

# IDOT Conservation Plan

State-threatened Eastern Sand Darter, *Ammocrypta pellucida*, and State endangered Smooth Softshell, *Apalone mutica*, which inhabit the Embarras River in the vicinity of the proposed Embarras River Bridge Replacement Project near Lawrenceville, IL in Lawrence County, IL.

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## 1. Description of the impact likely to result from the proposed taking.

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### A. Legal Description of the project area

The project is located on IL Route 1 in Lawrence County, Illinois. Specifically, the bridge to be replaced is at the north corporate limits of the City of Lawrenceville, IL. The project area is on IDOT right of way. See Exhibit 1.

The bridge is within the SE  $\frac{1}{4}$  of the SE  $\frac{1}{4}$  of Section 36 Township 4 North, Range 12 West, Lawrence Township. A point centered on the bridge is used for the following locality information as a reference point for the project: latitude 38.73348°N, longitude 87.68614°W.

### B. Biological Data

The Embarras River has been sampled extensively by INHS and Illinois Department of Natural Resources (IDNR) personnel over the past 30 years, and the aquatic fauna is well documented from over 100 known fish and 130 known mollusk collections. In the last 30 years, 88 species of native fishes and 53 species of freshwater mollusks have been recorded in the Embarras River (INHS Fish Collection database, Champaign, and INHS Mollusk Collection database, Champaign).

Fishes – Prior to the 2014 study, surveys for fishes in the Embarras River near the Illinois Route 1 (IDOT FAP 332) bridge by INHS and IDNR personnel had been conducted on six occasions; each of these previous surveys were conducted in the river at sites within one mile of this bridge. A total of 40 species of fishes were collected during those surveys. Of particular importance to this study, based on those previous records, is the possibility that the state threatened Eastern Sand Darter, *Ammocrypta pellucida*, is present in the immediate vicinity of the Illinois Route 1 (IDOT FAP 332) bridge.

Other than a single locality in Riley Creek (Mississippi River drainage), the Eastern Sand Darter is present only in the upper Wabash River drainage in the state of Illinois (INHS Fish database, Smith 1979). More than 160 specimens from 53 collections have been recorded between 1900 and 2012 in this area. Within the Embarras River basin, the Eastern Sand Darter occurs commonly in stretches in Coles, Cumberland, Jasper, Crawford, and Lawrence counties. An intensive survey for the species in the Embarras River drainage found it to occur at 35 sites between Charleston (Coles County) and Westport (Lawrence County) in 2007 (Henry et. al. 2009). Prior to the 2014 survey, the most recent record, and the only collection made in Lawrenceville, was found in 2012 at the U.S. Route 50 bridge located just a half mile upstream of the Illinois Route 1 (IDOT FAP 332) bridge by INHS personnel C.A. Taylor, J.S. Tiemann, and S.L. Kilburn (INHS Fish Collection Catalogue #105554; Wetzel et al. 2012). In 2014 the Illinois Natural History Survey (INHS) conducted a fish survey at the project site and found one juvenile Eastern sand darter under the IL 1 bridge. See Exhibit 4.

Smith (1979) reported that the darter was historically more widespread in occurrence but populations had been decimated as a result of siltation and impoundments. Pollution has also been cited as a factor in the decline of the species (Page and Burr 2011). The preferred habitat of the Eastern Sand Darter is runs of pure sand in small to medium sized rivers (Smith 1979; Page and Burr 2011).

Turtles – While there was no survey in the project area itself, in 2015, Aquatic Turtle Surveys of the Embarras River Bottoms State Habitat Area (ERBSHA), in Lawrence County, were conducted. See Exhibit 5. This area of survey begins approximately 3 miles downstream of the subject Embarras River Bridge. This was a herpetological survey with an emphasis on aquatic turtles in the ERBSHA. Four sampling sessions each consisting of four day and three nights were conducted by INHS aquatic ecologist / herpetologist A.R. Kuhns from June through October 2015. Sampling in June and early August focused on lentic wetlands and trap locations were paired to other long term monitoring stations within the property. September and October sampling sessions focused on the Embarras River proper that flows through the ERBSHA property. Of interest to this conservation plan, 9 Smooth Softshell, *Apalone mutica* species were captured in the August 25-28 sampling and 9 were found during the September 30- October 2 samplings. The Smooth Softshell turtle is considered a specialist species that prefers flowing currents over sandy substrates. The findings of this study suggest that there may be a sizeable population of the state endangered Smooth Softshell in the Embarras River within the ERBSHA.

The Smooth softshell has a wide range throughout Illinois. It is found in 19 Counties ranging from as far north as Lee and Whiteside, to as far south as Gallatin and Jackson. It ranges from Hancock and Pike Counties in the west to Vermillion and Lawrence Counties in the east. Looking at the map of known locations demonstrates that this species occurs in several different river systems such as the Illinois, Sangamon, Kaskaskia, and Embarras. See Exhibit 11.

### **C. Habitat and description of activities that will result in take.**

The Eastern Sand Darter is known to occur within the Embarras River in the project area. The preferred habitat of this species is runs of pure sand in small to medium sized rivers.

The Smooth Softshell is known to occur within the Embarras River Bottoms State Habitat Area, Lawrence County, Illinois, approximately five miles downstream. The preferred habitat is flowing currents over sandy substrates, which is present in the project area. The Smooth Softshell turtles nest in high sand bars that do not flood easily. Even though no survey was completed at the project site for this species, it is possible that the Smooth Softshell does occur within the Embarras River at the construction site since there are sand bars upstream, downstream, and currently under the bridge. This bridge collects woody debris from frequent flooding. The debris can alter the river current and create or remove sand bars throughout the years.

At this time, it is unknown as to what contractor will be awarded the project, and subsequently, which method they would choose to complete the necessary work (contractor means and methods). Methods that have been presented and discussed to date that would ultimately result in a take would include the following:

- 1) Construct a temporary rock causeway in the stream from the river bank(s). This causeway will not cross the river completely at any time.
- 2) Construct a floating barge causeway in the effort to remove and reconstruct the bridge. This method is unlikely since the river is frequently very low, and the barge will rest on the bottom of the river.

Assuming option 1) is selected, prior to the demolition of the existing bridge and subsequent construction of the new bridge, temporary rock causeways will be constructed for river and land access for materials and equipment. The causeways will be constructed of clean concrete chunks and new clean riprap with an approximate weight of 50 pounds and the size of a basketball or slightly larger. The causeways will reach from the embankments toward the center of the bridge. The top of the causeway will be roughly 20 feet wide for equipment access. The causeways will not dam the river at any time. The river is estimated to be ten feet deep at the bridge, so the causeway footprint is estimated to be 40 feet wide at the bottom. Approximately 3200 cubic yards of rock will be needed for the causeway. However, the depth of the river varies and the debris pile upstream may cause unexpected issues, so the area of impact includes an additional 30 feet upstream from the bridge. The causeway within the Embarras River is included in the impact area of 0.83 Acres. See Exhibit 2.

The deck is made of Precast Prestressed Concrete (PPC) deck beams. These beams are hollow, rectangular beams that are placed on piers and abutments. The traffic drives on the top of the beams. Therefore, they are relatively easy to lift out intact. The contractor will remove each beam, intact if possible, with a crane and stockpile them for disposal. If any beam is structurally deficient and cannot be lifted out intact, the contractor will break it as necessary and the debris will be captured by protective means. No debris will fall in the river during deck removal.

The existing bridge has five piers in total. Three of the existing piers are in the water year round. The other two are right on the banks. Once the deck is removed, the piers will be removed. The contractor will saw the concrete piers into pieces for removal by machinery from the causeways. Once the pier has been removed to the top of the water, the contractor will jack-hammer the remaining pier under the water to one foot below top of existing river bed. The broken concrete and reinforcement bars will be immediately removed from the river and disposed. The removal of the piers is considered instream and in-river work and will not take place during the restricted time of Eastern Sand Darter spawning May15 – August15 nor Smooth Softshell nesting (June 1 – September 30). The impact from this action is included in the total area of impact of 0.83 Acres. See Exhibit 2.

The new bridge will have two piers constructed in the river. Each pier will have drilled shafts to support the pier. Construction of these drilled shafts and the piers they support will require the contractor to access the area around the piers with heavy equipment. This will be done by using the temporary causeways in the river. The area of impact for the pier construction is included in the impact area of 0.83 Acres. See Exhibit 2. There are no plans to construct cofferdams for these piers. The notes and the construction sequences in the plans show that the designer intended for these piers to be built “in the wet” without dewatering the area around the pier.

Once the new bridge is in place, the contractor will remove the causeways by excavating the rocks out of the waterway by the use of an excavator. The excavator shall be situated on the side slope of the waterway. Rocks shall be removed out of the main channel area first, and then excavation shall continue working back toward the side slope. Rock shall be placed on the side slopes to assist in slope stabilization. After the causeway is removed, the stream channel will be returned to its preconstruction cross section per IDOT policy. *See Exhibit 10.*

## **D. Explanation of the anticipated adverse effects on the listed species.**

There will be no instream work during the Eastern Sand Darter spawning season (May 15 – August 15). The construction activities are temporary and the Eastern Sand Darter is most likely to avoid the construction area as much as possible. However, there is a possibility of a fish take during the construction. It is anticipated that the number of Eastern Sand Darter takes will be four (one per 10,000 sq. ft. of impact area.) Construction specifications call for restoring the river bed to its preconstruction condition upon the completion of the project. Minimization and mitigation strategies are outlined Section 2.

There will be no in-river work during the Smooth Softshell nesting season (June 1 – September 30). The construction activities are temporary and the Smooth Softshell is most likely to avoid the construction area as much as possible. However, there is a possibility of a take during the construction. It is anticipated that the number of Smooth Softshell takes will be seven (based on the 2015 survey downstream.) However, if the river rises and all sandbars are inundated for more than five consecutive days after July 1<sup>st</sup>, the Smooth Softshell work restriction can be lifted because any smooth softshell turtle eggs deposited on the sandbar will have drowned, and no new clutches are likely to be laid after that date.

## **2. Measures the applicant will take to minimize and mitigate that impact.**

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### **A. Plans to minimize the area affected by the proposed action, the number of individuals of an endangered or threatened species that will be taken and the amount of habitat affected.**

Prior to construction all contractor and on-site personnel will receive training regarding legal and ecological aspects of all suspected State of Illinois listed fish and turtle species. The Resident Engineer will monitor the project to ensure the equipment and personnel are staying within the area of impact and following all restriction dates at all times.

Additionally, Illinois Route 1 will be temporarily closed during construction and the traffic will be detoured. This will expedite the construction and reduce the time of instream work. The work is expected to take two construction seasons with the potential of the causeways during the entire construction period.

The number of Eastern Sand Darter takes is estimated to be four, while the number of Smooth Softshell takes is estimated to be seven. The area of impact is 0.83 acres.

## **B. Plans for management of the area affected by the proposed action that will allow continued use of the area by the species.**

During construction, adjacent land areas will contain erosion and sediment control features. The Department's erosion and sediment control policy will be followed and will be in compliance with the U.S. Army Corps of Engineers Section 404 permit, the water quality certification policies of Illinois EPA, and the requirements within the NPDES construction permit.

The temporary causeway will never completely restrict the river. All fish and turtles in the water will be able to navigate in and around the project area during construction.

Following the bridge removal and replacement, the temporary causeways will be removed by excavating the rocks out of the waterway by the use of an excavator. The contractor will begin the removal from the centermost part of the river and continue toward the bank. The channel bottom/slope banks shall be constructed to similar conditions as prior to construction activities. It is expected, that after the in-stream work has been completed, the area will be available for continued habitation of the Eastern Sand Darter and Smooth Softshell turtle.

## **C. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the endangered or threatened species.**

To minimize the effects of the project on the observed State listed Eastern Sand Darter and potential habitat for the Smooth Softshell turtle, prior to construction all contractors and construction personnel will receive training regarding legal and ecological aspects of all suspected State of Illinois listed fish and turtle species. The contractor will use Best Management Practices (BMP) to remove the existing structure and construct the new bridge. Also erosion and sediment control Best Management Practices shall be utilized to prevent additional silt from entering the river. The Illinois Department of Transportation's Bureau of Design and Environment Special Provisions entitled "National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction" and Temporary Erosion Control will be included for this project.

Limiting the contractor's work time allowed in stream, as well as limiting the work area, will further minimize the impact.

As mitigation INHS IDOT/BSAP staff will conduct surveys for the Smooth Softshell Turtle (*Apalone mutica*) in rivers identified as needing contemporary surveys for the species<sup>1</sup> (Bluett and Hulin 2014). The suggested rivers include the Wabash, Skillet Fork, and Little Wabash in that order. The rivers to survey will be determined in consultation with IDNR. The INHS IDOT/BSAP personnel will follow the protocols provided in Bluett and Hulin by setting 20 baited hoop

traps for 3 days yielding 2 sampling events per river reach. Traps will be placed approximately every 200 meters as determined by a handheld GPS. Three sampling events will occur. If the Smooth Softshell is detected before all three sampling events have occurred in one river, a new river and reach will be surveyed for the remaining sampling events. Thus, at a minimum, three reaches of one river may be sampled, and at most three reaches of three rivers will be sampled. Surveys will be completed 31 December 2018.

The estimated cost to conduct the survey is \$6540, including salary, mileage, lodging and per diem. Please note that these personnel costs are already being paid by the Department of Transportation.

Mitigation for the impacts to the Eastern Sand Darter will include a \$10,400 donation to INHS and IDNR for publishing costs associated with the upcoming book, "An Atlas of Illinois Fishes". This book contains information about listed species in Illinois, including the Eastern Sand Darter. This publication will list the comprehensive and current account of fish species distribution throughout Illinois.

#### **D. Plans for monitoring the effects of the measures implemented.**

The Illinois Natural History Survey (INHS) will conduct surveys two and five years following construction and removal of the temporary causeway. The purpose of the monitoring effort is to determine if the Eastern Sand Darter habitat and Smooth Soft Shell have recovered and that the fish and turtle species is still present. It is anticipated that the habitat at the construction site will have recovered and that the listed species are still present. Based on the results of the monitoring survey, the need for further monitoring will be assessed.

#### **E. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on endangered or threatened species.**

The piers will be constructed using drilled shafts. A cofferdam will not be used on this project. A cofferdam is constructed to keep any water from entering the working space in the river. A drilled shaft is a method of constructing the foundation of the pier.

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#### Literature Cited

<sup>1</sup>Bluett, R.D. and Hulin, A.C. 2014. Status of the Smooth Softshell (*Apalone mutica*) in Illinois: Sampling Protocols for Assessment and Proposed Thresholds for Considering Changes in the Species' Status as Endangered, Threatened or Secure. Illinois Department of Natural Resources Report dated October 2014. 25pp.

The drilling company will submit a detailed plan before any drilling begins. Here is what previous drilling companies have used with success (see figure 1.):

- a) Drive a steel, tubular casing (hollow “pipe”) vertically in the water and push it down into the river bed (soil).
- b) The driller then starts to bore a hole with an auger through the casing. The boring will go through the river bed, and continue into the rock bottom. They will stop when the proper elevation is reached; in this case it is approximately 10 feet into the rock. This step does not release any sediment from the boring into the river. It is all contained in the casing.
- c) At this point, the driller will pump any water left in the casing out to an acceptable location. The driller then changes from the auger to a “muck bucket.” The muck bucket goes down in the hole and scoops the soil and debris out. They dispose the soil and debris in a designated area. This is a fairly clean process with little or nothing falling into the water. The muck bucket continues until the bottom has been reached. The contractor will then lower a steel reinforcement bar “cage” into the shaft.
- d) Then the concrete will be pumped into the casing and fill it to the top of the shaft. The top of the shaft will be about two feet above the water level.

