



# ILLINOIS NATURAL HISTORY SURVEY

## T E C H N I C A L   R E P O R T

AMPHIBIANS AND REPTILES  
OF THE UPPER LITTLE WABASH RIVER BASIN, ILLINOIS,  
PART 1. FINAL REPORT FOR 2006 – 2007 - SURVEYS OF SITES ALONG  
THE UPPER LITTLE WABASH RIVER AND MAIN TRIBUTARIES

Christopher A. Phillips

Illinois Natural History Survey  
Division of Biodiversity and Ecological Entomology  
Section for Biotic Surveys and Monitoring

Prepared for: The Upper Little Wabash River C-2000 Partnership

INHS Technical Report 2008(7)  
Date of issue: 11 February 2008

INHS • 1816 S. Oak St. • Champaign, IL 61820 <http://www.inhs.uiuc.edu>

## ABSTRACT

A Herpetological survey of the Little Wabash River basin, Illinois, was conducted to determine the status and distribution of the group. During the summers of 2006 and 2007, amphibians and reptiles were surveyed at 19 sites, using Visual Encounter Surveys, aquatic hoop traps, minnow traps, and incidental encounters. A total of 18 species was found. The most abundant species found was *Acris crepitans*, which was found at 14 sites. An examination of literature and museum records brings the total number of species recorded from the drainage to 46. The amphibian and reptile assemblage of the Little Wabash River basin is similar to those for other basins at similar latitudes within Illinois.

## INTRODUCTION

River drainages traditionally have not been the unit of choice for herpetological surveys, even though there are compelling reasons to do so. The vast majority of species are either aquatic or semi-aquatic, and many of the terrestrial species are attracted to the vicinity of aquatic systems, either for moisture or resources (prey). In addition, riparian areas are often used by amphibians and reptiles as dispersal corridors, especially if the riparian areas are forested (Burbrink et al. 1994). This serves to tie a drainage basin together into a cohesive unit with a common herpetofauna. The herpetofauna of the Little Wabash River drainage has not been systematically surveyed, although smaller sections have been the focus of some unpublished survey effort. It is hoped that the present survey will serve as a baseline to which future efforts can be compared. Repeated surveys or monitoring allows natural resource agencies to document long-term trends of, and assess the effects of land use practices or anthropogenic disturbances on, the flora and fauna.

Although amphibians and reptiles are not each other's closest relatives, they have traditionally been studied together under the discipline of Herpetology because they share many habits and are outwardly similar. Field surveys for amphibians and reptiles are usually conducted in a single effort because of these similarities. They are both secretive in their habits and being ectothermic, they are generally active under a narrower temperature range than birds and mammals. However, there are also a number of differences between amphibians and reptiles that make combined surveys very difficult. Amphibians are restricted to moist conditions because they exchange gasses through their skin and lay eggs in water or other moist situations (rotting logs, etc.). Most amphibians have an aquatic larval stage that may last several months to a year.

Reptiles, on the other hand, are less restricted by available moisture and may go weeks without direct contact with water. All these factors combine to make amphibians and reptiles one of the most difficult vertebrate groups to survey, especially in a single effort.

### **DESCRIPTION OF STUDY AREA**

The Little Wabash River in southeastern Illinois flows 382 km from Coles County south through Cumberland, Shelby, Effingham, Clay, Richland, Wayne, Edwards, and White counties to its confluence with the Wabash River near New Haven, Illinois (Figure 1). It is the second largest tributary of the Wabash River and has a drainage area of approximately 5,125 km<sup>2</sup> (Ogata, 1975). The river originates in the area of the Shelbyville Moraine, continues on a relatively flat plain until it reaches Clay County where the topography of the basin becomes hilly and rolling, then flattens out again when it reaches the Wabash River floodplain near Carmi, Illinois. The Little Wabash River is a postglacial stream with its meandering length nearly twice as long as the basin (Page et al., 1992). The river averages 11.5 m in width and is a slow-moving, continuous flow stream with predominately silt/sand substrates, many pools, and few riffles. The average slope of the Little Wabash River is about 61 cm/km with nearly half the available fall occurring in its upper 65 km (Barker et al., 1967). The basin is subjected to oil, municipal, industrial, and agricultural pollution (Smith, 1971). Major tributaries include Skillet Fork, Elm River, Fox River, and Big Muddy Creek, and are low-gradient, brushy streams (Smith, 1971).

