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Winnebago County

CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

IL 2 over the Rock River in Rockton - Removal and Replacement of Twin Structures

Prepared for:

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TABLE OF CONTENTS

a) Introduction.....	1
b) Conservation Plan.....	2
1) Description of the impact likely to result from the proposed taking	2
A) Legal Description.....	2
B) Biological data on the affected species	2
Black Sandshell Mussel	2
Gravel Chub	3
Spike Mussel.....	4
C) Description of the activities that will result in the taking	5
D) Explanation of anticipated adverse effects	7
(1) Direct and Indirect Effects	7
(a) Relocation	7
(b) Construction.....	8
(2) Cumulative Effects.....	9
2) Measures the applicant will take to minimize and mitigate the impact and the funding that will be available	9
A) Plans to minimize the area affected by the proposed action, and the estimated number of individuals of an endangered or threatened species that will be taken and the amount of habitat affected.....	9
B) Plans for management of the area affected by the proposed action that will enable continued use of the area by endangered or threatened species.....	10
C) Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on endangered or threatened species	10

D) Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on endangered or threatened species.....	11
E) Adaptive management practices used to deal with changed or unforeseen circumstances	11
F) Verification that adequate funding exists.....	12
3) Description of alternative actions considered.....	12
4) Data and information to indicate the proposed taking will not reduce the likelihood of the survival of the endangered species.....	12
5) Implementing Agreement	14
Literature Cited	15
Table 1 – List of freshwater mussels collected in the Rock River within the IL 2 bridge project area	17
Table 2 – List of fish species collected in the Rock River within the IL 2 bridge project area	18
Figure 1 – Location Map.....	19
Figure 2 – GIS Shapefile of Project Location.....	20
Figure 3 – Plan Sheet of Existing Bridges	21
Figure 4 – Streambed Boring Locations	22
Appendix A – Mussel Survey Report for IL 2 over the Rock River, Rockton, IL	23
Appendix B – Fish Survey Report for IL 2 over the Rock River, Rockton, IL.....	24
Appendix C – Permit #S-16-034 to collect, tag, and relocate freshwater mussels in 2016...25	
Appendix D – Natural Resources Review Renewal Memorandum.....	26
Appendix E – Special Provisions.....	27
Appendix F – Research Proposal to Study Gravel Chub.....	28

a) Introduction

The Illinois Department of Transportation (IDOT) and the Federal Highway Administration (FHWA) are proposing a project to remove and replace the twin structures (S.N. 101-0125 and 101-0126) carrying IL 2 over the Rock River in Rockton, Illinois in Winnebago County (Figure 1). This project will require in-stream work in the Rock River to construct the bridges. There will be no land acquisition required for this project. Five trees will be removed. Land cover in the vicinity of the proposed bridge replacement project is urban and residential, with athletic fields in the southwest quadrant of the project area. There is a wooded riparian corridor along the Rock River.

A mussel survey was conducted via diving on July 14, 2016 and led by personnel from the Illinois Natural History Survey (INHS) and EnviroSciences, as requested by IDOT. The purpose of the survey was to collect and relocate all of the mussels sampled within the proposed project construction limits. The proposed project construction limits are 200 feet up and downstream from the bridges plus under and between the existing bridges (100 feet wide). Thus the total width is 500 feet. INHS used thirty 1-yd² quadrants to sample within the proposed project, but their sampling did not include the entire project footprint. (Tiemann 2016b - see Appendix A). A total of 74 live individuals representing seven species were collected, including seven individuals of the state-threatened Black Sandshell mussel (*Ligumia recta*) (density = 0.23 individuals per square yard). Three additional species were collected as fresh-dead, and ten others as relict. The shallow areas (< 2 feet) along the left (north) descending bank were also randomly sampled. No additional species were collected and no additional Black Sandshells were found. No other mussels collected during this present survey are listed as endangered or threatened at the state and federal level (Tiemann 2016b – see Appendix A). The current status of threatened and endangered species is taken from U.S. Fish and Wildlife Service (USFWS) (1996, 1997) and the Illinois Endangered Species Protection Board (IESPB) (2015).

A fish survey was conducted on May 17, 2016 by INHS personnel utilizing the trawling method specifically to collect benthic fishes. The purpose of the survey was to determine if three state-listed fish species were present and if their preferred habitat was present in the project area. These species are the state-endangered Lake Sturgeon (*Acipenser fulvescens*), the state-threatened Gravel Chub (*Erimystax x-punctatus*), and the state-threatened Brassy Minnow (*Hybognathus hankinsoni*). Seven trawl hauls yielded 37 individuals representing six species, including nine individuals of the state-threatened Gravel Chub (density = 0.43 individuals per 100 square yards). No other fishes collected are listed as endangered or threatened at the state or federal level, or are under consideration for such listing (Tiemann 2016a – see Appendix B).

Given the presence of suitable habitat, it was assumed that the state-threatened Gravel Chub is present at moderate densities throughout the project corridor. The Brassy Minnow's preferred habitat conditions were not observed, suggesting construction activities will not likely affect this species. Additionally, the Lake Sturgeon is extremely rare in the Rock River basin, especially in Winnebago County. Even though spawning habitat for this species is present in the construction area, sturgeon would likely swim away to another part of the river if any disturbance occurred (Tiemann 2016a – see Appendix B).

IDNR's response to the EcoCAT on December 27, 2016 recommended obtaining an Incidental Take Authorization (ITA) for the Black Sandshell Mussel and the Gravel Chub in order to minimize or avoid potential adverse impacts to these species. The Spike Mussel has also been included because even though it is rarely found in the Rock River (collected once since 1980), there is potential habitat for this species (Natural Resources Review Renewal – see Appendix D). These two mussel species have been or will be relocated out of harms way before construction. Construction practices will be employed to minimize harm to the gravel chub and other fish species of concern.

b) Conservation Plan

Incidental taking of Illinois state-listed endangered and threatened species shall be authorized by the Illinois Department of Natural Resources (IDNR) only if the applicant submits a conservation plan that satisfies all criteria established in 17 Ill. Adm. Code § 1080.10.

1) Description of the impact likely to result from the proposed taking –

A) Legal Description - This project consists of removing and replacing the twin bridges carrying IL 2 over the Rock River in Rockton, Winnebago County, Illinois. The project is located at Latitude 42.44924° North, Longitude 89.05961° West; Second Principal Meridian; Township 46N, Range 1E, Section 24. Figure 2 is the GIS shapefile of the project area. The Rock River is approximately 160 yards wide, and between one to eight feet deep in the vicinity of the bridges. It had a discharge rate of about 2,000 cubic feet per second on July 14, 2016 (Tiemann 2016b). The Rock River flows in an east-southeasterly direction at the project location. The proposed project construction limits are within existing right of way owned by IDOT.

B) Biological data on the affected species – The Black Sandshell, the Spike Mussel, and the Gravel Chub are all currently listed as threatened by the State of Illinois. State listed species are protected under the Illinois ESPA and regulatory authority lies with the IDNR.

Black Sandshell Mussel (*Ligumia recta*)

Species Description

The Black Sandshell Mussel is approximately 8 inches in length and is listed as threatened in Illinois. Cummings and Mayer (1992) indicate the shell of this species is elongate, solid, and moderately compressed with a rounded anterior end. The posterior end is pointed in males and saber-shaped in females. The shell is smooth and shiny and is dark green, brown, or black with green rays visible on some individuals (see picture in Appendix A, Figure 2). The beak cavity is shallow.

Habitat Requirements

This species was historically widely distributed in medium to large rivers in riffles or raceways in gravel or firm sand (Cummings and Mayer 1992). However, it is

now uncommon in much of the upper Midwest. Within Illinois, the Black Sandshell is found sporadically in the northern half of the state as well as in the Ohio River (Cummings and Mayer 1997; Tiemann et al. 2007; Appendix A, Figure 2). Live specimens of the Black Sandshell have been documented more than nine times in the Rock River in Winnebago County since 1980 (data from INHS Mollusk Collection).

Life History

The reproductive cycle of the Black Sandshell is similar to that of other native freshwater mussels. Phylogenetically, this species is in the Tribe Lampsilini, inclusive of species which typically have a periodic life history strategy. This strategy is characterized by a moderate to high growth rate, moderate life span, low to moderate age at maturity and fecundity, small to moderate adult size, and typically are long-term brooders. This species is considered bradytictic, meaning females are gravid from autumn to the following early summer (i.e., overwinter glochidia) (Watters et al. 2009). Males release sperm into the water column. The sperm are then taken in by the females through their siphons during feeding and respiration. The females retain the fertilized eggs in their gills until the glochidia fully develop. The glochidia are released into the water and within a few days they must attach to the appropriate species of fish, which they parasitize for a short time while they develop into juvenile mussels. The breeding season is between May and September (Baker 1928) and glochidial release has been reported during June and July (Waller and Holland-Bartels 1988) and May and September (Surber 1912). Reproduction is attempted annually. The Sauger (*Sander canadensis*), Walleye (*Sander vitreus*), Black Basses (*Micropterus spp.*), Crappie (*Pomoxis spp.*), Sunfishes (*Lepomis spp.*), and a few other small-bodied fishes are likely host species for the Black Sandshell (Watters et al. 2009).

Status in the Action Area

The Black Sandshell has been found historically in 16 drainages in Illinois, and has been collected alive in eight drainages in the state since 1970 (Cummings and Mayer 1997; Tiemann et al. 2007; Bales et al. 2012), including the entire length of the Rock River. It has been captured in the Rock River in Winnebago County at nine locations since 1980 (INHS Mollusk Collection database). Seven individuals were collected on July 14, 2016.

Gravel Chub (*Erimystax x-punctatus*)

Species Description

The Gravel Chub is a somewhat small minnow which is typically 2 to 3.5 inches long and is listed as threatened in Illinois. It is olive green dorsally, silvery on sides, silvery and white on belly. The Gravel Chub gets its Latin species name from the many small, x-shaped spots found on its back and sides (Smith 1979; Page and Burr 2011). It has a rather long snout and sub-terminal (ending below tip of snout) mouth (see picture in Appendix B, Figure 3).

Habitat Requirements

This species occupies deeper riffles and runs of moderate to fast current over firm, silt-free sand-gravel substrates in medium to large streams (Smith 1979; Becker 1983; Mullen 1992; Kansas Fish Committee 2014; Tiemann 2016a). This fish probes under rocks and crevices for a diet of desmids, diatoms, plant debris, and other vegetation (Becker 1983). The Gravel Chub rests under rocks in riffles to reduce the effects of strong currents (Becker 1983; Kansas Fish Committee 2014). They are intolerant of clayey silts and other pollutants which makes them a good indicator of high quality rivers. This species has experienced a decline in distribution in Illinois as a result of siltation in streams (Smith 1971; Smith 1979; Mullen 1992).

Life History

The Gravel Chub is believed to spawn in spring (e.g., April-May) when water temperatures approach 60° F (Smith 1979; Becker 1983; Mullen 1992; Kansas Fish Committee 2014). Little research has been done to describe the natural and life history of this species (Stites and Sherwood 2019).

Status in the Action Area

The Gravel Chub has been collected throughout the Rock River basin both historically and recently. The Illinois Natural Heritage Database contains 21 records for the Gravel Chub within the last 25 years, most of the records occur in the Rock River. There are eight records in Winnebago County (data from the INHS Fish Collection database and IDNR Heritage database). Nine individuals were collected during the survey conducted on May 17, 2016.

Spike Mussel (*Elliptio dilatata*)

Species Description

The Spike Mussel is approximately 5 inches long and listed as threatened in Illinois. Cummings and Mayer (1992) describe the shell of this mussel as solid, elongate, elliptical, and compressed to moderately inflated. The anterior end is rounded, and the posterior end is rounded to slightly pointed. The surface of the shell is smooth, greenish brown with faint green rays visible on small shells. The rays become dark brown to black in adults (see picture in Appendix A, Figure 3).

Habitat Requirements

This species was historically widespread with sporadic distribution in medium to large streams and occasionally lakes in gravelly or mixed sand/gravel with moderate currents (Cummings and Mayer 1992). Populations have declined in Illinois due to habitat degradation and fragmentation and limited dispersal capabilities (Cummings and Mayer 1997; Douglass and Stodola 2014).

Life History

The reproductive cycle of the Spike is similar to that of other native freshwater mussels. Phylogenetically, this species is in the Tribe Amblemini, which include

species which typically have a periodic life history strategy. This strategy is characterized by a moderate to high growth rate, moderate life span, low to moderate age at maturity and fecundity, small to moderate adult size, and typically are long-term brooders. The Spike is a bradytictic species, meaning females are gravid from autumn to the following summer (i.e., overwinter glochidia) (Watters et al. 2009). Males release sperm into the water column. The sperm are then taken in by the females through their siphons during feeding and respiration. The breeding season is early to mid May. The females retain the fertilized eggs in their gills until the glochidia fully develop. The females brood the glochidia larvae from August through winter to the following July before they are released (Waller and Holland-Bartels 1988). The glochidia are released into the water and within a few days they must attach to their host fish, which they parasitize for a short time while they develop into juvenile mussels. After metamorphosis, the small, young mussels break free from the cysts on the host fish and drop to the bottom of the stream to begin an independent life (Cummings and Mayer 1992). Known host fish for the Spike include Sauger, Gizzard Shad (*Dorosoma cepedianum*), Flathead Catfish (*Pylodictis olivaris*), and White Crappie (*Pomoxis annularis*). Possible host fishes include Darters (*Etheostoma spp.*), Perches (*Perca spp.*), Basses (*Micropterus spp.*), and Sunfishes (*Lepomis spp.*) (Watters et al. 2009).

Status in the Action Area

The Spike is common in Missouri and Ohio, and uncommon in other states including Illinois. This mussel was historically found in 21 drainages in Illinois, and has been collected alive in nine drainages, including the Rock since 1970 (Cummings and Mayer et al. 1997; Tiemann et al. 2007; Bales et al. 2012). The INHS database contains 53 records for the Spike Mussel in the last 25 years scattered throughout the state. However, there is only one record in Winnebago County and it occurs in the Rock River. Although the species is rare and no live specimens were found during the mussel survey conducted at the site on July 14, 2016, there is suitable habitat in the project area. There is only a small chance to encounter this species, given its rarity, in the Rock River.

C) Description of the activities that will result in the taking - The IDOT and the FHWA are proposing a project to remove and replace the twin bridge structures which carry IL 2 over the Rock River in Rockton, Illinois. Figure 3 is a plan sheet of the existing bridges. Construction plans cannot be designed until streambed borings are completed. The existing bridges will be removed and replaced one at a time, while traffic is shifted to the other bridge. The bridges will be replaced along the existing alignment.

This project requires two phases. The first phase is to drill streambed borings to determine the depth of bedrock in the streambed, and determine if scour protection will be required. The data from the borings will be used to design and construct the piers and bridges. The second phase is the actual construction of the bridges. IDOT is proposing to drill the streambed borings during the summer of 2019. Then plans can be designed and actual construction of the twin structures would take place after July 1, 2022.

Phase 1 – The streambed borings consist of drilling a total of eight soil borings within the river. The boring locations are shown on Figure 4. To perform the borings they will mobilize and drill from a barge. Each boring will consist of a 4-inch diameter casing being set to a depth of about eight to ten feet below the streambed and then the boring will be advanced through the casing with a rotary drilling bit. The area of disturbance for one boring would be 12.6 sq. inches, totaling 100.8 sq. inches for all eight borings. The barge used for this procedure will be 50 feet long by 30 feet wide. It will be anchored with two spuds on the back end only. The spuds are steel squares which are 12 inches on each side. This would impact two square feet per anchoring. Therefore, a total of 16 square feet of additional area would be impacted by the barge anchoring. It is assumed the fish will have time to swim away. There is a slight possibility that a few mussels which were not relocated could be crushed when a boring is drilled, but this would be a minor impact. This Phase must be completed before bridge plans are completed.

