UPPER MISSISSIPPI RIVER, NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM (NESP)

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https://www.mvr.usace.army.mil/Rock-Island-District/Programs/NESP/







WHAT IS THE NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM (NESP)?

The Navigation and Ecosystem Sustainability Program (NESP) is a long-term, dual-purpose program that integrates navigation improvements and ecosystem restoration together to provide Upper Mississippi River System, once in a generation-type, positive impacts.

The primary goals of the program are to:

- Increase the capacity and improve the reliability of the inland navigation system;
- While restoring, protecting, and enhancing the environment.





NESP PLANNING STUDY TO IMPLEMENTATION TIMELINE

1993 Initiate Feasibility Study 2007

Program authorized in Water Resources Development Act of 2007

19 January 2022 Construction New Start Received (\$829.1M)

Fiscal Year 2023 Appropriations (\$67.679M)

2004
Feasibility Report
Completed
Chief's Report Signed

2020-2021 Implementation funds received (\$9.5M) Fiscal Year 2022 Appropriations (\$57.279M) Fiscal Year 2024 Appropriations (\$120M)







NESP INTEGRATES NAVIGATION IMPROVEMENTS WITH ENVIRONMENTAL RESTORATION

NAVIGATION ACTIVITIES

- 7 total New 1200' locks at Locks 20-25 on the Mississippi River and Peoria and LaGrange Locks on the Illinois Waterway.
- Mooring cells at 7 locations on both the Mississippi River and Illinois Waterway.
- Switchboats at Locks 20-25 during construction of those locks to aid in navigation.
- Systemic and site-specific mitigation to offset the 1200' lock ecosystem effects.



ECOSYSTEM ACTIVITIES

- Fish passage structures at Locks 4, 8, 22, and 26 along with advancement of design for fish passage at Lock 19 all on the Mississippi River.
- Dam point control (for water level management) at Locks 16 and 25 on the Mississippi River.
- 225 total Ecosystem Restoration measures including:
 - Island building, floodplain restoration, backwater restoration, side channel restoration, wing dam and dike modification, and island and shoreline protection.
- Plus Forest Management, Cultural Mitigation & Adaptive Management Activities

WHAT IS INCLUDED IN THE ECOSYSTEM RESTORATION COMPONENT OF NESP?

The principal problems addressed by all Navigation and Ecosystem Sustainability Program (NESP) ecosystem projects are the adverse changes to ecosystem structure, function, and dynamic processes that have occurred over many years from many causes, but especially since initiation of the operation and maintenance of the existing Nine-Foot Channel Navigation Project.

Table EX-1. UMRS ecosystem restoration measures.

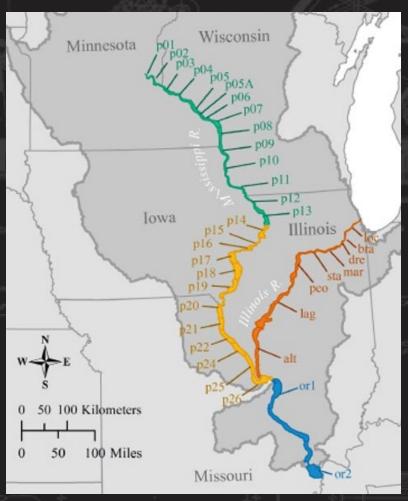
- Island Building
- · Island Protection
- Shoreline Protection
- Fish Passage
- · Floodplain Restoration
- Water Level Management Pool

- Water Level Management Backwater
- Backwater Restoration (Dredging)
- Side Channel Restoration
- Wing Dam/Dike Alteration
- · Improve Topographic Diversity
- · Dam Point Control

While the principal problems are universal, individual projects will be based on project-specific problem statements based on the unique physical and ecological resource conditions in the study area.*







NESP ECOSYSTEM RESTORATION FEATURES

Table EX-1. UMRS ecosystem restoration measures.

