Final

Restoration Plan and Environmental Assessment

for the

Mississippi River Pool 15 Superfund Site
Scott County, Iowa

June 30, 2011

U.S. Department of the Interior
Fish and Wildlife Service
Ecological Services Field Office
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Restoration Plan and Environmental Assessment for the Mississippi River Pool 15 Superfund Site, Scott County, Iowa

1.0 Introduction

1.1 Purpose

The purpose of this assessment is to consider and evaluate various alternatives available to the action agencies to help restore the natural resources that were injured as a result of exposure to hazardous substances that were released into Navigation Pool Number 15 of the Upper Mississippi River System. The hazardous substances included a variety of inorganic and organic compounds. These contaminants were released into the Upper Mississippi River from a Superfund Site located along the shoreline in Riverdale, Scott County, Iowa.

The Comprehensive Environmental Compensation and Liability Act (CERCLA) (Title 42 United States Code Sections 9061 to 9675), the Clean Water Act (Title 33 U.S.C. Section 1251 *et seq*), and the Natural Resource Damage Assessment and Restoration (NRDAR) regulations (Title 43 Code of Federal Regulations Part 11) are laws and rules that direct the restoration of natural resources that have been injured by such a release. According to the laws, government Trustees for natural resources are responsible for ensuring that the public is fairly compensated for these kinds of injuries to natural resources.

The Natural Resource Trustees sought a damage claim from the responsible party for the Mississippi River Pool 15 Superfund Site because natural resources under their Trusteeship were injured and the response actions did not restore them to the condition that existed prior to the release. The U.S. Fish and Wildlife Service is the Federal Trustee and the Iowa Department of Natural Resources is the State Trustee for the injured natural resources. The injured natural resources included river surface water, aquatic sediments, and aquatic life including mussels, fishes, and aquatic dependent wildlife such as migratory birds that depend on the aquatic life for food and the river for shelter.

In 2008, the Federal government received a natural resource damage settlement from the responsible party by entering into a civil consent decree. The Trustees are now required to use the settlement money for restoration actions. The Trustees are obligated to develop and adopt a Restoration Plan before the settlement money can be used for a project, and that in doing so, there must be adequate public notice, opportunity for public comment, and consideration of available restoration alternatives. In addition, the Federal government must balance engineering and economic decisions with the environmental consequences of its actions according to the National Environmental Policy Act (NEPA). Therefore, this Restoration Plan was developed as an Environmental Assessment under NEPA to facilitate public involvement and to be in compliance with agency environmental decision-making requirements.

1.2 Needs

There is the need to compensate the public for injuries from contamination to the natural resources due to the release of hazardous substances into Pool 15. Furthermore, the Trustees are responsible for satisfying the requirements in the 2008 consent decree with the responsible party. The requirements of the consent decree included using the settlement funds to help restore natural resources as compensation for the injuries.

The Trustees intend to use the restoration funds in such a manner as to provide the maximum benefits. To accomplish this, the Trustees sought out partnership opportunities to leverage the

settlement funds to be part of larger scale or Regional projects. Partnerships will also be needed to help protect the natural resources on into the future.

Mussels are an imperiled faunal group in North America (Williams *et al.* 1993). There are National and Regional plans to help conserve native mussel species (Williams *et al.* 1993 and USFWS 2011). The introduction of exotic species such as the zebra mussel (*Dreissena polymorpha*) can cause extirpation of native mussel fauna (Ricciardi *et al.* 1998). The zebra mussels establish colonies on top of the native mussel beds. This creates problems for native mussels by limiting food intake, reproduction, growth, and survival. Mississippi River native mussels showed high mortality due to past zebra mussel infestations (Schloesser *et al.* 1996). The native mussels affected by exotic zebra mussels would benefit from augmentation of populations.

1.3 Background

Pool 15 of the Upper Mississippi River is between lock and dam number 14 in LeClaire, Iowa and lock and dam number 15 in Rock Island, IL (see Figure 1 in Appendix A). The aquatic habitats in Pool 15 include open water of the main channel, main channel border, islands, and side channels.

The aquatic habitats of Upper Mississippi River supports at least 106 fish species (Koel 2004) and at one time up to 39 species of mussels (van der Schalie and van der Schalie 1950). Mussels are important components of river ecosystems (Strayer *et al.* 1999). These bivalves can constitute the majority of invertebrate biomass of rivers. They filter and help cycle carbon and nutrients in the water column of rivers. Mussel beds are attractive to fish as a source of other invertebrates for food. Fish in turn serve as a prey base for aquatic dependent birds. Common aquatic dependent birds for Pool 15 include a variety of gull species, waterfowl, and the bald eagle (*Haliaeetus leucocephalus*).

