DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

CESAM-PD-EI

MAY 11, 2020

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

SECTION 14 OF THE CONTINUING AUTHORITIES PROGRAM EMERGENCY STREAMBANK AND SHORELINE PROTECTION MOUNDVILLE ARCHAEOLOGICAL PARK PROJECT, HALE AND TUSCALOOSA COUNTIES, ALABAMA

A. DESCRIPTION OF THE PROPOSED ACTION

The proposed action would occur at Moundville Archaeological Park on the Black Warrior River in Moundville, Alabama. The Moundville Archaeological Park is located in both Hale and Tuscaloosa Counties in Alabama. Moundville Archaeological Park is located approximately 17 miles south of Tuscaloosa, Alabama. The immediate area of concern is approximately 700 feet in length along the Black Warrior River and lies within the Tuscaloosa County Portion of the park. The proposed project is located along the Black Warrior River between river miles 304 and 303.

The proposed action consists of the removal of debris and vegetation from approximately 700 feet of the river bank, followed by the placement of 17,000 cubic yards of Alabama Department of Transportation (ALDOT) Class II riprap along the shoreline, of this up to 7,000 cubic yards of stone will be placed below the mean water elevation. This will create a stable river bank to preserve the integrity of the bank and to protect the cultural resources currently being lost to erosion. The project will also include two tiebacks to secure the new riprap revetment into the existing shoreline.

The bank will be scraped back to remove debris and vegetation and loaded onto a barge for disposal at an approved upland disposal area. An upstream tieback will be created by digging a trench 30 feet wide by 6 feet deep with a 10 foot bottom width and 1V:1.5H side slopes. The downstream tieback will be placed in a naturally occurring low point and will not require excavation. A large sheet of geotextile will be staked to the top of the bank and rolled down into the water. Phase I of riprap placement will consist of a stone toe consisting of ALDOT Class II riprap placed from the water. Phase II will consist of the placement of riprap in water and on the bank from the water and on the rock placed in Phase I. This will create a 1V:2H slope for the Phase II revetment. Additional details can be found in Section 3.0 of the Environmental Assessment.

B. ALTERNATIVES TO THE PROPOSED ACTION

Several alternatives were analyzed as a part of this effort a “No Action” alternative, Alternatives #2, #3, #4, #6, and #7, and the selected alternative, Alternative #5.

No Action: The Council on Environmental Quality (CEQ) requires the analysis of the “No Action” alternative. This “No Action” alternative would mean the continued loss of streambank and associated cultural resources to erosion and mass wasting events.

Alternative #2: This plan will provide stabilization with a stone toe and a layer of riprap along approximately 700 linear feet of the riverbank. The eroded area of the existing riverbank would be graded to a 1V:3H slope, a 6-inch layer of bedding stone would be placed, a stone toe would be keyed into the hard clay layer at the base of the bank near the normal water level and an 18 inch layer of riprap would be placed on the bedding stone up to elevation 125 feet. Alternative 2 was not selected due to its potential impacts compared to the Proposed Action.

Alternative #3: Similar to Alternative 2 except that a gabion basket retaining wall would be built in an area of known human remains and artifacts to reduce the excavation impacts to those resources. The wall would be set back from the toe, and then built up to the top of the bank. The upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. Alternative 3 was not selected due to its potential impacts compared to the Proposed Action.

Alternative #4: For this alternative a stone toe would be placed at the base of the embankment, keying it into the hard clay layer anticipated to exist near the edge of water at normal pool. The stone toe would protect portions of the embankment from scour during slightly elevated river levels. The vertical and horizontal extent of the stone toe would provide some measure of protection against slope failure, generally where the mass of stone is sufficient to prevent slip failure geometries from exiting the slope. Alternative 4 was not selected due to its potential impacts compared to the Proposed Action.

Alternative #6: Place a sheet pile wall at the toe of the existing bank and back fill the area between the bank and the wall. Depending on the soil, the required length of sheet pile, and site conditions, anchoring of the sheet pile wall could be required. A gentle transition slope could be planted between the bank and the wall to provide extra protection against erosion. The upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. Alternative 6 was not selected due to its potential impacts compared to the Proposed Action.

Alternative #7: This alternative would be similar to Alternative 2 except that articulated concrete mats would be used to stabilize the riverbank instead of the riprap layer. A riprap toe would still need to be placed to key in the bottom edge of the mats. The

upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. Alternative 7 was not selected as it would require excavation of the streambank.

C. POTENTIAL ENVIRONMENTAL IMPACTS

A careful review of the emergency streambank protection project identified in Environmental Assessment shows any associated adverse impacts are expected to be minor both individually and cumulatively. The potential environmental impacts associated with the proposed action are temporary, and minor.

D. DETERMINATION

Based on the Environmental Assessment (EA) prepared for this project, I have determined that this action does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, the restoration action does not require the preparation of a detailed statement under Section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.). My determination was made considering the following factors discussed in the EA to which this document is attached:

a. The proposed action would not jeopardize the continued existence of any threatened or endangered species. USACE entered into formal consultation with the U.S. Fish and Wildlife Service (USFWS) on November 22, 2019, regarding the endangered mussel, the inflated heelsplitter at the project site. [This section is reserved for a description of coordination efforts with USFWS that are negotiated and agreed upon by both agencies.]

b. No significant cumulative or secondary impacts would result from implementation of this action.

c. USACE is in consultation with the Alabama State Historic Preservation Office (SHPO) and the federally recognized tribes regarding this project.

d. The proposed action would result in no significant impacts to air or water quality.

e. The proposed action would result in no significant adverse impact to fish and wildlife resources.

f. The proposed action will not cause any environmental health risks or safety risks that may disproportionately affect children and complies with Executive Order 13045, “Protection of Children from Environmental Health Risks and Safety Risks.”

g. The proposed action will not cause any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations and complies with Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.”

E. FINDING OF NO SIGNIFICANT IMPACT

A careful review of the EA shows the proposed action would not have a significant adverse impact on the natural and human environment. The implementation of the proposed action would not have a significant adverse impact on the quality of the environment and an environmental impact statement is not required. The requirements of the National Environmental Policy Act and the CEQ regulation have been satisfied.

DATE _____ _____

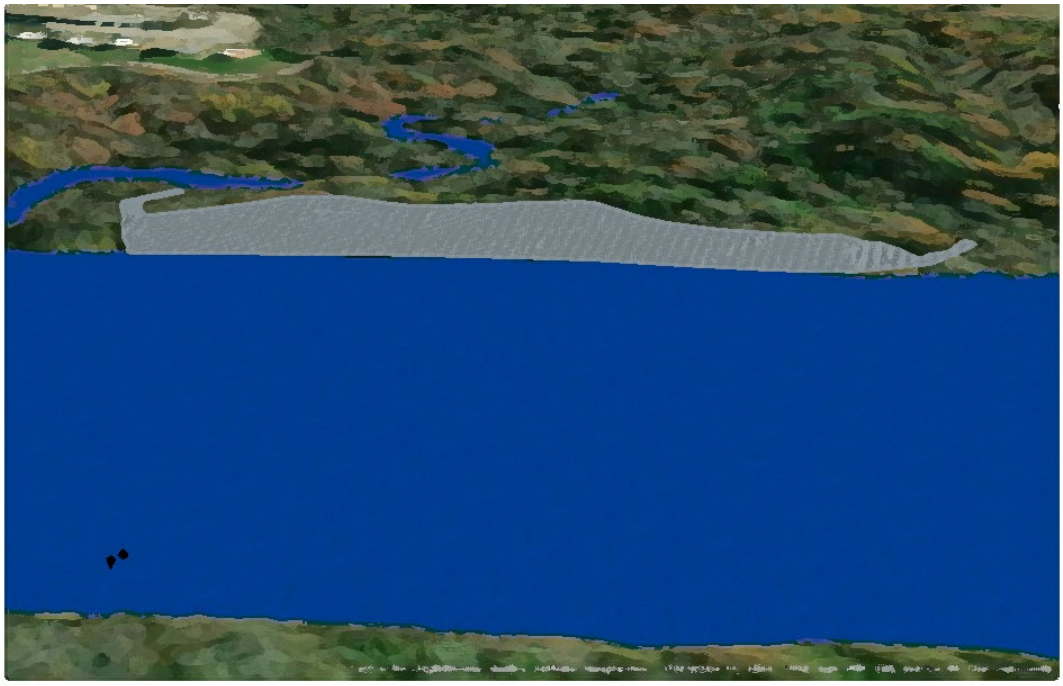
Sebastien P. Joly
Colonel, U.S. Army
District Commander

ENVIRONMENTAL ASSESSMENT

SECTION 14 OF THE CONTINUING AUTHORITIES PROGRAM

EMERGENCY STREAMBANK AND SHORELINE PROTECTION

MOUNDVILLE ARCHAEOLOGICAL PARK PROJECT, HALE AND TUSCALOOSA COUNTIES, ALABAMA



May 2020

Prepared by

United States Army Corps of Engineers,

Mobile District

Planning & Environmental Division

Inland Environment Team

Contents

List of Acronyms

ADEM- Alabama Department of Environmental Management

ALDOT- Alabama Department of Transportation

BMPs- Best Management Practices

BWT- Black Warrior Tombigbee Project

CAA- Clean Air Act

CAP- Continuing Authorities Program

CEQ- Council on Environmental Quality

Cfa- Humid Subtropical

CFR- Code of Federal Regulations

cys- cubic yards

DPR- Detailed Project Report

EA- Environmental Assessment

EIS- Environmental Impact Statement

EO- Executive Order

EPA- Environmental Protection Agency

ER- Engineer Regulation

ESA- Endangered Species Act

F- Fahrenheit

FEMA- Federal Emergency Management Agency

FONSI- Finding of No Significant Impact

Ft- feet

IPaC- Information for Planning and Conservation Tool

mg/L- milligrams per Liter

NAA- No Action Alternative

NEPA- The National Environmental Policy Act of 1969

NFIP- National Flood Insurance Program

NHL- National Historic Landmark

NLEB- Northern Long-eared Bat

NRHP- National Register of Historic Places

SHPO- State Historic Preservation Officer

SHU- Strategic Habitat Units

SRRU- Strategic River Reach Units

ug/L- microgram per Liter

USACE- U.S. Army Corps of Engineers

USFWS- U.S. Fish and Wildlife Service

1. INTRODUCTION

This Environmental Assessment (EA) presents impacts that would potentially result from stabilizing a section of streambank along the Black Warrior River. The purpose of this EA is to determine whether or not the proposed action has the potential for creating significant impacts to the environment and would thereby warrant a more detailed study on possible impacts, mitigation, and alternative courses of action.

The U.S. Army Corps of Engineers (USACE), Mobile District seeks to stabilize a section of streambank at Moundville Archaeological Park, along the left descending bank of the Black Warrior River, Tuscaloosa County, Alabama, under Section 14 of the Continuing Authorities Program (CAP). The Moundville Archaeological Park is located in both Hale County and Tuscaloosa County, Alabama in the City of Moundville, Alabama. It is located approximately 17 miles south of Tuscaloosa, Alabama. The immediate area of concern is approximately 700 feet in length along the Black Warrior River and lies within the Tuscaloosa County portion of the Park. The University of Alabama, as the owner and operator of Moundville Archaeological Park, requested emergency streambank erosion assistance in the vicinity of McGowan's Bluff. The streambank erosion is progressive with bank losses near 25 feet (ft) over the past decade. Due to severe streambank erosion, Moundville Archaeological Park is in imminent threat of damage. Included in the potential damage is the loss of human remains, and significant artifacts. Damage could result in continued erosion of or the total loss of historic McGowan's Bluff on the streambank adjacent to Mound D.

Emergency streambank and shoreline protection efforts under the CAP of Section 14 of the Flood Control Act of 1946, as amended, are proposed to protect this significant historical landmark owned by the University of Alabama.

1.1 Location

The proposed action would occur at Moundville Archaeological Park on the Black Warrior River in Moundville, Alabama. The Moundville Archaeological Park is located in both Hale and Tuscaloosa Counties, Alabama. Moundville Archaeological Park is located approximately 17 miles south of Tuscaloosa, Alabama. The immediate area of concern is approximately 700 ft in length along the Black Warrior River and lies within the Tuscaloosa County portion of the park. The proposed project is located along the Black Warrior River between river miles 304 and 305. The legal description is Section 36 Township 24 North Range 4 East Alabama in Tuscaloosa County, Alabama (Latitude 33°00'38.6" North Longitude 87°37'51.9" West). See Figure 1.1.

Figure 1.1 Location of Project within Moundville, Alabama and within the state of Alabama

1.2 Purpose and Need for Proposed Action

The University of Alabama, the non-Federal Sponsor, in letters dated May 16, 2013, January 27, 2014, and July 31, 2017, requested emergency streambank erosion assistance in the vicinity of McGowan's Bluff along the Black Warrior River. Due to severe streambank erosion (see Figures 1.2 and 1.3) attributed to several high water events, Moundville Archaeological Park is in imminent threat of losing significant artifacts. Other concerns include possible damage or destruction of McGowan's Bluff on the streambank adjacent to Mound D and possible damage or destruction of Mound D itself. Almost 25 ft of streambank have been lost over the past decade to progressive streambank erosion. Damage from a recent high-water event caused the closure of an existing riverfront boardwalk due to public safety concerns. The erosion has been exacerbated by the flooding events in December 2015, December 2018 and February 2020.

Figure 1.2: Bank loss at Moundville Archaeological Park from 1999 to 2019.

Figure 1.3: Progressive bank loss at Moundville Archaeological Park during the February 2020 high water event.

1.3 Authority

This study is being conducted by the USACE, Mobile District under the CAP of Section 14 of the Flood Control Act of 1964, as amended: “Section 14, Emergency Streambank and Shoreline Protection of Public Works and Non-Profit Public Services”. Section 14 allows for the implementation of projects to protect public facilities and facilities owned by non-profit organizations that are used to provide public services that are open to all on equal terms. These facilities must have been properly maintained but be in imminent threat of damage or failure by natural erosion processes on streambank and shoreline, and are essential and important enough to merit Federal participation in their protection. Eligible facilities are: highways, highway bridge approaches, public works, churches, public and private non-profit hospitals, schools, and other public or non-profit facilities offering public services open to all on equal terms; and known historic properties whose significance has been demonstrated by a determination of eligibility for listing on, or actually listing on, the National Register of Historic Places (NRHP). Historic properties must be open to all on equal terms. In compliance with requirements for potential Federal funding under Section 14, this EA is being prepared to evaluate the environmental and socioeconomic effects, and in compliance with the National Environmental Policy Act of 1969 (NEPA). The University of Alabama is the non-Federal sponsor for this proposed Section 14 project.

1.4 Proposed Action

The proposed action consists of the removal of debris and vegetation from approximately 700 linear ft of river bank, followed by the placement of 17,000 cubic yards (cys) of Class II Alabama Department of Transportation (ALDOT) riprap along the shoreline, of this up to 4,500 cys of stone will be placed below the mean water elevation. This effort will create a stable river bank to preserve its integrity and to protect the cultural resources currently being lost to erosion. The project will also include two tiebacks to secure the new riprap revetment into the existing shoreline.

The bank will be scraped back to remove debris and vegetation. Debris and vegetation will be loaded onto a barge for disposal at an approved upland disposal area. An upstream tieback will be created by digging a trench 30 ft wide by 6 ft deep with a 10 ft bottom width and 1V:1.5H side slopes. The downstream tieback will be placed in a naturally occurring low point and will not require excavation. A large sheet of geotextile will be staked to the top of the bank and rolled down into the water. Phase I of riprap placement will consist of a stone toe consisting of Class II riprap placed from the water. Phase II will consist of the placement of riprap in water and on the bank from the water and on the rock placed in Phase I. This will create a 1V:1.5H slope for the Phase I stone toe and a 1V:2H slope on the Phase II revetment. Around the riprap revetment, native canes and grasses will be planted to help stabilize the soils.

1.5 Scope

NEPA and Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508 (40 CFR 1500-1508), require Federal agencies to consider the potential environmental consequences of proposed actions and alternatives. NEPA excuses or excludes the USACE from the preparation of any formal environmental analysis with respect to actions that result in minor or no environmental effects, which are known as "categorical exclusions.” An intermediate level of analysis, an EA, is prepared for an action that is not clearly categorically excluded, but does not clearly require an Environmental Impact Statement (EIS) [40 CFR §1501.3 (a) and (b)]. Based on the EA, the USACE either prepares an EIS, if one appears warranted, or issues a "Finding of No Significant Impact" (FONSI), which satisfies the NEPA requirement. This EA is prepared according to the Engineer Regulation (ER) 200-2, Procedures for Implementing NEPA, and the Council for Environmental Quality (CEQ) regulations (40 CFR § 1508.27) for Implementing the Procedural Provisions of NEPA (40 CFR § 1500-1508).

This EA, written by the USACE, Mobile District, has been prepared to present the potential impacts associated with the Moundville Archaeological Park CAP Section 14 Emergency Streambank and Shoreline Protection Project. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality (amended by EO 11991), provides policy directing the Federal government to take leadership in protecting and enhancing the environment.

Per CEQ guidance, the EA focuses on those resource areas where there is potential impacts.

1.6 Public Involvement

NEPA requires that the public be involved in the decision-making process on Federal actions. Consideration of the views and information of all interested parties promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having a potential interest in the proposed action are urged to participate in the decision-making process.

Coordination with the general public will be accomplished by making the EA, Section 404(b)1 Evaluation, and the unsigned FONSI available electronically at https://www.sam.usace.army.mil/Missions/Planning-Environmental/Environmental-Assessments. There will be a 30-day comment period. Should new information be presented that constituents need for updates, the EA will be revised accordingly.

2. ENVIRONMENT SETTING WITHOUT THE PROJECT

Moundville is located in the East Gulf Plain (see Section 2.1.2). The topography is gently rolling, with medium to fine textured soils. The locale is characterized by southern floodplain forest. The western end of the project area is a forested tract adjacent to both an industrial park and semirural land. The area is primarily mixed pine and hardwoods, consisting of oaks (water, willow, red, and star), sweetgum, sycamore, beech, shaggy hickory, willow, mimosa, magnolia, elm, red maple, and sugarberry. The edges and underbrush are primarily privet. There are also areas of high quality bottomland hardwoods and hardwood stands. Pine tends to cluster on the ridges with other species scattered through the area and nearer the slough edges. The area is populated by wildlife species capable of adapting to close proximity of industry and human habitation, such as turkey, white-tail deer, and squirrels. Development flanking this area includes an industrial park, an archaeological park and museum, conference center, research building, curation facility, picnic and camping areas, and prehistoric mound sites.

2.1 Physical Environment

2.1.1 Climate

Moundville, Alabama is located in the Southeastern United States in the Köppen climate classification, Cfa, humid subtropical. Moundville experiences warm summers with mild winters. On average, Moundville, Alabama experiences 111.3 days of rain a year, totaling on average 55.6 inches of rain a year. The hottest summer month (July) has an average high of 92.1° Fahrenheit (F) and the coldest month (January) has an average low of 33.8° F.

2.1.2 Geology and Soil

The project is located within the East Gulf Coastal Plain (see Figure 2.1) which is a broad, flat coastal plain that stretches across the southern portion of Alabama, extending north from the Gulf coast to the fall line near Montgomery, Alabama. The geologic units, composed mainly of sediments, are described variously as gravels, sands, silts, and clays. The rocks are mainly composed of chalk, sandstone, limestone, and claystone. The beds slope gently southward at about 40 ft per mile. Locally, higher elevations are underlain by more resistant material (in some areas it is sediment, in others sedimentary rock), and the lowlands are underlain by softer material. The type of resistant material varies from one physiographic district to another.

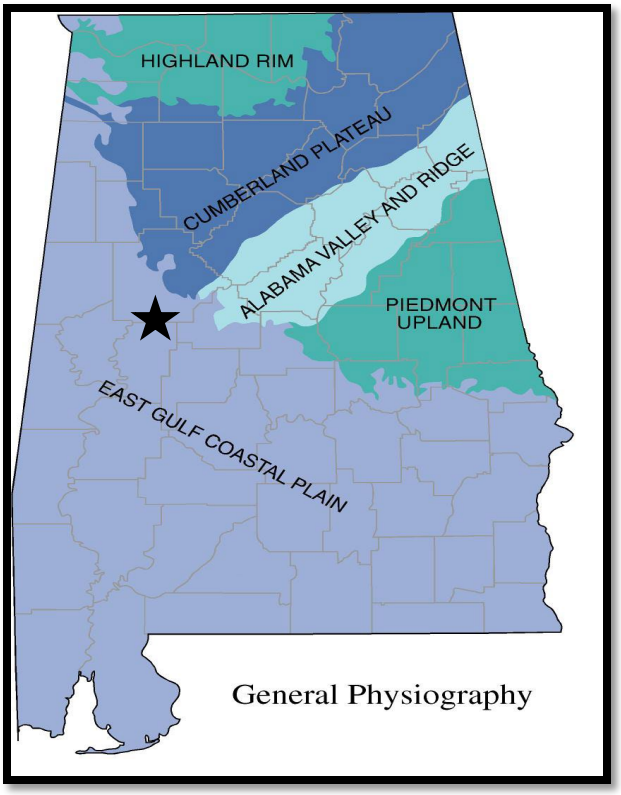


Figure 2.1: Project Location on a map of Alabama's General Physiography

2.1.3 Water Quality

The Black Warrior River is classified for fish and wildlife purposes for its entire length, in Alabama. Under this classification, the river must meet Alabama Department of Environmental Management (ADEM) Water Quality Criteria as outlined in Chapter 335-6-10-.09(5). Standards set out in ADEM 335-6-10-.09(5) include but are not limited to a maximum temperature not to exceed 90° F and dissolved oxygen no less than 5.0 milligram per liter (mg/L). ADEM 335-6-10-.09 also states that chlorophyll a in Warrior Lake should be below 12 micrograms per liter (ug/L) during the growing season (April-October). The 303 (d) list of impaired waters does not list any impaired waters in the vicinity of the project location.

2.1.4 Groundwater

The Southeastern Coastal Plain aquifer is the major source of water supply for central south Alabama. Groundwater recharges along east-west and northwest-southeast outcrop in central Alabama. Moundville and the surrounding localities obtain their groundwater primarily from the Eutaw aquifer formation.

2.1.5 Air Quality

On November 30, 1993, the U.S. Environmental Protection Agency (EPA) published its final General Conformity Rule to implement Section 176(c) of the Clean Air Act (CAA) for geographic areas designated as CAA nonattainment areas and in those attainment areas subject to maintenance plans required by CAA Section 175(a). The General Conformity Rule requires Federal agencies to ensure that Federal actions in nonattainment or maintenance areas conform to the initiatives established in the applicable state implementation plan. EPA established national ambient air quality standards for six criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, lead, and particulate matter less than or equal to 2.5 microns in diameter. According to the EPA (USEPA 2020), Tuscaloosa County, Alabama is not in a non-attainment area.