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- Island Protection
- · Shoreline Protection
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NESP ECOSYSTEM RESTORATION FEATURES

















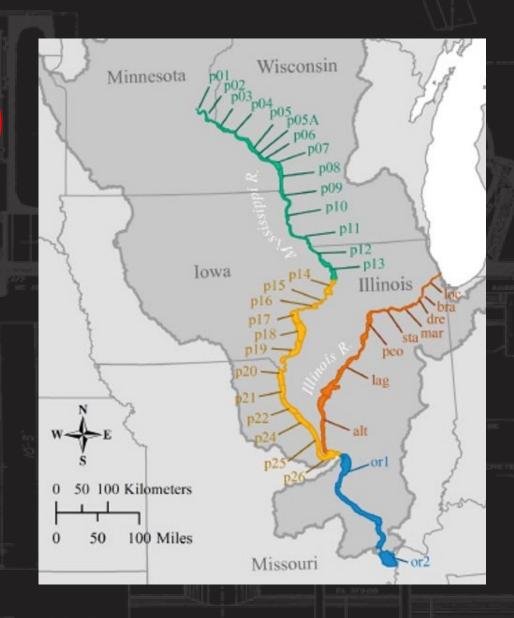
NESP ECOSYSTEM RESTORATION PLANNING CHALLENGES

How do we identify, design, and construct:

- ~225 restoration projects
- Across five states
- Covering hundreds of river miles
- Meeting system objectives
- Meeting site-specific needs
- Avoiding impacts to navigation
- Incorporating modern scientific knowledge
- Considering public perspectives & community needs
- In partnership w/ a diverse set of stakeholders and interest groups
- While managing financial limitations

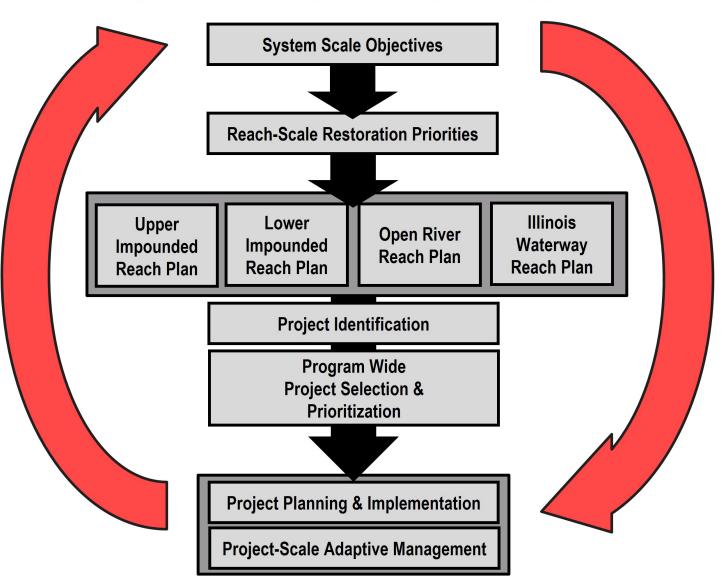






SYSTEMIC ADAPTIVE MANAGEMENT OVERVIEW

The foundation of NESP ecosystem project planning is a tiered system-scale adaptive management approach





