

Illinois Department of Natural Resources CONSERVATION PLAN

Application for an Incidental Take Authorization

Geotechnical Borings
for Design of I-80 Bridge (#081-0011)
over the Mississippi River
Reconstruction

February 2022

Version 1

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1. Introduction

Illinois Department of Natural Resources

CONSERVATION PLAN

(Application for an Incidental Take Authorization)

Per 520 ILCS 10/5.5 and 17 Ill. Adm. Code 1080

150-day minimum required for public review, biological and legal analysis, and permitting

PROJECT APPLICANT: Illinois Department of Transportation (IDOT)

PROJECT NAME: Geotechnical Borings for Design of I-80 Bridge (#081-0011) over the Mississippi River Reconstruction

COUNTY: Rock Island

AMOUNT OF IMPACT AREA: 612 square feet, 0.014 acre, 56.9 square meters

This conservation plan is for the geotechnical borings in the Mississippi River to aid in the planning for the replacement of the existing Interstate 80 (I-80) (existing bridge structure #081-0011) that is scheduled for reconstruction. The bridge is located over the Mississippi River in Pool 14 at RM 495.4 near the town of LeClaire, Scott County, Iowa and Rapids City, Rock Island County, Illinois (N41.580028°, W-90.364882°) (See Appendix A, Figure 1). The existing bridge is approximately 2,600 feet in length.

Township, Range, Section:

18N, 1E, 2
18N, 1E, 3
18N, 1E, 10
18N, 1E, 11
18N, 1E, 14
18N, 1E, 23
18N, 1E, 24
18N, 1E, 26

The closest street intersections are the I-80 and State Route 84 ramps on the Illinois side of the Mississippi River, and the I-80 and the U.S. 67 ramps on the Iowa side of the River.

The incidental taking of endangered and threatened species shall be authorized by the Illinois Department of Natural Resources (IDNR) upon acceptance of this Conservation Plan.

Appendix A includes the report Figures, Appendix B includes the Mussel Surveys for the Reconstruction of Interstate 80 Bridge (#081-0011), and Appendix C includes photos of the study area.

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2. Biological data on the affected species

A mussel survey for the study area was completed in August 2020 and revised on November 4, 2020 (Helms & Associates 2020). It is included as Appendix B. Another mussel survey for the study area was completed in November 2021 (EnviroScience 2021). The January 7, 2021, Ecological Compliance Assessment Tool (EcoCAT) review recommends the applicant seek an Incidental Take Authorization (ITA) pursuant to Part 1080 and Section 5.5 of the Illinois Endangered Species Protection Act for the Federal endangered Higgins' eye (*Lampsilis higginsii*) Illinois state threatened species of mussels: monkeyface (*Quadrula metanevra*) and butterfly (*Ellipsaria lineolata*).

Table 1: Incidental Take Application Species Biological Data

Species	Scientific Name	Species Type	Federal Status*	Illinois Status*	Suitable Habitat
State Listed Species					
Higgins' eye	<i>Lampsilis higginsii</i>	Mussel	E	E	Deep water in sand and gravel river bottoms within large rivers with moderate currents.
Monkeyface	<i>Quadrula metanevra</i>	Mussel		T	Mixed sand and gravel areas in large rivers or streams.
Butterfly	<i>Ellipsaria lineolata</i>	Mussel		T	Large rivers in sand or gravel substrates especially in bars in current at a depth of 1-2 m or more.

T = Threatened

2.1 Federal Endangered Species and State Threatened Species

2.1.1 Higgins' eye (*Lampsilis higginsii*)

Status

This species is listed as a federal and state endangered species. It was federally listed on June 14, 1976, and state listed on July 25, 1984.

Appearance

The Higgins' eye is a freshwater mussel with a rounded to slightly elongate smooth-textured shell that is usually yellowish brown with green rays. The shell, made up of 2 hinged, inflated halves, is up to 4 inches long with a rounded side and a pointed (males) or squared (females) side. The inside of the shell is white with portions that are iridescent and areas that may be tinged with cream or salmon. The soft body enclosed by the shell consists of gills for breathing, a digestive tract for processing food, and a large-muscled foot for moving and for anchoring on the stream bottom. (U.S. Fish and Wildlife Service [USFWS] 2021)

Range

Since 1980, live Higgins' eye have been found in parts of the upper Mississippi River north of Lock and Dam 19 at Keokuk, Iowa and in three tributaries of the Mississippi River: the St. Croix River between Minnesota and Wisconsin, the Wisconsin River in Wisconsin, and the lower Rock

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River between Illinois and Iowa. Recently, it was successfully reintroduced the Higgins' eye into the Iowa River and Wapsipinicon River in Iowa. The current range is about 50% of the historic range, which extended as far south as St. Louis, Missouri and included several additional tributaries of the Mississippi River. (USFWS 2021)

Habitat

The Higgins' eye is a freshwater mussel of larger rivers where it is usually found in deep water with moderate currents. The animals bury themselves in sand and gravel river bottoms with just the edge of their partially opened shells exposed. River currents flow over the mussels as they siphon water for microorganisms such as algae and bacteria, which they use as food. Higgins' eye are prey for wildlife like muskrats, otters, and raccoons; they filter water which improves water quality; and mussel beds create microhabitats on river bottoms that provide food and cover for other aquatic life. (USFWS 2021)

