

# Reevaluation of U.S. Coast Guard Environmental Assessment

**Project:** Union Pacific Railroad Osage River Bridge, Mile 5.49, Near Osage City, between Cole and Osage Counties, Missouri

**Background:** On December 13, 2007, the U. S. Coast Guard approved a Finding of No Significant Impact for this project. Information included in this document identified the proposed bridge would consist of three 300+-foot spans, one 252-foot span, and one 69-foot span. It also identified approximately 7,310 cubic yards of material being dredged and deposited in a prior converted non-wetland area. The original FONSI supported issuance of Coast Guard Bridge Permit (2-08-8) dated January 31, 2008. The applicant has revised the plans to change pier span spacing, eliminate dredging and possible construction method.

This reevaluation is being prepared to document the change in project design and impacts. The proposed new bridge will consist of 10 spans consisting of seven deck plate girders, one through plate girder and two steel beam spans. This new design will eliminate the need to dredge without impacting navigational concerns. A proposed construction alternative for building the new bridge would consist of placing a temporary elevated work platform adjacent to the new bridge to facilitate bridge construction instead of using barges. The temporary elevated platform would be built with H-pile driven into the ground with a steel supported deck. A 45-foot section of the elevated platform would be removed every night, weekend and as necessary to provide passage of vessels.

**Summary and recommendation:** Changes in bridge design, reduced dredging requirements and possible construction methods have been evaluated under the provisions of NEPA. All other impacts associated with the project have been reviewed and remain the same as described in the original EA. The revised project has been reevaluated and determined not to have significant impacts on the human environment.



Roger K. Wiebusch  
Bridge Administrator  
Coast Guard Bridge Branch


3/17/10  
Date

U. S. COAST GUARD  
FINDING OF NO SIGNIFICANT IMPACT  
FOR  
UNION PACIFIC RAILROAD  
OSAGE RIVER CROSSING, MILE 5.49, AT THE TOWN OF OSAGE CITY,  
OSAGE/COLE COUNTIES, MISSOURI

This action has been thoroughly reviewed by the USCG and it has been determined, by the undersigned, that this project will have no significant effect on the human environment.

This finding of no significant impact is based on the attached USCG prepared environmental assessment dated December 12, 2007 which has been determined to adequately and accurately discuss the environmental issues and impacts of the proposed action and provides sufficient evidence and analysis for determining that an environmental impact statement is not required.


12/13/2007  
Date

  
David A. Orzechowski  
Environmental Reviewer

Bridge Management Specialist  
Title/Position

I have considered the information contained in the EA, which is the basis for this FONSI. Based on the information in the EA and this FONSI document, I agree that the proposed action as described above, and in the EA, will have no significant impact on the environment.

12/13/07  
Date

  
Roger K. Wiebusch  
Responsible Official

Bridge Administrator  
Title/Position



**U. S. Coast Guard  
Environmental Assessment**

**for the:**

**Union Pacific Railroad  
Osage River Bridge**

**Mile 5.49, Near Osage City,  
Between Cole and Osage Counties, Missouri**

**Prepared by:  
Eighth Coast Guard District (dwb)  
1222 Spruce Street  
St. Louis, MO 63103-2832**

**December 12, 2007**

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## **1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION**

### **1.1 Introduction**

This Environmental Assessment (EA) has been prepared in support of the Union Pacific Railroad (UPRR) application for a Coast Guard Bridge Permit to construct a second railroad bridge adjacent to the existing railroad bridge that crosses the Osage River at Mile 5.49, at Osage City, MO. The UPRR and its consultant performed studies that identified and assessed the impacts of the proposed action on the human environment. The results of these studies have been incorporated into this EA and satisfy all applicable federal environmental control laws. The U.S. Coast Guard is the lead federal agency for satisfying the requirements of the National Environmental Policy Act.

#### **1.1.2 Description of the Proposed Action**

The proposed project would construct a new railroad bridge over the Osage River at mile 5.49, at Osage City, Missouri, immediately downstream and adjacent to the existing UPRR bridge. The construction of an additional 0.49 miles of track will upgrade UPRR's rail system to a double-track through the Jefferson City Subdivision, which includes the Osage River Bridge. The proposed bridge would parallel the existing bridge to create a second mainline track. The proposed bridge would consist of three 300+-foot spans, one 252-foot span, and one 69-foot span. The existing bridge will be altered by pushing back the western abutment and replacing a 50-foot span with spans approximately 36 and 68 feet in length and construction of a pier. The proposed substructures to support the new bridge would be new-drilled shaft foundations with cast-in-place concrete columns and caps. See Appendix 1 for plans of the proposed Osage River Bridge.

In addition to the construction of the Osage River Bridge, the second mainline track approaches need to be constructed to complete the elimination of a pinch point. As a result of the second mainline track Osage County Road-415 which runs parallel to the existing track will be reconstructed. UPRR will construct a road from the south side of the #2 main track from CR-415 west to the private road to where it crosses the main tracks again. For farming operations to have access without crossing the main tracks, UPRR will construct a roadway under the Osage River Bridge and construct a new roadway on the north side of #1 main track up to the point where the CR-415 had crossed the railroad tracks to allow the farmer a roadway and field access. The portion of CR-415 north of the existing tracks will be abandoned.

#### **1.1.3 Statement of Need for the Proposed Action**

The existing Osage River Bridge is a single track railroad bridge constructed in 1925. UPRR has been enhancing their rail system and upgrading the Jefferson City Subdivision, which includes the Osage River Bridge, from single-track to double-track. UPRR plans to upgrade the Osage River Bridge segment as well as the only other remaining single-track segment to double-track in order to complete a more efficient route through Missouri. The segment of track across the Osage River is 0.49 miles long and acts as a pinch point for train traffic across Missouri. This segment of track is part of a critical freight route carrying over 110,000,000 gross tons of freight

on an annual basis. A total of 42 trains, including four Amtrak trains, pass through the single-track segment of the Jefferson City Subdivision everyday. Trains are forced to idle in the areas of double track on either side of this segment until the Osage River Bridge is free for crossing. Total train idling time per day ranges from 8 to 15 hours. This could be one train idling for eight hours or multiple trains idling for a total of 15 hours. The construction of a second-track bridge would complete the two mainline track system in the Jefferson City Subdivision for one of the two remaining single-track segments and would eliminate the need for any trains to idle near Osage City while waiting for track access across the Osage River. The purpose of the project is to eliminate the pinch point that currently exists in the UPRR track system in the Jefferson City Subdivision at the Osage River Bridge.

## **2.0 Alternatives Considered**

### **2.1 Evaluated Alternatives**

**2.1.1 No-Build, No Action:** This alternative was determined not to be feasible because the pinch point created by the single-track segment of the Osage River Bridge would remain and train service would not be improved.

**2.1.2 Construct Second-Track Bridge Upstream of Existing Bridge:** An alignment located upstream of the existing bridge would adversely impact a residential neighborhood and require the taking of residential property.

**2.1.3 Construct Second-Track Bridge Downstream of the Existing Bridge:** This alternative was designed to be compatible with the existing bridge and would not require the taking of additional property. UPRR already controls the majority of right-of-way for the proposed double-track alignment.

## **3.0 Summary of Environmental Impacts of the Proposed Action and Alternatives**

### **3.1 Community, Social and Economic**

The proposed Osage River Bridge is located approximately 40 feet north of the existing bridge and will be compatible with the proposed double-track alignment. Construction will take place primarily within existing UPRR right-of-way and will not result in any residential or business displacements. There will be no direct impacts to schools, churches, shopping areas, businesses or other similar neighborhood or community institutions. There will be no disproportionate adverse impacts on any minority, low income, or unique social groups due to this project. Current bicycle and pedestrian travel would not be altered. The proposed project will comply with the requirements of Executive Order 12898, Environmental Justice.

### **3.2 Floodplain**

The proposed Osage River Bridge is located within the 100-year floodplain of the Osage River. With the preferred alternative no material would be placed below the 100-year flood contours for temporary access roads, workpads, causeways, or bridges. The existing bridge will be altered by

pushing back the western abutment and replacing a 50 foot span with spans approximately 36 and 68 feet in length with construction of a pier. A maximum total impact of 7,310 cubic yards of material will be dredged and deposited in a prior converted non-wetland area located adjacent to the left descending bank of the Missouri River, between river mile 138.4 and 138.6 in Callaway County, Missouri.

Floodplain Development Permits were issued by Cole and Osage County on April 7, 2004 and May 26, 2004, respectively (Appendix 2). The floodplain permits are conditional on the approval of a Section 404 Permit and 401 Water Quality Certification. The proposed project will not have a significant impact on flood heights, nor stimulate additional development within the floodplain.

### **3.3 Wetlands**

A desktop screening was performed to identify potential waters that may be impacted by the proposed project. Information used to conduct the desktop screening included the Soil Surveys from Cole and Osage Counties, Missouri, hydric soils lists, the National Wetland Inventory Data, preliminary plan drawings, and aerial photography.

A field investigation was performed on November 21, 2003 to identify wetlands within the project area. Wetlands were delineated in accordance with the 1987 Manual for Delineating Wetlands (USACE 1987). The field investigation confirmed that there are five waters of the U.S. (four wetland areas and the Osage River) within the project limits. The U.S. Fish and Wildlife Service manual Classification of Wetlands and Deepwater Habitats (Cowardin et.al. 1979) was used to classify wetland features. A total of three wetland areas totaling 0.15 acres were delineated in the project area including 0.09 acres of palustrine emergent wetlands, 0.02 acres of palustrine scrub-shrub wetlands, and 0.04 acres of palustrine forested wetlands.

Impacted wetlands will be mitigated through the purchase of one credit, which is one acre of wetland from the Lower Missouri River Mitigation Bank. One acre would allow for mitigation of emergent and scrub-shrub wetland impacts at a 3:1 ratio and forested wetland impacts at a 4:1 ratio. (Appendix 2).

A Corps of Engineers' Section 404 Permit for wetland fill has been submitted and is being processed. The requirements of Executive Order 11990, Protection of Wetlands have been satisfied.

### **3.4 Fish and Wildlife**

A variety of large and small mammals and herpetofauna can be expected to occur in the project vicinity. A Biological Assessment (BA) was prepared to identify federally listed species and habitat that could support these species in the Study Area and to evaluate the potential impacts of implementing one of the alternatives (Appendix 3). In compliance with the Endangered Species Act, the U.S. Fish and Wildlife Service (USFWS) Columbia Field Office provided a list of threatened and endangered species that could potentially occur within Osage and Cole Counties, Missouri. This list included the threatened bald eagle (*Haliaeetus leucocephalus*), endangered

Indiana Bat (*Myotis sodalists*), endangered pallid sturgeon (*Scaphirhynchus albus*), endangered pink mucket pearlymussel (*Lampsilis abrupta*), and the endangered scaleshell mussel (*Leptodea leptodon*). In addition to federally listed species, the USFWS expressed concern regarding impacts on any freshwater mussel beds that may be present within the project area and impacts on lake and shovelnose sturgeon and paddlefish. The Missouri Department of Conservation has identified the state-listed giant floater mussel (*Pyganodon grandis*) and black sandshell mussel (*Ligumia recta*) as species that are known to occur in the Osage River near the project area.

During a site visit on January 14, 2003, the USFWS stated that the project area did not contain suitable habitat for the Indiana bat and surveys would not be required. Therefore, the project would have no effect on the Indiana bat and it is not included in the BA.

#### **3.4.1 Bald eagles (*Haliaeetus leucocephalus*)**

Bald eagles are known to exist for wintering and roosting purposes within the proposed Osage River Bridge area, however, there are no known nests in the vicinity. Wintering and migrating eagles are present in Missouri typically between November 15 and March 1. In order to minimize the effect of the Project on bald eagles, tree-clearing activities would be conducted between March 1 and November 15 to the extent possible. If the removal of trees is necessary between November 15 and March 1, surveys will be required to determine if bald eagles are present. Trees will be removed only as required for construction activities. If a bald eagle is sited roosting or nesting in the Project vicinity construction would stop until the USFWS can be contacted and appropriate actions will be taken based on USFWS consultation.

While some bald eagle habitat would be removed for construction, the amount of habitat removed is an insignificant disturbance and would not adversely affect the bald eagle population. Noise levels during construction may cause bald eagles to avoid the general area near the project during construction, but eagles would likely return to the area once the sporadic and louder noises of construction cease. The type and extent of predicted impacts on bald eagles are considered insignificant effects and should not reach the scale where it adversely affects bald eagles.

#### **3.4.2 Pallid sturgeon (*Scaphirhynchus albus*)**

Pallid sturgeon are known to occur in the portion of the Osage River flowing through the proposed Osage River Bridge. However, the channelization of the Missouri River, as well as over-harvesting of the species, has greatly reduced the numbers of pallid sturgeon in the area. The majority of the impacts on the pallid sturgeon would be temporary in nature and associated only with pier construction. Over the long term, the scour areas located immediately upstream and downstream of the piers may provide small areas of pool habitat for pallid sturgeon to use for wintering purposes. The type and extent of predicted impacts on pallid sturgeons are considered insignificant effects and is not likely to adversely affect the pallid sturgeon.



### 3.4.3 Mussels

The Osage River is known to support a variety of species of mussels, including the pink mucket pearlymussel (*Lampsilis abrupta*), the scaleshell mussel (*Leptodea leptodon*), and the Missouri state-listed species of giant floater mussel (*Pyganodon grandis*) and black sandshell mussel (*Ligumia recta*). A habitat survey was conducted for freshwater mussels in and immediately up- and downstream of the Project Area. Live mussels as well as weathered dead shells were observed during the habitat survey, including one weathered dead shell of a pink mucket pearlymussel. Based upon the results of this survey, a freshwater species survey was determined necessary.

The UPRR coordinated with the USFWS to complete the species survey. The surveys identified 63 live mussels of 14 different species scattered throughout the area. No threatened or endangered species were found. A regression analysis was completed to determine the likely mussel abundance in the entire survey area and resulted in an estimate of 320 live mussels of 18 species. No mussel beds were identified. Ecological Specialists, Inc. determined that the mussels present in the area likely washed downstream from upstream beds and only those finding a stable place to live remain in the area. While no threatened or endangered species were found there remains some minimal potential for a small number pink mucket pearlymussels to be found in the project area, however, the Project would only affect a few individual mussels and would not affect the pink mucket pearlymussel population in the Osage River.

In a June 16, 2004 letter, USFWS indicated concurrence with the species survey findings and the determination that the Project may affect but is not likely to adversely affect state and/or Federally listed mussel species (Appendix 2).

### 3.4.4 Wildlife

The construction of 0.49 miles of a second-track adjacent to the existing track and constructing an additional bridge is not expected to alter wildlife movements through the area. Long-term impacts are expected to be minimal as they are already restricted by the existing rail facility. Natural features traversed include open water associated with the Osage River, vegetated floodplain, and small wetlands. Loss of habitat is negligible.

### 3.5 Prime and Unique Farmlands

The majority of the Osage River Bridge Project Area consists of existing right-of-way (29.4 acres). The Project Area will acquire an additional 0.4 acres on the north side of the railroad tracks in Osage City and 5.3 acres on the east side of the Osage River for a total of 5.7 acres. None of this land is currently serving an agricultural use. The 0.4 acres required in Osage City is currently acting as part of a buffer between the railroad tracks and nearby homes. This 0.4 acres is located near the pinch point where two tracks reduce to one. On the east side of the Osage River, County Road 145 parallels the existing single-track. This county road would need to be moved north to accommodate the addition of a second-track. Approximately 6 acres of existing farmland will need to be acquired for reconstruction of the road.

A U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Farmland Conversion Impact Rating Form was completed for the proposed Project. The approximately 6 acres of land required for reconstruction of the county road is the only prime farmland that would be converted by the Project. This is less than 0.003 percent of Osage County's total available farmland of 194,645 acres. The NRCS relative value of this farmland on a scale of 0 to 100 is 80. The total score including the Site Assessment is 118 points. A rating of 160 points or higher is considered to be a substantial impact (Appendix 2).

### **3.6 Wild and Scenic Rivers**

No portions of the Osage River are designated as Wild and Scenic Rivers.

### **3.7 Air Quality**

The area is in an attainment area and will have no significant impact on air quality (Appendix 2). Constructing the second-track will eliminate the 8 to 15 hours per day of trains idling while waiting to cross the Osage River Bridge. A written conformity determination is not required for this project because the project area is in an area designated "attainment". In accordance with 40 CFR 93.102, the Transportation Conformity Rule does not apply because the project was not developed, funded, or approved under Title 23 U.S.C. or the Federal Transit Act.

### **3.8 Noise**

The construction and operation of the Osage River Bridge is not anticipated to have a significant impact on noise levels within and surrounding the Project Area. Noise associated with construction of the proposed Osage River Bridge may temporarily increase noise levels in the immediate vicinity of the Project Area. However, long-term post-construction noise increases are not anticipated. Train traffic would not increase in volume in Osage City. In addition, the second mainline track will eliminate trains idling 8 to 15 hours per day while waiting to cross the Osage River Bridge.

### **3.9 Water Quality**

Application for the Section 401 Water Quality Certification (Clean Water Act of 1977 PL 95-217) will be made to the State of Missouri Department of Natural Resources, Water Pollution Control Program. Construction and operational activities related to this project are consistent with and will not violate the water quality standards set by the state of Missouri. There are no wastewater treatment plants within the project area, and the design does not involve realignment of or other impacts to local water supply systems.

Best Management Practices will be incorporated into the project design to minimize the opportunity for pollutants to enter the Osage or Missouri River systems. Appropriate erosion and sediment controls will be used and maintained during construction; measures will be taken to minimize soil disturbance by heavy equipment.

