

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM

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US Army Corps
of Engineers®



UPPER MISSISSIPPI RIVER RESTORATION PROGRAM



PROGRAM VISION ►

A healthier and more resilient Upper Mississippi River ecosystem that sustains the river's multiple uses

PROGRAM HISTORY ►



PRIMARY PROGRAM ELEMENTS ►

- Habitat Rehabilitation and Enhancement Projects (HREP)
- Long Term Resource Monitoring (LTRM)

LONG-TERM MONITORING OF 6 STUDY REACHES (BY 5 STATE AGENCIES) ►

- Water quality [1993 - present]
- Aquatic vegetation [1998 - present]
- Fish [1993 - present]
- Assess ecological status and trends of UMRS
- Understand the structure and function of the ecosystem and its ecological resilience
- Inform the restoration and management of the UMRS

PROGRAM PARTNERS ►



NATURAL RESOURCES

Habitat projects have restored and connected more than 100,000 acres along the Upper Mississippi River, with an additional 65,000 acres of habitat projects planned for the next decade. These projects provide vital habitat for diverse fish and wildlife species, including rare and endangered species.

FISH & WILDLIFE



BIRDS

More than 40% of North American migrating birds use the Mississippi River corridor as their migration route. Restoring forests and wetlands improves bird habitat and provides opportunities for hunting and birdwatching.



AQUATIC LIFE

Wetlands and backwater lakes provide habitat for many valued fish and aquatic species. Millions of people enjoy fishing and boating on the Upper Mississippi River System each year.



FORESTS

Forest corridors provide habitat for wildlife species, opportunities for wildlife viewing and hunting, and connect communities and animals to the river. The health of floodplain forests and wet prairies along the river contribute to improved quality of drinking water for millions of people.



- ◆ LTRM monitoring stations
- ▲ in-progress habitat projects
- completed habitat projects



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HABITAT REHABILITATION AND ENCHANCEMENT PROJECTS (HREPs)



- Increase and maintain quality **waterfowl habitat**
- Create habitat for **neotropical migrants and shorebirds**
- Create backwater **fish overwintering habitat**
- Enhance backwater **fish spawning and summer habitat**
- Enhance channel habitat for riverine fish and **mussels**
- Increase emergent, submersed and floating leaved **aquatic vegetation**
- Enhance and restore **forest diversity** and function
- **Restore and protect island** acreage and function
- Protect and enhance **backwater** and interior **wetland areas**





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HABITAT REHABILITATION AND ENHANCEMENT PROJECTS

Restoring and Protecting the Nationally Significant Mississippi River Ecosystem



Submerged and Emergent Aquatic Vegetation Restoration MVP, MVR, and MVS



1986-2022: 63 Completed Projects 120,400 Acres



Pool 8 Island Restoration MVP



Beaver Island Protection MVR



McGregor Lake Beneficial Use Island Creation MVP



Pool 12 Forest Restoration MVR



Clarence Cannon Water Control Structure MVS



Lake Odessa Water Level Management MVR





LONG TERM RESOURCE MONITORING ELEMENT

Advance Knowledge for Restoring and Maintaining a Healthier and More Resilient

Upper Mississippi River Ecosystem



Long-term monitoring of 6 study reaches

- USGS leads science
- State-operated field stations collect data
- Water quality (1993 - present)
- Aquatic vegetation (1998 - present)
- Fish (1993 – present)

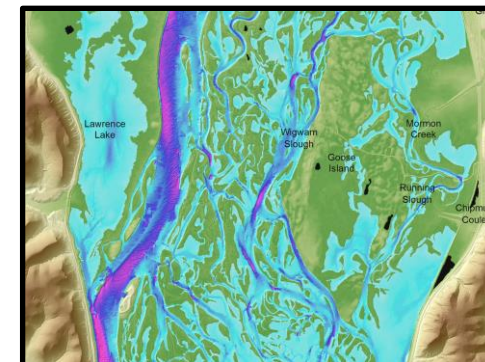
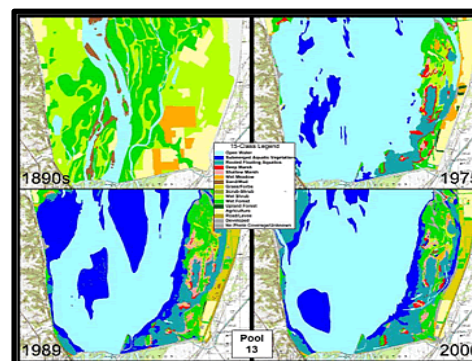


- Assess ecological status and trends of UMRS
- Understand the structure and function of the ecosystem and its ecological resilience
- Inform the restoration and management of the UMRS