As the concrete is poured into the casing, the casing will be slowly lifted to remove it. At this point, any water in the casing will rise above the concrete and be pushed up as the concrete goes down; the casing goes up along with any water in the casing. The contractor will pump the water at the top of the casing to an approved location.

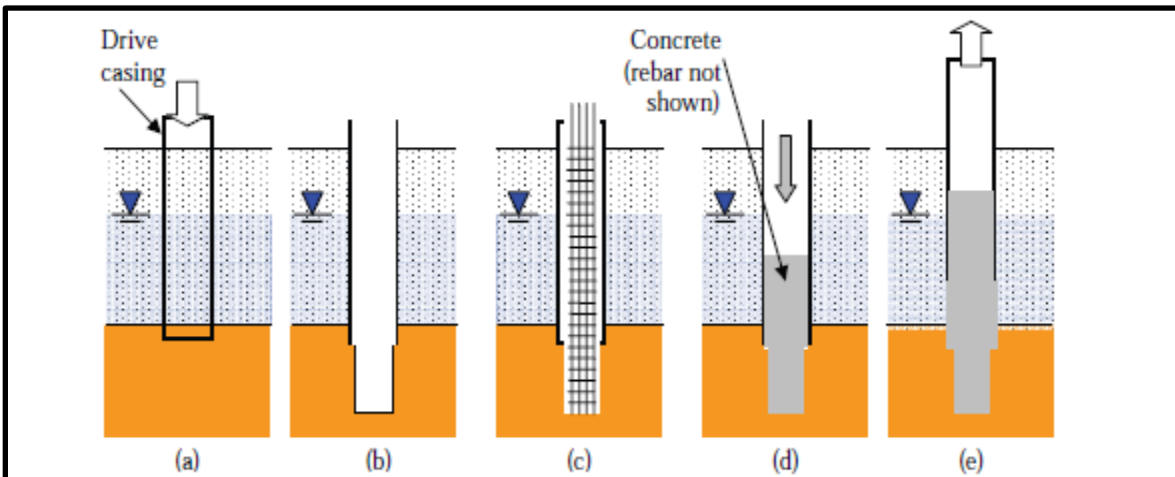


Figure 4-8 Construction Using Casing Advanced Ahead of Excavation: (a) drive casing into bearing stratum; (b) drill through casing; (c) complete and clean hole, set reinforcing; (d) place concrete to head greater than external water pressure; (e) pull casing while adding concrete



Once the drilled shafts are in place, the contractor will continue to build the piers up to the proper elevation using normal concrete forming procedures without anything falling in the water.

The project will have erosion control measures in place at all times. However, this river is prone to unexpected flood events. When the river floods and the erosion control fails, the District personnel will send an incidence of non-compliance to the EPA and repair the erosion control as soon as possible. The runoff will mainly consist of soil which happens frequently, even during non-construction times.

Additionally, the causeway should not be affected by any flood event. The district has used this type of access on other projects, and the causeways for those projects were not impacted by any flood events, even if the causeway was overtopped.

If conditions become unsafe for the PPC deck beams to be removed intact, or the protective measures fail, bridge portions shall be dropped into the waterway. All bridge portions shall be removed as soon as possible. The potential impact area has been extended out 12 feet downstream of the existing bridge footprint to account for this potential change in project scope.

## **F. Verification that funding to support mitigation activities will be available for the life of conservation plan.**

The project estimated budget will include line items for implementation of Best Management Practices included in the Storm Water Pollution Prevention Plan (SWPPP), including seeding of all disturbed areas draining to the stream. Maintenance and repair of SWPPP items, and additional measures implemented during construction will be paid for by change or force account. By law, the erosion and sediment control measures will remain in place for the life of the project. Additionally, the Illinois Department of Transportation has a contractual obligation with the INHS. The INHS will be in charge of the monitoring surveys. The Illinois Department of Transportation will also reserve funds to pay for any mitigation that is included in this agreement.

## **3. Alternative actions that would not result in the take.**

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The only alternative that would not result in the “take” of the listed fish or turtle is the “no action” alternative, which means that the bridge would not be replaced. This structure was closed temporarily twice in 2016 for issues related

to the deteriorated condition of the structure and the debris drift issues. The woody debris gets caught in front of the bridge and pushes against the bridge. If the replacement project is delayed and / or not built, permanent closure of the structure will be necessary, and the structure could fall into the river on its own. This bridge is located at the corporate limits of Lawrenceville and carries approximately 4000 vehicles per day. A permanent closure would impact the City of Lawrenceville tremendously.

Another alternative for construction is using a floating barge causeway in the effort to remove and reconstruct the bridge. The Embarras River water level is normally low with exposed sandbars. The barge option will have similar impacts to the stream as the rock causeway because it will rest on the bottom of the river.

## 4. Data and information to assure that the proposed taking will not reduce the likelihood of the survival of the species.

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Fishes –

Other than a single locality in Riley Creek (Mississippi River drainage), the Eastern Sand Darter is present only in the upper Wabash River drainage in the state of Illinois (INHS Fish database, Smith 1979). More than 160 specimens from 53 collections have been recorded between 1900 and 2012 in this area. Within the Embarras River basin, the Eastern Sand Darter occurs commonly in stretches in Coles, Cumberland, Jasper, Crawford, and Lawrence counties. An intensive survey for the species in the Embarras River drainage found it to occur 35 sites between Charleston (Coles County) and Westport (Lawrence County) in 2007 (Henry et. al. 2009). Prior to the 2014 survey, the most recent record, and the only collection made in Lawrenceville, was found in 2012 at the U.S. Route 50 bridge located just a half mile upstream of the Illinois Route 1 (IDOT FAP 332) bridge by INHS personnel C.A. Taylor, J.S. Tiemann, and S.L. Kilburn (INHS Fish Collection Catalogue #105554; Wetzel et al. 2012). In 2014 the Illinois Natural History Survey (INHS) conducted a fish survey at the project site and found one juvenile Eastern sand darter under the IL 1 bridge. See Exhibit 4.

Suitable habitat exists upstream of the IL 1 bridge. Due to the relatively small proposed area affected by removal and replacement of the bridge, limitations on instream work during spawning, and the assumption that adult fish will swim away from the construction activity, it is expected that Eastern Sand Darter will continue to exist in this reach of the Embarras River. It is not likely that this project will reduce the survival or recovery of the species in the wild in Illinois.

Turtles –

The project area of the Embarras River Bridge, on Illinois Route 1, Lawrence County, has not been surveyed for turtles. However, the 2015 “Aquatic Turtle Surveys of the Embarras River Bottoms State Habitat Area (ERBSHA)”, Exhibit

5, indicates that there are Smooth Softshell, *Apalone mutica*, in the ERBSHA in Lawrence County, Illinois. This was a herpetological survey with an emphasis on aquatic turtles in the ERBSHA. The ERBSHA is a 2200 acre site consisting of lowland floodplains along approximately 5 miles of the Embarras River. This site is approximately three miles downstream of the bridge removal site. Finding 18 individuals, including 8 mature females suggests that there may be a sizeable population of the state endangered Smooth Softshell in the Embarras River. The project should have no negative effect on this site. Exhibit 11 shows the statewide distribution of smooth softshells. The species can be found as far north as Lee and Whiteside counties and as far South as Jackson and Gallatin counties. There are a significant number of records for the species in Shelby and Fayette counties, and along the Illinois River in Mason, Cass, and Menard counties. Therefore, it is not likely that this project will reduce the survival or recovery of the species in the wild in Illinois.

## 5. Attachments

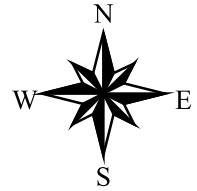
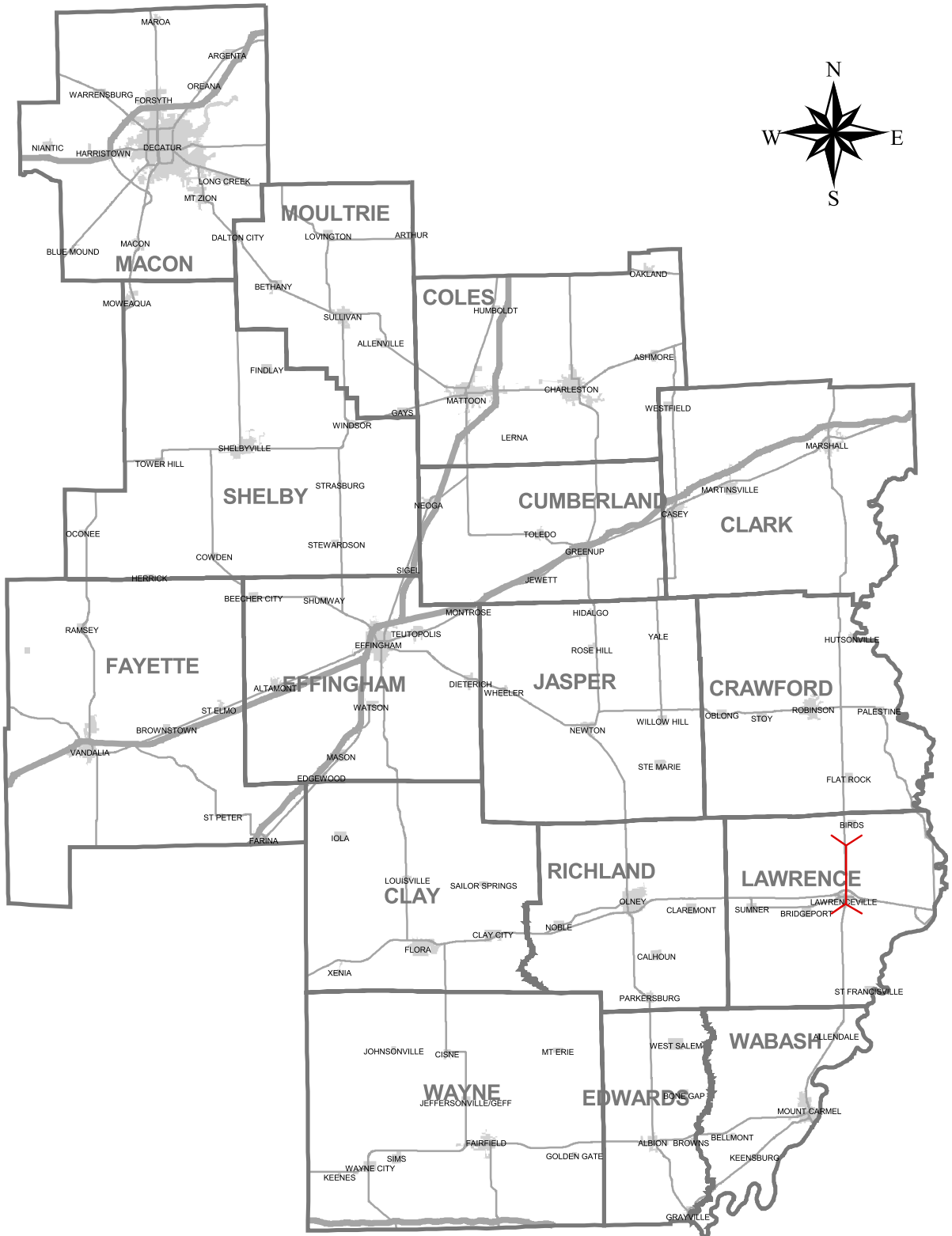
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Exhibit 1:	Project Location Map & Project Site Topographic Map
Exhibit 2:	Area of Impact plan sheet
Exhibit 3:	Photos
Exhibit 4:	Fish Report
Exhibit 5:	Turtle Report
Exhibit 6:	US Army Corps 404 permit
Exhibit 7:	US Fish & Wildlife Service letter
Exhibit 8:	IL EPA 401 permit
Exhibit 9:	OWR permit
Exhibit 10:	Check Sheet #8
Exhibit 11:	Locations of Smooth Softshell turtles in Illinois
Exhibit 12:	GIS Shapefiles – Impact Area and Fish - (electronic file)

EXHIBIT 1:

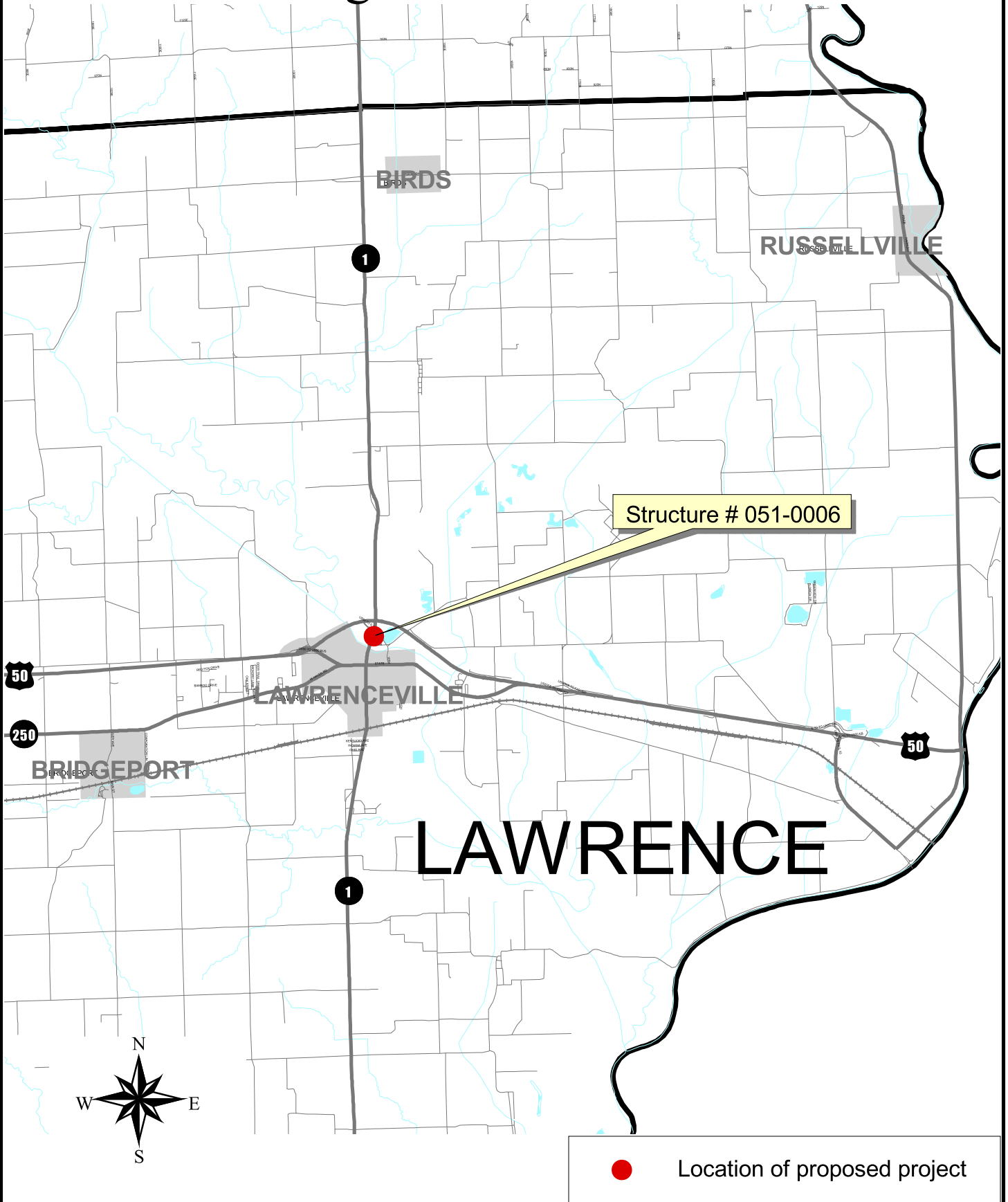
PROJECT LOCATION MAPS &  
PROJECT SITE TOPOGRAPHIC MAP