Reproduction

Male Higgins' eye release sperm into river currents and females downstream siphon the sperm to fertilize their eggs. After fertilization, females store developing larvae (glochidia) in their gills until expelling them back into the current. Some glochidia are able to attach to the gills of host fish, where they develop further. After a few weeks, juvenile mussels detach from the fish's gills and settle on the river bottom, where they can mature into adult mussels and possibly live up to 50 years. The sauger, walleye, yellow perch, largemouth and smallmouth bass, and freshwater drum are considered suitable hosts for Higgins' eye glochidia. (USFWS 2021)

Reason for Status

Habitat Loss and Degradation: Higgins' eye depend on deep, free-flowing rivers with clean water. Much of their historic habitat has been changed from free-flowing river systems to impounded river systems. Impoundments changed water flow patterns, substrate characteristics, and host fish habitat which, in turn, affect how Higgins' eye feed, live, and reproduce. Municipal, industrial, and farm run-off degrade water quality. As filter-feeders, mussels concentrate chemicals and toxic metals in body tissues and can be poisoned by chemicals in their water. Dredging and waterway traffic produce siltation which can cover river substrate and mussel beds. (USFWS 2021)

Exotic Species: Invasive zebra mussels are the greatest known threat to Higgins' eye. They are a freshwater mussel native to the Black and Caspian Seas that were introduced into Lake Erie in the late 1980's from ship ballast water discharge. These small mussels are less than 2 inches long, but tens of thousands can colonize a square meter area. Zebra mussels attach to any hard surface, including shells of other mussels, preventing them from normal travel, burrowing, and opening and closing their shells. (USFWS 2021)

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November 2020 Survey Report Information

No living specimens of this species were observed. However, one non-fresh, dead-shell specimen of this species was collected on the Iowa side of the river. (Helms & Associates 2020)

November 2021 Survey Report Information

One live Higgins' eye mussel (representing 0.2% in Illinois) was collected in Illinois during the quantitative sampling during the 2021 survey (EnviroScience 2021). Two live Higgins' eye were collected in Iowa during the qualitative sampling in 2021.

2.1.2 Monkeyface (*Quadrula metanevra*)

Status

This species is listed as a state threatened species. It was state listed on March 17, 1989.

Appearance

The shell of the monkeyface can reach up to 12.7 cm (5 in.) long. It is squarish in shape with thick valves and a prominent posterior ridge, which often has a series of large knobs surrounded by scattered pustules (bumps). The posterior slope of the shell is flattened, appearing winged, often with a series of small ridges that curve upward. The posterior shell margin is indented. The outside of the shell is yellowish, greenish or brown, and usually marked with green chevrons (V-shaped markings). The pseudocardinal and lateral teeth are heavy, and the inside of the shell is white. The monkeyface can be distinguished from other similar species by its large, knobbed posterior ridge and green V-shaped markings. (Minnesota Dept. of Natural Resources [MnDNR] 2021a)

Range

Monkeyface mussels were once widely distributed in the larger streams of the Mississippi basin, although they were among the less common mussels where they occurred (Fuller 1978). They are no longer found in the Minnesota River (Bright et al. 1990) and are very rare in the Mississippi River (Thiel 1981; MnDNR 2021a).

Habitat

Monkeyface mussels may be found in medium to large rivers and streams. The monkeyface lives mostly in areas with mixed sand and gravel or gravel areas. (MnDNR 2021a; National Park Service 2021; Animal Diversity Web [ADW] 2021a)

Reproduction

Monkeyfaces spawn once a year in the spring. Males release gametes into the water that are taken up by the females. Monkeyfaces are short-term brooders, meaning the females brood the larvae (glochidia) in their gills for only a few months in the summer. After being brooded for a few weeks or months, the glochidia are discharged into the water and will attach to a host fish.

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Brooding females were found in Tennessee between March and July. Glochidia drop from the host after they transform into juveniles. (Garner, et al., 1999; ADW 2021a)

Reason for Status

The monkeyface is declining or extirpated throughout most of its former range. The viability of remaining populations is jeopardized by the continuing decline in habitat conditions on the Mississippi River associated with its management as a navigation canal, and from non-point and point source water and sediment pollution. Dams, channelization, and dredging increase siltation, physically alter habitat conditions, and block the movement of fish hosts. The monkeyface is also being impacted by the infestation of non-native zebra mussels (*Dreissena polymorpha*) in the Mississippi River and its tributaries. Zebra mussels can attach in large numbers to the shells of native mussels, eventually causing death by suffocation. (MnDNR 2021a)

November 2020 Survey Report Information

One live individual of monkeyface was collected on the Illinois side of the river. The specimen was 30 mm and had no zebra mussels attached. (Helms & Associates 2020)

November 2021 Survey Report Information

There were no live individuals of monkeyface collected during the 2021 survey (EnviroScience 2021).

2.1.3 Butterfly (*Ellipsaria lineolata*)

Status

This species is listed as a state threatened species. It was state listed on January 18, 1994.