This study focused on the upper portion of the drainage, from its source to the border between Wayne and Edwards counties.

Published information on the mussel fauna of the Little Wabash River basin is limited.

### **METHODS**

During the summers of 2006 and 2007, amphibians and reptiles were surveyed at 19 sites along the Little Wabash River and its main tributaries using Visual Encounter Surveys (VES), aquatic hoop traps, minnow traps, and incidental encounters. Visual encounter surveys and aquatic hoop traps were the main methods used. Visual encounter surveys involve searching appropriate habitat (mainly turning cover items such as logs, rocks, and miscellaneous debris and also visually scanning open habitats) and recording all species encountered. A thorough explanation of this technique can be found in Heyer, et al (1994). The effort expended in visual encounter surveys is recorded as man-hours. Aquatic trapping (hoop traps, minnow traps, etc.), baited or unbaited, are placed in the water and checked at regular intervals. Incidental encounters also

accounted for some amphibian and reptile observations. An incidental encounter is an observation of an amphibian or reptile species when no structured survey is being conducted. VES and aquatic hoop traps were chosen for this survey because effort is easily quantified and the methods involved are repeatable with the least amount of bias.

Geographic coordinates of survey sites were taken with a Garmin GPS unit or were taken from [www.topozone.com](http://www.topozone.com). Voucher specimens of selected species were collected, cataloged, and deposited in the Illinois Natural History Survey amphibian and reptile collection. Catalogue number will be submitted as they are assigned.

## RESULTS / DISCUSSION

A total of 18 species was collected from 19 sites along the Upper Little Wabash River and its main tributaries during 2006 and 2007 (Table 1; Appendix I). Search effort and trap-nights are given by site in Table 2. The most abundant species encountered was the Cricket Frog, *Acris crepitans*. The number of species encountered per site ranged from 1 to 7 (Table 1). Incidental encounters are listed in Table 3. The most notable species encountered were the Redbelly Snake, *Storeria occipitomaculata*, the Stinkpot Turtle, *Sternotherus odoratus*, and the Slimy Salamander, *Plethodon glutinosus*. There is one historical record for the Redbelly Snake from the ULWR drainage from “Birdhaven, near Olney” in 1912, so the specimen encountered during this study is a new county record for Marion County. The Slimy Salamander has been encountered recently at several sites in the upper basin by IDNR Heritage Biologist Terry Esker, (INHS Amphibian and Reptile Collection), but this is the first record for Wayne County. The Stinkpot has not previously been recorded from Clay or Richland counties. Because both individuals were encountered along a stretch of the Big Muddy Creek that forms the boundary between these two counties, it can be considered a county record for either or both. The Redbelly snake and the Slimy Salamander were vouchered in the INHS Amphibian and Reptile Collection (catalogue numbers pending), but the Stinkpots were not collected, rather a photo voucher was deposited in the INHS Amphibian and Reptile Photo Collection (INHS 2008-04).

Table 4 lists species known from the Upper Little Wabash River basin that were not encountered during the 2006 – 2007 surveys. These records were taken from the INHS Amphibian and Reptile Database, which includes specimen records from 35 museums in the United States and sight or photographic records from reliable sources. The total number of species known from the Upper Little Wabash River basin is 46. This is similar to the species richness of other rivers in Illinois at the same latitude such as the Embarras River.

## **MANAGEMENT RECOMMENDATIONS**

The sites visited during this study were generally in fair to good condition, as evidenced by an overall healthy appearance of the water (clear, no obvious pollution – e.g. oil slicks, little eutrophication – e.g. no serious algal blooms) and minimal channelization (but see below) or major impoundments. This is in general agreement with Smith’s (1971) characterization of the upper reaches as “very good”. However, several of the survey sites had severe bank erosion from row-crops immediately adjacent to the stream. In one site stabilization was attempted with rip-rap, but row-cropping continues right up to the stream bank and there was a heavy silt load in this reach.