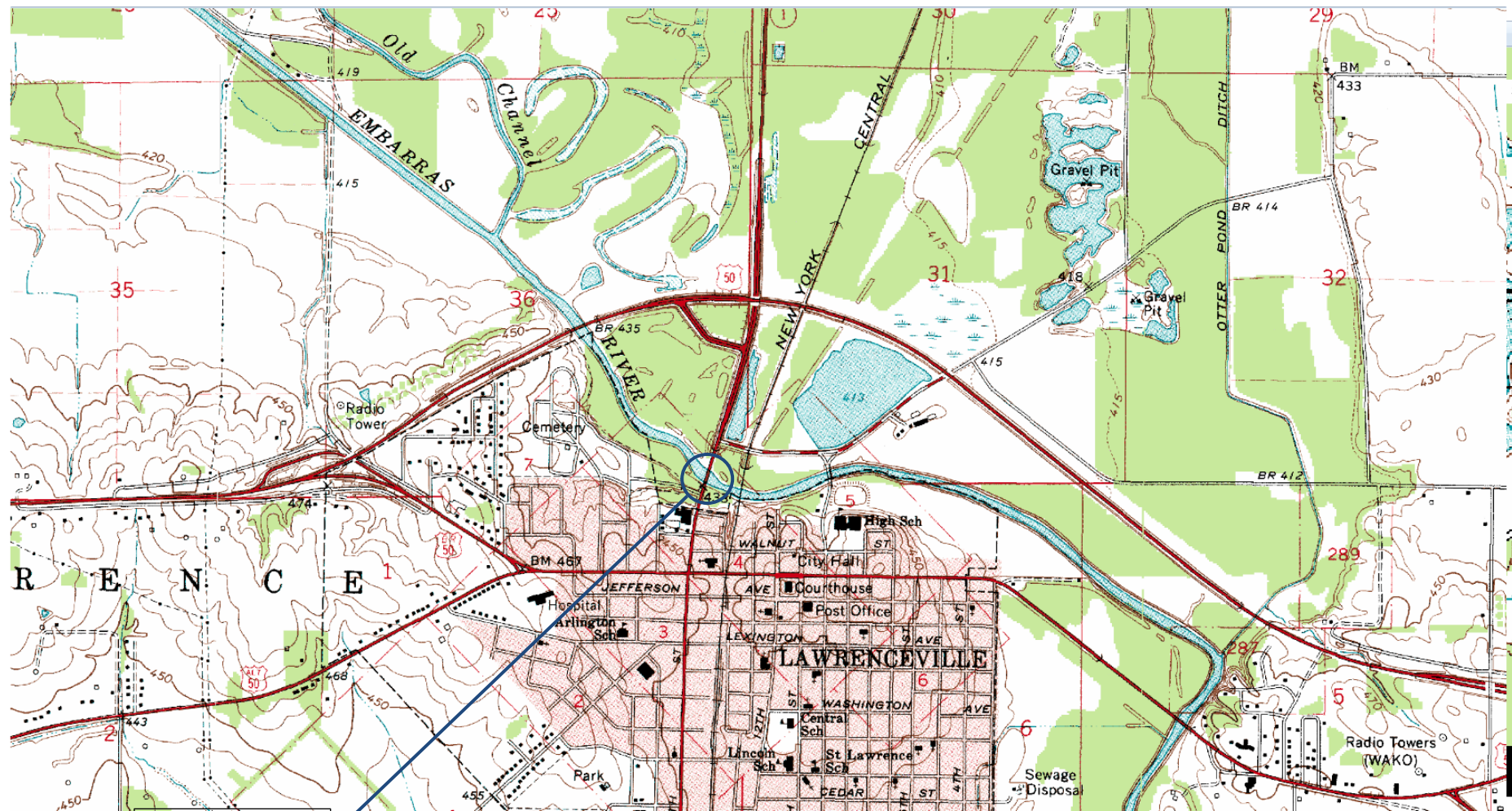
# Illinois Department of Transportation Region 4 - District 7



 Location of proposed project

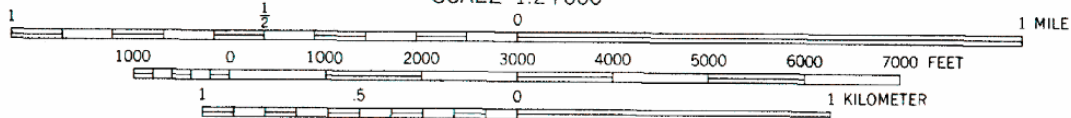
# Illinois Department of Transportation Region 4 - District 7



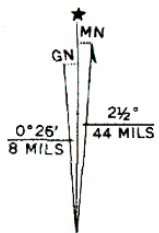


**Site Location**

SCALE 1:24 000



CONTOUR INTERVAL 10 FEET  
 DOTTED LINES REPRESENT 5-FOOT CONTOURS  
 DATUM IS MEAN SEA LEVEL



UTM GRID AND 1965 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
 FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22  
 AND ILLINOIS GEOLOGICAL SURVEY, CHAMPAIGN, ILLINOIS 61820  
 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Mapped, edited, and published by the Geological Survey  
 Control by USGS and USC&GS

Topography by photogrammetric methods from aerial  
 photographs taken 1962 and planetable surveys 1965

Polyconic projection. 1927 North American datum  
 10,000-foot grid based on Illinois coordinate system, east zone  
 1000-meter Universal Transverse Mercator grid ticks,  
 zone 16, shown in blue

Red tint indicates area in which only landmark buildings are shown  
 Fine red dashed lines indicate selected fence and field lines where  
 generally visible on aerial photographs. This information is unchecked

Map photoinspected 1977  
 No major culture or drainage changes observed

**LAWRENCEVILLE, ILL.**

NW/4 VINCENNES 15' QUADRANGLE  
 N3837.5—W8737.5/7.5

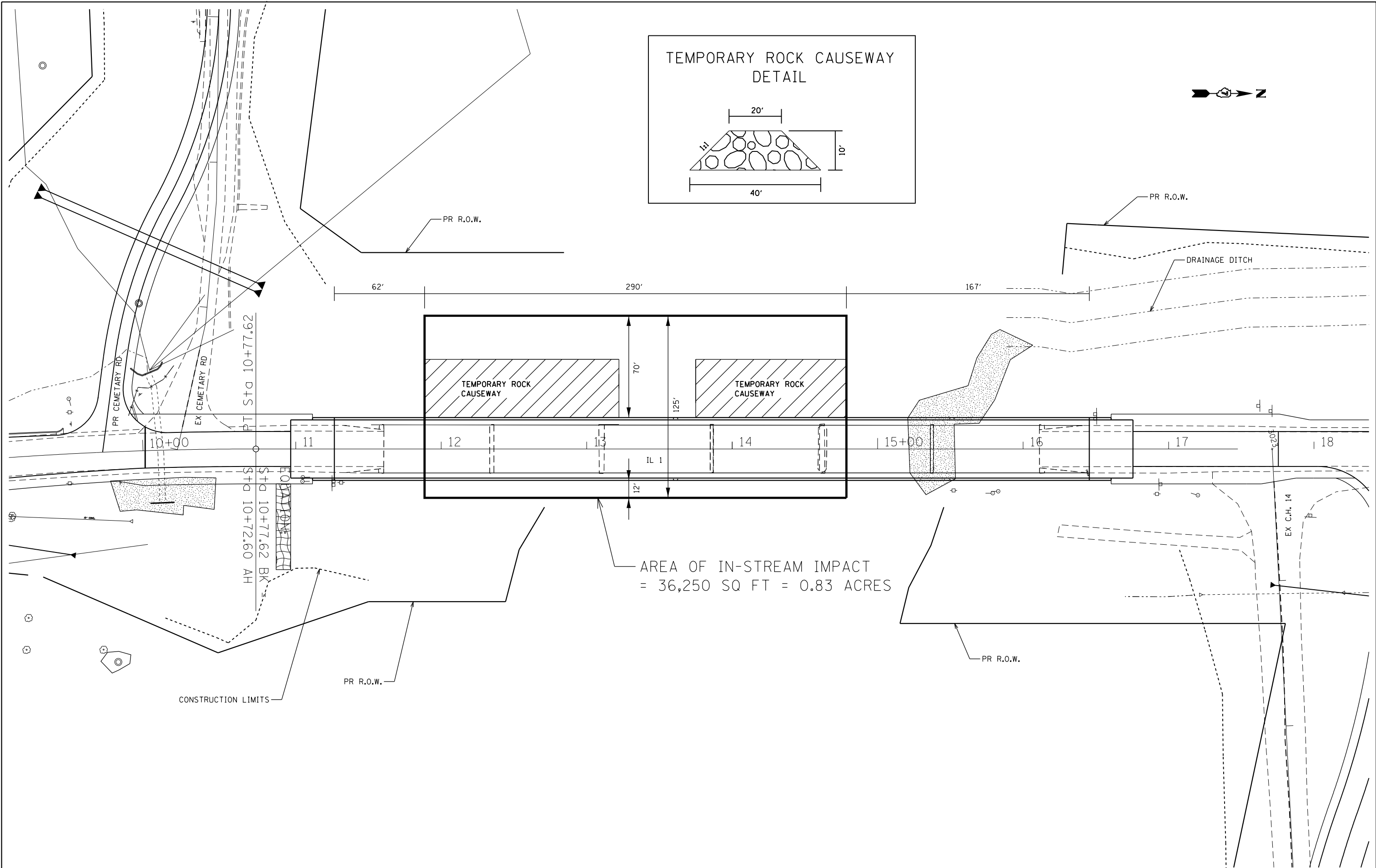
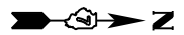
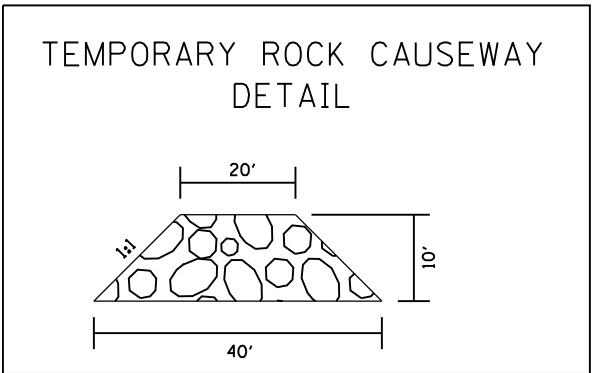
1965  
 PHOTOINSPECTED 1977  
 AMS 3461 II NW—SERIES V863

EXHIBIT 2:

AREA OF IMPACT

EXHIBIT 2





FILE NAME =	USER NAME = hirtzelk1	DESIGNED -	REVISED -
pw:\IL\084EBIDINTEG\Illinois.gov\PWIDOT\Documents\DOT Offices\District 7\Projects\74180\Drawings\Studies\D774180RiverImpactLimits		DRAWN -	REVISED -
Default	PLOT SCALE = 60.0000' / in.	CHECKED -	REVISED -
	PLOT DATE = 11/9/2016	DATE -	REVISED -

**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION**


**CONSTRUCTION IMPACT  
EMBARRAS RIVER**


SCALE: 30      SHEET 1      OF 1 SHEETS      STA.      TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
332	(16BR)B-1	Lawrence	1	1
CONTRACT NO. 74180			ILLINOIS FED. AID PROJECT	

EXHIBIT 3

PHOTOS

DATE:11/7/2016	SITE NAME: Proposed Embarras River Bridge Replacement Project;
TAKEN BY: SP	Lawrenceville, IL
<p>COMMENTS</p> <p>Looking downstream (east) from the bridge.</p>	
PHOTO #1	

DATE:11/7/2016	SITE NAME: Proposed Embarras River Bridge Replacement Project;
TAKEN BY: SP	Lawrenceville, IL
<p>COMMENTS</p> <p>Looking north at downstream side.</p>	
PHOTO #2	

DATE:11/7/2016	SITE NAME: Proposed Embarras River Bridge Replacement Project;
TAKEN BY: SP	Lawrenceville, IL
<p>COMMENTS</p> <p>Looking upstream (west) from bridge</p>	
PHOTO #3	


DATE:11/7/2016	SITE NAME: Proposed Embarras River Bridge Replacement Project;
TAKEN BY: SP	Lawrenceville, IL
<p>COMMENTS</p> <p>Looking north at the upstream side of bridge</p>	
PHOTO #4	

EXHIBIT 4

FISH REPORT



## **Fish and Freshwater Snail Surveys in the Embarras River at Illinois Route 1 (IDOT FAP 332), Lawrence County, Illinois**

IDOT Job No.: P-97-041-06 (Sequence Number: 14595)



Prepared by:  
Jeremy S. Tiemann  
Rachel M. Vinsel  
Kevin S. Cummings

**INHS/IDOT Statewide Biological Survey & Assessment Program  
Report 2014 (55)**

10 September 2014



## Project Summary

This report is submitted in response to a request from IDOT for INHS personnel to conduct surveys for fishes and freshwater snails in the Embarras River at Illinois Route 1 (IDOT FAP 332) bridge, Lawrenceville, Lawrence County, Illinois. In this report, we summarize the results of these surveys conducted on 28 July 2014. Eight species of fish and no species of snail were collected during the survey. One state threatened fish, the Easter Sand Darter, *Ammocrypta pellucida*, was recorded in the Embarras River at this site. No other species of fish collected or observed during this survey are listed as endangered or threatened at the state or federal level, nor are any presently under consideration for such listing.



Approved By: Kevin Cummings, Further Studies Aquatics  
Group Coordinator-Malacologist

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**Cover photo:** The Embarras River just upstream (west) of the Illinois Route 1 (IDOT FAP 332) bridge in Lawrenceville, Lawrence County, Illinois. Photograph is facing the downstream (east-southeast) flow direction of the river (K.S. Cummings photo, taken 28 July 2014).



## INTRODUCTION

This report is submitted in response to a request made by Susan Hargrove of the Illinois Department of Transportation (IDOT) to Joe Merritt of the Illinois Natural History Survey (INHS), dated 24 January 2014, for a fish and freshwater snail survey in the area of the Illinois Route 1 (IDOT FAP 332) bridge (SN 051-0006, (16BR)B-1) over the Embarras River in Lawrenceville, Lawrence County, Illinois (IDOT Job No. P-97-041-06, Sequence No. 14595). The purpose of this survey was to assess the river for the presence of any state or federally protected fish and freshwater snail species, in particular – to document the status of the state threatened Eastern Sand Darter, *Ammocrypta pellucida*, and the state endangered Shawnee Rocksnail, *Lithasia obovata*, which have been known to historically occur near the bridge site.