2.1.6 Floodplain

Floodplains are designated and mapped by the National Flood Insurance Program (NFIP), which is administered by the Federal Emergency Management Agency (FEMA). Those maps are available on the FEMA internet web site (FEMA 2020). The Black Warrior Tombigbee project (BWT) is not a flood control project, there are areas of floodplains that vary in size along the river. This proposed project is located along the river shoreline at river mile 303 to 304 within the floodplain. Flooding is anticipated at the project site during high flow events.

2.1.7 Wetlands

The proposed project area consists of an actively sloughing high river bank. The National Wetland Inventory shows an 11.56 acre Freshwater Forested/Shrub Wetland habitat is classified as a PFO1A (USFWS, 2020). Ground-truthing reveals a small patch of forest that is only temporarily flooded during large scale flood events.

2.2 Biological Resources

2.2.1 Fish and Fishery Resources

There are no commercial fisheries in the vicinity of the proposed project. Sport fish in the Black Warrior River basin include largemouth bass (*Micropterus salmoides*), striped bass (*Morone saxatilis*), spotted bass (*Micropterus punctulatus*), crappie (*Pomoxis spp.*), catfish (*Ictalurus spp.*), bluegill (*Lepomis macrochirus*), and sunfish (*Lepomis spp.*). Other species are drum (*Aplodinotus grunniens*), small mouth buffalo (*Ictiobus bubalus*), carp (*Cyprinus carpio*), Alabama shad (*Alosa alabamae*), and striped mullet (*Mugil cephalus*).

Common mussels found in the BWT river basin include washboard (*Megalonaias nervosa*), (*Plectomerus dombeyana*), Alabama ord (*Quadrula asperata*), southern mapleleaf (*Quadrula apiculata*), ebonyshell (*Fusconaia ebena*), (*Fusconaia cerina*), elephant-ear (*Elliptio crassidens*), fragile papershell (*Leptodea fragilis*), yellow sandshell (*Lampsilis teres*), southern fatmucket (*Lampsilis straminea claibornensis*), inflated heelsplitter (*Potamilus inflatus*), and threehorn wartyback (*Obliquaria reflexa*).

2.2.2 Wildlife Resources and Habitat

The proposed project area is a semi-rural environment. Species residing in the area are adapted to the close proximity of human habitation. Primary fauna in the area include white-tail deer *(Odocoileus virinianus),* turkey *(Megeagris gallopavo)*, squirrels *(Sciurus spp.)*, and Easter cottontail rabbit *(Sylvilagus floridanus)*, etc.

Three species of bird thought to occur at the project site are protected under the Migratory Bird Treaty Act and the Bald or the Golden Eagle Protection Act, the lesser yellowlegs (*Tringa flavipes*), red-headed woodpecker (*Melanerpes erythrocephalus*), and the wood thrush (*Hylocichla mustelina*).

Small forested patches, such as those in the project site, could provide resting places for migratory birds and nesting areas for generalist species, such as mourning dove *(Zenaida macroura)*, blue jay *(Cyanocitta cristata)*, American crow *(Corvus brachyrhynchos)*, mockingbird *(Mimus polyglotus)*, starling *(Sturnus vulgaris)* and others. Larger trees could support woodpeckers, bats, and owls.

No Strategic Habitat Units (SHU) or Strategic River Reach Units (SRRU) are within the project area.

2.2.3 Endangered and Threatened Species

The project area is in Tuscaloosa County, Alabama, along a bend in the Black Warrior River. The river and surrounding land are known to host threatened and endangered species pursuant to the Endangered Species Act (ESA). The threatened and endangered species known, or thought to occur within the county are listed in **Table 1**.

Table 1: Threated and Endangered Species in Tuscaloosa County, AL.

Common Name	Scientific Name	Status
Mammals		
Gray Bat	*Myotis grisescens*	**E**
Indiana Bat	*Myotis sodalist*	**E**
Northern Long-eared Bat	*Myotis septentrionalis*	**T**
Birds		
Red-cockaded Woodpecker	*Picoides borealis*	**E**
Wood Stork	*Mycteria americana*	**T**
Reptiles		
Flattened Musk Turtle	*Sternotherus depressus*	**T**
Amphibians		
Black Warrior (=sipsey Fork) Waterdog	*Necturus alabamensis*	**E**
Fishes		
Cahaba Shiner	*Notropis cahabae*	**E**
Goldline Darter	*Percina aurolineata*	**T**
Mussels		
Alabama Moccasinshell	*Medionidus acutissimus*	**T**
Dark Pigtoe	*Pleurobema furvum*	**E**
Finelined Pocketbook	*Lampsilis altilis*	**T**
Inflated Heelsplitter	*Potamilus inflatus*	**T**
Orangenacre Mucket	*Lampsilis perovalis*	**T**
Ovate Clubshell	*Pleurobema perovatum*	**E**
Southern Acornshell	*Epioblasma othcaloogensis*	**E**
Southern Clubshell	*Pleurobema decisum*	**E**
Triangular Kidneyshell	*Ptychobranchus greenii*	**E**
Upland Combshell	*Epioblasma metastriata*	**E**
Snails		
Cylindrical Lioplax (snail)	*Lioplax cyclostomaformis*	**E**
Flat Pebblesnail	*Lepyrium showalteri*	**E**
Round Rocksnail	*Leptoxis ampla*	**T**
Insects		
Mitchell's Satyr Butterfly	*Neonympha mitchellii mitchellii*	**E**
Flowering Plants		
Gentian Pinkroot	*Spigelia gentianoides*	**E**
Georgia Rockcress	*Arabis georgiana*	**T**
Mohr's Barbara's Buttons	*Marshallia mohrii*	**T**
Tennessee Yellow-eyed Grass	*Xyris tennesseensis*	**E**
White Fringeless Orchid	*Platanthera integrilabia*	**T**

Further evaluation was conducted with the U.S. Fish and Wildlife Services' (USFWS) Information for Planning and Conservation Tool (IPaC) which uses an overlay of the proposed project area and the river bend downstream. IPaC, used to obtain the official species list obtained for the project (04EA1000-2019-SLI-1231), showed that of the threatened and endangered species known, or thought to occur within the county, only four occur or are thought to occur within the project footprint. The species include the Indiana bat, the northern long-eared bat (NLEB), the wood stork, and the inflated heelsplitter.

The Indiana bat primarily inhabits caves. The Indian bat forages in riparian areas, upland forest, ponds, and fields and feeds upon flying insects. Mating occurs from August to October and sperm is then stored through hibernation. Females then become fertilized soon after emergence from hibernation and pups are born in June and July. Female Indiana bats typically give birth to one pup. Summer habitat consists of wooded areas often along streams. Roost trees can include elm, oak, beech, hickory, maple, ash, sassafras, birch, sycamore, locust, aspen, cottonwood, pine, and hemlock. Maternity sites consist of the bark of dead, dying, and exfoliating trees in addition to cavities in trees (NatureServe, 2019).

The NLEB inhabits both caves and old-growth forest. Mating occurs in late summer and early fall, during this swarming period large groups congregate in caves. Females store sperm through hibernation and then become fertilized soon after emergence. Pups are born in June and July. The NLEB normally gives birth to one pup. Most nursery colonies occur in cavities or beneath loose bark in trees or snags in upland forests, females use a wide variety of trees. The NLEB feeds upon insects both flying and on the ground. Foraging occurs in riparian areas, upland forest, ponds, and fields. (NatureServe, 2019).

The wood stork (*Mycteria americana)* inhabits chiefly freshwater marshes, swamps, lagoons, ponds, flooded fields; and depressions in marshes during drought. They nest primary in cypress trees, mangroves, and dead hard woods over shallow lakes. Foraging occurs in shallow waters of swamps, flooded lowlands, and flooded depressions (Nature Serve, 2019).

The inflated heelsplitter is a moderately sized bivalve reaching an adult size of about 5 ½ inches in length. It is black and brown in color, juveniles may have green rays. Adult inflated heelsplitter are sedentary spending most of their lives near where they dropped out. Horizontal movement is slow, but individuals have been known to move a few meters (NatureServe, 2019). With the exception of these few observations, the life history is presumed to be similar to that of other Unionids. During the spawning period,

males discharge sperm into the water and females collect the sperm by the siphoning process. Eggs are fertilized and held in the female's gills where they develop into larvae or glochidia. The glochidia are discharged into the water where they attach to a fish host, become encysted, and metamorphose into juvenile mussels that are capable of surviving if they fall to suitable substrata. Mussels are also dependent upon the water currents to bring food particles within the range of their siphons (US Army Corps of Engineers, 2017).

This species is found in sand, mud, silt, and sandy-gravel substrates in slow to moderate currents and is usually collected on the protected side of bars in water as deep as 20 feet (US Army Corps of Engineers, 2017).

No critical habitat is designated within the project area. All critical habitat in Tuscaloosa County occurs well north of the project area.

2.3 Socioeconomic Environment

2.3.1 Socioeconomic Conditions

Key demographic facts for Moundville, Alabama are derived from the 2010 Bureau of the Census. There were 2,427 people, 1,003 total housing units with 894 being occupied households, and 652 families residing in the town of Moundville, Alabama according to the 2010 census. The population density was 622.3 per square mile. There were 1,003 housing units at an average density of 257.2 per square mile. The racial demographic of the town was 56.2% White, 40.4% Black or African American, 0.7% Native American, 0.7% Asian, 0.6% from other races, and 1.4% multiracial. Of the remaining demographic, 1.8% of the population identified as Hispanic or Latino of any race.

There were 894 households of which 37.2% had children under the age of 18 living with in the residence, 48.7% were married couples living together, 18.8% had a female householder, and 27.1% were non-families. Of those households, 23.4% consisted of individuals and 7.6% had someone living alone who was 65 years of age or older. The average household size was 2.62 persons and the average family size was 3.11.

Population consists of 27.7% under the age of 19, 7.6% from 20 to 24, 29.0% from 25 to 44, 23.5% from 45 to 64, and 12.1% who were 65 years of age or older. The median age was 34.7 years. For every 100 females, there were 92.2 males.

The median household income was $43,083 and the median family income was $55,821. Males had a median income of $50,893 compared with $29,375 for females. The per capita income was $17,574. About 14.5% of families and 17.0% of the population were below the poverty line, including 13.0% of those under age 18 and 24.1% of those age 65 or over.

2.3.2 Land Use

Land use in the area is dominated by semirural use, both agricultural and residential. A small industrial park is located adjacent to the Park. The project site is to be constructed entirely within the bounds of Moundville Archaeological Park as previously described. No prime farmlands are located within the project area. Agriculture is extensive in the area, however the park property has been held in stewardship in an effort to conserve the mound complex. Land use controls on private lands in this area, as well as other parts of Tuscaloosa County are imposed by local government and home owner associations.

2.3.3 Historic and Archaeological Resources

Moundville Archaeological Park, is a Mississippian Era mound site situated on the Black Warrior River in Hale and Tuscaloosa Counties, near the city of Tuscaloosa, Alabama. Extensive archaeological investigations have shown that the site was the political and ceremonial center of a regionally organized Mississippian chiefdom. The archaeological park is administered by the University of Alabama Museums and encompasses 185 acres, consisting of 29 platform mounds arranged around a rectangular plaza. The park also contains a museum and research laboratory. The site was declared a National Historic Landmark (NHL) in 1964 and was added to the NRHP in 1966. Designation as a NHL is one of the highest forms of congressional recognition for a historical resource. Additionally, Moundville's importance has been internationally recognized by the United Nations Educational, Scientific, and Cultural Organization, which has identified the site as a World Heritage Site candidate.

Moundville's contribution to the collective body of knowledge regarding the Mississippian cultural period is immeasurable. Moundville was occupied from around A.D. 1000 until A.D. 1450 and is the second-largest classic Middle Mississippian site in the United States. Villages dating to this period are found throughout the central Mississippi River Valley, the lower Ohio River Valley, and most of the Mid-South. Kentucky, Tennessee, Alabama, and Mississippi represent the core of classic Mississippian cultural area.

The Mississippian period is characterized by important developments in technology, settlement patterns, and social complexity. Hallmarks of the Mississippian Period include the construction of massive platform mounds, the establishment of social hierarchy, intensive maize agriculture, long-distance trade, and the production of extremely elaborate forms of artwork featuring complex iconography. At the apex of Moundville's development, this populous town site covered 300 hundred acres of land overlooking the Black Warrior River and was second only to the Cahokia site in Illinois in size and complexity.

In addition to the political and religious significance of Moundville, the site is also the location of one of the largest known necropolises in the Southeast. Since this site served as an important administrative center, it is likely that only high status individuals were buried at Moundville. This likely included Moundville's own elites, as well as high status individuals from surrounding communities. Native Americans view Moundville as a sacred monument and as a resting place for many of their ancestors.

2.3.4 Water Supply

There is no direct use of either of the nearby ponds or streams for water supply. Any area drained is part of the larger Black Warrior River watershed. A number of communities use that waterway for public and industrial water supply. The nearby stream (Carthiage Branch) does not account for a significant contribution of water volume to the Black Warrior River.

2.3.5 Recreation

Moundville Archaeological Park encompasses the original Moundville archaeological site, with its large earthen mounds arranged around an open plaza, a museum with interpretive displays of artifacts, an archaeological research center, a nature trail, and camping facilities. Administered by the University of Alabama Museums, Moundville Archaeological Park receives about 40,000 visitors a year, including hundreds of Alabama school children. Activities in the park include camping, walking trails, and Native American Festivals. Currently, recreation on the riverfront boardwalk section of the park is closed due to erosion.

2.3.6 Traffic

The important highway transportation artery is Alabama State Highway 69, providing a link to other interstate highways such as I-20. Within the immediate project area, transportation is composed of local streets designed for residential traffic. Traffic tends to be light at most times in the residential areas and generally light to medium on the major routes leading to the City of Tuscaloosa.

2.3.7 Noise

There are no specific studies related to the existing noise levels in the project area. The rural area which encompasses the project area is assumed to have low noise levels.

2.3.8 Navigation

The Black Warrior River is a federally maintained navigation channel that is actively used for navigation. The navigation channel is connected by a series of locks and dams and is dredged when needed to ensure sufficient depths. The river adjacent to the proposed project is a wide “U” shape and consists of two turns in relatively deep waters. The natural channel depth along the Black Warrior River at Moundville does not require dredging.

2.3.9 Aesthetics

The streambank consists of mainly actively eroding exposed soils with sparse annual plant growth. There are a number sections of perennial vegetation growth upland of the naturally eroding bank. The natural streambank is aesthetically pleasing and shows little human influence.

2.3.10 Hazardous and Toxic Materials

Operating Moundville Archaeological Park may occasionally require the use of pesticides, paints, solvents, and petroleum products. The use of petroleum products would be expected from the operation of tractors and from park staff vehicle use. The handling, use, storage, and disposal of such materials must be in accordance with label recommendations, University regulations, and local, State, and Federal regulatory guidelines. These petroleum products are housed off-site of the Park.

2.3.11 Public Safety

Moundville Archaeological Park is a public park open during daylight hours. The most notable public safety issue is the recent closure of the riverfront boardwalk within the project area. The rapid erosion and recent bank instability have destroyed the access boardwalk at the site.

2.3.12 Protection of Children

On April 12, 1991, the President issued EO 13045, Protection of Children from Environmental Health Risks and Safety Risks. The EO seeks to protect children from disproportionately incurring environmental health or safety risks that might arise as a result of Federal policies, programs, activities, and standards. Children are potentially at greater risk for accidents such as those described in the section above. There are per the EPA’s Environmental Justice Screening tool a proportionately large number (79th percentile US) of children who live within a mile of the proposed project. Children do frequent the park.

2.3.13 Environmental Justice

On February 11, 1994, the President issued EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. The EO is designed to focus Federal attention on the environmental and human health conditions in minority and low-income communities with the goal of achieving environmental justice. The EO is also intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment. The EO states that Federal activities, programs, and policies should not produce disproportionately high and adverse impacts on minority and low-income populations.

Moundville includes a high percentage of minority populations with demographics consisting of 56.2% White, 40.4% Black or African American, 0.7% Native American, 0.7% Asian, 0.6% from other races, and 1.4% multiracial. Of that remaining, 1.8% of the population identified as Hispanic or Latino of any race.

3. DESCRIPTION OF THE PROPOSED ACTION

The erosion at Moundville Archaeological Park is a result of the existing embankment being undermined at its toe, likely by high current velocities that are experienced during high water events. This allows the slope above to slide into the river. Larger embankment failures are occurring after high water events on the river resulting from the wetting and drying of overburdened material thereby reducing the material's sheer strength and producing mass wasting events along the face of the bank.

The Proposed Action (Alternative #5) consist of the placement of riprap in the river to first create a stone toe. Then riprap will be placed along the existing bank to create a new riverbank with a 1V:2H slope. The upstream and downstream ends of the project will be tied back into the riverbank to prevent erosion around the ends of the project. A typical cross section is shown in Figure 3.1. Alternative 5 will be approximately 700 ft long by 100 ft wide with an upstream tieback that is 110 ft long by 30 ft wide and a downstream tieback that is 60 ft long by 30 wide.

Phase I will consist of the scraping of the bank to remove debris and vegetation that will be loaded onto a barge for disposal. A large sheet of geotextile will be staked to the top of the bank and rolled down into the water. Phase I of riprap placement will consist of creating a stone toe composed of Class II riprap placed from the water. The upstream tieback will be created by digging a trench 30 ft wide by 6 ft deep with a 10 foot bottom width and 1V:1.5H side slopes. The downstream tieback will be placed in a naturally occurring low point and will not require excavation. These tiebacks will be filled with Class II riprap.

Phase II will consist of the placement of riprap in water and on the bank from the water and on the rock placed in Phase I. This will create a 1V:1.5H slope for the phase I stone toe and a 1V:2H slope on the phase II revetment. Native canes and grasses will be planted at the site to improve aesthetics and soil stability.

Alternative 5 provides a satisfactory solution to the bank failure of the Black Warrior River adjacent to Moundville Archaeological Park. The riprap toe placed in the river will protect subaqueous portions of the bank from scour due to river currents, while the 1V:2H riprap bank protect against erosion from high flows and the effects of wetting and drying. Protecting subaqueous portions of the bank from scour may be key to reducing bank failure and slope failure at higher elevations. Because of the archaeological sensitivity of the park, the construction access would occur from the river, which is a viable option for this project because of the maintained navigation channel adjacent to the project. This alternative represents a tradeoff between reducing cultural costs/impacts and increasing other environmental impacts, as well as, design and construction costs.

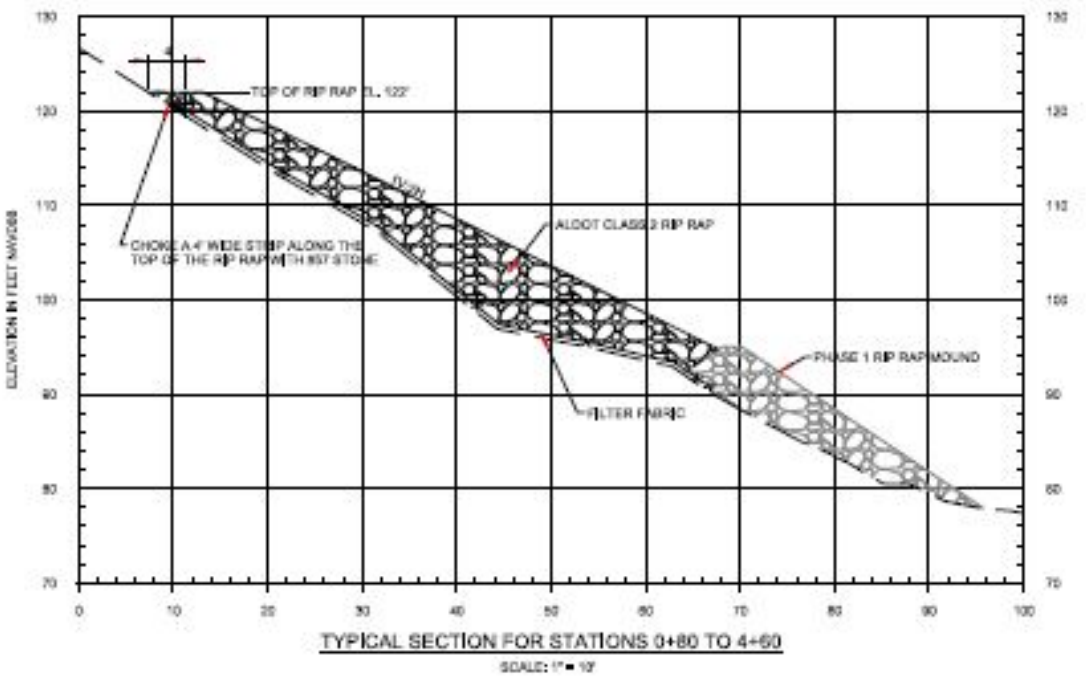


Figure 3.1: A typical cross section of the proposed action.

This proposed action was selected as it would minimize impacts to cultural resources at the project site. No material would be removed from the streambank, minimizing the disturbance and exhumation of the burials at the mounds adjacent to the streambank

4. ALTERNATIVES TO THE PROPOSED ACTION

USACE conducted and completed a Detailed Project Report (DPR) for the Moundville Emergency Streambank and Shoreline Protection project in December 2015. The purpose of the study was to formulate engineering solutions that would be cost efficient and would protect the eroding shoreline at Moundville. The DPR included the collection of limited field data by USACE and geotechnical data by the non-Federal Sponsor for analysis; review of existing maps with LiDAR and topography; estimation of the construction methods and materials required for the alternatives; and the assessment of alternatives that would provide the greatest protection with least impacts to both the natural and cultural environment. Seven alternatives were proposed (including the No Action Alternative (NAA)) based on the study results, all of which were intended to reduce shoreline erosion, increase public safety, and protect cultural resources.

4.1 Alternative 1: No Action

Under the NAA, the USACE would not design or construct riverbank protection to address the existing erosion and slope failure of the Black Warrior riverbank in the vicinity of the Moundville Archaeological Park. With no action taken to address the bank degradation, erosion is expected to continue or worsen. If the erosion and failure of the riverbank is allowed to continue, it will result in the further loss of Native American remains, historical artifacts, valuable and irreplaceable scientific data regarding tribal cultures, and park property. There are no direct construction costs with this alternative, however, there are significant cultural costs associated with this alternative as the park initiates emergency recovery efforts to recover remains and artifacts that are discovered emerging from the riverbank. Without the implementation of an engineering solution, these recovery efforts will be a continual cost to the park.