Appearance

The shell of the butterfly mussel is somewhat triangular with rounded ventral, dorsal and anterior margins. The exterior of the shell has numerous rays and is generally yellowish in color, but older specimens can be brown. The hinge may have a green tint and the interior of the shell is white. The male mussels have a compressed body shape while the females are slightly inflated. The shell of both sexes is thick and females generally measure less than 7 cm while males can reach up to 12.7 cm in length. The beak is turned forward and the beak sculpture consists of a few fine, double-looped lines. This species also has fully developed pseudocardinal and lateral teeth. (MnDNR 2021b; Nyboer, Herkert, and Ebinger, editors. 2006)

Range

Present Distribution: This freshwater mussel is known from the Mississippi River drainage from western Pennsylvania to Iowa and Kansas, north to Minnesota, southwest to Oklahoma, and southeast to Alabama. (Parmalee 1967; Nyboer, Herkert, and Ebinger, editors. 2006)

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Former Illinois Distribution: In Illinois, the butterfly mussel has been recorded from the Kaskaskia, Illinois, Rock, Wabash, Ohio and Mississippi rivers (Parmalee 1967; Cummings and Mayer 1992). This species has been extirpated from all Illinois rivers except the Ohio and Mississippi rivers. (Nyboer, Herkert, and Ebinger, editors. 2006)

Habitat

This species prefers large rivers in sand or gravel substrates especially in bars in currents at a depth of 1-2 m or more (Parmalee 1967; Cummings and Mayer 1992; Nyboer, Herkert, and Ebinger, editors. 2006)

Reproduction

In late summer, butterfly mussel males release sperm into the water. The sperm is carried by the current to nearby females, which draw in the sperm through the incurrent siphon. (Coker, et al. 1921; ADW 2021b)

Once the eggs are fertilized, they are brooded in the gills of the female. They then develop into larvae called glochidia. Females brood their young long-term (bradytictic) from August to July before releasing them as glochidia. These glochidia then live as parasites by attaching themselves to a fish's gills or fins using their valves. They remain attached until they turn into juvenile mussels at which time they detach from the fish and fall to the riverbed as free-living mussels. (Coker, et al. 1921; ADW 2021b)

Reason For Status

The butterfly mussel is fairly widespread in the Midwest but only locally abundant and is disappearing from many areas where it formerly occurred {Cummings and Mayer 1992; Nyboer, Herkert, and Ebinger, editors. 2006). Threats to this species are water pollution, industrial discharge, residential discharge, siltation, herbicide and fertilizer run-off, changes to the natural flow of rivers, increased water temperatures, dredging, and invasive species such as zebra mussels (ADW 2021b).

November 2020 Survey Report Information

No living or dead specimens of this species were observed (Helms & Associates 2020).

November 2021 Survey Report Information

Four live butterfly mussels (representing 0.5% of total) were collected during the quantitative sampling during the 2021 survey (EnviroScience 2021).

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3. Description of Project Activities

The project will include geotechnical river borings conducted in two stages:

1. Target date Fall 2022 – estimated 12 borings
2. Target date Spring 2023 – estimated 24 borings

The Fall 2022 river borings would be uniformly distributed over an area bank-to-bank. The Spring 2023 I-80 river borings would be conducted along the preferred alignment. Figure 2 in Appendix A shows the study area and an example of a potential boring area within the study area.

Over-water operations, such as geotechnical borings in the Mississippi River, typically involve mounting drill rigs on a barge or elevating boat in port. Once on the river, drilling crews work closely with surveyors to pinpoint the drilling location typically with GPS technology, then position the barge over the correct section of river.

Drilling requires an extremely stable platform. Barges equipped with extendable spuds, or legs, that can be used to anchor the vessel to the bottom of the river are typically employed. In deeper water, a system of up and downstream anchors to hold position on the drill site maybe required. Both of these solutions also require the driller to be positioned above an area of the channel bottom that is free from obstacles.

The strong current in the Mississippi is another challenge. A typical length of drill pipe extending from a barge to the river bottom can bend unless protected by additional pipe casing. Drilling usually begins by placing a sturdy 8-inch casing down to the mudline, and then dropping smaller casing through it to help strengthen the outer casing. This casing also allows pushing in and out of the same borehole and return drilling fluid to the surface.

Each geotechnical river boring location will include four piles/barge spuds pushed/lightly driven into the riverbed from an 80-foot by 40-foot rectangular work barge. The spuds would disturb the river bottom substrate in an area of approximately two feet by two feet at each spud location. After the barge is stabilized by the barge spuds the boring activity will begin. The boring activity will be performed by punching a four-inch auger 50 feet down at each boring location for a one foot by one foot disturbance area. See Figure 3 in Appendix A for a technical diagram of the barge mounted geotechnical river boring.

The maximum area of river bottom substrate disturbance from all piles/barge spuds is 576 square feet. The maximum area of river bottom substrate disturbance from all borings is 36 square feet. The total combined disturbance of river bottom substrate is 612 square feet. This disturbance will take place over approximately 10 to 15 days in the Fall of 2022 and approximately 25 to 30 days in the spring of 2023.

The project activities have the potential to bury and crush mussel species within the barge spud and boring locations. Any noise, vibration, or turbidity resulting from the project activities (drilling

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and driving of spuds) would be temporary and would return to pre-activity conditions shortly after activities cease.

It is anticipated the construction activities for this river boring project will commence as early as September 2022. This date is dependent on the approval of the ITA. The river boring project is scheduled to be complete by the end of June 2023.

The results of the river boring study will help determine the location and design of the future I-80 Bridge over the Mississippi River.

After the river boring study is complete the U.S. Army Corp of Engineers will be coordinated with to determine the course of permitting based on the future I-80 Bridge design alternatives. The project will require authorization through a Section 404 of the National Clean Water Act Individual Permit. Their review will consider cultural, historical, biological, and wetland resources as part of an Individual Permit issuance.

4. Anticipated Adverse Effects on Listed Species

The project will include up to 36 geotechnical river borings uniformly distributed from bank to bank within the study area (Fall 2022) and along the potential alignment (Spring 2023) as shown in Figure 2. The exact location of the borings are not known at this time; therefore, **this document requests clearance anywhere in the study area to perform the geotechnical borings.** This request is being made to account for any potential shifting of alternative alignments that might occur prior to the borings being conducted.