Mussels have a unique life history. The adult mussels brood the fertilized eggs in internal pouches. The larvae from the eggs are released directly into fish or into the water column for ingestion by fish. The larvae then attach to the gills or the fins in some cases of the fish to obtain nourishment. After a short period of time the larvae metamorphose into a young mussel and drop from the fish to the bottom of the river where it continues to grow. It takes several years for the young mussel to mature.

2.0 The Alternatives

In developing the Restoration Plan, the Trustees considered the various types of restoration alternatives that are defined in the NRDAR regulations (Title 43 Code of Federal Regulations Part 11.81). Restoration is defined as an action or group of actions taken to either: 1) rehabilitate the injured natural resource if clean-up or remediation was sufficient to prevent future problems; 2) replace the injured natural resource by creating new resources or enhancing existing resources; or 3) acquisition of equivalent natural resources to those that were injured.

Two broad categories of restoration actions include in-kind and out-of-kind. In-kind means that the project focuses on the restoration of natural resources that are comparable to those that were lost. Out-of-kind means that the project focuses on restoration of natural resources that are different than those that were lost. Out-of-kind projects are usually considered if in-kind projects are not available or feasible.

The Trustees prefer to locate the restoration action in the vicinity of the natural resource loss. However, it is often necessary to locate restoration actions further away, but as close as possible, based on the restoration opportunities available.

2.1 Alternatives Eliminated from Analysis

The Trustees did not consider the restoration alternative of on-site rehabilitation for the following reason. The on-site rehabilitation alternative was deemed risky because sediment contamination exists in the Upper Mississippi River Pool 15 Superfund Site. The contamination is expected to attenuate naturally over time through scour and dilution, and burial with clean sediments being transported in the Mississippi River. The anticipated recovery of the Mississippi River is outlined in the Record of Decision by the U.S. Environmental Protection Agency for the Aluminum Company of American Site Riverdale, Iowa and Mississippi River Pool 15 Site near Riverdale, Iowa (USEPA 2004).

It is expected that over time, aquatic life will re-colonize the affected parts of Pool 15 once sediment quality improves. Therefore, our restoration action is intended to help compensate for the interim lost use of the ecological services provided by the natural resources.

Other alternatives that were considered for this action included the creation of rock riffle structures or other fish and mussel habitat in the Upper Mississippi River or in the tributary streams of the Upper Mississippi River. Riffle structures include gravel and cobble substrates that are used by fish for spawning and allow mussels to colonize because of the lack of sedimentation due to the higher flow over shallow rocky bars.

The creation of new gravelly substrate areas in Pool 15 of the Upper Mississippi River may be feasible with the right partner to help with the costs to find, transport, and dump the materials in the river. Creation of new gravelly substrates in the Upper Mississippi River may be considered under other mussel restoration projects and was not further considered here due to the timing of partnerships.

The creation of new gravelly substrate areas in the tributary streams of Pool 15 may be feasible in streams with good water quality to support a diverse assemblage of aquatic life including multiple species of mussels and their host fishes. Creation of new gravelly substrates in the tributary streams may be considered under other watershed restoration projects and was not further considered here due to the timing of partnerships.

The construction of riffle structures, other fish and mussel habitat, and creation of new gravelly substrates will require Clean Water Act permits, Rivers and Harbors Act permits, and/or a more detailed cultural resource review which is beyond the scope of this Restoration Plan and Environmental Assessment given the alternatives carried forward for analysis.

2.2 The Alternatives Carried Forward for Analysis

In our review for the Restoration Plan, we were able to identify and develop the following timely alternatives to meet the restoration purpose and need to compensate the public for the interim losses of natural resources. The available alternatives include stocking of artificially propagated mussels (preferred alternative), stocking of artificially propagated fish, and natural recovery (no action).

2.2.1 Alternative A: Mussel Stocking (preferred alternative)

Under the mussel stocking alternative (Alternative A), injuries to natural resources would be compensated by propagating and culturing mussels from area hatcheries. The objectives for Alternative A are to introduce immature mussels into the population to

augment the numbers of young mussels and speed up the natural recovery of the Upper Mississippi River ecosystem.

The augmentation strategy would include multiple methods, multiple species and occur over multiple years at multiple locations. The brood stock for artificial propagation will be collected and returned afterwards from the same areas and river reaches as selected for the stocking. This approach will allow the Trustees to address many of the affected mussel species.

Introduced young mussels can augment existing mussel populations. There is a high mortality rate for the early life stages of freshwater mussels in the wild. Some of the young cultured mussels can be held in captivity for a few extra years to mitigate for the high natural mortality rates. This approach has to be balanced with risks of overwintering and diseases. In addition, the augmentation methods may include releases of free ranging or caged fish that have been inoculated with the larval stage of mussels. The fish will be certified as disease free.