4.2 Alternative 2: Stone Toe with Riprap Slope Protection

For this alternative, a stone toe would be placed at the base of the embankment and keyed into the hard clay layer near the edge of the river at normal elevation of 95 ft. The weight of the stone toe would stabilize the protected embankment by preventing slides, while protecting the lower portion of the embankment from scour. The bank would be re-graded to a 1V:3H slope, with the lower portion being protected by an 18-inch layer of riprap below elevation 125 ft and the upper portion being planted with native grasses and vegetation to provide slope stability. Riprap protection up to elevation 125 ft should provide bank protection for river stages near the flood of record. The riprap layer will be placed on top of a layer of bedding/filter stone which will be designed during the Design .the project would be keyed into the riverbank to prevent erosion around the ends of the project. A typical cross-section is shown in Figure 4.1. Alternative 2 was not selected due to its potential impacts compared to the Proposed Action.

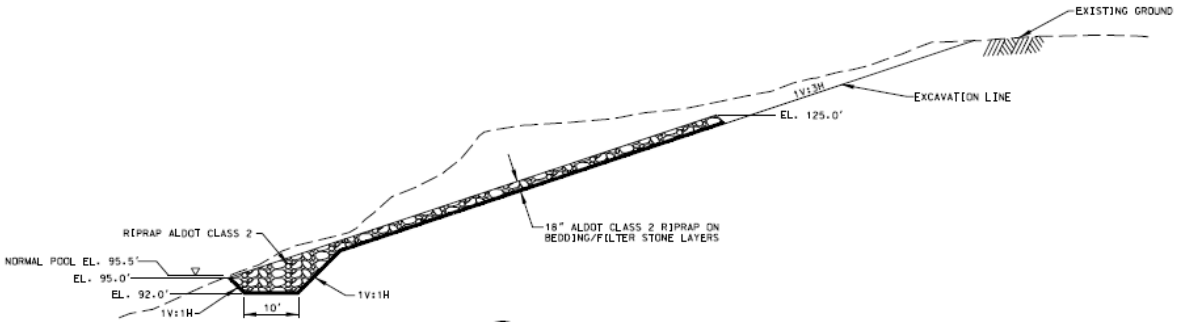


Figure 4.1 Typical Cross-Section, Alternative 2

4.3 Alternative 3: Stone Toe with Riprap Slope Protection and Gabion Wall

Similar to Alternative 2 except that a gabion basket retaining wall would be built in an area of known human remains and artifacts to reduce the excavation impacts to those resources. The wall would be set back from the toe, and then built up to the top of the bank. The layout and a typical cross-section are shown in Figures 4.2 and 4.3. The upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. Alternative 3 was not selected due to its potential impacts compared to the Proposed Action.

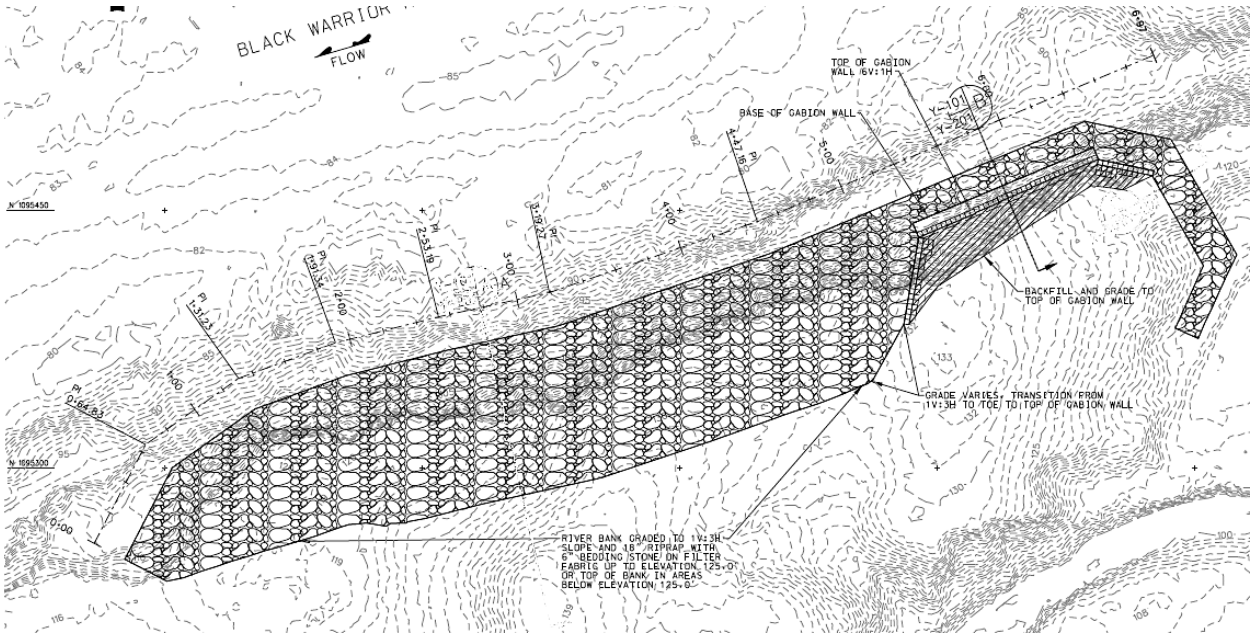


Figure 4.2 Overview, Alternative 3

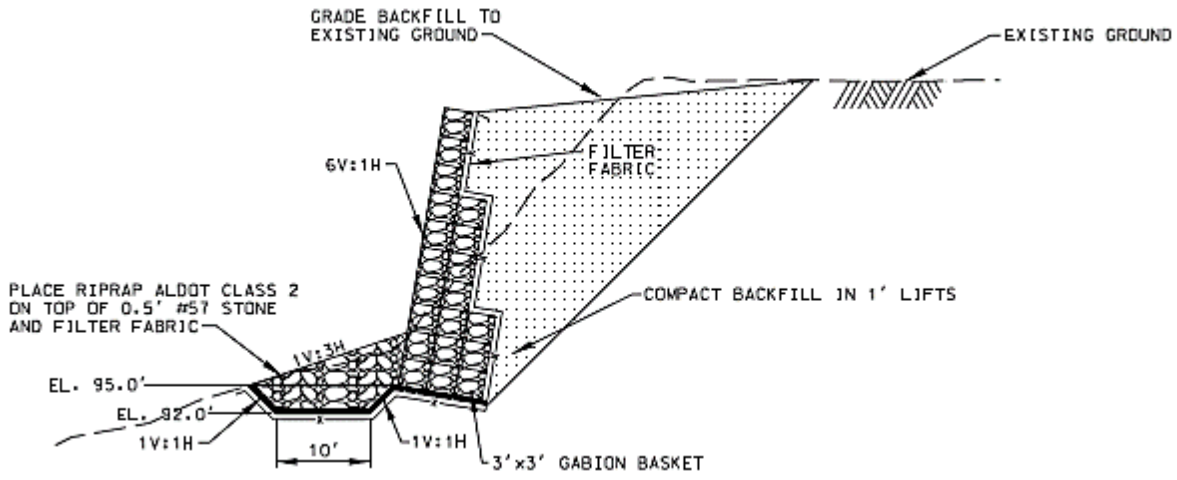


Figure 4.3 Typical Cross-Section with Gabion Wall, Alternative 3

4.4 Alternative 4: Stone Toe

For this alternative, a stone toe would be placed at the base of the embankment, keying it into the hard clay layer anticipated to exist near the edge of water at normal pool. The stone toe would protect portions of the embankment from scour during slightly elevated river levels. The vertical and horizontal extent of the stone toe would provide some measure of protection against slope failure, generally where the mass of stone is sufficient to prevent slip failure geometries from exiting the slope. However the weight of the stone toe would add load to the slope, increasing the likelihood of some form of slope failure (that which could exit the slope, perhaps, at some location other than the toe location). Over time, erosion over upper unprotected portions of the embankment would progress until it reached a stable slope. The upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. A typical cross-section is shown in Figure 4.4. Alternative 4 was not selected due to its potential impacts compared to the Proposed Action.

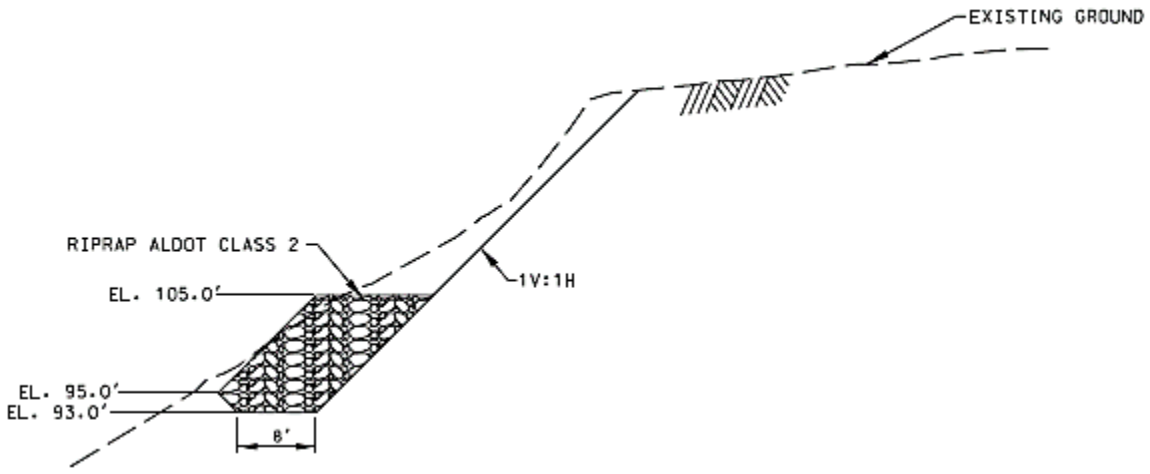


Figure 4.4. Typical Cross-Section, Alternative 4

4.5 Alternative 6: Sheet Pile Wall at the Base of the Riverbank

Place a sheet pile wall at the toe of the existing bank and back fill the area between the bank and the wall. Depending on the soil, the required length of sheet pile, and site conditions, anchoring of the sheet pile wall could be required. A gentle transition slope could be planted between the bank and the wall to provide extra protection against erosion. The upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. Alternative 6 was not

selected due to its potential impacts compared to the Proposed Action.

4.6 Alternative 7: Articulated Concrete Mats

This alternative would be similar to Alternative 2 except that articulated concrete mats would be used to stabilize the riverbank instead of the riprap layer. A riprap toe would still need to be placed to key in the bottom edge of the mats. The upstream and downstream ends of the project would be keyed into the riverbank to prevent erosion around the ends of the project. Alternative 7 was not selected as it would require excavation of the streambank.

5. ENVIRONMENTAL IMPACTS

For the purposes of clarity, Alternatives #2, #3, #4, #6, and #7 will be referred to as Action Alternatives with Alternative #1 referred to as NAA in this section as appropriate. Alternative #5 is the Proposed Action.

5.1 Physical Environment

5.1.1 Climate

None of the Alternatives would have an effect on the climate at or around the project site.

5.1.2 Geology and Soils

None of the alternatives would have impacts on the geology or overall topography of the area.

NAA: The NAA would result in continued erosion with soil loss.

Action Alternatives: All of the action alternatives would provide long-term beneficial impacts to the areas soils, by minimizing mass loss from the streambank. Heavy equipment would be used to move soil, excavate and grade the area at the work sites. There would be potential for both soil compaction and erosion during the construction of the project. Alternatives #2, #3, #4, #6, and #7 would require the removal of material to shape the bank.

Proposed Action: The proposed action would have long-term beneficial impacts to the area soils. Stabilization of the bank would reduce erosion and soil loss. Riparian planting will also be implemented to help stabilize soils. The proposed action would have local impacts to soils. There would be potential for both soil compaction and erosion during the construction of the project. However, the proposed action would be implemented with all appropriate Best Management Practices (BMPs) and soil and erosion controls in place, and conduct work primarily by barge from the river reducing soil impacts. Such controls would result in minor adverse impacts.

5.1.3 Water Quality

NAA: Without the shoreline stabilization, the existing shoreline would continue to slough and erode. In the event of a complete collapse, the material from the bank would flow into the river which would cause a significant increase in total suspended solids throughout the waters. Thus the NAA could cause excess sedimentation to occur in

smaller streams and tributaries entering the river and could cause a significant impact to water quality.

Action Alternatives: Impacts to water quality that result from all action alternatives would be short-term, localized, and minor. Increased suspended sediments and turbidity could occur during construction due to erosion. These conditions would subside upon completion of the work.

Proposed Action: The proposed action may temporarily degrade water quality around the project site. The construction of the proposed action requires placement of riprap below the surface of the water, this would temporary suspend sediments in the local area's water column. The Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas will be used to implement BMPs at the construction site to protect water quality. Following the 30-day public review, the USACE, Mobile District will request water quality certification from the ADEM. The USACE, Mobile District will adhere to conditions identified in the WQC. After project construction is complete, water quality at the project site will improve due to reduced sediment loading at the project site.

5.1.4 Groundwater

For the proposed action and all "action" alternatives, there would be no work that would significantly interact with groundwater. Although artesian wells are located on park property, there would be no planned discharge contaminants that could reach groundwater. Likewise, the NAA would have no impacts to groundwater.

5.1.5 Air Quality

Any action alternative (including the proposed action) would have short-term effects on emissions into the air as a result of exhaust from internal combustion engines.

The NAA would not result in any emissions of engine exhaust or fugitive dust.

5.1.6 Floodplain

This project is located along the river shoreline within the floodplain so some flooding is anticipated during high flow events.

NAA: Under the NAA erosion of the streambank would continue unimpeded. This would expand the floodplain as the streambank is eroded into the river.

Action Alternatives: All of the action alternatives would involve the modification of the 1% annual floodplain. Alternatives #2, #3, and #7 would require the removal of material from the floodplain. Alternatives #2, #3 and #6 would involve the placement of fill material in the floodplain. These actions are not expected to have a major effect on the

overall flood process in the area.

Proposed Action: The proposed action would involve the modification of both the active streambank and the 1% annual floodplain associated with both the River and Cartridge Branch Creek. Impact to this area will be minimal, as no major cut or fill activities are being conducted, and structures built in the area consist of placed riprap that will not impede the rise or fall of floodwaters. Accordingly, there will be no major changes to floodplains as a result of this proposed project.

5.1.7 Wetlands

There is a small stand of temporary flooded hardwood bottom habitat at the project site.

NAA: The NAA would allow the continued erosion of the streambank in front of the hardwood stand.

Action Alternatives: Alternatives #2 #3, #6, and #7 would involve the filling of the temporarily flooded bottomland hardwood stand.

Proposed Action: The proposed action would fill a small portion of the bottom with riprap as part of a stabilizing tie back for the larger project. This would affect less than an acre of the forested area.

5.2 Biological Resources

5.2.1 Fish and Fishery Resources

There are no commercial quality fisheries in the vicinity of the proposed project.

NAA: The NAA would allow the continued erosion of the streambank into the Black Warrior River. This would lead to increased turbidity in the waters around the proposed projects.

Action Alternatives: Any of the action alternatives would stop or decelerate the streambank erosion.

Proposed Action: The proposed action would decelerate the streambank erosion at the site. The streambank would be modified by rock placement, this would continue into the water changing the river bottom over a small area. This will create new habitat containing cracks and crevices that may be used by hatchling and juvenile fish for cover.

5.2.2 Wildlife Resources and Habitat

The species currently inhabiting the area use the riparian areas for food, water, shelter and breeding habitat. They are mostly tolerant of human activities. As such, there would be no significant impacts to those populations as a result of the proposed action. In the immediate vicinity of the work areas, small animals including mammals, birds, reptiles and amphibians would be temporarily displaced during the construction period. A few individuals incapable of escaping, such as slow-moving amphibians, could be lost during the construction period. The project has been coordinated with USFWS as noted above. Due to the scope of the project and previously disturbed habitat, this would be a minor impact and any lost individuals would be replaced through natural increase following project completion.

NAA: This ongoing shoreline erosion of sediment would continue to bury benthic species. The NAA would result in loss of wildlife habitat due to continued shoreline erosion. This may be gradual overtime or could be accelerated by a high flood event. Ultimately, the shoreline bank will continue to erode causing a loss of riparian habitat and adversely impact benthic species.

Action Alternatives: Alternatives #4 and #7 would have more immediate impacts as described in the NAA, due to removal of the vegetation along the bank with replanting nourishing the habitat. Alternative #6 would have adverse impacts to aquatic habitat due to placing the stone/boulder toe below the ordinary high water and could impact the habitat of endangered mussel species. All of the Action Alternatives would provide some improvement in habitat for both the aquatic and terrestrial species in the project area. In addition, temporary turbidity increases would occur within the immediate water column due to water-based construction activities; however, the turbidity would be short-term and would cease following construction.

Proposed Action: The proposed action may have a temporary impact on wildlife and habitat, however the stabilization of the streambank would provide a more stable habitat for both aquatic and terrestrial species. The area would be replanted with a mixture of native upland plant species and, upon project completion provide cover and favorable habitat for wildlife species.

5.2.3 Endangered, Threatened, or Protected Species

NAA: Under the NAA, the streambank would continue to erode. This continued erosion of sediment will continue to bury and suffocate benthic species, such as the federally protected inflated heelsplitter. In addition, the continued erosion of the bank could cause the loss of potential roosting trees for the Indiana bat and the NLEB.

Action Alternative: All of the Action Alternatives have potential to impact the protected bats which include the Indiana bat and the NLEB. Alternative #6 has the potential to impact the inflated heelsplitter.

Proposed Action: The proposed action also has the potential to impact bats. Thus prior to construction during the spring/summer roosting, the USACE will follow the procedures outlined in the Range-wide Indiana Bat Protection and Enhancement Plan Guidelines provided by the USFWS. Live trees and/or snags ≥ 5 inches dbh (12.7 cm) for Indiana bat and ≥ 3 inches dbh (7.6 cm) for the NLEB that have exfoliating bark, cracks, crevices, and/or hollows, should be cleared. Tree clearing will consist of cutting and dropping the trees that fit the description of potential spring/summer habitat during the October 15 to March 31 timeframe and returning to finish the process (clearing the brush, removing stumps, and preparing the ground for pipe installation) during the April 1 to October 14 timeframe.

The inflated heelsplitter has been found in a freshwater mussel survey of the proposed action area. A 2015 survey conducted by AST Environmental at the proposed project site revealed that the project site contained potentially suitable habitat for freshwater mussels including the inflated heelsplitter. In addition, a total of 23 protected inflated heelsplitter mussels were observed. The USACE submitted a letter to the USFWS requesting the initiation of formal consultation regarding the inflated heelsplitter on November 25, 2019. It is expected that the USACE, Mobile District will be required under the terms of the forthcoming Biological Opinion from the USFWS to have qualified divers relocate any locatable inflated heelsplitter to a location determined sufficient by the USFWS outside of the project area.

5.3 Socioeconomic Environment

5.3.1 Socioeconomic Conditions

The proposed action and other action alternatives would result in a temporary increase in construction-related jobs in the local area. This impact is considered minor due to the scope of the project. It is not known whether such employment would be represented by those already employed or whether new jobs would result. There would be a short-term increase in the sale of construction related materials and fuel in the local area.

There would be no relocations required as a result of the proposed action. There would be no changes in expected population growth patterns or local residential or commercial development. There would be no impacts to salaries or property values in the area.

Essentially, no differences between alternatives would be expected in impacts to the above socioeconomic conditions. The NAA would not result in any impacts to local employment.

5.3.2 Land Use

NAA: Without shoreline stabilization, the bank would continue to slough and erode causing potential bank failures. This could cause further restrictions in public access to this portion of the park due to safety concerns, thus affecting current land use.

Action Alternatives: None of the action alternatives would result in impacts to current land use. Implementation of these alternatives would be conducted in and around the immediate vicinity of the existing park. These areas are not currently developed areas. There would be no impacts to residential and commercial uses of surrounding lands. Agricultural lands would not be impacted. The project would not affect current local land use ordinances. No prime farmlands are located within the project area; therefore no coordination with the Natural Resources Conservation Service regarding farmland is required.

Proposed Action: The proposed action would not change the land use in the vicinity of the project. The proposed action would provide safer access to the streambank for public use. This project would provide the Moundville Archaeological Park the ability to reconstruct the public access boardwalk that was destroyed due to previous river erosion.

5.3.3 Historic and Archaeological Resources

The USACE, Mobile District determined that there would be historic properties affected by all alternatives including the proposed action as per 36 CFR 800.4(d)(1). Consultations regarding this determination are being conducted with the Alabama State Historic Preservation Officer (SHPO), Native American Tribes, and other interested parties. Any comments received from SHPO, Native American Tribes, or other interested parties will be addressed in this EA or as appropriate. Additionally, as this site is a NHL, the USACE, Mobile District is also coordinating with the National Park Service and the Advisory Council on Historic Preservation.

NAA: If no action occurs, stream bank erosion will continue to damage or destroy irreplaceable cultural resources. The archaeological significance of elements of the site could be diminished or lost. Valuable artifacts and features important to several federally recognized Tribes will be destroyed.

Action Alternatives: All of the action alternatives would provide long-term beneficial impacts to the site by minimizing erosion of the stream bank and preventing damage to important cultural features and artifacts. Portions of a 700 linear foot stretch of bank would need to be mitigated for cultural resources. Human burials and disarticulated human skeletal remains have been found in the area, increasing the risk of impacts to cultural resources.

Proposed Action: The proposed action would provide long-term beneficial impacts to the site by minimizing erosion of the streambank and preventing damage to important

cultural features and artifacts. This alternative would minimize construction related impacts by working primarily from the water and limiting land based construction excavations to the tie back portion of the project. By limiting construction related excavations mitigation excavations and costs will be reduced.

5.3.4 Water Supply

None of the alternatives will impact water supply. All nearby artesian wells are capped, and the local drinking supply is far removed from the construction site. Due to the small size of the project area, the nearby stream at McGowan Branch does not account for a significant contribution to the Black Warrior River water supply.

5.3.5 Recreation

NAA: Under the NAA, the continued erosion of the streambank will reduce access to the riverbank from Moundville Archaeological Park. The park will continue to keep access to the streambank restricted to the public for safety reasons.

Action Alternatives: Any of the action alternatives will stabilize the river bank, possibly allowing Moundville Archaeological Park to reopen access to the riverbank.

Proposed Action: With the stabilization of the streambank, Moundville Archaeological Park may be able to reopen public access to the riverbank. In addition, recreational fishing from the river may increase at the project site due to the changes in fish habitat.

5.3.6 Traffic

The proposed action and other action alternatives would not impact the major roads in the area. Most of the work would be conducted from the river. Anticipated traffic as a result of the action would include increase as temporary construction traffic from the movement of equipment to and from the construction site. This would consist of equipment brought in by trucks and trailers, and worker's privately owned vehicles. These would be expected to be very small in number, due to the limited scope of work. Entry to the sites would likely occur via access points from local streets. Residential areas with crews entering and exiting specific work areas may experience some adverse traffic impacts. However, the impacts are considered to be minor and short term. It is anticipated that short term delays of a few minutes could be expected while equipment is being loaded and unloaded. No differences between alternatives would be expected in impacts to traffic. The NAA would not result in any impacts to traffic.