### **3.10 Navigation**

Waterborne traffic will not be permanently or unreasonably obstructed by the proposed project. The navigation channel would be maintained throughout the life of the Project. The Osage River is primarily used by recreational boats and does not support large vessels. The navigation clearance of the new Osage River Bridge would be the same as the existing bridge. The U.S. Coast Guard has reviewed preliminary bridge drawings and has approved the navigational clearance. The Corps of Engineers does not maintain a navigation channel nor has plans for a navigation project on this waterway.

### **3.11 Parks, Historic and Cultural Properties, and Recreation**

The Missouri State Historic Preservation Officer (SHPO) stated in a letter dated March 24, 2004 that none of the archaeological sites located in the Area of Potential Effects are eligible for listing in the National Register of Historic Places and further conclude there will be no historic properties affected by the project (Appendix 2).

## **4.0 A Comparative Analysis of the Proposed Action and Alternatives**

### **4.1 Preferred Alternative**

This EA has evaluated the potential environmental, cultural, and socioeconomic impacts from the proposed construction of the Osage River Bridge. The EA determined that one feasible construction (build) alternative for the proposed action exist.

#### **4.1.1 No Action**

This alternative was determined not to be feasible because the pinch point created by the single-track segment of the Osage River Bridge would remain and train service would not be improved.

#### **4.1.2 Construct Second-Track Bridge Upstream of Existing Bridge**

This is not a viable option because the location and design of the second-track. An alignment located upstream of the existing bridge would adversely impact a residential neighborhood and require the taking of residential property.

#### **4.1.3 Construct Second-Track Bridge Downstream of Existing Bridge**

This alternative was designed to be compatible with the existing bridge and would not require the taking of additional property. UPRR already controls the majority of right-of-way for the proposed double-track alignment. This alternative was designed to be compatible with the existing bridge and minimize the amount of time required for construction of the proposed bridge.

## **5.0 Statement of Environmental Significance of the Proposed Project**

The proposed project will result in minimal short-term (during construction) and no long-term adverse environmental impacts. The project will improve environmental conditions and efficiency of rail operations. Best management practices will be followed and all measures to minimize harm have been included in the planning of the proposed Osage River Bridge. The new bridge will provide for the reasonable needs and safety of navigation. Also the city of Osage City will benefit with cleaner air and a quieter atmosphere with the elimination of trains idling for 8 to 15 hours per day while waiting to cross the single-track Osage River Bridge.

## **6.0 Agency Coordination**

Listed are agencies contacted in preparation of this environmental assessment.

### **U.S. Coast Guard**

U.S. Coast Guard Bridge Permit  
(Roger Wiebusch, David Orzechowski)

### **U.S. Department of Agriculture**

Soil Conservation Service  
Prime and Unique Farmland  
(Keith Davis)

### **U.S. Department of the Interior**

#### **Fish and Wildlife Service**

Threatened & Endangered Species Inquiry  
(Jane Ledwin, Rick Hansen)

### **Missouri Department of Natural Resources**

#### **Division of Historic Preservation**

(Mark Miles, Brant Vollman)

#### **Clean Water Commission**

(Stephen Manipod)

#### **Air Pollution Control Program**

(Leanne J. Tippett)

#### **Water Pollution Control Program**

Section 401 Water Quality Certification  
(Dan Boos)

**Missouri Department of Conservation**  
Headquarters  
(Brian Canaday)

**Cole County – Emergency Management Agency**  
Floodplain Development Permit  
(Chris Yarnell)

**Osage County – Emergency Management Agency**  
Floodplain Development Permit  
(Bradley Strobe)

**APPENDIX 1**  
**Proposed Bridge Plans**

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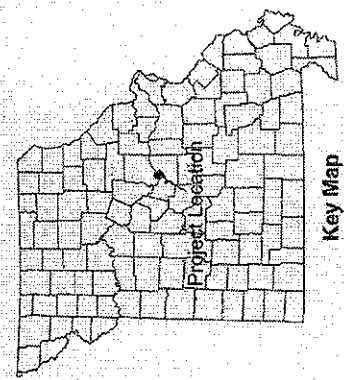
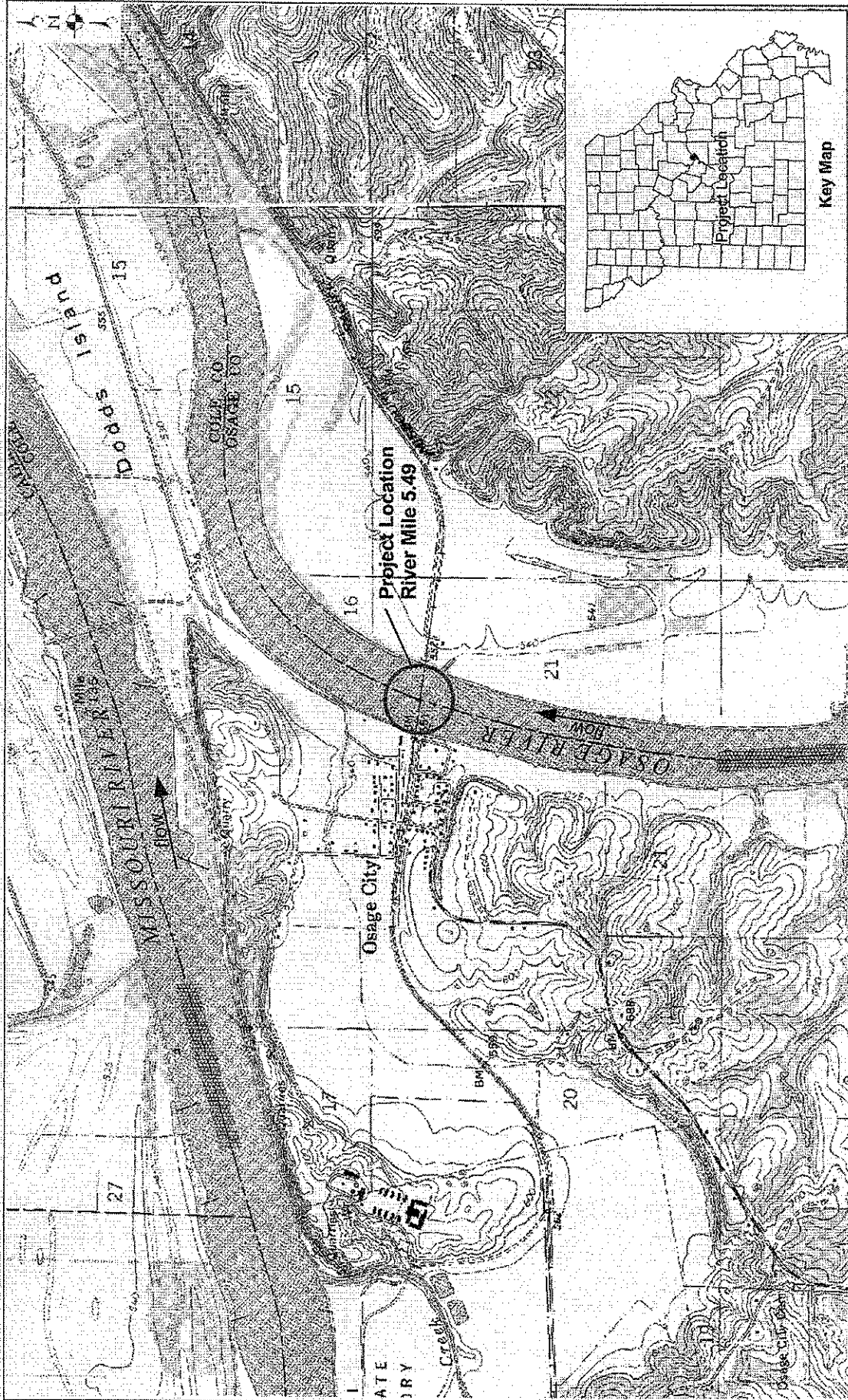
**PROPOSED OSAGE RIVER BRIDGE**  
**RIVER MILE 5.3**  
**NEAR OSAGE CITY, MISSOURI**  
**OSAGE/COLE COUNTIES**  
**APPLICATION BY**  
**UNION PACIFIC RAILROAD**

Date: December 2005



Scale

Source: MSDIS; Cole County GIS

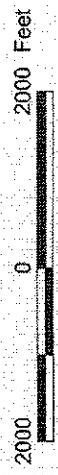
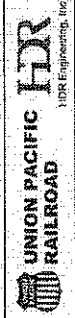


Key Map

PROPOSED OSAGE RIVER BRIDGE  
 RIVER MILE 5.49  
 NEAR OSAGE CITY, MISSOURI  
 OSAGE/COLE COUNTIES  
 APPLICATION BY  
 UNION PACIFIC RAILROAD

Date: February 2004  
 Rev: July 2004  
 Rev: April 2005

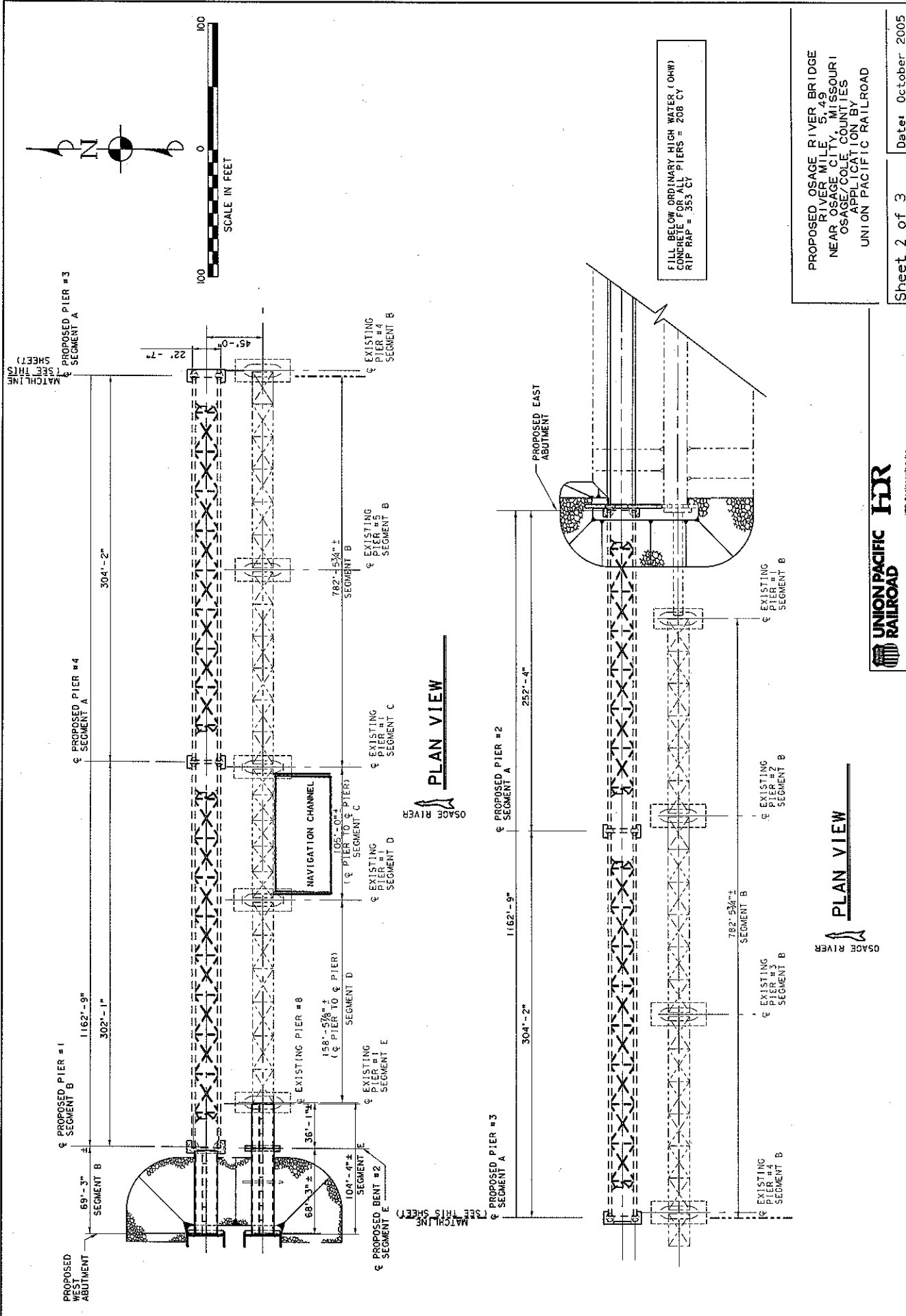
Sheet 1 of 3



Scale

Source: USGS 7.5' Topographic Map, Osage City and Loose Creek, MC Quadrangles





UNION PACIFIC RAILROAD

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PROPOSED OSAGE RIVER BRIDGE  
 RIVER MILE 5.49  
 NEAR OSAGE CITY, MISSOURI  
 OSAGE/COLE COUNTIES  
 APPLICATION BY  
 UNION PACIFIC RAILROAD



**APPENDIX 2**  
**Agency Correspondence and Comments**



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Columbia Ecological Services Field Office  
101 Park DeVille Drive, Suite A  
Columbia, Missouri 65203-0007



Phone: (573) 234-2132 Fax: (573) 234-2181

December 11, 2003

Mr. William Sigler  
Senior Environmental Scientist  
HDR Engineering, Inc.  
8404 Indian Hills Drive  
Omaha, NE 68114-4098

Dear Mr. Sigler:

Please refer to your November 19, 2003, letter, requesting information on federally listed species that may occur in the vicinity of the proposed Union Pacific Railroad bridge across the Osage River in Cole County, Missouri. The U.S. Fish and Wildlife Service has reviewed your letter and submits these comments under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), and the Endangered Species Act of 1973, (16 U.S.C. 1531-1543), as amended.

The following federally listed species may occur in the project area:

**Bald eagle (*Haliaeetus leucocephalus*), Threatened** – Bald eagles are common migrants and winter residents throughout the state and are uncommon breeders along some of the major rivers and larger reservoirs in the state. During winter, they congregate near rivers and reservoirs with open water and often near large concentrations of waterfowl. Wintering eagles usually occupy river habitats between November 15 and March 1, and use large diameter riparian tree species as daytime perches and night roosts. They usually perch within a riparian corridor or along lake shores and prefer areas with limited human activity. At night, wintering bald eagles may congregate at communal roosts and will travel as much as 20 kilometers (12 miles) from feeding areas to a roost site. The period January 1 to March 1 is important for initiating nesting activity; March 1 to May 15 is the most critical time for incubation and rearing of young.

Bald eagles are known to prefer trees greater than 11 inches dbh and within 100 to 600 feet of water for perching sites. Eagles also tend to roost on the tallest trees (greater than 63 feet above ground level). Cottonwood (*Populus deltoides*) and sycamore (*Platanus occidentalis*) are often selected over other trees for perching and roosting. We recommend the project be designed to avoid the loss of trees matching these criteria.

**Indiana bat (*Myotis sodalis*), Endangered** – From late fall through winter Indiana bats in Missouri hibernate in caves in the Ozarks and Ozark Border Natural Divisions. During the spring and summer, Indiana bats utilize living, injured (e.g. split trunks and broken limbs from lightning strikes or wind), dead or dying trees for roosting throughout the state. Indiana bat roost trees tend to be greater than 9 inches diameter at breast height (dbh) (optimally greater than 20 inches dbh) with loose or exfoliating bark. Most important are structural characteristics that provide adequate space for bats to roost.

Preferred roost sites are located in forest openings, at the forest edge, or where the overstory canopy allows some sunlight exposure to the roost tree, which is usually within 0.6 miles of water. Indiana bats forage for flying insects (particularly moths) in and around the tree canopy of floodplain, riparian, and upland forests. If trees suitable for use by Indiana bats are to be removed for the proposed project, they must be removed between October 1<sup>st</sup> and March 30<sup>th</sup> to avoid the potential injury or death to roosting individuals and maternity colonies. If it is not feasible to schedule tree removal during this period, the Service requires a survey, to determine the presence or absence of Indiana bats, be conducted by a qualified biologist. Survey efforts should include using a combination of mist nets and bat detection devices [e.g., "Anabat" (© Titley Electronics, Ballina, New South Wales, Australia)]. If it is determined that a survey for Indiana bats is needed, please contact the Missouri Ecological Services Field Office to obtain specific information regarding survey protocol. If surveys indicate that Indiana bats are using trees proposed to be removed during their breeding season (April 1 to September 30) further consultation with the Service under section 7 of the Act will be required.

**Pallid sturgeon (*Scaphirhynchus albus*), Endangered**- The pallid sturgeon's range is primarily the Missouri River and the Mississippi River downstream of its confluence with the Missouri River. Limited data is available concerning preferred habitats in Missouri, but the species has been captured in tributary mouths, over sandbars, along main channel borders, and in deep holes (in winter) in the Missouri River. Small sturgeon have been captured in off-channel backwaters.

**Pink mucket pearlymussel (*Lampsilis abrupta*), Endangered** - The pink mucket pearlymussel is found in medium to large rivers, in habitats ranging from silt to boulders, rubble, gravel and sand substrates in moderate to fast-flowing water, at depths ranging from 0.5 to 8.0 meters. The pink mucket occurs in the Black River in Wayne and Butler counties; the Little Black River in Ripley County; the Meramec River from the Bourbeuse River confluence downstream to the Highway 231 bridge in Franklin, Jefferson and St. Louis counties; the Big River in Jefferson County; the Gasconade River in Maries, Osage and Gasconade counties; the Osage River downstream of Bagnell Dam to its confluence with the Missouri River; and the Sac River in Cedar County. Increases in turbidity and suspended sediments cause nutritional stress and mortality in the pink mucket pearlymussel.

