



# Illinois Department of Natural Resources

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Bruce Rauner, Governor  
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## **Authorization for Incidental Take and Implementing Agreement**

Pursuant to the Illinois Endangered Species Protection Act (Act) (520 ILCS 10/5.5) and the regulations adopted to implement the Act (17 Ill. Adm. Code 1080), authorization is hereby granted to the Illinois Department of Transportation and the Iowa Department of Transportation (hereinafter referred to collectively as DOT) for the incidental take of Higgins eye (*Lampsilis higginsii*), spectaclecase (*Cumberlandia monodonta*), sheepnose (*Plethobasus cyphus*), butterfly (*Ellipsaria lineolata*), ebonyshell (*Fusconaia ebena*), and black sandshell mussels (*Ligumia recta*). The Illinois Department of Natural Resources (hereinafter referred to as Department) has determined that the taking is incidental to activities associated with the I-74 Bridge replacement between Moline, Illinois, in Rock Island County, and Bettendorf, Iowa, in Scott County. The project area is located in Pool 15 near River Mile 486. The project area is also located within the Mississippi River – Moline Illinois Natural Areas Inventory Site (INAI #1295) and lies directly upstream of Sylvan Slough, an area known for high mussel diversity and abundance.

### **Procedural History**

The Department received a Biological Assessment (BA) containing a Conservation Plan specifically addressing the State of Illinois' requirements (Appendix A of BA) prepared by Stantec Consulting Services for the DOT on May 5, 2016, as a request for authorization for the incidental take of Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels. The Department requested additional information on May 11, 2016, to make the conservation plan complete as prescribed by Ill. Adm. Code 1080.10. That additional information was received by the Department on May 13, 2016. The public notice period will be detailed under #6 of the Compliance section below.

### **Compliance with the Illinois Endangered Species Protection Act**

The Act includes six criteria that must be satisfied for the authorization of incidental take of an endangered or threatened species. These criteria and the Department's determination for each are listed below.

1. The taking will not be the purpose of, but will only be incidental to, the carrying out of an otherwise lawful activity:

The stated and apparent purpose of this proposed action is the replacement of the I-74 Bridge across the Mississippi River between Rock Island County, Illinois and Scott County, Iowa to improve capacity, travel reliability, and public safety. The project will include the construction of a new basket handle twin arch bridge, the removal of the existing I-74 suspension bridge, the construction of two storm

sewer outfalls to the Mississippi River, and dredging to allow barge access to staging, construction, and demolition areas. In total (Illinois and Iowa), the new bridge will be 3,372 feet in length and consist of 14 concrete piers supporting the deck. Mussel relocation efforts will begin during the summer of 2016. The construction of the new bridge is scheduled to begin in September 2017 and be completed in November 2020. The demolition of the existing bridge is scheduled to take place from November 2020 to fall 2021. Due to the size of the project and the uncertainty of river conditions, it is understood that the project schedule may be altered. Construction and/or demolition activities will occur year-round. Specifically, temporary impact to suitable mussel habitat at the new bridge could include approximately 6.2 acres of dredging. Permanent impact to suitable mussel habitat at the new bridge includes approximately 0.69 acre due to the placement of piers. The storm sewer outfall projects could temporarily impact 0.028 acre of suitable mussel habitat due to coffer dam installation. In general, the temporary impact action area includes the construction and demolition footprints as well as a 50-foot buffer on both the upstream and downstream sides of the existing and proposed bridges within the Mississippi River. Though construction and demolition activities will occur within and adjacent to the navigation channel, the channel is regularly dredged by the U.S. Army Corps of Engineers and no impacts to mussels are expected; therefore, the navigation channel is not included in the action area. Take of Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels could occur as a result of crushing or burial of individuals left behind following the relocation efforts when construction materials are placed into the riverbed or during dredging. Noise and vibration resulting from coffer dam installation, drilling, and construction may have an adverse effect on some life history stage of the mussels. Some mortality from relocation is expected. Construction and relocation activities may indirectly result in the short-term decrease to reproduction due to stress and/or disturbance to mussels. Construction may cause the displacement of glochidial fish hosts and increase sedimentation in mussel habitat areas. The take of Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels that could result from this project is not the purpose of the DOT's activities, but is incidental to the carrying out of an otherwise lawful activity.

