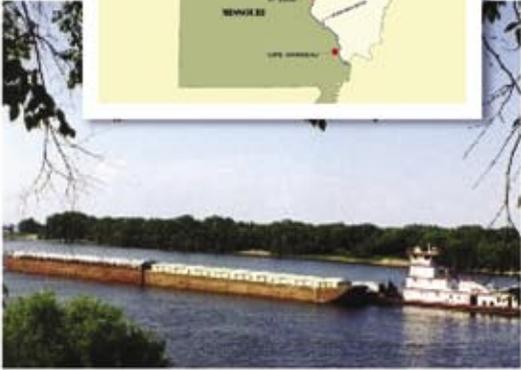
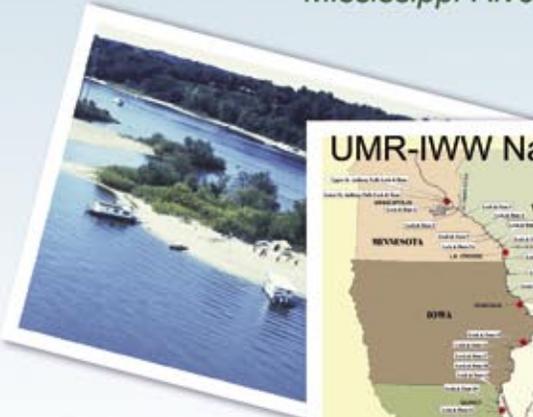


Upper Mississippi River System

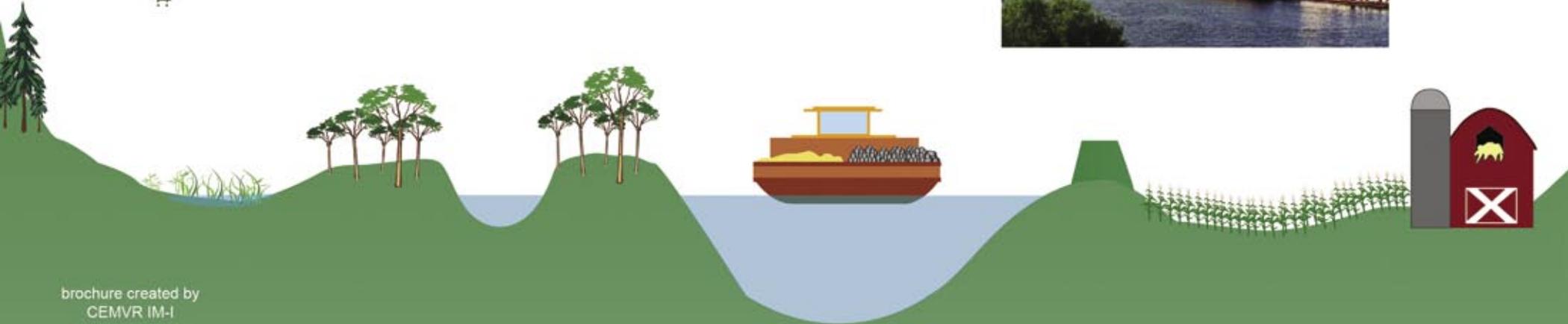
# SUSTAINABILITY

*"To seek long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System."*

U.S. Army  
Corps of Engineers  
Clock Tower Building  
Rock Island, IL 61201



For additional information, please check our website at:  
<http://www2.mvr.usace.army.mil/NESP/>



# ECOSYSTEM CHALLENGES

## Backwater Sedimentation

Watershed development, farming, boat wakes, and other causes of stream bank erosion have added sediment to the river system. When stirred by waves, sediments cloud the water and block light that aquatic plants need to grow. It also fills in deeper areas of backwaters and channels. The loss of backwater depth and aquatic plants results in less diverse habitat.

## Connectivity

Seasonal flooding connects the river to its floodplain, which is important to enrich the soil, rejuvenate marshes, prairies and forests, and provide seasonal habitat for fish and aquatic birds. Permanent flooding to maintain navigation has increased aquatic connectivity in northern parts of the river, while levees have decreased aquatic connectivity in southern parts of the river.

More than 30 species of fish move upstream and downstream throughout the river system to spawning, feeding, or over-wintering habitat. Navigation dams, however, impede fish movement which has negatively impacted many species.