**Scaleshell mussel (*Leptodea leptodon*), Endangered** – The scaleshell mussel occurs in small to large streams from riffles in stable substrates consisting of gravel, cobble, boulder, and occasionally mud or sand. Most extant populations are restricted to river stretches with stable channels that have maintained relatively good water quality. Additionally, scaleshell is usually found in association with a high diversity of other freshwater mussels. Like most other native

freshwater mussels, scaleshell requires a host fish during the early stages of development to complete its life cycle. The scaleshell appears to utilize the freshwater drum (*Aplodinotus grunniens*) as a host. In Missouri, the scaleshell is known from the Meramec, Bourbeuse, Big, Gasconade, and Osage rivers.

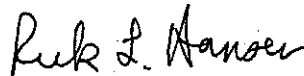
Since freshwater mussels are sedentary, they can be particularly vulnerable to local impacts of construction sites such as road improvements. Construction related impacts that could adversely affect the pink mucket or scaleshell mussel include bank or channel disturbance, accidental spills and runoff of contaminants; and increases in turbidity and suspended sediments. Additionally, mussels can be removed from the water, buried, or crushed by machinery. If you suspect that the proposed project may cause any of these effects, further consultation with this office may be necessary.


The Service is also interested in avoiding and minimizing impacts to other significant mussel resources that may be present in the project vicinity. In-stream construction can have significant impacts to mussel populations if the activity is located in or adjacent to habitat that supports a large number of species and individuals. Because mussels are sessile organisms and cannot move away from disturbances, in-stream activities can destroy entire mussel beds by directly burying or crushing mussels and/or altering habitat

In addition to the pallid sturgeon, the Osage River is extremely important habitat for Lake and shovelnose sturgeon and paddlefish. To maintain habitat quality for those species, we recommend minimizing activities that would modify the river bottom or circulation/flow patterns. If you have not already done so, please contact the Missouri Department of Conservation (Planning Division, P.O. Box 180, Jefferson City, Missouri 65102-0180) for information concerning State-listed rare and endangered species.

Should you have questions, or if we can be of any further assistance, please contact Ms. Jane Ledwin at the address above, or by telephone at (573)234-2132, extension 109.

Sincerely,



 Charles M. Scott  
Field Supervisor

cc: MDC; Jefferson City, (Brian Canaday)

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STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

Bob Holden, Governor • Stephen M. Mahfood, Director

www.dnr.state.mo.us

DEC 18 2003

Mr. Kevin Rose, J. D.  
HDR Engineering, Inc.  
8404 Indian Hills Drive  
Omaha, NE 68114-4098

RE: Cole and Osage County Missouri National Ambient Air Quality Standard Status  
Concurrence.

Dear Mr. Rose:

Per your December 5, 2003, FAX request, this is a letter of concurrence that Cole and Osage Counties in Missouri are in attainment (or unclassified) for the National Ambient Air Quality Standards, and are not under any maintenance plans for criteria pollutants.

This letter was requested in order to fulfill a requirement to demonstrate that a General Conformity Determination would not be required for a project under Federal oversight that may take place in these counties.

For reference, 40 CFR Part 81.326 lists the federal attainment status area designations for all states.

Thank you for your inquiry. If you have further questions, please contact Jim Kavanaugh with the Air Pollution Control Program at P.O. Box 176, Jefferson City, MO 65102 or by phone at (573) 751-4817.

Sincerely,

Air Pollution Control Program

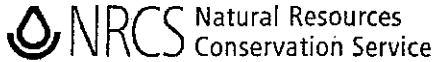
Leanne J. Tippet  
Director

LJT:pms



*Integrity and excellence in everything we do*





Area Office, 1911 Boggs Creek Road, Jefferson City, Missouri 65101

Phone: 573 761-3105 Ext. 5

February 11, 2004

Ms. Kelly J. Farrell  
Environmental Scientist  
HDR One Company  
8404 Indian Hills Drive  
Omaha, NE 68114-4098

Dear Ms. Farrell,

Attached is the completed CPA-106 form per your request for a Farmland Conversion Impact Rating for a track realignment and bridge construction on the Union Pacific Railroad near Osage City. As I read the ArcView files you sent, there will be no farmland converted on the Cole County side of the bridge, so I completed the evaluation only on the Osage County portion of the project. After you complete the form, please return one copy for our records.

Please feel free to contact me if I can be of further assistance.

A handwritten signature in cursive script that reads "Keith Davis".

Keith Davis  
Area Resource Soil Scientist

Cc: Shawn Anderson, District Conservationist, Linn  
Gary VanDeVelde, District Conservationist, Jefferson City



**FARMLAND CONVERSION IMPACT RATING  
FOR CORRIDOR TYPE PROJECTS**

|  |  |  |  |
|--|--|--|--|
| <b>PART I (To be completed by Federal Agency)</b>  |  | 3. Date of Land Evaluation Request   | 4. Sheet 1 of <u>1</u>                               |
| 1. Name of Project <b>Osage River Bridge MP 116.89</b>   |  | 5. Federal Agency Involved<br><b>US Army Corps of Engineers &amp; US Coast Guard</b> |  |
| 2. Type of Project <b>Transportation Corridor</b>  |  | 6. County and State <b>Osage County, Missouri</b>                                    |  |
| <b>PART II (To be completed by NRCS)</b>   |  | 1. Date Request Received by NRCS<br><b>2/9/04</b>                                    | 2. Person Completing Form<br><b>Keith Davis</b>      |
| 3. Does the corridor contain prime, unique statewide or local important farmland?<br>(If no, the FPPA does not apply - Do not complete additional parts of this form). |  | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>                  | 4. Acres Irrigated   Average Farm Size<br><b>266</b> |
| 5. Major Crop(s)<br><b>Corn (for index)</b>  | 6. Farmable Land in Government Jurisdiction<br>Acres: <b>194,645</b> % <b>50</b> | 7. Amount of Farmland As Defined in FPPA<br>Acres: % <b>50</b>                       |  |
| 8. Name Of Land Evaluation System Used<br><b>Osage County</b>  | 9. Name of Local Site Assessment System<br><b>none</b>                           | 10. Date Land Evaluation Returned by NRCS<br><b>2/11/04</b>                          |  |

| <b>PART III (To be completed by Federal Agency)</b>               | <b>Alternative Corridor For Segment</b> |            |            |            |
|---|---|------------|------------|------------|
|   | Corridor A                              | Corridor B | Corridor C | Corridor D |
| A. Total Acres To Be Converted Directly                           | 0                                       |            |            |            |
| B. Total Acres To Be Converted Indirectly, Or To Receive Services | 6                                       |            |            |            |
| C. Total Acres In Corridor  | 6                                       | 0          | 0          | 0          |

| <b>PART IV (To be completed by NRCS) Land Evaluation Information</b>               |             |
|--|-------------|
| A. Total Acres Prime And Unique Farmland   | 6           |
| B. Total Acres Statewide And Local Important Farmland                              | 0           |
| C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted            | <b>.003</b> |
| D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value | <b>19.1</b> |

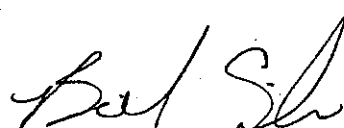
**PART V (To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)**

| <b>PART VI (To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))</b> | Maximum Points |           |          |          |          |
|--|----------------|-----------|----------|----------|----------|
| 1. Area in Nonurban Use  | 15             | 15        |          |          |          |
| 2. Perimeter in Nonurban Use   | 10             | 8         |          |          |          |
| 3. Percent Of Corridor Being Farmed  | 20             | 0         |          |          |          |
| 4. Protection Provided By State And Local Government   | 20             | 0         |          |          |          |
| 5. Size of Present Farm Unit Compared To Average   | 10             | 10        |          |          |          |
| 6. Creation Of Nonfarmable Farmland  | 25             | 0         |          |          |          |
| 7. Availability Of Farm Support Services   | 5              | 5         |          |          |          |
| 8. On-Farm Investments   | 20             | 0         |          |          |          |
| 9. Effects Of Conversion On Farm Support Services  | 25             | 0         |          |          |          |
| 10. Compatibility With Existing Agricultural Use   | 10             | 0         |          |          |          |
| <b>TOTAL CORRIDOR ASSESSMENT POINTS</b>  | <b>160</b>     | <b>38</b> | <b>0</b> | <b>0</b> | <b>0</b> |

| <b>PART VII (To be completed by Federal Agency)</b>                       |            |               |          |          |          |
|---|------------|---------------|----------|----------|----------|
| Relative Value Of Farmland (From Part V)                                  | 100        | <b>80</b>     |          |          |          |
| Total Corridor Assessment (From Part VI above or a local site assessment) | 160        | <b>38</b>     | <b>0</b> | <b>0</b> | <b>0</b> |
| <b>TOTAL POINTS (Total of above 2 lines)</b>                              | <b>260</b> | <b>38 118</b> | <b>0</b> | <b>0</b> | <b>0</b> |

|  |   |   |   |
|--|---|---|---|
| 1. Corridor Selected:<br><b>Corridor A</b> | 2. Total Acres of Farmlands to be Converted by Project:<br><b>6</b> | 3. Date Of Selection:<br><b>2/12/04</b> | 4. Was A Local Site Assessment Used?<br>YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> |
|--|---|---|---|

5. Reason For Selection:



Signature of Person Completing this Part: \_\_\_\_\_ DATE **2/12/04**

NOTE: Complete a form for each segment with more than one Alternate Corridor

February 13, 2004

Keith Davis  
Natural Resource Conservation Service  
Area Office  
1911 Boggs Creek Road  
Jefferson City, Missouri 65101

Dear Mr. Davis:

Thank you for your prompt response regarding my request for a farmland conversion impact rating for the Osage River Bridge Milepost 116.89 Project. As requested, I have attached a completed copy of the CPA-106 form for your records.

If you require any additional information or have any questions concerning this request please contact me at (402) 399-1457.

Sincerely,  
HDR ENGINEERING, INC.



Kelly J. Farrell  
Environmental Scientist

Enclosure

cc: Cheney - UPRR  
Teig - HDR  
File



# MISSOURI DEPARTMENT OF CONSERVATION

## *Headquarters*

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180

Telephone: 573/751-4115 ▲ Missouri Relay Center: 1-800-735-2966 (TDD)

JOHN D. HOSKINS, Director

March 9, 2004

Ms. Kelly J. Farrell  
Environmental Scientist  
HDR  
8404 Indian Hills Drive  
Omaha, Nebraska 68114-4098

Dear Ms. Farrell:

Subject: Railroad Bridge Construction – Osage River, Osage County, Missouri

I enjoyed meeting with you to discuss the proposed railroad bridge construction project across the Osage River at river mile 5.3 near Osage City, Missouri. At your request, I have reviewed Department records and information on sensitive species or communities for this location.

A review of our records shows that sensitive species and communities are known to exist at and near the above-referenced site. Specifically, a mussel bed containing the state listed giant floater mussel, the black sandshell mussel, the federally endangered scaleshell mussel, and the federally endangered pink mucket mussel are known to occur in the Osage River near the proposed construction site. Please be advised that this is not a site clearance letter. Rather, this letter provides an indication of whether or not sensitive resources are known to be (or are likely to be) located close to the proposed project.

Incorporating information from our Heritage Database into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive natural resources. The Heritage Database is only one reference which should be used to evaluate potential adverse impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information and species biological characteristics would additionally ensure that species of conservation concern are appropriately identified and addressed.

COMMISSION

STEPHEN C. BRADFORD  
Cape Girardeau

ANITA B. GORMAN  
Kansas City

CYNTHIA METCALFE  
St. Louis

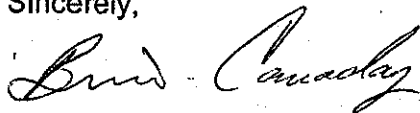
LOWELL MOHLER  
Jefferson City

Impacts on the aquatic environment can be minimized if the following best management practices for the river and the species are implemented into project design and construction.

1. Channel modification or stream relocation should not occur unless conditions of the Missouri Department of Natural Resources State Channel Modification Guidelines are met.
2. Grade and seed disturbed areas as soon as possible to minimize erosion. The Missouri Department of Conservation can provide seeding and planting recommendations to enhance site conditions.
3. Disturbance to stream banks and riparian areas should be avoided.
4. Stream flows should not be interrupted. All temporary in channel fills that could impound water should be culverted with appropriately sized structures.
5. Avoid work in the channel between March 15 and June 15 to the best extent possible.
6. Take all necessary precautions to prevent petroleum products from entering the stream.

Thank you for the opportunity to provide our comments pertaining to the bridge project. The Department would like the opportunity to review any revised project plans and may provide additional comments during the formal 404/401 permitting process. Please feel free to contact me if you have any questions.

Sincerely,



BRIAN D. CANADAY  
POLICY COORDINATOR

Enclosures



## Introduction

The streams and rivers of Missouri support a wide and diverse community of wildlife that includes many species of mammals, birds, fishes, mussels, crayfish, and insects. The continued diversity and health of this community is dependent upon how well Missourians manage and protect this resource. While water quality is essential, maintaining a diverse array of habitat features also is essential for aquatic wildlife to persist. Since implementation of the Clean Water Act, point source pollution has been greatly reduced, but polluted and sediment-laden runoff (non-point source) from rural and urban development is still a serious problem.

There are management practices that can be implemented to prevent degradation of our streams and rivers. By adapting these best management practices we can prevent the loss of species diversity and maintain the quality of our lives as well. Preventative measures may require extra effort initially, but they provide long-term dividends by eliminating costly damage resulting from poor management practices.

## Access and Staging Area Management Recommendations

Staging areas are those short- or long-term sites within a construction or development area where most equipment and materials are stored. These areas often are accessed frequently, and when fuel and oil are stored here, the potential for runoff and erosion in these areas may be high.

- Erosion and sediment controls should be installed and maintained to prevent discharge from the site.
- Staging areas for crew, equipment, and materials should be established well away from streams and rivers or highly erodible soils.
- Stationary fuel and oil storage containers should remain within a staging area or another confined area to avoid accidental spills into the stream systems.
- Excess concrete and wash water from trucks and other concrete mixing equipment should be disposed of where this material cannot enter the stream systems.
- If temporary roadways must be built, ensure that roadways are of low gradient with sufficient roadbed and storm water runoff drains and outlets.
- Containment basins, silt fences, filter strips, etc. should be included for retention of storm water runoff for reducing sediment introduction into natural waterways.

- Avoid stream crossings. If unavoidable, temporary crossings should be used. Temporary crossings should not restrict or interrupt natural stream flow. If temporary in-channel fill is necessary, culverts of sufficient size should be employed to avoid water impoundment and allow for fish passage.

## Riparian Corridor Management Recommendations

The riparian corridor is the vegetation adjacent to a stream or river. This area is critical to the health and quality of the aquatic environment because of its ability to slow and reduce sediment and chemical runoff into the stream or river channel. A riparian corridor with a minimum width of 100 feet from the edge of the stream or river should be maintained along both sides of streams and rivers.

- Limit clearing of vegetation, including both standing and downed timber, to that which is absolutely necessary for construction purposes.
- Heavy equipment use within the riparian corridor should be restricted to minimize vegetation destruction and compaction of soils. Flagging or fencing areas that are not to be disturbed is helpful in alerting construction personnel.
- General application of pesticides, herbicides, or fertilizers within the riparian corridor should be prohibited to avoid water contamination due to overspray or runoff. Fertilizer use or spot application of pesticides and herbicides is acceptable if appropriate non-restricted chemicals are used.
- Riparian areas located down slope of construction zones should be physically screened with sediment controls, such as silt fences or filter strips. Sediment controls should be monitored after rain and maintained for the duration of the project.
- All riparian corridors disturbed by the project should be revegetated immediately following or concurrent with project implementation. Appropriate native bottomland or riparian trees, shrubs, and grasses should be planted to ensure long-term stability in areas where the soil erosion threat is not critical. Annual non-native grasses such as rye or wheat may be planted in conjunction with native species to provide short-term erosion control. Areas judged to be subject to immediate soil loss due to steep slopes or other factors causing critical erosion conditions may be planted with non-native mixtures to assure rapid establishment and erosion control.

→ Post-construction evaluation of vegetation establishment should be conducted at one month intervals for at least three months after completion of the project. Any recommended sediment controls should be inspected at these times. If determined beneficial to soil stability and not adversely impacting site function and/or aesthetics, recommended sediment controls should remain permanent.

→ All temporary erosion and sediment controls should be removed (unless removal would cause further disturbance) and properly disposed of within 30 days after final site stabilization is achieved or after temporary practices are no longer needed.

### **Bank and Channel Management Recommendations**

The structure of a bank is an important feature of a stream or river. It defines and provides stability for the channel.

→ Bank stability will vary depending on height, slope, and soil conditions. Project engineers and hydrologists should thoroughly investigate the physical properties and hydrologic record of the proposed site before construction begins.

→ Limit clearing of vegetation, including both standing and downed timber, to that which is absolutely necessary for construction purposes.

→ Projects in which bank alteration is necessary should employ, to the highest degree possible, erosion prevention measures before actual excavation activities begin. These preventative measures should be monitored regularly and maintained for the duration of the project.

→ Use of riprap for stream bank stabilization should be limited to those areas that could experience substantial erosion before adequate vegetation becomes established. The material for the rock blanket should consist of durable stone or broken concrete that is well graded. It is preferable that 40-60 percent of the material be as large as the thickness of the blanket, with enough smaller pieces of various sizes to fill the larger voids. It should not contain more than 10 percent of earth, sand, shale, and non-durable rock. Bank stabilization materials should allow for continuous passage of fish and other aquatic species.