The main exception to the general lack of channelization in the Upper Little Wabash drainage is the channelized cut-off that bypasses a stretch of Big Muddy Creek along the border between Richland and Clay counties. Sites 40 and 41 are on the Big Muddy Creek downstream of this cut-off and had little to no flow during the 2007 surveys. Site 40 was broken into isolated pools with abundant emergent vegetation resembling marsh, especially upstream of the low-water dam. For amphibians and reptiles, this provides ideal breeding and foraging habitat, but at the cost of eliminating other aquatic species (e.g. fishes and mussels).

The primary management recommendation is to retain buffer strips of natural vegetation of at least 100m along the riparian zone.

## **ACKNOWLEDGEMENTS**

M. Buhnerkemper, K. Cummings, T. Esker, L. Frankland, S. Fulton,, A. Kuhns, S. Miller, P. Ochs, T. Probst, E. Stork, and J. Tiemann assisted in the field during the 2007 surveys. This study was supported by a grant from the Upper Little Wabash C-2000 Partnership through the Illinois Department of Natural Resources; additional funding was provided by the Illinois Department of Transportation.

## LITERATURE CITED

- Barker, B., J.B. Carlisle, and R. Nyberg. 1967. Little Wabash River basin study; a comprehensive plan for water resource development. Illinois Department Public Works and Buildings, Division of Waterways, Springfield. 78 pp.
- Burbrink, F.T., C.A. Phillips, and E.J. Heske. 1998. A riparian zone in southern Illinois as a potential dispersal corridor for reptiles and amphibians. *Biological Conservation* 86:107-115.
1994. Heyer, W.R., M. A. Donnelly, R. W. McDiarmid, L.-A. C. Hayek, & M. S. Foster (editors), *Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians*. Smithsonian Institution Press.
- Ogata, K.M. 1975. Drainage area for Illinois streams. U.S. Geological Survey, Water Resources Investigations 13-75. 120 p.
- Page, L.M., K.S. Cummings, C.A. Mayer, S.L. Post and M.E. Retzer. 1992. Biologically significant Illinois streams - an evaluation of the streams of Illinois based on aquatic biodiversity. Center for Biodiversity Technical Report 1992(1), Illinois Natural History Survey, Champaign, Illinois. vi + 479 pp + appendices.
- Smith, P.W. 1971. Illinois streams: A classification based on their fishes and an analysis of factors responsible for disappearance of native species. Illinois Natural History Survey, Biological Notes Number 76, Champaign. 14 pp.  
663 pp + appendices.
- Tiemann, J.S., K.S. Cummings, C.A. Phillips. 2008. Freshwater mussels (mollusca: unionoidea) of the Little Wabash River basin, Illinois, with comments on historical changes in the mainstem during the past half-century. Unpublished report to the Upper Little Wabash River C-2000 Partnership. Illinois Natural History Survey Technical Report 2008 (4).