Phase 2 – Bridge construction will be undertaken as the second phase of this project. Since the plans cannot be designed without the streambed borings, wide construction limits are assumed so as to provide for the worst case for species impacts. Also, all possible construction methods are analyzed for the worst case scenario. Once the bridge is designed, the bridge plans, practices, equipment to be used, and timeline will be provided.

The existing bridges will probably be demolished by dropping them into the river and then removing the material from the stream bottom. The mussels that were not relocated could be crushed by falling debris of the bridges. It is assumed that most of the fish would be frightened and swim away, but a few could also get crushed by falling debris.

Causeways and/or barges may be required for bridge construction. Causeways will actually fill in part of the riverbed for construction equipment to work on the bridges. Any mussels not relocated in the causeway areas would be crushed. The fish should be able to swim away. The causeway will be removed after construction is completed. Barges may be used to carry equipment to construct the bridges. The barge anchor points (spuds) could crush any remaining mussels in the spud footprint. The fish would have time to swim away.

Cofferdams will be used to dewater the area for each pier construction. A cofferdam is constructed around the area of a proposed pier. Then this area is dewatered, so the pier can be constructed inside on a dry surface. When the cofferdam is dewatered, there is a potential for fish and mussels to become trapped inside and killed. All individuals shall be rescued from the cofferdams to the maximum extent that is practicable for the project.

A mussel survey was conducted via diving on July 14, 2016. The purpose of the survey was to collect and relocate all of the mussels sampled within the proposed project

construction limits. A total of 74 live individuals representing seven species were collected and relocated, including seven individuals of the state-threatened Black Sandshell mussel (*Ligumia recta*) (density = 0.23 individuals per square yard) (Table 1). No other mussels collected during this survey are listed as endangered or threatened at the state or federal level (Tiemann 2016b). Although no individuals were collected of the state-threatened Spike mussel (*Elliptio dilatata*), suitable habitat is present for this species. Therefore, we assume this species could also be impacted during bridge construction, if present.

Per the signed agreement with the IDNR in 2016 (Permit #S-16-034, see Appendix C), all state listed individuals were passive integrated transponder (PIT) tagged and all mussels collected were relocated to a suitable habitat upstream and outside of the project area. The Rock River at the confluence with the Pecatonica River in Rockton, Winnebago County, Illinois (Latitude 42.45284° North, Longitude 89.08910° West) (see Figure 1) was chosen as the relocation area because suitable habitat for the Black Sandshell is present there. This area would not receive any negative influence from construction activities. A current permit will be provided with the 2022 mussel survey and relocation at a later date once it is obtained.

A fish survey was conducted on May 17, 2016 by INHS personnel utilizing the trawling method specifically to collect benthic fishes. The purpose of the survey was to determine if three state-listed fish species were present and if their preferred habitat was present in the project area. These species are the state-endangered Lake Sturgeon (*Acipenser fulvescens*), the state-threatened Gravel Chub (*Erimystax x-punctatus*), and the state-threatened Brassy Minnow (*Hybognathus hankinsoni*). Seven trawl hauls yielded 37 individuals representing six species, including nine individuals of the state-threatened Gravel Chub (density = 0.43 individuals per 100 square yards) (Table 2). No other fishes collected are listed as endangered or threatened at the state or federal level, or are under consideration for such listing (Tiemann 2016a – see Appendix B).

Given the presence of suitable habitat, it was assumed that the state-threatened Gravel Chub is present at moderate densities throughout the project corridor. The Brassy Minnow's preferred habitat conditions were not observed, suggesting construction activities will not likely affect this species. Additionally, the Lake Sturgeon is extremely rare in the Rock River basin, especially in Winnebago County. Even though spawning habitat for this species is present in the construction area, sturgeon would likely swim away to another part of the river if any disturbance occurred.

D) Explanation of anticipated adverse effects –

(1) Direct and Indirect Effects

(a) Relocation. On July 14, 2016, prior to construction activities and streambed borings, all mussels collected were relocated. Mussels were sampled by using 30 1-yard² quadrants by use of SCUBA in areas 6 feet deep or greater. The proposed project construction limits are

200 feet up and downstream from the bridges plus the existing bridge area (which is 100 feet), making the total width 500 feet. The bridge length over the river is about 480 feet (160 yards). The survey occurred within the project limits but did not include the entire project footprint. Also, INHS staff randomly handpicked the shallow (< 2 feet deep) areas along the left (north) descending bank for one person-hour (see Figure 1 in Tiemann 2016b).

All freshwater mussels were identified, measured, enumerated, and state listed mussels and species in Greatest Need of Conservation affixed with PIT tags. All mussels were relocated to an area of suitable habitat upstream from the project area in the Rock River at the confluence with the Pecatonica River (Figure 1). An additional 25 individuals of non-listed species were also tagged to increase sample size to monitor success of translocation.

During the mussel relocation a total of 74 mussels were found and relocated. It was estimated that a 5% mortality of the relocated mussels could occur. Seven state listed mussels were relocated. Therefore, possibly one (1) Black Sandshell mussel may not survive relocation. The actual construction limits will be surveyed between 60 to 90 days prior to construction, and all mussels collected will be relocated as described previously.

(b) Construction. Direct effects of construction on the mussels include mortality of individuals left behind following the relocation efforts. Although the area of the construction limits will be extensively searched by divers prior to construction, it is estimated that up to 10% of mussels more than 1 inch in length could be missed. The Black Sandshell will not be found homogeneously throughout the project area and there is a small chance that the Spike Mussel will be found. Mussels that could be missed would be crushed. The total estimated take due to mussels being crushed as a result of being missed is 10-20 Black Sandshell mussels and 1-5 Spike mussels. These take estimates may be adjusted after the survey and relocation are performed within the entire construction limits prior to construction.

Fish hosts may be temporarily displaced from the area due to increased activity associated with construction; however, no host fish habitat will be permanently destroyed. Though effects to fish hosts are expected to be temporary and minor, construction and relocation activities may indirectly result in the loss of up to one year of reproduction due to stress and/or disturbance to mussels. At water depths greater than six feet, the effects to mussels as a result of propeller wash due to construction barges are expected to be discountable.

Direct effects of construction include mortality of individual fish caught in the construction area, mainly in the cofferdams. It is estimated that up to 10% of the Gravel Chubs could be killed during construction. Therefore, the total estimated take for Gravel Chub would be a maximum of 12 fish.

Fish may be temporarily displaced from the area due to increased activity associated with construction. However, no fish habitat will be permanently destroyed.

Indirect effects to these species as a result of construction activities also include the potential for increased sedimentation. The Black Sandshell mussel, Spike mussel, and Gravel Chub are intolerant of siltation.

In addition, some mussels are present upstream that could provide a source of glochidia/juveniles to be dispersed via host fish movement.

In summary, potential adverse effects to mussel species include mortality, disturbance, and stress to the animals as a result of relocation and construction activities, temporary disruption to reproduction, and temporary displacement of host fish. Potential adverse effects to fish species include mortality, disturbance, and stress to the animals as a result of construction activities, and temporary displacement.

(2) Cumulative Effects

No plans for future State, tribal, local or private projects within or immediately adjacent to the aquatic action area are known. Within the aquatic action area, ongoing water quality issues such as siltation and chemical pollution unrelated to the IL 2 over the Rock River in Rockton Bridge Replacement project will continue to affect mussels and fish.

2) Measures the applicant will take to minimize and mitigate the impact and the funding that will be available -

A) Plans to minimize the area affected by the proposed action, and the estimated number of individuals of an endangered or threatened species that will be taken and the amount of habitat affected - The aquatic action area was limited to the construction footprint around the two IL 2 bridges. A discussion of the project activities is in b)1)C) of this Conservation Plan. As worst case, the construction area is limited to no more than 200 feet beyond the outside edges of the existing bridges, equaling a total width of 500 feet. Approximately 5.5 acres (26,667 sq. yards) of suitable mussel and fish habitat may be impacted for bridge construction as worst case. Project-specific Special Provisions were developed by IDOT to avoid and minimize effects to mussel and fish

species (Appendix E). Take estimates and the number of state listed mussels relocated are listed in b)1)D)(1) of this Conservation Plan.

B) Plans for management of the area affected by the proposed action that will enable continued use of the area by endangered or threatened species – After construction and the removal of the existing bridges, the streambed will be restored back to its pre-construction elevations. 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 IEPA Section 401 Water Quality Permit, the Individual IDNR-OWR Permit, and the requirements within the NPDES construction permit. All of these permits are pending the receipt of the Incidental Take Authorization (ITA). It is anticipated that the areas affected by construction activities will return to pre-construction conditions in time and mussels and fish will recolonize the area. This is explained in more detail in 1)D)(1)(b).

C) Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on endangered or threatened species – Conservation measures for the mussel species included relocating the mussels from the aquatic action area prior to construction. This was completed on July 14, 2016, and will be performed again 60 to 90 days prior to construction. The relocation process is described above in 1)C) and 1)D). Recently, Tiemann et al. (2016) suggested short-distance relocations are a viable minimization tool for protecting freshwater mussels at bridge construction sites, and their methodology was followed for this present mussel relocation in the Rock River at the confluence with the Pecatonica River in Rockton.

The first season of bridge construction is scheduled to begin after July 1, 2022, which will avoid the spawning period of the Gravel Chub. This will minimize impact to this fish species during the first season of construction. However, the project is expected to be completed in two years. Therefore, the second year of construction will occur during the spawning time.

Project-specific Special Provisions were developed by the IDOT (Appendix E) to avoid and minimize potential effects to mussel, fish, and bat species. In addition to the relocation efforts described above, these measures include:

(1) Barges and water craft used for construction activities shall be inspected for the presence of zebra mussels prior to placing the barges into the Rock River and shall be completely out of water for 10 days to ensure properly drying and reduce potential infestation by zebra mussels.

(2) The contractor will be responsible for implementing measures to prevent debris from falling in the river. Debris will not be allowed to collect at the bottom of the river. The contractor will remove any debris from the water or river bed as soon as practicable during the same work day in order to prevent the accumulation of potentially polluted materials. Construction inspectors will be present during construction activities to ensure compliance with IDOT Special Provisions (Appendix E).

The Special Provisions (Appendix E) also address measures to avoid and minimize effects to water quality which also protect mussel and fish species.

Mitigation to the maximum extent practicable is required by the Act. Mitigation has been scaled at \$16,742 for each mussel species (Black Sandshell and Spike), totaling \$33,484 to the Illinois Wildlife Preservation Fund. As mitigation for the Spike mussel, IDOT shall provide compensatory mitigation in the amount of \$16,742 to bring benefit to the species potentially impacted by the project. The Illinois Department of Natural Resources is currently reviewing a delisting petition for the Black Sandshell. This petition has been preliminarily approved by the Illinois Endangered Species Protection Board (IESPB). At the time of this Conservation Plan, the Black Sandshell is currently listed as an Illinois Threatened or Endangered Species. The project is set to commence in fiscal year 2022 which will be after the IESPB makes a decision. In the case that the species is delisted, no mitigation will be required. If the decision by the Board supports keeping the species on the list, mitigation in the amount of \$16,742 will be due within 90 days of the decision.

Mitigation for take of the Gravel Chub has been scaled to \$15,600. As mitigation for the potential taking of the Gravel Chub, IDOT will fund an INHS research project to study the life history and habitat of the Gravel Chub (Stites and Sherwood 2019 – see proposal in Appendix F). The sampling for this study will take place in the Rock River basin, including sites near the proposed construction project. The proposal identified in Appendix F is a preliminary proposal. An updated proposal will be provided to IDNR prior to the execution of the Incidental Take Authorization. In the event that the cost of the research does not equal the scaled amount of mitigation, IDOT shall provide compensatory mitigation to the Illinois Wildlife Preservation Fund.

D) Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on endangered or threatened species - All PIT tagged mussel individuals will be monitored with an aquatic PIT tag reading system on two occasions – at one year, and at three years post-release. Post-construction monitoring for the mussels and fish will occur in both the construction footprint and the mussel relocation site. All data associated with this survey, PIT tagging, and results of post-translocation monitoring are stored in the INHS Mollusk PIT tag database, Champaign.

E) Adaptive management practices used to deal with changed or unforeseen circumstances – Mussel relocation is dependent on the flow and volume of water in the river at that time. For this reason, the mussel relocation may be delayed until the water levels and the current conditions are suitable for the mussels. Potential mussel relocation beds were carefully screened to assure that habitat was suitable for transplanted mussels and that risks of external threats to the relocation beds (siltation, chemical spills) are minimized. The confluence of the Pecatonica River was chosen for the relocation site because the habitat was suitable for these species of mussels and it is a short distance upstream from the IL 2 Bridges. These factors minimize impacts to the relocated

mussels. The relocation was done and will be done according to accepted standards to minimize mussel mortality.

F) Verification that adequate funding exists – All proposed mitigation will be completed as part of, and not separate from, the construction of the project and in many cases will also be conditions of other permits (e.g. NPDES). Therefore, funding for the mitigation will be included in funding for the overall project. IDOT and FHWA commit to funding construction of the project, and by extension, funding of the mitigation.

3) Description of alternative actions considered – The proposed action was selected after carefully evaluating alternatives, including the No-Action Alternative. This proposed construction plan is described in b)1)C) of this Conservation Plan. This design will have the smallest area of impact around the bridges. The other build alternate would require the replacement of the bridges on new alignment, which would have an impact to mussels and fish under the entire length of the existing bridges and the new bridges. This would at least double the area of impact to mussels and fish.

The No-Action Alternative was also considered and was defined as no bridge replacement. Selection of the No-Action Alternative would have meant no mussels or fish would have been impacted by the project because there would be no bridge construction. However, the alternative would not meet the purpose and need of the IL 2 bridges replacement project. The existing structures are load restricted structures, which are below the legal load by design (40 tons maximum). The existing structures are also fracture critical type bridges and therefore undesirable to remain in place. Based on the configurations of the existing bridge structure and the cost estimate, a total bridge replacement is warranted (per IDOT, District 2 Bridge Maintenance Engineer). Failure to implement this project may require closure of the bridges.

4) Data and information to indicate the proposed taking will not reduce the likelihood of the survival of the endangered species – The project area around the IL 2 bridges was surveyed using quadrant sampling on July 14, 2016 for mussels. This survey occurred within the project construction limits but did not include the entire project footprint. The mussels in the project area were collected and relocated to an area upstream in the Rock River at the confluence of the Pecatonica River. A total of 74 live individual mussels representing seven species were collected and relocated, including seven state-threatened Black Sandshell. The Spike was not collected, but there is suitable habitat present, so there is a small chance that they could be impacted during the project construction. No other mussels collected during this survey are listed as endangered or threatened at the state or federal level. It was estimated that up to 10% of the mussels could have been missed. Mussels that could be missed would be crushed. Another 5% mortality could occur of the relocated mussels. The total estimated take due to mussels being crushed as a result of being missed, or not surviving the relocation, is 10-20 Black Sandshell Mussels and 1-5 Spike Mussels. The risk of “incidental take” does exist. The aquatic action area is not the only location in Illinois where the affected species are found, and very few mussels were collected in this action area. These species are found in other locations of the Rock River as well as in some other Illinois rivers. Therefore,

the incidental taking of the Black Sandshell and Spike mussels will not reduce the likelihood of the survival of the species in the wild in Illinois.