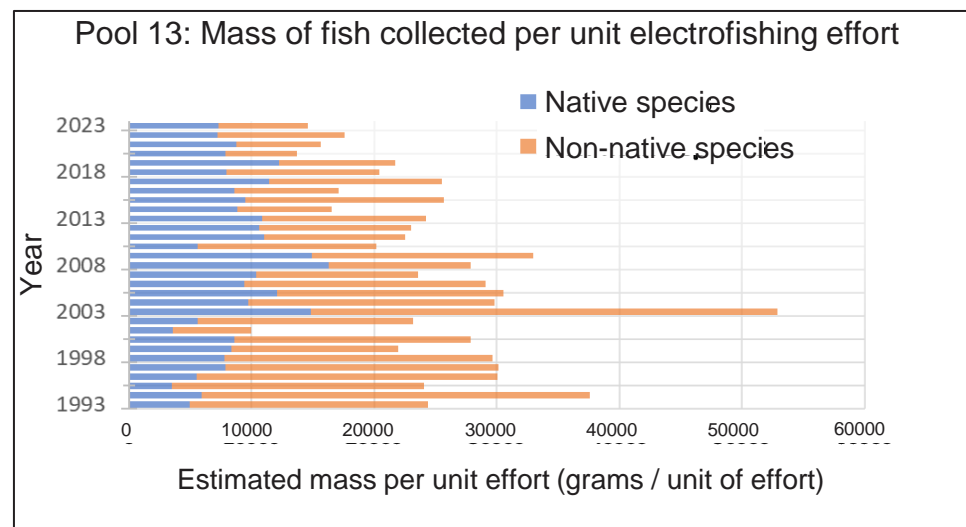
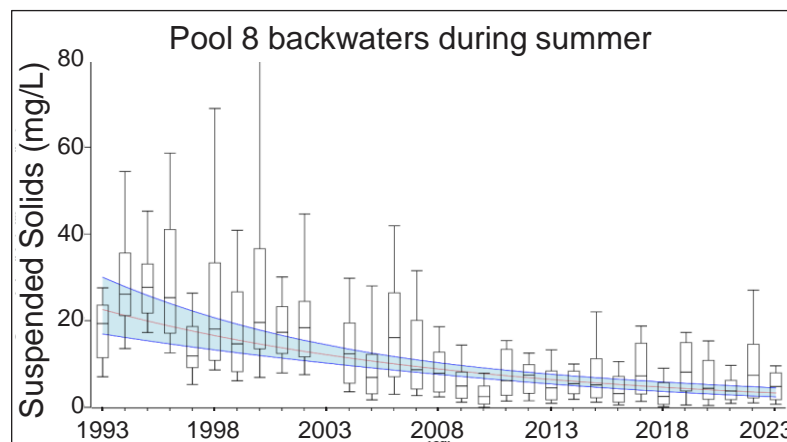
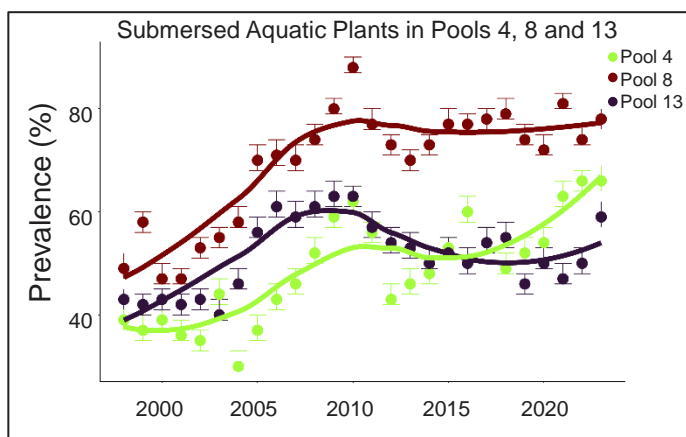
Data and Information Delivery

<https://umesc.usgs.gov/ltrm-home.html>



Systemic land cover data collected every 10 yrs.

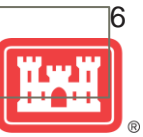
Seamless elevation data across river and floodplain





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LONG TERM RESOURCE MONITORING ELEMENT



2022 Ecological Status and Trends of the Upper Mississippi and Illinois Rivers

WHAT DO WE KNOW?

- Throughout the UMRS:
 - More **water** more of the time
 - High **nutrient concentrations** (total nitrogen and total phosphorus)
- In most of the UMRS:
 - **Floodplain forest area** has declined (not including mortality associated with the 2019 flood)
 - **Total phosphorus** has declined; total nitrogen has not
 - **Water clarity** has increased (**total suspended solids** and **turbidity** have declined)
- In some areas of the UMRS
 - **Aquatic vegetation** has increased significantly and interacts with water clarity
 - Where **invasive carp (silver and bighead)** have proliferated, they have changed the ecosystem
 - **Lentic fishes** (prefer still-water) have increased
 - Overlap with vegetation increase
 - **Forage fish** (middle of the food web) have decreased
 - Overlap with proliferation of invasive carps
 - **Sediment** has accumulated in backwaters
- The UMRS is a large and diverse river system with many regional differences
- <https://pubs.er.usgs.gov/publication/ofr20221039>



Indicator	Upper Mississippi River					Illinois River		
	Upper Impounded			Lower Impounded	Unimpounded	La Grange		
	Pool 4	Pool 8	Pool 13	Pool 26	Open River	La Grange		
Water quality	Main channel suspended solids (flow-normalized concentration)	▲	▲	▲	▲	▲	▲	
	Main channel nutrients (flow-normalized concentration)	Nitrogen	▲	▲	▲	▲	▲	▲
		Phosphorus	▲	▲	▲	▲	▲	▲
	Chlorophyll <i>a</i>	Main channel	■	■	■	■	■	~
Backwater		~	▲	■	■	■	■	
Backwater hypoxia (dissolved oxygen < 5 milligrams per liter)	Summer	~	~	~	~	■	~	
	Winter	▲	~	~	■	■	■	
Aquatic vegetation	Submersed aquatic vegetation prevalence	▲	▲	~	■	■	■	
	Invasive submersed species	▲	▲	▲	■	■	■	
	Aquatic vegetation diversity	~	▲	~	■	■	■	
	Free-floating plant dominance	▲	▲	▲	■	■	■	
	Emergent vegetation	▲	▲	■	■	▲	▲	
Fisheries	Fish community	■	■	■	■	■	■	
	Lentic fishes	▲	▲	■	■	▲	▲	
	Lotic fishes	■	■	■	■	■	■	
	Nonnative fishes (excluding <i>cyprinus carpio</i> (common carp))	■	■	■	▲	■	▲	
	Forage fishes	▲	■	■	▲	▲	▲	
	Recreationally valued native fishes	■	▲	▲	▲	■	▲	
	Commercially valued fishes	Native	■	▲	▲	■	■	▲
Nonnative		▲	▲	▲	▲	▲	▲	