Having workers stocking mussels at the existing mussel beds also allows the opportunity to clean zebra mussels off of the native mussels. The zebra mussels are attached to the native mussels by thin threads that are easily brushed away. The cleaned native mussels would be placed back from where they were removed for the cleaning.

The mussel species target list would include species that are naturally found in the area of the loss and are able to be propagated thus ensuring we would have good numbers of young available for restocking. The mussel species target list could also include species that are more difficult to propagate to allow for some benefits to rare species.

See Table 1. for a complete list of mussel species for the restocking effort. All of these mussel species and fish host species occur or historically occurred in the affected reaches of Upper Mississippi River Pool 15 (personal communication Bernard Schonhoff of the Iowa Department of Natural Resources, and Cummings and Mayer 1992)

This alternative is desirable because it meets the purpose and the needs for the action. The implementation of this alternative would contribute to other larger scale mussel restoration projects by the State of Iowa and Federal agencies. There are a variety of partners for the preferred alternative (see Section 6 below). There is additional funding available to help do research on mussel propagation techniques while implementing the preferred alternative.

Table 1. List of mussel species found or historically found in Pools 14, 15, and 16 and that can be propagated at the Genoa National Fish Hatchery, Genoa, Wisconsin.

Common Name	Scientific Name	Difficult to Propagate	Species Status[1]
Black sandshell	*Ligumia recta*		
Butterfly	*Ellipsaria lineolata*		ST
Fatmucket	*Lampsilis siliquoidea*		
Deertoe	*Truncilla truncata*		
Fat pocketbook	*Potamilus capax*	Extirpated[2]	FE, SX
Fawnsfoot	*Truncilla donaciformes*		
Hickorynut	*Obovaria olivaria*		
Higgins eye	*Lampsilis higginsii*		SE FE
Mapleleaf	*Quadrula quadrula*	Yes	
Monkeyface	*Quadrula metanevra*	Yes	
Mucket	*Actinonaias ligamentina*		
Pink heelsplitter	*Potamilus alatus*		
Plain pocketbook	*Lampsillis caridum*		
Pimpleback	*Quadrula pustulosa*	Yes	
Sheepnose or bullhead	*Plethobasus cyphyus*	Yes	SE, FC
Spectaclecase	*Cumberlandia monodonta*	Host unknown[3]	SE, FC
Threeridge	*Amblema plicata*	Yes	
Threehorn wartyback	*Obliquaria reflexa*	Yes	
Wartyback	*Quadrula nodulata*	Yes	
Washboard	*Megalonaias nervosa*	Yes	
Yellow sandshell	*Lampsilis teres anodontoides*		SE

[1] ST = State threatened, SE = State endangered, FE = Federal endangered, FC = Federal candidate, SX = State extirpated

[2] The fat pocketbook is believed extirpated from the Iowa reach of the Upper Mississippi River.

[3] Host fish species is unknown for this mussel species.

These two before mentioned species are added to the list should there be restoration opportunities during the life of the project.

2.2.2 Alternative B: No Action

Under the no action alternative (Alternative B), natural resource losses would be uncompensated. Given sufficient time, natural processes should enable the natural resources at the Site to recover to conditions that existed prior to the release of hazardous substances into Pool 15. Recovery of mussel species is expected to take decades because of the low recruitment (introduction of young into the population) rates and high early life stage mortality rates reduce the number of organisms that can reach mature age classes. For instance, a common mussel species, Washboard (*Megalonaias nervosa*), requires 10 years to reach maturity and may live to over one hundred years.

2.2.3 Alternative C: Fish Stocking

Under the fish stocking alternative (Alternative C), natural resource losses would be compensated for by purchasing fish available from commercial or government sources. The objectives for Alternative C are to make fish available for fishermen and to speed up the natural recovery of ecological services through augmentation of the fish populations. The fish species could include game species such as largemouth bass (*Micropterus salmoides*) and channel catfish (*Ictalurus punctatus*) that are available from regional hatcheries. Fish stocking would include multiple species and occur over multiple years at multiple locations.

This alternative is less desirable because fish reproduction is presumed to be more resilient compared to mussel reproduction. Note, that some mussel augmentation methods may include the release of the host fish that have been inoculated with mussel glochidia (immature stage) into the wild so there may be some fish stocking that is part of Alternative A.

3.0 Affected Environment

3.1 Alternative A: Mussel Stocking

Project Areas:

Mussel Bed A: Mississippi River, Pool 14, Princeton, Iowa at 41.672240^{o} and -90.338426^{o}.

Mussel Bed B: Mississippi River, Pool 15, Riverdale, Iowa at 41.552021^{o} and -90.435055^{o}.