→ No permanent fill materials, other than design-approved structures and related bank stabilization materials, should be placed in the stream channel. Avoid channelization. Excavated materials should not be stored or stockpiled below the high bank.

→ Work should be conducted during low flow periods when possible.

→ Care should be taken to keep machinery out of the waterway as much as possible.

→ Do not alter or remove natural stream features, such as riffles and pools.

→ Large woody debris is an important habitat component of a stream and should not be removed unless absolutely necessary for construction and maintenance purposes.

### **Information Contacts**

For further information regarding regulations for development near streams and rivers, contact:

U.S. Fish and Wildlife Service  
Ecological Services Field Office  
608 E. Cherry Street, Room 200  
Columbia, MO 65201  
Telephone: 573/876-1911

U.S. Army Corps of Engineers  
Regulatory Branch  
700 Federal Building  
Kansas City, MO 64106-2896  
Telephone: 816/983-3990

Missouri Department of Conservation  
Policy Coordination Section  
P.O. Box 180  
2901 W. Truman Blvd  
Jefferson City, MO 65102-0180  
Telephone: 573/751-4115

U.S. Environmental Protection Agency  
Water, Wetlands, and Pesticides Division  
901 North 5th Street  
Kansas City, KS 66101  
Telephone: 913/551-7307

Missouri Department of Natural Resources  
Division of Environmental Quality  
P.O. Box 176  
Jefferson City, MO 65102-0176  
Telephone: 573/526-3315

### **Disclaimer**

These Best Management Practices were prepared by the Missouri Department of Conservation with assistance from other state agencies, contractors, and others to provide guidance to those people who wish to voluntarily act to protect wildlife and habitat. Compliance with Best Management Practices is not required by the Missouri Wildlife and Forestry Law nor by any regulation of the Missouri Conservation Commission. Other federal, state, or local laws may affect construction practices.

# Best Management Practices

MISSOURI DEPARTMENT OF CONSERVATION



## Pink mucket

*Lampsilis abrupta*

- Common name** • Pink mucket
- Scientific name** • *Lampsilis abrupta*
- Federal status** • Endangered
- State status** • Endangered

### Ecology

The pink mucket is generally found in large rivers in moderate to fast-flowing water. This mussel species will use a range of substrates but generally prefers sand, gravel and cobble. It has been found in standing to moderately-flowing water as shallow as 1 inch to as deep as 5 feet.

Mussels are filter feeders that pump water through their siphons to collect food particles from the water. They gather necessary nutrients and remove unwanted toxins from the water through this process. Almost all mussel species depend on a fish host to complete their life cycle. Mature adult mussels release glochidia (the immature stage), which must attach to the gills or fins of fish to complete their development. After an average of 2-4 weeks, the newly metamorphosed juveniles drop from the fish; and if they land in suitable habitat, they will burrow into the substrate and grow to repeat the cycle. Fish are an important link in the reproductive cycle of mussels and, typically, only certain species of fish are suitable hosts. The pink mucket uses several species of fish for a host, including the black basses (largemouth, smallmouth and spotted bass) and walleye. The pink mucket spawns in August and September and releases glochidia the following year from May to July.

### Reasons for Decline

The pink mucket has disappeared from much of its historic habitat in approximately 26 rivers throughout the Midwest and eastern United States. It has always been rare or uncommon throughout its range. Alteration and degradation of habitat as a result of rural and urban development has adversely impacted this species. Declines in pink mucket numbers in Missouri rivers and streams can be attributed to direct mortality or habitat loss from dam construction, channelization, improper and untimely gravel and sand removal, increased sedimentation from clearing of streamside vegetation, run-off of fertilizers, pesticides and urban non-point source pollutants and excessive nutrient input from free-roaming livestock. These

practices have reduced availability and quality of habitat for fishes, further reducing the inherently-low probability for successful encounters between mussels and their hosts.

### Specific Recommendations

Close adherence to guidelines provided by the Missouri Department of Conservation will help ensure successful pink mucket reproduction and recruitment.

- A survey of the waterways in the project area must be conducted by a trained biologist in order to identify occurring populations of this species.
- Dams and other water impoundment structures should be prohibited in stretches of rivers where there is possible pink mucket habitat to avoid altering water temperature, turbidity and oxygen levels.
- Project activities should not be allowed below the high bank of the stream between May 1 and September 30 to protect the spawning season and glochidial release period of the pink mucket.
- Sheet piling used to construct in-stream coffer dams can be placed after September 30 and removed before the following May 1.
- All equipment that enters the waterway should be washed and checked for juvenile zebra mussels before entering another body of water. This will help prevent the spread of this exotic European mussel species that can negatively affect native aquatic organisms and mussel species like the pink mucket.

### General Recommendations

Refer to Management Recommendations for Construction Projects Affecting Missouri Streams and Rivers.

### Information Contacts

Missouri Department of Conservation  
Policy Coordination Section  
P.O. Box 180  
2901 W. Truman Blvd  
Jefferson City, MO 65102-0180  
Telephone: 573/751-4115

Missouri Department of Natural Resources  
Division of Environmental Quality  
P.O. Box 176  
Jefferson City, MO 65102-0176  
Telephone: 573/526-3315

U.S. Army Corps of Engineers  
Regulatory Branch  
700 Federal Building  
Kansas City, MO 64106-2896  
Telephone: 816/983-3990

U.S. Environmental Protection Agency  
Water, Wetlands, and Pesticides Division  
901 North 5th Street  
Kansas City, KS 66101  
Telephone: 913/551-7307

U.S. Fish and Wildlife Service  
Ecological Services Field Office  
608 E. Cherry Street, Room 200  
Columbia, MO 65201  
Telephone: 573/876-1911

## **Disclaimer**

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# Best Management Practices

MISSOURI DEPARTMENT OF CONSERVATION



## Scaleshell mussel

*Leptodea leptodon*

**Common name** • Scaleshell mussel

**Scientific name** • *Leptodea leptodon*

**Federal status** • Candidate

**State status** • Endangered

### Ecology

In the Gasconade and Meramec river basins in Missouri, the scaleshell inhabits clear, unpolluted riffles with moderate current and firm gravel, cobble and sand substrates. It frequently buries itself in riffles to a depth of 4 - 5 inches.

Almost all mussel species depend on a fish host to complete their life cycle. Mature adult mussels release glochidia (the immature stage), which must attach to the gills or fins of fish to complete their development. After an average of 2 - 4 weeks, the newly metamorphosed juveniles drop from the fish; and if they land in suitable habitat, they will burrow into the substrate and grow to repeat the cycle. Fish are an important link in the reproductive cycle of mussels and, typically, only certain species of fish are suitable hosts. The freshwater drum, which spawns in late April or May in Missouri, is the scaleshell's only known fish host. The scaleshell spawns in early to mid-August and releases glochidia in early summer, probably ending in June.

### Reasons for Decline

The scaleshell mussel was historically found in 13 states within the Ohio, Missouri and Mississippi River drainage basins. It occurred from South Dakota eastward to Ohio and Minnesota southward to Arkansas and Tennessee. Now, however, they are endangered and are known to exist in only a few rivers in Missouri, Arkansas and Oklahoma. Alteration and degradation of habitat as a result of rural and urban development have adversely impacted this species. Declines in scaleshell numbers in Missouri streams can be attributed to direct mortality or habitat loss from improper and untimely gravel and sand removal, increased sedimentation from clearing of streamside vegetation, run-off of fertilizers, pesticides and urban non-point source pollutants and excessive nutrient input from free-roaming livestock. These practices have also reduced the quality and quantity of habitat for fishes, further reducing the inherently-low probability for successful mussel and fish encounters.

### Specific Recommendations

If guidelines provided by the Missouri Department of Conservation are closely followed, in-stream activities should result in few negative impacts on the scaleshell.

- A survey of the waterways in the project area should be conducted by a trained biologist in order to identify occurring populations of this species.
- Dams and other impoundment structures that alter water depth and turbidity and promote siltation should be avoided in rivers that contain habitat for the scaleshell.
- Project activities should not be allowed below the high bank of the stream between May 1 and June 30 and from August 1 to August 31.
- Sheet piling used to construct in-stream coffer dams can be placed after August 31 and removed before the following May 1.
- All equipment that enters the waterway should be washed and checked for juvenile zebra mussels before entering another body of water. This will help prevent the spread of this exotic European mussel species that can negatively affect native aquatic organisms and kill mussel species like the scaleshell.

### General Recommendations

Refer to Management Recommendations for Construction Projects Affecting Missouri Streams and Rivers.

### Information Contacts

Missouri Department of Conservation  
Policy Coordination Section  
P.O. Box 180  
2901 W. Truman Blvd  
Jefferson City, MO 65102-0180  
Telephone: 573/751-4115

Missouri Department of Natural Resources  
Division of Environmental Quality  
P.O. Box 176  
Jefferson City, MO 65102-0176  
Telephone: 573/526-3315

U.S. Army Corps of Engineers  
Regulatory Branch  
700 Federal Building  
Kansas City, MO 64106-2896  
Telephone: 816/983-3990

U.S. Environmental Protection Agency  
Water, Wetlands, and Pesticides Division  
901 North 5th Street  
Kansas City, KS 66101  
Telephone: 913/551-7307

U.S. Fish and Wildlife Service  
Ecological Services Field Office  
608 E. Cherry Street, Room 200  
Columbia, MO 65201  
Telephone: 573/876-1911

### **Disclaimer**

These Best Management Practices were prepared by the Missouri Department of Conservation with assistance from other state agencies, contractors, and others to provide guidance to those people who wish to voluntarily act to protect wildlife and habitat. Compliance with Best Management Practices is not required by the Missouri wildlife and forestry law nor by any regulation of the Missouri Conservation Commission. Other federal, state or local laws may affect construction practices.

To be completed by community permit official: Floodplain Development Permit No. \_\_\_\_\_

### ENGINEERING "NO-RISE" CERTIFICATION

|   |   |                  |
|---|---|------------------|
| Community: _____<br>Union Pacific Railroad Company                    | County: <u>OSAGE</u>  | State: <u>MO</u> |
| Applicant: <u>(Mark McCune)</u> Date: <u>03/12/04</u>                 | Engineer: <u>John K. Denlinger</u>                                    |                  |
| Address: <u>1416 Dodge Street, Room 940</u><br><u>Omaha, NE 68179</u> | Address: <u>4435 Main Street</u><br><u>Kansas City, MO 64111-1860</u> |                  |
| Telephone: <u>(402) 271-5194</u>                                      | Telephone: <u>(816) 360-2740</u>                                      |                  |

**SITE DATA:**

1. Location: NW 1/4; NE 1/4; Section 21; Range 10W; Township: 44N

Street Address: \_\_\_\_\_

2. Panel(s) No. of NFIP map(s) affected: 290268 0075

3. Type of development: Filling \_\_\_\_\_ Grading \_\_\_\_\_ Excavation \_\_\_\_\_ Minor Improv \_\_\_\_\_  
Substantial-Improv \_\_\_\_\_ New Construction X Other \_\_\_\_\_

4. Description of Development: Construction of a second mainline bridge, 1,235 feet in length, located 45 feet downstream of existing structure.

5. Name of flooding source: Osage River

COMMENTS: See Attached Memo  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This is to certify that I am a duly qualified engineer licensed to practice in the State of MO. It is to further certify that the attached technical data supports the fact that the proposed development described above will not create any increase to the 100-year elevations on said flooding source above at published cross sections in the Flood Insurance Study for the above community dated FEB. 1990 and will not create any increase to the 100-year flood elevations at unpublished cross-section in the vicinity of the proposed development.

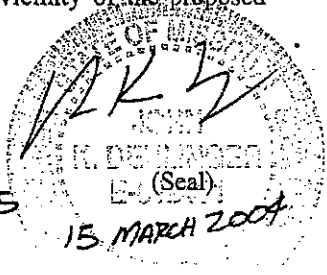
Name: John K. Denlinger

Signature: [Handwritten Signature]

Date: 15 MARCH 2004

Title: SR. WATER RESOURCES ENGINEER

License No.: 2001007035



To be completed by community permit official: Floodplain Development Permit No. \_\_\_\_\_

### ENGINEERING "NO-RISE" CERTIFICATION

|  |                                  |   |
|--|----------------------------------|---|
| Community: _____   | County: <u>COLE</u>              | State: <u>MO</u>  |
| Applicant: <u>Union Pacific Railroad Company</u><br><u>(Mark McCune)</u> Date: <u>03/12/04</u> |                                  | Engineer: <u>John K. Denlinger</u>                                    |
| Address: <u>1416 Dodge Street, Room 940</u><br><u>Omaha, NE 68179</u>                          |                                  | Address: <u>4435 Main Street</u><br><u>Kansas City, MO 64111-1860</u> |
| Telephone: <u>(402) 271-5194</u>   | Telephone: <u>(816) 360-2740</u> |   |

**SITE DATA:**

1. Location: NW 1/4; NE 1/4; Section 21; Range 10W; Township: 44N

Street Address: \_\_\_\_\_

2. Panel(s) No. of NFIP map(s) affected: 290107 0125

3. Type of development: Filling \_\_\_\_\_ Grading \_\_\_\_\_ Excavation \_\_\_\_\_ Minor Improv \_\_\_\_\_  
Substantial-Improv \_\_\_\_\_ New Construction X Other \_\_\_\_\_

4. Description of Development: Construction of a second mainline bridge, 1,235 feet  
in length, located 45 feet downstream of existing structure.

5. Name of flooding source: Osage River

COMMENTS: See Attached Memo

This is to certify that I am a duly qualified engineer licensed to practice in the State of MO. It is to further certify that the attached technical data supports the fact that the proposed development described above will not create any increase to the 100-year elevations on said flooding source above at published cross sections in the Flood Insurance Study for the above community dated JUNE 1981 and will not create any increase to the 100-year flood elevations at unpublished cross-section in the vicinity of the proposed development.

Name: John K. Denlinger

Signature: [Handwritten Signature]

Date: 15 MARCH 2004

Title: SR. WATER RESOURCES ENGINEER

License No.: 2001007035



LOWER MISSOURI RIVER, L.L.C.  
16640 CHESTERFIELD GROVE ROAD, SUITE 200  
CHESTERFIELD, MO 63005

March 18, 2004

Ms. Kelly J. Farrell  
HDR  
8404 Indian Hills Drive  
Omaha, NE 68114-4098

Re: Required Wetland Mitigation  
UPRR Osage River Bridge Project

Dear Ms. Farrell:

We understand that the UPRR Osage River Bridge Project is required to provide 1.0 acres (or 1.0 credits) from a wetland mitigation bank as a requirement of the current 404 Permit application. We believe that the Lower Missouri River Mitigation Bank is a viable source of mitigation for the project's mitigation requirement. The 1.0 credit will cost \$60,000.00. A check can be made out to Lower Missouri River, L.L.C. and mailed to my attention at the address above.

If you have any technical questions or comments regarding the bank specifications, please call Scott Harding at (636) 296-6111 ext.22.

Sincerely,



Kenneth Stricker  
Lower Missouri River, L.L.C.

Cc: Mr. Scott Harding

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

Bob Holden, Governor • Stephen M. Mahfood, Director

March 24, 2004

www.dnr.mo.gov

RECEIVED

APR 2 2004

HDR Engineering, Inc.

Mr. Michael Madson  
HDR Engineering, Inc.  
6190 Golden Hills Drive  
Minneapolis, Minnesota 55416-1567

Re: SHPO Project Number: 001-OS-04 - Proposed new bridge across Osage River at mile 5.3 in Cole and Osage Counties

Dear Mr. Madson:

Thank you for submitting information concerning the above-referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which require identification and evaluation of historic properties.

After reviewing the information provided we find the report to be adequate. We concur none of the archaeological sites located in the Area of Potential Effects are eligible for listing in the National Register of Historic Places. We also concur there will be no historic properties affected by the project.

Please be advised that, if the project area is increased, cultural materials are encountered during construction or adjacent areas that may contain significant cultural resources may be adversely impacted, appropriate information must be provided to this office for further review and comment.

If you have any questions please write or call Brant Vollman at (573) 526-1680 or State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 and refer to SHPO Project Number: 001-OS-04. If the information is provided via telephone call, please follow up in writing for our files.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

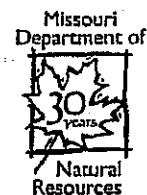


Mark A. Miles  
Director and Deputy State  
Historic Preservation Officer

MAM:bv

c: Tallgrass Historians L.C.

*Integrity and excellence in all we do*



ROAD AND BRIDGE  
(573) 636-3614

**COLE COUNTY  
DEPARTMENT OF PUBLIC WORKS**  
5055 MONTICELLO ROAD  
JEFFERSON CITY, MISSOURI 65109-9182

PLANNING  
(573) 636-2084

FAX (573) 636-8389

E-MAIL [cyarnell@colecouny.org](mailto:cyarnell@colecouny.org)

[www.colecounty.org/pw](http://www.colecounty.org/pw)

April 7, 2004

Mr. John Denlinger, PE  
HDR Engineering, Inc.  
8404 Indian Hills Dr  
Omaha, NE, 68114-4098

RE: UPRR Floodplain Development Permit

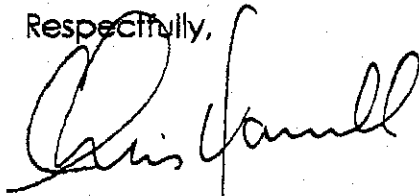
Mr. John Denlinger;

Please consider this a conditional approval for the Floodplain Development Permit.

