



Hatchie-Loosahatchie Mississippi River Ecosystem Restoration Study



Appendix 2c – Preliminary Section 404(b)(1) Evaluation

February 2023

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Section 1

Preliminary Clean Water Act Section 404(b)(1) Evaluation

PRELIMINARY

SECTION 404(b)(1) EVALUATION

MISSISSIPPI RIVER HATCHIE/LOOSAHATCHIE

MISSISSIPPI RIVER MILE 775-736

TENNESSEE AND ARKANSAS

ECOSYSTEM RESTORATION STUDY

I. Introduction

- a. As required by Section 404(b)(1) of the Clean Water Act, this evaluation assesses the short and long-term impacts associated with the discharge of dredged and fill materials into the waters of the United States resulting from Alternative C3 (the tentatively selected plan).

II. Project Description

a. Location

The project area is a 39-mile reach of the Mississippi River and the surrounding batture (the riverside area between the levee and main channel) beginning approximately at the mouth of the Hatchie River (River Mile 775) and extending south to approximately the mouth of the Wolf River Harbor (River Mile 736) (Figure A2c-1). The project area lies in portions of Lauderdale, Tipton, and Shelby counties, Tennessee and Mississippi and Crittenden counties, Arkansas.

b. General Description

Alternative C3 is a comprehensive plan consisting of 38 ecosystem restoration measures across the mosaic of vegetative and aquatic floodplain habitats in the lower Mississippi River, that collectively address historically significant and ecologically important habitats in the states of Arkansas and Tennessee by restoring hydrologic connectivity to rare geological features that support special status species and critical vegetative habitats. A description of proposed measures, restored habitat types, and sub-basin location is shown

in Figure A2c-1 and can be found in Appendix 1 of the main report. Alternative C3 also supports the promotion of alligator gar spawning habitats, a species that is known to control invasive species such as invasive carp. Additionally, Alternative C3 also provides additional benefits to underserved communities by enhancing hydrologic connectivity with resourced-managed areas to enhance access for recreational opportunities.

c. Authority and Purpose

Section 1202(a) of WRDA 2018, Public Law 115-270 authorized the study to determine feasibility of habitat restoration for selected priority reaches reported in the Lower Mississippi River Resource Assessment, of which the Hatchie/Loosahatchie Mississippi River Mile 775-736 reach is included. The purpose for the proposed action is to restore habitat and ecosystem function along an approximate 39-mile reach of the Mississippi River and its floodplain in harmony with the existing U.S. Army Corps of Engineers (USACE) mission areas of ensuring navigation and flood risk reduction

d. General Description of Dredged or Fill Material

1) General Characteristics of Material

Rip-rap – R200, R400, and C-stone riprap would be used to prevent erosion and scour when removing or replacing obstructions (e.g., culverts, bridges, etc.) and for chevron creation for meander scarp flow diversion.

Backfill – excavated material would be used and/or re-shaped on-site when creating low flow channels and increasing connectivity to backwater slough and meander scarp flow restoration, and wetland complex restoration.

Corrugated Metal Pipe – Both 48-inch and 60-inch corrugated metal pipe (CMP) would be used in development of backwater slough restoration to improve fish access.

2) Quantity of Material

The total estimated quantity of rip-rap, backfill, and CMP that would be deposited into waters, and wetlands, of the United States regulated by Section 404 guidelines is presented by state in Table A2c-1.

Table A2c- 1. Estimated quantities of material by state.

State	Rip-Rap (Cubic Yards)			Backfill (Cubic Yards)	Corrugated Metal Pipe (Linear feet)
	R200	R400	C-Stone		
Tennessee	22,056.6	2,684.0	0.0	99,281.6	320.0

Arkansas	284,258.0	0.0	43,400.0	88,541.0	100.0
Total	306,314.6	2,684.0	43,400.0	187,822.6	420.0

3) Source of Material

Rip-rap – R200, R400, and C-stone riprap would be provided from commercial sources.

Backfill – excavated material would be obtained/shaped from the project and adjacent areas riverside of the Mississippi River Levee (MRL).

Corrugated Metal Pipe – Both 48-inch and 60-inch CMP would be provided from commercial sources.

e. Description of Proposed Discharge Site(s)

1) Location – Earthen material would be excavated/obtained from within and re-shaping existing waterways near each proposed project feature and placed with the project area to improve connectivity to backwater sloughs, meander scarps, and wetland complexes. Additionally, rip-rap would be placed within selected project reaches to prevent erosion and scour. Locations and descriptions of project features are summarized in Figure A2c-1 and found in Appendix 1 of the main report.