2. The parties to the conservation plan will, to the maximum extent practicable, minimize and mitigate the impact caused by the taking:

Proposed minimization measures were included in the DOT conservation plan.

To meet the "maximum extent practicable" standard, additional minimization and/or mitigation measures may be required beyond those proposed by the DOT, based on the life history needs of the Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels. **All required minimization and mitigation measures are presented under the Authorization section below.**

3. The parties to the conservation plan will ensure that adequate funding for the conservation plan will be provided:

The DOT states that 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. Therefore, funding for the mitigation will be included in funding for the overall project. The DOT, along with the Federal Highway Administration, commit to funding construction of the project, and by extension, funding of the mitigation.

4. Based on the best available scientific data, the Department has determined that the taking will not reduce the likelihood of survival or recovery of the endangered species or threatened species in the wild within the State of Illinois, the biotic community of which the species is a part, or the habitat essential to the species' existence in Illinois:

The **Higgins eye mussel** is a Federally-endangered and Illinois State-endangered mussel species. It is a medium-sized mussel that is known to inhabit large rivers. Literature supports that the species' preferred habitat consists of plant-free, stable areas of mixed sand and gravel, and that it is unlikely to be found in areas of shifting sand or silt.

Higgins eye mussels are bradyctictic, or long-term brooders, meaning that the females will retain developing glochidia in their gills over winter and release them the following spring or summer. Higgins eye females will retain glochidia from September through May, with glochidial release occurring from May to August. As with other mussels, Higgins eye glochidia parasitize certain fish species until they grow into juvenile mussels. Possible glochidial host fish species for the Higgins eye include sauger (*Sander canadensis*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus*), yellow perch (*Perca flavescens*), black crappie (*Pomoxis nigromaculatus*), and green sunfish (*Lepomis cyanellus*).

Higgins eye mussels are rare or extirpated from much of their historical range. Their decline is due to poor habitat conditions resulting from human river management, non-point and point-source water and sediment pollution, and the infestation of invasive zebra mussels (*Dreissena polymorpha*). The Higgins eye mussel was the first freshwater mussel species to gain federal protection in the United States. In Illinois, Higgins eye mussels have been found in the Mississippi and Rock Rivers. There are currently nine (9) extant Element Occurrence Records for Higgins eye mussels in the Illinois Natural Heritage Database in four (4) of 102 Illinois counties. The Department has three (3) pending or issued Incidental Take Authorizations for the Higgins eye mussel. Types of projects included dredging, bridge removal and replacement, and pier removal.

In August and September 2014, personnel from Ecological Specialists, Inc., performed surveys for freshwater mussels in and near the area that will be affected by this project. Based on the surveys, an estimated average density of 1,121,871 freshwater mussels (estimated 72,608 listed mussels) may be located within the entire Action Area (old bridge, new bridge and storm sewer outfalls) on the Illinois side of the river. The DOT estimates that this project has the potential to take approximately 3,530 Higgins eye mussels from the Illinois side of the river.

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The **spectaclecase mussel** is a Federally-endangered and Illinois State-endangered mussel species. It is known to inhabit large rivers with swiftly flowing water. They are usually found among boulders in patches of sand, cobble, or gravel in areas of reduced current.

Spectaclecase mussels are thought to be tachytictic, or short-term brooders, releasing their glochidia from early April to late May. Some researchers believe it is possible that spectaclecase mussels are capable of producing two broods per year, one in the spring or early summer and another in the fall; however, this has not been confirmed. Spectaclecase mussels produce the smallest known glochidia of any North American mussel. Glochidia are released in capsules called conglutinates. A single conglutinate may contain ten to hundreds of thousands of glochidia, and females may release between 50 and 90 conglutinates at a time. Despite this extremely high reproductive potential, evidence shows that spectaclecase glochidia have extremely low survival rates to adulthood. Host fish for spectaclecase glochidia are unknown, but glochidia were found in one instance on bigeye chub (*Hybopsis amblops*) and pealip redhorse (*Moxostoma pisolabrum*).