The proposed action could potentially impact the Higgins' eye, monkeyface and the butterfly. The geotechnical river boring activities could potentially bury or crush the mussels in the area of the barge spud and boring locations. There is also potential for some sediment to be disturbed in the areas where boring and spudding will occur. The maximum area of river bottom substrate disturbance from the piles/barge spuds is 576 square feet (53.5 square meters). The maximum area of river bottom substrate disturbance from boring is 36 square feet (3.3 square meters). The total combined disturbance of river bottom substrate is 612 square feet, which is 0.014 acre (56.9 square meters). The activities could also cause noise and turbidity disturbance to host fish species, though this disturbance would be temporary (less than 15 days in the fall and 30 days in the spring) and the area would return to normal or pre-drilling conditions shortly after project activities are complete.

The November 2020 report summarized that one hundred eight live native mussels, representing fifteen species were collected with the study area. Among these fifteen species was one specimen of monkeyface collected on the Illinois side of the river. Monkeyface is threatened in Illinois. No other living federal or state (Illinois or Iowa) threatened or endangered species were found in this survey (Helms & Associates 2020). In addition, one dead specimen of Higgins' eye was reported in the November 2020 report.

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The November 2021 report summarized “Twenty-three species, including the federally endangered Higgins’ Eye and Illinois and Iowa threatened Butterfly, were observed in the survey. Two additional federally endangered species (spectaclecase and sheepsnose) and several additional Illinois and/or Iowa T&E species were observed as dead shell; some of these species could occur in the study area in low abundance” (EnviroScience 2021).

Since no live monkeyface mussels were observed during the 2021 survey, the 2020 survey was used to estimate the possible occurrence of monkeyface mussels in the study area. Overall density based on substrate samples was 1.43 (+ or – 0.76, $p > .05$) mussels/m². The maximum area of disturbance is 612 square feet (56.9 square meters). However, one-third of the borings will take place in the channel where no mussels are present. Therefore, the maximum area of disturbance outside of the channel is 37.9 square meters. Furthermore, half of the borings will occur in Illinois and half will occur in Iowa. Thus, the maximum area of disturbance outside of the channel and in Illinois is 18.97 square meters. Within the area of disturbance outside of the channel and in Illinois, it can be estimated that there are approximately 27 total mussels. Monkeyface represented 0.9% of the combined catch as reported in the 2020 Survey Report (Helms & Associates 2020). At that percentage it can be estimated that 0.244 monkeyface mussel could be present in the disturbance area.

Since one live Higgins’ eye mussel was observed on the Illinois side of the river during the 2021 survey, the 2021 survey was used to estimate the possible occurrence of Higgins’ eye in the study area. The density estimate for Higgins’ Eye in Illinois is 0.01/m² (with a range of 0.00-0.02). Since the maximum area of disturbance outside of the channel and in Illinois is 18.97 square meters, it can be estimated that approximately 0.19 Higgins’

Since butterfly mussels were observed during the 2021 survey, the 2021 survey was used to estimate the possible occurrence of butterfly mussels in the study area. Overall density based on substrate samples was 4.2 ± 0.7 mussels/m². Density estimates were calculated for butterfly mussels and the density estimate for Illinois is 0.020 per square meter and 0.023 per square meter in Iowa. Since the maximum area of disturbance outside of the channel and in Illinois is 18.97 square meters, it can be estimated that approximately 0.38 butterfly mussel could be present in the disturbance area.

Indirect effects are those that are caused by the action but are later in time or farther in distance. The borings and spudding will not have any indirect effects to the mussels.

The potential adverse impacts are listed on Table 2:

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Table 2: Incidental Take Application Species Potential Adverse Impacts

Species	Scientific Name	Likelihood of Species Present in Disturbance Area	Potential Impact	Rationale
Higgins' eye	<i>Lampsilis higginsii</i>	Not Likely, but possible	Potential to bury or crush mussels due to river boring or barge spud placement. Potential to cause some sediment disturbance within the area of impact.	It is possible that this species is present, but is not likely due to the small areas of disturbance at each river boring location. Prior to project activities all mussels within the disturbance area will be relocated. Only one dead specimen of this species was observed in the November 2020 Report (Helms & Associates 2020).
Monkeyface	<i>Quadrula metanevra</i>	Not Likely, but possible	Potential to bury or crush mussels due to river boring or barge spud placement. Potential to cause some sediment disturbance within the area of impact.	It is possible that this species is present but is not likely due to the small areas of disturbance at each river boring location. Only one specimen of this species was observed in the 2020 Report (Helms & Associates 2020), and no live individuals were observed in the 2021 Report (EnviroScience 2021).
Butterfly	<i>Ellipsaria lineolata</i>	Not Likely, but possible	Potential to bury or crush mussels due to river boring or barge spud placement. Potential to cause some sediment disturbance within the area of impact.	It is possible that this species is present but is not likely due to the small areas of disturbance at each river boring location. This species was not observed in the 2020 Report (Helms & Associates 2020) but was observed in the 2021 Report (EnviroScience 2021)

5. Minimization, Management, and Mitigation Measures

The following are measures that will be taken to minimize and mitigate the impact and the funding that will be available to undertake the measures.