2) Size – It is anticipated that fill materials would be placed in approximately 20 acres total (9 acres in TN and 11 acres in AR) of waters, and wetlands, of the United States Regulated by Section 404 guidelines, as the invert elevations of obstructions are lowered and bridges and culverts are replaced, sediment plugs are removed and low flow channels are created, berms and weirs are created for hydrologic wetland restoration, and erosion and bank protection is installed.

3) Type(s) of Habitat – Habitat types predominantly include open water, forested and agricultural lands located within the batture (area between the high bluffs and mainline levee of the Mississippi River).

4) Timing and Duration of Discharge – Discharge timing would depend on preconstruction planning and construction activities, as each project feature is a separate item of work and would be designed and constructed incrementally, subject to funds availability and priority. However, every effort would be made to construct during periods of low water and dry conditions, and best management practices would be applied.

f. Description of Disposal Method

Excavated material from the proposed earthwork, as well as rip-rap, would be placed and graded with conventional earth moving equipment (e.g., bulldozers and excavators) within the existing project feature area to provide anticipated ecological benefits.

III. Factual Determinations

a. Physical Substrate Determinations

- 1) Substrate Elevation and Slope – The area contained within and adjacent to the MRL in the lower Mississippi Valley are founded on the Quaternary alluvium of the Mississippi River system. The flood plain has a typical downstream slope of 0.6 foot per mile and relief generally less than 10 feet. The greatest relief is associated with natural levees and point bar ridges. Ground slope ranges from 300 feet, National Geodetic Vertical Datum, in the northern part of the valley to sea level on the delta. No significant effects to these existing slopes are anticipated to result from the proposed project.
- 2) Sediment Type – Soils within borrow areas comprised of primarily clay, silt, and sand alluvium.
- 3) Dredged/Fill Material Movement – Placement of fill material into waters of the United States would occur when material is removed from waterways and adjacent areas and placed and/or shaped in a manner to facilitate the desired restoration effects (e.g., increasing connectivity). Temporary and permanent erosion control measures would be conducted according to the storm water pollution prevention plans at each project feature location. Thus, there would be no foreseeable movement of fill or excavated material upon completion of construction. No open water discharges, which would be subject to current or wave action, are expected.
- 4) Physical Effects on Benthos – Physical destruction of the benthic macroinvertebrate community would occur during the removal of material and placement of fill into wetlands and waters within the project area. Colonization of benthic organisms would occur in the newly constructed borrow areas created by the project over time.
- 5) Other Effects – N/A
- 6) Actions Taken to Minimize Impacts – Earthen fill materials to be discharged is the same material at discharge sites (e.g., reshaping channels to increase connectivity). Open water discharge would be avoided to the extent possible. Wetlands and other waters would be avoided to the extent practicable in the design and construction of each project feature. In addition, the following best management practices will be implemented during construction to minimize impacts:
 - Effective erosion control (silt fences, etc.) will be in place prior to construction and maintained throughout the construction period.
 - When practicable, construction will take place during periods of low rainfall and low water stages.

- Vegetation to be cleared will be the minimum necessary to allow for construction access.
- All disturbed areas will be seeded within 30 days after construction is completed.
- Construction debris will be kept from entering nearby channels and shall be disposed of properly.
- Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the water.

b. Water Circulation, Fluctuation, and Salinity Determinations

1) Water – Water quality impacts resulting from project construction would primarily be short term and localized. Excavation at project sites would result in localized increases in turbidity and suspended solids adjacent to excavation operations. Increased turbidity levels and suspended solids would be expected to return to preconstruction levels upon completion of excavation operations.

a) Salinity – N/A

b) Water Chemistry – As reported in Section 3 of the main report, operations associated with this project are not anticipated to significantly affect the water chemistry of either the Mississippi River or the existing project areas.

c) Clarity – There would be temporary increases in turbidity during rip-rap and fill placement. Turbidity would be expected to return to pre-construction levels shortly after construction is completed.

d) Color – No expected change.

e) Odor – No expected change.

f) Taste – No expected change.

g) Dissolved Gas Levels – There would likely be some short-term and localized reductions in dissolved oxygen (DO) associated with increased turbidity and suspended solids during construction. The decreases in DO will only occur during construction operations and are not anticipated to fall below minimum standards.

h) Nutrients – No expected change.

i) Eutrophication – No expected change.

j) Others as Appropriate – No expected change.