Spectaclecase mussels live close together in colonies, which makes them particularly vulnerable to infestations of the invasive zebra mussel. In Illinois, spectaclecase mussels have been found in the Mississippi River in Hancock, Henderson, Madison, Mercer, and Rock Island Counties. There are currently three (3) extant Element Occurrence Records for spectaclecase mussels in the Illinois Natural Heritage Database in three (3) of 102 Illinois counties. This is the first Incidental Take Authorization written by the Department for spectaclecase mussel.

In August and September 2014, personnel from Ecological Specialists, Inc., performed surveys for freshwater mussels in and near the area that will be affected by this project. Based on the surveys, an estimated average density of 1,121,871 freshwater mussels (estimated 72,608 listed mussels) may be located within the entire Action Area (old bridge, new bridge and storm sewer outfalls) on the Illinois side of the river. The DOT estimates that this project has the potential to take approximately 408 spectaclecase mussels from the Illinois side of the river. However, the primary location of spectaclecase mussels, Pier K of the old

bridge, will not be removed as a minimization measure; thus drastically reducing the potential for take of this species.

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The **sheepnose mussel** is a Federally-endangered and Illinois State-endangered mussel species. It is known to inhabit medium to large rivers in shallow areas of moderate to swift current. The species usually inhabits gravel or gravel mixed with sand, although it has also been found in areas of mud, cobble, and boulders.

Sheepnose mussels are short-term brooders, with reproduction occurring between May and July. Glochidia are released in conglomerates that mimic food organisms of fish, so that they are eaten and glochidia gain access to host fish. Sauger are the only confirmed host fish of sheepnose glochidia, but lab experiments have been successful with flathead minnow (*Pimephales promelas*), central stoneroller (*Campostoma anomalum*), and brook stickleback (*Culaea inconstans*).

Sheepnose mussels are declining in today's rivers due to their management as navigation canals. Dams, channelization, and dredging increase siltation, physically alter habitat conditions, and block the movement of fish hosts. In Illinois, sheepnose mussels have been found in the Mississippi, Rock, Ohio, Wabash, Kaskaskia, and Kankakee Rivers. There are currently nine (9) extant Element Occurrence Records for sheepnose mussels in the Illinois Natural Heritage Database in 11 of 102 Illinois counties. The Department has five (5) pending or issued Incidental Take Authorizations for sheepnose mussels. Types of projects included an oil pipeline, diffuser installation, railroad construction, and a dredge/pier removal.

In August and September 2014, personnel from Ecological Specialists, Inc., performed surveys for freshwater mussels in and near the area that will be affected by this project. Based on the surveys, an estimated average density of 1,121,871 freshwater mussels (estimated 72,608 listed mussels) may be located within the entire Action Area (old bridge, new bridge and storm sewer outfalls) on the Illinois side of the river. The DOT estimates that this project has the potential to take approximately 866 sheepnose mussels from the Illinois side of the river.

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The **butterfly mussel** is an Illinois State-threatened mussel species. It is known to inhabit large rivers in areas of moderate to swift current, and is usually found in substrates of coarse sand and gravel.

Butterfly mussels are long-term brooders, with females retaining developing glochidia in their gills from August until the following July. Known glochidial host fish for this species are freshwater drum (*Aplodinotus grunniens*), green sunfish, and sauger.

Butterfly mussel populations are shrinking due to a decline in habitat conditions associated with river/water management, impacts from the invasive zebra mussel, and from overharvest caused by the button and pearl industries. In Illinois, butterfly mussels have been found in the Mississippi and Ohio Rivers. There are currently 33 extant Element Occurrence Records for butterfly mussels in the Illinois Natural Heritage Database in 12 of 102 Illinois counties. The Department has ten (10) pending or issued Incidental Take Authorizations for butterfly mussels. Types of projects included dredging, construction of offshore structures, bridge removal and replacement, riprap installation, and boat dock installation.