EXPLANATION
 ▲ Significant long-term increase ▼ Significant long-term decrease ■ No trend ◆ No data available or analyzed ~ Dynamic trend

Indicator	Upper Mississippi River			Illinois River		
	Upper Impounded	Lower Impounded	Unimpounded	La Grange		
Hydrology	Annual discharge	Maximum	▲	▲	▲	▲
		Mean	▲	▲	▲	▲
		Minimum	▲	▲	▲	▲
Duration of high flows	■	■	■	■		
Monthly discharge	▲	▲	▲	▲		
Geomorphology	New landform surface area	■	■	◆	◆	
	Backwater bed elevation (note, increase in bed elevation is a decrease in water depth)	▲	◆	◆	◆	
Landcover	Forest cover	Patch forest	▲	▲	▲	▲
		Dominant forest	▲	▲	▲	▲
		Interior forest	▲	▲	▲	▲
		Core forest	▲	▲	▲	▲
		Total forest	▲	▲	▲	▲

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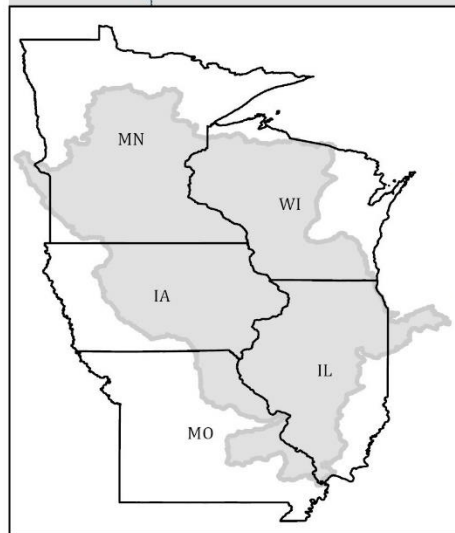
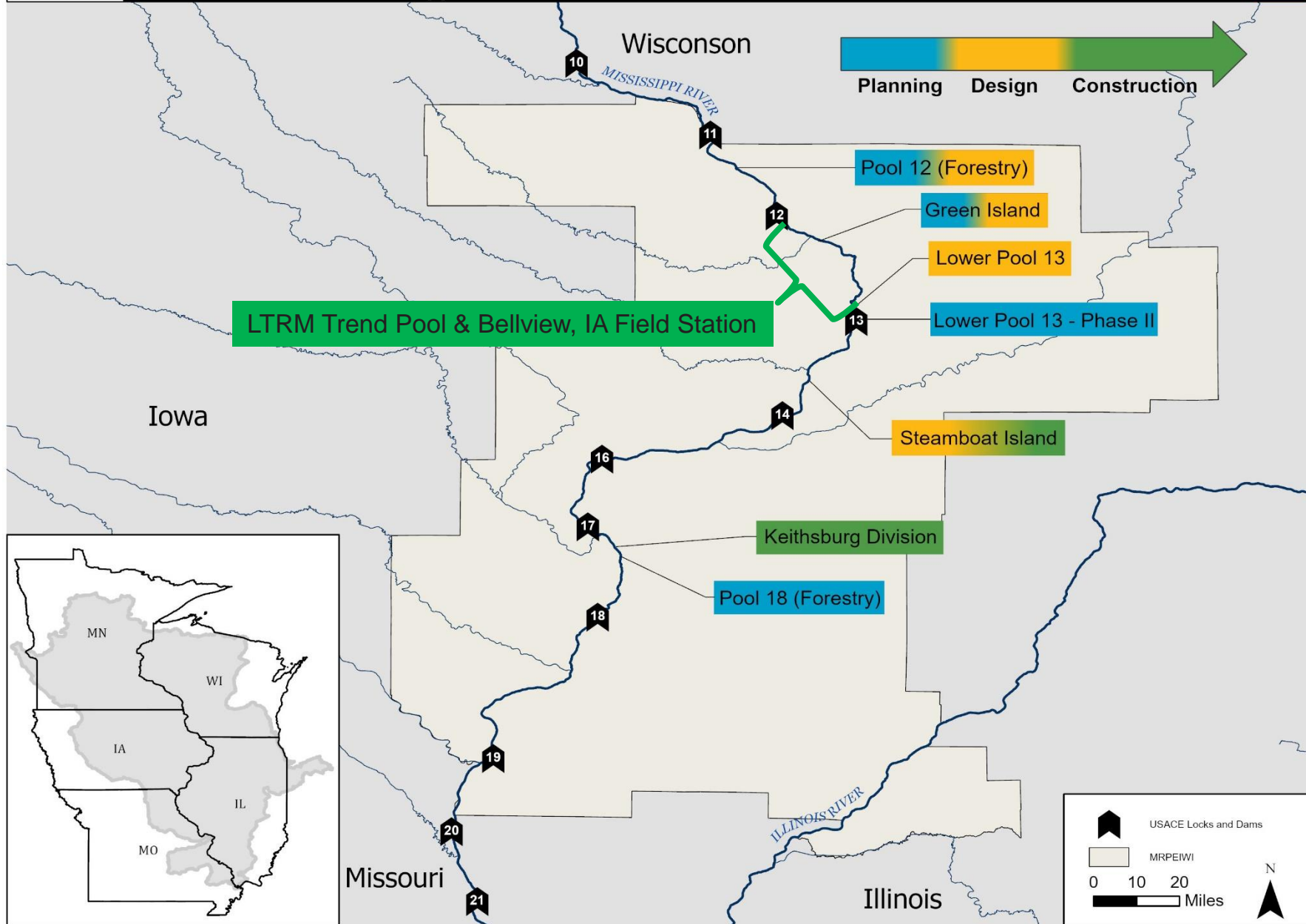