- I am unsure if there is a need for a COE 404 permit and a DNR 401 permit for this type of structure. All Structures we build have this requirement and I assume a railroad structure will also have these same requirements. We request copies of these for our files.
- We understand the phasing of construction and will allow the permit to run through 2007. At that time the bridge must be under contract with a completion date scheduled or the partially constructed structure must be removed at the UPRR's expense.

Should you have any questions please contact this office at your convenience.

Respectfully,



CHRIS YARNELL, PE  
Director

CC: file

### FLOODPLAIN DEVELOPMENT PERMIT/APPLICATION

Application No. \_\_\_\_\_ Date: \_\_\_\_\_

TO THE ADMINISTRATOR: The undersigned hereby makes application for a permit to develop in a floodplain. The work to be performed, including flood protection works, is as described below and in attachments hereto. The undersigned agrees that all such work shall be in accordance with the requirements of the Floodplain Management Ordinance and with all other applicable county/city ordinances, federal programs, and the laws and regulations of the State of Missouri.

03/12/04

Union Pacific Railroad (Mark McCune)

Owner or Agent

Date

Builder

Date

1416 Dodge St., Rm. 940 Omaha, NE 68179

Address

Address

(402) 271-5194

Phone

Phone

#### SITE DATA

1. Location: NW 1/4; NE 1/4; Section 21; Township 44N; Range 10W

Street Address \_\_\_\_\_

2. Type of Development: Filling \_\_\_\_\_ Grading \_\_\_\_\_ Excavation \_\_\_\_\_ Minimum Improvement \_\_\_\_\_

Routine Maintenance \_\_\_\_\_ Substantial Improvement \_\_\_\_\_ New Construction X Other \_\_\_\_\_

3. Description of Development: Construction of a second mainline bridge, 1,235 ft. in length, located 45' downstream of existing structure.

4. Premises: Structure Size \_\_\_\_\_ ft. By \_\_\_\_\_ ft. Area of Site \_\_\_\_\_ Sq Ft.

Principal Use \_\_\_\_\_ Accessory Uses (storage, parking, etc.) \_\_\_\_\_

5. Value of Improvement (fair market) \$ \_\_\_\_\_ Pre-Improvement/Assessed Value of Structure \$ \_\_\_\_\_

6. Property Located in a Designated FLOODWAY? Yes X No \_\_\_\_\_

IF ANSWERED YES, CERTIFICATION MUST BE PROVIDED PRIOR TO THE ISSUANCE OF A PERMIT TO DEVELOP, THAT THE PROPOSED DEVELOPMENT WILL RESULT IN NO INCREASE IN THE BASE (100-YEAR) FLOOD ELEVATIONS.

7. Property Located in a Designated Floodplain FRINGE? Yes \_\_\_\_\_ No X

8. Elevation of the 100-Year Flood (ID source) 545.0 (Cole Co. FIS) MSL/NGVD

9. Elevation of the Proposed Development Site \_\_\_\_\_ MSL/NGVD

10. Local Ordinance Elevation/Floodproofing Requirement 1' Above BFE MSL/NGVD

11. Other Floodplain Elevation Information (ID and describe source) \_\_\_\_\_

|                             |   |              |             |                |
|-----------------------------|---|--------------|-------------|----------------|
| 12. Other Permits Required? | Corps of Engineer 404 Permit:                     | Yes <u>1</u> | No _____    | Provided _____ |
|                             | State Department of Natural Resources 401 Permit: | Yes <u>1</u> | No _____    | Provided _____ |
|                             | Environmental Protection Agency NPDES Permit:     | Yes _____    | No <u>1</u> | Provided _____ |

All Provisions of Ordinance Number \_\_\_\_\_, the "Floodplain Management Ordinance", shall be in Compliance.

#### PERMIT APPROVAL/DENIAL *subject to Attached Conditions*

Plans and Specifications Approved/Denied this 7<sup>th</sup> Day of April, 2004

Signature of Developer/Owner: Mark L. McCune Authorizing Official: Chris Yarnall

Print Name and Title: Mark L. McCune, Director Structure Design Chris Yarnall, Director

THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING BASEMENT FLOOR) OF ANY NEW OR SUBSTANTIALLY IMPROVED RESIDENTIAL BUILDING WILL BE ELEVATED \_\_\_\_\_ FOOT/FEET ABOVE THE BASE FLOOD ELEVATION. IF THE PROPOSED DEVELOPMENT IS A NON-RESIDENTIAL BUILDING, THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING BASEMENT) OF A NEW OR SUBSTANTIALLY IMPROVED NON-RESIDENTIAL BUILDING WILL BE ELEVATED OR FLOODPROOFED \_\_\_\_\_ FOOT/FEET ABOVE THE BASE FLOOD ELEVATION.

THIS PERMIT IS USED WITH THE CONDITION THAT THE DEVELOPER/OWNER WILL PROVIDE CERTIFICATION BY A REGISTERED ENGINEER, ARCHITECT, OR LAND SURVEYOR OF THE "AS-BUILT" LOWEST FLOOR (INCLUDING BASEMENT) ELEVATION OF ANY NEW OR SUBSTANTIALLY IMPROVED BUILDING COVERED BY THIS PERMIT.



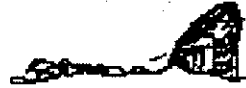


# Ecological Specialists, Inc.

1417 Hoff Industrial Drive • O'Fallon, MO 63366

Phone: 636.281.1982 • Fax: 636.281.0973

www.ecologicalspecialists.com



25 May 2004

Kelly Farrell

HDR Engineering, Inc.

8404 Indian Hills Drive

Omaha, NE 68114-4098

Dear Kelly:

Ecological Specialists, Inc. has completed the unionid mussel survey of the Osage River at River Mile 5.3 for the railroad bridge construction study. Only 63 live unionids, but 14 species were collected:

| Species                        | Total Live |
|--------------------------------|------------|
| <i>Amblema plicata</i>         | 4          |
| <i>Lampsilis cardium</i>       | 7          |
| <i>Lampsilis siliquoidea</i>   | 1          |
| <i>Lasmigona c. complanata</i> | 3          |
| <i>Leptodea fragilis</i>       | 4          |
| <i>Ligumia recta</i>           | 6          |
| <i>Megalonaias nervosa</i>     | 2          |
| <i>Obliquaria reflexa</i>      | 1          |
| <i>Potamilus alatus</i>        | 24         |
| <i>Pyganodon grandis</i>       | 3          |
| <i>Quadrula metanevra</i>      | 1          |
| <i>Quadrula p. pustulosa</i>   | 3          |
| <i>Quadrula quadrula</i>       | 1          |
| <i>Truncilla truncata</i>      | 3          |
| Total Live                     | 63         |
| Number of Species              | 14         |

Six of the 63 individuals were *Ligumia recta* (a Missouri species of Special Concern).

A total of 73 samples were collected; approximately five samples per 10m X 75m section. However only two samples were collected upstream on the east bank because of dangerous diving conditions caused by railroad debris. Each sample was a 5min search by a diver and covered approximately 20m<sup>2</sup>. See attached map figure.

Although species richness was high, unionids were scattered throughout the study area. This suggests random colonization of transient mussels from upstream beds. Many mussels were collected next to boulders and in small, stable pockets of substrate. Therefore, the mussels in the area were most likely

Ecological Specialists, Inc.

1417 Hoff Industrial Dr. • O'Fallon, MO 63366 • Phone: 636.281.1982 • Fax: 636.281.0973

---

washed in from upstream and only those that found a stable place to live remain in the area. A stable unionid bed does not occur in the study area due to lack of substrate stability.

Regression analysis estimates that in the total survey area (estimated as 14,000m<sup>2</sup>) there are approximately 560 animals of 20 species. An estimated 320 unionids of 18 species occur in the proposed causeway footprint area (estimated at 8000m<sup>2</sup>). The following table shows actual and theoretical values derived from regression analysis and average number of animals collected per sample (0.4 unionids/m<sup>2</sup>).

|             | Sample Area<br>(m <sup>2</sup> ) | No. Live | No. Species |
|-------------|----------------------------------|----------|-------------|
| Actual      | 1460                             | 63       | 14          |
| Theoretical | 1250                             | 50       | 12          |
|             | 2500                             | 100      | 15          |
|             | 8000                             | 320      | 18          |
|             | 14,000                           | 560      | 20          |
|             | 25,000                           | 1000     | 22          |

Since additional species could occur in the study area, a few federally endangered Pink Muckets (*Lampsilis abrupta*) could possibly be found with additional searching. Additional searches were not possible at the time of this study due to sever thunderstorms. Therefore it is possible that dredging in the proposed causeway area or constructing the proposed causeway in this area could impact a few of the *L. abrupta*. However it is unlikely that dredging or causeway construction would affect more than a few individual *L. abrupta* and therefore is not likely to impact the *L. abrupta* population in the Osage River.

If a relocation is deemed necessary, ESI suggests that only the dredging area or footprint of the causeway should be considered due to the overall low density of the area, and that effort be limited to recovery as many unionids as possible in a few days, focusing on areas around boulders and logs, and patches of stable substrate.

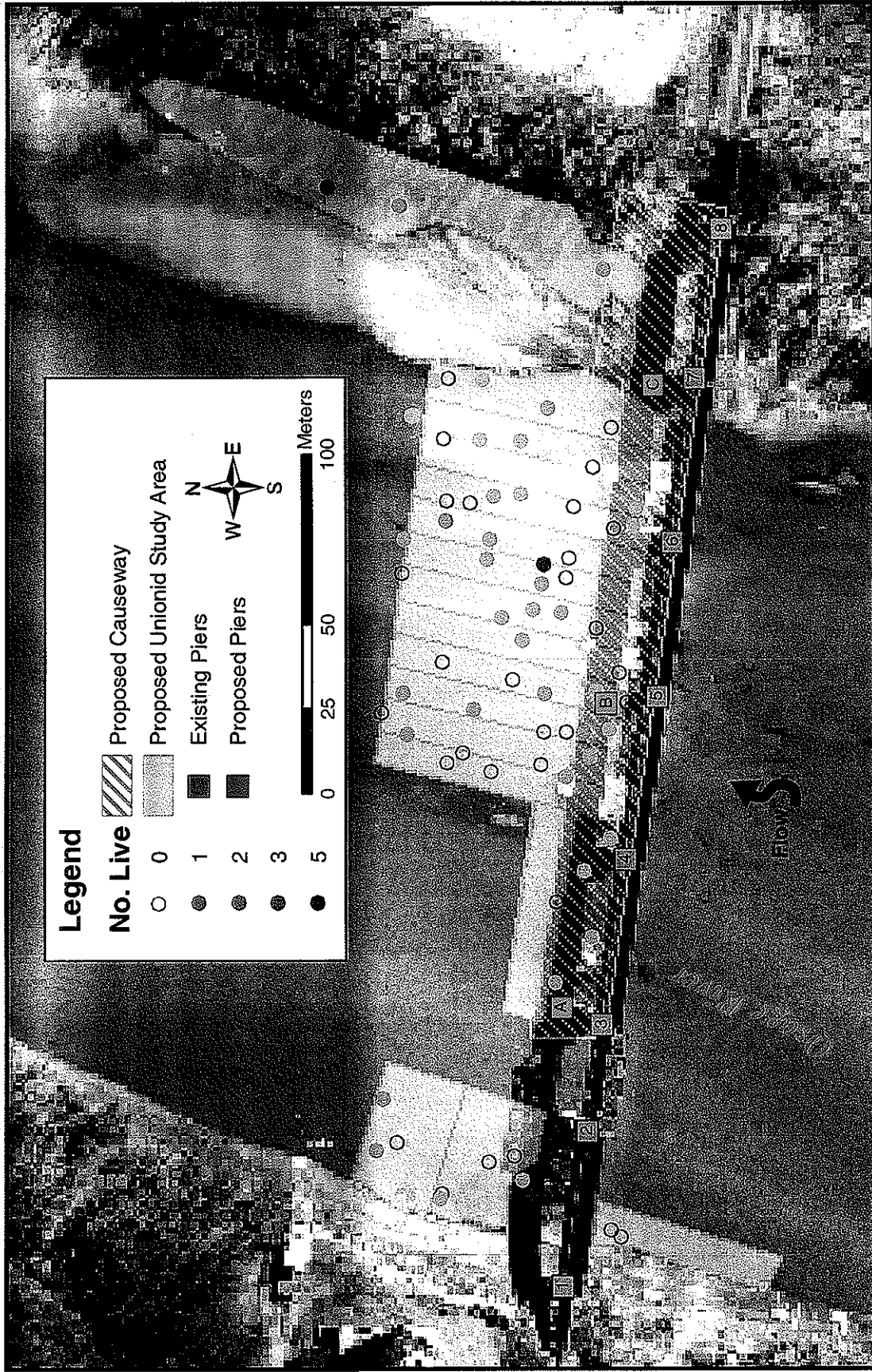
The GPS mapping portion of the survey will be conducted as soon as river conditions permit. Please find the attached invoice for the fieldwork and this report completed, and do not hesitate to call should you have any questions or comments.

Sincerely,












Eric Belt

Aquatic Ecologist/GIS Technician



**Legend**

|   |                             |  |
|---|-----------------------------|--|
|  | Proposed Causeway           |   |
|  | Proposed Unionid Study Area |  |
|  | 0                           |  |
|  | 1                           |  |
|  | 2                           |  |
|  | 3                           |  |
|  | 5                           |  |

**ESI**

Unionid survey area on the Osage River, near Osage City, Missouri.

**ECOLOGICAL  
SPECIALISTS, INC.**

**OSAGE COUNTY  
EMERGENCY MANAGEMENT**

Russell Schuelen  
Presiding Commissioner

106 East Main Street  
P.O. Box 1011  
Linn, Missouri 65051

Bradley Strope  
EMA Director

Telephone: (573) 897-3561

Fax: (573) 897-0379

Email: [osage\\_ema@hotmail.com](mailto:osage_ema@hotmail.com)

May 26, 2004

Mr John Denlinger, PE  
HDR Engineering, Inc.  
8404 Indian Hills Drive  
Omaha, NE. 68114-4098

Re: UPRR Floodplain Development Permit

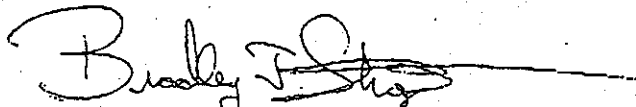
Mr. Denlinger;

Please consider this a conditional approval for the Floodplain Development Permit.

- I am unsure if there is a need for a COE 404 permit and a DNR 401 permit for this structure in Osage County. If these permits have been completed, please forward copies to retain in our file.
- I understand the phasing of construction and will allow the permit to run through 2007 as Cole County. At this time the bridge must be under contract with a date of completion or the partially constructed structure must be removed at the UPRR's expense.

Should you have any questions please contact this office at your convenience.

Respectfully,



Bradley J. Strope  
Osage County  
Floodplain Administrator

CC: File

FLOODPLAIN DEVELOPMENT PERMIT/APPLICATION

Application No. \_\_\_\_\_ Date: \_\_\_\_\_

TO THE ADMINISTRATOR: The undersigned hereby makes application for a permit to develop in a floodplain. The work to be performed, including flood protection works, is as described below and in attachments hereto. The undersigned agrees that all such work shall be in accordance with the requirements of the Floodplain Management Ordinance and with all other applicable county/city ordinances, federal programs, and the laws and regulations of the State of Missouri.

03/12/04
Union Pacific Railroad (Mark McCune)
Owner or Agent Date Builder Date
1416 Dodge St., Rm. 940 Omaha, NE 68179
Address Address
(402) 271-5194
Phone Phone

SITE DATA

- 1. Location: NW 1/4; NE 1/4; Section 21; Township 44N; Range 10W
Street Address
2. Type of Development: Filling Grading Excavation Minimum Improvement
Routine Maintenance Substantial Improvement New Construction X Other
3. Description of Development: Construction of a second mainline bridge, 1,235 ft. in length, located 45' downstream of existing structure.
4. Promises: Structure Size ft. By ft. Area of Site Sq Ft
Principal Use Accessory Uses (storage, parking, etc.)
5. Value of Improvement (fair market) \$ Pre-improvement/Assessed Value of Structure \$
6. Property Located in a Designated FLOODWAY? Yes X No

IF ANSWERED YES, CERTIFICATION MUST BE PROVIDED PRIOR TO THE ISSUANCE OF A PERMIT TO DEVELOP, THAT THE PROPOSED DEVELOPMENT WILL RESULT IN NO INCREASE IN THE BASE (100-YEAR) FLOOD ELEVATIONS.