In August and September 2014, personnel from Ecological Specialists, Inc., performed surveys for freshwater mussels in and near the area that will be affected by this project. Based on the surveys, an estimated average density of 1,121,871 freshwater mussels (estimated 72,608 listed mussels) may be located within the entire Action Area (old bridge, new bridge and storm sewer outfalls) on the Illinois side of the river. The DOT estimates that this project has the potential to take approximately 14,764 butterfly mussels from the Illinois side of the river.

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The **ebonyshell mussel** is an Illinois State-endangered mussel species. It is known to inhabit large rivers in areas of swift current. It is usually found in stable sand or gravel substrate.

Ebonyshell mussels are short-term brooders. Reproduction takes place from May to early fall, after which glochidia are released. The primary host fish for ebonyshell glochidia is the skipjack herring (*Alosa chrysochloris*); although literature supports that it is possible that largemouth bass, white crappie (*Pomoxis annularis*), and black crappie could also be hosts for this species.

Ebonyshell was historically the most abundant mussel species in the Upper Mississippi River, but populations have declined dramatically over the past century. One cause of the ebonyshell's decline was that its pearly-white interior shell was highly prized by button-makers, which led to its overharvest. In Illinois, they have been found in the Mississippi, Illinois, Ohio, Wabash, and Little Wabash Rivers. There are currently 12 extant Element Occurrence Records for ebonyshell mussels in the Illinois Natural Heritage Database in eight (8) of 102 Illinois counties. The Department has issued one (1) previous Incidental Take Authorization for ebonyshell for a dredging project in the Ohio River.

In August and September 2014, personnel from Ecological Specialists, Inc., performed surveys for freshwater mussels in and near the area that will be affected by this project. Based on the surveys, an estimated average density of 1,121,871 freshwater mussels (estimated 72,608 listed mussels) may be located within the entire Action Area (old bridge, new bridge and storm sewer outfalls) on the Illinois side of the river. No live ebonyshell mussels were found in the surveyed areas; however one weathered dead ebonyshell was collected. The DOT

do not estimate any take of ebonyshell mussels from the Illinois side of the river as a result of this project.

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The **black sandshell** mussel is an Illinois State-threatened mussel species. It is found in medium to large rivers in areas with strong currents. The species is known to prefer substrates of coarse sand, gravel, cobble, or silt.

Black sandshell mussels are long-term brooders, with females retaining developing glochidia in their gills from August until the following July, after which glochidia are released. Gravid female black sandshells are known to display their marginal papillae, moving them in a way that attracts fish hosts before releasing the parasitic glochidia. Black sandshell host fish include walleye, bluegill (*Lepomis macrochirus*), largemouth bass, sauger, white crappie, and many others that have been suggested as possible hosts.

Black sandshell populations have declined due to habitat degradation. In Illinois, black sandshells have been found in the Mississippi, Kaskaskia, Vermilion, Ohio, Kankakee, Rock, Iroquois, and Little Wabash Rivers, as well as several smaller creeks and tributaries. There are currently 97 extant Element Occurrence Records for black sandshell mussels in the Illinois Natural Heritage Database in 30 of 102 Illinois counties. The Department has 23 pending or issued Incidental Take Authorizations for black sandshell. Types of projects included dredging, bridge removal and construction/replacement, boat dock construction, railroad construction, pier removal, dam removal, piling installation, riprap installation, oil pipeline construction, and diffuser installation.

In August and September 2014, personnel from Ecological Specialists, Inc., performed surveys for freshwater mussels in and near the area that will be affected by this project. Based on the surveys, an estimated average density of 1,121,871 freshwater mussels (estimated 72,608 listed mussels) may be located within the entire Action Area (old bridge, new bridge and storm sewer outfalls) on the Illinois side of the river. The DOT estimates that this project has the potential to take approximately 53,312 black sandshell mussels from the Illinois side of the river.

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Based on the amount of habitat impacted by this project, the number of known occurrences of the Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels in Illinois, an assessment of the potential effect of this project on individual mussels in the project footprint, and the conservation measures included in this authorization for incidental take; the Department has concluded that the taking proposed herein will not reduce the likelihood of survival or recovery of the Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels in the wild within the State of Illinois,

the biotic community of which the species are a part, or the habitat essential to the species' existence in Illinois.