Mussel Bed C: Mississippi River, Pool 16, Northeast of Walnut Creek, Iowa at 41.41552021^{o} and -90.644286^{o}.

Mussel Bed D: Other mussel resource areas in Pools 14, 15, and 16 that would benefit from mussel population augmentation.

Geologic Resources: The proposed project sites are located in the modern main channel and main channel border areas of the Upper Mississippi River with underlying sands and gravels (fluvial deposition) that have been deposited more recently by riverine processes.

Cultural Resources: We reviewed the public version of the cultural resources spatial database (Isites) for Iowa maintained by the Office of State Archeologist for the State of Iowa (http://ags.gis.iastate.edu/IsitesPublicAccess/). The Isites map indicates that there are cemeteries and archeological sites along the Upper Mississippi River in Scott County. Early plat maps of the townships for Scott County indicates the potential for historic sites along the Iowa side of Mississippi River along Pool 15 (http://digital.lib.uiowa.edu/maps/).

Habitat Resources: The proposed project sites include coarse sand and gravel bar habitats. Gravelly bars are created in the river by hydraulic conditions that promote scouring of fine sands, silt, and clay sized sediment particles leaving behind the coarser sand and gravel materials. The gravel size particles are moved more slowly along the bottom by river currents.

Biological Resources: Gravelly bars support an assemblage of benthic macroinvertebrates including mussels, and fishes. Fish eating wildlife such as turtles, mammals, and birds forage over gravelly bars. Gravelly bars do not typically support major beds of aquatic plants.

Endangered Species: We reviewed the federally listed species database for Iowa maintained by the U.S. Fish and Wildlife Service. The review indicates that there is the federally listed endangered Higgins eye mussel and the potentially the federally listed candidate Sheepnose mussel found at proposed project sites. The sheepnose mussel is proposed for federally listed endangered status (Federal Register January 19, 2011 Volume 76 Number 12 Pages 2292-3420).

The fat pocketbook is extirpated from Iowa. The closest population of fat pocketbook found in a large river system connected to the Upper Mississippi River is in the Lower Ohio River between Illinois and Kentucky and the Lower Wabash River between Illinois and Indiana.

Surrounding Land Use: The shoreline, floodplain, and uplands around the project sites are developed urban areas.

3.2 Alternative B: No Action

Resources and land use will remain in the reduced baseline conditions under the no action alternative until natural recovery is completed which is expected to take up to decades.

3.3 Alternative C: Fish Stocking

Project Area: The proposed fish stocking location is at the boat access points along the Iowa side of Pool 15 for dispersion of stocked fish throughout the Pool.

Geologic Resources: The proposed project sites are located in main channel and main channel border areas of the river with underlying bedrock, coarse grain sediments, and fine grain sediment that have been deposited by riverine processes.

Cultural Resources: We reviewed the public version of the cultural resources spatial database (Isites) for Iowa maintained by the Office of State Archeologist for the State of Iowa (http://ags.gis.iastate.edu/IsitesPublicAccess/). The Isites map indicates that there are cemeteries and archeological sites along the river in Scott County. Early plat maps of the townships for Scott County indicates the potential for historic sites along the Iowa side of Mississippi River in Pool 15 (http://digital.lib.uiowa.edu/maps/).

Habitat Resources: The proposed project sites include aquatic open water habitats of the main channel, main channel border, and side channels.

Biological Resources: The main channel, main channel border, and side channels support a diverse assemblage of benthic macroinvertebrtes including mussels, fishes, and aquatic dependent wildlife. High numbers of migrating waterfowl can be observed during the spring and fall. Some backwater areas and bays include submergent and rooted-floating aquatic plant beds.

Endangered Species: We reviewed the federally listed species database for Iowa maintained by the U.S. Fish and Wildlife Service. The review indicates that there is the federally listed endangered Higgins eye mussel and the federally listed candidate Sheepnose mussel found at proposed project sites area. The sheepnose mussel is proposed for federally listed endangered status (Federal Register January 19, 2011 Volume 76 Number 12 Pages 2292-3420).

Surrounding Land Use: The shoreline, floodplain, and uplands are urban developed.

Table 2. Summary of current environmental conditions for the action alternatives considered in the alternative analysis.