5.1 Minimization

The project will include up to 36 geotechnical river borings uniformly distributed from bank to bank within the study area (Fall 2022) and along the potential alignment (Spring 2023) as shown in Figure 2. If feasible this number will be reduced to the minimum possible needed to collect adequate and useful data.

It is unknown how many individual mussels or what species of mussels will be present at the barge spud and/or river boring locations. It is possible, based on the 2020 and 2021 surveys that less than one higgins' eye mussel, less than one monkeyface mussel and less than one butterfly mussel could be present within the maximum disturbance area outside of the channel and in Illinois which amounts to 18.97 square meters. Due to the small area of disturbance, it is not likely that any other threatened or endangered species would be present. (Helms & Associates 2020) (EnviroScience 2021)

5.2 Plans for Management of the Area

All work in the channel is temporary. It is expected, after the geotechnical boring are completed, the area will be available for recolonization by all species of mussels. There are no plans for management of the area as a result of the project activities.

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5.3 Mitigation

IDNR is not requiring a mussel relocation prior to the project activities (Bradley Hayes, IDNR, email to Felecia Hurley, IDOT, January 14, 2021). IDOT will apply for an ITA before any future bridge work will occur and will relocate any listed mussels prior to construction.

Mitigation for the impact will consist of having a malacologist identify mussel shells and shell fragments from the top 5 inches of each 4" core. The malacologist will identify the mussel shells and shell fragments, if possible, to the species and identify if the mussels are relict, recently dead, or fresh dead. This information will inform valuable data about the mussels in the area.

6. Monitoring Plan

IDOT will apply for an ITA before construction will occur and will relocate any listed mussels prior to construction. IDOT will monitor the relocation efforts as described in that ITA.

7. Adaptive Management

The main circumstances that may arise that would require adaptive management would be weather and water conditions during project activities. Weather conditions could delay the project schedule.

Existing geological data show that on both sides of the river less than 10 feet natural surficial cover is underlain by Silurian-age dolostone on the Iowa side and Silurian and Devonian limestones and dolostones on the Illinois side. The bedrock crops out within the limits of Le Claire, Iowa, and it is quarried just north of the city. It is estimated that the sediment cover within the river measures less than 10 feet in thickness.

Given the expected subsurface conditions, the potential of hydraulic fracturing during normal geotechnical drilling operations, of critical gradient development, or internal erosion are low. None of the conditions normally associated with higher potential for the occurrence of hydraulic fracturing by drilling media are present at this site. Metal casing will be installed in each borehole through the thin sediment cover to the top of rock. The competent bedrock itself is not prone to hydraulic fracturing. The pump used to circulate the drilling fluids operates at pressures of less than 150 psi whereas the compressive strength of intact dolostone/limestone is at least one order of magnitude higher. Moreover, if loss of drilling fluid will be noted, polymer will be added to it to create an impermeable mud cake on the borehole wall.

8. Verification that adequate funding exists to support and implement all minimization and mitigation activities

The Illinois Department of Transportation confirms that there is sufficient project funding to support and implement the minimization and mitigation activities in this conservation plan.

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9. Alternative Actions Considered

The need to replace the I-80 Bridge over the Mississippi River due to safety concerns is the driving force for this project. In order to replace the bridge, geotechnical river boring must be completed to determine the most appropriate location and the best bridge design. The results of the river boring will inform the engineering and construction of the future I-80 Bridge and it cannot be completed without this study. There are no anticipated impacts to economic or social resources as a result of the river boring activities.

9.1 No-action Alternative

The only alternative that would not result in the possibility of taking a state listed species is the “No Action” alternative.

However, the need for this project is tied to the need for the replacement of the I-80 Bridge over the Mississippi River. The No Action alternative would result in leaving a structure which is functionally obsolete and structurally deficient in place to the traveling public.

The following is a statement on the need to replace the I-80 Bridge:

Based on the analysis of bridge conditions, existing roadway geometric deficiencies, existing and future traffic conditions, and safety, the following represents the project need.

The I-80 Mississippi River Bridge, built in 1967, is a non-redundant two-girder system design with numerous fatigue prone details. Based on historical experience with this structure, these fatigue prone details remain susceptible to cracking. The structural cracks can quickly propagate to the point of local bridge component failure. This could, in turn trigger immediate load restrictions and possible long-term bridge closure. Emergency lane closures due to cracking have occurred multiple times in the past.

- Costly bridge inspections due to the Fracture Critical Inspections which are necessary to assure integrity of bridge.
- There are bridge deficiencies on the I-80 Bridge over the Mississippi River
- Crash trends (i.e., higher concentrations of crash numbers and/or crash types) occur at the following locations:
 - I-80 Bridge Over the Mississippi

10. Data to Assure the Proposed Take Will Not Reduce the Survival of Species

Suitable habitat exists both upstream and downstream of the proposed river boring locations site in the Mississippi River. This is evident as the November 2020 Survey Report observed mussels throughout the survey study area. There are 75 records of monkeyface, from the Illinois Natural Heritage Database, occurring throughout Illinois from the last 25 years. This includes records throughout the Mississippi River, Illinois River, and Kankakee River plus other waterways. Three of the 75 records occur in Rock Island County and each record accounts for more than one sighting. There are 51 records of sheepsnose within the Illinois Natural Heritage

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Database occurring throughout Illinois from the last 25 years. The 51 records occur in the Mississippi River and Ohio Rivers. Three of the 51 records occur in Rock Island County, and each record accounts for more than one sighting.

Due to the small area of disturbance of the river borings, it is expected that any impacted mussel species will continue to exist in this reach of the Mississippi River. Therefore, this project will not affect the survivability of the species in the wild in Illinois.