5.3.7 Noise

Noise would be generated by the proposed action and other action alternatives from a number of construction-related sources. These include the vehicular traffic cited above and heavy construction equipment. Typical sources of construction-related noise are shown in Table 3, along with expected noise levels at 25 and 50 feet from the source. These noise levels exceed the ambient noise levels cited in the USACE study (USACE, 1998) of 58-72 dB for urban residential areas. It is estimated that such noise levels from the proposed action would be comparable to noise originating from a residential home or commercial building construction project. This may constitute a minor nuisance to the nearby park. Work would occur only during daylight hours assuring no sleep disturbance for most people, and the overall impact would be short term and minor. The NAA would not result in any noise generation. All “action” alternatives would generate similar degrees of noise.

Table 2: Source: Typical Noise Generating Sources in Typical Urban Environments U.S. Department of Transportation, 1977

Typical Noise Generating Sources in Typical Urban Environments			
Construction Phase	**Equipment**	**Noise Level at 25 feet (dBA-Leq)**	**Noise Level at 50 feet (dBA-Leq)**
Clearing and grubbing	Bulldozer, backhoe	95	89
Earthwork	Scraper, bulldozer	97	91
Foundation	Backhoe, loader	94	88
Superstructure	Crane, loader	95	89
Base preparation	Trucks, bulldozer	97	91
Paving	Paver, trucks	98	92
Source: U.S. Department of Transportation, 1977			

5.3.8 Navigation

NAA: The NAA could impact navigation if the erosion continues to worsen causing shear bank failures providing material for downstream shoaling. The Moundville Archaeological Park current structure does not interfere with the main navigation channel.

Action Alternatives: Alternative #6 that extends into the water may affect navigation between Black Warrior River Miles 303 and 305. However, the impacts would be minor.

Proposed Action: The proposed action may slightly modify navigation through the

channel between River Miles 303 and 305 during construction. The construction activities will be communicated with the users and stake holders via the USACE, Mobile District Navigation Bulletin available at https://www.sam.usace.army.mil/Missions/Civil-Works/Navigation/Navigation-Notices/. It is expected that the proposed action will have no perceivable effect on navigation upon completion.

5.3.9 Aesthetics

The project is proposed along the natural streambank at Moundville. The excavation and disposal activities during the action alternatives may be aesthetically displeasing to those who may be visiting the park or using the river during construction. However, this adverse condition would only be temporary for the any of the action alternatives.

NAA: The NAA would eventually lose the natural aesthetic of the streambank due to severe erosion.

Action Alternatives: All of the action alternatives would degrade the natural aesthetics of the streambank, due to the man-made modifications to the streambank.

Proposed Action: The proposed action would slightly degrade the aesthetics of the streambank. The placement of riprap on the shoreline would create a more man made aesthetic to the shoreline. However, this would be partially offset with the planting of native cane and grasses such as switch cane (*Arundinaria tetcta*). After a few years, the area will be grown in with native vegetation and look like a typical natural shoreline.

5.3.10 Hazardous and Toxic Materials

Information provided by the non-Federal Sponsor identified no evidence of hazardous or toxic materials within the work area and therefore, none of the alternatives would have the potential of interacting with such materials. There would be no differences among any of the alternatives and there would be no potential impacts due to hazardous and toxic materials.

5.3.11 Public Safety

For all action alternatives, there would be no specific change in public safety hazards on site. During construction, standard safety measures would be taken to ensure unauthorized persons do not have access to the site. This would include use of construction fencing, signage, prohibiting trespassers, etc. Minor benefits could result post-construction by stabilizing the existing bank. None of the alternatives would result in increased safety hazards for the public.

5.3.12 Protection of Children

With the exception of the NAA, none of the action alternatives would result in increased safety hazards to children. During construction, standard safety measures would be taken to ensure children do not have access to the site. This would include use of construction fencing, signage, prohibiting trespassers, etc. After construction, placement of a fence around the property would help prevent accidents by preventing access to the property.

5.3.13 Environmental Justice

No negative impacts to minority communities are expected from any of the action alternatives. The NAA would have negative impacts to Tribal Communities from the loss of their ancestral artifacts and burials.

5.4 Cumulative Impact

The CEQ regulations define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action.” (40 CFR. § 1508.7). Actions considered in the cumulative impacts analysis include implementation of the proposed action and no action alternatives and other Federal, State, Tribal, local agencies, or government or private actions that impact the resources affected by the proposed action.

The total direct impacts associated with the proposed action are minor. Dive efforts will occur prior to construction to relocate federally protected freshwater mussel species. The non-Federal Sponsor will survey and relocate potential artifacts to an area outside of the construction area. The proposed stabilization of the Moundville Archaeological Park shoreline would benefit the local community because it would reduce erosion and provide improved safety and protection of a valuable cultural resource.

In terms of National Significance, the cumulative effects felt by Tribal Governments for the preservation of their ancestral homeland, sacred sites, and buried relatives is a positive net gain for the project. Additionally, the protection of a National Historic Landmark is also another positive effect of this project. No adverse cumulative effects are expected from the proposed action.

With the exception of the NAA, the proposed action, as well as the other action alternatives, would have no more than minor direct, indirect, mitigated, or cumulative impacts on the environment.

6. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED SHOULD THE PROPOSED ACTION BE IMPLEMENTED

Any irreversible or irretrievable commitments of resources involved in the proposed action have been considered and are either unanticipated at this time, or have been considered and determined to present minor impacts by scope and scale. Although natural habitat would be impacted, it is not considered irreversible. Vegetative plantings would be made that would restore the resource. Some larger second-growth trees may be required to be removed and their replacement with similar sized trees would be in the order of decades to reach maturity; but the impact is not irreversible.

7. ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED

In order to stabilize the streambank Moundville as proposed, the adverse impacts discussed in **Section 5** cannot be avoided. Notably the impacts to the cultural resources and existing river shoreline with their aquatic habitat would experience short-term adverse impacts in order to provide long term gain. Any adverse environmental effects, which cannot be avoided during implementation of the project, are expected to be mitigated in consultation with the appropriate review agencies and Tribes and have been minimized in design to the extent practicable.

8. THE RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The project would implement a stabilization of an existing shoreline, as previously discussed. There would be short-term negative impacts associated with the work. Long-term shoreline benefits would result by reducing the existing erosion and enhancing historic preservation. The proposed action constitutes a short-term use of man's environment and would enhance the environment of the area.

9. List of Preparers

Terry Rickey
Biologist, U.S. Army Corps of Engineers
M.S. Environmental Toxicology, University of South Alabama

Michael F. Malsom
Supervisory Biologist, U.S. Army Corps of Engineer
M.S. Environmental Science, University of Alaska, Fairbanks

Jennifer Jacobson
Environmental and Resources Branch Chief, U.S. Army Corps of Engineers
M.S. Marine Biology and Coastal Zone Management, Nova Southeastern University

Patrick O'Day
Archeologist, U.S. Army Corps of Engineers
Ph.D. Anthropology, University of Florida

10. References

2010 Census Population Of Moundville, AL

http://censusviewer.com/city/AL/Moundville/2010

Federal Emergency Management Agency. (2020, April) *FEMA's National Flood Hazard Layer (NFHL) Viewer*. Flood Mapping Products. https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&extent=-87.6679077569579,32.997991706939196,-87.58482365051269,33.03397701987572

NatureServe. (2019, October) *Potamilus inflatus*. Nature Serve Explorer. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.108966/Potamilus_inflatus

NatureServe. (2019, October) *Mycteria americana*. Nature Serve Explorer. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.105982/Mycteria_americana

NatureServe. (2019, October) *Myotis septentrionalis*. Nature Serve Explorer. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.102615/Myotis_septentrionalis

NatureServe. (2019, October) *Myotis sodalis*. Nature Serve Explorer. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100428/Myotis_sodalis]

US Army Corps of Engineers. (2017) *Biological Assessment for Foscue Creek, Marengo County, Alabama USCG Demopolis Navigational Channel Maintenance Dredging*. Mobile, AL: Mobile District.

U.S. Department of Transportation (1977) *Typical Noise Generating Sources in Typical Urban Environments*

U.S. Environmental Protection Agency. (2020, March) *Current Nonattainment Counties for All Criteria Pollutants*. Nonattainment Areas for Criteria Pollutants (Green Book).https://www3.epa.gov/airquality/greenbook/ancl.html

U.S. Fish & Wildlife Service. (2020, April) *Wetlands Mapper*. National Wetlands Inventory https://www.fws.gov/wetlands/data/Mapper.html

U.S. Fish & Wildlife Service (2019, November) *Official Species List.* Information for Planning and Conservation Tool (IPaC). https://ecos.fws.gov/ipac/

APPENDIX A 404 (b)(1) Evaluation

DRAFT

SECTION 404(B) (1) EVALUATION FOR

EMERGENCY STREAMBANK PROTECTION
MOUNDVILLE ARCHAEOLOGICAL PARK
MOUNDVILLE, ALABAMA

I. PROJECT DESCRIPTION:

a. Location. Along the left descending bank of the Black Warrior River between river miles 303 and 304. See Figure 404(b)1-1 Location of Project.

b. General Description. The work to be performed consists of the removal of debris and vegetation from approximately 700 feet (ft) of the river bank, followed by the placement of 17,000 cubic yards (cys) of Class II Alabama Department of Transportation (ALDOT) riprap along the shoreline. See Figure 404(b)1-2. Of this 17,000 cys, up to 5,500 cys of stone will be placed below the mean water elevation of 95 ft NAVD 88. This stone placement will create a stable river bank to preserve the integrity of the bank and to protect the cultural resources currently being lost to erosion.

Phase I will consist of the scraping of the bank to remove debris and vegetation that will be loaded onto a barge for disposal. A large sheet of geotextile will be staked to the top of the bank and rolled down into the water. Phase I of riprap placement will consist of creating a stone toe composed of Class II riprap placed from the water. The upstream tieback will be created by digging a trench 30 ft wide by 6 ft deep with a 10 foot bottom width and 1V:1.5H side slopes. The downstream tieback will be placed in a naturally occurring low point and will not require excavation. These tiebacks will be filled with Class II riprap. See Figure 404(b)1-3.

Phase II will consist of the placement of riprap in water and on the bank from the water and on the rock placed in Phase I. This will create a 1V:1.5H slope for the phase I stone toe and a 1V:2H slope on the phase II revetment. See Figure 404(b)1-4 and Figure 404(b)1-5. Native canes and grasses will be planted at the site to improve aesthetics and soil stability.

c. Authority and Purpose. This construction is being conducted by the U.S. Army Corps of Engineers (USACE) under the continuing authority of Section 14 of the

Flood Control Act of 1964, as amended (Section 14, Emergency Streambank and Shoreline Protection of Public Works and Non-Profit Public Services). It allows for the implementation of projects to protect public facilities and facilities owned by non-profit organizations that are used to provide public services that are open to all on equal terms. These facilities must have been properly maintained but be in imminent threat of damage or failure by natural erosion processes on streambank and shoreline, and are essential and important enough to merit Federal participation in their protection. Eligible facilities are: highways, highway bridge approaches, public works, churches, public and private non-profit hospitals, schools, and other public or non-profit facilities offering public services open to all on equal terms; and known historic properties whose significance has been demonstrated by a determination of eligibility for listing on, or actually listing on, the National Register of Historic Places. The historic property(ies) must be open to all on equal terms.

d. General Description of Fill Material.

(1) General Characteristic of Material. Material will consist ALDOT Class II Riprap. No more than 10% of the stone will have a diameter greater than sixteen (16) inches; no more than 50% of the stone will have a diameter less than twelve (12) inches; and no more than 10% of the stone will have a diameter of less than six (6) inches.

Quantity of Material. See 404(b)1 Table *1* for the quantities to be used for fill material.

Phase	Below 95 NGVD 88	Above 95 NGVD 88
Phase I (Volume)	4000 cys	1000 cys
Phase II (Volume)	500 cys	1150 cys

404(b)1 Table 1: Quantities of fill material.

(2) Source of Material. The riprap will be selected from a commercial quarry in the region.

e. Description of the Proposed Discharge Site.

(1) Location. The riprap will be placed along the bank of the river above and below the mean water line.

(2) Size. The proposed riprap revetment will be approximately 700 ft long and extending no more than 180 ft from the top of bank.

(3) Type of Site. The proposed riprap placement will be along the edge of the Black Warrior River along an eroded cut bank.

(4) Type of Habitat. The bank consist of mainly actively eroding soils, with annual vegetation and a few permanent trees. Plant colonization is reduced due to high water events inundating much of the bank during yearly floods, and the erosion events associated with both high flows and local high rainfall. Approximately 20 ft of riverbank has been lost in recent years.

(5) Timing and Duration of Discharge. Phase I of the project is to begin no sooner than August 2020. Total construction is anticipated to take approximately 90 days.

f. Description of Disposal Method. Riprap will be placed at the site from the water utilizing overhead equipment such as an excavator bucket.

II. Factual Determinations:

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. Toe generally ranges between 78 ft and 90 ft NGDV 88. Top of revetment is generally between 120 ft and 122 ft NGDV 88.

(2) Sediment Type. No sediments will be used to repair the embankments.

(3) Dredged/Fill Material Movement. No dredging will occur. Riprap will be used to construct the new river bank.

(4) Physical Effects on the Benthos. Benthic species may be crushed under the riprap as it is placed. The river substrate at the location of the toe will be changed from sand to rock. Some benthos may be indirectly impacted in the surrounding river bed as the construction may increase local turbidity.

(5) Actions Taken to Minimize Impacts (Subpart H). Construction Best Management Practices and an Erosion, Sediment, and Pollution Control Plan will be implemented to contain potential increased turbidity resulting from the disposal and construction.

b. Water Circulation, Fluctuation, and Salinity Determinations.

(1) Salinity. Not applicable.

(2) Water Chemistry. Water chemistry not be impacted.

(3) Clarity. Water clarity would be temporarily decreased in the vicinity of the construction activities. These impacts would subside once construction activities are completed.

(4) Color. Color would not be significantly impacted.

(5) Taste. Taste would not be significantly impacted.

(6) Dissolved Gas Levels. Dissolved gas levels will not be significantly affected.

(7) Nutrients. Nutrient levels would not be significantly impacted.

(8) Eutrophication. Eutrophication would not be significantly impacted.

c. Water Circulation, Fluctuation, and Salinity Gradient Determinations:

(1) Current Patterns and Circulation.

(a) Current Patterns and Flow. The riprap may locally affect flow regimes as the river bank geometry will be altered but no significant impacts are anticipated.

(b) Velocity. The riprap may locally affect river velocity as the river bank geometry will be altered but no significant impacts are anticipated.

(2) Stratification. There would be no impacts on water stratification.

(3) Hydrologic Regime. There would be no impacts on the hydrologic regime.

(4) Normal Water Level Fluctuations. There would be no impacts on water level fluctuations.

(5) Salinity Gradients. Not applicable.

d. Suspended Particulate/Turbidity Determinants.

(1) Expected Changes in Suspended Particulate and Turbidity Levels in Vicinity of Disposal Sites. A temporary increase in suspended particulates and turbidity levels would occur in the immediate vicinity of the construction zone. These impacts will subside when the activities are completed.

(2) Effects on Chemical and Physical Properties of the Water Column.

(a) Light Penetration. Increases in suspended solids concentrations will be nominal and temporary. No significant impacts to light penetration are anticipated.

(b) Dissolved Oxygen. Dissolved oxygen will not be significantly impacted.

(c) Toxic Metals and Organics. No significant increases in toxic metals and organics are expected to occur due to the construction activities.

(d) Pathogens. Pathogen levels will not be affected as a result of this project.

(e) Aesthetics. The area would be permanently changed from a natural bank to a manmade riprap slope.

(3) Effects on biota.

(a) Primary Production, Photosynthesis. Temporary, localized impacts to primary production or photosynthesis levels may result from turbidity plumes generated by construction activities. These effects would be localized and would subside upon project completion.

(b) Suspension/Filter Feeders. Suspension/filter feeders would not be significantly affected by this action. Increased turbidity will be contained using Best Management Practices and an Erosion and Sediment Control Plan.

(c) Sight Feeders. Sight feeders would be temporarily affected by increased turbidity. These effects would subside upon completion of the construction activities.

(4) Actions taken to Minimize Impacts (Subpart H). Construction Best Management Practices and an Erosion, Sediment, and Pollution Control Plan would be implemented in order to minimize impacts.

e. Contaminant Determinations. No contaminants harmful to the environment are known to exist in the proposed construction zone where the riprap would be placed during construction and operation and maintenance activities. The riprap rock used for the repair is not contaminated.

f. Aquatic Ecosystem and Organism Determinations.

(1) Effects on plankton. There may be temporary effects on plankton in the immediate vicinity of the construction zone due to increased turbidity; however these effects would be localized and short-term.

(2) Effects on Benthos. Benthic organisms within the construction zone would be crushed underneath riprap placement. Adjacent benthic communities would be indirectly impacted from increased turbidity. No significant impacts would result from this project.

(3) Effects on Nekton. Nektonic species are expected to be temporarily affected during disposal and construction and may evacuate the immediate vicinity; however they are expected to return once turbidity levels return to pre-project conditions. No significant impacts are expected.

(4) Effects on Aquatic Food Web. This project would pose no significant impacts to the aquatic food web.

(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges. No sanctuaries or refuges occur within the proposed project area; therefore there would be no impacts resulting from this project.

(b) Wetlands. No jurisdictional wetlands are located within the proposed project area; therefore no wetland vegetation would be affected by this project.

(c) Mud Flats. No mud flats exist within the project vicinity; therefore there would be no impacts as a result of the project.

(d) Vegetated Shallows. No vegetated shallows would be affected by this

(e) Coral Reefs. Not applicable.

(f) Riffle and Pool Complexes. No riffle or pool complexes would be affected by this project.

(6) Threatened and Endangered Species. The inflated heelsplitter is known to be present the waters near the project site, therefore USACE has initiated Formal Consultation with the U.S. Fish and Wildlife Services per Section 7 of the Endangered Species Act.

(7) Other Wildlife. No impacts to wildlife are anticipated.

(8) Actions to Minimize Impacts. Impacts to the species will be minimized by avoidance of the animal's habitat.

g. Proposed Fill Site Determination.

(1) Mixing Zone Determination. This activity does not require a mixing zone determination. The nature of the construction activities and constituent concentrations preclude the need for a mixing zone determination.

(2) Determination of Compliance with Applicable Water Quality Standards. The proposed action will comply with applicable water quality standards as established by the Alabama Department of Environmental Management. Water Quality Certification will be obtained prior to project construction.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supply. This project would not significantly impact municipal or private water supplies.

(b) Recreation and Commercial Fisheries. Fishing activities at the sites would

be temporarily interrupted during the construction activities. No long-term impacts are anticipated to result from this project.

(c) Water Related Recreation. The proposed action would temporarily disrupt water-related recreation at the construction site; however, no negative, long-term effects are anticipated from the action.

(d) Aesthetics. Aesthetics would be temporarily impacted during construction activities. Aesthetics would return to normal when the project is complete.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The Moundville Archaeological Park is designated as a NHL. Some cultural resources associated with the Moundville Archaeological Park must be relocated as part of this effort.

(f) Other Effects. Not applicable.

(4) Determination of Cumulative Effects on the Aquatic Ecosystem. The impacts of the proposed action would be minor and temporary and, therefore, would not contribute to adverse cumulative impacts.

(5) Determination of Secondary Effects on the Aquatic Ecosystem. Temporary and localized impacts may occur in the areas of the construction activities.

III. Findings of Compliance or Noncompliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. The proposed discharge represents the least environmentally damaging practicable alternative that would accomplish the project objectives.

c. Based on the nature of the fill material, the placement of riprap would be in compliance with applicable state water quality standards. Furthermore, water quality certification will be obtained from the State of Alabama.

d. The fill material would not violate the Toxic Effluent Standard of Section

307 of the Clean Water Act.

e. The placement of fill material would not jeopardize the continued existence of any Federally listed endangered or threatened species or their critical habitat.

f. The proposed discharge of fill material would not contribute to significant degradation of waters of the United States. Nor would it result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing; life stages of organisms dependent upon the aquatic ecosystem; ecosystem diversity, productivity and stability; or recreational, aesthetic or economic values.

g. Appropriate and practicable steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem include:

(1) Locations, times and duration of the project have been selected to minimize potential adverse impacts to the aquatic ecosystem.

(2) An interdisciplinary team has evaluated sites, and project designs have been altered per their recommendations.