The project area was also surveyed on May 17, 2016 for fish species. A total of 37 individuals representing six fish species were collected, identified, and most released. This included seven individuals of the state-threatened Gravel Chub. Two additional Gravel Chubs were collected outside the project corridor. No other fishes collected during this survey are listed as endangered or threatened at the state or federal level. It was estimated that up to 10% of the fish or a maximum of 12 Gravel Chub could be killed during construction. The risk of “incidental take” does exist. This aquatic action area is not the only location in Illinois where the affected fish species are found, and very few Gravel Chub were collected in this action area. These species are found in other locations of the Rock River. Therefore, the incidental taking of the Gravel Chub will not reduce the likelihood of the survival of the species in the wild in Illinois.

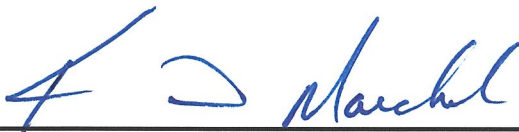
**5) Implementing Agreement
For
Conservation Plan
For the State-threatened Black Sandshell, *Ligumia recta*, the
State-threatened Gravel Chub, *Erimystax x-punctatus*, and the
State-threatened Spike, *Elliptio dilatata*, which inhabit the Rock River in the
vicinity of the Proposed IL 2 over the Rock River – Removal and Replacement
of Twin Structures Project in Rockton in Winnebago County, IL.**

The Illinois Department of Natural Resources (IDNR) is responsible for the review of this Conservation Plan and for subsequent issuance of the Incidental Take Authorization. The Illinois Department of Transportation is responsible for all biological clearance coordination and recommendations related to the project. IDOT is also responsible for securing authorization for the incidental take; securing all permits, including Section 404, Section 401, and Office of Water Resources; inspection of the work and contractor compliance with the contract documents.

The activities in the conservation plan will be implemented prior to construction (i.e. relocating the mussels and updating the bat bridge assessment) and after construction is completed (i.e. monitoring fish and mussels in the construction footprint and the relocated mussels). Soil borings are planned to take place during the summer of 2019. Construction is estimated to begin after July 1, 2022 and be completed in approximately two years. Progress reports will be provided to IDNR within 90 days of each monitoring event.

IDOT is authorized by the Illinois Highway Code to carry out its duties of providing safe and efficient highways for Illinois citizens.

The Illinois Department of Transportation exclusively abides by the National Environmental Policy Act and all associated federal and state environmental laws in carrying out their mission of performing the most environmentally sensitive methods of transportation planning and engineering. The Black Sandshell, Gravel Chub and Spike Mussel are listed as threatened in Illinois. They are thus covered by the Illinois Endangered Species Act of 1972 only. Compliance under the Federal Endangered Species Act of 1973 is not required for these species. No known local regulations are pertinent to this conservation plan.



Kevin Marchek, P.E.
Region Two Engineer
Illinois Department of Transportation

Date

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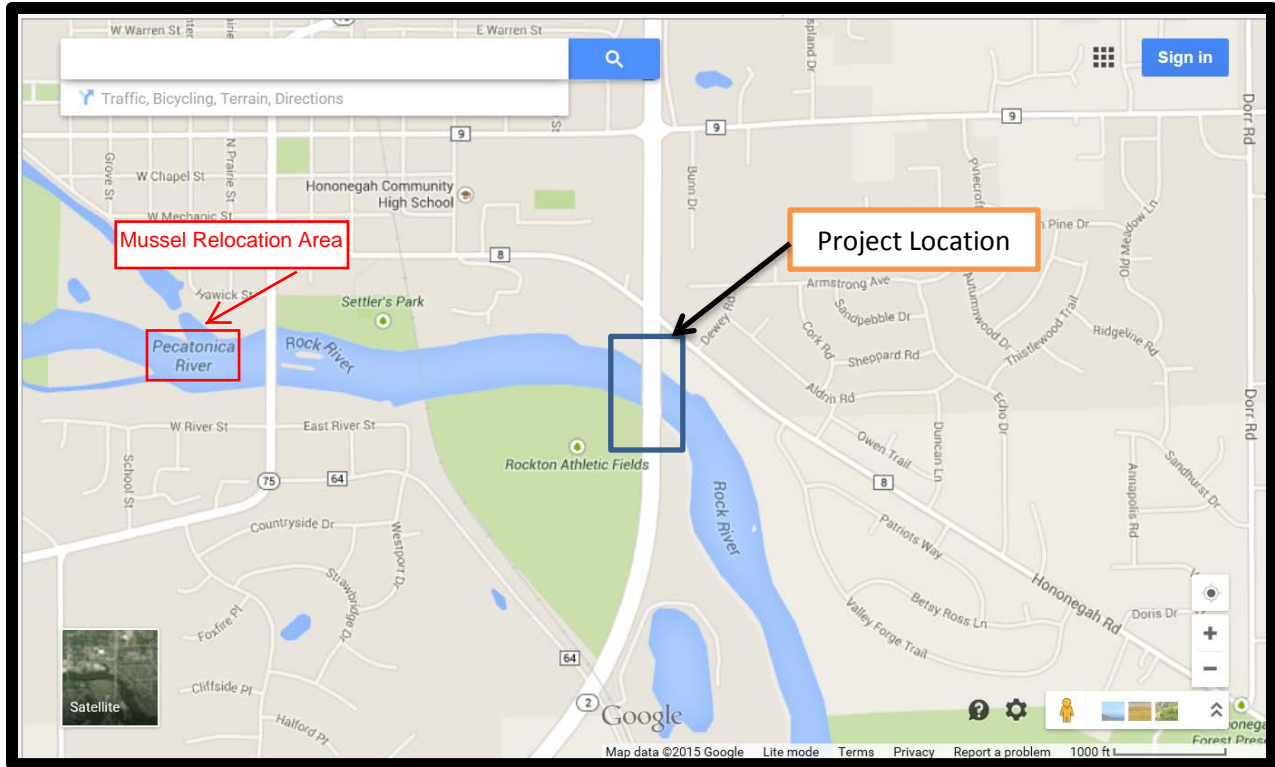
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Table 1. List of freshwater mussels collected in the Rock River within the IL 2 bridge project area by INHS and EnviroSciences personnel on July 14, 2016. Data from the survey includes the number of individuals found alive and those species found as fresh-dead ^(FD) or relict ^(R) shell. Special designation includes those species listed as state-threatened in Illinois ^(ST), Species in Greatest Need of Conservation ^(SGNC), and extirpated ^(SX). Species in **BOLD** indicate species considered extant in the Rock River in Winnebago County because they have been collected as live or fresh-dead shells from the river since 2000 (data from INHS Mollusk Collection, Champaign) (Tiemann 2016b).

Scientific name	Common name	IL Rt. 2 (2016)
<i>Actinonaias ligamentina</i>	Mucket	15
<i>Alasmidonta marginata</i> ^{SGNC}	Elktoe	1
<i>Amblema plicata</i>	Threeridge	R
<i>Amphinaias (Quadrula) pustulosa</i>	Pimpleback	42
<i>Cyclonaias tuberculata</i> ST	Purple Wartback	R
<i>Elliptio dilatata</i> ST	Spike	R
<i>Fusconaia flava</i>	Wabash Pigtoe	FD
<i>Lampsilis cardium</i>	Plain Pockebook	7
<i>Lampsilis siliquoidea</i>	Fat Mucket	R
<i>Lasmigona complanata</i>	White Heelsplitter	1
<i>Lasmigona costata</i> ^{SGNC}	Flutedshell	R
<i>Leptodea fragilis</i>	Fragile Papershell	1
<i>Ligumia recta</i> ST	Black Sandshell	7
<i>Pleurobema rubrum</i> ^{SX}	Pyramid Pigtoe	R
<i>Pleurobema sintoxia</i>	Round Pigtoe	FD
<i>Potamilus alatus</i>	Pink Heelsplitter	R
<i>Pyganodon grandis</i>	Giant Floater	FD
<i>Quadrula quadrula</i>	Mapleleaf	R
<i>Tritogonia verrucosa</i>	Pistolgrip	R
<i>Truncilla donaciformis</i>	Fawnsfoot	R

Table 2. List of fish species collected in the Rock River within the IL 2 bridge project area by INHS personnel on May 17, 2016. Data from the survey includes the number of individuals collected. Special designation is ST for state-threatened in Illinois (Tiemann 2016a).

Family	Scientific name	Common name	2016
Cyprinidae	<i>Erimystax x-punctatus</i> ST	Gravel Chub	7
	<i>Notropis stramineus</i>	Sand Shiner	1
Ictaluridae	<i>Ictalurus punctatus</i>	Channel Catfish	2
Percidae	<i>Etheostoma nigrum</i>	Johnny Darter	1
	<i>Etheostoma zonale</i>	Banded Darter	23
	<i>Percina maculata</i>	Blackside Darter	3



LOCATION MAP

for

FAP Route 734 (IL 2)

Section 77-1BR

Winnebago County

Job No. P-92-022-15

Contract No. 64K73

**IL 2 over the Rock River in Rockton -
Removal and replacement of the twin structures
S.N. 101-0125 and S.N. 101-0126**

IL 2 over the Rock River Construction Limits





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				SCALE:	SHEET	OF	SHEETS	STA.	TO STA.			

Figure 3



Figure 4
Streambed
Boring Locations

Appendix A

**Mussel Survey Report for IL 2 over the
Rock River, Rockton, IL (Tiemann 2016b)**



**Survey for Freshwater Mussels in the Rock River at the
Illinois Route 2 (FAP 734) project area
(IDOT Sequence No. 19861)
Rockton, Winnebago County, Illinois**



Prepared by:
Jeremy S. Tiemann

INHS/IDOT Statewide Biological Survey & Assessment Program
Program Report 2016 (81)

17 August 2016




PROJECT SUMMARY

This report is submitted in response to a request from IDOT to INHS for a freshwater mussel survey in the Rock River at the Illinois Route 2 (FAP 734) project area (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois. Specifically, this tasking asked for the presence of state-listed mussels (e.g., Black Sandshell *Ligumia recta* and Spike *Elliptio dilatata* – both listed as threatened in Illinois) within the project area. The mussel survey was conducted on 14 July 2016 by personnel from INHS and EnviroSciences.

The Rock River ranged in depth from 1 – 8 feet, and had a discharge of ~2,000 cubic feet per second. Thirty 1-yd² quadrants under and between the two bridges were sampled by using a self-contained underwater breathing apparatus (SCUBA). This work yielded 74 individuals representing seven species, including seven Black Sandshells (density = 0.23 individuals per square yard). Three additional species were collected as fresh-dead, and ten others as relict. Furthermore, the shallow areas (<2 feet) were randomly sampled for one man-hour. No additional species were collected, and no additional Black Sandshells were found in this effort. Aside from Black Sandshell, no other mussels collected alive are listed as endangered or threatened at the state or federal level. Given the presence of suitable habitat (e.g., gravel substrates with moderate flow), we would assume the Black Sandshell is present at low to moderate densities throughout the project area.

Per the signed agreement with the Illinois Department of Natural Resources (permit # S-16-034), all seven Black Sandshells were tagged and relocated upstream to the Rock River at the confluence with the Pecatonica River in Rockton, Winnebago County, Illinois (Latitude 42.45284° North, Longitude 89.08910° West). This area was chosen as the relocation site because it is an area within the watershed of suitable habitat and outside of the project area. Marked individuals will be monitored with an aquatic PIT tag reading system within two months, at one year, and at three years post-release per the signed agreement.



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

Surveys Conducted By: Jeremy S. Tiemann, Aquatic Zoologist
EnviroSciences, environmental consultants and commercial divers

Edited by: Mark J. Wetzel, INHS Research Affiliate

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TABLE OF CONTENTS

Project summary	1
Introduction	3
Project location	3
Habitat characterization.....	3
Background	3
Methods	5
Results and discussion.....	6
Acknowledgements.....	7
Literature Cited	7

Tables

Table 1 – List of freshwater mussels collected the Rock River at the Illinois Route 2 (FAP 734) project area (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West) on 14 July 2016 by INHS and EnviroSciences personnel	9
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Figures

Figure 1 – Map of the Illinois Route 2 (FAP 734) project area (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois	10
Figure 2 – The state-threatened Black Sandshell (<i>Ligumia recta</i>) and its distribution in Illinois.....	11
Figure 3 – The state-threatened Spike (<i>Elliptio dilatata</i>) and its distribution in Illinois	12
Figure 4 – INHS personnel J.S. Tiemann affixing passive integrated transponder (PIT) tags prior to the relocation of mussels.....	13
Figure 5 – The Rock River at the confluence with the Pecatonica River in Rockton, Winnebago County, Illinois (Latitude 42.45284° North, Longitude 89.08910° West) on 14 July 2016, where freshwater mussels were relocated following after being collected within the Illinois Route 2 (FAP 734) project area	14

Appendices

Appendix 1. A cover page referencing < 19861_Mussel_Survey_GIS.zip >, an ArcGIS shapefile with sampling point information for the Rock River at the Illinois Route 2 project area (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois, where a survey for mussels was conducted by INHS personnel on 14 July 2016.	15
Appendix 2. Permit # S-16-034 from Illinois Department of Natural Resources to the Illinois Natural History Survey granting the Survey permission to collect, tag, and relocate freshwater mussels at bridge construction projects.....	16

Cover photo: Rock River at the Illinois Route 2 (FAP 734) project area (IDOT Sequence No. 19861) in Rockton, Winnebago County (Latitude 42.44924° North, Longitude 89.05961° West) on 17 May 2016. Picture is facing downstream, in a southerly direction (A.J. Stites photo).

INTRODUCTION

This report is submitted in response to a request made by Susan Hargrove of IDOT to Wendy Schelsky of INHS, dated 22 March 2016, for fish and mussel surveys and bat habitat assessment at the Illinois Route 2 (FAP 734) project area in Rockton, Winnebago County, Illinois [IDOT Seq. No.: 19861; Section No. 77-1BR; Job No. P-92-022-15; Contract No. 64K73; INHS Project No. FS-885]. Work proposed by IDOT includes removal and replacement of the bridge structures (structure numbers 101-0125 and 101-0126) carrying Illinois Route 2 (FAP 734) over the Rock River. Specifically, this tasking suggests the presence of two state-listed fishes (the state-endangered Lake Sturgeon *Acipenser fulvescens* and the state-threatened Gravel Chub *Erimystax x-punctatus*) and two state-listed mussels (the state-threatened Black Sandshell *Ligumia recta* and Spike *Elliptio dilatata*) in the Rock River.

The results of the mussel survey conducted by INHS and EnviroSciences personnel on 14 July 2016 at this site are summarized in this report. A separate report summarizing the results of the fish survey of the Rock River at the Illinois Route 2 bridges was uploaded to Frostycap on 14 June 2016. The report summarizing the habitat assessment for bats will be forthcoming.

PROJECT LOCATION

This project consists of one area:

Rock River at the northbound and southbound Illinois Route 2 (FAP 734) bridges (IDOT Sequence No. 19861; structure numbers 101-0125 and 101-0126) in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West; Second Principal Meridian: Township 46N, Range 1E, Section 24) (**cover photo; Figure 1**). The Rock River flows in an east-southeasterly direction at this location.