2) Current Patterns and Circulation

a) Current Patterns and Flow – Current patterns are not expected to change.

b) Velocity – Water velocity is not expected to change.

c) Stratification – No expected change.

- d) Hydrologic Regime – The hydrologic regime of the Mississippi River would not be significantly impacted as a result of project implementation. No changes in existing drainage patterns that would result in a change in the hydrologic regime of the project area are anticipated.
 - 3) Normal Water Level Fluctuations – Normal water level fluctuations are influenced primarily by stages on the Mississippi River. Since project construction would not affect river stages, no impacts to normal water level fluctuations are anticipated, except in areas where flow has been restored.
 - 4) Salinity Gradients – N/A
 - 5) Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Physical Substrate Determinations section above.
- c. Suspended Particulate/Turbidity Determinations
- 1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site – Minor increases in suspended particulates and turbidity levels are expected during construction. Best management practices will be used throughout the construction process to minimize the impact. Ambient conditions are expected to return shortly after completion of construction.
 - 2) Effects on Chemical and Physical Properties of the Water Column
 - a) Light Penetration – Minor impacts are expected to light penetration due to an expected increase in turbidity levels during construction. Ambient conditions are expected to return shortly after completion of construction.
 - b) Dissolved Oxygen – There would likely be some short-term and localized reductions in DO associated with increased turbidity and suspended solids during construction. The decreases in DO will only occur during construction operations and are not anticipated to fall below minimum standards.
 - c) Toxic Metals and Organics – No expected change.
 - d) Pathogens – N/A
 - e) Aesthetics – Aesthetics would be temporarily impacted during construction due to the presence of construction equipment.
 - f) Others as Appropriate – None noted.
 - 3) Effects on Biota

- a) Primary Production – Project activities will disturb approximately 20 acres of wetlands and open water. Additionally, periodic reduction in light transmissions as a result of erosion associated with construction would reduce photosynthesis and primary production to a minor degree in portions of aquatic areas (*i.e.*, construction within existing open water). However, it is anticipated that new projects features would provide increased production to existing area conditions once established.
 - b) Suspension/Filter Feeders – Increased turbidity would be of short duration, and any organisms that are impacted should re-populate the area after project completion.
 - c) Sight Feeders – Resident fish are adapted to turbidity increases that occur after every rainstorm. Project-related turbidity increases would be minor compared to these natural events. Since fish and other sight feeders are highly mobile, project impacts to sight-feeding organisms would be insignificant and short term.
 - d) Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Physical Substrate Determinations section above.
- d. Contamination Determinations
- It is not expected that any contaminants would be introduced or translocated due to construction. Excavation and filling operations associated with this project are not anticipated to significantly affect the water chemistry of the Mississippi River, existing borrow areas, or wetlands affected by placement of fill material.
- e. Aquatic Ecosystem and Organism Determinations
- 1) Effects on Plankton – Planktonic organisms may be temporarily disturbed during construction, as increases in turbidity are expected. However, turbidity levels would be expected to return to pre-construction levels shortly after construction is completed. Therefore, there will be no significant impacts to plankton.
 - 2) Effects on Benthos – Benthic organisms may be disturbed with the turbidity increase, but no more than what would naturally occur during high flow events.
 - 3) Effects on Nekton – Nekton would be temporarily displaced during construction but will return shortly after project completion.
 - 4) Effects on Aquatic Food Web – Temporary reductions in benthic and suspension/filter communities in such a small area should not significantly impact the aquatic food web during construction. These organisms would quickly colonize the area after construction.
 - 5) Effects on Special Aquatic Sites
 - a) Sanctuaries and Refuges – N/A