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Current Habitat Rehabilitation and Enhancement Projects In Mississippi River Ports of Eastern Iowa & Western Illinois



POOL 12 FLOODPLAIN FOREST

HABITAT REHABILITATION & ENHANCEMENT PROJECT

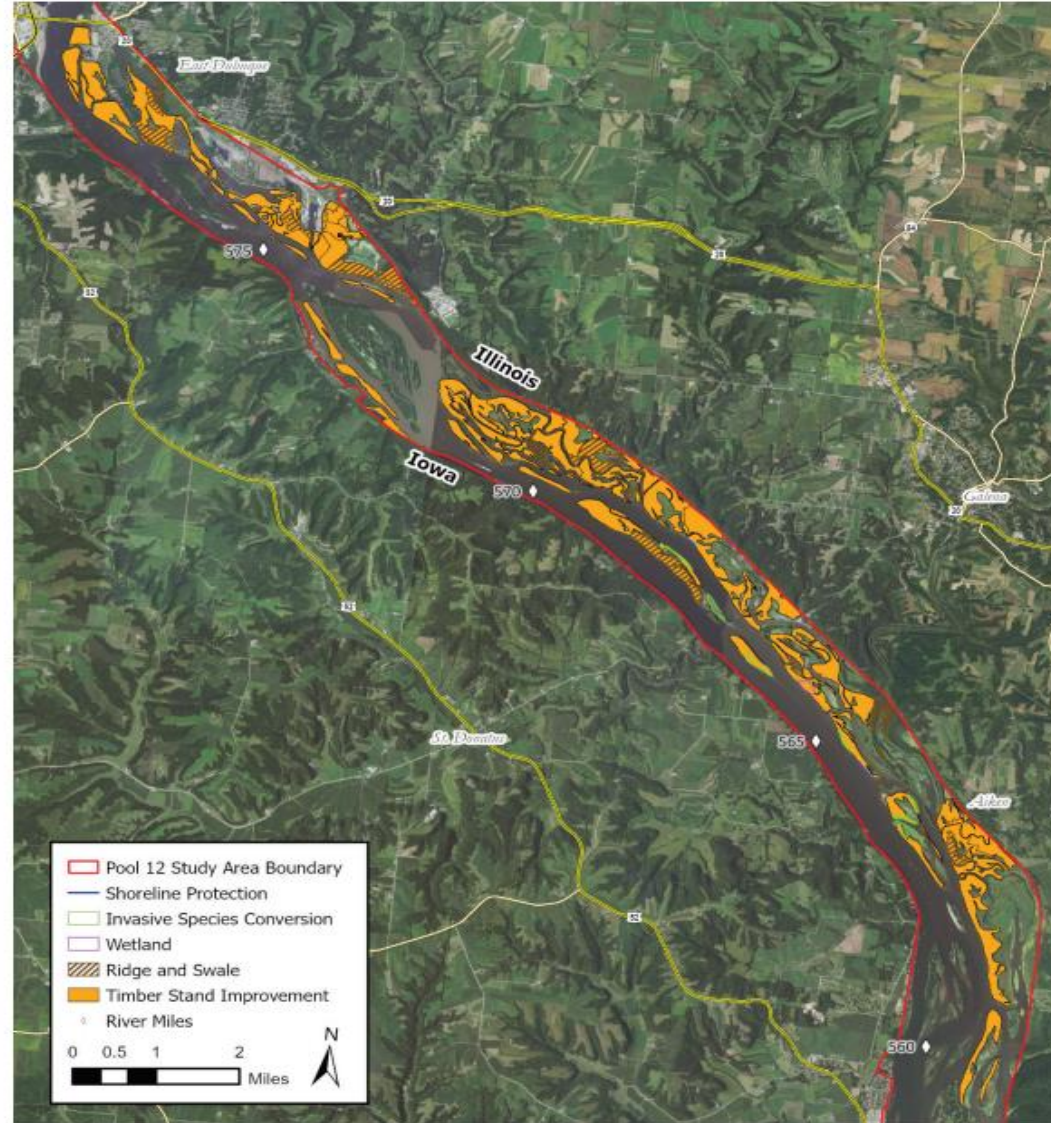


QUICK FACTS ▶

- Pool 12 River Miles 557.0 to 583.0 Dubuque and Jackson County, Iowa; Jo Daviess County Illinois; Grant County Wisconsin
- Feasibility Report Completed: Winter 2024
- Estimated Construction Start: Summer 2026
- Estimated Completion: Fall 2035
- Total Project Cost: \$34.9M



RECOMMENDED PLAN ▶



PROJECT OBJECTIVE ▶



Protect, restore, or create naturally regenerating, resilient, and diverse floodplain forest habitat.