Nomenclature used for fishes discussed in this report follows Page and Burr (2011) except that subspecies are not recognized. Nomenclature for freshwater snails follows Johnson et al. (2013). The current status of threatened and endangered species of fishes discussed in this report is taken from Illinois Endangered Species Protection Board [IESPB] (2011) and Mankowski (2010, 2012).

## PROJECT LOCATION

Sampling for fishes and freshwater snails in the Embarras River at the Illinois Route 1 (IDOT FAP 332) bridge in Lawrenceville, Lawrence County, Illinois (**Figure 1**) was conducted by INHS personnel on 28 July 2014. A point centered on that bridge is used for the following locality information as a reference point for the project: latitude 38.73348°N, longitude 87.68614°W. The river flows in an east-southeasterly direction at this location. **Appendix 1** references a shapefile with sampling point information for the Embarras River project site, as discussed in this report.

## HABITAT CHARACTERIZATION

The site was examined from approximately 310 yards upstream of the Illinois Route 1 (IDOT FAP 332) bridge to approximately 40 yards downstream of the bridge. This area is where the stream was easily workable (e.g., shallower) and offered the best habitat for both the Eastern Sand Darter (sandy runs) and the Shawnee Rock Snail (woody debris and rocks). River width was ~50 yards and the depth ranged from 0.1 feet to 5+ feet under the bridge. Substrate at the site was predominately firm sand with patches of shifting sand, mud / silted sand, and rip-rap; some woody debris was present here. Downstream of this sampled area, collecting was more problematic due to depths (e.g., 5+ feet); it had suitable habitat for the darter and the snail.

At the time of our visit to this project site on 28 July 2014, the U.S. Geological Survey's water gauge on the Embarras River at Lawrenceville was at 18 feet and discharge was 400 cubic feet per second ([http://waterdata.usgs.gov/il/nwis/uv?site\\_no=03346500](http://waterdata.usgs.gov/il/nwis/uv?site_no=03346500)), which was about average for summer months. The banks of the river were gradually sloped and predominately

lined with trees with small areas of rip-rap (**Figure 2**). Surrounding land use on the south side of the river included extensive residential development (Lawrenceville).



**Figure 1.** Aerial view of the Illinois Route 1 (IDOT FAP 332) bridge over the Embarras River in Lawrenceville, Lawrence County, Illinois where surveys for fishes and freshwater snails were conducted by INHS personnel J.S. Tiemann, K.S. Cummings, and M.J. Van Der Bosch on 28 July 2014. Area in blue / yellow indicates the stretch of the Wabash River in which surveys for fishes and freshwater mollusk were conducted. Map created by J.L. Jarvis (INHS).



**Figure 2.** The Embarras River just upstream (west-northwest) of the Illinois Route 1 (IDOT FAP 332) bridge in Lawrenceville, Lawrence County, Illinois. Photograph was taken on 28 July 2014 (K.S. Cummings photo).

## **BACKGROUND**

The Embarras River has been sampled extensively by INHS and Illinois Department of Natural Resources (IDNR) personnel over the past 30 years, and the aquatic fauna is well documented from over 100 known fish and 130 known mollusk collections. In the last 30 years, 88 species of native fishes and 53 species of freshwater mollusks have been recorded in the Embarras River (INHS Fish Collection database, Champaign, and INHS Mollusk Collection database, Champaign).

Fishes – Prior to this present study, surveys for fishes in the Embarras River near the Illinois Route 1 (IDOT FAP 332) bridge by INHS and IDNR personnel had been conducted on six occasions; each of these previous surveys were conducted in the river at sites within one mile of this bridge. A total of 40 species of fishes were collected during those surveys. Of particular importance to this study, based on those previous records, is the possibility that the state threatened Eastern Sand Darter, *Ammocrypta pellucida*, is present in the immediate vicinity of the Illinois Route 1 (IDOT FAP 332) bridge.

Other than a single locality in Riley Creek (Mississippi River drainage), the Eastern Sand Darter is present only in the upper Wabash River drainage in the state of Illinois (INHS Fish database, Smith 1979). More than 160 specimens from 53 collections have been recorded between 1900 and 2012 in this area. Within the Embarras River basin, the Eastern Sand Darter occurs commonly in stretches in Coles, Cumberland, Jasper, Crawford, and Lawrence counties. An intensive survey for the species in the Embarras River drainage found it to occur 35 sites between Charleston (Coles County) and Westport (Lawrence County) in 2007 (Henry et al. 2009). The most recent record, and the only collection made in Lawrenceville, was found in 2012 at the U.S. Route 50 bridge located just a half mile upstream of the Illinois Route 1 (IDOT FAP 332) bridge by INHS personnel C.A. Taylor, J.S. Tiemann, and S.L. Kilburn (INHS Fish Collection Catalogue #105554; Wetzel et al. 2012).

Smith (1979) reported that the darter was historically more widespread in occurrence but populations had been decimated as a result of siltation and impoundments. Pollution has also been cited as a factor in the decline of the species (Page and Burr 2011). The preferred habitat of the Eastern Sand Darter is runs of pure sand in small to medium sized rivers (Smith 1979; Page and Burr 2011).

Freshwater snails – The Embarras River within one mile of the Illinois Route 1 bridge had been sampled for freshwater mollusks by INHS and IDNR personnel on six occasions prior to this study. A total of 33 species of native freshwater mollusks were collected during those visits. Although no state or federally listed species were collected as live or fresh-dead since 1980, the state endangered Shawnee Rocksnail, *Lithasia obovata*, has been recorded in the Embarras River in the vicinity of the Illinois Route 1 bridge. The one and only collection of the Shawnee Rocksnail in the Embarras River was made in 1928 by C. Goodrich in Lawrenceville (University of Michigan Museum of Zoology Catalogue #44200). Today the Shawnee Rocksnail is found only in the Little Wabash and Ohio rivers in the state of Illinois (Tiemann and Cummings 2010).

The Shawnee Rocksnail normally occurs on woody debris and rocks in slow moving areas of large rivers. Major threats to the species include zebra mussels and impoundments (Tiemann and Cummings 2010).

## METHODS

A 350-yard stretch of the Embarras River at the Illinois Route 1 bridge (IDOT FAP 332) (**Figures 1, 2**) was sampled by INHS personnel Jeremy S. Tiemann, Kevin C. Cummings, and Matthew M. Van Der Bosch on 28 July 2014.

Fishes – Sampling for fishes was conducted for 15 minutes by positioning a minnow seine downstream of small sections of habitat while a survey crew member disturbed/kicked substrate, moving towards the net. The seine was then lifted and fish were examined. All fishes were identified, counted, and released, with the exception of a few specimens that were vouchered and deposited into the INHS Fish Collection (**Table 1**).

Freshwater snails – Sampling for freshwater snails was completed by hand-searching and visually inspecting rocks, woody debris, and the streambed (e.g., lifting a rock and visually

examining all sides) for one person-hour. Both banks and dried areas of shoreline were also visually searched for the presence of shells. No species of snails were collected during this survey, precluding deposition of voucher specimens in the INHS Mollusk Collection.

## RESULTS AND DISCUSSION

Fishes – Eighty-four individuals from eight species of fishes in six families (**Table 1**) were collected in the project location (**Figures 1, 2**). One juvenile state threatened Eastern Sand Darter was recorded in the Embarras River at this site. No other species of fish collected or observed during this survey are listed as endangered or threatened at the state or federal level, nor are any presently under consideration for such listing.

The Eastern Sand Darter’s preferred habitat is sandy runs of small to medium rivers with depths usually less than two feet (Smith, 1979; Page and Burr, 2011). This type of habitat is abundant at, immediately upstream, and immediately downstream of the Illinois Route 1 (IDOT FAP 332) bridge project corridor. As indicated by the juvenile collected during this 2014 survey, and using data from previous surveys (e.g., Wetzel et al. 2012), a reproducing population of the Eastern Sand Darter occurs in the Embarras River in the Lawrenceville area. In central Illinois, Eastern Sand Darters probably spawn in June and July at water temperatures ranging from 68 - 74° F (Johnston 1989). Therefore, all in-stream work associated with this bridge replacement project should be postponed until after the spawning season of the eastern sand darter has ended. We recommend no instream work between May 15 – August 15.

**Table 1.** Fishes collected by INHS personnel J.S. Tiemann, K.S. Cummings, and M.J. Van Der Bosch on 28 July 2014 from the Embarras River at the Illinois Route 1 (IDOT FAP 332) bridge, Lawrence County, Illinois. Special status includes <sup>ST</sup> = state threatened.

<b>Family</b>	<b>Scientific name</b>	<b>Common name</b>	<b>No. collected</b>
Lepisosteidae	<i>Lepisosteus platostomus</i>	Shortnose Gar	1
Cyprinidae	<i>Notropis buccatus</i>	Silverjaw Minnow	57
	<i>Notropis percobromus</i>	Carmine Shiner	13
Catostomidae	<i>Carpionodes carpio</i>	River Carpsucker	7
	<i>Moxostoma macrolepidotum</i>	Shorthead Redhorse	1
Ictaluridae	<i>Ictalurus punctatus</i>	Channel Catfish	3
Centrarchidae	<i>Lepomis macrochirus</i>	Bluegill	1
Percidae	<i>Ammocrypta pellucida</i> <sup>ST</sup>	Eastern Sand Darter	1

Freshwater snails – No freshwater snails were collected during this present survey of the Embarras River at the Illinois Route 1 (IDOT FAP 332) bridge. Based upon the number hours of sampling during our various survey for snails in the river at this site, we feel the Shawnee Rocksnail is extirpated from the Embarras River (INHS Mollusk Collection database; Tiemann and Cummings, 2010). The species has been collected only once from the Embarras River, and that single collection occurred nearly a century ago. Therefore, we feel the bridge construction activities will not affect the Shawnee Rocksnail.

## ACKNOWLEDGMENTS

We thank J.L. Jarvis (INHS) for her assistance in preparing the map in **Figure 1** and the associated shape file referenced in **Appendix 1**, Matthew J. Van Der Bosch (INHS) for his assistance with fieldwork, and Mark J. Wetzel for editing early drafts of this report.

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## **Appendix 1**

This page references < 14595\_Embaras\_River\_Fish\_Survey.zip and 14595\_Embaras\_River\_Mollusk\_Survey.zip > – containing ArcGIS shapefiles with sampling point information for the Embarras River site discussed in this report where surveys for fishes and freshwater snails were conducted by INHS personnel on 28 July 2014.

The ArcGIS shapefile and this report were both submitted to IDOT via the IDOT Site Assessment Tracking System extranet website (Frostycap) on 10 September 2014.

EXHIBIT 5

TURTLE REPORT



# INHS TECHNICAL REPORT

## Aquatic Turtle Surveys of the Embarras River Bottoms State Habitat Area (ERBSHA) in Lawrence County, Illinois

IDNR Project No.: NRDA1503



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**INHS Technical Report 2015 (43)**

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## PROJECT SUMMARY

This report details results of herpetological surveys with an emphasis on aquatic turtles in Embarras River Bottoms State Habitat Area (ERBSHA) in Lawrence County Illinois. Four sampling sessions each consisting of four day and three night were conducted by INHS aquatic ecologist / herpetologist A.R. Kuhns from June through October 2015. Sampling in June and early August focused on lentic wetlands and trap locations were paired to other long term monitoring stations within the property (**Figure 2**). September and October sampling sessions focused on the Embarras River proper that flows through the ERBSHA property. Seven freshwater turtle species were documented during the surveys. Additionally, six frog species and six snake species were encountered during the surveys. Notable captures include the Northern Musk Turtle, *Sternotherus odoratus*, and Spiny Softshell, *Apalone spinifera*, which represents the first documentations of the species in Lawrence County, Illinois; 18 Smooth Softshell, *Apalone mutica*, which is and endangered species in Illinois; and Eastern Ribbon Snake, *Thamnophis sauritus*, which is protected as a threatened species in Illinois. All sampling was conducted under an Illinois Department of Natural Resources (IDNR) Scientific collecting permit and IDNR Public Lands Research Permit to A.R. Kuhns and an IDNR State Threatened and Endangered Species Permit 05-11S (sub-permittee). Survey methods are approved under University of Illinois IACUC protocol 14000.



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**Cover Photo:** Smooth Softshell, *Apalone mutica*, captured in a single-throated, baited hoop trap set in the Embarras River, within the Embarras River Bottoms State Habitat Area in September 2015.

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## INTRODUCTION

The Embarras River Bottoms State Habitat Area (ERBSHA; **Figure 1**) was created as mitigation for the contamination of the old Indian Refinery south of Lawrenceville, IL and is managed by the Illinois Department of Natural Resources (IDNR). The habitat area currently consists of approximately 2,200 acres of bottomland forest and wetland habitat. In addition to the acreage, funds were provided to restore and enhance the quality of the habitat area. A four phase management and monitoring plan for the site was drafted by the IDNR and approved as a roadmap for restoration. Phase I of the plan includes 1) securing the site with boundary markers and gates, 2) baseline management such as brush cutting, mowing, bank stabilization, and oil-well management; and 3) baseline monitoring of flora and fauna within the property.

As one of the first steps towards capturing baseline data about the site, monitoring stations (**Figure 2**) were installed in the various habitat types throughout the site to 1) monitor vegetative succession, 2) as sites for point count bird surveys, and 3) camera traps for other wildlife. An initial effort to determine freshwater turtle species composition was conducted in 2013. Among other sampling efforts, the survey documented three species, Painted Turtles, *Chrysemys picta*, Snapping Turtle, *Chelydra serpentina*, and Sliders, *Trachemys scripta* from 20 traps set throughout the property.

This report builds upon the work done by IDNR to establish monitoring stations and set baseline information about the herpetological fauna of the ERBSHA site. The objective of this report is to increase the knowledge base of the amphibians and reptiles of the ERBSHA site with a special emphasis on freshwater turtle species. Additionally, results will aid in setting a baseline of turtle species composition to assess the effects of ongoing habitat restoration on the herpetofaunal community at the site.

## PROJECT AREA

The 2,200 acre site consists of lowland floodplains along approximately 8 km of the Embarras River. It encompasses parts of Sections 7, 8, 17, 18, 20, 21, 22, 26, 27, 28, and 34 of Township 3 N, Section 11 W of the USGS 7.5' Quadrangle Map (**Figure 1**). The habitat within the conservation area includes: mesic floodplain forest, old field habitat (both sand prairie and wet savanna), upland forest, and wetlands. The majority of the property has been disturbed by either agricultural use or oil reclamation.

## METHODS

Four rounds of trapping occurred in 2015: 02 through 05 June; 04 through 07 August; 25 through 28 August; 30 September through 02 October. Traps were set the first day, checked the next three days and pulled on the fourth day. Thus, each trapping session resulted in three separate samples of turtles per round. The predominant trap type used was collapsible hoop traps of various diameters (12", 20", and 26"). Utilizing different diameter of traps allowed for trapping

in various depths of water while still allowing the top of the trap to remain out of water and prevent turtles from drowning. Additionally, a two chambered, un-baited fyke net with a single lead was deployed in one wetland during the June and August sampling sessions.