5. Any measures required under Section 5.5(b)(6) of the Act will be performed:

These measures are listed below under "Authorization." This authorization is, by definition, subject to those terms and conditions and the signatures of representatives of the DOT indicate their commitment to performing those measures.

6. The public has received notice of the application and has had the opportunity to comment before the Department made any decision regarding the application:

Public notice of the DOT' request for authorization of incidental take was published in the Breeze Courier (official state newspaper) on May 19, 2016, and in The Quad-Cities Times on May 19, 26, and June 2, 2016. A copy of the conservation plan was deposited at the Moline Public Library, where it was available for public review. The deadline for public comment was July 2, 2016. Four (4) comments were received from the public. The comments were transmitted to DOT on June 13, 2016. An analysis of the comments was received by the Department on July 12, 2016.

### Authorization

It is the determination of the Department that the measures that will be implemented by the DOT will adequately minimize and mitigate the anticipated taking of Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels incidental to activities associated with the I-74 Bridge replacement over the Mississippi River between Rock Island County, Illinois, and Scott County, Iowa. Further, the Department has concluded that the take authorized herein will not reduce the likelihood of survival or recovery of the Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels in the wild within the State of Illinois, the biotic community of which the species are a part, or the habitat essential to the species' existence in Illinois. Additional listed mussel species are known to inhabit the Mississippi River, this agreement does not authorize take of any species except Higgins eye, spectaclecase, sheepnose, butterfly, ebonyshell, and black sandshell mussels.

All terms and conditions included in the aforementioned BA and Conservation Plan submitted by the DOT to the Department are incorporated into this agreement by reference and are made a part thereof.

Pursuant to Section 5.5 of the Illinois Endangered Species Protection Act [520 ILCS 10/5.5] and the Administrative Rules for the Incidental Taking of Endangered and Threatened Species [Ill. Adm. Code 1080.40(b)], this authorization is issued subject to the following terms and conditions, which may include additions or modifications to the minimization and mitigation measures proposed by the DOT in the conservation plan:

1. This authorization is effective upon the signature of the Department and shall remain in effect for a period of **fifteen (15) years** from the date of the Department signature, unless terminated by written agreement of all parties.

This authorization may be revoked pursuant to the Act and Ill. Adm. Code 1080.80(b) if the Department finds that the DOT has failed to comply with any of these terms and conditions or has been responsible for the taking of Higgins eye, spectaclecase, sheepsnose, butterfly, ebonyshell, or black sandshell mussels beyond that which is incidental to activities associated with the I-74 Bridge replacement over the Mississippi River between Rock Island County, Illinois, and Scott County, Iowa.

2. The effective period of this authorization may be altered by mutual written agreement between the DOT and the Department. The Illinois Endangered Species Protection Board shall be notified of any such alteration.

Any substantive changes, including but not limited to a change in the project footprint or a change in the State-listed species which could potentially be affected, will require that a new conservation plan be submitted to the Department to initiate the review and public notice process as required by the Act.

3. This authorization is non-transferable.
4. On-site personnel shall be educated on the sensitive biological resources in the area, the identification of listed mussel species, regulations protecting the species, where the species might be found, avoidance areas, travel restrictions for equipment and vehicles, how to report sightings or incidents that may involve take, and the importance of avoiding take of the species. The DOT shall submit a copy of all education materials to the Department.
5. The Department reserves the right of entry by its staff or representatives to inspect species, potential habitat, and species management practices.
6. Biological consultants employed by the DOT shall hold the necessary permits for work with non-listed and listed species; these include an Illinois Department of Natural Resources Scientific Collection Permit and an Illinois Department of Natural Resources Endangered Species Permit.
7. The DOT shall notify the Department's Endangered Species Program of construction commencement and completion of the I-74 Bridge replacement project. Any discoveries of additional listed species beyond those identified in this agreement shall be reported to the Department within 48 hours accompanied by location information (photograph and GPS coordinates).