Attribute	Alternative A Mussel Stocking	Alternative C Fish Stocking
Project Area	Pool 15, Lower Pool 14, Upper Pool 16	Pool 15
Surrounding Land Use	Urban	Urban
Cultural Resources	In vicinity	In vicinity
Habitats	Riverine	Riverine
Wetlands	Yes	Yes
Aquatic Resources	Warm water fishery	Warm water fishery
Resident Wildlife	Foraging Use	Foraging Use
Migratory Birds	Foraging Use	Foraging Use
Federally Listed Endangered (E), Threatened (T) and Candidate (C) Species	Higgins eye (E) Sheepnose (C) Fat pocketbook (E)	Higgins eye (E) Sheepnose (C)

4.0 Environmental Consequences

4.1 Effects Common to All

Archeological Resources: This restoration action would not affect any archeological resources because there are not any physical disturbances associated with stocking of aquatic species into the Upper Mississippi River by using existing car and boat access points.

Historical Resources: The historical maps and site inspections by the author of this assessment indicated that no farmstead ruins, old town buildings, or other historic cultural resources or ruins exist in the footprint of the proposed project sites. In addition, this restoration action would not affect any cultural resources because there are not any physical disturbances associated with stocking of aquatic species into the Upper Mississippi River by using existing car and boat access points.

Habitat Resources: The proposed project would not cause adverse affects to habitats because the action is only the release of native aquatic species back into the wild to augment existing populations that are already found in the project area.

Drainage: The projects would not cause any additional artificial increase of the natural level of surface water or groundwater. Thus, this project would not have any impact to drainage on neighboring lands.

Socioeconomic Impacts: No loss of local taxes will occur due to this project.

Environmental Justice: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 Federal Register 7629 (1994),

directs Federal agencies to incorporate environmental justice in their decision making process. Federal agencies are directed to identify and address as appropriate, any disproportionately high and adverse environmental effects of their programs, policies and activities on minority or low-income populations.

No environmental justice issues exist for any of the action alternatives. None of the alternatives would create environmental pollution. No minority or low-income populations would be displaced or negatively affected in any other way by the proposed action or any alternative.

There may be benefits to any low-income communities near the project areas by the action alternatives through improvements to environmental conditions and biological diversity.

Cumulative Impacts: The phrase "cumulative impacts" refers to the overall effect of the proposed action or a series of similar actions in a landscape or regional setting. Enhancing aquatic populations is considered to have positive environmental consequences. Native habitats, fish, and wildlife populations will all benefit on a regional basis by the action alternatives.

4.2 Alternative A: Mussel Stocking

Biological Resources: There will be beneficial effects from the augmentation of existing mussel species by recruitment of new young into the population that has been impacted by the release of hazardous substances and zebra mussel infestations. Genetic considerations and diversity will be managed by only using the brood stock collected in Pool 15 or the adjacent Pools 14 and 16 of the Upper Mississippi River.

Endangered Species: There may be take of a federally listed candidate species and/or of State listed endangered or threatened species. The take will be in the form of removal of brood stock from Pool 15 or adjacent Pools 14 and 16 for the artificial propagation. There may also be take in the form of removal of brood stock from the Lower Ohio River or Lower Wabash River for the artificial propagation of the fat pocketbook. The brood stock will be released back at the point of capture within 60 days. The probability of mortality due to capture, handling, and transportation will be avoided to the extent feasible and minimized with special care considerations. A consultation was completed with the U.S. Fish and Wildlife Service and with the Iowa Department of Natural Resources to determine that the level of anticipated take (in this case harassment) of a few organisms (1-4) of a few species (up to 3) would not jeopardize the continued existence of these species. See Appendix B for endangered species consultation forms.

Regulatory Considerations: The propagation, transportation, release into the wild, and collecting of mussels are subject to Federal and State permits. The augmentation of protected mussel species would not cause any new endangered species consultation or permitting beyond what is required now for the project area because federally listed and State listed endangered mussel species already exist in the project area at this time.

Partnership Considerations: The mussel propagation alternative has partnership opportunities including Federal agencies, State agencies, and local governments of the adjacent communities. There is the ability to leverage existing funding with outside funding and in-kind services to expand the scale of the mussel stocking alternative.

4.3 Alternative B. No Action

Under the no action alternative, injuries to natural resources would be uncompensated. Given sufficient time, natural processes should enable the natural resources at the Site to recover to pre-injury levels also known as the baseline condition. The public would not be compensated for its interim lost use of the natural resources during this recovery period. No natural resources impacts are expected from implementing the no action alternative.

4.4 Alternative C. Fish Stocking

Biological Resources: There will be beneficial effects from the augmentation of the existing fishery by recruitment of new young into population. None of the common fish species with proper disease free certification at the numbers targeted for reintroduction can cause adverse effects to the local fishery.

Endangered Species: No negative responses are predicted for federally listed species because only common fish species will be reintroduced into the wild.

Regulatory Considerations: The propagation, transportation, and release of artificially cultured fish into the wild are subject to permits.

Partnership Considerations: No partnership opportunities with sources of outside funding identified during the scoping process.

