga rubra (Summer Tanager - 2), Melospiza melodia (Song Sparrow - 2).

MAJOR FINDINGS

Mussels and Crayfishes

Freshwater mussels were discovered at three of our 23 sites. Because there had been virtually no mussel survey in the Cache drainage prior to ours, all specimens collected are valuable in documenting their occurrence and distribution. It is imperative, based on our finds, that further mussel surveying be conducted along the Cache, especially since excessive turbidity and heavy siltation poses a threat to those populations.

A total of ten species of crayfishes and shrimps were collected during the survey. All were previously reported from the drainage (Page 1985). Our recent collections indicate that populations of the dwarf crayfishes (Cambarellus puer and C. shufeldtii) and the southern Illinois endemic crayfish (Orconectes illinoiensis) are reproducing and showing recruitment at several sites. It is also worth noting that the spring crayfish, Cambarus tenebrosus, is maintaining itself at Bird Spring.

A coexisting population of two species of dwarf crayfish (Cambarellus puer and C. shufeldtii) was found at Watson Pond (site 5). The two species do not normally coexist (Page 1985).

We propose that Orconectes illinoiensis be considered for inclusion on the state endangered/threatened animals list because its range is small and confined to southern Illinois. Illinois has few endemic species; thus, we propose its consideration in order to protect its continued survival.

Other Aquatic and Semi-aquatic Macroinvertebrates

A total of 230 aquatic and semi-aquatic macroinvertebrate taxa were found during our survey of the Cache River and its associated wetlands. This, however is a conservative estimate of the total number of taxa due to the fact that several abundant groups of organisms (i.e., Chironomidae, Oligochaeta, Asellus, and Lirceus) were not identified to lower taxonomic levels because of the large numbers of individuals therein. Only 7% (17 taxa) were found at ten or more sites. Of those 17 taxa, six were crustaceans (aquatic sow bugs, sideswimmers, shrimps, and crayfishes) and six were surface or water-column dwelling beetles (Order Coleoptera) or bugs (Order Hemiptera). Over 20,503 individual macroinvertebrates were examined, excluding those obtained from qualitative samples.

The clubtail dragonfly (Arigomphus maxwelli) was observed and/or collected at four of our 23 study sites. This species was previously known from only a few Gulf Coast states until June of 1985 when a single adult male was collected at Mermet Lake in Massac County, Illinois. Thus, our findings confirm the existence of viable populations of this rare dragonfly in Illinois.

A reproducing population of the rare water scorpion (Nepa apiculata) was found at Limekiln Spring. The integrity of the site is considered threatened due to heavy siltation.

Fishes

A total of 46 fish species was collected during this survey. If small tributaries had been sampled, it is likely that twice as many fish species could have been added to our list.

The first records from the Cache River drainage of the bullhead minnow, pugnose minnow, logperch, and mud darter were obtained during this survey. The bullhead minnow was found at eight localities, the pugnose minnow at two, the logperch at one, and the mud darter at four. In addition, the spotted sunfish had been collected from one of our sites during a previous survey. These five species brings the total number of species for the drainage to 86. Smith (1971) recorded a total of 81 species for the Cache River drainage.

The cypress minnow, a species presently being considered for inclusion on the Illinois endangered/threatened species list, was discovered for the first time since 1940 in the Cache River drainage at Limekiln Slough. Specimens collected were young-of-the-year demonstrating that recent spawning and recruitment had occurred.

Amphibians and Reptiles

A total of 52 species of amphibians and reptiles has been recorded for the Cache River drainage, representing 52% of all the species known from Illinois. We encountered 35 species during this survey (mean number of species per site = 7.1); 67% of the species known from the drainage.

A surprising and highly significant find during this survey was an eastern ribbon snake near Heron Pond Slough (site 8b). This species is considered endangered in Illinois and had not been found in the state for over 100 years (Morris and Smith 1981) prior to this survey. All previous Illinois records are from Richland and Wabash counties and appear to be intergrades between T. s. sauritus and T. s. septentrionalis (Rossman 1963). This Johnson County specimen is identifiable as T. s. septentrionalis.

Habitat at some sites, especially in the adjacent forests, was outstanding for Coastal Plain and lowland species of amphibians and reptiles (sites 3, 4, 5, 7, 8b, 14, 17b, and 19). A few of those sites provided extremely high quality habitat because they contained a diversity of microhabitats (sites 3, 5, 7, and 19). However, many of those sites with outstanding habitat for amphibians and reptiles showed various signs of drainage manipulation, principally siltation. If allowed to continue, the herpetofaunal diversity and density would undoubtedly decrease. Some of the most disturbed sites (sites 2, 10, 11, and 18) showed little more herpetofaunal diversity than the highly disturbed sites in agricultural areas in central Illinois. Deforestation and drainage modifications were chiefly responsible for these lowered herpetofaunal diversities.

Further field work, over several years and during all seasons, is needed to fully understand the herpetofauna of the Cache River. The river valley has a diverse fauna and needs to be protected from further drainage modifications.

Birds

A total of 80 species of birds was observed or seen at our sites during this survey, including two state endangered species: the Little Blue Heron seen at one site, and the Red-shouldered Hawk seen at two sites.

CONCLUSION

We found excessive habitat destruction from dredging, clearing, and siltation at various sites (i.e., Orange Spring-4a, Cache River at Forman Trestle-9a, Flood Control Channel-10, Post Creek Cutoff-11, and Cache River at Cache Chapel Road-18). Even the integrity of wetland areas protected by state or private interests is being threatened by excessive siltation which is in the process of obliterating most of the available aquatic habitat (i.e., Little Black Slough and Hairy Hill-4b, Short Reach-15, Eagle Pond-16, and Limekiln Spring and Slough-19). Not only were the wetland sites heavily silted; those sites located along the Cache River proper were observed to be degraded from siltation as well as from other human activities (i.e., One Horse Bridge-2, Cache River at Heron Pond-7b, Cache River at Heron Pond Bridge-8a, Cache River at Forman Trestle-9a, Cache River at Karnak Trestle-12a, Porter Bottoms-13, Cache River at Illinois 37-14, Long Reach-17a, and Cache River at Perks Bridge-17b). Efforts should be made to reverse this trend.

The quality of the adjacent terrestrial habitat was variable; some sites having been cleared of all natural vegetation and others having mature, high quality forests or swamps (see the site descriptions). The integrity of those terrestrial communities directly affects the quality of the aquatic communities. Thus, it was observed that at the sites with the most disturbed terrestrial component there was the least diverse aquatic component.

In summary, we found that this preliminary survey of the Cache River and some of its associated wetlands yielded a surprising assemblage of animals, some of which are extremely rare in Illinois. Based on these findings we would expect that the area would yield more significant biological information through further concentrated field effort.

Increased siltation and the threat of further drainage and dredging activity would undoubtedly devastate much of the habitat that was found at the study sites. Implementation of a management that plan decreases further habitat destruction and improves habitat by decreasing siltation is necessary to maintain the integrity of this unique area of extraordinary biological significance.