Hoop traps were baited with invasive Asian carp, sourced from throughout the state. To prepare the bait, the fish was frozen whole and then sliced into approximately 1" cross sections (or steaks) using a reciprocating saw. Bait was hung from the center of the trap using either drainage tile sock, or suet bird feeders. With few exceptions, bait was changed daily.

During the June and early August sampling sessions I focused on wetlands within ERBSHA. In an effort to have trapping locations coincide with long term monitoring stations, traps were set at wetlands closest to the stations that were holding water (Table 2). In addition to setting turtle traps, transects were set and surveyed, and cover-boards were checked at each long-term monitoring location. Transects starting points were set as the pole denoting the long term monitoring station location and extended 50 m in a random direction with the stipulation that transects could not terminate on a vehicle path or regularly mowed area. The end of each transect was marked with a 6' narrow steel stake and flagged with orange flagging tape. Also at each long term monitoring station a pair of tin cover-boards (installed by IDNR in the spring of 2015) was flipped each time the traps were checked. The identity of all herptiles was recorded for all trap, cover-board, and transect samples. During the 04 through 07 August sampling session, only stations north of Billet Rd were sampled. The section south of Billet Road was inaccessible due to wet conditions. One trap location was replaced during the second sampling session because the traps at the original location were stolen. The new sampling station was set in an area that would receive less visitation and decrease the odds of trap theft. In addition to the set sampling that occurred at stations, I recorded all incidentally encountered amphibians and reptiles observed while travelling to the different locations. All species encountered are noted as such in **Appendix A**

The late August and September sessions were restricted to the Embarras River channel. Traps were set and checked via canoe and kayak. Traps placed in the Embarras River were 26" diameter single-throated hoop traps, also baited with invasive Asian carp. Traps were set with the entrance facing downstream and were selectively set along exposed sandbars in the Embarras River in an effort to document the state endangered Smooth Softshell, *Apalone mutica*. During these trapping sessions the long term monitoring stations were not checked as it was not logistically possible to sample both the wetlands and the river in a day.

All trap captures are reported as Catch Per Unit Effort (CPUE). For turtle surveys, the unit of effort is typically a trap night. As an example, if four traps are set for 3 nights in a sampling session, the total effort for that sample is 4x3 or 12 trap nights. The total number of captures per species is then divided by the total trap nights to generate the CPUE score. Thus, in the example above, if 6 individuals of a species were captured in those 12 trap nights, the CPUE for that species would be 0.5. CPUE is a means of standardizing results when effort is not equal between or among sites and more robust estimators are not warranted due to lack of robustness of the data.

## RESULTS

### Wetland Surveys

Turtle Trapping: Four of the monitoring stations were inaccessible for the duration of this study. Station R15-2P, the farthest south of the stations, is accessible only by crossing an old oxbow slough of the Embarras River. During both rounds of sampling in 2015 the water was too high to safely cross. In the northern unit of the site, a beaver dam has created a large pond that made R4-1P, R5-2P, and R6-1P inaccessible. Additionally, stations R13-1P and R13-2P were sampled in round one but were inaccessible for the second round of sampling.

The six long term monitoring stations I had access to were sampled for 144 trap nights and yielded five species of freshwater turtle (**Table 1**). Hoop traps never captured more than 3 species at any of the wetlands sampled and no turtles were captured at station R13-1P. Slider turtles were the most numerous species encountered (CPUE: Round 1 = 0.77; Round 2 = 0.91), followed by Painted Turtle (CPUE: Round 1 = 0.28; Round 2 = 0.12) and Snapping Turtle (CPUE: Round 1 = 0.22; Round 2 = 0.17). Two species, Northern Musk Turtle, *Sternotherus odoratus*, and Spiny Softshell, *Apalone spinifera*, were represented by a single individual. Additionally, the lone Northern Musk Turtle encountered was captured in the fyke net.

Cover-boards and Transects: Nothing was detected under the cover-boards or transects during the June round of sampling. The second round of sampling, in early August, produced 3 frog species and 2 snake species (**Table 2**).

### River Surveys

Three species of freshwater turtle were captured in 58 trap nights of sampling the Embarras River (**Table 3**). Slider Turtles were again the most frequently captured species (CPUE: Round 1 = 0.74; Round 2 = 0.49), but two species, Smooth Softshell, and Ouachita Map Turtle, were detected in the river that were absent from the wetland samples.

## DISCUSSION

Sampling at ERBSHA proved to be challenging due to hydrologic conditions of the site. Initial plans were to sample the site once each in May, June, July and August. However, as shown above, this proved impossible in 2015. I was unable to initiate any sampling at the site until June due to flooded conditions at the site. During that initial sampling session, the water rose over 3 feet in some wetlands, making it difficult to set traps in such a way to keep captured animals from drowning. Two additional sampling sessions were cancelled in July due to wet conditions at the site and during the early August sampling round I was still unable to access the southern portion of the site. Further, one sampling location had to be changed when traps set overnight were stolen. These factors have precluded an in depth analysis of occupancy and detection that I was hoping to provide with this study.

Despite these difficulties, sampling remained productive in determining species composition of the site. Cover boards set at the long term monitoring stations were probably set too late to be of great value in 2015. Heyer (1994) suggests setting cover-boards the year before sampling begins to have the greatest

odds of their success. Regardless, cover-boards did start to become productive by August, with Northern Watersnake, Common Gartersnakes, and Southern Leopard Frogs, all being found underneath them (**Table 2**). Transects were run with minimal success during 2015 although they did document four species (**Table 2**). By time the site was accessible in June, the vegetation was already well established along most transects, making observations of herpetofauna difficult. Regardless, these two sampling methods will be of value in the long term monitoring of the site. As repeated visits to the monitoring stations continue, and observations are recorded, a wealth of data should come from them.

The initial turtle survey in 2014 detected three species in ERBSHA. In 2015, those three species and three additional species of freshwater turtle were captured. In fact, every species of freshwater turtle currently known to occur in Lawrence County, Illinois was detected during this study (**Appendix D**). As is the norm in southern Illinois, the turtle community was dominated by the Slider Turtle, *Trachemys scripta*. This is also the case farther south in Gallatin County, IL (Dreslik et al. 2005) and in the backwaters of the Mississippi River (Dreslik and Phillips 2005). The Common Snapping Turtle, *Chelydra serpentina*, and Painted Turtle, *Chrysemys picta*, are also common species that inhabit many of the states wetlands and the two species were captured with equal regularity in this study. In the northern parts of the state, the Painted Turtle often replaces the Slider as the most numerous species.

The fourth most frequently encountered species the Smooth Softshell, *Apalone mutica*, was only encountered in the Embarras River channel. This is not surprising as it is considered a specialist species that prefers flowing currents over sandy substrates. Because the Smooth Softshell is afforded protection as an endangered species in Illinois (IESPB 2015), the 18 individuals, including 8 mature females, captured is promising. The lack of recaptures of this species prevents even a rudimentary estimate of population size. However, all individuals were marked (triangular notch at 5:00), so long term monitoring at the site may result in re-capture of these individuals and allow for a preliminary population estimate. Additionally, blood samples were taken from all Smooth Softshell captures and were accessioned into the INHS tissue collection.

The fifth most encountered species Ouachita Map Turtle, *Gratemys ouachitensis*, was also only captured in traps set in the Embarras River. All three individuals were males and were captured on the same day of sampling. While, map turtles typically inhabit riverine systems, they can also be found in backwater lakes and sloughs adjacent to rivers. While not captured, one Ouachita Map Turtle was tentatively identified basking on top a hoop traps set at R7-4P North during the first sampling session. Certainly, map turtles may be more abundant in the wetlands of ERBSHA than indicated from this study. This species is not often captured in hoop traps as they are typically not attracted to the cut fish used as bait.

The Spiny Softshell, *Apalone spinifera*, was represented by a single individual during this study. Spiny Softshell are not as catholic in their habitat requirements as are Smooth Softshell, therefore, it is somewhat surprising that only one individual was captured. Little is known about the interactions of the two softshell species. By sampling only sand bars in the river, I may have reduced the likelihood of capturing Spiny Softshell. While canoeing the Embarras River between sandbars a great number of softshell turtles were observed but identifying characteristics could not be discerned before they dove off their basking perches. Thus it is possible that the lack of Spiny Softshell in this sample is a result of sampling bias. The lone individual captured was from R7-4P South which does have discernable flow during the sampling sessions. Conversely, the fact that none were captured in the 2013 sample may indicate that they truly are uncommon in ERBSHA. Of note, this individual is the first documented record of the Spiny Softshell in Lawrence County, IL.



The other least encountered species Northern Musk Turtle, *Sternotherus odoratus*, was not captured in baited hoop traps at all. The lone individual, a female, was captured in the fyke net set west of R7-2P in the wetland colloquially known as Fishtail. *Sternotherus* are poor swimmers and generally frequent shallow waters where they can extend their heads to the surface while resting on the bottom. This may have some role in why none were captured in hoop traps as the water where traps were set was typically 18" or deeper. The lead of the fyke net in which the individual was captured extended nearly to shore (**Plate 3**) and may have intercepted the individual as it was walking the shallows of the wetland. Of note, this individual is the first documented record of the Northern Musk Turtle in Lawrence County, IL.

In conclusion, this study has produced a baseline for the freshwater turtle fauna and provided proof of concept for continued monitoring of other herpetofauna via cover-boards and transect sampling. This study detected three species of conservation concern in the state of Illinois (**Appendices A & C**) and suggests that there may be a sizeable population of the state endangered Smooth Softshell in the Embarras River within the site. Additionally, the captures of Northern Musk Turtle and Spiny Softshell, are the first records of the species from Lawrence County, Illinois. Long term monitoring of the herpetofaunal population at ERBSHA will be challenging. Floodplain dynamics are fluid and thus it is difficult to set regimented schedules for sampling. Although set scheduling of sampling may prove difficult, the long term monitoring stations should provide valuable information on the inhabitants of the site. Through repeated visits to the stations when and if conditions allow, it should be possible to continue to gain a better understanding of the inhabitants of the site and to detect trends in species composition as the site undergoes restoration.

## ACKNOWLEDGEMENTS

Thanks to Doug Brown, Terry Esker, John Bunnell, Chris Phillips, and John Crawford for assistance in the field. Thanks to T.J. Benson, Geoff Levin, Jessica Riney, and Beth Whetsell for institutional support and insight into the site. Thanks to Jessica Riney and Beth Whetsell for reviewing a draft of this manuscript.

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**Table 1.** Trap locations, Captures per Unit Effort\* (CPUE), and turtle captures by sex/stage class (Female: Male: Juvenile) during surveys of wetlands in the Embarras River Bottoms State Habitat Area near Billett in Lawrence County, Illinois.

	03-05 June 2015					05-07 August 2015				
Hoop Trap Site	Trap Nights	<i>C. picta</i>	<i>C. serpentina</i>	<i>T. scripta</i>	<i>S. odoratus</i>	Trap Nights	<i>C. picta</i>	<i>C. serpentina</i>	<i>T. scripta</i>	<i>A. spinifera</i>
R13-1P	12	0:0:0	0:0:0	0:0:0	0:0:0	0	---	---	---	---
R13-2P	12	0:0:0	0:2:0	5:13:0	0:0:0	0	---	---	---	---
R07-4P_N	6	1:2:0	0:0:0	9:9:0	0:0:0	6	0:1:0	0:1:0	0:7:2	0:0:0
R07-4P_S	6	0:0:0	0:0:0	0:1:0	0:0:0	6	0:0:0	1:1:0	3:4:0	1:0:0
R07-2P_W	12	6:4:0	5:5:0	6:8:4	0:0:0	12	0:0:0	0:2:0	6:7:0	0:0:0
R07-2P_E	12	1:5:0	0:0:0	0:1:0	0:0:0	12	1:4:0	0:0:0	0:3:1	0:0:0
R1-1P	12	0:0:0	3:2:0	0:0:0	0:0:0	12	1:1:0	0:2:0	5:6:0	0:0:0
R16-01T_S	6	1:2:0	0:0:0	3:0:1	0:0:0	6	0:0:0	0:0:1	0:0:0	0:0:0
R16-01T_N	0	---	---	---	---	12	0:0:0	3:0:0	6:10:0	0:0:0
<b>Totals</b>	78	9:13:0	8:9:0	23:32:5	0:0:0	66	2:6:0	4:6:1	20:37:3	1:0:0
<b>Hoop Trap CPUE</b>		0.28	0.22	0.77	0		0.12	0.17	0.91	0.02
<b>Fyke Net</b>	3	0:0:0	0:0:0	0:1:1	1:0:0	3	5:7:0	1:0:1	1:0:0	0:0:0
<b>Fyke Net CPUE</b>		0	0	0.67	0.33		4	0.66	0.33	0

\* CPUE is Catch Per Unit Effort. In this case the unit of effort is Trap Night. One Trap Night equals one trap in the water for one night. Thus two traps set for 3 nights results in 6 trap nights.

**Table 2.** Coordinates of wetlands that were paired with the long term monitoring stations within the Embarras River Bottoms State Habitat Area.

Station	Latitude	Longitude
R13-1P	38.65798	-87.6263
R13-2P	38.65508	-87.6237
R07-4P_N	38.67738	-87.6267
R07-4P_S	38.67698	-87.6265
R07-2P_W	38.68526	-87.633
R07-2P_E	38.68513	-87.6325
R1-1P	38.70077	-87.677
R16-01T_S	38.66378	-87.6335
R16-01T_N	38.6704	-87.6332
Fyke	38.68484	-87.6372

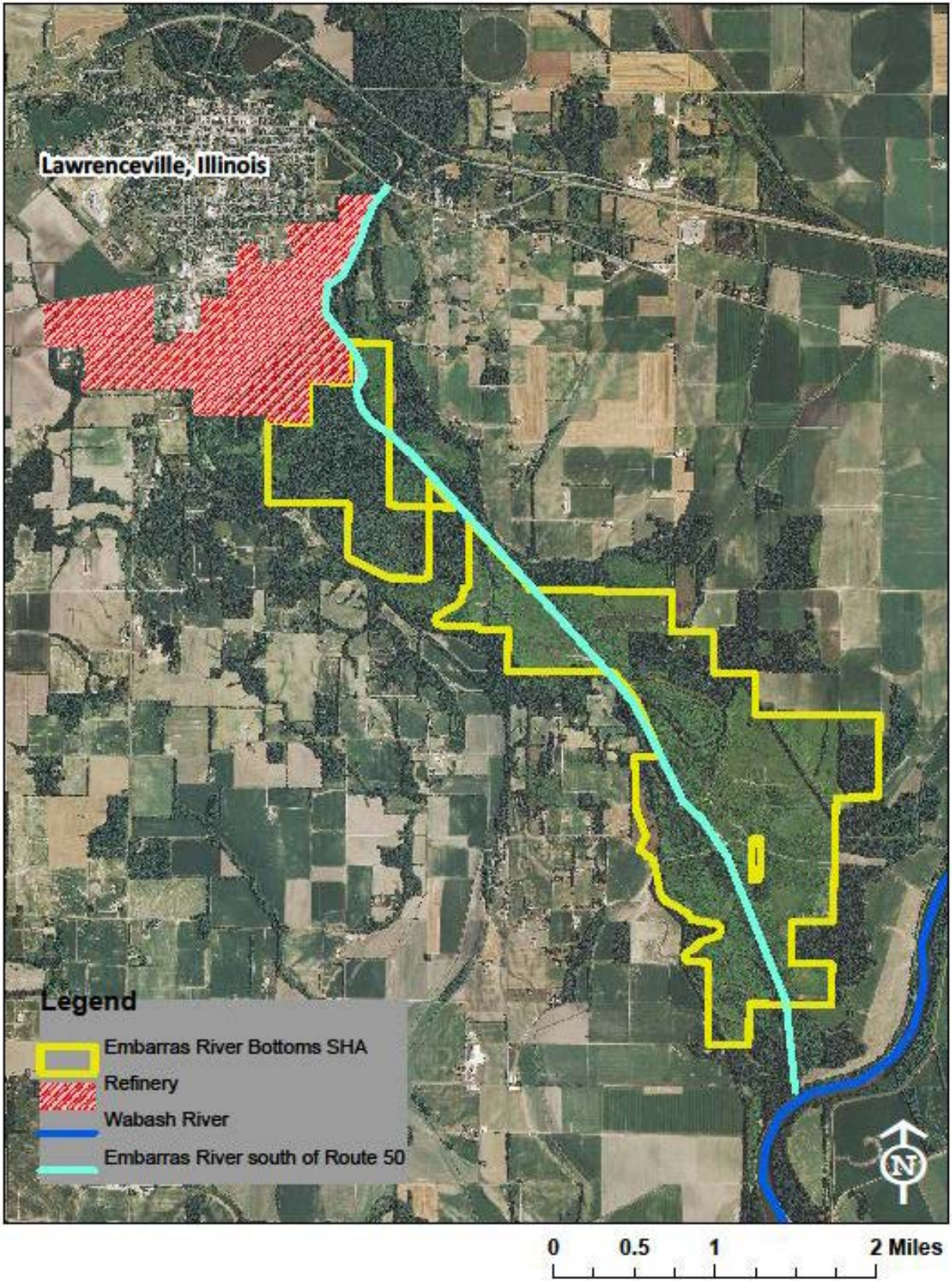
**Table 3.** Encounters along transects and under cover-boards at the ERBSHA long term monitoring stations in June and August 2015. All stations were checked in June but no observations were made. In August, only the stations North of Billet Road were checked.