11. Implementing Agreement

11.1 Names and signatures of all participants in the execution of the conservation plan

Participants in the Execution of the Conservation Plan:

Participant Entity



Masood Ahmad, Region Two Engineer
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Masood.Ahmad@Illinois.gov

11.2 Obligations/Responsibilities of Participants

The IDNR is responsible for the review of this Conservation Plan and for subsequent issuance of the ITA. IDOT will be responsible for the project and implementation of the Conservation Plan. All federal and state laws will be adhered to during the completion of the project.

11.3 Certification of Participant's Legal Authority

The Illinois Department of Transportation certifies that it has the authority to complete the project activities and to address the items proposed in the Conservation Plan in the event state listed threatened or endangered species are encountered during project activities. Compliance with all other Federal, State and local Regulations will be adhered to.

All other Federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan will be adhered to. Coordination of this project has taken place with the following agencies:

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- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Illinois Department of Transportation
- Illinois Department of Natural Resources
- Iowa Department of Transportation
- Iowa Department of Natural Resources

11.4 Submission

This document will be submitted to:

Incidental Take Authorization Coordinator, Illinois Department of Natural Resources, Division of
Natural Heritage, One Natural Resources Way, Springfield, IL, 62702 OR
DNR.ITAcordinator@illinois.gov

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12. References

- Animal Diversity Web (ADW). 2021a. *Quadrula metanevra*. University of Michigan. Museum of Zoology. Accessed August 24. https://animaldiversity.org/accounts/Quadrula_metanevra/
- ADW. 2021b. *Ellipsaria lineolata*. University of Michigan. Museum of Zoology. Accessed August 24. https://animaldiversity.org/accounts/Ellipsaria_lineolata/
- Bright, R. C., C. Gatenby, D. Olson, and E. Plummer. 1990. A survey of the mussels of the Minnesota River, 1989. Final report submitted to the Natural Heritage and Nongame Research Program, Minnesota Department of Natural Resources. 106 pp.
- Coker, R., A. Shira, H. Clark, A. Howard. 1921. Natural history and propagation of fresh-water mussels. Bulletin of the Bureau of Fisheries, 37: 75-181.
- Cummings, K.S. and C.A. Mayer. 1992. Field guide to freshwater mussels of the Midwest. Manual 5. Illinois Natural History Survey, Champaign, Illinois. 194 pp.
- EnviroScience. 2021. Freshwater Mussel Survey on the Mississippi River for the Interstate 80 Bridge Replacement Project, Le Claire, Iowa. Prepared for Illinois Natural History Survey on behalf of the Illinois Department of Transportation. Project No.: 14855. November 18.
- Fuller, S.L.H. 1978. Freshwater mussels (Mollusca: Bivalva: Unionidae) of the upper Mississippi River: Observations at selected sites within the nine-foot channel navigation project on behalf of The United States Army Corps of Engineers. Final report prepared for the U.S. Army Corps of Engineers no. 78-33, Academy of Natural Sciences of Philadelphia. 401 pp.
- Garner, J., T. Haggerty, R. Modlin. 1999. Reproductive cycle of *Quadrula metanevra* (Bivalvia: Unionidae) in the Pickwick Dam tailwater of the Tennessee River. American Midland Naturalist, 141 (2): 277-283.
- Helms & Associates, LLC. 2020. Mussel Survey for the Reconstruction of Interstate 80 Bridge (#081-0011); Mississippi River Pool 14, RM 495.4; Near LeClaire, Scott County, Iowa, and Rapids City, Rock Island County, Illinois. Prepared for Illinois Natural History Survey on behalf of Illinois Department of Transportation. August 2020, Revised November 4, 2020.
- Minnesota Dept. of Natural Resources (MnDNR), 2021a. Monkeyface. Minnesota Department of Natural Resources Rare Species Guide. Accessed August 20 at <http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=IMBI V39080>
- Minnesota Dept. of Natural Resources (MnDNR), 2021b. Butterfly. Minnesota Department of Natural Resources Rare Species Guide. Accessed August 20 at <https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=IMBIV 13010>

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Nyboer, R.W., J.R. Herkert, and J.E. Ebinger, editors. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 -Animals. Illinois Endangered Species Protection Board, Springfield, Illinois. 181 pp.

Parmalee, P.W. 1967. The fresh-water mussels of Illinois. Illinois State Museum, Popular Science Series 8. 108 pp.

Thiel, P. 1981. A survey of unionid mussels in the upper Mississippi River (pools 3-11). Technical Bulletin 124. Wisconsin Department of Natural Resources, Madison, Wisconsin. 24 pp.