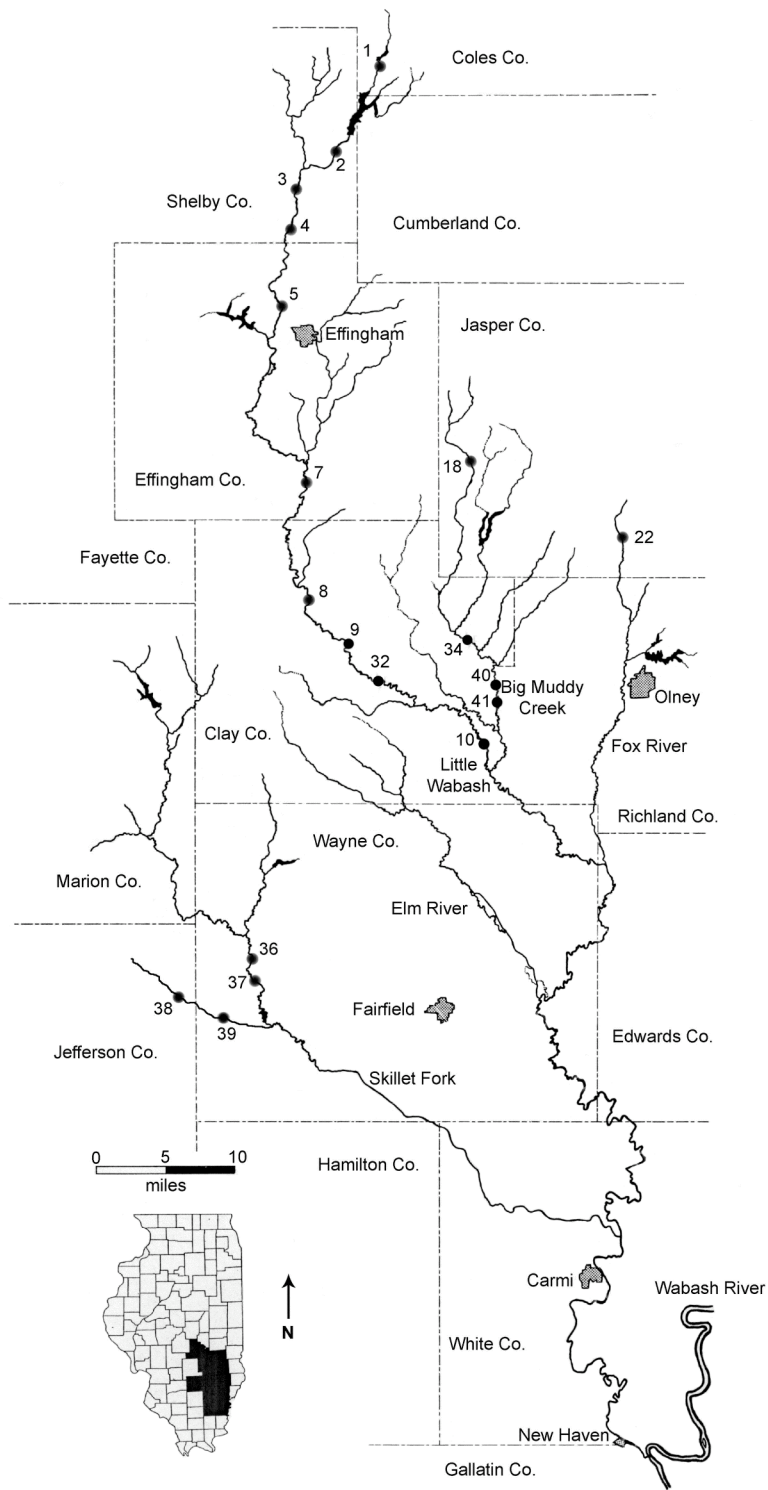


Figure 1. Map of the Little Wabash River basin, Illinois showing locations for the 2006 – 2007 herpetological survey.

Table 1. Amphibians and reptiles encountered by site during the 2006 - 2007 Little Wabash River basin survey. Data includes number of live individuals encountered. Site locations are given in Appendix I. Site numbers correspond to those in the concurrent mussel survey (Tiemann et al. 2008).

Scientific name	1	2	3	4	Site 5	7	8	9	10	18	22	32	34	36	37	38	39	40	41
<b>Amphibians</b>																			
<i>Plethodon dorsalis</i>															1	12			
<i>Acris crepitans</i>	20+	20+	50+	50+	20+	50+	20+		50+	10+			50+	4	10+	10+			50+
<i>Hyla chrysoscelis</i>														5*					
<i>Bufo americanus</i>		1	3																
<i>Bufo fowleri</i>											8	1							1
<i>Rana catesbeiana</i>	4																	50+	
<i>Rana sphenoccephala</i>		1										50+			8	4			
<b>Reptiles</b>																			
<i>Chelydra serpentina</i>	2	1	1	1	1			1			1	1			4	1			
<i>Sternotherus odoratus</i>																		1	1
<i>Terrapene carolina</i>				1							1		1			2			
<i>Chrysemys picta</i>						1		2						2				1	
<i>Trachemys scripta</i>								2							1				
<i>Apalone spinifera</i>			1		3								1			1			
<i>Eumeces fasciatus</i>										1									
<i>Elaphe obsoleta</i>			1	1															
<i>Nerodia sipedon</i>		1								1			2			1	1		
Total number species	3	5	5	4	3	2	1	3	1	3	3	3	4	3	5	7	1	3	3

\* heard calling – no photo



Table 2. Search effort for the Upper Little Wabash herpetological surveys, 2006- 2007. VES is recorded in man-hrs and aquatic trapping in trap-nights. Site locations are given in Appendix I. Site numbers correspond to those in the concurrent mussel survey (Tiemann et al. 2008).