- b) Wetlands – Approximately 20 acres of wetlands and adjacent open water would be impacted by the proposed project. However, proposed ecosystem restoration features have been developed to provide increased area and function compared to existing conditions, as modeled and described in Sections 3 and 5 of the main report. Therefore, compensatory mitigation is not required.
 - c) Mud Flats – N/A
 - d) Vegetated Shallows – N/A
 - e) Coral Reefs – N/A
 - f) Riffle and Pool Complexes – N/A
- 6) Threatened and Endangered Species – The proposed activities may affect but are not likely to affect (NLAA) listed species, pursuant to Section 7 of the Endangered Species Act (ESA), as amended. The measures in the TSP were formulated for the overall benefit of federally listed threatened and endangered species; however, there is the potential for some minor temporary impacts to listed species and/or their habitats, such as minimal tree clearing for access and temporary aquatic disturbances during construction. Site-specific ESA surveys and associated tiered ESA consultations will be conducted for any measure in the TSP prior to implementation. Additional details and current species lists are provided in Section 3 and Appendix A2a of the main report.
- 7) Other Wildlife – Terrestrial wildlife would be minimally impacted with the clearing of woody vegetation and may be temporarily displaced during project construction.
- 8) Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Physical Substrate Determinations section above.
- f. Proposed Disposal Site Determinations
- 1) Mixing Zone Determinations – N/A
 - 2) Determination of Compliance with Applicable Water Quality Standards – Changes to water quality conditions as a result of this project are not anticipated to cause long term changes to the existing water quality within the proposed project areas. The water quality in the project areas is in compliance with current water quality standards. Only temporary, short-term impacts to water quality are anticipated as a direct result of project construction. These impacts include temporary increases in suspended solids and increases in turbidity levels which would occur only during and adjacent to construction operations. Water quality certification would be obtained from applicable States prior to project feature construction.

3) Potential Effects on Human Use Characteristic

- a) Municipal and Private Water Supply – N/A
- b) Recreational and Commercial Fisheries – N/A
- c) Water Related Recreation – N/A
- d) Aesthetics – Aesthetics would be temporarily impacted during construction due to the presence of construction equipment.
- e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves – N/A

g. Determination of Cumulative Effects on the Aquatic Ecosystem

The requirement for deposition of fill material during ecosystem restoration feature construction would add relatively minimal amounts of pollutants to the proposed project area's ecosystem, primarily be in the form of temporarily increased sediment loads that would result in minor increases in both suspended solids and turbidity. However, anticipated ecological habitat gains were determined to provide an overall benefit to the project area. Therefore, no compensatory mitigation is required. Additional details on cumulative effects to environmental resources associated with proposed project features are provided in Section 3 of the main report.

h. Determination of Secondary Effects on the Aquatic Ecosystem

Secondary impacts to the aquatic ecosystem would be minimal and not significant.

IV. Findings of Compliance for Mississippi River Hatchie/Loosahatchie Ecosystem Restoration Project

a. Evaluation of Availability of Practical Alternatives to the Proposed Discharge Site Which Would have Less Adverse Impact on the Aquatic Ecosystem

A variety of measures that could be taken to achieve project objectives, including water level management structures, forest management actions, and geomorphic modifications, including elevation of the floodplain were identified and combined in combinations and using a suite of analysis resources. The National Environmental Policy Act analysis, incremental cost analysis, habitat evaluation, and criteria evaluation were considered in the decision-making process. A detailed description of the six-step process used in project plan formulation is provided in Section 2 of the main report. The tentatively selected plan, Alternative C3, meets study objectives, was identified as the national ecosystem restoration plan during cost efficiency analyses, and provides ecological lift to all benefit categories.

b. Compliance with Applicable State Water Quality Standards

The proposed placement of material for ecosystem restoration purposes would not violate any applicable State water quality standards. Water quality certification would be obtained from applicable States prior to project construction.

c. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act

The Toxic Effluent Standards of Section 307 of the Clean Water Act would not be triggered.

d. Compliance with Endangered Species Act of 1973

USACE is requesting concurrence with a may affect but are not likely to affect (NLAA) determination to listed species, pursuant to Section 7 of the Endangered Species Act (ESA), as amended, during the comment period of the draft report. The measures in the TSP were formulated for the overall benefit of federally listed threatened and endangered species; however, there is the potential for some minor temporary impacts to listed species and/or their habitats, such as minimal tree clearing for access and temporary aquatic disturbances during construction. Site-specific ESA surveys and associated tiered ESA consultations will be conducted for any measure in the TSP prior to implementation. This project has been coordinated with the USFWS throughout the duration of the study.

e. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

Not applicable.

f. Evaluation of Extent of Degradation of the Waters of the United States

The proposed disposal of fill material would not likely result in significant adverse effects on human health or welfare, municipal or private water supplies, recreational or commercial fishing, plankton, fish, shellfish, wildlife, or special aquatic sites. Rather, in light of proposed restoration, overall benefits are likely to occur to aquatic ecosystem diversity, to productivity and stability, or to recreational, aesthetic, and economic values.

g. Appropriate and Practical Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Actions that would be implemented during construction to minimize impacts have been previously described in the Physical Substrate Determinations section above. Chiefly, best management practices will be implemented, construction will occur during low-flow periods, and impact areas will be limited to the extent necessary for construction.

h. Based on the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material is:

Specified as complying with the requirements of these guidelines; or,

Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

Specified as failing to comply with the requirements of these guidelines.