Appendix 1 references a shapefile with sampling point information for the stream crossing, as discussed in this report.

HABITAT CHARACTERIZATION

During our visit to the project area on 14 July 2016 to conduct a survey for freshwater mussels, the Rock River in the immediate vicinity of the Illinois Route 2 bridges was approximately 160 yards wide, >6.0 feet deep, and had a discharge rate of ~3,200 cubic feet per second. Because water turbidity prevented visual examination of the river bottom, divers estimated the habitat and characterized the substrates by tactilely feeling the streambed with their hands during this survey. Stream substrates were predominantly gravel/pebble with small patches of silted sandy gravel or cobble/rip-rap; some woody debris accumulation was present along the stream edges and on the bridge piers. The riparian areas along each bank were tree-lined.

BACKGROUND

The Rock River originates in Dodge County, Wisconsin, flows 318 miles in a south-southwesterly direction in southern Wisconsin and northern Illinois before its confluence with the Mississippi

River at Rock Island, Rock Island County (Bales et al., 2012). Smith (1971) rated the Rock River as “Good” to “Excellent” except where it borders or passes through highly urbanized or industrialized areas, and the Biological Streams Characterization rates the Rock River mainstem from where it enters Illinois to Clear Creek (Ogle County) as a “B” stream, which is considered a Highly Valued Aquatic Resource (Hite and Bertrand, 1989).

The Rock River drainage historically supported a diverse (47 species) and abundant freshwater mussel fauna (Cummings and Mayer, 1997; Tiemann et al., 2007). Spot collections have been made in the mainstem by INHS and IDNR biologists working on various projects over the last 20 years (e.g., Bales et al., 2012). The results of these recent surveys have shown that the fauna is still relatively intact (32 live species) and individuals of uncommon to rare species are occasionally found (Cummings and Mayer, 1997; Tiemann et al., 2007). Threats to freshwater mussel populations in the Rock River mainstem are the same as those affecting other riverine species: siltation, chemical pollution, and impoundments.

Most of the 32 extant species in the Rock River drainage are common inhabitants of northern Illinois streams, and are not listed as endangered or threatened at the state or federal level, nor are any currently under consideration for such listing (Mankowski, 2010, 2012). However, twelve special status freshwater mussel species are known from the drainage, including seven state-threatened and five state-endangered species (INHS Mollusk Collection, Champaign). Only the state-threatened Black Sandshell *Ligumia recta* (**Figure 2**) and Spike *Elliptio dilatata* (**Figure 3**) have been collected alive in the mainstem of the Rock River in recent years.

The Black Sandshell is found in medium to large rivers in areas with strong currents and substrates of coarse firm sand, gravel, or cobble (Cummings and Mayer, 1992). Populations have declined in Illinois due to habitat degradation and fragmentation and limited dispersal capabilities (Cummings et al., 1997; Douglass and Stodola, 2014). Historically found in 16 drainages in Illinois, the Black Sandshell has been collected alive in eight drainages in the state since 1970 – the Galena/Apple, Rock, Fox, Kankakee, Kaskaskia, Vermilion (Wabash), Ohio, and Mississippi river basins (Cummings et al., 1997; Tiemann et al., 2007). Within the Rock River mainstem in Illinois, the mussel has been collected from near its confluence with the Mississippi River at Rock Island (Rock Island County), upstream, to near the Illinois-Wisconsin state-line at South Beloit (Winnebago County), including the Rockton area (INHS Mollusk Collection, Champaign). Since 1980, the Black Sandshell has been captured at the following locations in the Rock River, Winnebago County, Illinois (data from the INHS Mollusk Collection database):

- On 11 July 2012, INHS staff S.A. Bales, et al. collected nine live individuals at the Illinois Route 75 bridge in Rockton (Latitude 42.45075° North, Longitude 89.07151° West) in four person-hours.
- On 20 August 2002, INHS staff K.S. Cummings, et al. collected five live individuals at the boat ramp in Atwood Homestead Forest Preserve, 1 mi NE Hutchins Park (Latitude 42.3872° North, Longitude 89.0457° West) in three person-hours.
- On 8 September 2005, IDNR staff R.W. Schanzle and K. Anderson collected 23 live individuals at the Hononegah Forest Preserve, 2 mi SE Rockton (Latitude 42.4312° North, Longitude 89.0485° West) in eight person-hours.

- On 21 August 2002, INHS staff K.S. Cummings, et al. collected five live individuals at Rock River Homeowners Association in Roscoe (Latitude 42.4027° North, Longitude 89.01651° West) in three person-hours.
- On 20 August 2002, INHS staff K.S. Cummings, et al. collected 17 live individuals at Blackhawk Park in Rockford (Latitude 42.24641° North, Longitude 89.10380° West) in three person-hours.
- On 12 August 2013, INHS staff J.S. Tiemann, et al. collected 26 live individuals at the U.S. Highway 20 bridge in Rockford (Latitude 42.21943° North, Longitude 89.09534° West) while brailing, diving, and handpicking.
- On 14 August 2012, INHS staff S.A. Bales et al. collected 11 live individuals at the Beltline Road bridge, Blackhawk Island, 1.5 SW Rockford (Latitude 42.20470° North, Longitude 89.10941° West) in four person-hours.
- On 14 August 2012, INHS staff S.A. Bales, et al. collected 39 live individuals at the Kishwaukee Road bridge, 6 mi SSW Rockford (Latitude 42.18656° North, Longitude 89.13015° West) in four person-hours.
- On 10 September 2013, Openlands biologist L. Barghusen, et al. collected 6 live individuals 5.5 mi SSW Rockford (Latitude 42.18441° North, Longitude 89.14653° West) in an unknown effort.

The Spike is found in medium to large streams in gravelly or mixed sand/gravel areas with moderate currents (Cummings and Mayer, 1992). Populations have declined in Illinois due to habitat degradation and fragmentation and limited dispersal capabilities (Cummings et al., 1997; Douglass and Stodola, 2014). Historically found in 21 drainages in Illinois, the Spike has been collected alive in nine drainages in the state since 1970 – the Rock, Fox, Kankakee, Vermilion (Illinois), Mackinaw, Sangamon, Kaskaskia, Little Wabash, and Mississippi river basins (Cummings et al., 1997; Tiemann et al., 2007). Within the Rock River mainstem in Illinois, the Spike has been collected only once since 1980 (data from the INHS Mollusk Collection database):

- On 25 August 2005, IDNR staff R.W. Schanzle and D. Sallee collected one live individual at the Hononegah Forest Preserve, 2 mi SE Rockton (Latitude 42.4312° North, Longitude 89.0485° West) in 2.5 person-hours.

It appears that prior to this present survey, the Rock River in the immediate vicinity of the Illinois Route 2 bridges (IDOT Sequence No. 19861) in Rockton had never been sampled for the presence of freshwater mussels (INHS Mollusk Collection, Champaign).

METHODS

A survey for freshwater mussels was conducted in the Rock River in the Illinois Route 2 (FAP 734) project area on 14 July 2016 at 900 hrs by INHS personnel J.S. Tiemann and staff from EnviroScience (Stow, OH), a commercial diving and environmental consulting company. Thirty 1-yd² quadrants were sampled under and between the Illinois Route 2 bridges by using a self-contained underwater breathing apparatus, or SCUBA (**Figure 1**). In addition, INHS staff randomly hand-picked the shallow (<2 feet) areas for one person-hour; this shallow area was

along the left descending bank (north side of project area) and accounted for <5% of the project area.

Mussels were identified and numerated on site. Per the signed agreement with the Illinois Department of Natural Resources (permit # S-16-034 – **Appendix 2**), all state-listed mussels were tagged (**Figure 4**) and relocated to an area of suitable habitat outside of the project area (**Figure 5**). Subsequently, all Species in Greatest Need of Conservation (SGNC) and 25 individuals of non-listed species were also tagged to increase the sample size needed to monitor the success of translocation. Tiemann et al. (*in press*) suggested short-distance relocations are a viable minimization tool for protecting freshwater mussels at bridge construction sites based upon success rates with Mucket *Actinonaias ligamentina* and Plain Pocketbook *Lampsilis cardium*; however, further study is needed examine the success of translocation on other species.

Spent shell was retained as voucher specimens for deposition in the INHS Mollusk Collection, Champaign. Nomenclature discussed in this report follows Graf and Cummings (2007) with slight modifications. The current statuses of threatened and endangered species are taken from U.S. Department of Interior, Fish and Wildlife Service (USDI, FWS) (1996, 1997) and the Illinois Endangered Species Protection Board (IESPB) (2015).

RESULTS AND DISCUSSION

The survey for freshwater mussels in the Rock River within the Illinois Route 2 (FAP 734) project area conducted by INHS and EnviroSciences personnel on 14 July 2016 yielded 74 individuals representing seven species, including seven individuals of the state-threatened Black Sandshell (**Table 1**). Three additional species were collected as fresh-dead and ten others as relict (**Table 1**). Aside from Black Sandshell, no other mussels collected during this present survey are listed as endangered or threatened at the state or federal level (Mankowski, 2010, 2012). However, one of the species collected alive during this survey, the Elktoe *Alasmidonta marginata*, is listed as a Species in Greatest Need of Conservation in Illinois (Douglass and Stodola, 2014).

Based upon the specimens collected during quadrant sampling, the density estimate for Black Sandshell is 0.23 individuals per square yard. Given the presence of suitable habitat (e.g., gravel substrates with moderate flow), we would assume the mussel is present at low to moderate densities throughout the project corridor. Elktoe density estimate is 0.03 individuals per square yard. The Elktoe occupies swift, clean and clear currents in or near riffle habitats (Douglass and Stodola, 2014) and is known from the Rock River mainstem in Winnebago County (INHS Mollusk Collection database). Given its infrequency in collecting in the Rock River in Winnebago County, the Elktoe is expected to occur at low densities. One species we failed to collect as live or fresh-dead was the Spike (**Table 1**). Within the last 50 years, the Spike has been collected only once in the Rock River in Winnebago County. Although suitable habitat exists in the project area, we would expect a small chance of encounter given its rarity.

Per the signed agreement with the Illinois Department of Natural Resources (permit # S-16-034), all seven Black Sandshells were tagged and relocated upstream on 14 July 2016. The Rock River at the confluence with the Pecatonica River in Rockton, Winnebago County, Illinois (Latitude 42.45284° North, Longitude 89.08910° West) was chosen as the relocation area

because suitable habitat for the Black Sandshell is present there, and it is located outside of the project area, and thus any possible negative influence from construction activities associated with the proposed Illinois Route 2 bridge removal and replacement. The lone Elktoe (SGNC) and 25 Pimplebacks (common, not listed) were also tagged and relocated to this area to increase the sample size needed to monitor the success of translocation. All other individuals collected were not tagged but relocated to this area. After translocation, marked individuals will be monitored with an aquatic PIT tag reading system on three occasions: within two months, at one year, and at three years post-release per the signed agreement with the Illinois Department of Natural Resources (permit # S-16-034). All tagged data are stored in the INHS Mollusk PIT tag database, Champaign.

ACKNOWLEDGMENTS

The following EnviroScience (Stow, OH) staff assisted in collecting – P. Evankovich, P. Eastbourne, and C. Hartsell. J.L. Jarvis prepared the map in **Figure 1** and associated shape file referenced in **Appendix 1**; M.J. Wetzel for editing the report; and J. Barnes for providing IDNR Heritage records. Illinois Department of Natural Resources granted INHS permit # S-16-034, which allows the capture and marking of state listed mussels at bridge construction projects sponsored by IDOT.

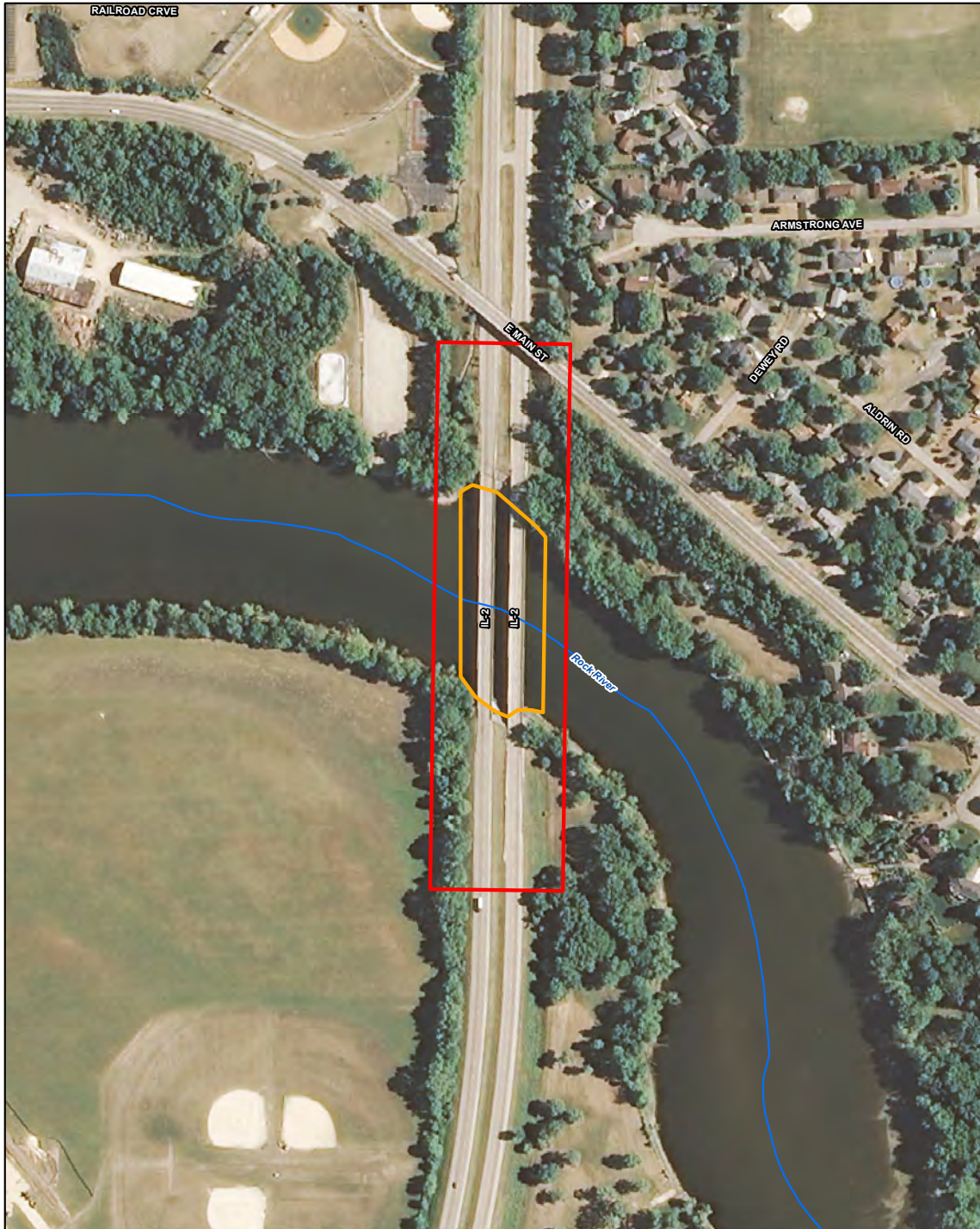
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Table 1. List of freshwater mussels collected in the Rock River within the Illinois Route 2 (IDOT Sequence No. 19861) project area in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West) on 14 July 2016 by INHS and EnviroSciences personnel. Data from these surveys include the number of individuals found alive and those species collected as fresh-dead (FD) or relict (R) shell. Species in **BOLD** indicate species considered extant in the Rock River in Winnebago County because they have been collected as live or fresh-dead shells from the river since 2000 (data from INHS Mollusk Collection Champaign). Special designation includes those species listed as Species in Greatest Need of Conservation^(SGNC), state-threatened in Illinois^(ST) and extirpated^(SX).