- 7. Property Located in a Designated Floodplain FRINGE? Yes No X
8. Elevation of the 100-Year Flood (ID source) 545.3 (Osage Co. FIS) MSL/NGVD
9. Elevation of the Proposed Development Site MSL/NGVD
10. Local Ordinance Elevation/Floodproofing Requirement MSL/NGVD
11. Other Floodplain Elevation Information (ID and describe source)

- 12. Other Permits Required?
Corps of Engineer 404 Permit: Yes No Provided
State Department of Natural Resources 401 Permit: Yes No Provided
Environmental Protection Agency NPDES Permit: Yes No Provided

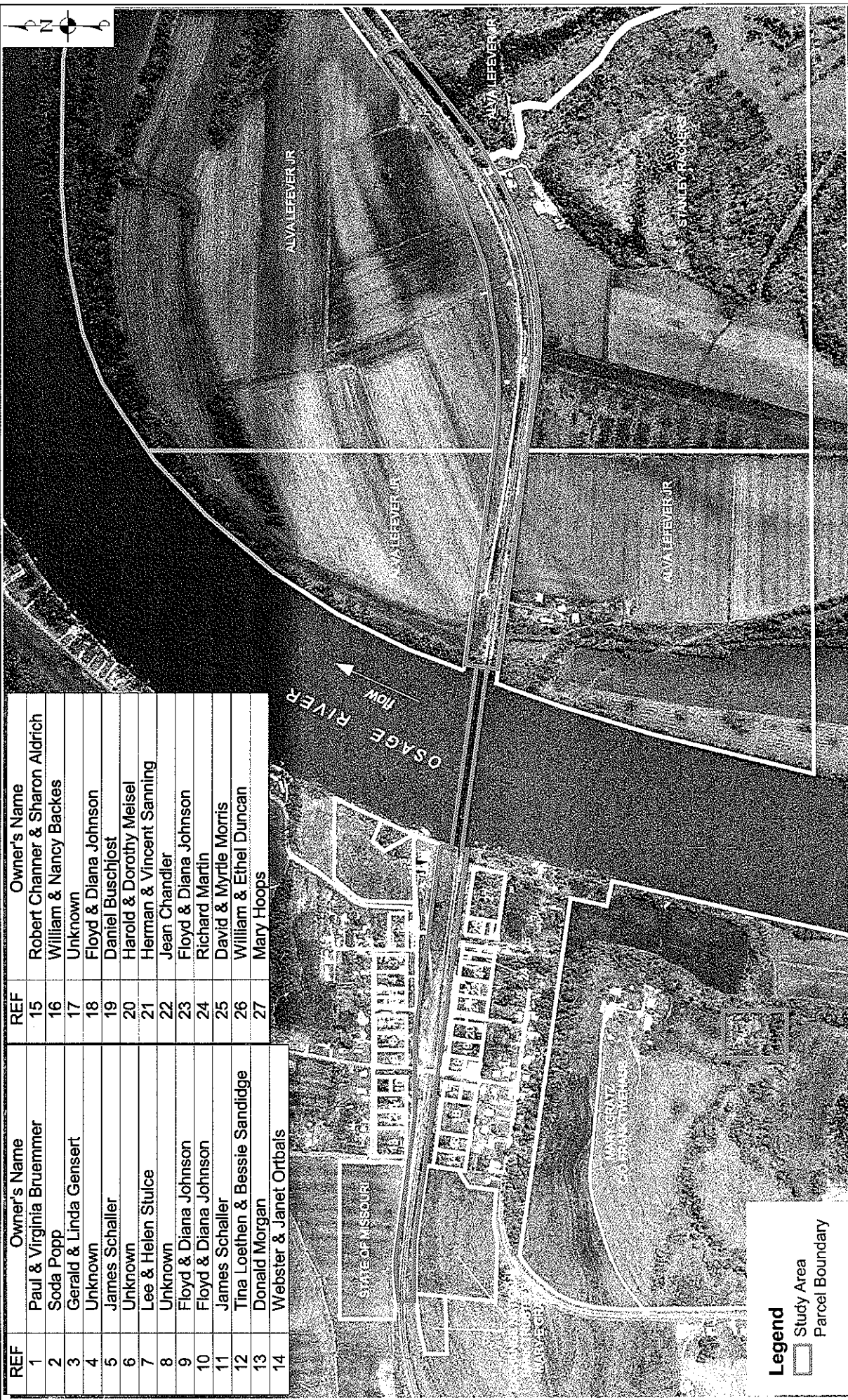
All Provisions of Ordinance Number \_\_\_\_\_, the "Floodplain Management Ordinance", shall be in Compliance.

PERMIT APPROVAL/DENIAL

Plans and Specifications Approved/Denied this 26 Day of MAY 20 04
Signature of Developer/Owner Mark L. McCune
Authorizing Official Bradley J. Strope
Print Name and Title Mark L. McCune, Director Structures Design BRADLEY J. STROPE, FP SUPERVISOR

THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING BASEMENT FLOOR) OF ANY NEW OR SUBSTANTIALLY IMPROVED RESIDENTIAL BUILDING WILL BE ELEVATED \_\_\_\_\_ FOOT/FEET ABOVE THE BASE FLOOD ELEVATION. IF THE PROPOSED DEVELOPMENT IS A NON-RESIDENTIAL BUILDING, THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING BASEMENT) OF A NEW OR SUBSTANTIALLY IMPROVED NON-RESIDENTIAL BUILDING WILL BE ELEVATED OR FLOODPROOFED \_\_\_\_\_ FOOT/FEET ABOVE THE BASE FLOOD ELEVATION.

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| REF | Owner's Name                   | REF | Owner's Name                    |
|-----|--------------------------------|-----|---------------------------------|
| 1   | Paul & Virginia Bruemmer       | 15  | Robert Channer & Sharon Aldrich |
| 2   | Soda Popp                      | 16  | William & Nancy Backes          |
| 3   | Gerald & Linda Gensert         | 17  | Unknown                         |
| 4   | Unknown                        | 18  | Floyd & Diana Johnson           |
| 5   | James Schaller                 | 19  | Daniel Buschlost                |
| 6   | Unknown                        | 20  | Harold & Dorothy Meisel         |
| 7   | Lee & Helen Stulce             | 21  | Herman & Vincent Sanning        |
| 8   | Unknown                        | 22  | Jean Chandler                   |
| 9   | Floyd & Diana Johnson          | 23  | Floyd & Diana Johnson           |
| 10  | Floyd & Diana Johnson          | 24  | Richard Martin                  |
| 11  | James Schaller                 | 25  | David & Myrtle Morris           |
| 12  | Tina Loethen & Bessie Sandidge | 26  | William & Ethel Duncan          |
| 13  | Donald Morgan                  | 27  | Mary Hoops                      |
| 14  | Webster & Janet Orbals         |     |                                 |

**Legend**

- Study Area
- Parcel Boundary



**Scale**

Source: MSD/IS; Cole County GIS; Osage County Plat Book 1998



**PROPOSED OSAGE RIVER BRIDGE  
RIVER MILE 5.3  
NEAR OSAGE CITY, MISSOURI  
OSAGE/COLE COUNTIES  
APPLICATION BY  
UNION PACIFIC RAILROAD**

Sheet 1 of 1

Date: June 2004

# Union Pacific Railroad Osage River Bridge MP 116.89 Project Property Owners List

| Owners Name              | Owners Address<br>(if different than Property)         | Property Address                                     |
|--------------------------|--|--|
| Stanley Rackers          | 3909 Shamrock Rd<br>Jefferson City, MO<br>65101        | Sec 22, T44N, R10W                                   |
| Alva Lafever Jr          | 207 Highway HH<br>Tuscumbia, MO<br>65082               | Sec 15, 16, 21, & 22,<br>T44N, R10W                  |
| Paul & Virginia Bruemmer |  | 9303 Osage Front St.<br>Jefferson City, MO<br>65101  |
| Soda Popp                |  | 11718 Engineers Rd.<br>Jefferson City, MO<br>65101   |
| Gerald & Linda Gensert   | 9209 Osage Front Street<br>Jefferson City, MO<br>65101 | 9212 Osage Grand Ave.                                |
| Current Resident         |  | 9210 Osage Grand Ave<br>Jefferson City, MO<br>65101  |
| James Schaller           | 10012 Steamboat Run Rd.<br>Jefferson City, MO<br>65101 | 9206 Osage Grand Ave.                                |
| Current Resident         |  | 2015 Osage Walnut St<br>Jefferson City, MO<br>65101  |
| Lee & Helen Stulce       |  | 2012 Osage Walnut St.<br>Jefferson City, MO<br>65101 |
| Current Resident         | 2012 Osage Walnut St.<br>Jefferson City, MO<br>65101   | 9108 Osage Grand Ave.                                |
| Floyd & Diana Johnson    | 9006 Stage Coach Rd<br>Jefferson City, MO<br>65101     | 2015 Osage Hickory St.                               |
| Floyd & Diana Johnson    | 9006 Stage Coach Rd.<br>Jefferson City, MO<br>65101    | 2016 Osage Hickory                                   |

| <b>Owners Name</b>               | <b>Owners Address<br/>(if different than Property)</b> | <b>Property Address</b>                             |
|----------------------------------|--|---|
| James Schaller                   | 10012 Steamboat Run Rd.<br>Jefferson City, MO<br>65101 | 9016 Osage Grand Ave                                |
| Tina Loethen<br>Bessie Sandidge  |  | 9012 Osage Front St.<br>Jefferson City, MO<br>65101 |
| Donald Morgan                    |  | 9003 Osage Front St.<br>Jefferson City, MO<br>65101 |
| Webster & Janet Ortvals          | 39749 Rt. V<br>Russellville, MO<br>65074               | 9002 Railroad St.                                   |
| Robert Channer<br>Sharon Aldrich | 11349 W. Rooks Ct.<br>Homasassa, FL<br>34448           | 9006 Railroad St.                                   |
| William & Nancy Backes           | 9018 Railroad St.<br>Jefferson City, MO<br>65101       | 9014 Railroad St.                                   |
| Current Resident                 |  | 9018 Railroad St.<br>Jefferson City, MO<br>65101    |
| Floyd & Diana Johnson            | 9006 Stage Coach Rd.<br>Jefferson City, MO<br>65101    | Osage Fourth St.                                    |
| Daniel Buschjost                 | 9836 Engineers Rd.<br>Jefferson City, MO<br>65101      | 9108 Railroad St.                                   |
| Harold & Dorothy Meisel          |  | 2106 Osage Third St.<br>Jefferson City, MO<br>65101 |
| Herman & Vincent Sanning         | 232 Mary Dr.<br>Jefferson City, MO<br>65101            | 9204 Railroad St.                                   |
| Jean Chandler                    | 1511 Stadium Blvd.<br>Jefferson City, MO<br>65109      | 9208 Railroad St.                                   |
| Floyd & Diana Johnson            | 9006 Stage Coach Rd.<br>Jefferson City, MO<br>65101    | 9212 Railroad St.                                   |



| <b>Owners Name</b>                                 | <b>Owners Address<br/>(if different than Property)</b>          | <b>Property Address</b> |
|--|---|-------------------------|
| Richard Martin                                     | 7824 Henwick Ln.<br>Jefferson City, MO<br>65109                 | 9216 Railroad St.       |
| David & Myrtle Morris                              | 5981 N Highway W<br>Columbia, MO<br>65202                       | Osage Second St.        |
| William & Ethel Duncan                             | 11570 County Rd. 4012<br>Holts Summit, MO<br>65043              | 2103 Osage Second St.   |
| Mary Hoops   | 4854 Hammett Place<br>St. Louis, MO<br>63166                    | 2106 Osage Water St.    |
| State of Missouri                                  | NRCS<br>1442 Arron Court #G<br>Jefferson City, MO<br>65101-2868 | Sec 16, T44N, R10W      |
| Exchange National Bank<br>Trustees<br>Mary E Gratz | P.O. Box 688<br>Jefferson City, MO<br>65102                     | Sec 16, T44N, R10W      |



**Legend**  
Parcel Boundary

800 0 800 Feet

**Scale**

Source: MSDIS; Cole County GIS; Osage County Plat Book 1998



**PROPOSED DREDGE MATERIAL  
DISPOSAL SITE BETWEEN MISSOURI  
RIVER MILES 138.4 AND 138.6  
NEAR OSAGE CITY, MISSOURI  
APPLICATION BY  
UNION PACIFIC RAILROAD**

Sheet 1 of 1

Date: June 2004

**Union Pacific Railroad Dredged Material Disposal Site  
Between Missouri River Mile 138.4 and 138.6  
Project Property Owners List**

| <b>Owners Name</b>  | <b>Owners Address<br/>(if different than Property)</b> | <b>Property Address</b> |
|---|--|-------------------------|
| Gary W. Vandelicht  | 3610 Buttonwood DR Ste 200<br>Columbia, Missouri 56203 | Sec 29, T44N, R10W      |
| Capital Sand Co. Inc.   | 700 Mokane Road<br>Jefferson City, Missouri 65101      | Sec 29, T44N, R10W      |
| James Edward and Anna Marie Knaebel<br>and Edward James Knaebel | 5901 Algoa Road<br>Jefferson City, MO 65101            | Sec 24, T44N, R11W      |
| OCCI, Inc.  | 3200 County Road 257<br>Fulton, Missouri 65251         | Sec 29, T44N, R10W      |



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Columbia Ecological Services Field Office  
101 Park DeVille Drive, Suite A  
Columbia, Missouri 65203-0007  
Phone: (573) 234-2132 Fax: (573) 234-2181

June 16, 2004

Ms. Kelly Farrell  
HDR Engineering, Inc.  
8404 Indian Hills Drive  
Omaha, Nebraska 68114-4098

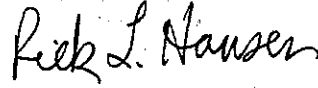
Dear Ms. Farrell:

Please refer to your recent email transmitting the May 24, 2004, report from Ecological Specialists, Inc., that described results of their mussel surveys in and around the proposed UPRR bridge project at approximately RM 5 along the Osage River, Cole County, Missouri. Those surveys were conducted at our request to determine the potential occurrence of federally listed mussels in the project area. The U.S. Fish and Wildlife Service (Service) has reviewed that information and offers the following comments pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1431 et seq.).

The Service worked with Ecological Specialists, Inc., to develop the survey design and protocols immediately following the April 27, 2004 interagency meeting in Jefferson City. The mussel report documented relatively high species richness, yet relatively low unionid densities. The author attributed the low densities to the instability of the river bottom in this area. Using a regression analysis to predict the potential of collecting additional species, the author indicates that additional sampling could possibly document an endangered mussel, but it is unlikely that the project would affect more than a couple of mussels, if they are there. Given the marginal habitat in this area, it is likely some of the mussels may have originated upstream and were washed down during high water events. Therefore we believe the mussel report adequately characterizes the unionid fauna in the project area. In addition, we concur with the general conclusion of the author, i.e., that the proposed work is not likely to adversely affect federally listed mussel species. As project details are further refined, we hope to work with the applicant and agencies to explore opportunities to improve mussel habitat in the area, if possible, consistent with their proposed bridge replacement.

Thank you for your coordination and cooperation regarding the mussel surveys. If you have questions regarding our comments, please contact Jane Ledwin (573/234-2132, extension 109).

Sincerely,



for Charles M. Scott  
Field Supervisor

cc: USCG, St. Louis, MO (Knutson)  
MDC, Jefferson City, MO (Canaday)  
USACE, Jefferson City, MO (Pointer)

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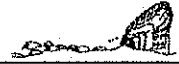


# Ecological Specialists, Inc.

1417 Hoff Industrial Drive • O'Fallon, MO 63366

Voice: 636.281.1982 • Fax: 636.281.0973

www.ecologicalspecialists.com



July 9, 2004

Kelly Ferrell  
Environmental Scientist  
HDR Engineering  
8404 Indian Hills Drive  
Omaha, NE 68114-4098

Dear Kelly:

Ecological Specialists, Inc. has completed the unionid and depth mapping survey of the Osage River below the Union Pacific Railroad Bridge at Osage River Mile 5.2. A dive crew surveyed this area of the river for two days to determine the presence of unionids and to locate a navigation route that would have minimal impact on habitat and minimize scouring. The crew recorded coordinates of areas (using GPS) where the depth was <10ft and therefore may be affected by barge movement. There are three areas where the navigation route crosses over shallow areas. Habitat was surveyed in these areas using 50m transects to determine substrate composition, depths, and unionid abundance. Only seven live unionids of four common species (*Quadrula pustulosa*, *Quadrula quadrula*, *Obliquaria reflexa*, and *Megaloniaias nervosa*) were collected from a total of 60 samples along 12 transects.

Attached is a map (Figures 1a and 1b) that shows navigable areas (>10ft) and areas that should be avoided (<10ft). The navigable areas are mostly >15ft but at least 10ft. Three shallow crossing areas are indicated where navigation over shallow areas was unavoidable. These areas were determined from results of transect samples and indicate the best route to minimize disturbance of potentially good habitat. Navigation points were created to aid in navigation. These points are marked on the maps, numbered by side from downstream to upstream, and their coordinates are listed in Table 1. The route maintains a minimum of 75m width to allow ample space for barge navigation.

Ecological Specialists, Inc.

1417 Hoff Industrial Dr. • O'Fallon, MO 63366 • Voice: 636.281.1982 • Fax: 636.281.0973

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The gage height averaged 3ft on both days of the survey and therefore would be a minimal requirement gage height for barge navigation.

If you have any questions feel free to contact me via phone or email ([ebelt@ecologicalspecialists.com](mailto:ebelt@ecologicalspecialists.com)).

Sincerely,

A handwritten signature in cursive script that reads "Eric Belt".

Eric Belt

Malacologist



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Columbia Ecological Services Field Office  
101 Park DeVille Drive, Suite A  
Columbia, Missouri 65203-0057  
Phone: (573) 234-2132 Fax: (573) 234-2181



October 19, 2004

**FILE**

Mr. Roger K. Wiebusch  
Bridge Administrator  
U.S. Coast Guard – Eighth District  
1222 Spruce Street  
St. Louis, Missouri 63103-2832

Dear Mr. Wiebusch:

Please refer to your September 21, 2004, letter and accompanying Biological Assessment (BA) regarding the Proposed Railroad Companion Bridge, Mile 5.49, Osage River, Osage and Cole Counties, Missouri. The U.S. Fish and Wildlife Service (Service) has reviewed that information and submits the following comments pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

The BA describes the effects of the proposed bridge construction adjacent to an existing railroad bridge near the mouth of the Osage River. The BA does not include the federally endangered Indiana bat based on an interagency site visit in January 2004. At that time, the USCG and the applicant limited their effects discussion to the proposed construction site because the details of removing the existing bridge at Boonville had not been determined. Currently those activities are undergoing review through a Clean Water act Section 404 permitting process, and have not been finalized. When the applicant has decided on a course of action, the Service will review the Corps determination of the effects of that action on the endangered pallid sturgeon, bald eagle, and Indiana bat which are likely to occur in and around the Boonville site. Therefore, our comments below are limited to the Osage construction site.