Table 3. Summary of environmental consequences by alternative.

Impacts	Alternative A Mussel Stocking	Alternative B No Action	Alternative C Fish Stocking
Geology or Soils	No change	No change	No change
Cultural Resources	No adverse effects	No adverse effects	No adverse effects
Habitat Resources	No adverse effects	Recovery over time	No adverse effects
Wetlands	No change	No change	No change
Aquatic Life	Ecological benefits	Recovery over time	Ecological and recreational benefits
Resident Aquatic or Wetland Dependent Wildlife	Benefits	Recovery over time	Benefits
Migratory Birds	Benefits	Recovery over time	Benefits
Federally Listed Endangered, Threatened Species	Benefits with minimal take	Recovery over time	No change
Hydrology/Drainage	No changes	No changes	No changes
Socioeconomic Issues	No changes	No changes	No changes
Part of larger restoration effort	Yes	No	No

5.0 List of Preparers

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6.0 References, Consultation, and Coordination

Local Governments:

Amy Johannsen and Brian Stineman, City of Davenport, Iowa

State Government:

Bernard Schonhoff, Fairport Fish Hatchery, Iowa Department of Natural Resources

Scott Gritters, Iowa Guttenberg Fish Hatchery, Department of Natural Resources

Daryl Howell, Des Moines Central Office, Iowa Department of Natural Resources

Jennifer Kurth, Des Moines Central Office, Iowa Department of Natural Resources

Kelly Poole, Des Moines Central Office, Iowa Department of Natural Resources

Federal Government:

Jim Colbert, U.S. Environmental Protection Agency – Region 7, Kansas City, KS

Joe Jordan, U.S. Army Corps of Engineers – Rock Island, IL District

Doug Aloisi, U.S. Fish and Wildlife Service – Genoa, WI National Fish Hatchery

Jody Millar, U.S. Fish and Wildlife Service - Rock Island, IL Ecological Services Field Office

Kristen Lundh, U.S. Fish and Wildlife Service - Rock Island, IL Ecological Services Field Office

7.0 Public Review and Comment

The Restoration Plan and Environmental Assessment report was posted on the Rock Island, IL Ecological Services web site on May 26, 2011(http://www.fws.gov/midwest/RockIsland/ec/index.html). A legal notice of availability was published in "The Quad Cities Times Newspaper" by the U.S. Fish and Wildlife Service on May 26, 2011 to solicit comment, issues, or concerns from the public. The public comment period was open between the dates of May 26, 2011 to June 29, 2011. There were no comments received on the Restoration Plan and Environmental Assessment during the public review and comment period.