Scientific name	Common name	IL Rte 2 (2015)
<i>Actinonaias ligamentina</i>	Mucket	15
<i>Alasmidonta marginata</i> ^{SGNC}	Elktoe	1
<i>Amblema plicata</i>	Threeridge	R
<i>Amphinaias (Quadrula) pustulosa</i>	Pimpleback	42
<i>Cyclonaias tuberculata</i> ST	Purple Wartyback	R
<i>Elliptio dilatata</i> ST	Spike	R
<i>Fusconaia flava</i>	Wabash Pigtoe	FD
<i>Lampsilis cardium</i>	Plain Pockebook	7
<i>Lampsilis siliquoidea</i>	Fat Mucket	R
<i>Lasmigona complanata</i>	White Heelsplitter	1
<i>Lasmigona costata</i> ^{SGNC}	Flutedshell	R
<i>Leptodea fragilis</i>	Fragile Papershell	1
<i>Ligumia recta</i> ST	Black Sandshell	7
<i>Pleurobema rubrum</i> ^{SX}	Pyramid Pigtoe	R
<i>Pleurobema sintoxia</i>	Round Pigtoe	FD
<i>Potamilus alatus</i>	Pink Heelsplitter	R
<i>Pyganodon grandis</i>	Giant Floater	FD
<i>Quadrula quadrula</i>	Mapleleaf	R
<i>Tritogonia verrucosa</i>	Pistolgrip	R
<i>Truncilla donaciformis</i>	Fawnsfoot	R



Mussel survey location on the Rock River at IL 2 (Seq no. 19861), Winnebago County, Illinois.

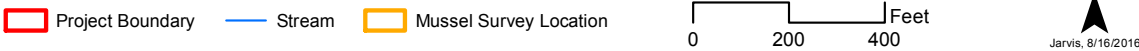


Figure 1. Map of the Illinois Route 2 (FAP 734) project area (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West). The Rock River flows in a southerly direction at this location. (Map created by J.L. Jarvis).



Black sandshell (*Ligumia recta*)

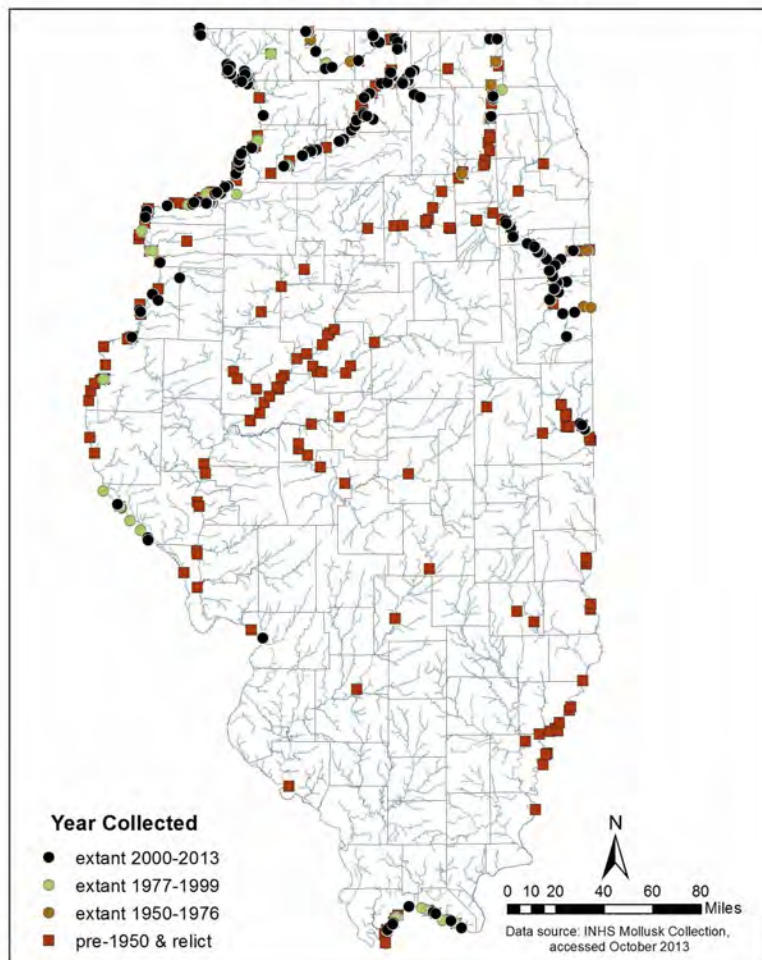


Figure 2. The state-threatened Black Sandshell (*Ligumia recta*) and its distribution in Illinois (K.S. Cummings photo; map from Stodola et al. 2014).



Spike (*Elliptio dilatata*)

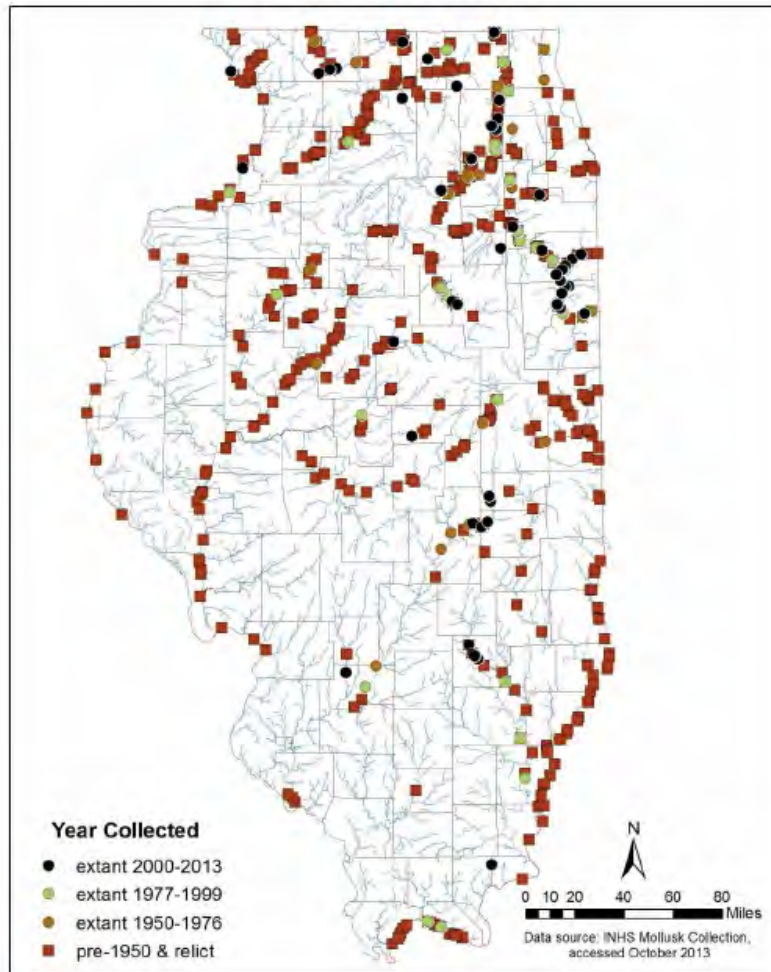


Figure 3. The state-threatened Spike (*Elliptio dilatata*) and its distribution in Illinois (K.S. Cummings photo; map from Stodola et al. 2014).



Figure 4. INHS personnel J.S. Tiemann affixing passive integrated transponder (PIT) tags. Seven Black Sandshells, one Elktoe, and 25 Pimplebacks collected in the Rock River at the Illinois Route 2 (FAP 734) project area on 14 July 2016 were externally outfitted with 12.5 mm, 134.2 kHz tags (BioMark, Inc., Boise, ID) using Devcon marine grade epoxy (Danvers, MA). Tagged mussels were held in small water troughs while the epoxy hardened and then relocated to an area ~1 mile upstream that had comparable habitat to the source site (e.g., sandy gravel run with moderate current – Figure 5).



Figure 5. The Rock River at the confluence with the Pecatonica River in Rockton, Winnebago County, Illinois (Latitude 42.45284° North, Longitude 89.08910° West) on 14 July 2016. Picture is facing upstream in a northeasterly direction on (P. Evankovich photo). This area is where INHS personnel released the individuals collected within the Illinois Route 2 (FAP 734) project area, located ~1 mile downstream, on 14 July 2016. Included in the release were seven tagged Black Sandshells, one tagged Elktoe, and 25 tagged Pimlebacks. Animals were hand placed in the substrate. Marked individuals will be monitored with an aquatic PIT tag reading system (BioMark FS2001F-ISO or BioMark HPR Plus with portable BP antennas) within two months, at one year, and at three years post-release per the signed agreement with the Illinois Department of Natural Resources (permit # S-16-034).

Appendix 1

This appendix cover page references < **19861_Mussel_Survey_GIS** > containing an ArcGIS shapefile with sampling point information for the site discussed in this report. Specifically, this shapefile includes site information for the Rock River at the Illinois Route 2 (FAP 734) project area (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois, where a survey for freshwater mussel was conducted by INHS personnel on 14 July 2016.

The ArcGIS shapefile and this report were both submitted to IDOT via the IDOT Site Assessment Tracking System extranet website (Frostycap) on 17 August 2016.

Appendix 2

Permit # S-16-034 from Illinois Department of Natural Resources to the Illinois Natural History Survey granting the Survey permission to collect, tag, and relocate freshwater mussels at bridge construction projects sponsored by the Illinois Department of Transportation.



Illinois
 Department of
Natural Resources

One Natural Resources Way • Springfield, Illinois 62702-1271

www.dnr.illinois.gov

**PERMIT FOR POSSESSION OF
 ENDANGERED OR THREATENED SPECIES**

Permit type: S Permit No. 16-034 is issued to: Jeremy Tiemann, Illinois Natural History Survey, 1816 South Oak Street, Champaign, IL. 61820 to allow **netting, brailing, hand capture, tagging/marking, data collection, photograph, immediate relocation and release in the same stream system only, and follow-up monitoring only** of the following animals or animal products of endangered or threatened species or federal endangered plants:

SPECIES	ITEM	QUANTITY
1. <u>All State Listed Mussel Species</u>	<u>Live Animal</u>	<u>As Encountered</u>

Permit version: Original X Renewal Amended

Special conditions: This permit allows the capture and marking of state listed mussels at bridge construction projects sponsored by the Illinois DOT. These mussels shall be relocated to an area of suitable habitat in the same stream from which they were collected. Relocated animals shall be monitored at 2 months, 1 year, and 3 years post-relocation. This permit is valid in all of Illinois' 102 counties. Subpermittees include: Kevin S. Cummings and Alison P. Stodola

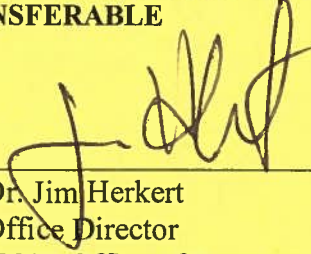
Standard conditions:

- **Reporting-** Annual reports must be submitted by January 31 of each year. Changes in inventory of specimens must be reported within 5 days. Changes in personal information or affiliation must be reported within 10 days.
- **Propagation-** Propagation requires a permit for such a purpose, only available under Scientific and Zoological/Botanical permits.
- **Disposal or Transfer-** Applicants must obtain a permit prior to transfer or disposal of specimens.

- **Facilities:** Holding facilities must meet the standards set forth by the Federal Animal Welfare Act.
- **Temporary holding:** Specimens allowed under limited permits may be held temporarily (up to 90 days) by other persons only after written consent of the director.
- **Revocation:** Permits may be revoked if false information was used to obtain permit, reports were not submitted, facility standards were not met, or applicant violates state or federal laws.

THIS PERMIT IS VOID IF IT CONTAINS ANY STRIKE-OUTS, OVERWRITES OR OTHER ALTERATIONS AND IS NON-TRANSFERABLE

ITEMS LISTED ON THIS PERMIT MAY BE SOLD, GIVEN AWAY OR OTHERWISE DISPOSED OF ONLY WITH PERMISSION OF THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Signed: 
Dr. Jim Herkert
Office Director
IDNR Office of Resource Conservation

Date issued: 6-2-14

Expiration Date: December 31, 2016

*This permit is issued pursuant to the Illinois Endangered Species Protection Act and authorizes only those activities listed above. This permit does NOT exempt the permittee from compliance with any other federal, state, or local law, statute, ordinance, or regulation. As a permit holder, the individual/agency acknowledges that all collections of Federal and State listed species be reported to the Endangered Species Program Manager (IL. DNR-Division of Natural Heritage) within 10 days of collection.

Appendix B

**Fish Survey Report for IL 2 over the
Rock River, Rockton, IL (Tiemann 2016a)**



**Survey for Fishes in the Rock River at the
Illinois Route 2 bridge (IDOT Sequence No. 19861)
Rockton, Winnebago County, Illinois**



Prepared by:
Jeremy S. Tiemann

INHS/IDOT Statewide Biological Survey & Assessment Program
Program Report 2016 (53)

14 June 2016



PROJECT SUMMARY

This report is submitted in response to a request from IDOT to INHS for a fish survey in the Rock River the Illinois Route 2 bridge (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois. Specifically, this tasking asked for the presence of the state-listed fishes (e.g., the state-endangered Lake Sturgeon *Acipenser fulvescens* and the state-threatened Gravel Chub *Erimystax x-punctatus* and Brassy Minnow *Hybognathus hankinsoni*) within the project corridor. The fish survey was conducted on 17 May 2016 by INHS personnel utilizing the trawling method specifically to collect benthic fishes.

Fishes were collected from five 100-yard trawl hauls of the Rock River within the project corridor. Because of several woody debris piles within the project corridor created obstacles and hindrances for trawling, two additional hauls – one upstream and one downstream – were conducted outside the project corridor. The seven trawl hauls yielded 37 individuals representing six species, including nine individuals of the state-threatened Gravel Chub (density = 0.43 individuals per 100 yards²). No other fishes collected are listed as endangered or threatened at the state or federal level, or are under consideration for such listing.

Given the presence of suitable habitat (e.g., gravel substrates with moderate flow), we would assume the state-threatened Gravel Chub is present at moderate densities throughout the project corridor. However, the Brassy Minnow's preferred habitat conditions (e.g., slower current velocities with mud or silt substrates and some vegetation) were not observed within the project corridor, suggesting that construction activities likely will not affect this species. Additionally, the Lake Sturgeon appears to be extremely rare in the Rock River basin, especially in Winnebago County. Despite spawning habitat for the species (e.g., areas with rocky substrates and moderate flow) being present at the Illinois Route 2 bridge site, sturgeon likely would swim away to another region of the Rock River if any construction activities resulted in disturbance of the river (flow, substrates) vicinity of the bridge in which this species is present.