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Appendix A

Figure 1: Site Vicinity Map

Figure 2: Study Area Map

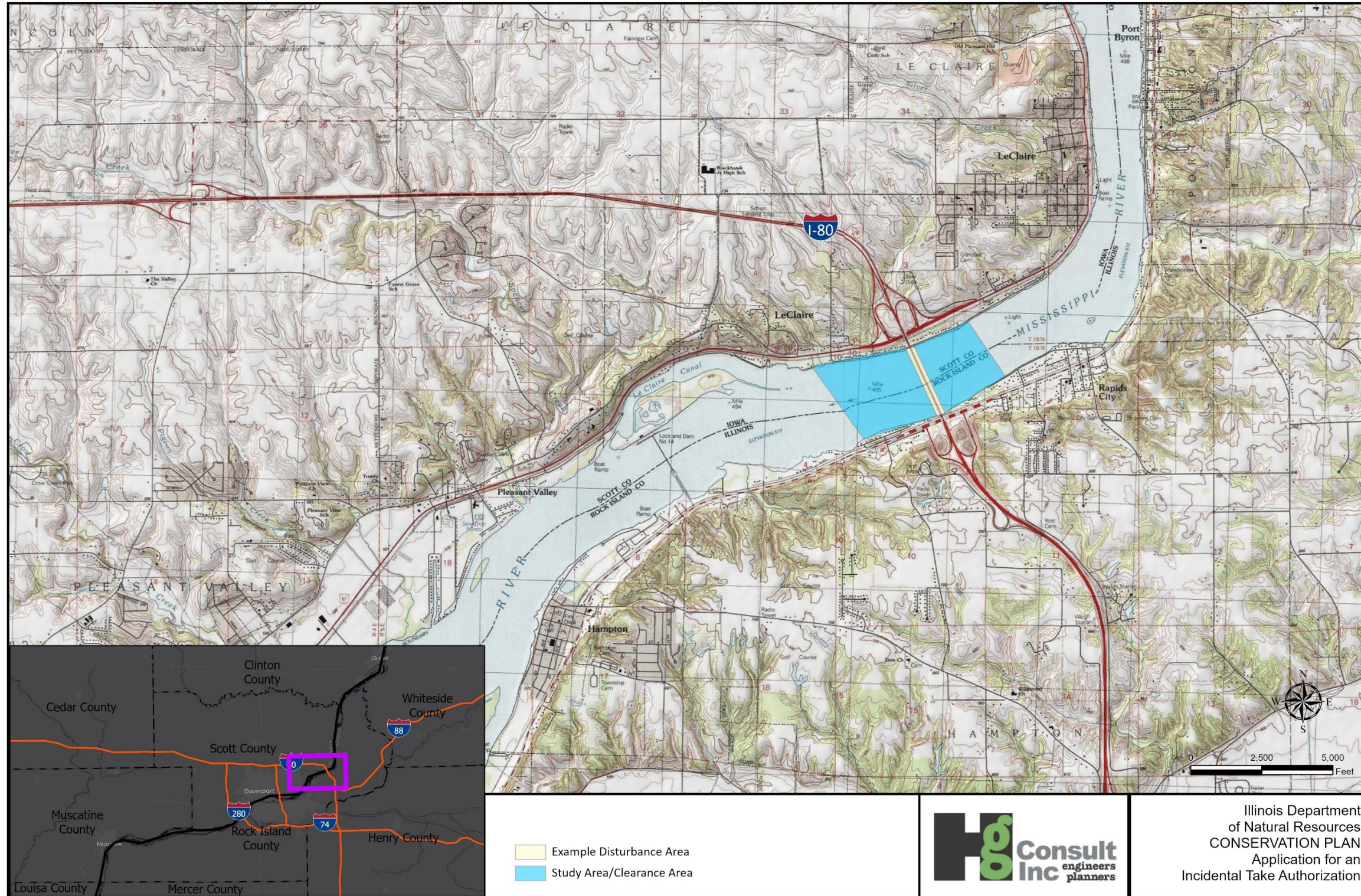
Figure 3: Barge Mounted Geotechnical River Boring Diagram