Station	Method	L. sphenoccephalus	A. fowleri	A. blanchardi	N. sipedon	T. sirtalis
R7-4P	Cover-boards	4	2	0	1	0
	Transects	2	0	0	1	0
R7-2P	Cover-boards	0	0	0	4	2
	Transects	0	0	5	0	0
R1-1P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R16-1T	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R13-01P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R13-2P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R1-1P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0

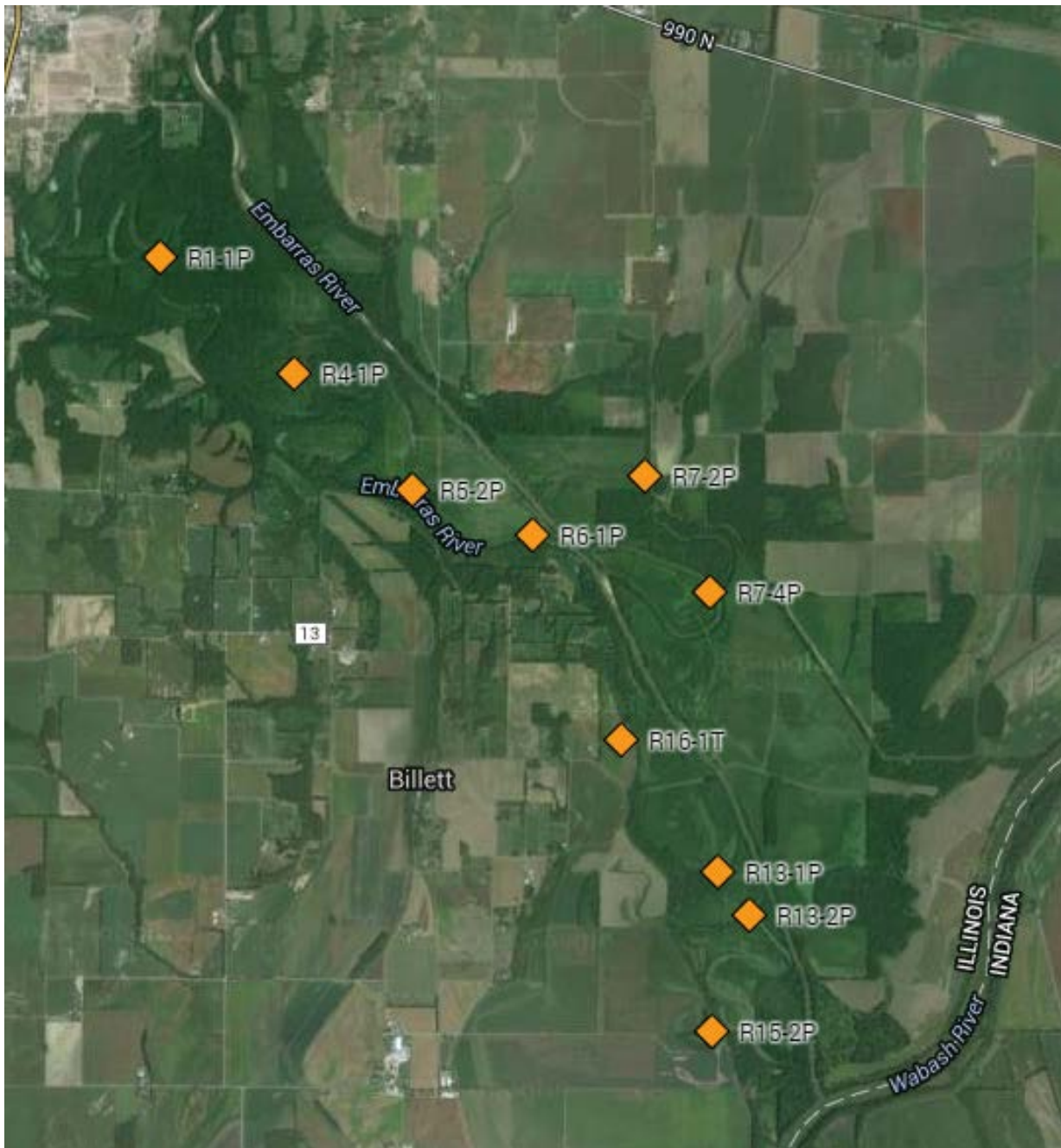
**Table 4.** Trap locations, Captures per Unit Effort\* (CPUE), and turtle captures by sex/stage class (Female: Male: Juvenile) during surveys of the Embarras River reach that passes through Embarras River Bottoms State Habitat Area near Billett in Lawrence County, Illinois.

Trap Site	Latitude	Longitude	Round 1 (25 -28 August 2015)			Round 2 (30 Sept -02 October 2015)				
			Trap Nights	<i>G. ouachitensis</i>	<i>T. scripta</i>	<i>A. mutica</i>	Trap Nights	<i>G. ouachitensis</i>	<i>T. scripta</i>	<i>A. mutica</i>
SB1	38.71204	-87.67159	4	0:0:3	3:7:0	0:0:0	8	0:0:0	4:5:0	1:1:0
SB2	38.70805	-87.66841	6	0:0:0	1:2:0	0:0:0	6	0:0:0	2:3:0	1:3:0
SB3	38.70329	-87.66678	7	0:0:0	1:0:0	4:3:0	6	0:0:0	1:2:0	0:3:0
SB4	38.69565	-87.65722	0	---	---	---	3	0:0:0	0:0:0	0:0:0
SB5	38.693698	-87.65473	6	0:0:0	1:2:0	2:0:0	6	0:0:0	0:0:0	0:0:0
SB6	38.677515	-87.63622	0	---	---	---	6	0:0:0	0:0:0	0:0:0
<b>Totals</b>			<b>23</b>	<b>0:0:3</b>	<b>6:11:0</b>	<b>6:3:0</b>	<b>35</b>	<b>0:0:0</b>	<b>7:10:0</b>	<b>2:7:0</b>
<b>CPUE</b>				<b>0.13</b>	<b>0.74</b>	<b>0.39</b>		<b>0</b>	<b>0.49</b>	<b>0.26</b>

\* CPUE is Catch Per Unit Effort. In this case the unit of effort is Trap Night. One Trap Night equals one trap in the water for one night. Thus two traps set for 3 nights results in 6 trap nights.



**Figure 1.** Embarras River Bottoms State Habitat Area, south of Lawrenceville in Lawrence County, Illinois



**Figure 2.** Location of long term monitoring stations in ERBSHA.

## Appendix A

### Herpetofaunal species recorded from Lawrence County, Illinois

\* Denotes species documented in this survey

+ denotes new observation of the species in the county

#### Amphibians

##### Salamanders

*Ambystoma maculatum*  
*Ambystoma opacum*  
*Ambystoma texanum*  
*Ambystoma tigrinum*  
*Plethodon cinereus*  
*Plethodon glutinosus*  
*Siren intermedia*  
*Hemidactylium scutatum*  
*Notophthalmus viridescens*  
*Cryptobranchus alleganiensis*

##### Frogs

*Acris blanchardi* \*  
*Pseudacris crucifer*  
*Pseudacris triseriata*  
*Hyla versicolor-chrysosecelis* \*  
*Anaxyrus fowleri* \*  
*Scaphiopus holbrookii*  
*Lithobates areolatus*  
*Lithobates catesbeianus*  
*Lithobates clamitans* \*  
*Lithobates sphenoccephalus* \*  
*Lithobates sylvaticus*

#### Reptiles

##### Turtles

*Apalone mutica* \*  
*Apalone spinifera* \*, +  
*Chelydra serpentina* \*  
*Chrysemys picta* \*  
*Graptemys ouachitensis* \*  
*Trachemys scripta* \*  
*Terrapene carolina* \*  
*Sternotherus odoratus* \*, +

##### Lizards

*Plestiodon fasciatus*  
*Plestiodon laticeps*

##### Snakes

*Coluber constrictor* \*  
*Heterodon platirhinos*  
*Lampropeltis calligaster*  
*Nerodia erythrogaster* \*  
*Nerodia sipedon* \*  
*Pantherophis spiloides* \*  
*Storeria dekayi*  
*Thamnophis sauritus* \*  
*Thamnophis sirtalis* \*

**Appendix B**  
**Plates of stations sampled at ERBSHA in 2015**



Plate 1. Wetland at station 07-2P West in ERBSHA



Plate 2. Wetland at 07-2P East in ERBSHA.





Plate 3. Fyke net set in same wetlands as station 07-2P West at ERBSHA.



Plate 4. Wetland sampled as 07-4P North at ERBSHA. Note one of the coverboards is visible in the foreground of the image



Plate 5. Station 07-4P South. This was the only location where a Spiny Softshell was captured.



Plate 6. Original location of sampling station R16-1T. It is denoted as R16-1T South in Table 1. The traps were stolen from this location so the site was changed to that depicted in Plate 7.



Plate 7. Replacement location for monitoring station R16-1T. Denoted as R16-1T North in Table 1.



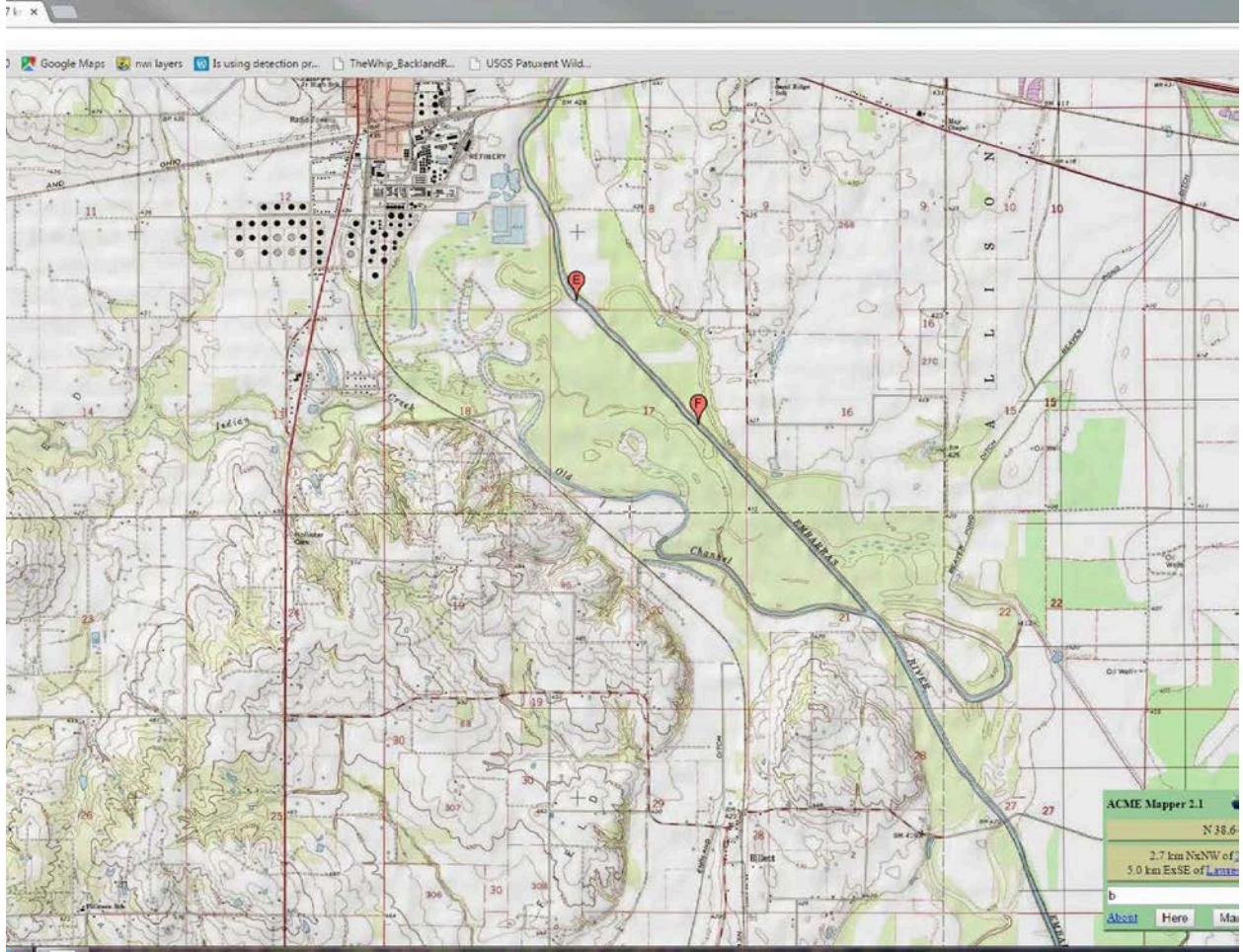
Plate 8. One of the five sand bar sampled on the Embarras River during the second two rounds of sampling at ERBSHA in 2015. Numerous Smooth Softshell turtles were captured at this sandbar.