SYSTEMIC ADAPTIVE MANAGEMENT PROCESS AND TOOLS

Structured hierarchy for decisions

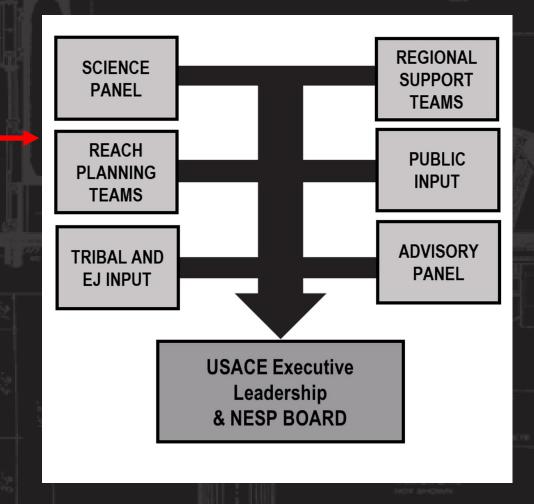
SYSTEM REACH PROJECT

- Structure hierarchy of teams
- Streamlined processes

18 month planning process w/ aided by specific tools

Programmatic tools

Design toolkit, template documents, programmatic standards & systemic metrics







NESP STREAMLINED PLANNING PROCESS



Planning (4 years)

Design (2 years)

Construction (3-5 years)

9-11 Yrs

Proposed Future State:

Planning (1.5 years)

Design (1-2 years)

Construction (1-3 years)

4-7 Yrs







NESP UTILIZING AVAILABLE SCIENCE WITHIN OUR ONE RIVER SYSTEM

Using 35 (plus) years of Mississippi River experience, knowledge, and expertise:

- Enables NESP to focus on Systemic Environmental Solutions informed by Science
- Builds upon lessons learned/successes to reduce risk and streamline implementation of NESP.
- Plus: Corps knowledge of the Mississippi River going back many years prior to implementation of large programmatic ecosystem restoration on the Upper Miss starting in the 1980s.
- Habitat Needs Assessment twelve HNA-II Indicators as related to the three general themes of resilience.



Upper Mississippi River Restoration

Upper Mississippi River Restoration Program

Habitat Needs Assessment-II:

Linking Science to Management Perspectives





Habitat Needs Assessment-II link: https://usace.contentdm.oclc.org/utils/getfile/collection/p266001coll1/id/8323

ENVIRONMENTAL DESIGN TOOLKIT

The Upper Mississippi River System has a **robust ecosystem restoration history**, with successful projects planned, designed, and constructed through a variety of programs. These ecosystem restoration projects were completed in coordination with numerous state, federal and non-profit resources agencies to meet ecosystem goals and objectives.

The toolkit includes:

- Key design elements to assist teams in efficiently identifying methods and measures to address
 ecosystem needs during the planning level of design.
- Provide a consistent format of design considerations, design details, and parametric cost development to support plan formulation and eventual selection of the Recommended Plan.





TOOLKIT COMPONENTS

Three primary components of the toolkit include:

- The Design Pamphlets summarize design criteria.
- **Drawings** of standard civil design templates developed to planning report and preliminary design.
- Parametric Costs: Information in the design pamphlets, other publications, and engineering judgment, can be used to determine the primary parameters for each measure/feature (e.g., length, height/elevation, etc.). These criteria can be input into the standard computational spreadsheets to calculate quantities and associated costs for each feature to the extent practicable.

US Army Corps

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ROCK REVETMENTS

SUMMARY: Variety of objectives require the protection of a shoreline, with the most common by protection of critical floodplain forest habitat, side channel habitat, or protection of constructed

- sizing (gradation and thickness) should utilize guidance in EM 1110-2-1601 and the UMRR Environmental Design Handbook, Consult with Project Design Team (PDT) geotechnical engineer on the need for a filter (geotextile material) or bedding material

- areas for fish (spawning, feeding, etc.)
- ree clearing may be required to place revetment. Revetment may be placed around existing
- Access may be done by truck or bard

- aturalization of the banks through material build up and expansion when possible





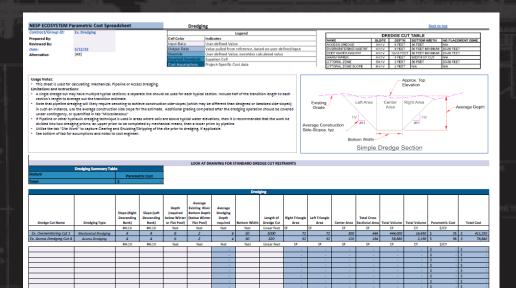
Environmental Design Pamphlet







EM 1110-2-1601 Hydraulic Design of Flood Control Channels EM 1110-2-1614 Design of Coastal Revetments, Seawalls, and Bulkheads





NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM (NESP)

ST. PAUL DISTRICT- ROCK ISLAND DISTRICT - ST. LOUIS DISTRICT

LOCK AND DAM 22 FISH PASSAGE

PROJECT SUMMARY

Lock and Dam 22 is located near Saverton, Missouri, on the Mississippi River, roughly 10 miles south of Hannibal, Missouri, at river mile 301.2. The fish passage structure will be constructed on the spillway portion of the dam, on the side furthest from the Illinois shoreline, and would extend downstream into the tailwater area.

The primary purpose of the Lock and Dam 22 Fish Passage Project is to increase fish access to upstream mainstream river and tributary habitats. Increased access to upriver habitat should result in an increase in the size and distribution of native migratory fish populations.

The secondary purpose is to monitor and adaptively manage this structure to optimize its effectiveness and inform design of subsequent fish passage projects.

MIGRATORY FISH SPECIES OF THE UPPER MISSISSIPPI RIVER



spotted sucker silver lamprey shorthead redhorse lake sturgeon black redhorse pallid sturgeon golden redhorse longnose gar silver redhorse shovelnose sturgeon northern hog sucker goldeye white sucker mooneye channel catfish paddle fish

blue catfish

Mar 2024 – 100% Design Completion

Jun 2024 – Construction Solicitation

Sep 2027 – Construction Complete

FY25-27 – Construction Monitoring

FY28-32 – Adaptive Management

FY22-24 - Pre-Construction Monitoring

FY28-32 – Post-Construction Monitoring

Sep 2024 – Construction Award

Project Deliverables & Tasks:

Monitoring Activities



Alabama shad flathead catfish skipjack herring white bass gizzard shad vellow bass threadfin shad northern pike blue sucker smallmouth bass smallmouth buffalo largemouth bass bigmouth buffalo sauger quillback walleve highfin carpsucker



Lock and Dam 22 Fish Passage Monitoring

 Inform Project Design and Construction

freshwater drum

- Monitor Fish Movement through Lock 22 and Fishway
- Monitor Systemic Ecological Response by Migratory Fishes
- Monitor Physical Performance of the Fish Passage Improvement Features
- Monitor Effects of the Project on Structural Integrity, Navigation Operations, Water Quality



DESIGN

- HQUSACE approved Final PIR June 2022
- Implementation Review Plan
- Final design received

CONSTRUCTION

 Base bid plus options contract structure

ADAPTIVE MANAGEMENT

- · Pre-Construction Monitoring
- Construction Monitoring
- Post-Construction Monitoring
- Adaptive Management

BI-PARTISAN INFRASTRUCTURE LAW (BIL) FUNDS: \$97,100,000, FY24 Congressionally Directed Spending: \$25.5M

OBJECTIVES



Provide habitat benefits for over 30 fish species



Restore natural connection between pools



Increase migration capabilities for native fish species



Provide spawning habitat for fish

As of 28-Mar-24

ESTIMATED

COST

>\$20M



PROJECT SCHEDULE

FEASIBILITY APPROVAL

SUMMER 2022 2022

SPRING

AND PRE-CONSTRUCTION MONITORING 100% DESIGN COMPLETION

WINTER SOLICITATION AND AWARD

SPRING-FALL CONSTRUCTION AND MONITORING

AND 2027-2032 MONITORING

2025-2027

POST-CONSTRUCTION MONITORING AND ADAPTIVE MANAGEMENT

PROGRAM PARTNERS

















https://www.mvr.usace.army.mil/Rock-Island-District/Programs/NESP/Ecosystem-Restoration/