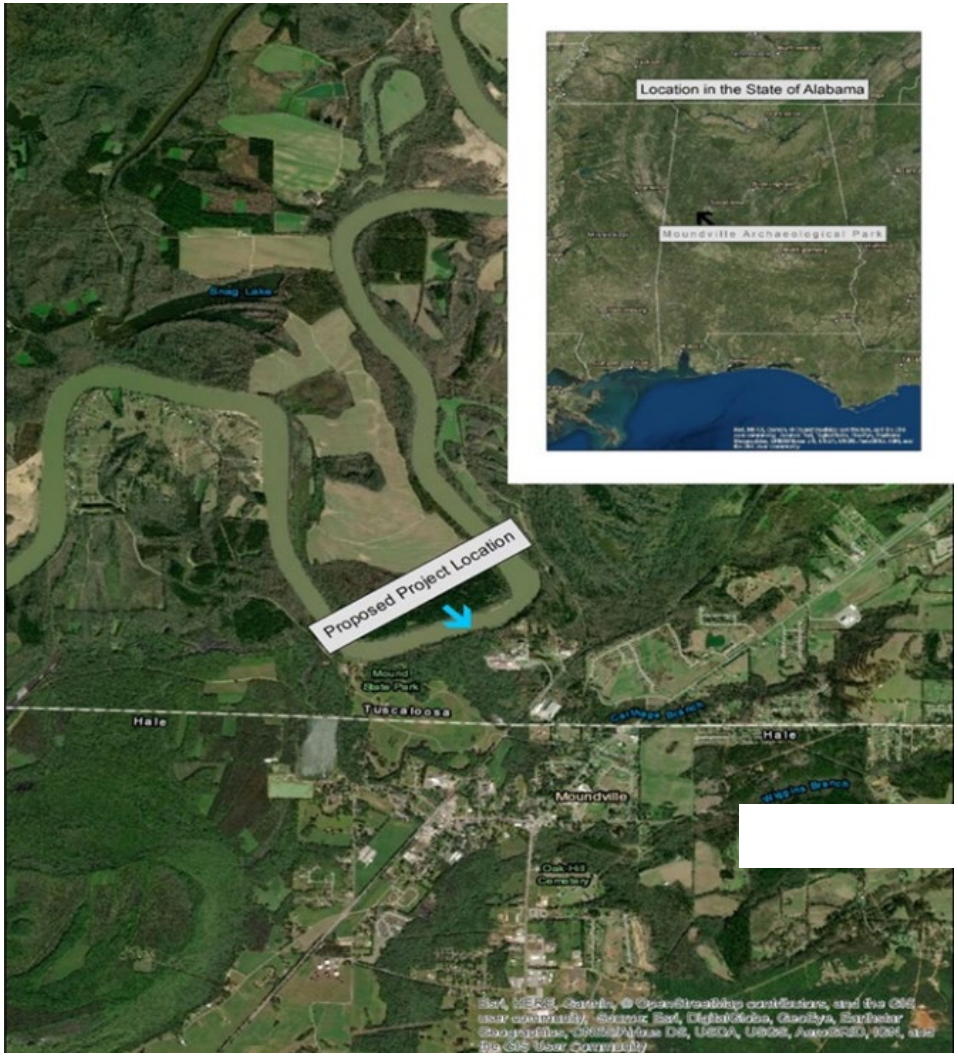
DATE: _____

_____

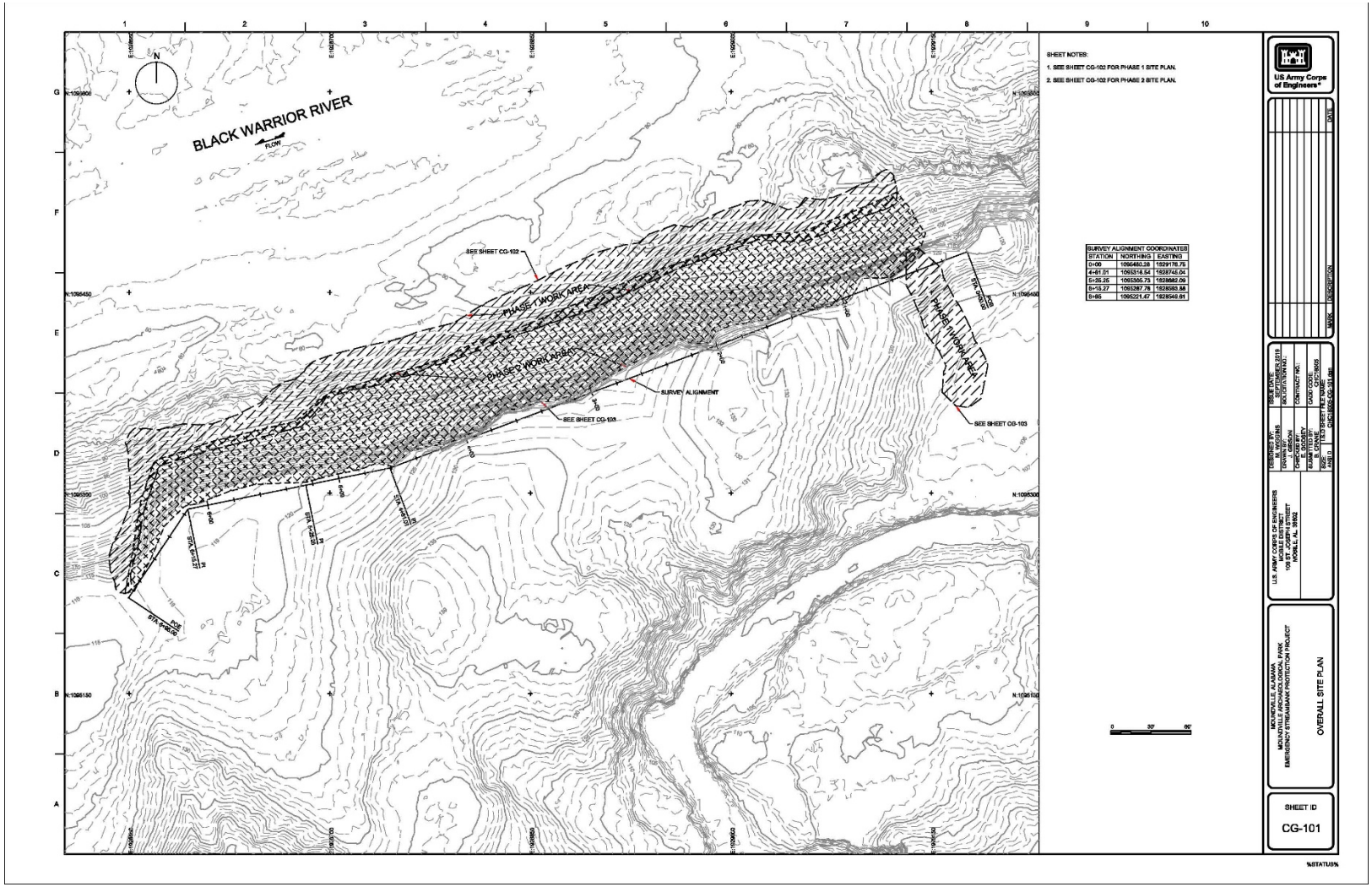
Sebastien P. Joly

Colonel, U.S. Army

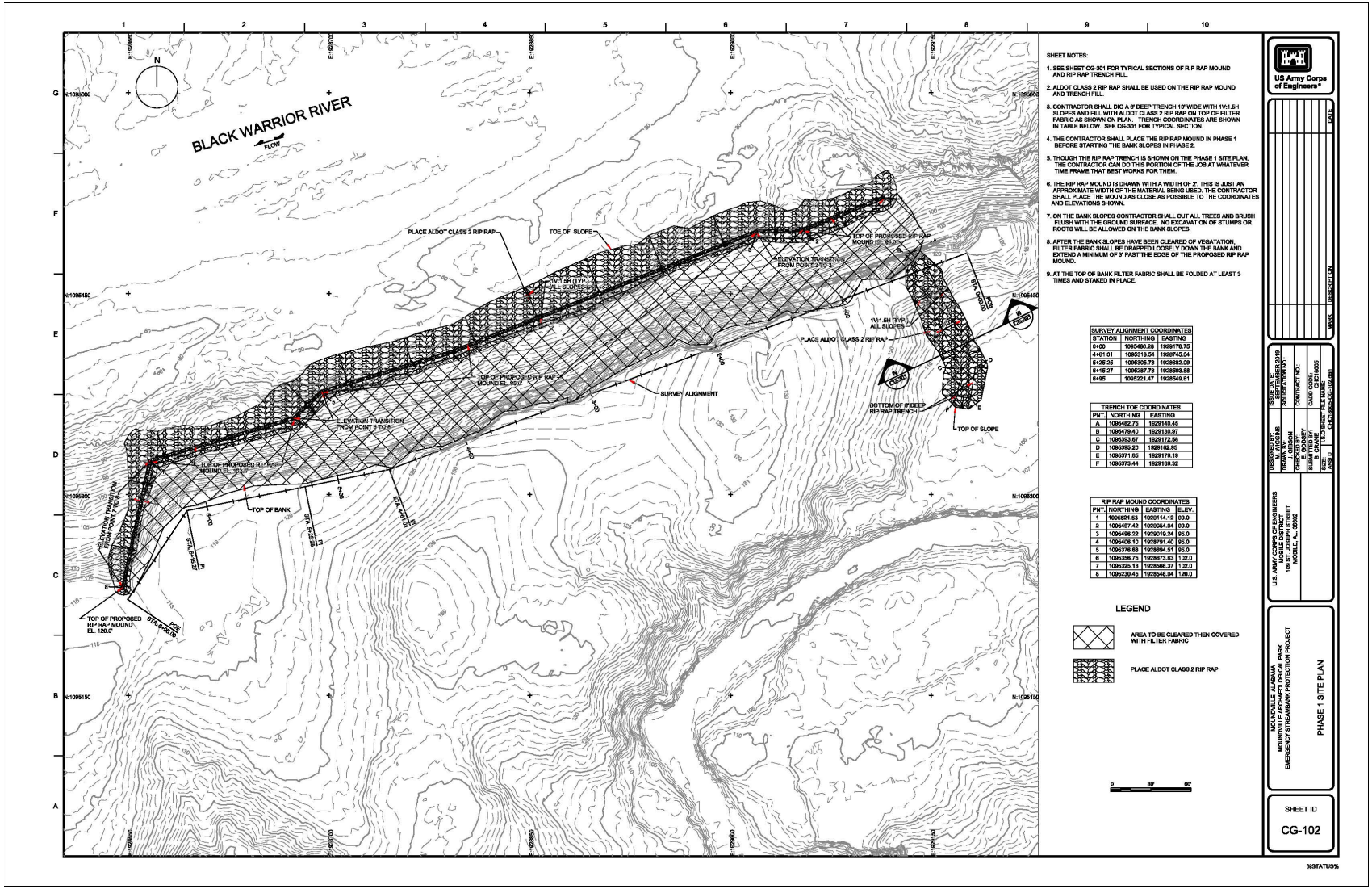
District Commander



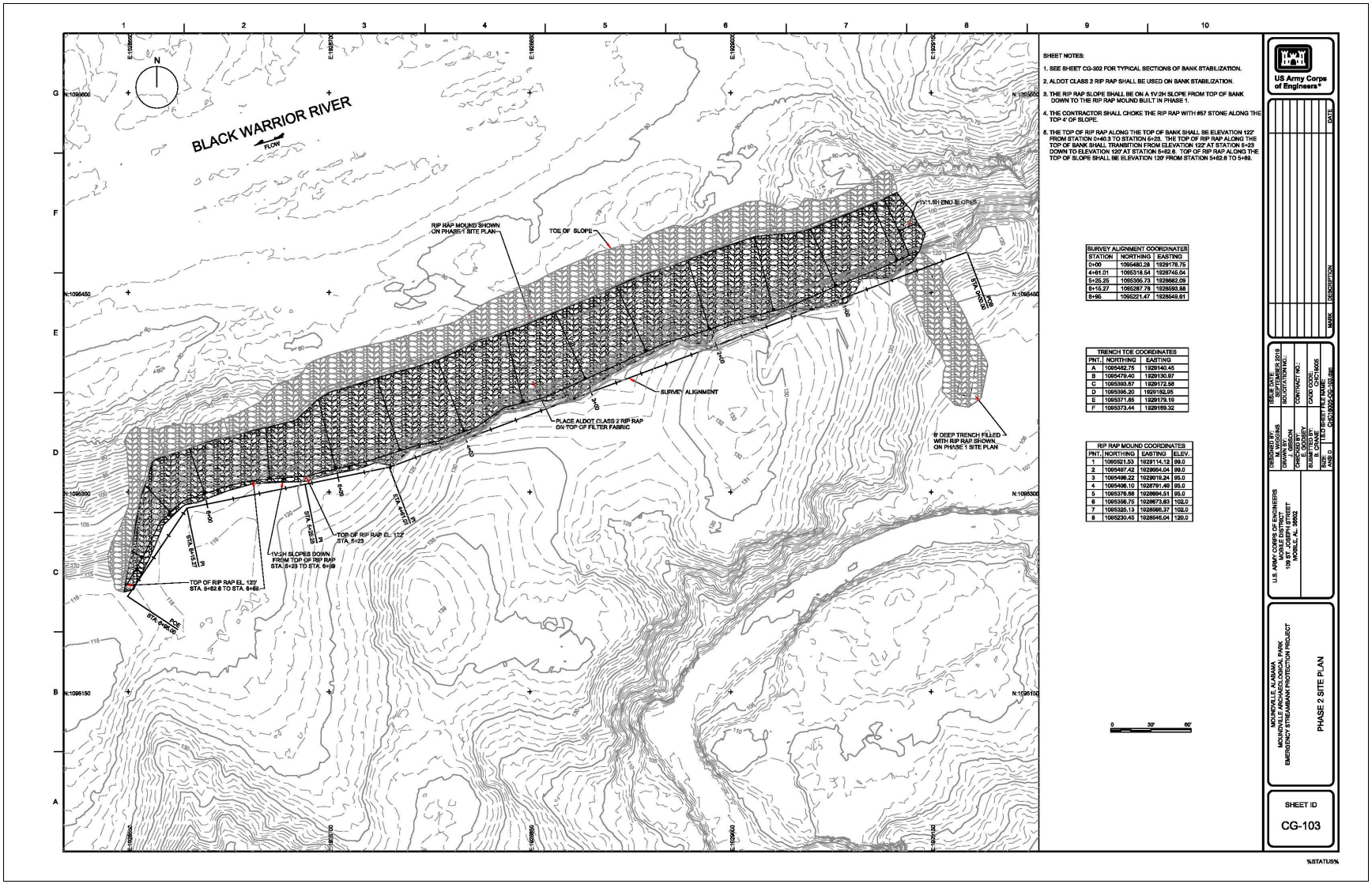
404(b)1- 1: Location of project.



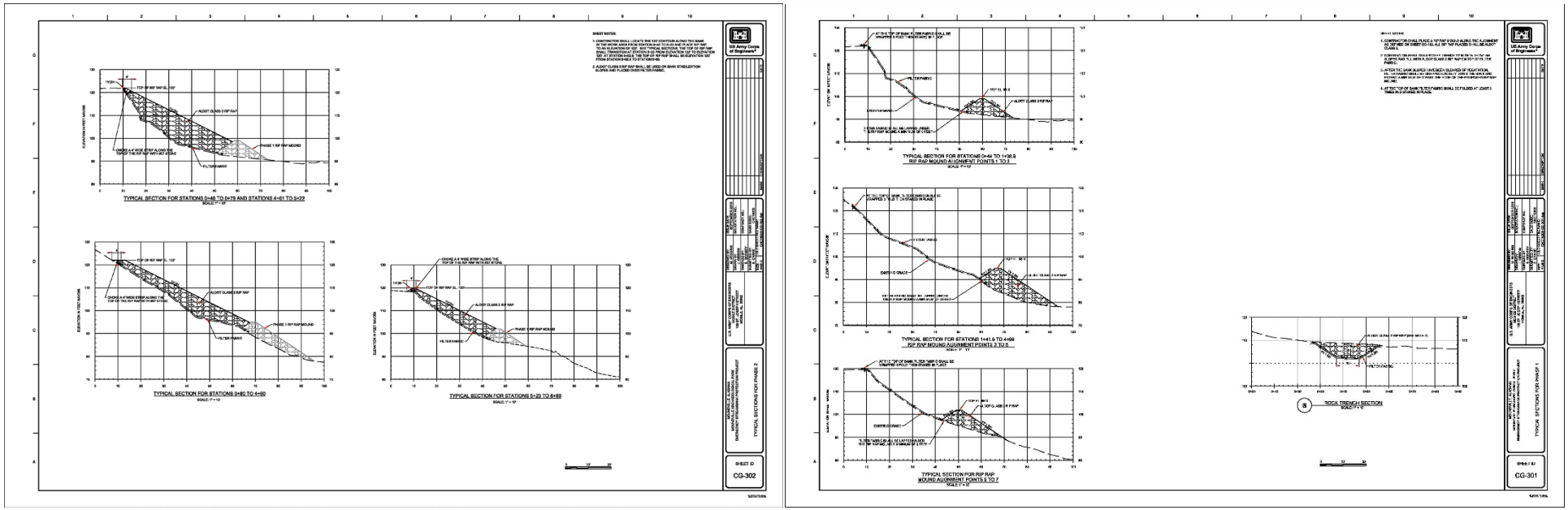
404(b)1- 2: Project overview.



404(b)1- 3: Phase I overview.



404(b)1- 4: Phase II overview.



404(b)1- 5: Typical project cross sections.

APPENDIX B CORDINATION

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

Inland Environment Team
Planning and Environmental Division

Mr. Bill Pearson
U.S. Fish and Wildlife Service
Alabama Ecological Services Field Office
1208 Main Street
Daphne, Alabama 36526

Dear Mr. Pearson:

The U.S. Army Corps of Engineers (USACE), Mobile District submits this letter to initiate formal consultation under Section 7 of the Endangered Species Act (ESA). This project proposes the stabilization of the bank of the Black Warrior River near the Moundville Archaeological Park in Tuscaloosa County, Alabama, between river miles 304 and 305.

The proposed action described in this Biological Assessment (BA) consists of the removal of debris and vegetation from approximately 700 linear feet of the river bank, followed by the placement of approximately 15,000 cubic yards of Class II ALDOT riprap along the shoreline. Of this up to 4,500 cubic yards of stone will be placed below the normal pool elevation.

The following federally listed species have been identified by the U.S. Fish and Wildlife Service as having the greatest potential to occur, and of particular concern, within the project footprint: the Indiana bat (*Myotis sodalist*), the northern long-eared bat (*Myotis septentrionalis)*, the wood stork *(Mycteria Americana)*, and the inflated heelsplitter *(Potamilus inflatus).* No critical habitat is designated within the project area.

Based upon the findings identified in the enclosed BA, we have determined the proposed activity will have no effect on the wood stork. The proposed project may affect, but is not likely to adversely affect the following species: the Indiana bat and the northern long-eared bat. USACE, Mobile District has found that the proposed action may affect and is likely to adversely affect the inflated heelsplitter.

By this letter, USACE, Mobile District request formal Section 7 consultation as required under the ESA for species identified in the enclosed BA as "likely to adversely affect" the endangered mussels.

We would appreciate your evaluation of the enclosed project information and receiving your comments or concurrence regarding our effects determination for the above referenced species. Should you need additional information, please contact Mr. Terry Rickey via phone at (251) 694-3857 or email terry.w.rickey@usace.army.mil.

Sincerely,

Jennifer L. Jacobson
Chief, Environment and Resources Branch

Enclosure

November 21, 2019

Biological Assessment

For

Moundville, Tuscaloosa, Alabama

Moundville Section 14 Emergency Stream Bank Stabilization

Introduction:

The U.S. Army Corps of Engineers (USACE), Mobile District is proposing the stabilization of the bank of the Black Warrior River near the Moundville Archaeological Park in Tuscaloosa County, Alabama, between river miles 304 and 305 (**Figure 1 of Appendix A**). This proposed action will be constructed utilizing the Continuing Authorities Program, Section 14: Emergency Streambank and Shoreline Protection authority. The University of Alabama, as the owner and operator of Moundville Archaeological Park, has expressed a need for streambank erosion assistance in the vicinity of McGowan's Bluff. The streambank erosion is progressive with bank losses near 25 feet over the past decade. Due to severe streambank erosion, Moundville Archaeological Park is currently in imminent threat of losing human remains and significant artifacts, damaging or losing the historic McGowan's Bluff on the streambank adjacent to Mound D, and experiencing damage to Mound D itself (**Figure 2 of Appendix A**). The U.S. Fish and Wildlife Service (USFWS) has expressed concern that the placement of riprap in the waters could potentially impact federally threatened inflated heelsplitter (*Potamilus inflatus)* mussels which are known to exist in the vicinity of the proposed project site. A 2015 mussel survey revealed the presence of inflated heelsplitter at the proposed project site. Based on the presence of the inflated heelsplitter at the proposed project location, the USACE, Mobile District is submitting this biological assessment (BA).

Location:

The proposed project is located along the Black Warrior River between river miles 304 and 305. The legal description is Section 36 Township 24 North Range 4 East Alabama in Tuscaloosa County, Alabama (Latitude 33°00'38.6" North Longitude 87°37'51.9"West). The river is approximately 15 feet deep at normal pool elevation at the maximum extent of the project. Project depth is variable ranging from 0 to 20 feet deep at normal river elevation. The normal pool elevation is 95 ft NAVD 88, however the river may reach 125 ft NAVD 88 during flood conditions.

Project Description:

The proposed action described in this BA consists of the removal of debris and vegetation from approximately 700 linear feet of the river bank, followed by the placement of approximately 15,000 cubic yards of Class II ALDOT riprap along the shoreline, of this up to 4,500 cubic yards of stone will be placed below the normal pool elevation. This will stabilize the river bank to preserve the integrity of the bank and to

protect the cultural resources currently being lost to erosion. The project will also include two tiebacks to secure the new riprap revetment into the existing shoreline (**Figure 3 of Appendix A**).

Construction is expected to begin in the Spring/ Summer of 2020. The bank will be scraped to bank to remove debris and vegetation and loaded onto a barge for disposal. The upstream tieback will be created by digging a trench 30 feet wide by 6 feet deep with a 10 foot bottom width and 1V:1.5H side slopes (**Figure 4 of Appendix A**). The downstream tieback will be placed in a naturally occurring low point and will not require excavation. A large sheet of geotextile will be staked to the top of the bank and rolled down into the water. Phase I of riprap placement will consist of a stone toe consisting of Class II riprap placed from the water (**Figure 5 of Appendix A**). Phase II will consist of the placement of riprap in water and on the bank from the water and on the rock placed in Phase I (**Figure 6 of Appendix A**). This will create a 1V:1.5H slope for the phase I stone toe and a 1V:2H slope on the phase II revetment. No access road will be constructed for this project. Construction should take approximately three months.

Previous Coordination:

The USACE, Mobile District initially coordinated with the USFWS Daphne Field Office on October 1, 2019 to remove trees prior to bat season that could be considered habitat for the northern long-eared bat (NLEB) and the Indiana bat during the October 15th - March 31st timeframe as outlined in the Range-wide Indiana Bat Protection and Enhancement Plan Guidelines to minimize impacts to these listed bat species. As construction is anticipated to begin in the summer of 2020, during bat roosting season, tree removal will occur during the winter of 2019-2020. The USFWS indicated via email on November 1, 2019 that they would accept the terms outlined by the USACE, Mobile District in regards to the tree clearing window. The USACE, Mobile District has also coordinated with the USFWS regarding the presence of the federally protected mussel, the inflated heelsplitter. The inflated heelsplitter was found during a 2015 endangered mussel survey and the USFWS indicated that mussel translocation would be required for this project.

Description of Listed Species:

The project area is in Tuscaloosa County, Alabama, along a bend in the Black Warrior River. The river and surrounding land are known to host threatened and endangered species. The threatened and endangered species known, or thought to occur within the county are listed in (**Table 1**).

Table 1: Threated and Endangered Species in Tuscaloosa County, AL.