## **Appendix C**

### **Element Occurrence Records submitted from this study**

Illinois Natural Heritage Database Endangered /Threatened Species Occurrence and Sighting Report Form											
Name of Species:		Thamnophis sauritus					Date Observed:		06/02/2015		
New Sighting		or Update	x	Entire extent of occurrence is:				known OR	x	not known	
Naturally Occurring	x	or	Introduced Location			When?		From Where?			
Location: (For more accurate mapping, please provide a map showing the exact location)											
County:	Lawrence		Latitude	38.69946		Longitude	-87.67763				
Direction from Nearest Landmark:			3.3 km S of Lawrenceville, Embarras River Bottoms State Habitat Area								
Natural Division and Section:											
Legal Description:		Township		Range		Section		Quad name			
INAI Site Name:						Survey Site Name (alias)		ERSHA			
Observations : (evidence of breeding or # of ♂, ♀ & juvenile animals or # fruiting/flowering/seedling plants, etc.): fruiting/flowering/seedling plants											
Description of Area:											
was found along a trail foraging in a puddle full of tadpoles											
Comments:											
not in great condition. skinny even for a ribbon snake											
Specimen/voucher #(s):		INHS Unvouchered				Where deposited?		released immediately			
Name of Observer:											
Andrew Kuhns, Dan Brown											
Observer's Phone Number		(	217	)	265	-	6707				
Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources, One Natural Resources Way, Springfield IL 62702-1271											
											Rev 11/07

Illinois Natural Heritage Database Endangered /Threatened Species Occurrence and Sighting Report Form											
Name of Species:		Apalone mutica					Date Observed:		8/27&28/2015		
New Sighting		or Update	x	Entire extent of occurrence is:				known OR	x	not known	
Naturally Occurring	x	or	Introduced Location			When?		From Where?			
Location: (For more accurate mapping, please provide a map showing the exact location) map attached											
County:	Lawrence		Latitude	38.69364 & .70323		Longitude	-87.65457 & -87.66708				
Direction from Nearest Landmark:			3.3 km N of Billett, IL & 4.5 km NxNW of Billett, IL								
Natural Division and Section:			Wabash Borders								
Legal Description: Township			Range		Section		Quad name				
INAI Site Name:						Survey Site Name (alias)		Embaras River			
Observations : (evidence of breeding or # of ♂, ♀ & juvenile animals or # fruiting/flowering/seedling plants, etc.): fruiting/flowering/seedling plants											
2 adult females at the first coordinates, 6 females & 2 males at second location.											
Description of Area:		Sand bars in the Embarras River within the Embarras River Bottoms State Habitat Area.									
Comments:		23 trap nights, single throated collapsible hoop traps baited with invasive asian carp resulted in 10 captures									
Specimen/voucher #(s):		INHS Photo and tissue				Where deposited?		turtles released, tissue INHS			
Name of Observer:		Andrew R Kuhns & John A Crawford									
Observer's Phone Number		(	217	)	265	-	6707				
Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources, One Natural Resources Way, Springfield IL 62702-1271											
											Rev 11/07



Illinois Natural Heritage Database Endangered /Threatened Species Occurrence and Sighting Report Form											
Name of Species:		Apalone mutica					Date Observed:		9/30/15 - 10/02/15		
New Sighting		or Update	x	Entire extent of occurrence is:				known OR	x	not known	
Naturally Occurring	x	or	Introduced Location			When?		From Where?			
Location: (For more accurate mapping, please provide a map showing the exact location) map attached											
County:	Lawrence		Latitude	37.71204		Longitude	-87.67159				
Direction from Nearest Landmark:			1.9 km to 3.2 km SxSE Lawrenceville, IL to								
Natural Division and Section:											
Legal Description:		Township		Range		Section		Quad name			
INAI Site Name:						Survey Site Name (alias)					
Observations : (evidence of breeding or # of ♂, ♀ & juvenile animals or # fruiting/flowering/seedling plants, etc.): fruiting/flowering/seedling plants											
2 Females, 7 males											
Description of Area: Sand bars along the Embarras River											
Comments: Captured with single throated hoop traps baited with asian carp; 38 trap nights of effort											
Specimen/voucher #(s):			INHS Unvouchered			Where deposited?		released immediately			
Name of Observer: Andrew Kuhns, J.A. Crawford, C.A. Phillips											
Observer's Phone Number		(	217	)	265	-	6707				
Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources, One Natural Resources Way, Springfield IL 62702-1271											
											Rev 11/07

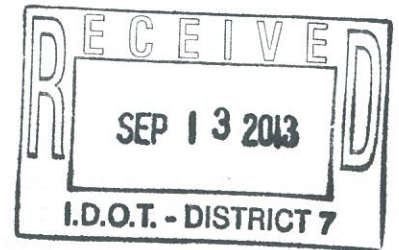


EXHIBIT 6

US ARMY CORPS 404 PERMIT



**DEPARTMENT OF THE ARMY**  
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE  
CORPS OF ENGINEERS  
REGULATORY BRANCH, WEST SECTION  
P.O. Box 489  
NEWBURGH, INDIANA 47629-0489  
September 11, 2013



Operations Division  
Regulatory Branch (West)  
ID No. LRL-2009-1218-GJD

Mr. Roger Driskell  
Illinois Department of Transportation  
Division of Highways  
400 West Wabash  
Effingham, Illinois 62401

Dear Mr. Driskill:

Enclosed, is a validated Department of the Army permit relating to your proposal to facilitate the replacement of the IL-1 Embarras River crossing. The proposed project would install a new 3 span composite 60" web plate girder structure, 481.5' back to back of abutments with a 40" clear width. The proposed structure would be shifted north to better align with the Embarras River and the profile would be raised @ 9'. An expanded right of way would be required to accommodate the grade raise and a detour would be utilized during construction. County Road 14, located to the northeast of the crossing would also be realigned. A 4'x5' culvert, located along Illinois 1, just south of Cemetery Road, would be replaced extended to meet the slopes and drainage ditch. The project would necessitate the impacts to 1.557 acres of palustrine forested wetlands (PFO). The project would also necessitate the installment of 2 piers associated footers within the river channel. The project is located where IL-1 crosses the Embarras River and adjacent wetlands, Lawrence County, Illinois. This permit is valid until December 31, 2018.

If you have any questions concerning this matter, please contact this office at the above address, ATTN: CELRL-OP-FW or call me at (812) 842-2807.

Sincerely,

George DeLancey  
Project Manager  
Regulatory Branch

Copy Furnished:

DeLancey/OP-FW  
ILEPA/401 WQC

## DEPARTMENT OF THE ARMY PERMIT

**Permittee:** Illinois Department of Transportation

**Permit Number:** LRL- 2009-1218-GJD

**Issuing Office:** U.S. Army Engineer District, Louisville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

**Project Description:** The authorized project will result in discharges of fill and/or dredged material into "waters of the United States" located at and adjacent to the IL-1 Embarras River crossing. The permittee is authorized to complete the following: 1. to fill 1.557 acres of Palustrine Fprested Wetlands and to install 2 piers with associated footers within the Embarras River bridge.

The proposed project would install a new 3 span composite 60" web plate girder structure, 481.5' back to back of abutments with a 40" clear width. The proposed structure would be shifted north to better align with the Embarras River and the profile would be raised 2' 9". An expanded right of way would be required to accommodate the grade raise and a detour would be utilized during construction. County Road 14, located to the northeast of the crossing would also be realigned. A 4'x5' culvert, located along Illinois 1, just south of Cemetery Road, would be replaced extended to meet the slopes and drainage ditch.

**Mitigation:** The permittee shall purchase 7.564 wetland credits from the Illinois Department of Transportation Lawrence Mitigation Bank.

**Project Location:** The mine project site is located at the IL-1 Highway crossing of the Embarras River and adjacent wetlands, Lawrence County, Illinois. The general project location and mitigation location are depicted in the maps (Map 1 and 2 of 2) attached to this authorization.

### Permit Conditions:

#### General Conditions:

1. The time limit for completing the authorized activity ends on **December 31, 2018**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification from this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
  - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
  - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
  - d. Design or construction deficiencies associated with the permitted work.
  - e. Damage claims associated with any future modification, suspension, or revocation of this permit.
4. **Reliance on Applicant's Data.** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
- a. You fail to comply with the terms and conditions of this permit.
  - b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
  - c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions.** General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give you favorable consideration to a request for an extension of this time limit. Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Rep 200000  
(PERMITEE)

9/3/13  
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

LUKE LEONARD  
COLONEL, CORPS OF ENGINEERS  
DISTRICT COMMANDER

11 SEPT 2013  
(DATE)

BY: George Delancey  
Regulatory Project Manager  
Regulatory West Section

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

\_\_\_\_\_  
(TRANSFEE)

\_\_\_\_\_  
(DATE)



Project Location

IL 1

ILDOT Embarras/IL-1 Crossing  
Project Location  
Corps ID# LRL-2009-1218-gjd  
Map 1 of 2



ILDOT Embarras/IL-1 Crossing  
Mitigation Location  
Corps ID# LRL-2009-1218-gjd  
Map 2 of 2 f d

Mitigation Location

England Pond Levee

EXHIBIT 7

US FISH & WILDLIFE SERVICE LETTER



**From:** [Walker, Brett S](#)  
**To:** [Walker, Brett S](#)  
**Subject:** FW: [External] Re: seq. 14595, IL 1 over Embarras R, Lawrenceville, Lawrence Co - bat coordination  
**Date:** Thursday, November 10, 2016 3:30:15 PM

---

**From:** Woeber, Heidi [mailto:[heidi\\_woeber@fws.gov](mailto:heidi_woeber@fws.gov)]  
**Sent:** Friday, November 04, 2016 12:54 PM  
**To:** Hargrove, Susan Dees  
**Subject:** [External] Re: seq. 14595, IL 1 over Embarras R, Lawrenceville, Lawrence Co - bat coordination

Susan:

This project adheres to the FHWA/FRA range-wide programmatic informal consultation, including ibat and nleb. We recommend that tree clearing be timed to minimize, to the extent possible, impacts to migratory birds.

Heidi Woeber  
Fish and Wildlife Biologist  
Ecological Services  
**U.S. Fish and Wildlife Service**  
1511 47th Avenue  
Moline, IL 61265  
309/757-5800, ext. 209  
309/757-5807 Fax  
[heidi\\_woeber@fws.gov](mailto:heidi_woeber@fws.gov)

On Tue, Nov 1, 2016 at 1:22 PM, Hargrove, Susan Dees <[Susan.Hargrove@illinois.gov](mailto:Susan.Hargrove@illinois.gov)> wrote:

Hi Heidi,

Consultation Code: 03E18100-2017-SLI-0060

Please find enclosed documents pertaining to the above project with respect to IN bat and NLEB programmatic bat BA for your review and response. We discussed this project briefly this week regarding tree removal.

This project replaces the IL 1 bridge over the Embarras River just north of Lawrenceville, IL. There will be 4.148 acres of new right of way, instream work in the Embarras River, and 3.04 acres of tree removal. Land cover is primarily floodplain silver maple forest and wetlands. Wetland mitigation shall occur at the Lawrence Wetland Mitigation Bank in the amount of 7.56 acres.

The Individual 404 and OWR permits have been obtained.

Please note that INHS conducted a bat tree habitat assessment conducted October 29, 2014 in which they located and marked 14 trees suitable for bat roosting. This had previously been coordinated with USFWS, with your concurrence dated November 18, 2014. Commitments receiving concurrence are the first two bullet points below. (The prior USFWS concurrence dated September 26, 2014, is also attached.)

This email updates the USFWS Section 7 coordination to include the bat bridge assessment and a map of tree removal locations and quantities. There will be nine areas of tree removal located in all four bridge quadrants. Tree removal quantities range from 0.15-0.6 acres in each area. Tree removal occurs adjacent to IL 1 and CR 14. The adjacent land use is residential and cemetery.

Attached: Project Submittal Form, location map, TREC, tree removal map, ESR form, 2014 bat tree survey report, 2016 bat bridge assessment, OWR permit, correspondence with USFWS.

Commitments:

- 14 trees identified and marked by INHS as potential suitable bat habitat will not be cleared from April 1 through September 30.
- The remaining trees three (3) inches or greater in diameter at breast height can be removed at any time.
  - A bat bridge assessment was conducted May 18, 2016, and is valid for one year. Expired assessments will need to be updated prior to the start of work on the bridge.

Let me know if you have any questions.

Thanks,

Susan Dees Hargrove

Biological Resources Specialist

Illinois Department of Transportation

Bureau of Design and Environment

2300 South Dirksen Parkway, Room 330

Springfield, Illinois 62764

217/785-0150

[Susan.Hargrove@illinois.gov](mailto:Susan.Hargrove@illinois.gov)

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.



# United States Department of the Interior



U.S. FISH AND WILDLIFE SERVICE  
Marion Illinois Sub-Office (ES)  
8588 Route 148  
Marion, Illinois 62959  
(618) 997-3344

April 17, 2013

Contract # 74180  
LAWRENCE Co.  
602/ 111-1  
EMBARRAS RIVER

U.S. Army Corps of Engineers  
Louisville District  
P.O. Box 489  
Newburgh, Indiana 47629

Attn: Mr. George DeLancey, CELRL-OP-FW

Dear Mr. DeLancey:

Thank you for the opportunity to comment on Public Notice LRL-2009-1218-gjd. The Illinois Department of Transportation (IDOT) is seeking a Department of the Army permit to install a new 3-span girder structure, expand a road right of way, and realign a county road near Lawrenceville in Lawrence County, Illinois. These comments are prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Information in the public notice indicates that the proposed project will impact a total of 1.557 acres of forested wetlands. The proposed mitigation includes establishing 7.564 acres of forested wetlands at the IDOT Lawrence Mitigation Bank. The Service concurs with the proposed mitigation and has no objection to issuance of a Department of the Army permit for the proposed activities.

## Threatened and Endangered Species

A determination has been made that the proposed activity will not destroy or endanger any federally listed threatened or endangered species or their critical habitats. To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service (Service) information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. That list includes the endangered Indiana bat (*Myotis sodalis*), endangered fat pocketbook (*Potamilus capax*), threatened eastern prairie fringed orchid (*Platanthera leucophaea*), and proposed as threatened rabbitsfoot (*Quadrula cylindrica cylindrica*). There is no designated critical habitat in the project area at this time.

Based on the location of the proposed project and project description, the Service concurs that the proposed project is not likely to adversely affect the fat pocketbook, eastern prairie fringed orchid, and rabbitsfoot. The Service recommends that any tree clearing be minimized or avoided if possible to reduce impacts to potential habitat for the Indiana bat. If tree clearing is necessary, it should not occur during the April 1 thru September 30 time frame to avoid impacting the Indiana bat. Provided this tree clearing restriction is adhered to, the Service would concur that the proposed project is not likely to adversely affect the Indiana bat. If it is necessary to clear trees during the April 1 to September 30th time frame, then we would recommend an Indiana bat habitat assessment be conducted in order to assess the value of the habitat to Indiana bats. Should this project be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination with this office, as appropriate, should be initiated.

Thank you for the opportunity to comment on the proposed permit and provide information on threatened and endangered species in the proposed project area. If you have any questions, please contact me at (618) 997-3344, ext. 345.

Sincerely,

*/s/ Matthew T. Mangan*

Matthew T. Mangan  
Biologist in Charge

EXHIBIT 8

IL EPA 401 PERMIT



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217)782-2829  
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

217782-3362

JUL 09 2013

U. S. Army Corps of Engineers  
Louisville District  
Newburgh Regulatory Office  
Post Office Box 489  
Newburgh, Indiana 47629-0489

Contract # 74180  
ILL-1  
(16 BR) B-1  
LAWRENCE C.