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

Surveys Conducted By: Jeremy S. Tiemann, Aquatic Zoologist
Andrew Stites, Fisheries Biologist

Edited by: Mark J. Wetzel, INHS Research Affiliate

GIS Layers: Janet L. Jarvis, GIS and Remote Sensing Specialist

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TABLE OF CONTENTS

Project summary	1
Introduction.....	3
Project location	3
Habitat characterization	3
Background.....	4
Methods	5
Results and discussion	6
Acknowledgements	7
Literature Cited.....	7

Tables

Table 1 – List of fishes collected the Rock River at the Illinois Route 2 bridge (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West) on 17 May 2016 by INHS personnel	9
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Figures

Figure 1 – Map of the Illinois Route 2 bridge project corridor (IDOT Sequence No. 19861), Rockton, Winnebago County, Illinois.....	10
Figure 2 – The state-endangered Lake Sturgeon (<i>Acipenser fulvescens</i>) and its distribution in Illinois	11
Figure 3 – The state-threatened Gravel Chub <i>Erimystax x-punctatus</i> and its distribution in Illinois.....	12
Figure 4 – The state-threatened Brassy Minnow (<i>Hybognathus hankinsoni</i>) and its distribution in Illinois	13

Appendices

Appendix 1. A cover page referencing < 19861_Fish_Survey_GIS.zip >, an ArcGIS shapefile which includes sampling point information for the Rock River at the Illinois Route 2 bridge (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois, where a survey for fishes was conducted by INHS personnel on 17 May 2016.....	14
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Cover photo: Rock River at the Illinois Route 2 bridge (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West) on 17 May 2016. Picture is facing downstream, in a southerly direction (A.J. Stites photo).

INTRODUCTION

This report is submitted in response to a request made by Susan Hargrove of IDOT to Wendy Schelsky of INHS, dated 22 March 2016, for fish and mussel surveys and bat habitat assessment at the Illinois Route 2 bridge (FAP 734) in Rockton, Winnebago County, Illinois [IDOT Seq. No.: 19861; Section No. 77-1BR; Job No. P-92-022-15; Contract No. 64K73; INHS Project No. FS-885]. Work includes removal and replacement of the bridge structures carrying Illinois Route 2 over the Rock River. Specifically, this tasking suggests the presence of two state-listed fishes (the state-endangered Lake Sturgeon *Acipenser fulvescens* and the state-threatened Gravel Chub *Erimystax x-punctatus*) and two state-listed mussels (the state-threatened Black Sandshell *Ligumia recta* and the state-threatened Spike *Elliptio dilatata*) in the Rock River. Additionally, in an email from IDOT on 19 May 2016, IDOT also inquired about the presence of the state-threatened Brassy Minnow *Hybognathus hankinsoni* within the project corridor.

In this report, we summarize the results of the fish survey conducted by INHS personnel on 17 May 2016 at this site. A separate report will summarize the results of the freshwater mussel survey of the Rock River at the Illinois Route 2 bridge.

PROJECT LOCATION

This project consists of one stream crossing:

Rock River at the Illinois Route 2 bridge (IDOT Sequence No. 19861) in Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West; Second Principal Meridian: Township 46N, Range 1E, Section 24) (**Figure 1**). The Rock River flows in an east-southeasterly direction at this location.

Appendix 1 references a shapefile with sampling point information for the stream crossing, as discussed in this report.

HABITAT CHARACTERIZATION

During our visit to the project area on 17 May to conduct a survey for fishes, the Rock River in the immediate vicinity of the Illinois Route 2 bridge was approximately 160 yards wide, >6.0 feet deep, and had a discharge rate of ~6,000 cubic feet per second on 17 May 2016 (**cover photo**). Habitat was estimated in two ways – 1) by visual examination of streambed in shallower areas with good water clarity; and 2) by feeling the vibrations of the trawl line when being dragged, as the line has a smoother feel (feedback through vibrations) in sand and mud substrates compared to the vibrations felt when being dragged over gravel and rocky substrates (during which the lead-line skims and slightly bounces over the rocks). Also, residual effects of substrate can be seen on and in the trawl (e.g., the trawl would be muddy through silt, or contain rocky substrates when drug through gravel, pebble, or cobble). Stream substrates appeared to be predominantly gravel/pebble with small patches of silted sandy gravel or riprap; some woody debris accumulation was present along the stream edges and on the bridge piers. The riparian areas along each bank were tree-lined.

BACKGROUND

The Rock River originates in Dodge County, Wisconsin, flows 318 miles in a south-southwesterly direction in southern Wisconsin and northern Illinois before its confluence with the Mississippi River at Rock Island, Rock Island County (Bales et al., 2012). Smith (1971) rated the Rock River as “Good” to “Excellent” except where it borders or passes through highly urbanized or industrialized areas, and the Biological Streams Characterization rates the Rocker River mainstem from where it enters Illinois to Clear Creek (Ogle County) as a “B” stream, which is considered a Highly Valued Aquatic Resource (Hite and Bertrand, 1989).

The Rock River drainage historically has supported a diverse and abundant fish fauna with over 110 species (Smith, 1979; Becker, 1983; Retzer, 2005; Burr and Page, 2009). Most of these species are common inhabitants of northern Illinois streams, and are not listed as endangered or threatened at the state or federal level, nor are any currently under consideration for such listing (Smith, 1979; Mankowski, 2010, 2012). However, at least three state-listed fish do occur in the Rock River mainstem near Rockton, including the state-endangered Lake Sturgeon *Acipenser fulvescens* (**Figure 2**), the state-threatened Gravel Chub *Erimystax x-punctatus* (**Figure 3**), and the state-threatened Brassy Minnow *Hybognathus hankinsoni* (**Figure 4**).

The Lake Sturgeon (**Figure 2**) is a robust, large-bodied, slow maturing, long-lived (~150 years) benthic fish, with adults obtaining lengths of 9 feet and weights of 300+ pounds (Smith, 1979; Kansas Fish Committee [KFC], 2014). The preferred habitat of adult Lake Sturgeon is lake bottoms and deep rivers with sand, mud, and gravel. Adults are highly mobile (can swim >100 miles on the basis of food or habitat availability) and in the spring migrate to spawn in shallower areas with rocky riffles or rapids and fast moving flow in depths between 1 foot to 15 feet (Becker, 1983; KFC 2014). Lake Sturgeon in Wisconsin spawn late April to early June when water temperatures range between 53°F and 59°F (Becker, 1983). Spawning Lake Sturgeon were abundant in Illinois prior to 1900 but populations were decimated due to overexploitation, direct and indirect effects of dams, and habitat degradation and contamination (Smith, 1979). However, recent restoration efforts, including restocking efforts by natural resource agencies, have been successful and the long-term trend is considered stabilized, although at a reduced population level. Since 1980, the Lake Sturgeon has been captured at one location in the Rock River, Winnebago County, Illinois (data from the INHS Fish Collection database and the IDNR Heritage database):

- one dead fish at the water intake at North American Hydro generating station in 2009 (IDNR EO ID 8813).

The Gravel Chub (**Figure 3**) is a somewhat small (<3”) minnow that occupies deeper riffles and runs of moderate to fast current over firm, silt-free sand-gravel substrates in medium to large streams (Smith, 1979; Becker, 1983; Mullen, 1992; KFC, 2014). The fish rests under rocks in riffles to reduce the effects of strong currents (Becker, 1983; KFC, 2014). The Gravel Chub is believed to spawn in spring (e.g., April – May) when water temperatures approach 60°F (Smith, 1979; Becker, 1983; Mullen, 1992; KFC, 2014). The Gravel Chub has experienced a decline in distribution in Illinois as a result of siltation in streams (Smith, 1971; Smith 1979; Mullen, 1992). The Gravel Chub has been collected throughout the Rock River basin both historically and recently (INHS Fish Collection database). A sizeable and stable population occurs in the Rock

River near South Beloit (Becker, 1983; Mullen, 1992). Since 1980, the Gravel Chub has been captured at the following locations in the Rock River, Winnebago County, Illinois (data from the INHS Fish Collection database and the IDNR Heritage database):

- Rockford, at Blackhawk Park (Latitude 42.24509° North, Longitude 89.10541° West; Township 44N, Range 1E, Section 34 SW), 20 August 2002, K.S. Cummings et al. (1 individual vouchered; INHS Fish Catalogue #95545), with seine.
- Rockford, at Rockford Dam (Latitude 42.2655° North, Longitude 89.09531° West; Township 44N, Range 1E, Section 26 NW), 23 July 1998, D.A. Carney et al. (2 individuals vouchered; INHS Fish Catalogue #54034), with seine and electrofishing boat. Individuals (N = 2 vouchered; INHS Fish Catalogue #102521) were collected again on 19 August 2008 by K. Rivera with an electrofishing boat.
- Roscoe, (Latitude 42.41236° North, Longitude 89.01601° West; Township 45N, Range 2E, Section 4, NW), 21 August 2002, K.S. Cummings et al. (1 individual collected; IDNR EO ID 8880).
- Rockton, (Township 46N, Range 1E, Section 12), 4 August 2003, K.S. Cummings et al. (1 individual vouchered; INHS Fish Catalogue #95545), with seine.
- South Beloit, ~1/2 mile downstream of the state line (Latitude 42.48878° North, Longitude 89.04623° West; Township 46N, Range 2E, Section 6 SE), 27 April 2016, J.S. Tiemann et al. (9 individuals collected) by kick-seining.
- South Beloit, state line (Latitude 42.4963° North, Longitude 89.0420° West; Township 46N, Range 2E, Section 6 NE), 18 August 2008, K. Rivera (1 individual vouchered; INHS Fish Catalogue #102526), with an electrofishing boat.

The Brassy Minnow (**Figure 4**) is generally found in small to medium-sized streams with slower current velocities, mud or silt substrates, and some aquatic vegetation (Smith, 1979; Becker, 1983; Mullen, 1992). It spawns in spring (e.g., May and June), and often occurs over vegetation, when water temperatures are between 60°F and 80°F (Smith, 1979; Becker, 1983). Since 1980, the Brassy Minnow has been captured at only one location in the Rock River, Winnebago County, Illinois (data from the INHS Fish Collection database and the IDNR Heritage database):

- Rockton, Illinois Route 75 bridge, (Latitude 42.44975° North, Longitude 89.07263° West; Township 46N, Range 1E, Section 24, NW), 23 July 1998, D.A. Carney & IDNR Stream Crew. (5 individuals vouchered; INHS Fish Catalogue #54059), with a seine and electrofishing boat.

METHODS

A survey for fishes was conducted in the Rock River in the Illinois Route 2 project corridor on 17 May 2016 at 1300 hrs by INHS personnel J.S. Tiemann and A.J. Stites. Five 100-yard trawl hauls were pulled within the project corridor (within red area of **Figure 1**). Because of several woody debris piles within the project corridor created obstacles and hindrances for trawling, two additional hauls – one upstream and one downstream – were conducted outside the project corridor. These augmented hauls were conducted to obtain better density estimates of benthic fishes with the project area (within blue areas of **Figure 1**). The area sampled while trawling

was approximately 300 yd² – the trawl expanded to approximately 3 yards wide and was pulled for 100 yards.

Fishes were identified on site, and most were released on site except those retained as voucher specimens for deposition in the INHS Fish Collection in Champaign, Illinois. Nomenclature discussed in this report follows Page and Burr (2011) except that subspecies are not recognized. The current status of threatened and endangered species of fishes discussed in this report are taken from U.S. Department of Interior, Fish and Wildlife Service (USDI, FWS) (1996, 1997), Illinois Endangered Species Protection Board (IESPB) (2011), and Mankowski (2010, 2012).

RESULTS AND DISCUSSION

The survey for fishes during the five trawl runs in the Rock River within the Illinois Route 2 bridge project corridor (e.g., red area with in **Figure 1**) conducted by INHS personnel on 17 May 2016 yielded 37 individuals representing six species, including seven individuals of the state-threatened Gravel Chub (**Table 1**). The remaining five species were common inhabitants of northern Illinois streams, and are not listed as threatened or endangered at the federal or state level, nor are candidates for listing in Illinois (Smith, 1979; Mankowski, 2010, 2012). Not included in this total are two additional Gravel Chubs that were collected (one each upstream and downstream) outside the project corridor during the supplemental trawls. No other species were collected during these two additional trawls.

Based upon the trawling efforts, the density estimate is at least 0.43 Gravel Chubs per 100 yards². This density estimate might be low, however. Sampling for fishes in the project area was difficult because of the habitat conditions. The discharge was strong (~6,000 cubic feet per second based upon the USGS Rock River at Rockton gage station – #05437500) and often interfered with deployment and retrieval of the trawl. When disturbed, the Gravel Chub has been observed to quickly dart away to hide under rocks (Becker, 1983; KFC, 2014) – an avoidance behavior which could have reduced our success of collecting. Our limited efforts (seven trawl hauls total) yielded nine Gravel Chubs, and at least one individual was collected in every trawl haul, including the two hauls just outside (one upstream and one downstream) of the project corridor. Given the presence of suitable habitat (e.g., gravel substrates with moderate flow), we would assume the fish is present at moderate densities throughout the project corridor.

The Brassy Minnow's preferred habitat conditions (e.g., slower current velocities with mud or silt substrates and some vegetation) were not seen within the project area. This observation, coupled with the fact that the fish is extremely rare in the Rock River basin and tends to prefer smaller streams (Smith, 1979; Becker, 1983; Mullen, 1992), suggests that construction activities likely will not affect the Brassy Minnow.

Additional target surveys for Lake Sturgeon at the Illinois Route 2 bridge site in Rockton are not warranted. The fish appears to be extremely rare in the Rock River basin, especially in Winnebago County (Smith, 1979; Becker, 1983; Mullen, 1992; Metzke et al., 2012). If any construction activity caused a disturbance to this species, Lake Sturgeon likely would swim away to another region of the Rock River. However, spawning habitat for the species (e.g., areas with rocky substrates and moderate flow) is present at the Illinois Route 2 bridge site.

ACKNOWLEDGMENTS

I thank the following INHS staff: A.J. Stites for assistance collecting; J.L. Jarvis for preparing the map in **Figures 1** and associated shape file referenced in **Appendix 1**; M.J. Wetzel for editing the report; and J. Barnes for providing IDNR Heritage records.