Although the BA notes that nesting bald eagle are uncommon in Missouri, each year more nests are found, including along the Missouri River. In fact, there is an eagle nest just downstream of the Boonville site near the Franklin Island Conservation Area. Nonetheless, the Service believes that the proposed surveys, operational windows and further consultation with the Service would result in no adverse effects to eagles if they are in the project area. The nesting period for bald eagles in Missouri lasts through June, thus underscoring the importance of pre-construction nest surveys to avoid adverse effects.



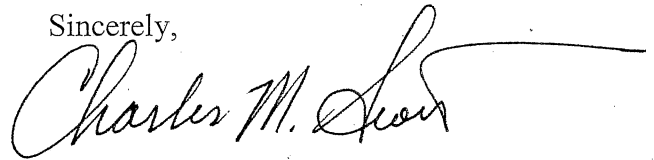
The BA correctly notes that the pallid sturgeon likely occur in and around the project area. Contrary to the BA, however, we cannot say at this time that the project area does not contain spawning or nursery habitat for the pallid. In fact, the mouths of major tributaries are known as important areas for sturgeon. However, given the limited temporal scope of the project and the commitment to return the river to pre-construction contours, the proposed work is not likely to adversely affect the pallid sturgeon.

Finally, the Service greatly appreciates the applicant's efforts to avoid effects to federally listed mussels by conducting mussel and habitat surveys of the projects area, and developing an access route that would minimize disturbance to the river bottom. Those surveys indicate that the project area has marginal mussel habitat because of substrate instability. In addition, it is likely that the existing mussel resources may be regularly resupplied from upstream populations.

Based on the information in the BA, the Service concurs with your determination that the proposed bridge construction on the Osage River is not likely to adversely affect any federally listed species. If the scope or location of the project changes, please reinstate consultation with this office via a telephone call. The Service will continue to consult on the Boonville portion of the project as the permitting process progresses.

Thank you for your coordination throughout the planning process. Please contact Ms. Jane Ledwin (573/234-2132, extension 109) if we can be of further assistance.

Sincerely,

A handwritten signature in black ink that reads "Charles M. Scott". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Charles M. Scott  
Field Supervisor

cc: USACE, Jefferson City, MO (Pointer)  
MDC, Jefferson City, MO (Canaday)  
MDNR, Jefferson City, MO (Boos)

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**APPENDIX 3**  
**Biological Assessment**

**BIOLOGICAL ASSESSMENT  
FOR  
UNION PACIFIC RAILROAD  
OSAGE RIVER CROSSING, RIVER MILE 5.49, NEAR THE TOWN OF OSAGE  
CITY, MISSOURI, OSAGE AND COLE COUNTIES, MISSOURI**

Prepared by: Commander, Eighth Coast Guard District (obr)  
1222 Spruce Street  
St. Louis, MO

**BIOLOGICAL ASSESSMENT**  
**FOR**  
**UNION PACIFIC RAILROAD**  
**OSAGE RIVER CROSSING, RIVER MILE 5.49, NEAR THE TOWN OF OSAGE**  
**CITY, MISSOURI, OSAGE AND COLE COUNTIES, MISSOURI**

**Introduction**

This Biological Assessment (BA) has been prepared in support of the Union Pacific Railroad's (UPRR) application for a U.S. Coast Guard (USCG) Bridge Permit for the construction of a single-track companion bridge adjacent to the existing UPRR bridge over the Osage River at river mile 5.49. The project is currently in the Informal Consultation phase of Endangered Species Act (ESA) Section 7 Consultation with the U. S. Fish and Wildlife Service (USFWS). This BA has been developed as a part of the USFWS consultation process.

**1.1 Biological Assessment**

A variety of large and small mammals and aquatic species can be expected to occur in the Project vicinity. The USFWS identified five Federally-listed endangered or threatened species: bald eagle (*Haliaeetus leucocephalus*, threatened), Indiana bat (*Myotis sodalis*, endangered), pallid sturgeon (*Scaphirhynchus albus*, endangered), pink mucket pearlymussel (*Lampsilis abrupta*, endangered), and scaleshell mussel (*Leptodea leptodon*, endangered). In addition to listed species, the USFWS expressed concern regarding impacts on any freshwater mussel beds that may be present within the project area and impacts on lake and shovelnose sturgeon and paddlefish. The Missouri Department of Conservation has identified the state-listed giant floater mussel (*Pyganodon grandis*) and black sandshell mussel (*Ligumia recta*) as species that are known to occur in the Osage River near the Project Area.

During a site visit on January 14, 2003, the USFWS stated that the Project Area did not contain suitable habitat for the Indiana bat and surveys would not be required. Therefore, the project would have no effect on the Indiana bat and it is not included in the Biological Assessment (BA).

**1.1.1 Purpose of Biological Assessment**

The purpose of this BA is to identify Federally listed species and habitat that could support these species in the Study Area and to evaluate the potential impacts of implementing one of the alternatives.

Section 7(C) of the ESA requires a Federal agency to prepare a BA to disclose effects of a proposed action on threatened or endangered species. USFWS uses the BA to determine if there is an effect on a species and to ensure that the proposed action does not contribute toward the loss of viability of a listed species, contribute to a trend toward a need for Federal listing, or jeopardize or adversely modify critical habitat of Federally listed species.

In compliance with the ESA and as part of the correspondence occurring during the preparation of the EA, the USFWS Columbia Field Office provided a list of threatened and endangered species that could potentially occur within Osage and Cole Counties, Missouri. This letter as well as all other agency correspondence is located in Appendix 1. This list included the threatened bald eagle (*Haliaeetus leucocephalus*), endangered Indiana Bat (*Myotis sodalis*), endangered pallid sturgeon (*Scaphirhynchus albus*), endangered pink mucket pearlymussel (*Lampsilis abrupta*), and the endangered scaleshell mussel (*Leptodea leptodon*).

Species identified by Missouri Department of Conservation (MDC) for the Osage River Bridge Site in a March 9, 2004 letter included the Federally-listed pink mucket pearlymussel and scaleshell mussel. State listed species identified were giant floater mussel (*Pyganodon grandis*) and black sandshell mussel (*Ligumia recta*).

This BA has been drafted to focus on the Federally listed species identified by the USFWS at the Osage River Bridge site and is based on thorough review of available research on the bald eagle, pallid sturgeon, pink mucket pearlymussel, and scaleshell mussel. These species are discussed in detail in the Sections 1.1.2, 1.1.3 and 1.1.4 respectively.

#### **1.1.2 Bald Eagle (*Haliaeetus leucocephalus*)**

The bald eagle was once found in every state of the nation except Hawaii. In 1782, because of its widespread geographic range, the bald eagle was named the national symbol of the United States. At that time, approximately 100,000 nesting pairs of bald eagles were located in what are now the lower 48 states (that is, excluding Alaska and Hawaii). During the mid- to late 1800s, a major decline in the population of the bald eagle was noted due to hunting and the loss of nesting habitat. Further decline of the bald eagle population was noted after World War II when the pesticide dichloro-diphenyl-trichloroethane (DDT) was introduced. This chemical compound was first sprayed along coastal and wetland areas to control mosquitoes. Then it was used in a widespread manner as a general crop insecticide. Eagles ingested DDT by eating contaminated fish, which consequently caused the shells of the bald eagle egg to thin and led to a high incidence of nesting failure. By 1963, only 417 nesting pairs of bald eagles were located in the lower 48 states (USFWS, 1999). This decline in population prompted USFWS in 1967 to list bald eagles south of the 40<sup>th</sup> parallel as endangered under the Endangered Species Preservation Act of 1966 (64 FR 36454-36464, 1999).

In 1972, the Environmental Protection Agency (EPA) banned the use of DDT within the United States. Nationwide bald eagle surveys were conducted in 1973 and 1974. These surveys concluded that the bald eagle population throughout the lower 48 states was continuing to decline. In 1978 under the Endangered Species Act of 1973, USFWS listed the species as endangered throughout the lower 48 states, except Michigan, Minnesota, Wisconsin, Washington, and Oregon, where the species was listed as threatened. USFWS set up recovery regions within the lower 48 states with the intent of protecting the bald eagle and preserving the habitat supporting the species. The recovery regions proved to be successful, and in 1995 USFWS officially changed the status of the bald eagle from threatened in five states and from endangered in the remaining lower 48 states to threatened throughout the lower 48 states (64 FR 36454-36464, 1999). The number of

nesting pairs of bald eagles steadily increased from 417 in 1963 to 6,104 in 1999 (USFWS, 2003a). USFWS concluded that the recovery programs had been successful. In 1999, USFWS made a proposal to remove the bald eagle from the list of threatened and endangered species (64 FR 36454-36464, 1999). A final decision on the proposed delisting has not been made.

#### **1.1.2.1 Affected Environment**

The analysis of potential effects of the Project on the bald eagle focuses the Project Area including and surrounding the ROW for the selected build alternative, located 5.49 miles from the confluence of the Osage and Missouri rivers. The portion of the Project in Cole County is predominantly urban as Osage City extends close to the Osage River bank. The portion of the Project in Osage County is dominated by agricultural land used for crops that surrounds the existing track and county road.

The riparian areas on the right and left banks of the Osage River contain a narrow band of vegetation with large, mature trees. However, in the immediate project area the vegetation is herbaceous or mowed. The open waters of the Osage River contain fish. These conditions provide the eagle a place for roosting and feeding. The riparian areas and open water associated with the nearby Missouri River also provide potential bald eagle habitat. The conditions found adjacent to and within the Osage and Missouri Rivers increase the likelihood that bald eagles could be found in the vicinity of the Project Area.

#### **1.1.2.2 Species Biology**

Literally translated, *Haliaeetus leucocephalus* means sea eagle with a white head. The bald eagle is the only species of sea eagle that is native to the North American continent. It is primarily a bird of aquatic ecosystems (Gerrard and Bortolotti, 1988 as printed in 60 CFR 36000-36010, 1995). Bald eagles frequent estuaries, large lakes, reservoirs, major rivers, and some seacoast habitats (64 FR 36454-36464, 1999). Bald eagles select areas to frequent that have an adequate food supply, perching areas, and nesting sites. In winter, bald eagles often gather together at specific sites that are close to open water and that offer good perch trees and night roosts (60 FR 36000-36010, 1995). Bald eagles utilize mature, forested, riparian areas near rivers, streams, lakes, and wetlands, and access along all the major river systems.

Bald eagles nest on both coasts from Florida to Baja, California, in the south and from Labrador, Canada to the western Aleutian Islands, Alaska, in the north (64 FR 36454-36464, 1999). The bald eagles' nest is built with large sticks lined with soft materials such as grass, leaves, and Spanish moss. A pair of bald eagles will use the same nest for several years, adding materials to the nest each year (Texas Parks and Wildlife, 2003). Nest sites are most often in large trees near water in relatively remote undisturbed areas. The nests are typically below the top crown of a live tree. The trees must be sturdy, as an average nest size is 5 feet wide and 3 feet deep (64 FR 36454-36464, 1999). Nests can be as large as nine feet across and twelve feet deep and weigh approximately two tons.

Bald eagles become sexually mature at 4 to 5 years of age. They are believed to be monogamous, though documentation of this is limited. Variations in pair bonding have been known to occur under certain circumstances. For example, if one mate were to die

or disappear the other would accept a new partner. Courtship begins about a month before egg laying. The courtship occurs as early as September in the south and as late as May in the north. Clutch size ranges from one to three eggs. The nesting period lasts about 6 months, with incubation lasting approximately 35 days and fledging taking place at 11 to 12 weeks of age. Parental care may extend 4 to 11 weeks after fledging. The fledgling bald eagle is mostly dark brown with white underwing linings. The characteristic white head and tail are not apparent until the bald eagle matures, occurring at 4 to 5 years of age (64 FR 36454-36464, 1999).

### **1.1.2.3 Current Condition of Species/Critical Habitat**

Habitat supporting the bald eagle is characterized by aquatic ecosystems. As discussed in Section 4.5.2.2, the bald eagle must have access to lakes, reservoirs, major rivers, and selected seacoast habitats that have an abundant source of food, including fish, seagulls, and carrion, and that have adjacent riparian areas with large, mature trees suitable for nesting and roosting. There have been no critical habitat designations for the bald eagle. Consequently, none of the land within the Study Area is considered critical habitat.

#### ***Rangewide***

In response to the 1978 listing of the bald eagle as threatened in Michigan, Minnesota, Wisconsin, Washington, and Oregon, and endangered throughout the remainder of the lower 48 states, USFWS established a recovery plan for the species. The lower 48 states were divided into five recovery regions. Within each recovery region, a team of experts on the bald eagle and the ecosystems in which they frequent was established. Each team developed a recovery plan for its region and then coordinated with the teams from other recovery regions to exchange information and data.

Since implementation of the plans developed by each recovery region, the population growth of the bald eagle has exceeded most of the designated goals. Between 1974 and 1994, the number of occupied breeding areas increased by 462 percent. This recovery was widespread throughout the lower 48 states. For example, in 1984 there were 13 states that did not report nesting bald eagles. By 1998, all but two of the lower 48 states had nesting pairs. As noted previously, the success of the recovery programs led to the reclassification of the bald eagle in 1995 to threatened throughout the lower 48 states and then to the proposal for delisting the species in 1999 (64 FR 36454-36464, 1999).

#### ***Regional Area and Study Area***

The state of Missouri is part of the Northern States Recovery Region under the USFWS bald eagle recovery program. In order for delisting to occur, the goals set for this region were for 1,200 occupied breeding areas to exist in at least 16 states, with an average annual productivity of at least 1.0 young per occupied nest. These goals were reached in 1991, with 1,349 occupied breeding nests existing in over 20 states and an estimated average productivity of greater than 1.0. In 1998, the number of occupied breeding nests exceeded 2,204 (64 FR 36454-36464, 1999).

The Missouri bald eagle population consists of primarily those migrating through the state as well as wintering in the state. Nesting does occur in Missouri but is uncommon. Bald eagles are most commonly found in Missouri near rivers and reservoirs with open

water and frequently near concentrations of waterfowl. "Wintering eagles usually occupy river habitats between November 15 and March 1, and... the period January 1 to March 1 is important for initiating nesting activity; March 1 to May 15 is the most critical time for incubation and rearing of young"(USFWS, 2003c). The trees present in the Project Area are not suitable for roosting or nesting, but may be used as perches for feeding. Bald eagles tend to select cottonwood (*Populus deltoides*) and sycamore (*Platanus occidentalis*) over other species of trees.

#### **1.1.2.4. Effects of the Project**

##### ***Direct Effects***

There are no known bald eagle nests located within the Study Area. This Project would not impact any bald eagle critical habitat. Tree removal in areas of previously undisturbed habitat would impact the bald eagle by removing a narrow swath of trees to construct temporary access roads for equipment to access the river and for the area required for the approaches of the second mainline track. The removed trees may include potential roosting trees; however, this impact would be minor due to the availability of additional suitable habitat nearby.

##### ***Indirect Effects***

Minor indirect impacts on the bald eagle would occur due to the removal of emergent wetlands associated with the build alternatives.

Noise associated with construction activities may temporarily and indirectly affect bald eagles near the site of the Project. Eagles that would normally roost in the general area may choose different locations along the river to roost during construction but would likely return to the area following the completion of construction. Roosting is a temporary condition, and individual birds use a variety of trees in different locations depending on the proximity of open water and other food sources. Overall train noise levels would remain fairly constant as the number of trains passing through the area is expected to remain constant.

Construction would temporarily impact fisheries in the Study Area, as many fish would likely avoid the area because of the noise and water disturbances caused by construction. However, bald eagles are also likely to avoid the area while construction is occurring, so the impact of the temporary change in fishery resources is expected to be minimal.

##### ***Cumulative Effects***

Overall, there will be a slight reduction in available habitat for the bald eagle. However, the conservation measures described in Section 1.1.2.5 would minimize this loss and reduce the impact on bald eagles to the extent practical.



### ***Incidental Take***

Construction of the UPRR Osage River Bridge is not likely to result in an incidental take<sup>1</sup> of bald eagles. However, bald eagles that roost in the area near the ROW may be disturbed by the noise caused by the construction of the new bridge. These bald eagles would likely relocate upstream or downstream of the new bridge during construction. The Project would result in the loss of minimal habitat through the clearing of the ROW to accommodate construction of the new bridge and temporary access roads, but plentiful habitat is available upstream and downstream of the Study Area.

#### **1.1.2.5. Conservation Measures**

Impacts on bald eagles should be minimized through construction timing. Wintering and migrating eagles are present in Missouri typically between November 15 and March 1. In order to minimize the effect of the Project on bald eagles, tree-clearing activities would be conducted between March 1 and November 15 to the extent possible. If the removal of trees is necessary between November 15 and March 1, surveys would be required to determine if bald eagles are present. Trees would be removed only as required for construction activities.

If a bald eagle is sited roosting or nesting in the Project vicinity construction would stop until the USFWS can be contacted and appropriate actions would be taken based on USFWS consultation.