Search Method	1	2	3	4	Site 5	7	8	9	10	18	22	32	34	36	37	38	39	40	41	Totals	
VES	2.5	1.8	1.6	1.25	0.3	1.25	0.25	0	0	6	6	1	1	1	1	1	1	1	1	1	28.95
Aquatic Traps	10	16	10	10	5	5	7	5	5	0	0	5	5	5	5	5	0	5	5	5	108

Table 3. Incidental encounters of amphibians and reptiles during the Upper Little Wabash herpetological surveys, 2006 – 2007.

Species	Lat/ Long	Location	Remarks
<i>Terrapene carolina</i>	38.9433 N, 88.3803 W	Effingham Co; Co Rd 2300E at Co Rd 300N	Dead on road
<i>Coluber constrictor</i>	38.7092 N, 88.2589 W	Richland Co; Glenwood Rd at Dayton Ln	Alive on road – got away, no photo
<i>Elaphe obsoleta</i>	38.6898 N, 88.5079 W	Clay Co; US Rt 45 at Co Rd 575N	Dead on road
<i>Storeria occipitomaculata</i>	38.6933 N; 88.7186 W	Marion Co; Seavers Rd bridge over Skillet Fork	Dead on road – too badly damaged for photo; COUNTY RECORD

Table 4. Amphibian and reptiles species known from the Upper Little Wabash River, but not encountered during the 2006 – 2007 herpetological surveys.

Species	County or Counties	Date Last Observed
Amphibians		
<i>Ambystoma opacum</i>	Clay, Effingham, Richland	1998
<i>Ambystoma texanum</i>	Clay, Effingham, Richland	2005
<i>Ambystoma tigrinum</i>	Marion, Richland	1998
<i>Pseudacris crucifer</i>	Effingham, Jasper	2005
<i>Pseudacris triseriata</i>	Clay, Coles, Effingham, Jasper, Marion, Richland	2005
<i>Rana areolata</i>	Clay, Coles, Jasper, Richland	1996
<i>Rana blairi</i>	Coles, Effingham, Jasper	1996
<i>Rana clamitans</i>	Richland	No date
<i>Rana sylvatica</i>	Effingham	1995
Reptiles		
<i>Apalone mutica</i>	Clay, Richland	No date
<i>Emydoidea blandingii</i> SE	Jasper	1998
<i>Terrapene ornata</i>	Clay, Effingham, Jasper, Marion, Richland	2006
<i>Eumeces laticeps</i>	Effingham, Marion	2003
<i>Ophisaurus attenuatus</i>	Richland	No date
<i>Sceloporus undulatus</i>	Clay, Effingham, Jasper, Marion, Wayne	1998
<i>Scincella lateralis</i>	Clay, Effingham	1998
<i>Agkistrodon contortrix</i>	Effingham	1957
<i>Carphophis amoenus</i>	Effingham, Richland	1955
<i>Clonophis kirtlandii</i> SE	Coles, Effingham	1994
<i>Crotalus horridus</i> SE	Effingham	1989
<i>Diadophis punctatus</i>	Effingham	2003
<i>Heterodon platirhinus</i>	Clay, Effingham, Marion, Richland	2005
<i>Lampropeltis calligaster</i>	Clay, Coles, Effingham, Richland, Shelby	1996
<i>Nerodia erythrogaster</i>	Clay, Richland, Wayne	2003
<i>Opheodrys aestivus</i>	Effingham, Jasper, Marion, Richland	2004