8.0 Literature Cited

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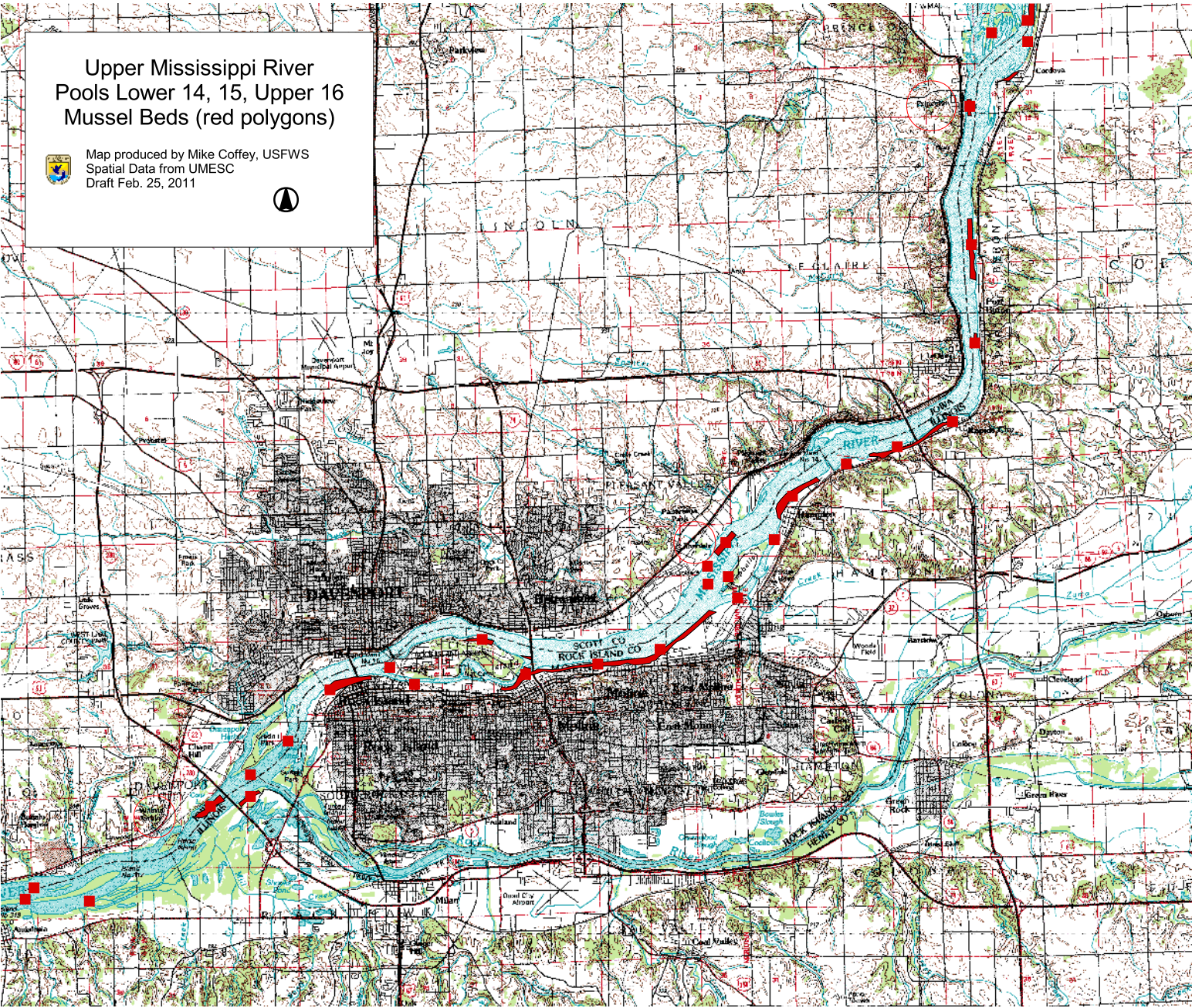
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Upper Mississippi River
Pools Lower 14, 15, Upper 16
Mussel Beds (red polygons)
Map produced by Mike Coffey, USFWS
Spatial Data from UMESC
Draft Feb. 25, 2011
DAVENPORT
SCOTT CO
ROCK ISLAND CO
HENRY CO
ILLINOIS
IOWA
RIVER
Moline
Milan
Cordova
Cleveland
Dayton
Green Rock
Port Byron
Camanche
Clinton
Bowlus Slough

Intra-Service Section 7 Biological Evaluation Form
Region 3

Originating Person: Michael J. Coffey (ES) and Nathan Eckert (Fisheries) Date Submitted: April 21, 2011

Telephone Number: Coffey 309-757-5800 x206 and Eckert 608-689-2605

I. Service Program and Geographic Area or Station Name:

II. Location: Location of the project including County, State and TSR (township, section & range):

Upper Mississippi River Pools 14, 15, 16 – Clinton, Scott, and Muscatine Counties, Iowa; and Whiteside, Rock Island, and Mercer Counties, Illinois
Lower Ohio River – Pulaski and Massac Counties, Illinois

III. Species/Critical Habitat: List federally-listed, proposed, and candidate species or designated or proposed critical habitat that may occur within the action area:

federally listed endangered Higgins eye mussel (*Lampsilis higginsii*)
federally listed candidate Sheepnose mussel (*Plethobasus cyphyus*)
federally listed endangered Fat Pocketbook mussel (*Potamilus capax*)

IV. Project Description: Describe the proposed project or action, including all conservation elements. If referencing other documents, prepare an executive summary. Include map and photos of site, if possible. (Attach additional pages as needed):

The proposed action is for the augmentation of existing mussel populations and for the reintroduction of a mussel species that has been extirpated from Iowa within its historic range. Please refer to Pool 15 Superfund Site Restoration Plan and NEPA Environmental Assessment with map figure for more details on this action (http://www.fws.gov/midwest/RockIsland/ec/Records/RP_EA_Pool15_Draft.pdf). The action includes the removal of about three live federally listed adult female mussel specimens from the wild for each of the three species mentioned above, the temporary holding, and use as brood stock for artificial propagation at Genoa, WI National Fish Hatchery. The brood stock and an allocation of the artificially propagated juvenile mussels will returned to the wild at the location of the original removal action. The other juvenile mussels will be used for the augmentation and reintroduction. The action is beneficial because natural mortality may be mitigated by the artificial propagation.

V. Determination of Effects:

A. Description of Effects: Describe how the action(s) will affect the species and critical habitats listed in item III, including how Part IV conservation elements benefit or avoid adverse effects. Your rationale for the Section 7 determinations made below (VB.) should be fully described here.

There is the potential for harassment and harm to federally listed adult female mussels species from the capture and handling due to stress and disease. In addition, the glochidia from the adult female specimens will be used to infest fish held at the hatchery for artificial propagation purposes. The artificially propagated juvenile mussels will be used to benefit the species by augmentation or for reintroduction back into the wild.