Common Name	Scientific Name	Status
Mammals		
Gray Bat	*Myotis grisescens*	**E**
Indiana Bat	*Myotis sodalis*	**E**
Northern Long-eared Bat	*Myotis septentrionalis*	**T**
Birds		
Red-cockaded Woodpecker	*Picoides borealis*	**E**
Wood Stork	*Mycteria americana*	**T**
Reptiles		
Flattened Musk Turtle	*Sternotherus depressus*	**T**
Amphibians		
Black Warrior (=sipsey Fork) Waterdog	*Necturus alabamensis*	**E**
Fishes		
Cahaba Shiner	*Notropis cahabae*	**E**
Goldline Darter	*Percina aurolineata*	**T**
Clams		
Alabama Moccasinshell	*Medionidus acutissimus*	**T**
Dark Pigtoe	*Pleurobema furvum*	**E**
Finelined Pocketbook	*Lampsilis altilis*	**T**
Inflated Heelsplitter	*Potamilus inflatus*	**T**
Orangenacre Mucket	*Lampsilis perovalis*	**T**
Ovate Clubshell	*Pleurobema perovatum*	**E**
Southern Acornshell	*Epioblasma othcaloogensis*	**E**
Southern Clubshell	*Pleurobema decisum*	**E**
Triangular Kidneyshell	*Ptychobranchus greenii*	**E**
Upland Combshell	*Epioblasma metastriata*	**E**
Snails		
Cylindrical Lioplax (snail)	*Lioplax cyclostomaformis*	**E**
Flat Pebblesnail	*Lepyrium showalteri*	**E**
Round Rocksnail	*Leptoxis ampla*	**T**
Insects		
Mitchell's Satyr Butterfly	*Neonympha mitchellii mitchellii*	**E**
Flowering Plants		
Gentian Pinkroot	*Spigelia gentianoides*	**E**
Georgia Rockcress	*Arabis georgiana*	**T**
Mohr's Barbara's Buttons	*Marshallia mohrii*	**T**

Tennessee Yellow-eyed Grass	*Xyris tennesseensis*	**E**
White Fringeless Orchid	*Platanthera integrilabia*	**T**

Further evaluation via the USFWS's Information for Planning and Conservation Tool (IPaC) which uses an overlay of the proposed project area and the river bend downstream. IPaC was used to obtain the official species list obtained for the project (04EA1000-2019-SLI-1231) showed that of the threatened and endangered species known, or thought to occur within the county, only four occur, and are thought to occur within the project footprint. Those species include the Indiana bat, the northern long-eared bat, the wood stork, and the inflated heelsplitter. The species that are known, or thought to occur, within the project area are listed in (**Table 2**). No critical habitat is designated within the project area.

Table 2: Threatened and endangered species around the project footprint (04EA1000-2019-SLI-1231).

Common Name	**Scientific Name**	**Status**
Mammals		
Indiana Bat	*Myotis sodalist*	**E**
Northern Long-eared Bat	*Myotis septentrionalis*	**T**
Birds		
Wood Stork	*Mycteria americana*	**T**
Clams		
Inflated heelsplitter	*Potamilus inflatus*	**T**
Designated Critical Habitat		**None**

Wood Stork

The wood stork (*Mycteria americana)* inhabits chiefly freshwater marshes, swamps, lagoons, ponds, flooded fields; and depressions in marshes during drought. They nest primary in cypress trees, mangroves, and dead hard woods over shallow lakes. Foraging occurs in shallow waters of swamps, flooded lowlands, and flooded depressions (Nature Serve, 2019). The proposed project area has a steep slope and is relatively deep. There are no wetlands or ponds within the project footprint. The Wood stork (*Mycteria americana*) would not be affected due to lack of suitable nesting and foraging habitat.

Bats

The Indiana bat primarily inhabits caves. The Indiana bat forages in riparian areas, upland forest, ponds, and fields and feeds upon flying insects. Mating occurs

from August to October and sperm is then stored through hibernation. Females then become fertilized soon after emergence from hibernation and pups are born in June and July. Female Indiana bats typically give birth to one pup. Summer habitat consist of wooded areas often along streams. Roost trees can include elm, oak, beech, hickory, maple, ash, sassafras, birch, sycamore, locust, aspen, cottonwood, pine, and hemlock. Maternity sites consist of the bark of dead, dying, and exfoliating trees in addition to cavities in trees (NatureServe, 2019).

The NLEB inhabits both caves and old-growth forest. Mating occurs in late summer and early fall; during this swarming period large groups congregate in caves. Females store sperm through hibernation and then become fertilized soon after emergence. Pups are born in June and July. The NLEB normally gives birth to one pup. Most nursery colonies occur in cavities or beneath loose bark in trees or snags in upland forests, females use a wide variety of trees. The NLEB feeds upon insects both flying and on the ground. Foraging occurs in riparian areas, upland forest, ponds, and fields. (NatureServe, 2019).

Upon taking the actions regarding tree removal outlined in the October 1, 2019 letter, the USACE, Mobile District determines that this project may affect, and is not likely to adversely affect the following species; the Indiana bat (*Myotis sodalist*), and the northern long-eared bat (*Myotis septentrionalis)*.

Inflated Heelsplitter

Of particular concern in the proposed project vicinity is the inflated heelsplitter (*Potamilus inflatus*). The inflated heelsplitter is a moderately sized bivalve reaching an adult size of about 5 ½ inches in length. It is black and brown in color, juveniles may have green rays.

Adult inflated heelsplitter are sedentary, spending most of their lives near where they dropped out. Horizontal movement is slow, but individuals have been known to move a few meters (NatureServe, 2019). With the exception of these few observations, the life history is presumed to be similar to that of other Unionids. During the spawning period, males discharge sperm into the water and females collect the sperm by the siphoning process. Eggs are fertilized and held in the female's gills where they develop into larvae or glochidia. The glochidia are discharged into the water where they attach to a fish host, become encysted, and metamorphose into juvenile mussels that are capable of surviving if they fall to suitable substrata. Mussels are also dependent upon the water currents to bring food particles within the range of their siphons (US Army Corps of Engineers, 2017).

This species is found in sand, mud, silt, and sandy-gravel substrates in slow to moderate currents and is usually collected on the protected side of bars in water as deep as 20 feet (US Army Corps of Engineers, 2017).

A 2015 survey conducted by AST Environmental (**Appendix B**) at the proposed project site revealed that the project site contained potentially suitable habitat for freshwater mussels including the inflated heelsplitter. In addition, a total of 23 protected inflated heelsplitter mussels were observed.

The USACE, Mobile District has found that the proposed action "may affect" and is likely to adversely affect the inflated heelsplitter.

Designated Critical Habitat

This project will not overlap any designated critical habitat.

Effects of Proposed Action:

Vegetation Removal and Bank Clearing

The removal of vegetation in the project area could potentially impact bat roosting areas. To avoid impacting either bat species, USACE, Mobile District will follow the procedures outlined in the Range-wide Indiana Bat Protection and Enhancement Plan Guidelines provided by the USFWS. In accordance with that guidance, live trees and/or snags ≥ 3 inches diameter at breast height (dbh) that have exfoliating bark, cracks, crevices, and/or hollows, will be cleared from October 15 to March 31. Vegetation removal may impact the inflated heelsplitter by raising the turbidity of the river in the vicinity of the project construction. The USACE, Mobile District shall follow best management processes during the construction of the proposed project to avoid soils and debris being inadvertently introduced into the water during the process of bank scraping. Temporary increased erosion from the bank may occur once the vegetation is removed. This will be temporary and will end once filter fabric and rock are placed on the site. The USACE, Mobile District shall follow best management processes during the construction of the proposed project.

Riprap Placement

To reduce the risk of potential direct impacts, the USACE, Mobile District will have USFWS permitted biologist remove any locatable mussels within the specific project area and relocate them in an area downstream of the construction area. This area will be determined by the mussel relocation team and approved by the USFWS.

Riprap placement is expected to adversely impact the inflated heelsplitter. Any mussels not relocated may be destroyed by the placement of riprap. The nature of riprap placement means that this project will remove approximately 3,000 sq. yards of suitable habitat for the inflated heelsplitter. Temporary degradation in the turbidity in excess of the natural condition is expected due to the deposition of riprap disturbing the sediment along the river bottom. After the completion of site work, the turbidity should return to normal levels and see a decrease from the current conditions due to reduced bank sloughing. The temporary degradation of water quality due to construction activities may adversely affect downstream mussels. However, the stabilization of the streambank will help prevent future habitat degradation and water quality degradation downstream of the project due to reduction in streambank mass wasting events.

Conservation Measures:

The following conservation measures and conditions are provided for the work within the project area:

- To avoid impacting either bat species the USACE, Mobile District will follow the procedures outlined in the Range-wide Indiana Bat Protection and Enhancement Plan Guidelines provided by the USFWS. In accordance with that guidance, live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or hollows, will be cleared from October 15 to March 31.
- The USACE, Mobile District will collect and translocate any locatable federally protected inflated heelsplitters present within the riprap placement footprint. All inflated heelsplitters will be collected and transported by a USFWS permitted biologist, in accordance with all USFWS protocols and reporting requirements.
- Best management practices would be used to minimize impacts to adjacent biological resources during construction. Best management practices to be used include monitoring turbidity levels and ensuring compliance with the Alabama Department of Environmental Management water quality certification.

Conclusion:

Based on the findings of this BA, the habitat for wood stork is not present in the project area; therefore, USACE has determined there will be "no effect". Upon taking the actions regarding tree removal outlined in the October 1, 2019 letter, the USACE determines that the proposed project "may affect", and is not likely to adversely affect the the Indiana bat (*Myotis sodalist*), or the northern long-eared bat (*Myotis septentrionalis).* The USACE has found that the proposed action "may affect" and is likely to adversely affect the inflated heelsplitter. The USACE will implement appropriate measures to minimize impacts to the mussel. However, due to the nature of the construction work, there could be unavoidable adverse impacts to the species if they

are not located during the mussel removal operation that is to occur before riprap placement occurs.

References:

NatureServe. 2019. "*Mycteria americana*" NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: October 22, 2019).

NatureServe. 2019. "*Myotis septentrionalis*" NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: October 22, 2019).

NatureServe. 2019. "*Myotis sodalist*" NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: October 22, 2019).

NatureServe. 2019. "*Potamilus inflatus*" NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: October 22, 2019).

US Army Corps of Engineers. (2017). Biological Assessment For Foscue Creek, Marengo County, Alabama USCG Demopolis Navigational Channel Maintenance Dredging. Mobile, AL: Mobile District.

List of Preparers

Terry Rickey- Principle Preparer
Biologist, U.S. Army Corps of Engineers
M.S. Environmental Toxicology, University of South Alabama
(251) 694-3857 terry.w.rickey@usace.army.mil

Michael F. Malsom- Reviewer
Supervisory Biologist, U.S. Army Corps of Engineers
M.S. Environmental Science, University of Alaska, Fairbanks
(251) 690-2023 michael.f.malsom@usace.army.mil

Jennifer Jacobson- Reviewer
Environmental and Resources Branch Chief, U.S. Army Corps of Engineers
M.S. Marine Biology and Coastal Zone Management, Nova Southeastern University
(251) 690-2724 jennifer.l.jacobson@usace.army.mil

APPENDIX A: Figures

Figure 1: Proposed Project Location in Moundville, Alabama. Latitude 33°00'38.6"North Longitude 87°37'51.9"West.

Figure 2: Erosion of Moundville Archaeological site.

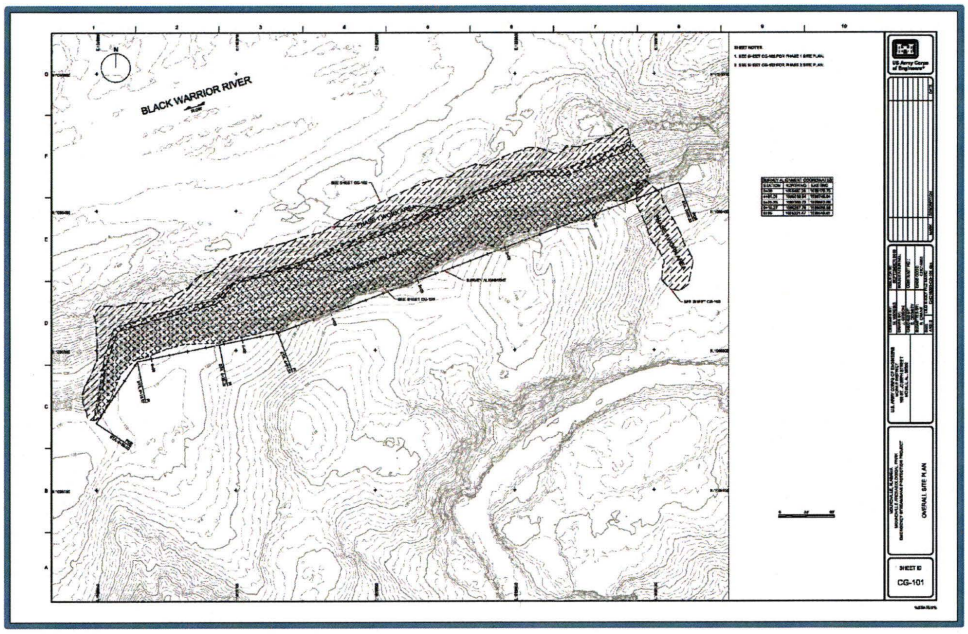


Figure 3: Proposed action footprint for the Moundville Section 14 project.

XXX

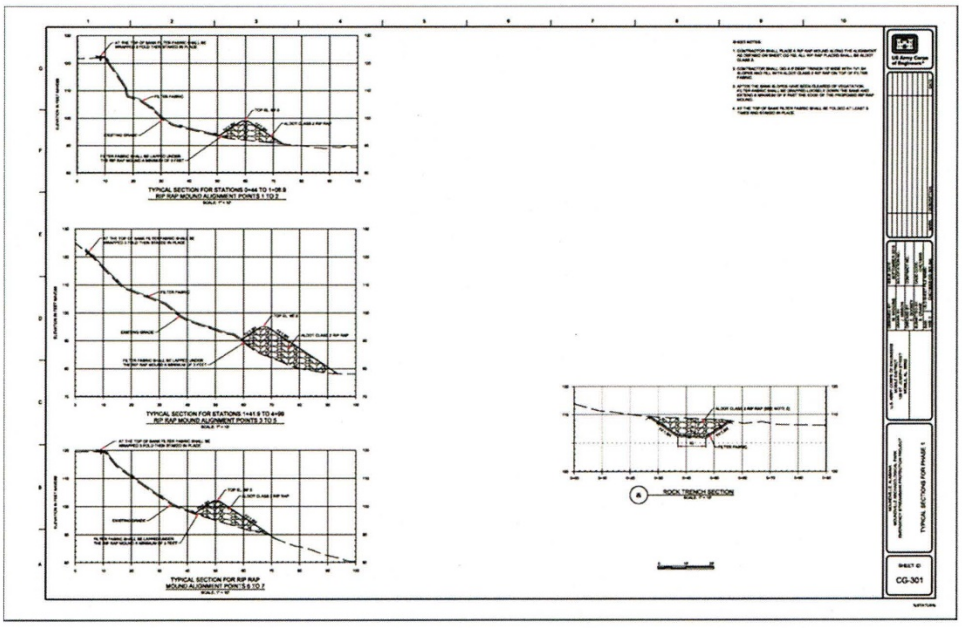


Figure 4: Typical cross-sections of the project. Note the rock trench cross section on the bottom right.

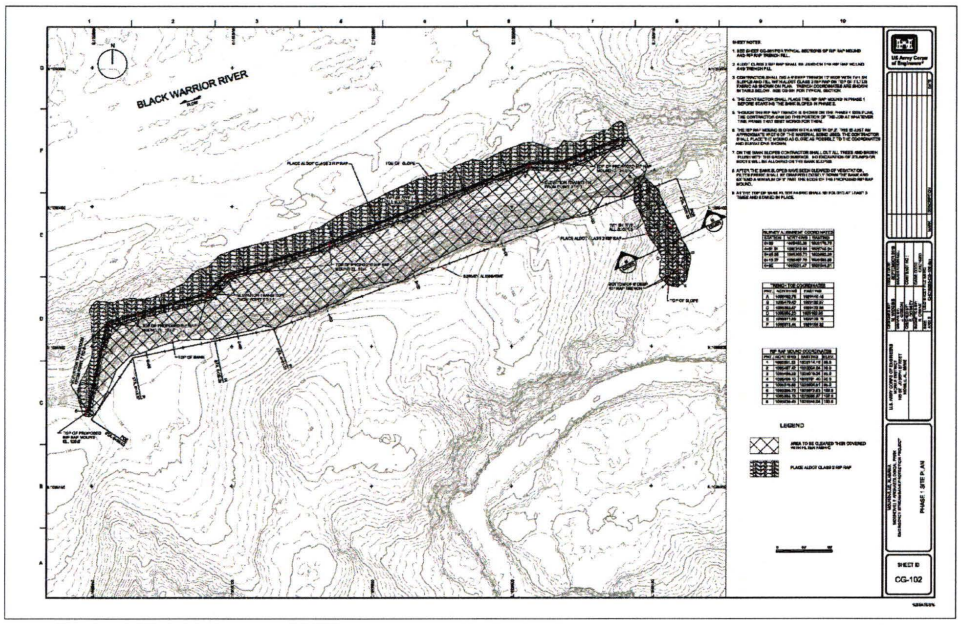


Figure 5: Phase I of riprap placement.

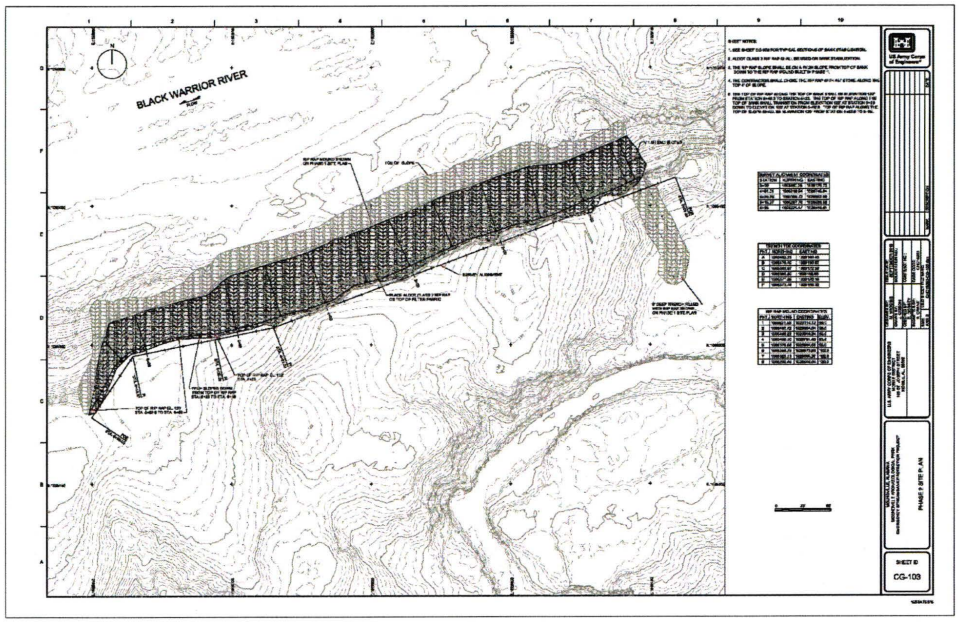


Figure 6: Phase II of riprap placement.

APPENDIX B: AST Environmental Mussel Survey Report

AST Environmental

98 Mark Selby Pvt. Dr.
Decatur, AL 35603
Phone: (256) 476-7355

July 14, 2015
JS15-112

TO: TTL
20210 Highway 59 N, Suite 2
Summerdale, Alabama 36580

ATTENTION: Mary Beth Sullivan

RE: Protected Species Survey
Black Warrior River
Moundville, Alabama – Tuscaloosa County

Ms. Sullivan:

AST Environmental (AST) is pleased to present this report of findings for the above referenced project. Our survey methods and results are detailed below.

PROJECT INFORMATION
The proposed project consists of bank stabilization along the south shore of the Black Warrior River near the Moundville State Park. An approximate 2,500-feet reach of shoreline is to be stabilized using rip-rap to prevent or reduce shoreline erosion (see attached Survey Map).

BACKGROUND INFORMATION
The Black Warrior River is part of the Mobile drainage basin and is the largest river system contained entirely within the state of Alabama. The river flows 178 miles (286 km) in a southwesterly direction to its confluence with the Upper Tombigbee River with its drainage basin encompassing nearly 6,275 square miles (16,252 km^2).

Currently, there are 51 known freshwater mussel species estimated to exist within the Black Warrior River Basin including several federally listed species. The lower mainstem of the Black Warrior River supports 36 bivalve species, five of which are known to be federally listed. Only one species, the Inflated Heelsplitter (*Potamilus inflatus*), is known to exist in the vicinity of the proposed bank stabilization project.

In July of 2004, the U.S. Fish and Wildlife Service (USFWS) designated critical habitat for several federally listed mussel species within the Black Warrior River Basin; however, no critical habitat was designated in the mainstem Black Warrior River or the site of the proposed bank stabilization project. In addition to the designation of critical habitat, the USFWS also approved and published the multi-species Mobile River Basin Aquatic Ecosystem Recovery Plan in November 2000. The immediate goal of the recovery plan is to prevent the further decline of these species by locating, protecting, and restoring sites with remaining populations. The Inflated Heelsplitter was included in this recovery plan.

SPECIES INFORMATION

The Inflated Heelsplitter, *Potamilus inflatus*, was federally listed as Threatened by the USFWS in 1990 and is protected throughout its range. The shell of the Inflated Heelsplitter, is brown to black and may have green rays in young individuals. Adults attain a maximum shell length of about 140 mm (5 ½ in.). The shell outline is roughly trapezoidal with an obliquely truncate posterior margin and a bluntly pointed anterior margin. A dorsal wing is just posterior to the umbo and ventral margin is somewhat convex and sinusoid in profile. The preferred habitat is soft, stable substrates like sand, mud, silt, and sandy-gravel in large to intermediate rivers and streams with slow to moderate flow. It is typically found on sloping banks of inside bends and the protected side of bars, in water as deep as 20 feet. This species is known historically from the Amite and Tangipahoa rivers, LA; the Pearl River, MS; and the Alabama, Tombigbee, Black Warrior, and Coosa Rivers, AL. The current distribution is limited to the Amite River in Louisiana and the Alabama, Tombigbee, and Black Warrior rivers in Alabama. The Alabama River population's viability is in question.

SURVEY METHODS

A mussel survey was conducted in order to determine the presence or absence of federally listed species in areas to be affected by the proposed bank stabilization. Specifically, AST surveyed 10, 60-feet x 100-feet areas within the Black Warrior River for the presence of the federally protected (Threatened) Inflated Heelsplitter mussel (*Potamilus inflatus*). Ten points along the 2,500 shore project line were selected for survey. Each of the 10 search areas extended 60-feet out from shore and 50-feet upstream and 50-feet downstream from each survey point. The survey included intense visual and tactile examination of the river substrate for the presence of freshwater mussels within each search area. A surface air supplied diving rig equipped with a surface to diver communication system was used to complete the survey.

The protected species survey was completed in accordance with USFWS protocol. Jeff Selby (USFWS Federal Collection Permit TE100626-8) was the lead biologist on the survey.

SURVEY RESULTS

Survey locations 033-08 and 033-09 were located at the upstream portion of the project. The river banks in the vicinity of these two sites were particularly eroded above and below the water line. Suitable habitat for freshwater mussels was only marginally present at search areas 033-08 and 033-09. No mussels were present at 033-08.