PROJECT MEASURES ▶

- **Timber Stand Improvement** - TSI actions including thinning, coppice cutting, tree planting, shrub planting, and invasive species management, would occur on ~2,400 acres throughout Pool 12.
- **Invasive Species Conversion** - These actions would occur on ~60 acres overtaken by invasive species where native forest communities could not naturally reestablish. These areas would receive herbicide to eradicate the invasive species footprint and soil manipulation treatments to allow forest establishment.
- **Ridge and Swale** - This action would occur on ~200 acres in specific areas throughout the pool where there is currently no live forest community or sparse mature trees. Material would be moved to create ridges and planted with trees and shrubs. The ridges would be planted with trees, the swales would be left to be naturally vegetated based on conditions suitable of the area.
- **Herbaceous Wetland Restoration** - This action would restore ~10 acres of emergent and submergent wetland habitat.
- **Shoreline Stabilization** - ~5 acres of eroding shoreline would be stabilized to protect intact, mature forest from continued erosion and forest loss.



THE PROBLEM ▶

The important and unique floodplain forest habitat of the Pool 12 study area have experienced significant degradation over the last century and is predicted to further degrade over the coming decades. More frequent and longer-duration floods contributed significantly to the degradation of Pool 12 floodplain forests. Several additional factors including, land use, invasive species, disease, herbivory, and erosion, also contributed to reduced resiliency and diversity of the forest community. Flat topography, high water levels caused by impoundment, increased flood frequency and duration, and erosion have decreased the amount of terrestrial habitat capable of supporting a diverse, sustainable forest community.



PROJECT PARTNERS ▶



Green Island | HABITAT REHABILITATION & ENHANCEMENT PROJECT

QUICK FACTS ▶

- Pool 13 River Miles 545.9 to 548.7 Jackson County, Iowa
- Completed Feasibility: Winter 2024
- Construction Started: Summer 2027
- Scheduled Completion: Winter 2035
- Total Project Cost: \$36.6M