8. The DOT shall conduct, or cause to be conducted, the following pre-construction or construction efforts:
- a. Staging area locations will be chosen according to the following restrictions - on the Illinois side, no construction access within Sylvan Slough and extending upstream of the proposed bridge corridor beyond 50-foot buffer.
  - b. All barges and watercraft used for construction activities shall be inspected for the presence of zebra mussels prior to placing the barges into the Mississippi River and shall be completely out of water for 10 days to ensure proper drying and reduce potential infestation by zebra mussels.
  - c. Workers shall be transported to and from the construction/demolition areas daily via either a small watercraft or work barge.
  - d. Materials shall be transported to and from the construction/demolition areas by work barge as needed.
  - e. Dredged material will not be placed back into the river. Areas disturbed by dredging shall be backfilled with a special revetment.
  - f. Floating silt curtains shall be installed prior to construction of the bridge to retain sediment created by construction. This action protects the City of Moline's drinking water intake structure, in addition to avoiding and/or minimizing the effects of sedimentation on mussels.
    - i. Silt curtains shall be installed.
    - ii. A permitted diver shall be present to remove and relocate any mussels that may be present at proposed silt curtain anchor locations. Mussels shall be handled and relocated according to the protocol described below in Authorization condition # 9.
    - iii. Silt curtains shall be inspected regularly and subject to routine maintenance.
    - iv. Any accumulated debris on the river bottom and at the surface caught by the silt curtain shall be removed before curtain removal.
  - g. Debris shall not be allowed to collect at the bottom of the river. Any debris that falls into the water shall be removed by the contractor during the same work day as soon as is practicable.
  - h. All spoil from construction shall be placed on barges and taken offsite. No fill material shall be left in the river.
  - i. The removal of the existing I-74 Bridge shall include the removal of the bridge deck and all existing piers with the exception of Pier K in Sylvan Slough. This pier shall remain intact to minimize effects on the mussel bed at that location. The contractor shall be restricted from impacting the river bottom within a 16.4-foot buffer of Pier K.
  - j. No explosive demolition or dropping of materials into the river shall take place on the Illinois side of the river.
  - k. No causeway or elevated rock work platform shall be installed in the river.
  - l. Any and all other construction provisions and work zone restrictions as identified in the BA shall apply, including but not limited to those provisions outlined in Appendix C (Iowa DOT Special Provisions).

9. The DOT shall conduct, or cause to be conducted, the following mussel survey and relocation efforts:
- a. A thorough search for freshwater mussels within the footprint of the construction of the replacement bridge. Areas to be searched shall include the projected locations for the first five (5) piers on the Illinois bank and within a 10-meter buffer of each of those five piers (each pier/buffer area will be approximately 90 meters long by 30 meters wide). Due to the number of mussels to be relocated (estimated 268,212 listed and non-listed individuals), the relocation effort is anticipated to take approximately 60 days. Therefore, mussels will be relocated from the removal areas between July and September 2016 (the year prior to initiation of construction). The search shall be conducted during biologically suitable mussel relocation periods. All freshwater mussels found shall be identified to species, marked, and enumerated. Those conducting the search must be qualified at accurate identification of freshwater mussel species. All native freshwater mussels found during this search shall have zebra mussels removed from their shells and be relocated to suitable habitat as discussed below under (g).
  - b. A thorough search for freshwater mussels within the footprint of the existing bridge prior to demolition and removal. Areas to be searched shall include the area underneath the bridge where debris could fall. This search shall be conducted prior to initiation of demolition of the old bridge and during biologically suitable mussel relocation periods. All freshwater mussels found shall be identified to species, marked, and enumerated. Those conducting the search must be qualified at accurate identification of freshwater mussel species. All native freshwater mussels found during this search shall have zebra mussels removed from their shells and be relocated to suitable habitat as discussed below under (g).
  - c. All mussels shall be salvaged from any cofferdam areas.
  - d. Relocation sites have been pre-approved by the Department. In order to accommodate the large-scale relocation effort prior to construction, three sites were identified by Ecological Specialists, Inc. as potential suitable relocation areas for all mussel species. In addition, two relocation sites were identified specifically due to their suitability for the spectaclecase mussel. This species is a habitat specialist and primarily occurs on substrate composed of large rock. Surveys delineated the existing mussel bed at each location and estimated species richness and density of mussels at each location to determine suitability as relocation areas.
  - e. Mussels will not be relocated when air temperatures are at or below 32 degrees Fahrenheit, nor when water temperatures are at or below 40 degrees Fahrenheit. All mussels will be held in mesh bags suspended in the river or in containers of water changed every hour (every half-hour when air temperatures are at or above 80 degrees Fahrenheit). Water in containers shall be taken from the river where the mussels were collected. No mussels shall be held for more than three (3) hours before being returned to the locality from which they were taken or previously authorized relocation sites.