With the measures described above, the Project may affect, but is not likely to adversely affect bald eagles.

#### **1.1.2.6. Conclusion**

Bald eagles are known to use the Study Area for wintering and roosting purposes. There are no known nests in the Study Area. The Project would result in some lost habitat as well as temporarily increased noise levels in the area. In addition, there would be loss of some wetland areas. These impacts are not expected to be of a magnitude that would result in the incidental take of any bald eagles.

#### **1.1.2.7. Determination of Effects (Finding)**

The Project may affect, but is not likely to adversely affect bald eagles in the Study Area. While some bald eagle habitat would be removed for construction, the amount of habitat removed is an insignificant disturbance and would not adversely affect the bald eagle population. Noise levels during construction may cause bald eagles to avoid the general area near the Project during construction, but eagles would likely return to the area once the sporadic and louder noises of construction cease. The type and extent of predicted impacts on bald eagles are considered insignificant effects and should not reach the scale where a take would occur.

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<sup>1</sup> An incidental take is defined in 50 CFR §402.02 as "takings [of listed fish or wildlife species] that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant."

### **1.1.3. Pallid Sturgeon (*Scaphirhynchus albus*)**

The pallid sturgeon is believed to have occupied areas in the Missouri and Mississippi river drainages since the late Cretaceous period. Within the Missouri River, known pallid sturgeon habitat extends from central Montana to St. Louis (USFWS, 1995). The pallid sturgeon is also suspected to be present in the Osage River. The range of the pallid sturgeon is primarily limited to the mainstem Missouri and Mississippi Rivers, but pallid sturgeons have been found in tributary mouths, over sandbars, along main channel borders, and in deep holes. Small sturgeons have been captured in off-channel backwaters. Little is known about pallid sturgeon use of the Osage River.

The pallid sturgeon was first recognized as a species in 1905 (USFWS, 2002). The pallid sturgeon population was abundant prior to commercial over-harvesting and habitat modification. An 1894 commercial harvest report indicates that 7,136 pounds of lake sturgeon were caught in the Missouri River and 810 pounds of lake sturgeon were caught in the Platte River. This data was compiled prior to the designation of the pallid sturgeon as its own species. Consequently, it is believed that the pallid sturgeon was also included in turn-of-the-century commercial harvest statistics for lake sturgeon. During this same period, the eggs of the lake sturgeon and pallid sturgeon were harvested for caviar. Because there were no harvest restrictions on these species, the populations were exploited (NGPC, 1993).

The habitat supporting the pallid sturgeon was significantly modified in the 20<sup>th</sup> century, particularly in the latter half of that century. The pallid sturgeon habitat encompasses 3,350 miles of riverine habitat in the Missouri and Mississippi rivers. Of this habitat, approximately 51 percent has been channelized, 28 percent has been impounded, and the remaining 21 percent is downstream of dams, which have altered the flow regimes, temperature, and turbidity of the rivers (USFWS, 1998). These modifications have been detrimental to the pallid sturgeon because they have restricted fish to limited flowing river reaches, reduced food sources and the ability to obtain food, created physical blockages that preclude normal migration patterns, and destroyed spawning areas (Duffy, Berry, and Keenlyne, 1994).

The combination of over-harvesting and habitat modifications caused the population of the pallid sturgeon to decline dramatically. This led to the species being Federally listed as endangered in 1990 under the ESA. The listing of the species as endangered prompted habitat conservation and recovery activities. USFWS's objective for the pallid sturgeon is for its population to be restored to a level in which they will be self-sufficient and no longer need the protection of the ESA (NGPC, 1993).

#### **1.1.3.1. Affected Environment**

The analysis of potential effects of the Project on the pallid sturgeon focuses on the Project Area including and surrounding the ROW for the build alternative, located 5.49 miles from the confluence of the Osage and Missouri rivers. This includes riverine habitat that was historically prime habitat for the pallid sturgeon. Although conditions along the Missouri and Osage Rivers have been modified and the habitat is no longer ideal for the pallid sturgeon, the fish species is known to be present in areas such as this

in the Missouri and Osage Rivers. Therefore, the pallid sturgeon is assumed present within the Project Area.

### **1.1.3.2. Species Biology**

The pallid sturgeon has a flattened shovel-shaped snout, bony plates (instead of scales) running lengthwise from the dorsal fin to the tail fin (no plates are on the stomach), and a long, slender reptile-like tail (USFWS, 1998; PRESP, 2003). The species has four fringed chin barbells located at about one-third the distance between the mouth and snout. The inner two barbells are about one-half of the length of the outer two barbells (NGPC, 1993; PRESP, 2003). The pallid sturgeon's mouth is toothless and positioned far under the snout for sucking small fish and other types of food from the river bottom (USFWS, 1995; USFWS, 1998). The back and sides of the pallid sturgeon are grayish-white and the underside is white (USFWS, 1998; PRESP, 2003). The pallid sturgeon is one of the largest fish species found in the Missouri-Mississippi drainage. Pallid sturgeons can grow to 6 feet in length and weigh up to 85 pounds (55 FR 36641-36647, 1990; NGPC, 1993). They are also a long-lived species, with males living to at least 39 years of age and females to at least 41 years of age; however, some individuals reach up to 50 years of age (Ruelle and Keenlyne, 1993 as printed in Duffy, Berry, and Keenlyne, 1999; USFWS, 1998).

The pallid sturgeon requires turbid, strong current riverine habitat with a firm sandy substrate (Gilbraith et al., 1988 as printed in 55 FR 36641-36647, 1990; PRESP, 2003). Pallid sturgeons seem to prefer deeper, slower, and more turbid water than other sturgeon species. Pallid sturgeons are river-bottom dwellers and prefer a natural hydrograph (surface water flow changing in response to seasons and precipitation events). These fish also prefer a diversity of depths and flow rates developed by braided channels, sand bars, sand flats, and gravel bars (USFWS, 1998; PRESP, 2003).

The male pallid sturgeon reaches sexual maturity at 533 to 584 millimeters in length and between 5 to 7 years of age. Males spawn every 2 to 3 years. Spawning occurs over hard surfaces such as sand or gravel beds. The female pallid sturgeon reaches sexual maturity at 850 millimeters in length and between 7 to 15 years of age. The interval between times of spawning is up to 10 years for females (Fogle, 1961 and Keenlyne and Jenkins, 1993 as printed in Duffy, Berry, and Keenlyne, 1994; USFWS, 1998). Little is known about the spawning requirements for pallid sturgeon other than that spawning occurs from March through July throughout the pallid sturgeon's range, and begins in late May or early April in the Lower Missouri River (USFWS, 2000c). According to current understanding, pallid sturgeon spawn at the head of islands and larvae are transported to the tail of islands or to eddy pools by currents (USFWS, 2003b). Flow, photoperiod, water temperature, and substrate composition are also believed to serve as spawning cues (Missouri River Basin Association, 2003).

### **1.1.3.3. Current Condition of Species/Critical Habitat**

As discussed in Section 1.1.3.4, the pallid sturgeon prefers a habitat characterized by turbid, swiftly moving waters with a natural hydrograph and a sandy substrate. However, all 3,350 river miles of the natural habitat of the pallid sturgeon have been modified. This alteration combined with over-harvest of the species caused the species to be listed as endangered under the ESA. There have been no critical habitat designations for the pallid sturgeon. Consequently, none of the portions of the river within the Study Area are considered critical habitat.

#### ***Rangewide***

The 3,350 river miles of pallid sturgeon habitat is primarily within the Missouri River and the Mississippi River downstream of the junction with the Missouri River (Gilbraith et al. 1988, as printed in 55 FR 36641-36647, 1990). However, a population of the pallid sturgeon has been detected in the Atchafalaya River (in Louisiana) downriver from its confluence with the Mississippi River (Keenlyne and Jenkins, 1993, Keenlyne and Evenson 1993 as printed in Duffy, Berry, and Keenlyne, 1999). Sightings of the pallid sturgeon have been reported from the mouth of the Mississippi to the mouth of the Missouri, from the mouth of the Missouri to where the river flows through Fort Benton, Montana, and in the lower Yellowstone River (55 FR 36641-36647, 1990). Occasionally other sightings of the pallid sturgeon are reported near the mouths of large tributaries to the Mississippi and Missouri Rivers. These sightings have occurred at the Big Sunflower River and St. Francis River, which are tributaries to the Mississippi River, and the Kansas River and Platte River, which are tributaries to the Missouri River (55 FR 36641-36647, 1990).

Sightings of the pallid sturgeon have steadily decreased over time. During the 1960s, an average of 50 pallid sturgeons was observed per year throughout the entire 3,350 river mile range of the species. An average of 21 observations per year was made during the 1970s and seven observations per year were made during the 1980s (55 FR 36641-36647, 1990).

Following the 1990 listing of the pallid sturgeon as a Federally endangered species, USFWS established the Pallid Sturgeon Recovery Plan. The goals of the plan are to restore habitat by reconnecting rivers with side channels and backwaters, return river flows to their natural hydrographs, and establish hatchery reproduction programs (USFWS, 2001). As a result of the plan, during the 1990s approximately 10,000 hatchery-reared pallid sturgeons were released into the lower Missouri and middle Mississippi Rivers (USFWS, 2000a). Biologists have also identified plans to trigger spawning and rearing of young. For example, biologists have recommended that USACE stimulate spawning in the stretch of the Missouri below Gavin's Point Dam by adjusting releases of the dam to include a spring water level rise and then reduce summer flow in order to allow for better growing and feeding conditions for young pallid sturgeons (USFWS, 2001).

Efforts put forth as part of the Pallid Sturgeon Recovery Plan have resulted in the first known natural reproduction of the pallid sturgeon in the Lower Missouri River in at least 50 years (USFWS, 2000b). Several pallid sturgeons were found at a habitat restoration project on a unit of the Big Muddy National Fish and Wildlife Refuge near Columbia, Missouri (USFWS, 2000a). USFWS purchased land and allowed the river to follow natural processes of erosion, deposition, and succession. During flooding in 1993, the river cut a sandbar in a side channel of the Lower Missouri River. This was expanded to a chute-island-sandbar complex during flooding in 1995 and 1996 (USFWS, 2000b). USFWS biologists consider this finding to be an encouraging step in the recovery of the pallid sturgeon but caution that the species is still in danger of extinction (USFWS, 2000a).

### ***Regional Area and Study Area***

The pallid sturgeon is known to occur in the portion of the Osage River flowing through the Study Area. However, the channelization of the Missouri River, as well as over-harvesting of the species, has greatly reduced the numbers of pallid sturgeon in the area. The USFWS has designated the Missouri-Osage River confluence, located just to the northeast of the Study Area, as a Recovery-Priority Management Area (RPMA) for the pallid sturgeon (USFWS, 1993). The RPMA extends upstream and downstream from the Missouri-Osage River confluence for 20 miles (USFWS, 1993). RPMAs for the pallid sturgeon are designated in areas that have suitable habitat to support the species and have the potential to contribute to the recovery of the species (USFWS, 2000c). The USFWS 2000 Biological Opinion states that the Missouri River from Gavins Point Dam downstream to the confluence with the Mississippi River is now considered a RPMA (USFWS, 2000c).

#### **1.1.3.4. Effects of the Project**

##### ***Direct Effects***

Based on known information on the pallid sturgeon as described above, it is possible for the pallid sturgeon to be in the Study Area. However, pallid sturgeon spawning habitat or young growth habitat is not present within the Study Area. Therefore, the Project should not result in any direct impacts on spawning or growth of young. The Osage River is channelized in the Study Area, and water velocities and turbidity are not conducive to pallid sturgeon inhabitation<sup>2</sup>. In addition, there are no side channels or chutes in the Study Area. However, downstream of the Study Area, at the confluence with the Missouri River, suitable habitat is available, so there is potential for migrating pallid sturgeons to be in the Study Area. The species is mobile and would likely avoid the area of the Project during construction. Pallid sturgeons are likely to continue using this portion of the river for migration purposes following the completion of construction.

Construction of the new Osage River crossing would result in the placement of four piers in the Osage River for the proposed bridge. The bridge would be located approximately

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<sup>2</sup> Inhabitation is defined as "the act of inhabiting, or the state of being inhabited; the condition of an inhabitant; residence; occupancy" (MICRA, Inc., 1998).

at Osage River Mile 5.49; the mouth of the Osage River is at Missouri River Mile 130. The proposed substructures to support the bridge would be drilled shaft foundations with cast-in-place concrete columns and caps. Two channels would be dredged prior to emplacement of the piers to allow construction access in the Osage River. The flow (e.g. deposition, scouring, etc.) of the Osage River would be temporarily altered by construction activities but permanent alterations resulting from the placement of the piers in the river would be insignificant.

The long-term impact of the piers on the pallid sturgeon would be minimal because the pallid sturgeons may be migrating through the area of the Project to reach the confluence with the Missouri River or to swim upstream to spawn. The water flow modifications would be minor, and the piers would not be located in an area of suitable habitat.

### ***Indirect Effects***

Some tree and vegetation removal would be required within the ROW of the new track realignment to accommodate construction of the new bridge. The clearing of vegetation could result in a short-term increase in sedimentation and runoff resulting from the exposed ground. This impact should be minimized by using silt fencing where needed as well as seeding cleared ground as quickly as possible to secure the soil and reduce the potential for sedimentation and runoff. Because the pallid sturgeon is adapted to living close to the bottom of large, silty rivers, temporary increases in turbidity and sedimentation would be insignificant effects.

Activities that are particularly noisy have been identified as of concern for the pallid sturgeon. Pier construction would be completed using permanently cased drilled shaft. Pile driving or the use of explosives is not planned.

Following construction of the proposed bridge and track realignment, development is not likely to occur along the new track realignment ROW.

### ***Cumulative Effects***

Overall, the effects on the pallid sturgeon would be minimal and potentially beneficial in the long-term. After construction is completed, the dredged areas on the Osage River would remain in place and would have the potential to serve as wintering areas for the pallid sturgeon that were not previously available. —

### ***Incidental Take***

Construction of the UPRR Osage River Bridge 116.89 is not likely to result in an incidental take of pallid sturgeons. However, pallid sturgeons may avoid the area because of turbidity changes and sediment disturbance during construction. Pallid sturgeon would likely remain upstream or downstream of the new bridge during construction.

#### **1.1.3.5. Conservation Measures**

To minimize the impact of construction on pallid sturgeon, it would be beneficial to avoid pier construction during the spawning period (early April through July) for the pallid sturgeon as described above. The area of the confluence with the Missouri River provides habitat for pallid sturgeon and their young, so minimization of sediment disturbance during construction during April through July may also allow for continued pallid sturgeon migration through the Study Area to reach the Missouri River. Measures to avoid harm to the pallid sturgeon would include controlling erosion from construction activities, measures to avoid water quality impacts on the Osage River, and maintaining suitable water flow and fish passage.

#### **1.1.3.6. Conclusion**

The Project is located within a RPMA for the pallid sturgeon on the Osage River, but the Study Area is located in a reach that currently lacks suitable habitat. Pallid sturgeon use of this area is primarily migratory in nature. Construction of the project is not expected to result in the incidental take of any pallid sturgeon. The Project may provide some minor habitat enhancement through the scouring of small pool areas above and below the bridge piers that could provide wintering habitat for pallid sturgeon.

#### **1.1.3.7. Determination of Effects (Finding)**

The UPRR Osage River Bridge may affect, but is not likely to adversely affect, the pallid sturgeon. The majority of the impacts on the pallid sturgeon would be temporary in nature and associated with pier construction. Over the long term, the scour areas located immediately upstream and downstream of the piers may provide small areas of pool habitat for pallid sturgeon to use for wintering purposes. The type and extent of predicted impacts on pallid sturgeons are considered insignificant effects and should not reach the scale where a take would occur.

#### **1.1.4. Freshwater Mussels**

The Osage River is known to support a variety of species of mussels, including the pink mucket pearl mussel (*Lampsilis abrupta*) that was Federally listed as endangered in June of 1976, the scaleshell mussel (*Leptodea leptodon*) that was Federally listed as endangered in 2001, and the Missouri state-listed species of giant floater mussel (*Pyganodon grandis*) and black sandshell mussel (*Ligumia recta*).

A habitat survey was conducted for freshwater mussels in and immediately up- and downstream of the Project Area on February 3, 2004. The area was surveyed by a diver along transects. The substrate was found to consist primarily of "unconsolidated gravel with some sand and silt" but "patches of consolidated clay and shifty sand" were also noted (Ecological Specialists, Inc., 2004). Live mussels as well as weathered dead shells were observed during the habitat survey, including one weathered dead shell of a pink mucket pearl mussel. Based upon the results of this survey, a freshwater species survey was determined necessary.

The UPRR coordinated with the USFWS to complete the species survey. Species surveys were completed in May 2004 by Ecological Specialists, Inc. The surveys identified 63 live mussels of 14 different species scattered throughout the area. No threatened or endangered species were found. A regression analysis was completed to determine the likely mussel abundance in the entire survey area and resulted in an estimate of 320 live mussels of 18 species. No mussel beds were identified. Ecological Specialists, Inc. determined that the mussels present in the area likely washed downstream from upstream beds and only those finding a stable place to live remain in the area. While no threatened or endangered species were found there remains some minimal potential for a small number pink mucket pearlymussels to be found in the project area, however, the Project would only affect a few individual mussels and would not affect the pink mucket pearlymussel population in the Osage River.

In a June 16, 2004 letter USFWS indicated concurrence with the species survey findings and the determination that the Project may affect but is not likely to adversely affect state and/or Federally listed mussel species (USFWS, 2004).



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