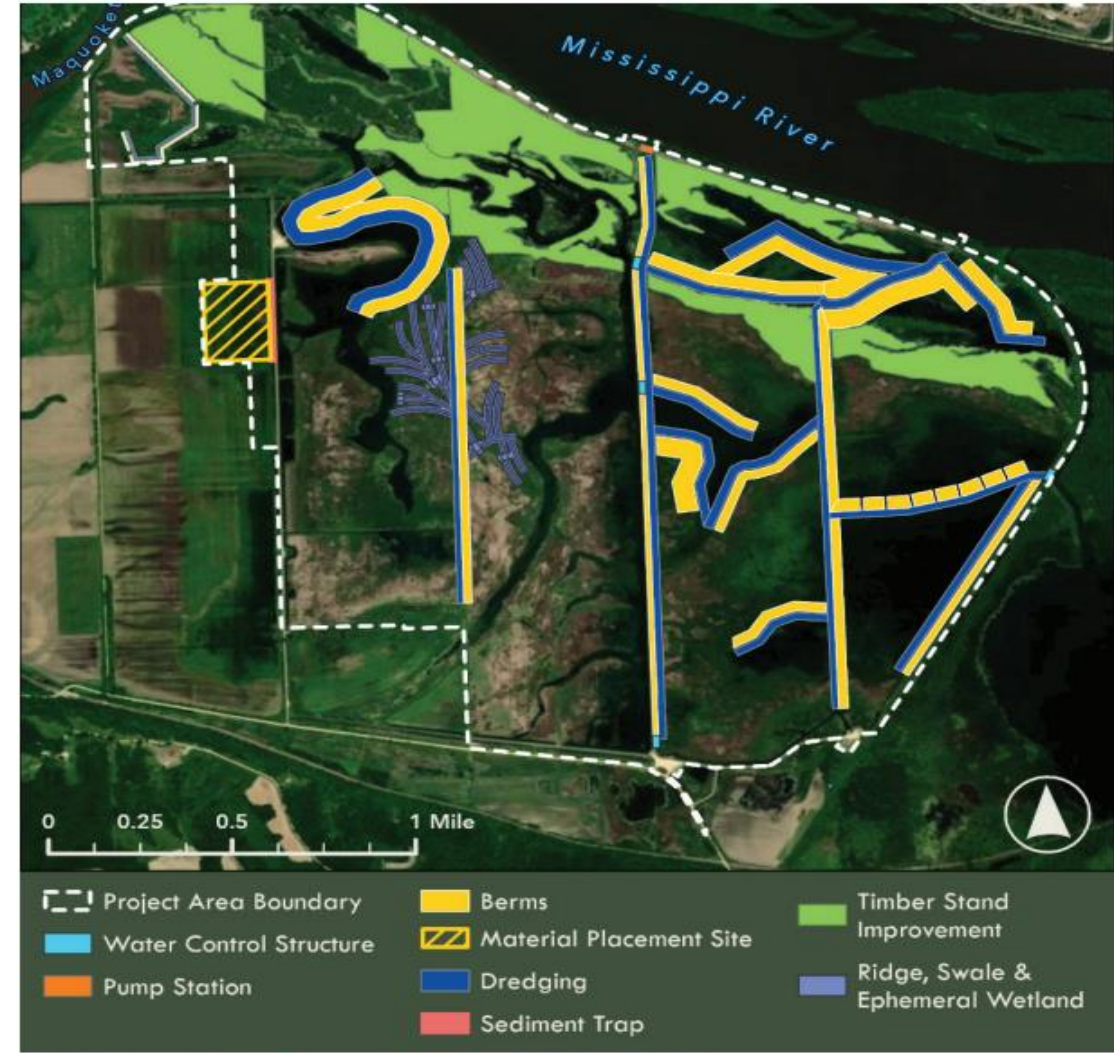


POTENTIAL MEASURES ▶

- Sediment Management
 - ▶ Sediment Trap
- Vegetation Restoration
 - ▶ Timber Stand Improvement
 - ▶ Plantings
- Water Level Management
 - ▶ Pumpstation
 - ▶ Water Control Structures
- Topographic Diversity
 - ▶ Berms
 - ▶ Ridge and Swale



SITE PLAN ▶



PROJECT PARTNERS ▶



PROBLEMS ▶

Limited ability to manage water levels, sediment accumulation reduces water storage capacity, loss of aquatic and terrestrial vegetation, loss of topographic and bathymetric diversity.

PROJECT OBJECTIVES ▶

- Restore the historic hydraulic cycle
- Restore the quality, quantity, and diversity of emergent, submerged aquatic, and forest vegetation
- Improve sediment management
- Restore aquatic ecosystems
- Restore bathymetric and topographic diversity

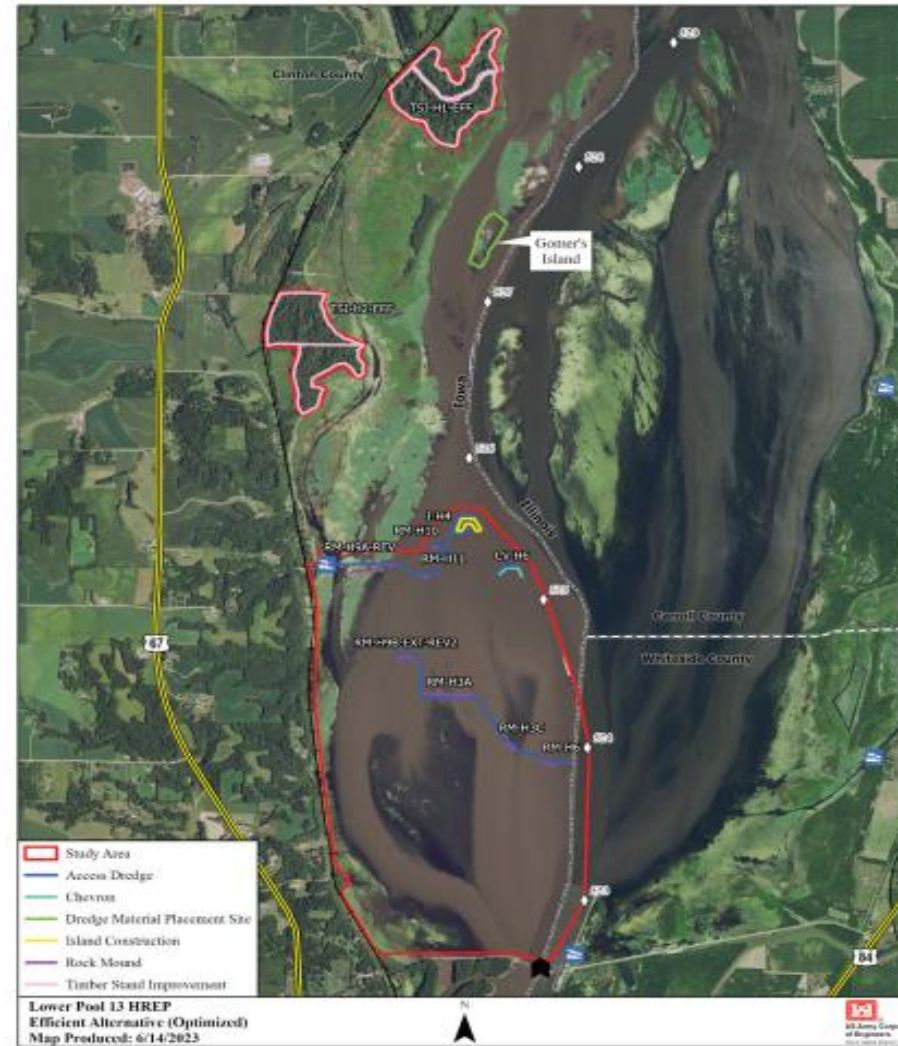


LOWER POOL 13 | HABITAT REHABILITATION & ENHANCEMENT PROJECT

QUICK FACTS ▶

- Location: Pool 13, River Mile 522.5 to 529, Whiteside & Carroll Counties, Illinois and Clinton County, IA
- Feasibility Report Completed: Dec 23
- Estimated Construction Start: Fall 2026
- Estimated Completion: Winter 2033
- Total project cost: \$26.0M

SITE PLAN ▶



PROJECT OBJECTIVES ▶

- Restore and enhance Submerged Aquatic Vegetation (SAV).
- Restore and enhance coverage, species richness and age distribution of the forest community