- f. Any and all other mussel survey and relocation provisions as identified in the BA shall apply, including but not limited to those provisions outlined in Appendix D (Mussel Relocation Plan).
  - g. **A report including, but not limited to, the survey methodology utilized, the species and numbers of mussels located, the age and size of each individual sampled, and maps of the area searched and the relocation site shall be provided to the Department within 90 days of completion of the survey and relocation effort.**
10. The DOT shall conduct, or cause to be conducted, the following post-construction freshwater mussel monitoring efforts:
- a. Monitoring shall be conducted within and adjacent to the footprint of the new I-74 Bridge. The objective will be to examine the effects of construction on the mussel community and the rate of recolonization. Baseline data related to mussel density and species composition shall be collected prior to the start of construction. Monitoring shall occur during Year 1 or the first safe time after pier installation and in the 3<sup>rd</sup>, 6<sup>th</sup>, and 9<sup>th</sup> years following construction completion.
  - b. Recipient site monitoring of the three (3) species listed both federally and by the State shall take place in select relocation areas. Marked specimens of Higgin's eye, sheepnose, and spectaclecase mussels will be placed within cells in a 5x5 grid. Each specimen shall be measured, aged, sexed, and marked with a unique identification number. Spectaclecase mussels will also be marked with a PIT tag. The grid cell in which each individual is placed shall be recorded. Monitoring shall then be conducted in order to relocate the marked individuals and collect data regarding their survival, movement, and growth over time. Monitoring shall take place annually for the first two years, along with the 4<sup>th</sup>, 7<sup>th</sup>, and 10<sup>th</sup> years following mussel relocation.
  - c. Mussel surveys shall not take place when air temperatures are at or below 32 degrees Fahrenheit, nor when water temperatures are at or below 40 degrees Fahrenheit. If mussels are removed from the water during surveys, they will be held in mesh bags suspended in the river or in containers of water changed every hour (every half-hour when air temperatures are at or above 80 degrees Fahrenheit). Water in containers shall be taken from the river where the mussels were collected. No mussels shall be held for more than three (3) hours before being returned to the locality from which they were taken or previously authorized relocation sites.
  - d. Any and all other mussel monitoring provisions as identified in the BA shall apply, including but not limited to those provisions outlined in Appendix G (Monitoring Plan).
  - e. **Detailed reports including, but not limited to, the survey methodology utilized, the species and numbers of mussels located (noting any marked individuals), the age and size of each individual sampled, and a map of the species locations, shall be provided to the Department within 90 days of completion of each monitoring event.**
11. The DOT shall mitigate for the potential taking of listed species to the maximum extent practicable by bringing conservation benefit to the species potentially impacted.

On May 10, 2016, an Intergovernmental Agreement (IGA) was executed between the Department, the Iowa Department of Natural Resources, and the USFWS regarding the collaborative development of a conservation strategy to serve as mitigation for take associated with the I-74 Bridge project. As a result of this collaboration, the following mitigation proposals were agreed to by the DOT for implementation:

- a. A large-scale study of Pool 15 will occur in three phases to map habitat and mussel distribution consisting of compilation and mapping of existing data, quantitative sampling to map the distribution of existing mussel beds in channel border habitat and provide calibration for larger scale sampling, poolwide sampling to determine density and population estimates. Data from this study will help resource agencies track impacts from the I-74 Bridge project on mussel resources and guide future conservation efforts in Pool 15.
- b. A study will be conducted to investigate the effects of increasing resident mussel density at varying rates resulting from the I-74 Bridge project mussel relocation. A subset of relocated mussels will be placed at varying densities within the three general (not spectaclecase) relocation sites. The sites will be monitored to determine whether different densities persist or if the beds return to pre-relocation numbers. Monitoring shall occur annually for the first two years and in the 4th, 7th, and 10th years following mussel relocation. Data from this study will provide valuable information on the potential carrying capacity of mussel beds and inform future relocation efforts.
- c. A two-year mussel education and outreach staff position to serve as the point of contact, to develop education materials, to conduct classroom and public interpretive outreach, to perform media and community education, and to develop and coordinate a social media presence. The staff will educate on both the ecology of mussels and bridge demolition/construction techniques. A document may be developed through this position to address best management practices for future bridge projects that have the potential to impact mussel resources.
- d. A five-year effort to inoculate host fish with mussel glochidia and perform free release of 10,000 inoculated fish annually near the project impact in cooperation with the Genoa National Fish Hatchery's Native Mussel Recovery Program. This effort will assist with repopulation of impacted areas and offset the impacts from bridge construction and demolition. The resource agencies will determine which mussel species and host fish species will be stocked based on the data collected from the mussel relocation and the impacts to mussel beds within the action area.

Above synopses are abbreviated descriptions of the agreed-to mitigation projects. Implementation of each of the mitigation projects shall follow the more detailed proposals provided to the DOT with further negotiation, as necessary, with the natural resource agencies. Mitigation value is estimated to be in excess of \$545,000.00.

Mitigation valuations are based on the Department's best current understanding of the species life history needs, real estate values, and impact analysis relevant to the project site's proposed conceptual design elements available at the time of review.

12. As stated previously in this agreement and to emphasize that it relates not only to the project's construction schedule but also to monitoring, relocation, and mitigation studies; due to the size of the project and the uncertainty of river conditions, it is understood by the Department that the schedule may be altered.

13. The DOT shall submit reports on all surveys within 90 days of survey completion.

14. All reports, notifications, and other project documentation shall be submitted to:

Illinois Department of Natural Resources  
Office of Resource Conservation  
Endangered Species Program – Incidental Take Authorization Coordinator  
One Natural Resource Way  
Springfield, IL 62702-1271

(217)557-8243

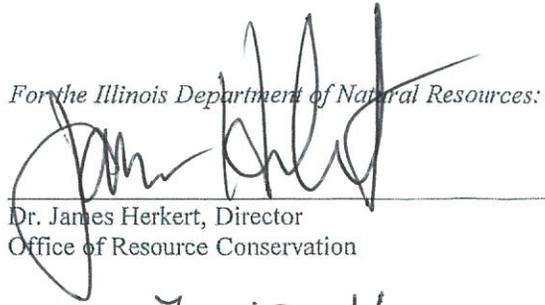
[DNR.ITAcoordinator@illinois.gov](mailto:DNR.ITAcoordinator@illinois.gov)

The Department's Endangered Species Program shall provide all reports required under this agreement to the Illinois Endangered Species Protection Board and to the Department's Natural Heritage Database.

15. The DOT officials identified below are authorized to execute this agreement. Execution by the DOT indicates acceptance of all terms and conditions described in this authorization.

16. The execution of this agreement does not waive or excuse the responsibilities of the DOT to comply with other Federal, State, or local regulations, including but not limited to obtaining any required permits for the execution of this project.

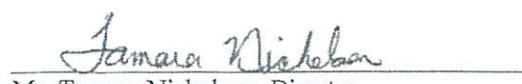
*For the Illinois Department of Natural Resources:*

  
\_\_\_\_\_  
Dr. James Herkert, Director  
Office of Resource Conservation

Date

7-15-16

*For Iowa Department of Transportation:*

  
\_\_\_\_\_  
Ms. Tammy Nicholson, Director  
Office of Location and Environment

Date

7/13/2016

*For the Illinois Department of Transportation:*

  
\_\_\_\_\_  
Mr. Kevin Marchek, P.E.  
Region 2 Engineer

Date

7-13-16