Re: Illinois Department of Transportation – District 7 (Lawrence County)  
Illinois Route 1 Bridge Replacement – Embarras River and unnamed wetlands  
Log # C-0783-09 [CoE appl. # 2009-1218]

Gentlemen:

This Agency received a request on October 6, 2009 from Illinois Department of Transportation District 7 requesting necessary comments concerning the replacement of the bridge carrying Illinois Route 1 over the Embarras River impacting the Embarras River and unnamed wetlands. We offer the following comments.

Based on the information included in this submittal, it is our engineering judgment that the proposed project may be completed without causing water pollution as defined in the Illinois Environmental Protection Act, provided the project is carefully planned and supervised.

These comments are directed at the effect on water quality of the construction procedures involved in the above described project and are not an approval of any discharge resulting from the completed facility, nor an approval of the design of the facility. These comments do not supplant any permit responsibilities of the applicant toward the Agency.

This Agency hereby issues certification under Section 401 of the Clean Water Act (PL 95-217), subject to the applicant's compliance with the following conditions:

1. The applicant shall not cause:
  - a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulations;
  - b. water pollution defined and prohibited by the Illinois Environmental Protection Act; or
  - c. interference with water use practices near public recreation areas or water supply intakes.
2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.
3. Any spoil material excavated, dredged or otherwise produced must not be returned to the waterway but must be deposited in a self-contained area in compliance with all state statutes, regulations and permit requirements with no discharge to waters of the State unless a permit has been issued by this Agency. Any backfilling must be done with clean material and placed in a manner to prevent violation of applicable water quality standards.

4302 N. Main St., Rockford, IL 61103 (815)987-7760  
595 S. State, Elgin, IL 60123 (847)608-3131  
2125 S. First St., Champaign, IL 61820 (217)278-5800  
2009 Mall St., Collinsville, IL 62234 (618)346-5120

9511 Harrison St., Des Plaines, IL 60016 (847)294-4000  
5407 N. University St., Arbor 113, Peoria, IL 61614 (309)693-5462  
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200  
100 W. Randolph, Suite 10-300, Chicago, IL 60601 (312)814-6026

4. All areas affected by construction shall be mulched and seeded as soon after construction as possible. The applicant shall undertake necessary measures and procedures to reduce erosion during construction. Interim measures to prevent erosion during construction shall be taken and may include the installation of staked straw bales, sedimentation basins and temporary mulching. All construction within the waterway shall be constructed during zero or low flow conditions. The applicant shall be responsible for obtaining an NPDES Storm Water Permit prior to initiating construction if the construction activity associated with the project will result in the disturbance of 1 (one) or more acres, total land area. An NPDES Storm Water Permit may be obtained by submitting a properly completed Notice of Intent (NOI) form by certified mail to the Agency's Division of Water Pollution Control, Permit Section.
5. The applicant shall implement erosion control measures consistent with the "Illinois Urban Manual" (IEPA/USDA, NRCS; 2012).
6. Asphalt, bituminous material and concrete with protruding material such as reinforcing bar or mesh shall not be 1) used for backfill, 2) placed on shorelines/streambanks, or 3) placed in waters of the State.
7. The applicant shall use adequate measures (i.e., flumes, culverts, etc.) to maintain normal stream flow during construction.
8. The proposed work shall be constructed with adequate erosion control measures (i.e., silt fences, straw bales, etc.) to prevent transport of sediment and materials to the adjoining wetlands and downstream.
9. The mitigation plan received by the Agency on March 20, 2013 shall be implemented. Modifications to the mitigation plan must be submitted to the Agency for approval. The permittee shall submit annual reports by July 1 of each calendar year on the status of the mitigation. The first annual report shall include a hydric soils determination that represents the soils at the completion of initial construction for the wetland mitigation site(s). The permittee shall monitor the mitigation for 5 years after the completion of initial construction. A final report shall be submitted within 90 days after completion of a 5-year monitoring period. Each annual report and the final report shall include the following: IEPA Log No., date of completion of initial construction, representative photographs, updated topographic maps, description of work in the past year, the performance standards for the mitigation as stated in the mitigation plan, and the activities remaining to complete the mitigation plan. For wetland mitigation sites containing non-hydric soils at the time of initial construction, the final report shall include a hydric soils determination that represents the soils at the end of the 5-year monitoring period. For mitigation provided by purchase of mitigation banking credits, in lieu of the above monitoring and reporting, the permittee shall submit written proof from the mitigation bank that the credits have been purchased within thirty (30) days of said purchase. The subject reports and proof of purchase of mitigation credits shall be submitted to:

Illinois Environmental Protection Agency  
Bureau of Water  
Permit Section  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

Page No. 3  
Log No. C-0783-09

This certification becomes effective when the Department of the Army, Corps of Engineers, includes the above conditions # 1 through # 9 as conditions of the requested permit issued pursuant to Section 404 of PL 95-217.

This certification does not grant immunity from any enforcement action found necessary by this Agency to meet its responsibilities in prevention, abatement, and control of water pollution.

Sincerely,



Alan Keller, P.E.  
Manager, Permit Section  
Division of Water Pollution Control

SAK:TJF:0783-09.docx

cc: IEPA, Records Unit  
IEPA, DWPC, FOS, Marion  
IDNR, OWR, Springfield  
USEPA, Region 5  
Mr. Roger Driskell, IDOT 7



EXHIBIT 9

OWR PERMIT

EXHIBIT 9

*DLG*



# Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
<http://dnr.state.il.us>

Pat Quinn, Governor  
Marc Miller, Acting Director

May 22, 2009

SUBJECT: Permit No. DS2009059  
Bridge Replacement  
IL Route 1 over the Embarras River  
FAP Route 805, Section (16BR)B-1  
Lawrence County

Illinois Department of Transportation, Region 4  
400 West Wabash Avenue  
Springfield, Illinois 62401

ATTENTION: Roger L. Driskell, P.E.

Gentlemen:

Enclosed is Illinois Department of Natural Resources, Office of Water Resources Permit No. DS2009059 authorizing the subject project. Our approval is based on: 1) the fact that the proposed crossing is no more restrictive to flows than the existing crossing; and 2) certification that the existing crossing has not been the cause of demonstrable flood damage. This permit does not supersede any other federal, state or local authorizations that may be required for the project.

If any changes of the permitted work are found necessary, revised plans should be submitted promptly to this office for review and approval. Also, this permit expires on the date indicated in Condition (13). If unable to complete the work by that date, the permittee may make a written request for a time extension.

Please feel free to contact Jerry Bishoff of my staff at 217/558-6617 if you have any questions concerning this authorization.

Sincerely,

Michael L. Diedrichsen, P.E.  
Acting Manager, Downstate Regulatory Programs

MLD:JMB:crw  
Enclosure

cc: IDOT, Bureau of Bridges & Structures (Ralph Anderson, Attn: Todd Ahrens) —  
U.S. Army Corps of Engineers, Louisville District



PERMIT NO. DS2009059  
DATE: May 22, 2009

**State of Illinois**  
**Department of Natural Resources, Office of Water Resources**

Permission is hereby granted to:

ILLINOIS DEPARTMENT OF TRANSPORTATION, REGION 4  
400 WEST WABASH AVENUE  
EFFINGHAM, ILLINOIS 62401

to replace the Illinois Highway 1 bridge crossing of the Embarras River in the Southeast  $\frac{1}{4}$  of Section 36, Township 4 North, Range 12 West of the 3<sup>rd</sup> Principal Meridian in Lawrence County,

in accordance with an application dated April 16, 2009, and the plans and specifications entitled:

STATE OF ILLINOIS, DEPARTMENT OF TRANSPORTATION  
ILLINOIS ROUTE 1 PLAN AND PROFILE  
(Sheets 1 - 2 of 2, Dated 3/24/08).

Examined and Recommended:

*Michael L. Diedrichsen*

Michael L. Diedrichsen, Acting Manager  
Downstate Regulatory Programs

Approval Recommended:

*Gary R. Clark*

Gary R. Clark, Director  
Office of Water Resources

Approved:

*Marc Miller*

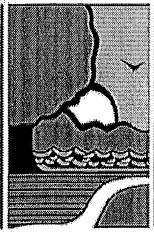
Marc Miller, Acting Director  
Department of Natural Resources

**THIS PERMIT IS SUBJECT TO THE FOLLOWING CONDITIONS:**

- 1) This permit is granted in accordance with the Rivers, Lakes and Streams Act "615 ILCS 5."
- 2) This permit does not convey title to the permittee or recognize title of the permittee to any submerged or other lands, and furthermore, does not convey, lease or provide any right or rights of occupancy or use of the public or private property on which the activity or any part thereof will be located, or otherwise grant to the permittee any right or interest in or to the property, whether the property is owned or possessed by the State of Illinois or by any private or public party or parties.
- 3) This permit does not release the permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.
- 4) This permit does not relieve the permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity; and if the permittee is required by law to obtain approvals from any federal or other state agency to do the work, this permit is not effective until the federal and state approvals are obtained.
- 5) The permittee shall, at the permittee's own expense, remove all temporary piling, cofferdams, false work, and material incidental to the construction of the project. If the permittee fails to remove such structures or materials, the Department may have removal made at the expense of the permittee.
- 6) In public waters, if future need for public navigation or other public interest by the state or federal government necessitates changes in any part of the structure or structures, such changes shall be made by and at the expense of the permittee or the permittee's successors as required by the Department or other properly constituted agency, within sixty (60) days from receipt of written notice of the necessity from the Department or other agency, unless a longer period of time is specifically authorized.
- 7) The execution and details of the work authorized shall be subject to the review and approval of the Department. Department personnel shall have the right of access to accomplish this purpose.
- 8) Starting work on the activity authorized will be considered full acceptance by the permittee of the terms and conditions of the permit.
- 9) The Department in issuing this permit has relied upon the statements and representations made by the permittee; if any substantive statement or representation made by the permittee is found to be false, this permit will be revoked; and when revoked, all rights of the permittee under the permit are voided.
- 10) In public waters, the permittee and the permittee's successors shall make no claim whatsoever to any interest in any accretions caused by the activity.
- 11) In issuing this permit, the Department does not ensure the adequacy of the design or structural strength of the structure or improvement.
- 12) Noncompliance with the conditions of this permit will be considered grounds for revocation.
- 13) If the construction activity permitted is not completed on or before December 31, 2012, this permit shall cease and be null and void.

**THIS PERMIT IS SUBJECT TO THE FOLLOWING SPECIAL CONDITION:**

- a) This approval is based, in part, on the over-the-road relief flow which will occur due to the low grade of the approach roadway. Thus, if at any future date the road grade is to be raised, prior approval should be secured from this office.



# Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
<http://dnr.state.il.us>

Pat Quinn, Governor

Marc Miller, Acting Director

May 12, 2009

SUBJECT: Application for Permit #20093039

IDOT/Region 4  
400 West Wabash Avenue  
Effingham, Illinois 62401

ATTENTION: Roger L. Driskell, P.E.

Dear Mr. Driskell:

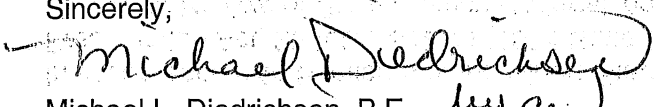
Receipt of your application for an Illinois Department of Natural Resources, Office of Water Resources permit is acknowledged. Review of your proposed project to ensure its compliance with the Rivers, Lakes and Streams Act, 615 ILCS 5, will be completed by Office of Water Resources' permit engineer, Jerry Bishoff (217/558-6617). **No work on the project should be initiated until an IDNR/OWR permit has been received.**

In accordance with Section 4 of the Illinois State Agency Historic Resources Preservation Act, 20 ILCS 3420/4 (1994 State Bar Edition), and the resulting IHPA "Rules for Review of State Agency Undertakings" (17 Ill. Adm. Code 4180), we are delegating to you responsibility to provide to IHPA any necessary documents regarding compliance of the project with the aforementioned Act. If you have any questions in this regard, please contact IHPA at 217/785-5027.

We are providing a copy of your application to this agency's Office of Realty and Environmental Planning (OREP). Consultation with that office may be required regarding your project's compliance with the Illinois Endangered Species Protection Act, 520 ILCS 10 (1994 State Bar Edition), and the resulting rules for "Consultation Procedures for Assessing Impacts of Agency Actions on Endangered and Threatened Species" (17 Ill. Adm. Code 1075). If any further action regarding consultation is necessary, OREP will notify you within 30 days.

You are also advised that OREP reviews U. S. Army Corps of Engineers Sections 10 and 404 permit activities. If your project requires a Corps permit, you may receive comments or recommendations from OREP, primarily related to the biological effects of the work, which may be outside the purview of the Illinois Department of Natural Resources, Office of Water Resources permit process.

Sincerely,

  
Michael L. Diedrichsen, P.E.  
Acting Manager, Downstate Regulatory Programs

MLD:JMB:crw  
Enclosure  
cc: OREP w/encl.

74180  
EMBARRAS RIVER NCL  
RECEIVED  
MAY 13 2009  
IDOT-DISTRICT

EXHIBIT 10

CHECK SHEET #8

EXHIBIT 10

# **Supplemental Specifications and Recurring Special Provisions**

Adopted January 1, 2017

Excerpt for Incidental Take Authorization –  
Conservation Plan (Check Sheet #8 only)



**Illinois Department of Transportation**

State of Illinois  
Department of Transportation

SPECIAL PROVISION  
FOR  
TEMPORARY STREAM CROSSINGS AND IN-STREAM WORK PADS

Effective: January 2, 1992

Revised: January 1, 1998

Haul Road and Other Temporary Stream Crossings. A temporary low flow structure such as a pipe culvert shall be installed at haul road and other temporary stream crossings. The haul road shall be constructed with materials (i.e., coarse aggregate) meeting the requirements of Article 1004.04 of the Standard Specifications, except, if pit run gravel is used, prior approval of the source may be required by the Engineer. Upon completion of the work, the haul road or other temporary stream crossing shall be removed and the stream channel returned to its original cross section or the cross section called for in the plans.

The Contractor may propose other methods of constructing the stream crossing to the Department of Natural Resources and, if approved by them, the Contractor may proceed with that method.

In-Stream Work Pads. All in-stream work pads shall be constructed with materials (i.e. e., coarse aggregate) meeting the requirements of Article 1004.04 of the Standard Specifications, except, if pit run gravel is used, prior approval of the source may be required by the Engineer. In cases where the work pad will span the stream, a temporary low flow structure such as a pipe culvert shall be installed. Upon completion of the work, the in-stream work pads shall be removed and the stream channel returned to its original cross section or the cross section called for in the plans.

The Contractor may propose other methods of constructing the work pads to the Department of Natural Resources, and if approved by them, the Contractor may proceed with that method.

Method of Measurement and Basis of Payment. Haul Roads and Other Temporary Stream Crossings or In-Stream Work Pads will not be measured or paid for separately but shall be considered as included in the unit cost of the various pay items in the contract.

The salvaged aggregates and pipe culverts used in the Haul Roads and Other Temporary Stream Crossings or In-Stream Work Pads shall remain the property of the Contractor but may be used in construction if approved by the Engineer.




EXHIBIT 11

LOCATIONS OF SMOOTH SOFTSHELL TURTLES IN ILLINOIS

Locations for Smooth softshell turtle in Illinois

Legend

 Locations\_of\_smooth\_softshell