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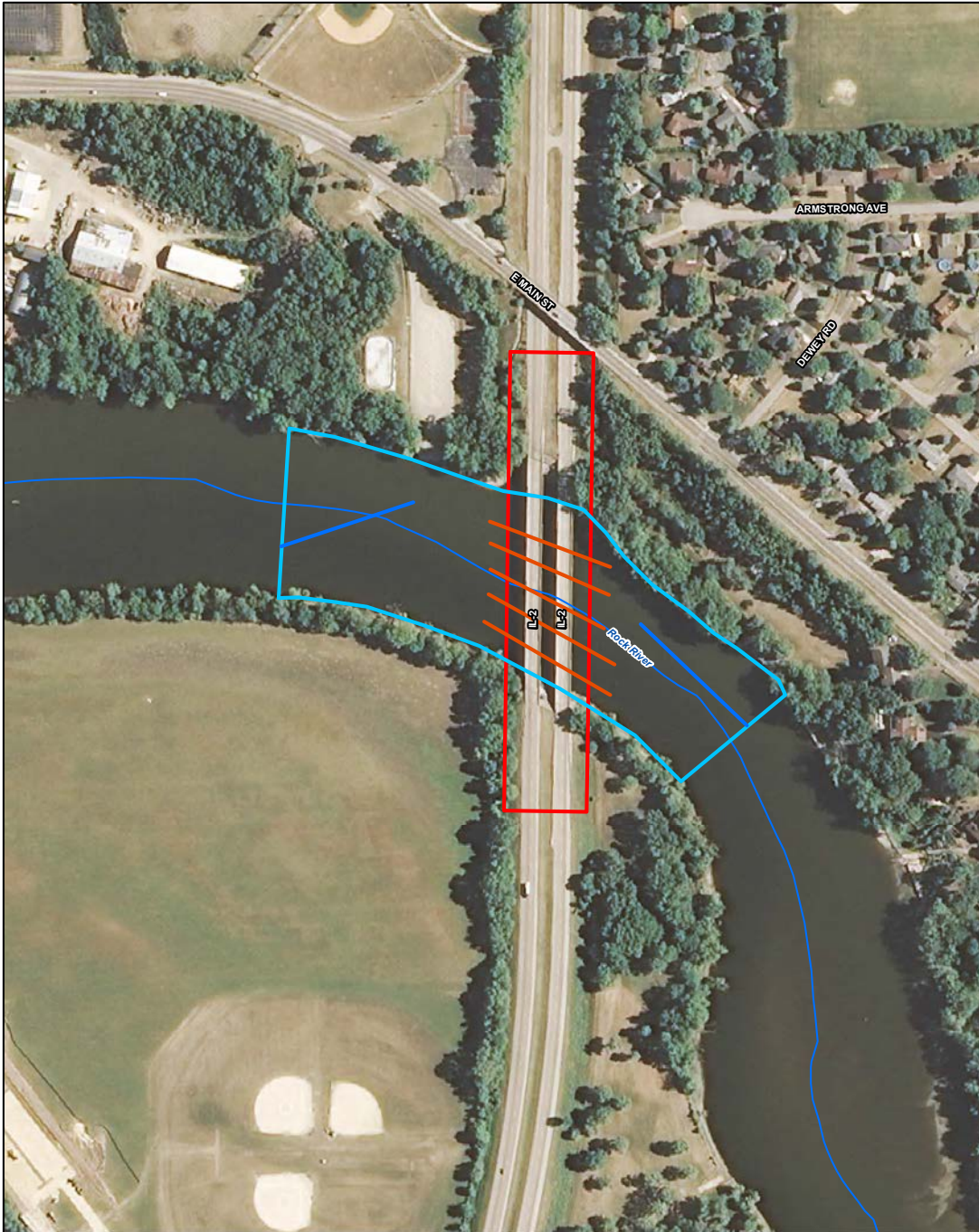
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Table 1. List of fishes collected the Rock River within the Illinois Route 2 bridge (IDOT Sequence No. 19861) project corridor (red area within Figure 1), Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West) on 17 May 2016 by INHS personnel.¹ Data include the number of individuals collected. Special status = ST – State-Threatened.

Family	Scientific name	Common name	2016
Cyprinidae	<i>Erimystax x-punctatus</i> ST	Gravel Chub	7
	<i>Notropis stramineus</i>	Sand Shiner	1
Ictaluridae	<i>Ictalurus punctatus</i>	Channel Catfish	2
Percidae	<i>Etheostoma nigrum</i>	Johnny Darter	1
	<i>Etheostoma zonale</i>	Banded Darter	23
	<i>Percina maculata</i>	Blackside Darter	3

¹ Not included in this total are two additional Gravel Chubs – one collected each upstream and downstream of the project corridor during the supplemental trawls (blue areas in Figure 1). No other species were collected during these two additional trawls



Fish survey location on the Rock River at IL 2 (Seq no. 19861), Winnebago County, Illinois.

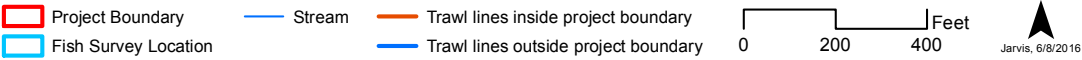


Figure 1. Map of the Illinois Route 2 bridge project corridor (IDOT Sequence No. 19861), Rockton, Winnebago County, Illinois (Latitude 42.44924° North, Longitude 89.05961° West). Red indicated the project area, and blue represents where additional trawl runs were conducted. The Rock River flows in a southerly direction at this location. (Map created by J.L. Jarvis).

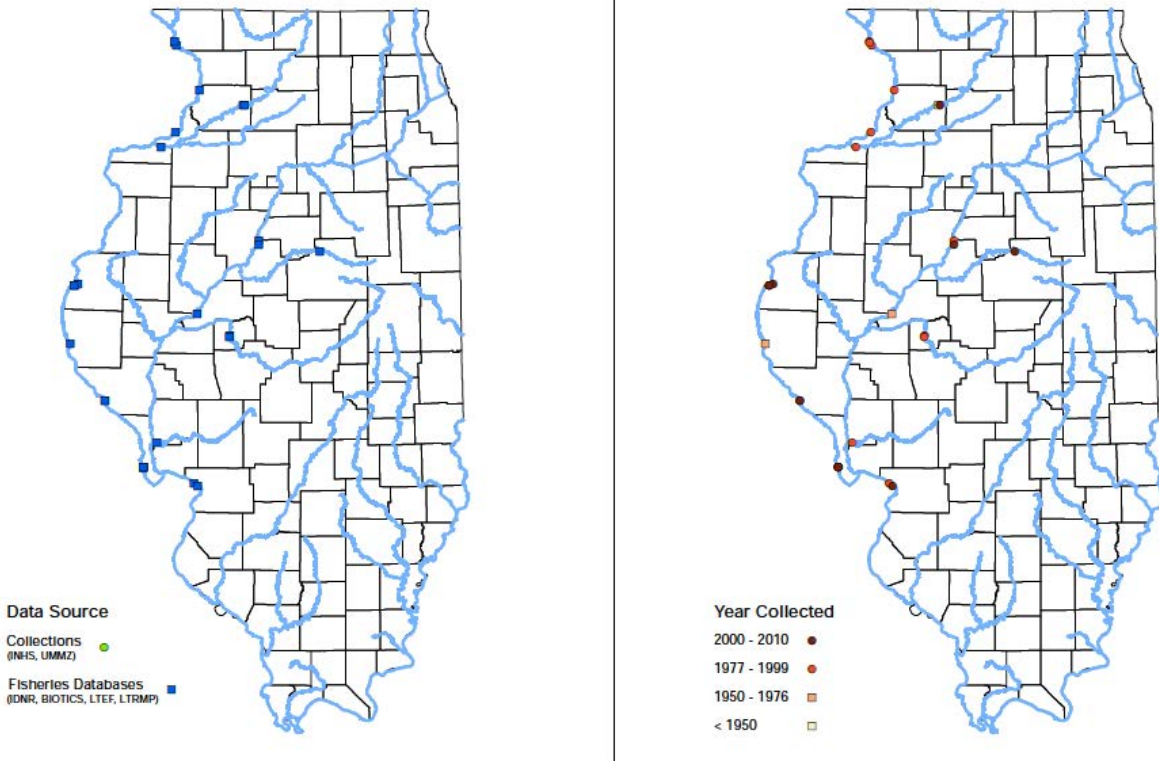
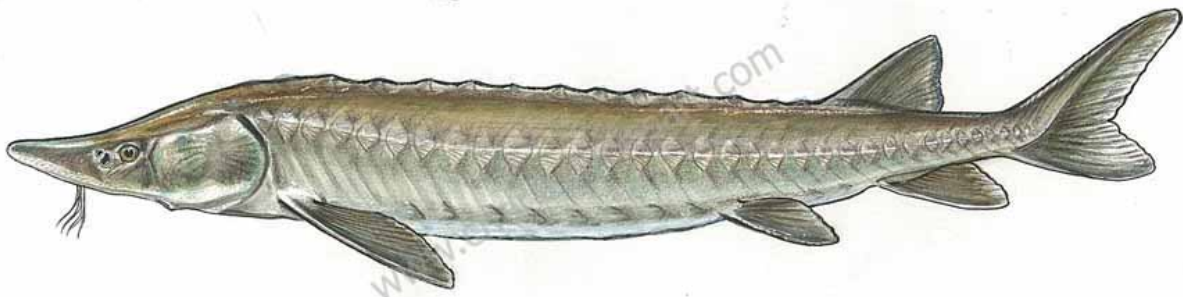


Figure 2. The state-endangered Lake Sturgeon (*Acipenser fulvescens*) and its distribution in Illinois (photo from Charles Weis Art [<http://www.charlesweissart.com/sideviews.html>]; map from Metzke et al., 2012).

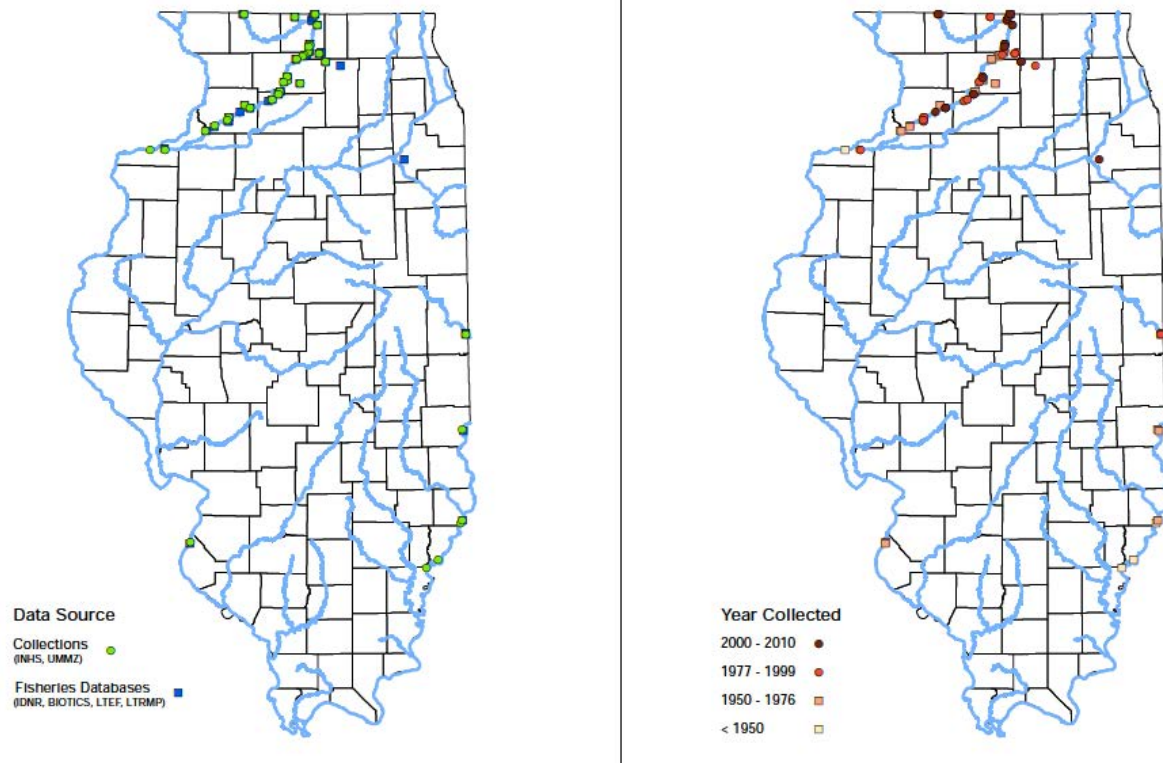


Figure 3. The state-threatened Gravel Chub (*Erimystax x-punctatus*) and its distribution in Illinois (photo downloaded from the North American Native Fishes Association webpage [gallery.nanfa.org]; map from Metzke et al., 2012).



Hybognathus hankinsoni Collection Sites in Illinois
Before and After 1979

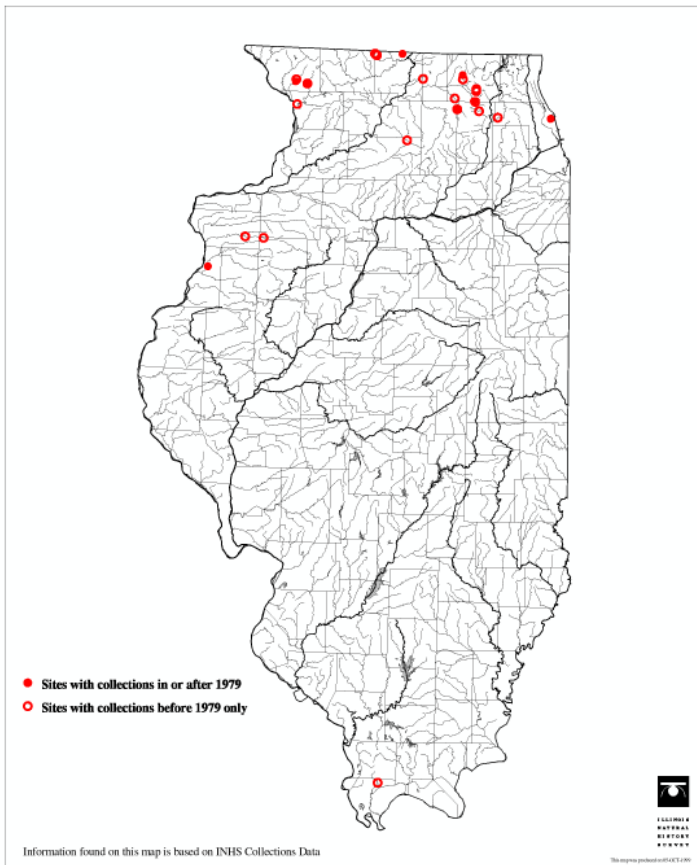


Figure 4. The state-threatened Brassy Minnow (*Hybognathus hankinsoni*) and its distribution in Illinois (photo downloaded from the North American Native Fishes Association webpage [gallery.nanfa.org]; map from INHS Fish Collection [http://www.inhs.illinois.edu/collections/fish/data/ichthyology/ilfish/]).

Appendix 1

This appendix cover page references < **19861_Fish_Survey_GIS** > containing an ArcGIS shapefile with sampling point information for the site discussed in this report. Specifically, this shapefile includes site information for the Rock River at the Illinois Route 2 (IDOT Sequence No. 19861) project, Rockton, Winnebago County, Illinois, where a survey for fishes was conducted by INHS personnel on 17 May 2016.

The ArcGIS shapefile and this report were both submitted to IDOT via the IDOT Site Assessment Tracking System extranet website (Frostycap) on 14 June 2016.

Appendix C

Permit #S-16-034 from Illinois Department of Natural Resources to the Illinois Natural History Survey granting the Survey permission to collect, tag, and relocate freshwater mussels at bridge construction projects sponsored by the Illinois Department of Transportation in 2016.

Note: A current permit will be provided with the 2022 survey and relocation.



**PERMIT FOR POSSESSION OF
 ENDANGERED OR THREATENED SPECIES**

Permit type: S Permit No. 16-034 is issued to: Jeremy Tiemann, Illinois Natural History Survey, 1816 South Oak Street, Champaign, IL. 61820 to allow **netting, brailing, hand capture, tagging/marking, data collection, photograph, immediate relocation and release in the same stream system only, and follow-up monitoring only** of the following animals or animal products of endangered or threatened species or federal endangered plants:

SPECIES	ITEM	QUANTITY
1. <u>All State Listed Mussel Species</u>	<u>Live Animal</u>	<u>As Encountered</u>

Permit version: Original X Renewal Amended

Special conditions: This permit allows the capture and marking of state listed mussels at bridge construction projects sponsored by the Illinois DOT. These mussels shall be relocated to an area of suitable habitat in the same stream from which they were collected. Relocated animals shall be monitored at 2 months, 1 year, and 3 years post-relocation. This permit is valid in all of Illinois' 102 counties. Subpermittees include: Kevin S. Cummings and Alison P. Stodola

Standard conditions:

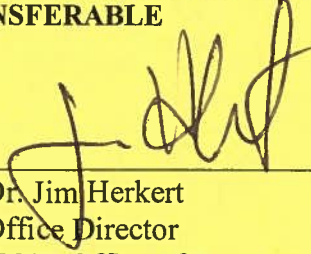
- **Reporting-** Annual reports must be submitted by January 31 of each year. Changes in inventory of specimens must be reported within 5 days. Changes in personal information or affiliation must be reported within 10 days.
- **Propagation-** Propagation requires a permit for such a purpose, only available under Scientific and Zoological/Botanical permits.
- **Disposal or Transfer-** Applicants must obtain a permit prior to transfer or disposal of specimens.