POTENTIAL PROJECT MEASURES ▶

- River Structures
 - Chevrons
 - Rock Mounds
- Island Construction and Protection
- Excavation
- Closure Structures
- Timber Stand Improvement

PROJECT PARTNERS ▶



QUICK FACTS ▶

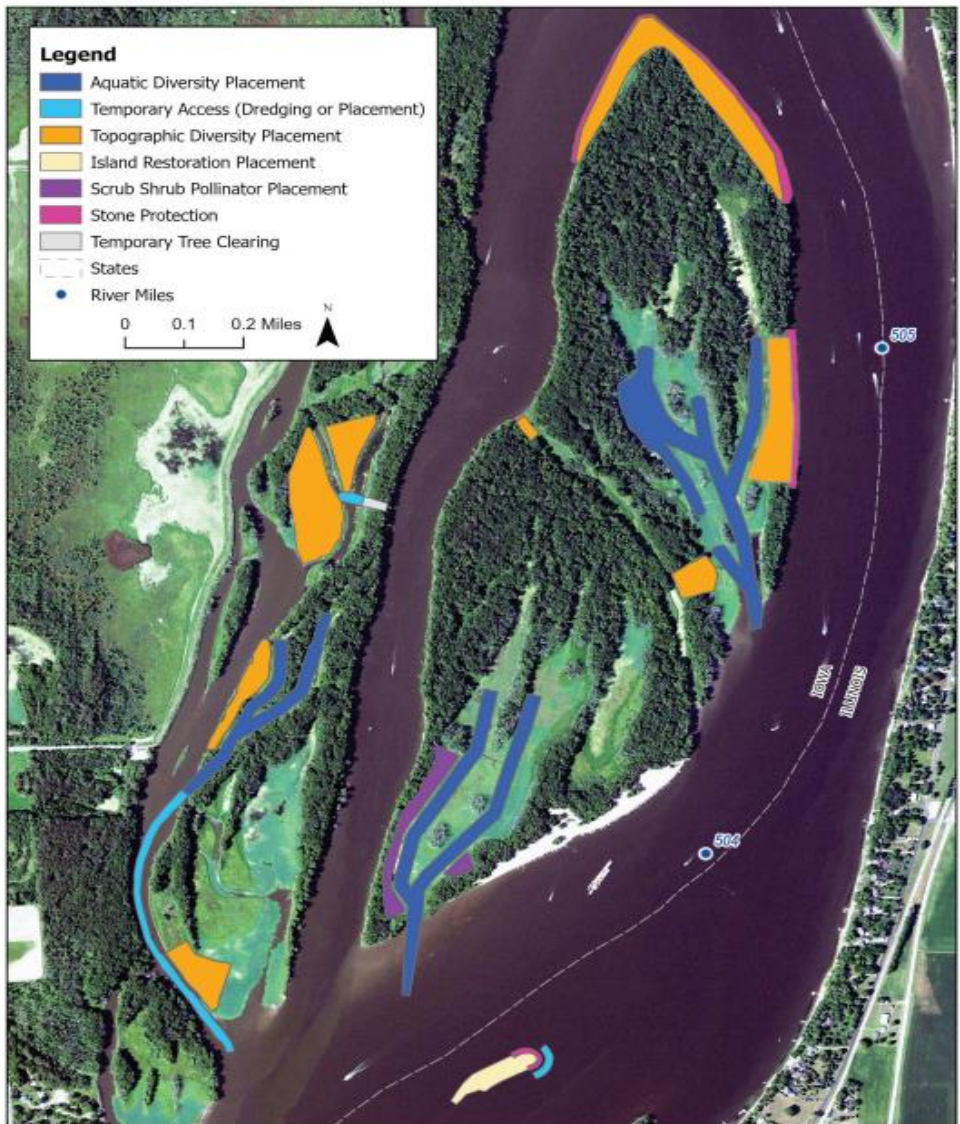
- Location:
Pool 14, River Miles 508-502.5
Clinton and Scott Counties, IA and Rock Island County, IL
- Feasibility Report Completed: Feb 2021
- Construction Began: Spring 2023
- Creating:
607 acres of aquatic habitat
2,013 acres of floodplain habitat
- Total project cost: \$33.6 million

PROJECT MEASURES ▶

- Excavate backwater channels
- Fisheries habitat
- Placement berms
- Scrub-shrub pollinator habitat
- Timber Stand Improvement
- Island restoration
- Stone protection



MEASURES EXCLUDING TIMBER STAND IMPROVEMENT ▶



PROJECT OBJECTIVES ▶

- Enhance and restore areal coverage and diversity of forest stands and habitat and increase diversity of bottomland hardwood forest
- Increase year-round aquatic habitat diversity
- Restore acreage and topography of islands and protect from erosion
- Protect existing backwater habitat from sedimentation and enhance backwater and interior wetland areas

PROJECT STAGES ▶

- Stage I - Stone protection at head of island, northeast bank line, Southeast Island and the grade control structure [Completed Dec 2024]
- Stage II- Dredging backwater channels in upper lake, topographic placement at upper lake, northeast bank, grade control structure and at the head of island [Started construction in 2024]
- Stage III - Southeast island restoration and dredging backwater channels in Lower Lake (Started design in 2024)
- Stage IV - Timber Stand Improvements, plantings and dredging for aquatic diversity and topographic placement