Locations 033-10 through 033-17 contained potentially suitable habitat for freshwater mussels including the Inflated Heelsplitter. The substrate at seven of the eight downstream search areas was comprised of 95-100% clean, firm sandy mud with ≤5% gravel. The substrate at search area 033-14 was comprised of 95% clean, firm sandy mud and 5% sticky clay (only potentially suitable habitat). See Table 1 for a list of habitat findings by search area.

Freshwater mussels, including the listed Inflated Heelsplitter, were present within all but one (Location 033-08) of the 10 search areas (Table 2). The Inflated Heelsplitter was the most common mussel found during the survey with 23 individuals and was most abundant at location 033-17 where eight specimens were found. Also fairly common were *Lampsilis teres*, *P. purpuratus* and *Obliquaria reflexa.* See Table 2 for a complete list of species findings by search location.

CONCLUSIONS
A total of 23 protected Inflated Heelsplitter mussels were observed within the 10 60-ft x 100-ft search areas. Due to the finding of listed species in the proposed bank stabilization activity area, The US Fish and Wildlife Service should be consulted prior to initiating any proposed bank stabilization activity. Please feel free to call should you have further questions. I can be reached at **(256) 476-7355.**

Sincerely,

Jeff Selby, M.S.
Senior Biologist
AST Environmental

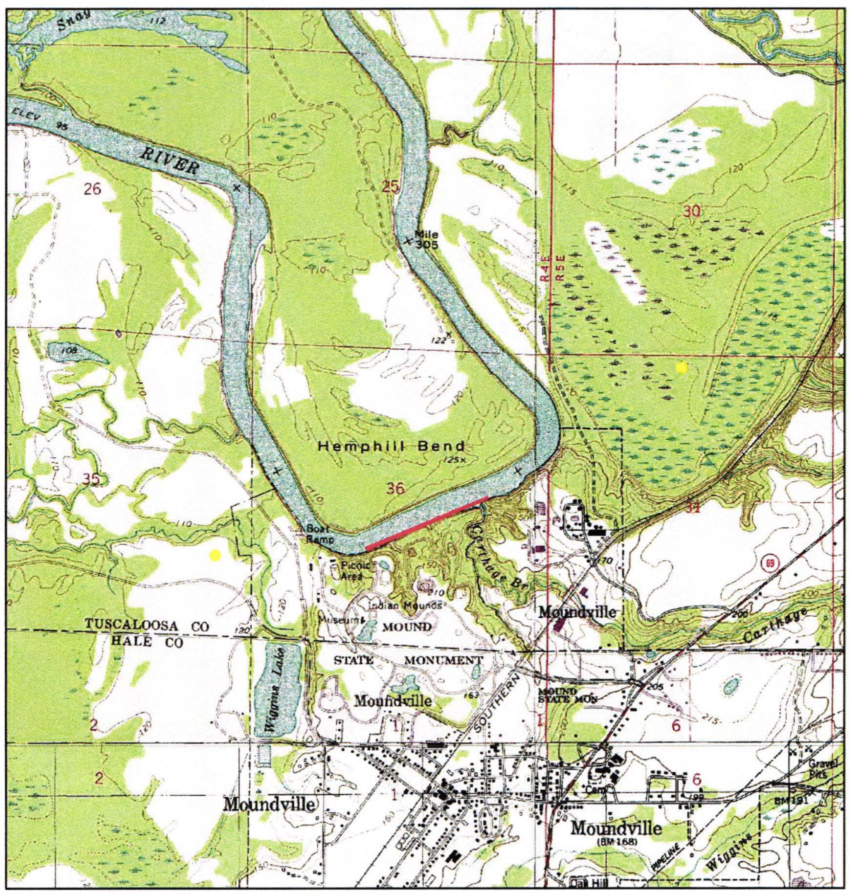
Table 1. Water depth and estimated substrate composition within 10 (100 feet x 60 feet) search areas located along the southern bank of the Black Warrior River at Moundville State Park. Tuscaloosa County, Alabama.

Location	Water Depth *(max. feet)*	Sandy Mud	Hard Clay	Sticky Clay	Gravel	Cobble
033-08	30	20	65	5	10	
033-09	17	15	65	10	5	5
033-10	17	95			5	
033-11	15	95			5	
033-12	16	100				
033-13	14	100				
033-14	12	95		5		
033-15	14	100				
033-16	10	100				
033-17	10	100				

Table 2. Freshwater mussel species composition within 10 (100 feet x 60 feet) search areas located along the southern bank of the Black Warrior River at Moundville State Park, Tuscaloosa County, Alabama.

Location	*Potamilus inflatus* *	*P. purpuratus*	*Lampsilis straminea*	*L. teres*	*Lasmigona complenata*	*Leptodea fragilis*	*Obliquaria reflexa*	*Plectomerus dombeyanus*	*Quadrula apiculata*
033-08									
033-09				2					
033-10	1, 1r				1r		1		
033-11	1, 1r	3, 1r		2, 1r		1r	1		1
033-12	2	1					1		1
033-13	4, 1r	3	1	4			2	1	1
033-14		1					2		
033-15	3			1					1
033-16	4, 1r								
033-17	8	3		2			3		
Total	23	11	1	11			10	1	4

* Federally listed as Threatened; r = relict
033-15 2 juveniles present in sample
033-17 2 juveniles present in sample



0 2,500 5,000 Feet

SCALE = 1 : 24,000

N

Site Location

Site Coordinates:
N 33.00968
W -87.63468

SITE MAP JS15-112
Black Warrior River
Tuscaloosa County, AL

AST Environmental

SOURCE: USDA - NRCS DRG and NAIPM
Tuscaloosa County, Alabama

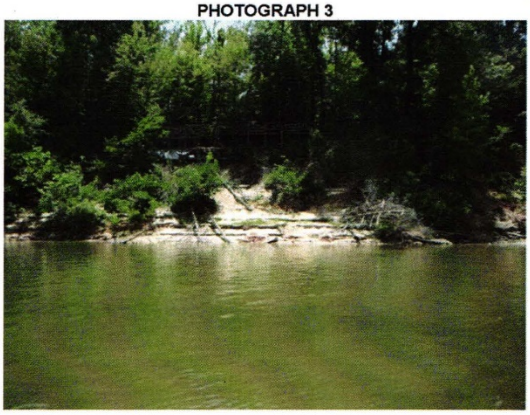
PHOTOGRAPH 1

Black Warrior River, facing south near proposed bore location 033-08. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 2

Black Warrior River, facing south near proposed bore location 033-09. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 3

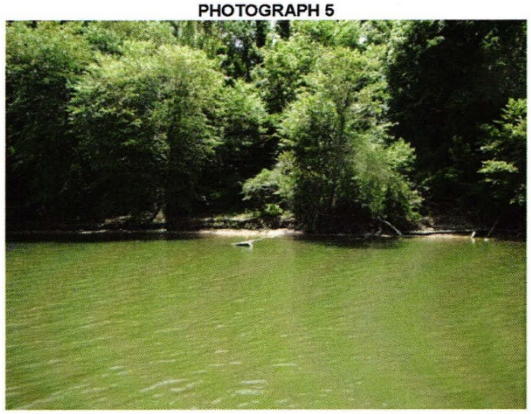


Black Warrior River, facing south near proposed bore location 033-10. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 4

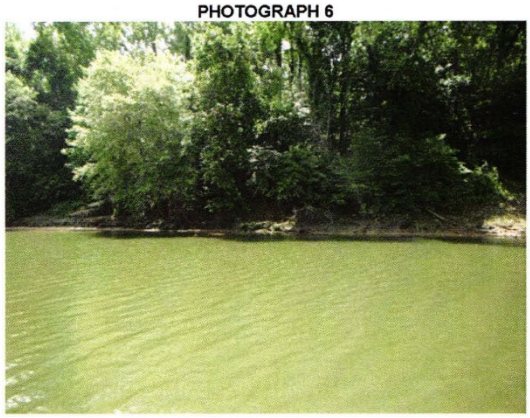
Black Warrior River, facing south near proposed bore location 033-11. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 5



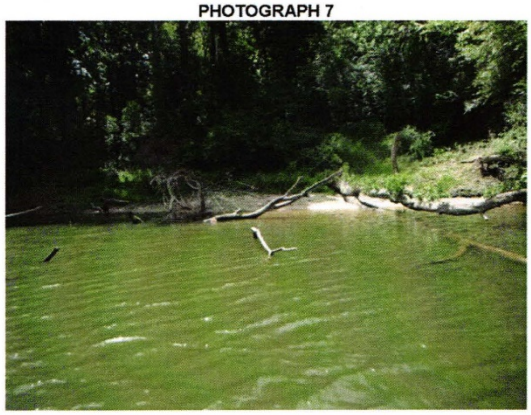
Black Warrior River, facing south near proposed bore location 033-12. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 6



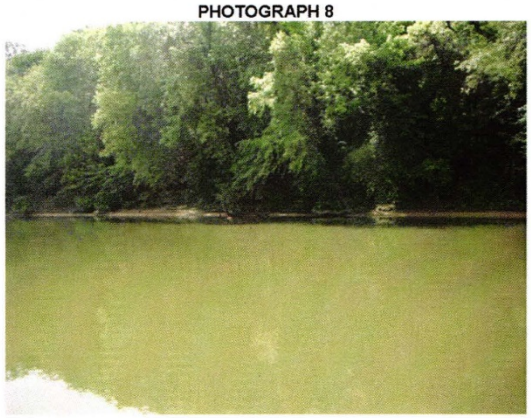
Black Warrior River, facing south near proposed bore location 033-13. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 7



Black Warrior River, facing south near proposed bore location 033-14. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 8



Black Warrior River, facing south near proposed bore location 033-15. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 9

Black Warrior River, facing south near proposed bore location 033-16. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 10

Black Warrior River, facing south near proposed bore location 033-17. Taken by Jeff Selby, 7-8-15.

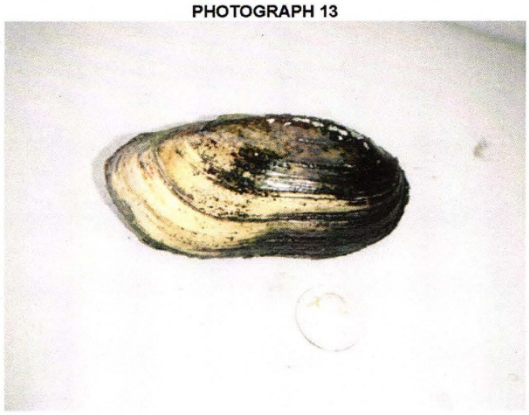
PHOTOGRAPH 11

Potamilus inflatus collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 12

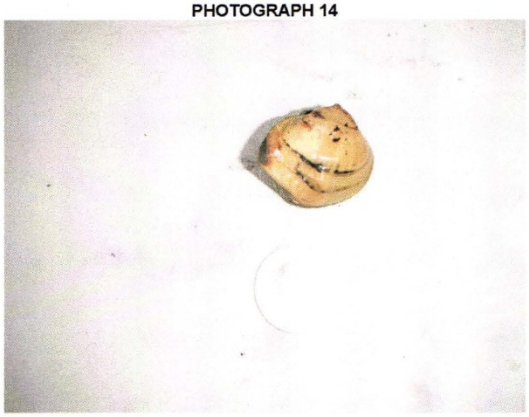
Lampsilis straminea collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 13



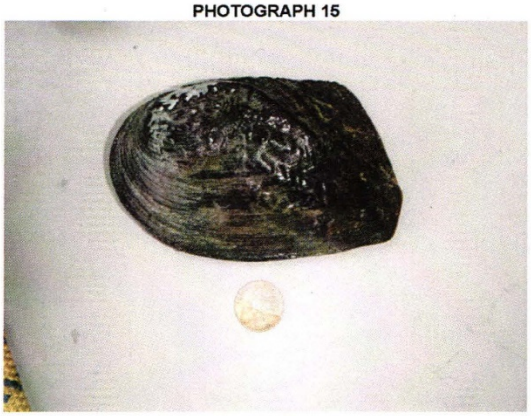
Lampsilis teres collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 14



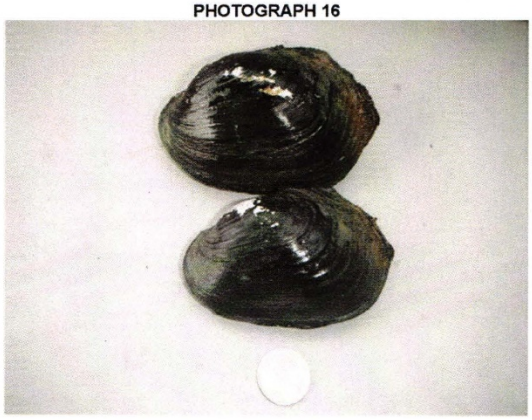
Obliquaria reflexa collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 15



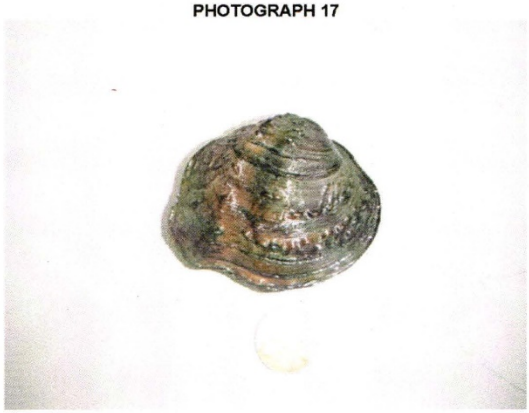
Plectomerus dombeyanus collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 16



Potamilus purpuratus collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 17



Quadrula apiculata collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 18

Lasmigona complanata relict shell collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

PHOTOGRAPH 19

Leptodea fragilis relict shell collected from the Black Warrior River. Taken by Jeff Selby, 7-8-15.

APPENDIX C: Letter regarding bats to the USFWS.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

Inland Environment Team
Planning and Environmental Division

Mr. Bill Pearson
U.S. Fish and Wildlife Service
Alabama Ecological Services Field Office
1208 Main Street
Daphne, Alabama 36526

Dear Mr. Pearson:

The U.S. Army Corps of Engineers (USACE), Mobile District is proposing the stabilization of the bank of the Black Warrior River near the Moundville Archaeological Park in Tuscaloosa County, Alabama between river miles 304 and 305 (Enclosure 1). This proposed action will be constructed utilizing the existing Continuing Authorities Program, Section 14: Emergency Streambank and Shoreline Protection authority.

The University of Alabama, as the owner and operator of Moundville Archaeological Park, expressed a need for streambank erosion assistance in the vicinity of McGowan's Bluff. The streambank erosion is progressive with bank losses near 25 feet over the past decade. Due to severe streambank erosion, Moundville Archaeological Park is currently in imminent threat of losing human remains and significant artifacts, suffering damage to the historic McGowan's Bluff on the streambank adjacent to Mound D, and experiencing damage to Mound D itself (Enclosure 2).

This proposed action will consist of debris and vegetation removal including approximately one acre of trees along approximately 700 feet of the river bank, followed by riprap placement along the shoreline and in the water (extending approximately 50 feet from the normal river elevation mark). This proposed action will stabilize and preserve the integrity of the river bank in order to protect the culturally sensitive resources currently being lost to erosion. The project will also include two dug tiebacks to secure the new riprap revetment into the existing shoreline (Enclosure 3). Construction on this project is anticipated to begin in the summer of 2020.

Pursuant to the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (USFWS) lists the following species as either threatened or endangered that may occur within the project area: the Indiana bat (*Myotis sodalist*), the northern long-eared bat (*Myotis septentrionalis*) [NLEB], the wood stork (*Mycteria Americana*), and the inflated heelspliter (*Potamilus inflatus*).

While it is anticipated that there will be no effect for the wood stork, listed bat species and the inflated heelsplitter may be affected by the project's implementation. Following the Guidelines set forth by USFWS for the Indiana bat and the NLEB, USACE, Mobile District will avoid impacts to those listed bat species by harvesting those described trees with suitable roosting habitat characteristics before the project begins. Those characteristics include live trees and/or snags ≥3 inches diameter at breast height that have exfoliating bark, cracks, crevices, and/or hollows. Harvesting the suitable trees would occur during the October 15th- March 31st timeframe outlined in the Range-wide Indiana Bat Protection and Enhancement Plan Guidelines and a 2015 email from Ms. Jennifer Pritchett of USFWS.

Given an anticipated summer 2020 construction, USACE, Mobile District respectively requests to remove suitable trees between October 15, 2019 and March 31, 2020 which is outside of bat roosting season. Pursuant to the ESA, USACE, Mobile District has determined that this tree clearing action associated with the proposed project may affect but is not likely adversely affect the Indiana bat and the NLEB. USACE, Mobile District requests USFWS' concurrence with this determination. Given that the impacts may likely adversely affect the mussel species, formal consultation for the inflated heelspliter species will be initiated later this year. Should you require any further assistance, please contact Mr. Terry Rickey via email at terry.w.rickey@usace.army.mil or at (251) 694-3857.

Sincerely,

Jennifer L. Jacobson
Chief, Environment and Resources Branch

Enclosures

li

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1208-B Main Street
Daphne, Alabama 36526

JAN 2 9 2020

IN REPLY REFER TO:
2020-I-0284

Inland Environment Team
Planning and Environmental Division
Ms. Jennifer Jacobson
Department of the Army
Corps of Engineers, Mobile District
P.O. Box 2288
Mobile, AL 36628-0001

Dear Ms. Jacobson:

This letter acknowledges the U.S. Army Corps of Engineers' (USACE) Mobile District November 25, 2019, letter requesting initiation of formal section 7 consultation under the Endangered Species Act. The consultation concerns the possible effects of your proposed bank stabilization of the Black Warrior River near Moundville Archaeological Park in Tuscaloosa County, Alabama, between river mile 304 and 305 on the inflated heelsplitter (*Potamilus inflatus*) mussel. No critical habitat will be impacted.

The Fish and Wildlife Service has not received all of the information necessary to initiate formal consultation on the Black Warrior bank stabilization near Moundville Archaeological Park as outlined in the regulations governing interagency consultations (50 CFR 402.14). To complete the initiation package, we will require the following information:

1. Total length and width of the project work area, including working equipment. A detailed equipment list may be helpful. An accurate project area working footprint is currently unable to be determined without knowledge of the barge size(s) to be used. How many additional linear feet of potential mussel habitat on each end of the described 700 linear feet of riverbank should be surveyed in the total work footprint in order to accommodate work equipment? For example: will an excavator with an extended boom chained down on a small barge or a floating physical plant with an actual crane be used for riprap placement? What are the approximate lengths and capacity (200 - 300 cubic yard?) of the rock barges, and how many will be used to supply rip-rap?

2. The specific best management practices (BMPs) used for work processes for prevention of additional erosion and sedimentation into the Black Warrior River during project construction. Thus far, only monitoring of turbidity levels and ensuring compliance with Alabama Department of Environmental Quality (ADEM) water quality certification have

PHONE: 251-441-5181 FAX: 251-441-6222

been specified. How is the turbidity monitoring information to be used? When, where, and how often is the planned turbidity level monitoring to occur? What are the steps if turbidity levels are above acceptable limits? What is the sedimentation prevention plan? Are there plans to address current bank vegetation or to dress the bank prior to filter cloth covering? Is a turbidity curtain to be used during rip-rap placement? In the event of unplanned delays or unexpected weather conditions, are silt fences (land) and/or additional turbidity curtains (water) to be used to prevent sedimentation? Is any covering of exposed soil or seeding planned for this project in the event of delays or inclement weather?

3. Timing between actions. There are two interval periods of primary concern. The first is the interval between mussel removal, as stated in your letter as a conservation measure, and the placement of rip-rap on the toe slope. Placement of rip-rap on the toe slope should begin no later than 30 days following mussel removal activities due to this mussel species ability to rapidly colonize suitable habitat. In the event of a delay of 30 days or more, the project area would need to be re-surveyed for mussel removal and relocation.

   The second interval period of concern lies between the conclusion of bank scraping / slope preparation activities and the introduction of geotextile filter cloth onto the bank project area. When in the work process is the geotextile filter cloth to be applied to the bank as part of the sedimentation prevention plan?

The formal consultation process for the project will not begin until we receive all of the information, or a statement explaining why that information cannot be made available. We will notify you when the necessary information to initiate formal consultation has been received.

If you have any questions or concerns about this consultation or the consultation process in general, please call Mr. Jason Ross of my staff at 205-247-3723.

Sincerely,

William J. Pearson
Field Supervisor
Alabama Ecological Services Field Office

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

Inland Environment Team
Planning and Environmental Division

April 03, 2020

Mr. Bill Pearson
Alabama Ecological Services Field Office
1208 Main Street
Daphne, Alabama 36526

Dear Mr. Pearson:

Pursuant to Section 7 of the Endangered Species Act, as amended, on November 22, 2019, the U.S. Army Corps of Engineers, Mobile District submitted a Biological Assessment (BA) with a letter requesting formal consultation for the Emergency Stream Bank Stabilization at Moundville Archeological Park.

This letter is in response to your letter dated January 29, 2020, requesting additional information to complete the initiation package for formal consultation (reference number 2020-1-0284). The enclosed addendum to the BA provides further information to complete the initiation package.

Thank you for the continued work of the U.S. Fish and Wildlife Service on this effort. If you have any questions please contact Mr. Terry Rickey via phone at (251) 694-3857 or via email at terry.w.rickey@usace.army.mil.

Sincerely,

JACOBSON.JENNIFER.L.1230598386
Digitally signed by JACOBSON.JENNIFER.L.1230598386
Date: 2020.04.03 13:28:55 -05'00'

Jennifer L. Jacobson
Chief, Environment and Resources Branch

Enclosures

ADDENDUM TO BIOLOGICAL ASSESSMENT
PROPOSED EMERGENCY STREAMBANK STABILIZATION
MOUNDVILLE ARCHEOLOGICAL PARK

This addendum provides additional information as requested by U.S. Fish and Wildlife Service (USFWS) in a letter dated January 29, 2020.

USFWS Request 1a:

Total length and width of the project work area, including working equipment. A detailed equipment list may be helpful.

USACE Response 1a:

The rock placement will be approximately 700 feet long. The width of rock placement is approximately 180 feet from the top of the bank. The rock will extend approximately 50 feet into the water. It is expected that the work area will not exceed 16,000 sq yards (in water). This is calculated by allowing a 100-foot buffer upstream, a 200-foot buffer downstream, and a buffer extending to the centerline of navigation in the Black Warrior River. The specific equipment type and quantity that will be used during construction is unknown to USACE until after the contract is awarded. Equipment on site could include, but is not limited to: barges, tug boats, excavators, cranes, small boats, and skid steers.

USFWS Request 1b:

An accurate project area working footprint is currently unable to be determined without knowledge of the barge size(s) to be used.