Table 4. continued

<i>Storeria dekayi</i>	Marion, Richland, Wayne	2002
<i>Thamnophis sirtalis</i>	Effingham, Jasper, Marion, Richland	2005
<i>Virginia valeriae</i>	Effingham	1947

ST = State Threatened; SE = State Endangered

Appendix I. Collection sites for the Upper Little Wabash River herpetological surveys, 2006 - 2007. Geographic coordinates are for the approximate center of the site and in decimal degrees and in Map Datum NAD 83. Site numbers correspond to those in the concurrent mussel survey (Tiemann et al. 2008), except that sites 40 and 41 were not sampled for mussels because these sites did not have sufficient flow.

SITE #	LOCATION
1.	Little Wabash River, below Lake Paradise spillway, Coles Co., IL. T11N, R7E, sec. 8; 39.4093 N, 88.4398 W
2.	Little Wabash River, 0.5 mi E Trowbridge at CR 700N bridge, Shelby Co., IL. T10N, R6E, sec. 14; 39.3192 N, 88.5008 W
3.	Little Wabash River, 3.5 mi E Stewardson at CR 400N bridge, Shelby Co., IL. T10N, R6E, sec. 29; 39.2734 N, 88.5556 W
4.	Little Wabash River, 4 mi W Sigel at CR 100N bridge, Shelby Co., IL. T9N, R6E, sec. 7 ; 39.2383 N, 88.5631 W
5.	Little Wabash River, 2 mi NW Effingham at Rte 33 bridge, Effingham Co., IL. T8N, R5E, sec. 13; 39.1475 N, 88.5767 W
7.	Little Wabash River, 4 mi E Mason at CR 900N bridge, Effingham Co., IL. T6N, R6E, sec. 17; 38.9582 N, 88.5456 W
8.	Little Wabash River, 4.5 mi NW Louisville at CR 1525N bridge, Clay Co., IL. T5N, R6E, sec. 33; 38.8288 N, 88.5410 W
9.	Little Wabash River, E edge of Louisville at CR 1150N bridge, Clay Co., IL. T4N, R6E, sec. 23; 38.7758 N, 88.4908 W
10.	Little Wabash River, 1.6 mi E Clay City at US 50 bridge, Richland Co., IL. T3N, R8E, sec. 23; 38.6884 N, 88.3180 W
18.	Big Muddy Creek, Latona at CR 900N bridge, Jasper Co., IL. T6N, R8E, sec. 9; 38.9807 N, 88.3203 W
22.	Fox River, 3 mi NNW West Liberty at CR 300N bridge, Jasper Co., IL. T5N, R10E, sec. 4/9; 38.8919 N, 88.1098 W
32.	Little Wabash River, 4.5 mi NNE Flora at CR 1300E bridge, Clay Co., IL. T3N, R7E, sec. 5; 38.7342 N, 88.4563 W.
34.	Big Muddy Creek, 2 mi NE Sailor Springs at CR 2025E bridge, Clay Co., IL. T4N, R8E, sec. 12; 38.7836 N, 88.3275 W.
36.	Skillet Fork, 3 mi NNE Keenesville at CR 1250N bridge, Wayne Co., IL. T1S, R5E, sec. 15; 38.4392 N, 88.6263 W
37.	Skillet Fork, 2 mi ENE Keenesville at CR 1050N bridge, Wayne Co., IL. T1S, R5E, sec. 26; 38.4119 N, 88.6217 W
38.	Horse Creek, 3.25 mi SSW Stratton near CR 2250E bridge, Jefferson Co., IL. T1S, R4E, sec. 26; 38.4071 N, 88.7414 W
39.	Horse Creek, 2.25 mi N Keenes at CR 300E bridge, Wayne Co., IL. T2S, R5E, sec. 10; 38.3708 N, 88.6439 W
40.	Big Muddy Creek at Antioch Rd bridge, Richland Co., IL. T3N, R8E, secs. 11 & 14; 38.7161 N, 88.2822 W.
41.	Big Muddy Creek at Asbury Ln bridge, Clay Co., IL. T2N, R8E, sec. 35; 38.6486 N, 88.2842 W.