PROJECT PARTNERS ▶



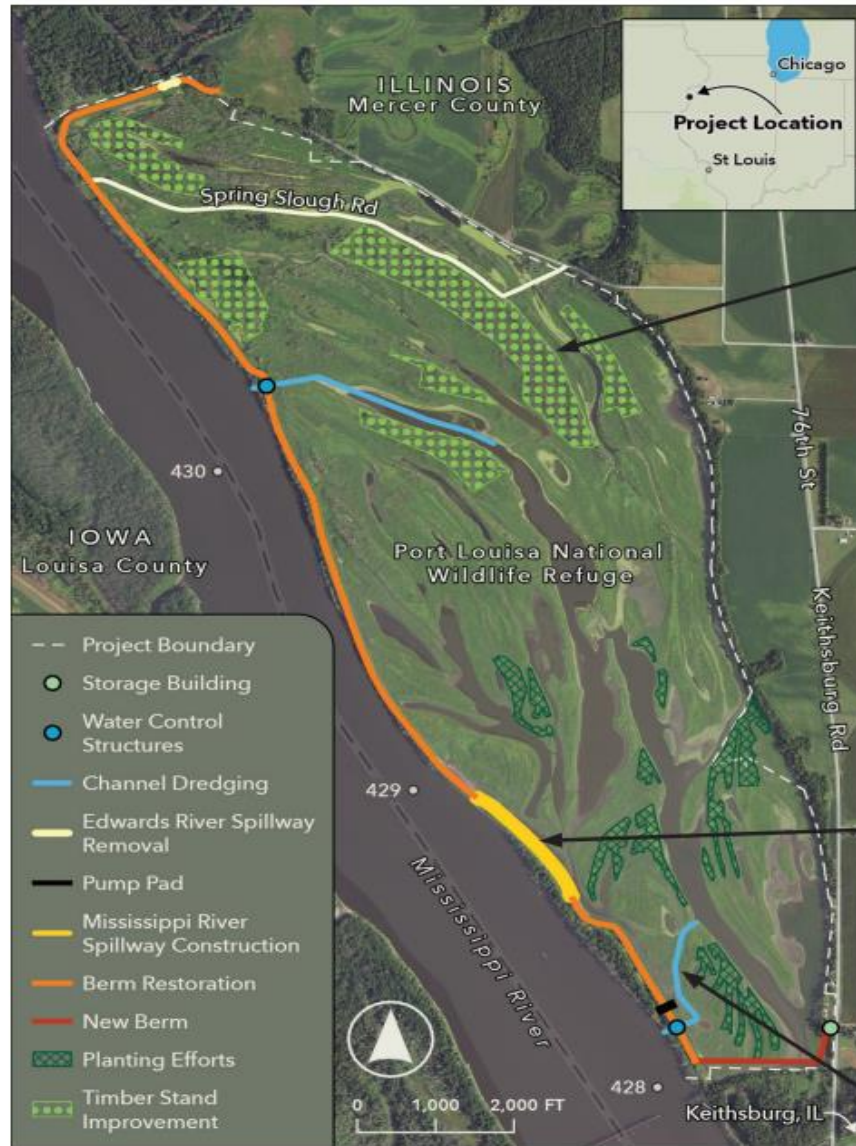
QUICK FACTS ▶

- Location:
 - ▶ Pool 18, River Miles 431-428
 - ▶ Mercer County, IL
- Feasibility Report Completed: Nov 2018
- Construction Started: Sep 2019
- Scheduled Completion: Fall 2026
- 1,400 acres of backwater complex
- Total project cost: \$29.6 million

PROJECT OBJECTIVES ▶

- Restore mudflat and shallow water habitat for shorebird use during the migration periods – measured in acres
- Restore submergent and emergent vegetation for waterfowl during migration periods – measured in acres
- Improve existing scrub-shrub community for waterfowl and other wildlife – measured in acres
- Increase areal coverage of hard mast-producing forest stands – measured in acres
- Improve year-round bottomland hardwood habitat for neotropical migrants and other woodland-dwelling species – measured in acres

SITE PLAN ▶



PROJECT MEASURES ▶

- Enhance existing berm structures
- Construct spillways, water control structures, and pumping stations
- Excavate channels in backwater areas
- Repair existing road
- Plant floodplain forest trees and shrubs
- Timber Stand Improvement



PROJECT PARTNERS ▶



QUICK FACTS ▶

- Location:
 - ▶
 - ▶
- Feasibility
- Construction
- Estimated Cost
- Creating:
 - ▶
 - ▶
- Total project

SITE PLAN ▶



PROJECT OBJECTIVES ▶

Increase year-round aquatic habitat diversity, measured by fish use and spawning areas. Restore 100 acres of riparian forest and tree canopy. Improve water quality and function of the river – freshwater



PROJECT MEASURES

- Restore Bar
- Topographic
- Timber Sta
- Closure Str



DREDGING



CHEVRON



PROJECT PARTNERS ▶





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UMRR INVESTMENT IN THE MISSISSIPPI RIVER PORTS OF EASTERN IOWA & WESTERN ILLINOIS

Investment:

- 1986 – 2024
 - 14 Completed Projects
 - 26,590 Acres

- 2024 – 2034
 - 8 Projects in Planning, Design, and Construction
 - \$188M Estimate Cost
 - 31,294 Acres

- Long Term Resource Monitoring
 - Habitat Needs Assessment II

- Science in Support of Restoration
- Status and Trends
- Next Generation of HREPs





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DISCUSSION