- **Facilities:** Holding facilities must meet the standards set forth by the Federal Animal Welfare Act.
- **Temporary holding:** Specimens allowed under limited permits may be held temporarily (up to 90 days) by other persons only after written consent of the director.
- **Revocation:** Permits may be revoked if false information was used to obtain permit, reports were not submitted, facility standards were not met, or applicant violates state or federal laws.

THIS PERMIT IS VOID IF IT CONTAINS ANY STRIKE-OUTS, OVERWRITES OR OTHER ALTERATIONS AND IS NON-TRANSFERABLE

ITEMS LISTED ON THIS PERMIT MAY BE SOLD, GIVEN AWAY OR OTHERWISE DISPOSED OF ONLY WITH PERMISSION OF THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Signed: _____


Dr. Jim Herkert
Office Director
IDNR Office of Resource Conservation

Date issued: 6-2-14

Expiration Date: December 31, 2016

*This permit is issued pursuant to the Illinois Endangered Species Protection Act and authorizes only those activities listed above. This permit does NOT exempt the permittee from compliance with any other federal, state, or local law, statute, ordinance, or regulation. As a permit holder, the individual/agency acknowledges that all collections of Federal and State listed species be reported to the Endangered Species Program Manager (IL. DNR-Division of Natural Heritage) within 10 days of collection.

Appendix D

Natural Resources Review Renewal Memorandum January 11, 2019



Illinois Department of Transportation

Memorandum

To: Kevin Marchek Attn: Masood Ahmad
From: Jack A. Elston By: Thomas C. Brooks
Subject: Natural Resources Review Renewal
Date: January 11, 2019

Thomas C Brooks

FAP 734 IL 2
T 46N, R 1E, S 19
Winnebago County
Sequence # 19861
Contract #:64K73

This is a renewal. The proposed project involves replacing FAP 734, IL 2, over the Rock River in Rockton. The structures are numbers 101-0125 and 101-0126. The total length of the project is 0.25 miles. In order to collect necessary information for the proposed project, streambed borings will occur, involving drilling holes 8" X 8" for a total disturbed area of less than six square feet. The scope of the bridge replacement requires the use of cofferdams and or causeways. Once the borings are taken, a more specific scope can be defined for the project. Construction will be staged construction.

There will be no land acquisition. There will be in-stream work in the Rock River which consists of cofferdams and or causeways. There will be five trees to be removed. Land cover in the vicinity of the proposed improvement is urban, residential, with athletic fields in the southwest project quadrant, and a wooded riparian corridor along the Rock River.

Review for Illinois Endangered Species Protection and Illinois Natural Areas Preservation – Part 1075

The Illinois Natural Heritage Database (INHDB) contains no records for dedicated Nature Preserves or registered Land and Water Reserves in the vicinity of the project. The Rock River Rockton segment was recently classified as an Illinois Natural Area Inventory Site. In 2017, the site was added as a Category II INAI site due to the presence of the State-threatened Gravel chub and the Black sandshell. The INHDB includes records for several state-listed threatened or endangered aquatic species in the Rock River. The Illinois Natural History Survey (INHS) conducted fish and mussel surveys in 2016. INHS found seven Black sandshell mussels on July 14, 2016, and seven Gravel chubs on May 17, 2016. The Spike mussel was not collected during the survey; however, the report notes that suitable habitat exists within the project area. The report also notes that while the species was not encountered during the survey, there is a small chance it could be encountered, though it is unlikely given its historical rarity. No other species listed as threatened or endangered were found during the 2016 surveys.

Eco CAT was submitted to IDNR September 21, 2016, with a response dated December 27, 2016. IDNR recommended obtaining an Incidental Take Authorization (ITA) for the Black sandshell mussel and Gravel chub. **By copy of this memorandum, we request closure of Part 1075 consultation by IDNR, based upon our commitment to obtain an ITA for the Black sandshell mussel the Spike mussel, and Gravel chub.**

Review for Illinois Interagency Wetland Policy Act – Part 1090

The National Wetlands Inventory, Ducks Unlimited Wetlands Inventory, ground level and aerial photos, plan sheets, USDA soil maps, and topographic quadrangle maps were examined. Soils on the north bank are hydric Comfrey loams. Although soils are hydric, this area is highly urban and developed. Soils on the south bank are non-hydric, Lahoguess loam. There are no inventoried wetlands in the vicinity of the project. Additionally, the project requires no right of way or land acquisition and the project area is predominantly urban. **Therefore, the wetland review under Part 1090 is terminated.**

Review for Endangered Species Act - Section 7

The proposed improvement was reviewed in fulfillment of our obligation under Section 7(a)2 of the Endangered Species Act. Our review included use of the US Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) web-based review tool. Through IPaC, an official species list was received and is saved to the project folder. The list contains the endangered, threatened, proposed and candidate species and proposed and designated critical habitat that may be present within or in the vicinity of the proposed improvement. The following species are listed: Indiana bat (Ibat) Northern long-eared bat (NLEB) and Eastern prairie fringed orchid, and the Rusty patched bumblebee. No proposed or designated critical habitat is listed in Winnebago County. **Under 50 CFR 2.12(e) the accuracy of the species list is limited to 90 days.**

Within IPaC there is a Determination Key for the NLEB and Ibat. We used the key to determine applicability of the project with the USFWS revised programmatic biological opinion for transportation projects dated 12-15-2016 and to assess what effect the project would have on NLEB or Ibat. We completed an IPaC qualification interview and determined that **the project is within the scope of the programmatic biological opinion and is not likely to affect either bat species provided the following conservation measures are implemented:**

Trees three (3) inches or greater in diameter at breast height shall not be cleared from April 1 through September 30 of any given year.

Our determination is based on the results of the bat bridge assessment which showed no bats or signs of bats utilizing the bridge. **Please note that the bat bridge assessment was conducted in 2016 and is no longer valid. An updated assessment shall be conducted prior to construction.**

We cross-referenced the preferred habitat of each of the remaining listed species with our knowledge of the project area and determined that the proposed improvement will have no effect on those species.

Should the proposed improvement be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination should be initiated.

KCB

Appendix E
SPECIAL PROVISIONS

Appendix E

SPECIAL PROVISIONS

1. Once the bridge is designed, the bridge plans, practices, equipment to be used, and timeline shall be provided to IDNR.
2. No more than five trees shall be removed for construction of this project.
3. Trees three (3) inches or greater in diameter at breast height will not be cleared from between April 1 through September 30 of any given year.
4. The bridges will be reassessed for the presence of bats 60 to 90 days prior to the start of construction on the bridges.
5. The actual bridge construction limits will be surveyed by INHS between 60 to 90 days prior to construction, and all mussels collected will be relocated.
6. The river will remain open to recreational boat traffic at times possible. The Contractor shall delineate the passageway and use any necessary signage and warning lights needed to ensure safe passage through the work area.
7. 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 IEPA Section 401 Water Quality Permit, the Individual IDNR-OWR Permit, and requirements within the NPDES construction permit.
8. Barges and water craft used for construction activities shall be inspected for the presence of zebra mussels prior to placing the barges into the Rock River and shall be completely out of water for 10 days to ensure properly drying and reduce potential infestation by zebra mussels. If the barge is obtained from a local source, USFWS and IDNR staff must still be contacted to discuss previous locations at which the barge has been used.
9. Barges used during the streambed borings and construction shall only be anchored within the proposed construction footprint.
10. If the existing bridges are demolished by dropping them into the river, they will be removed from the river as soon as practicable.
11. The contractor will be responsible for implementing measures to prevent debris from falling in the river. Debris will not be allowed to collect at the bottom of the river. The contractor will remove any debris from the water or river bed as soon as practicable during the same work day in order to prevent the accumulation of potentially polluted materials.

12. Construction inspectors will be present during construction activities to ensure compliance with IDOT Special Provisions.
13. Spill protection material (i.e. spill kit) shall be readily available at the project site, and on work barges, to contain and absorb accidental spills of fluids from construction equipment. Personnel trained in the implementation of the spill kit shall be readily available onsite to respond to accidental spills.
14. The anticipated construction date cannot begin until summer of any given year.
15. If during the course of construction, any discoveries of protected plants or animals are made in the project area, the contractor will notify the Engineer immediately.
16. When the cofferdams are constructed all individuals of fish and mussels shall be rescued from inside the cofferdams to the maximum extent that is practicable for the project.
17. All PIT tagged individuals will be monitored with an aquatic PIT tag reading system on two occasions – at one year, and at three years post-release. All data associated with this survey, PIT tagging, and results of post-translocation monitoring are stored in the INHS Mollusk PIT tag database, Champaign.
18. Post-construction monitoring for the mussels and fish will occur in Year 1 and Year 3 in both the construction footprint and the mussel relocation site.
19. Mitigation to the maximum extent practicable is required by the Act. As mitigation for the potential taking of black sandshell and the spike mussels, the IDOT shall provide compensatory mitigation to bring conservation benefit to the species potentially impacted by the project in the amount of \$33,484 (\$16,742 per species). Compensatory mitigation shall be directed to the Illinois Wildlife Preservation Fund to support mussel propagation research.
20. As mitigation for the potential taking of the Gravel Chub, the IDOT shall fund the proposed research project to study the Gravel Chub (see Appendix F). Also, IDOT shall provide compensatory mitigation to bring conservation benefit to the species potentially impacted by the project. The mixture of the monetary mitigation and research funding will be valued at \$15,600. Compensatory mitigation shall be directed to the Illinois Wildlife Preservation Fund to support Gravel Chub research.

Appendix F

Research Proposal to Study Gravel Chub

Executive Summary

Application Date: 4/23/2019

Project Title: Status Assessment of the Gravel Chub (*Erimystax x-punctatus*) in Illinois

Organization:

Illinois Natural History Survey
1816 S. Oak St.
Champaign, IL 61820

Grant Initiators:

Andrew J. Stites (Associate Ichthyologist – Illinois Natural History Survey)
Joshua L. Sherwood (Associate Ichthyologist – Illinois Natural History Survey)

Project Purpose:

The purpose of this project is to investigate the status and habitat of the Gravel Chub (*Erimystax x-punctatus*) in Illinois.

Contact Information:

Andrew Stites
Associate Ichthyologist
Illinois Natural History Survey
1816 S. Oak St.
Champaign, IL 61820
stites1@illinois.edu

Funds Requested:

\$15,600

Narrative

Status survey of Gravel Chub (Erimystax x-punctatus)

Project Goals:

The Gravel Chub (*Erimystax x-punctatus*), listed as state-threatened in Illinois, is a species that has experienced significant range reductions during the past century, largely due to siltation in streams (Smith 1971; Smith 1979; Mullen 1992). Within Illinois, the Gravel Chub is found within the Rock River basin (e.g., Rock River mainstem, Kishwaukee River, and Turtle Creek), and the mainstem Vermilion River (Wabash River drainage). This small cyprinid primarily occupies medium to large streams in deep riffles and runs with swift current, over sand-gravel substrates (Smith 1979; Becker 1983; Kansas Fish Committee [KFC] 2014). Due to its affinity for deep, swift flowing water, this species is difficult to capture with traditional sampling methods and could be overlooked during normal community assessments. This has led to a general lack of published knowledge regarding the Gravel Chub's natural and life history. The goals of this project are 1) to perform a status assessment of the Gravel Chub in Illinois, and 2) to investigate habitat associations (preferred substrate and flow characteristics) for this species.

Objective 1:

The first objective of this study is to perform a status survey of the Gravel Chub in Illinois. Because this species could be overlooked in traditional community assessments, we would perform samples throughout the Rock and Vermilion River basins at pre-determined random locations in order to update the known range and status of the Gravel Chub in Illinois.

Objective 2:

The second objective of this study is to determine Gravel Chub habitat associations. At each sample site habitat variables such as water velocity, dominant substrate, and depth will be recorded to determine if they are associated with Gravel Chub presence or absence.

Methods

Status Survey

To update the status of Gravel Chub in Illinois we will perform a basin wide survey of the Rock River basin in northern Illinois, as well as the Vermilion River mainstem in Vermilion County. Across the Rock and Vermilion River basins, 50 stream segments (confluence to confluence reaches) will be randomly selected. Segments on large rivers will be accessed by boat and sampled with a mini-Missouri trawl (Herzog et al. 2006). Smaller wadable stream sites will be accessed by kayak or at road-stream crossings and sampled by dragging a bag seine as this is the most comparable method to the mini-Missouri trawl. Both gear types have been predetermined as appropriate methods for collecting Gravel Chub (Neebling and Quist 2011).

Within each segment, 3 trawls/hauls will be performed in the best available habitat as well as 3 trawls/hauls in all other available habitat types. The length of the trawls/hauls will be standardized to 50 m for river segments and 15 m for wadable segments (Neebling and Quist 2011). All fish collected in each trawl/haul will be placed in 1 of 3 separate aerated live wells. Upon completion of all trawls/hauls,

the number of Gravel Chubs collected in each trawl/haul will be recorded, as well as the length and weight of each individual. If Gravel Chub are collected at previously unknown sites, a single voucher specimen will be retained for deposition into the Illinois Natural History Survey Fish Collection, Champaign.

Habitat Association

To determine habitat associations for Gravel Chub in wadable streams we will record dominant substrate, surface water velocity, and depth at each trawl/seine haul. For non-wadeable sites, we will measure surface water velocity as well as record depth and estimate substrate using a side-scan sonar. These data will be analyzed to determine which variables are associated with Gravel Chub presence/absence.

Evaluation

The results of this project will give a better understanding of the distribution and status of Gravel Chub in Illinois. By accessing random segments along the entire reach of rivers and streams we will be able to determine if the Gravel Chub is as rare as current data indicates, or if they have been largely underrepresented in state-wide fish community surveys. By determining habitat associations, we will make it easier to determine the likelihood of Gravel Chub presence/absence based on a quick habitat quantification prior to any sampling.

Budget

Travel

Mileage			Total
<i>Estimated Miles/Trip</i>	<i>Mileage Rate</i>	<i># of Trips</i>	
500 miles	\$0.51/mile	7	\$1,785
Per Diem			
<i>Per Diem Rate</i>	<i>Personnel</i>	<i>Estimated # of days</i>	
\$32/day/person	4	30	\$3,840
Lodging			
<i>Hotel Rate/Night</i>	<i>Rooms/night</i>	<i>Estimated # of nights</i>	
\$70	4	24	\$6,720
Supplies			
<i>Boat Fuel</i>			
\$135			\$135
Overhead			
<i>F&A Rate</i>			
20%			\$3,120
Total Asking			\$15,600

Deliverables

A report of the findings of this study will be delivered to the Illinois Department of Natural Resources Heritage Division upon study completion. Results will also be presented to other researchers at scientific meetings (e.g., Midwest Fish and Wildlife Conference) and via peer-reviewed publication. The information gathered will allow us to better understand this rare, understudied species, and will also provide valuable information to be included in the Gravel Chub's Species Guidance Document.

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