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Figure 1: Site Vicinity Map

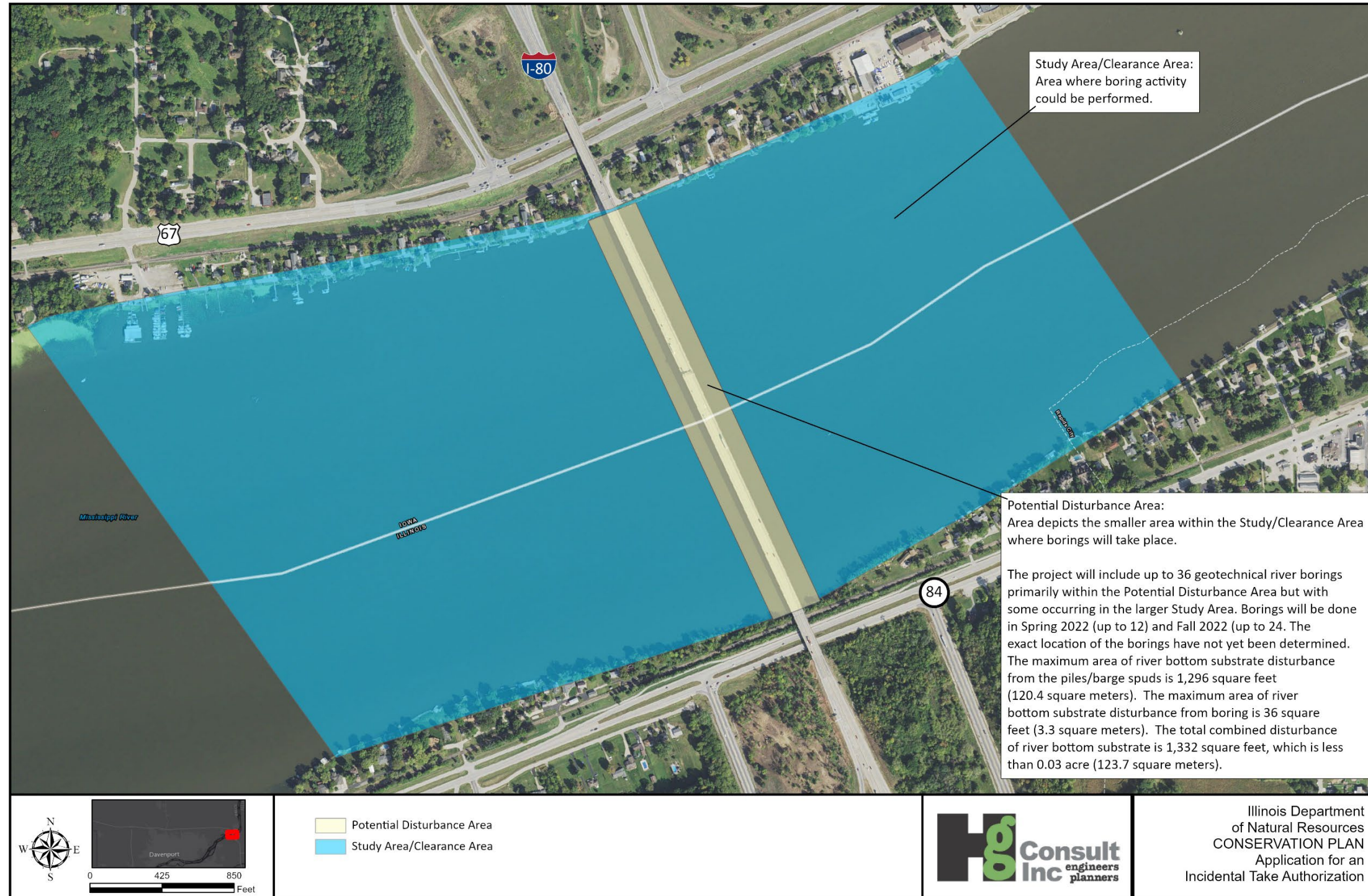


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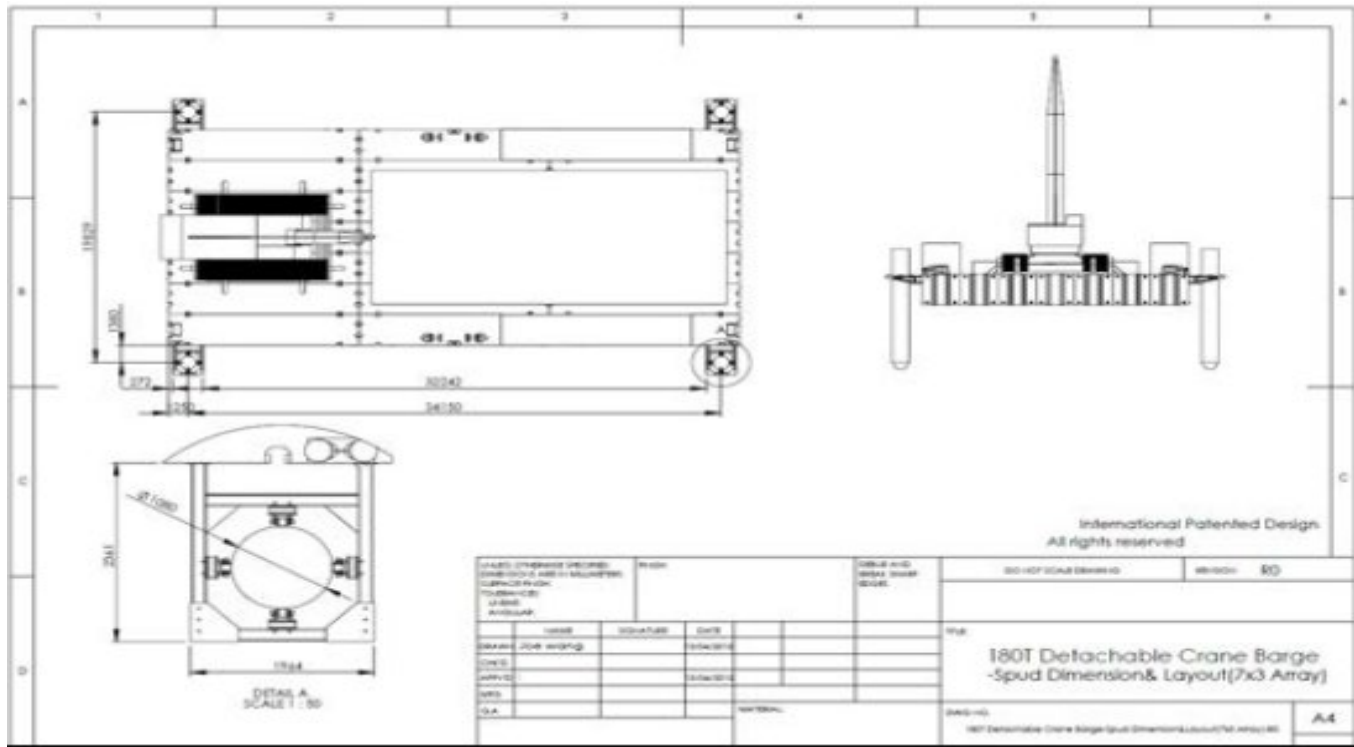
Figure 2: Study Area Map



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Figure 3: Barge Mounted Geotechnical River Boring Diagram



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Appendix B

2020 Survey: Mussel Survey for the Reconstruction of Interstate 80 Bridge (#081-0011)

2021 Survey: Freshwater Mussel Survey on the Mississippi River for the Interstate 80 Bridge Replacement Project

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Appendix C

Photos