Date

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DRAFT

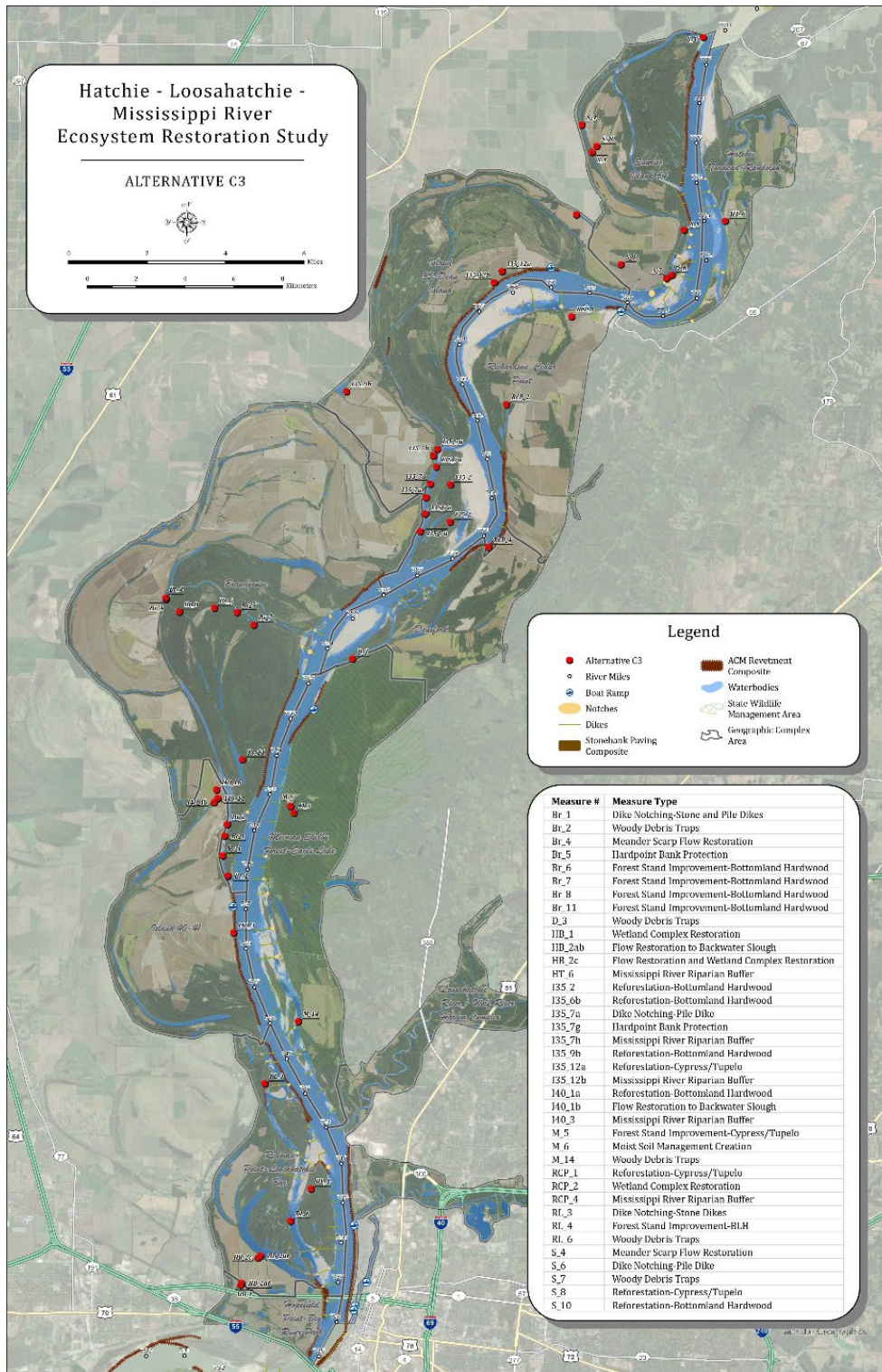


Figure A2c- 1. Mississippi River Hatchie/Loosahatchie Ecosystem Restoration Project study area and proposed ecosystem restoration measures, Tennessee and Arkansas.