USACE Response 1b:

The barge size will be determined by the contractor and the rock supplier after the contract is awarded. Without knowing exact size and number of barges to be used, an additional aquatic area of 1,000 feet (ft) by 150 feet (ft) has been estimated for the work area to accommodate a variety of barges to be used. It is expected that the work area will not exceed 16,000 sq. yards in water as identified in Figure 1.

Figure 1: The anticipated indirect impact area of 16,000 square feet.

USFWS Request 1c:

How many additional linear feet of potential mussel habitat on each end of the described 700 linear feet of riverbank should be surveyed in the total work footprint in order to accommodate work equipment? For example: will an excavator with an extended boom chained down on a small barge or a floating physical plant with an actual crane be used for riprap placement?

USACE Response 1c:

Additional 300 feet beyond the identified 700 feet would need to be surveyed to account for the potential workspace.

USFWS Request 1d:

What are the approximate lengths and capacity (200 - 300 cubic yard?) of the rock barges, and how many will be used to supply riprap?

USACE Response 1d:

The barge size and number of barges will be determined by the contactor based upon plans and specifications needs.

USFWS Request 2a:

The specific best management practices (BMPs) used for work processes for prevention of additional erosion and sedimentation into the Black Warrior River during project construction. Thus far, only monitoring of turbidity levels and ensuring compliance with Alabama Department of Environmental Quality (ADEM) water quality certification have been specified.

USACE Response 2a:

Vegetation along the embankment will be removed flush with the ground surface; however, the embankment material and root mass will be left largely undisturbed in order to prevent additional erosion and sedimentation. Immediately following the vegetation removal, geotixtle fabric will be laid to reduce sedimentation runoff. Additional BMPs will be designed and implemented by the contractor as part of attainment and compliance with a 402 National Pollutant Discharge Elimination System (NPEDS) Permit, per Section 402 of the Clean Water Act.

USFWS Request 2b:

How is the turbidity monitoring information to be used? When, where, and how often is the planned turbidity level monitoring to occur? What are the steps if turbidity levels are above acceptable limits?

USACE Response 2b:

USACE, Mobile District will seek Section 401 Water Quality Certification following public review. All requirements set forth in the water quality certification by ADEM will be met. The specific details of the requirements, such as turbidity monitoring schedule, will be provided to USFWS once received by USACE, Mobile District. The embankment material and root mass will be left largely undisturbed in order to prevent additional erosion and sedimentation.

USFWS Request 2c:

What is the sedimentation prevention plan? Are there plans to address current bank vegetation or to dress the bank prior to filter cloth covering? Is a turbidity curtain to be used during riprap placement?

USACE Response 2c:

The current site is primarily an exposed clay streambank which is on a sheer slope. The existing conditions do not allow for effective usage of siltation fences adjacent to the river. Once construction commences with the vegetation clearing, the geotextile fabric will be laid immediately to prevent sedimentation. The contractor will develop and implement the necessary BMPs as part of the required 402 permit, per Section 402 of the Clean Water Act. The BMPs will be provided to USFWS after the completion of the Section 402 permit.

USFWS Request 2d:

In the event of unplanned delays or unexpected weather conditions, are silt fences (land) and/or additional turbidity curtains (water) to be used to prevent sedimentation? Is any covering of exposed soil or seeding planned for this project in the event of delays or inclement weather?

USACE Response 2d:

The contractor will develop and implement the necessary BMPs as part of the required 402 NPDES Permit, per Section 402 of the Clean Water Act.

USFWS Request 3a:

Timing between actions. There are two interval periods of primary concern. The first is the interval between mussel removal, as stated in your letter as a conservation measure, and the placement of riprap on the toe slope. Placement of riprap on the toe slope should begin no later than 30 days following mussel removal activities due to this mussel species ability to rapidly colonize suitable habitat. In the event of a delay of 30 days or more, the project area would need to be re-surveyed for mussel removal and relocation.

USACE Response 3a:

USACE understands and acknowledges that construction on this project must begin within 30 days after the completion of the mussel translocation dives. In the event of a delay of 30 days or more, USFWS will be notified and the project area will be re-surveyed for mussel removal and relocation prior to beginning project activities. The

results of the survey and any needed translocations will be provided to USFWS accordingly.

USFWS Request 3b:

The second interval period of concern lies between the conclusions of bank scraping/ slope preparation activities and the introduction of geotextile filter cloth onto the bank project area. When in the work process is the geotextile filter cloth to be applied to the bank as part of the sedimentation prevention plan?

USACE Response 3b:

The filter fabric will be placed as soon as the bank is cleared of vegetation and prior to stone placement.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

MAR 09 2020

Inland Environment Team
Planning and Environmental Division

Ms. Ellen Rankin
Architectural Historian
Acting Regional Program Manager, National Historic Landmarks
National Park Service
100 Alabama Street SW
Atlanta, Georgia 30303

Dear Ms. Rankin:

The U.S. Army Corps of Engineers (USACE), Mobile District is writing to consult with you on the Emergency Streambank and Shoreline Protection Project (Project), Moundville Archaeological Park, Tuscaloosa County, Alabama to comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (Section 106; 54 USC 306108). As the lead Federal agency, USACE has determined that the proposed Project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and that the Project has potential to cause effects on historic properties. We would like to initiate consultation with you according to 36 CFR § 800.3 and 36 CFR § 800.10. We are also requesting your comments on the Project's Area of Potential Effect (APE). The proposed emergency streambank and shoreline protection efforts are being conducted under the continuing authority of Section 14 of Flood Control Act of 1946, as amended, to protect this National Historic Landmark owned by the University of Alabama.

Severe streambank erosion is currently causing the loss of fragmented human remains and artifacts and is washing away historic McGowan's Bluff adjacent to the Mound D feature of the Moundville Archaeological Park. Mound D is also being eroded and the University of Alabama has requested assistance from USACE to design and build erosion resistance measures along McGowan's Bluff. The APE has been subjected to recent flood events and will continue to erode the site without the proposed Project.

The project's APE comprises a 1 hectare (2.5 acres) strip of land, approximately 240 meters (790 feet) long (Enclosure 1) and runs along the Black Warrior River between river miles 304 and 305. The APE is situated within the Tuscaloosa County Portion of the Archaeological Park. The physical address is 634 Mound State Parkway, Moundville, Alabama 35474 and the legal description is Section 36 Township 24 North Range 4 East Alabama in Tuscaloosa County, Alabama.

The proposed action will armor the streambank against ongoing erosion from the Black Warrior River. Project related construction will consist of the removal of debris and vegetation from the river bank within the APE and placement of geotextile fabric over the cleared area. The geotextile will be anchored to the top edge of the bluff and rolled down the bank into the water and covered with approximately 17,000 cubic yards of riprap. This will include 4,500 cubic yards of stone placed below the mean water elevation to create a stable river bank. The Project will also include two tiebacks placed at each end of the APE, to secure the new riprap revetment into the existing shoreline. Construction of the upstream tieback will involve digging a trench 10 feet wide at the base, 30 feet wide at the top, and 6 feet deep that will be covered with geotextile fabric and filled with riprap. The downstream tieback will be placed in a naturally occurring low point and will not require excavation. Upon completion of the riprap revetment, native canes and grasses will be planted to help stabilize the soils on top of the bluff. To the extent possible, debris and vegetation removal and construction related excavations will be conducted from barges anchored in the river. This will limit land based excavations to the upstream tieback area and reduce impacts to archaeological deposits on top of the bluff.

USACE is committed to making every effort to invite all parties with an interest in the Project and those agencies with responsibilities under Section 106 of the NHPA to participate. We have also mailed letters to initiate consultation with various Tribes, the Advisory Council on Historic Preservation, the National Park Service, and other interested parties.

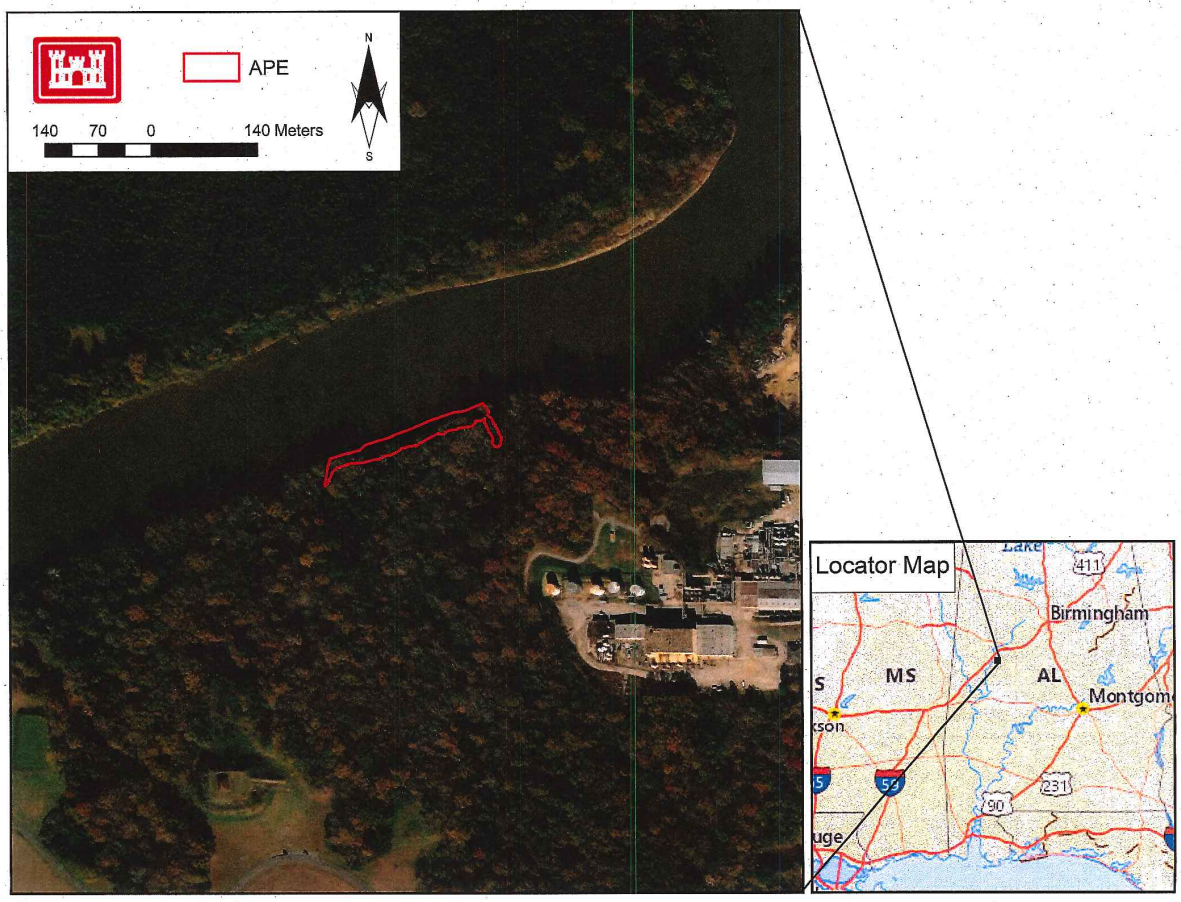
We respectfully request any comments you may have on the Project's APE. Please send any comments and questions regarding the Project to U.S. Army Corps of Engineers, Mobile District, CESAM-PD-EI, Attention: Dr. Patrick O'Day, Archaeologist, Post Office 2288, Mobile, Alabama 36628. Dr. O'Day can also be reached via email at Patrick.M.O'Day@usace.army.mil or via phone at (251) 690-2326.

Sincerely,

Jennifer Jacobson

Jennifer L. Jacobson
Chief, Environment and Resources Branch

Enclosures


APE
140 70 0 140 Meters
N
S
Locator Map
Birmingham
MS
AL
Montgom
411
231
90

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

MAR 11 2020

Inland Environment Team
Planning and Environmental Division

[redacted]

Dear [redacted]

The U.S. Army Corps of Engineers (USACE), Mobile District is writing to consult with you on the Emergency Streambank and Shoreline Protection Project (Project), Moundville Archaeological Park, Tuscaloosa County, Alabama to comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (Section 106; 54 USC 306108). As the lead Federal agency, USACE has determined that the proposed Project is an undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and that the Project has potential to cause effects on historic properties. We would like to initiate consultation with you according to 36 CFR § 800.3 and 36 CFR § 800.10. We are also requesting your comments on the Project's Area of Potential Effect (APE). The proposed emergency streambank and shoreline protection efforts are being conducted under the continuing authority of Section 14 of Flood Control Act of 1946, as amended, to protect this National Historic Landmark owned by the University of Alabama.

Severe streambank erosion is currently causing the loss of fragmented human remains and artifacts and is washing away historic McGowan's Bluff adjacent to the Mound D feature of the Moundville Archaeological Park. Mound D is also being eroded and the University of Alabama has requested assistance from USACE to design and build erosion resistance measures along McGowan's Bluff. The APE has been subjected to recent flood events and will continue to erode the site without the proposed Project.

The project's APE comprises a 1 hectare (2.5 acres) strip of land, approximately 240 meters (790 feet) long (Enclosure 1) and runs along the Black Warrior River between river miles 304 and 305. The APE is situated within the Tuscaloosa County Portion of the Archaeological Park. The physical address is 634 Mound State Parkway, Moundville, Alabama 35474 and the legal description is Section 36 Township 24 North Range 4 East Alabama in Tuscaloosa County, Alabama.

The proposed action will armor the streambank against ongoing erosion from the Black Warrior River. Project related construction will consist of the removal of debris and vegetation from the river bank within the APE and placement of geotextile fabric over the cleared area. The geotextile will be anchored to the top edge of the bluff and rolled down the bank into the water and covered with approximately 17,000 cubic yards of riprap. This will include 4,500 cubic yards of stone placed below the mean water elevation to create a stable river bank. The Project will also include two tiebacks placed at each end of the APE, to secure the new riprap revetment into the existing shoreline. Construction of the upstream tieback will involve digging a trench 10 feet wide at the base, 30 feet wide at the top, and 6 feet deep that will be covered with geotextile fabric and filled with riprap. The downstream tieback will be placed in a naturally occurring low point and will not require excavation. Upon completion of the riprap revetment, native canes and grasses will be planted to help stabilize the soils on top of the bluff. To the extent possible, debris and vegetation removal and construction related excavations will be conducted from barges anchored in the river. This will limit land based excavations to the upstream tieback area and reduce impacts to archaeological deposits on top of the bluff.

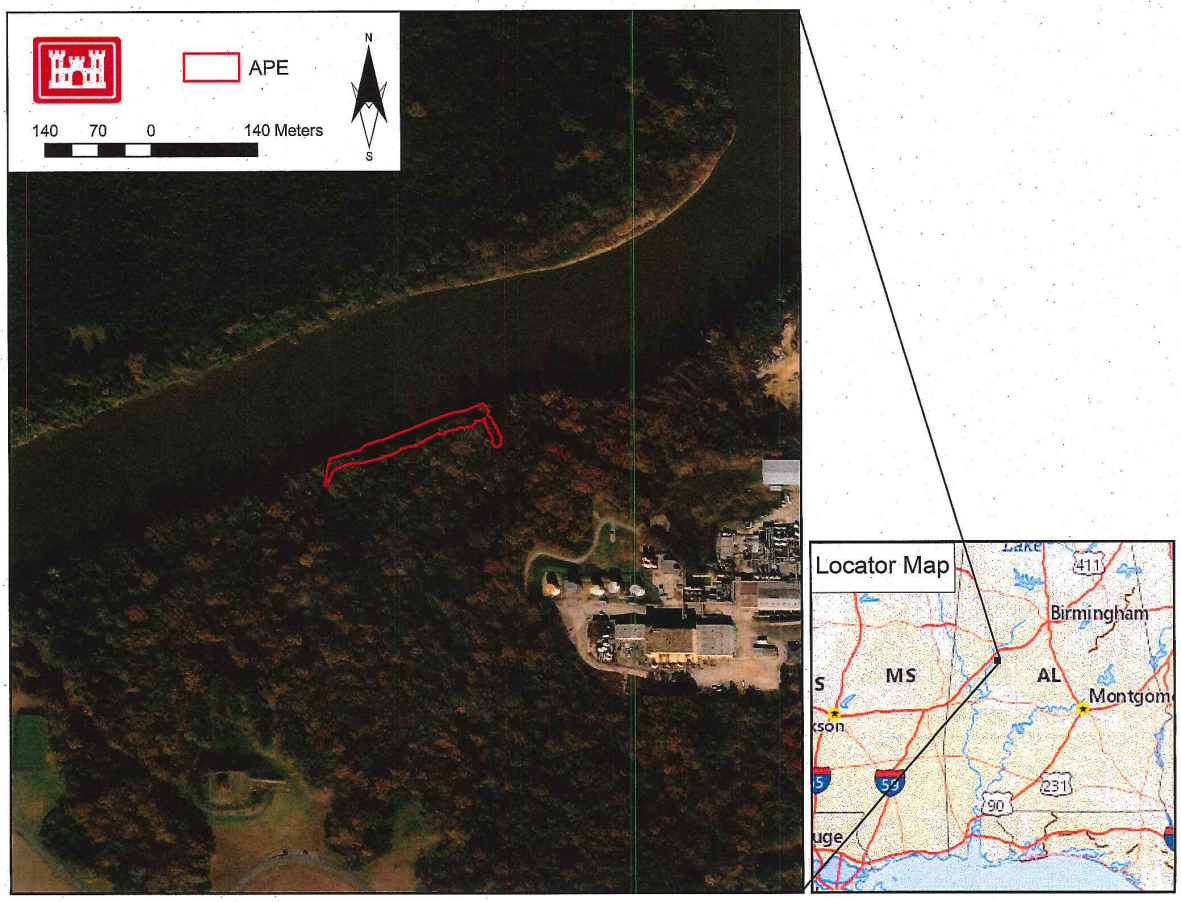
USACE is committed to making every effort to invite all parties with an interest in the Project and those agencies with responsibilities under Section 106 of the NHPA to participate. We have also mailed letters to initiate consultation with various Tribes, the Advisory Council on Historic Preservation, the National Park Service, and other interested parties.

We respectfully request any comments you may have on the Project's APE. Please send any comments and questions regarding the Project to U.S. Army Corps of Engineers, Mobile District, CESAM-PD-EI, Attention: Dr. Patrick O'Day, Archaeologist, Post Office 2288, Mobile, Alabama 36628. Dr. O'Day can also be reached via email at Patrick.M.O'Day@usace.army.mil or via phone at (251) 690-2326.

Sincerely,

Todd A. Nettles
Acting Chief, Planning and Environmental Division

Enclosures



The preceding letter was distributed to the following mailing list.

MOUNDVILLE TRIBAL LETTERS (25)

1) Ms. Devon Frazier
Tribal Historic Preservation Officer
Absentee-Shawnee Tribe Oklahoma
2025 South Gordon Cooper Drive
Shawnee, Oklahoma 74801

2) Mr. Bryant J. Celestine
Tribal Historic Preservation Officer
Alabama-Coushatta Tribes of Texas
571 State Park Road 56
Livingston, Texas 77351

3) Ms. Janice Lowe
Tribal Historic Preservation Officer
Alabama-Quassarte Tribal Town
Post Office Box 187
Wetumpka, Oklahoma 74883

4) Mr. Phil Cross
Tribal Historic Preservation Officer
Caddo Nation, Oklahoma
Post Office Box 487
Binger, Oklahoma 73009

5) Dr. Wenonah G. Haire
Executive Director
Catawba Indian Nation
1536 Tom Steven Road
Rock Hill, South Carolina 29730

6) Ms. Elizabeth Toombs
Cherokee Nation, Oklahoma
Post Office Box 948
Tahlequah, Oklahoma 74465

7) Ms. Karen Brunso
Tribal Historic Preservation Officer
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 74821-1548

8) Ms. Kimberly Walden
Cultural Resources Director, NAGPRA Representative
Chitimacha Tribe, Louisiana
Post Office Box 661
Charenton, Louisiana 70523

9) Dr. Ian Thompson, RPA
Director, Historic Preservation Department
Choctaw Nation of Oklahoma
Post Office Drawer 1210
Durant, Oklahoma 74701

10)Ms. Linda Langley
Tribal Historic Preservation Officer
Coushatta Tribe of Louisiana
Post Office Box 10
Elton, Louisiana 70532

11)Mr. Russell Townsend
Tribal Historic Preservation Officer
Eastern Band of the Cherokee Nation
Post Office Box 455
Cherokee, North Carolina 28719

12)Mr. Brett Barnes
Cultural Preservation Officer
Eastern Shawnee Tribe of Oklahoma
Post Office Box 350
Seneca, Missouri 64865

13)Ms. Alina Shively
Tribal Historic Preservation Officer
Jena Band of Choctaw Indians, Louisiana
Post Office Box 14
Jena, Louisiana 71342

14)Mr. David Cook
Tribal Administrator
Kialegee Tribal Town, Oklahoma
Post Office Box 332
Wetumpka, Oklahoma 74883

15)Mr. Fred Dayhoff
NAGPRA and Section 106 Representative
Miccosukee Tribe of Indians of Florida
HC 61, SR68 Old Loop Road
Ochopee, Florida 34141

16)Mr. Kenneth H. Carleton
Tribal Historic Preservation Officer
Mississippi Band of Choctaw Indians
101 Industrial Road
Philadelphia, Mississippi 39350

17)Ms. Corain Lowe-Zepeda
Tribal Historic Preservation Officer
Muscogee (Creek) Nation
Post Office Box 580
Okmulgee, Oklahoma 74447

18)Ms. Carolyn M. White
Tribal Historic Preservation Officer
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, Alabama 36502

19)Mr. Everett Bandy
Tribal Historic Preservation Officer
Quapaw Tribe of Indians, Oklahoma
Post Office Box 765
Quapaw, Oklahoma 74363-0765

20)Ms. Tonya Tipton
Tribal Historic Preservation Officer
Shawnee Tribe, Oklahoma
Post Office Box 189
Miami, Oklahoma 74355

21)Mr. Thedore Isham
Tribal Historic Preservation Officer
Seminole Nation of Oklahoma
Post Office Box 1498
Wewoka, Oklahoma 74884

22)Dr. Paul Backhouse
Tribal Historic Preservation Officer
Seminole Tribe of Florida
30290 Josie Billie Highway PMB 1004
Clewiston, Florida 33440

23)Mr. Galen Cloud
Tribal Historic Preservation Officer
Thlopthlocco Tribal Town
Post Office Box 188
Okemah, Oklahoma 74859

24)Mr. Earl J. Barbry, Jr.
Tribal Historic Preservation Officer
Tunica-Biloxi Indian Tribe of Louisiana
Post Office Box 1589
Marksville, Louisiana 71351

25)Ms. Karen Pritchett
Tribal Historic Preservation Officer
United Keetoowah Band of Cherokee Indians in Oklahoma
Post Office Box 746
Tahlequah, Oklahoma 74465