The personnel involved with the above described action will follow all of the conservation measures, reasonable prudent measures, and the terms and conditions outlined in the Section 7 Programmatic Consultation for Federally listed Mussels in Region 3 in Relation to the Issuance of Section 10(a)(1)(A) Scientific Take Permits and Funding Recovery Activities Pursuit to Section 6(c)(1) by the U.S. Fish and Wildlife Service (October 3,

2001). These measures call for safe handling procedures to avoid and minimize mortality of the live mussel specimens. The numbers of live organisms that will be temporarily removed from the wild are between zero and three adults per the three species listed above in Section III.

B. Determination: Determine the anticipated effects of the proposed project on species and critical habitats listed in item III. Check all applicable boxes and list the species (or attach a list) associated with each determination.

	Determination
No Effect: This determination is appropriate when the proposed project will not directly or indirectly affect (neither negatively nor beneficially) individuals of listed/proposed/candidate species or designated/proposed critical habitat of such species. No concurrence from ESFO required.	____
May Affect but Not Likely to Adversely Affect: This determination is appropriate when the proposed project is likely to cause insignificant, discountable, or wholly beneficial effects to individuals and designated critical habitat. Concurrence from ESFO required.	____
May Affect and Likely to Adversely Affect: This determination is appropriate when the proposed project is likely to adversely impact individuals of listed species or designated critical habitat of such species. Concurrence from ESFO required.	X
Not Likely to Jeopardize candidate or proposed species/critical habitat: This determination is appropriate when the proposed project is not expected to jeopardize the continued existence of a species proposed for listing or a candidate species, or adversely modify an area proposed for designation as critical habitat. Concurrence from ESFO required.	____
Likely to Jeopardize candidate or proposed species/critical habitat: This determination is appropriate when the proposed project is reasonably expected to jeopardize the continued existence of a species proposed for listing or a candidate species, or adversely modify an area proposed for designation as critical habitat. Concurrence from ESFO required.	____

Signature _____ Date 5/10/11
[Supervisor at originating station]

Reviewing Ecological Services Office Evaluation (check all that apply):

A. **Concurrence** _____ **Nonconcurrence** _____
Explanation for nonconcurrence:

B. Formal consultation required X
List species or critical habitat unit

C. Conference required _____
List species or critical habitat unit

Name of Reviewing ES Office RIFO

Signature _____ Date 5/10/11

Intra-Service Section 7 Addendum Review Form

I. Biological Opinion: Pool 15 Superfund Site Mussel Population Augmentation and Reintroduction as part of the Section 7 Programmatic Consultation for Federally listed Mussels in Region 3 in Relation to the Issuance of Section 10(a)(1)(A) Scientific Take Permits and Funding Recovery Activities Pursuit to Section 6(c)(1) by the U.S. Fish and Wildlife Service (October 3, 2001)

Date Issued: April 21, 2011

II. Actions identified in part V of the attached Intra-Service Section 7 Biological Evaluation Form were contemplated in the referenced above Biological Opinion. Yes __X__ No_____.

III. The appropriate conservations measures identified in the referenced above Biological Opinion have been explicitly incorporated into to the project design and are described in part V of the attached Intra-Service Biological Evaluation Form. Yes __X__ No_____.

IV. The effects of the proposed action as described in part VI of the attached Intra-Service Biological Evaluation Form are commensurate with the effects anticipated in the referenced above Biological Opinion. Yes __X__ No_____.

V. Anticipated Take

1. Describe the type & extent of take anticipated to occur as a result of the proposed action.

Between zero and three adult female mussels each of Higgins eye mussel, sheepnose mussel, and fat pocketbook mussel. The loss of glocidia and juvenile mussels is anticipated to be not greater that what naturally occurs in the wild.

2. Reconcile take anticipated with proposed action with the type & extent of take authorized via the referenced above Biological Opinion (describe take authorization provided in the programmatic and confirm that the level anticipated with the proposed action is within those specified limits).

The anticipated level of take is within the limits prescribed by the Section 7 Programmatic Consultation for Federally listed Mussels in Region 3 in Relation to the Issuance of Section 10(a)(1)(A) Scientific Take Permits and Funding Recovery Activities Pursuit to Section 6(c)(1) by the U.S. Fish and Wildlife Service (October 3, 2001).

VI. The appropriate RPMs and TCs identified in the referenced above Biological Opinion have been explicitly incorporated into to project design and are described in part V of the attached Intra-Service Biological Evaluation Form. Yes __X__ No_____.

J S Miller

Reviewing Biologist

5/10/11

Date