## Island Loss

The system's scenic islands create a diverse mix of aquatic and terrestrial habitats beneficial to many types of fish and wildlife. In some river reaches, islands are being eroded at an alarming rate and critical habitat is being lost in the process.

## Bank Erosion

Bank erosion is a problem at many locations on the river where river currents and waves attack shorelines. Severe erosion can damage shoreline resources such as heron rookery trees, eagle roosting trees, and archeological sites.

## Species Abundance & Diversity

The Mississippi River Corridor is used by 40 percent of North American migratory waterfowl. There are also about 300 bird species, 150 fish species, and a unique mussel community. All species face threats from numerous activities that are degrading habitat quality.

## Invasive Species

Non-native fish, plants and other organisms, species like the common carp, zebra mussels and purple loosestrife, disrupt the river's ecological balance by competing with native species for food and habitat.



# NAVIGATION SOLUTIONS

## New Lock

New longer locks that fit the size of today's tows will save almost one hour per each lockage, dramatically reducing delays on the system. In turn, transportation costs are reduced which translates to national economic benefits.



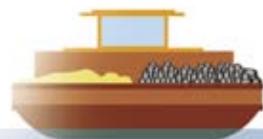
## Mooring Cells

Installing moorings at several locks would reduce delays by allowing tows to wait closer to a lock while another tow is completing the lockage process.



## Switchboats

Switchboats improve efficiency by reducing exit times for tows requiring a double lockage process. Switchboats can be placed at locks relatively quickly compared to efficiency measures such as new locks.

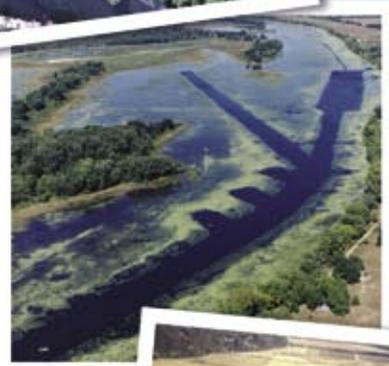


# ECOSYSTEM SOLUTIONS



## Fish Passage

Modifications to dams and naturalistic bypass channels are being considered as a way to increase opportunities for migratory fish (some 30 species) to reach spawning, rearing, feeding, and winter habitat. Proposals could improve fish access to thousands of miles of main stem and tributary river channels and backwaters.



## Backwater

Deepening and aeration of backwaters provides winter fish habitat and improved fish populations, increasing angler success and recreational opportunities. Backwater marsh restoration also benefits waterfowl, shorebirds, fish, reptiles, and amphibians.



## Floodplain Restoration

The 15-year ecosystem restoration plan targets 35,000 acres of floodplain habitat for restoration. The program will focus on restoring large blocks (>1,000 acres) of floodplain forest, wetland, and prairie with priority given to river reaches below Rock Island and on the lower Illinois Waterway.

# NAVIGATION CHALLENGES

## Lockage Delay & Congestion

Delays near the lower end of the river system can reach 4.5 hours on average, resulting in serious economic losses to the region and nation. The major cause of these delays is the need for today's larger 1,200-foot tows (15 barges) to go through 600-foot locks in two parts. This process is known as a double lockage. With a double lockage, the first nine barges are pushed into the lock and uncoupled. The towboat and other barges then back out of the lock chamber while the first "cut" locks through. When the chamber is ready, the second cut locks through. The entire process can take almost two hours, and the delay to waiting tows accumulates significantly as traffic increases.



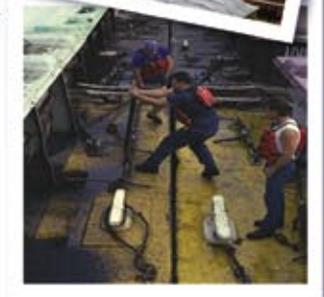
## Fleeting

A total of 50 towing or barge companies operate on the system with 12,500 hopper barges, 1,300 tank barges, and 500 towboats. There are 160 fleeting areas along the Upper Mississippi River and 42 on the Illinois Waterway. Fleeting problems include aesthetics, shoreline erosion, mussel bed impact, tree damage, hazardous spills, and others.



## Safety & Reliability

Safety is a concern around heavy equipment and water, especially in bad weather and at night. Each time a tow must be uncoupled and remade, the inherent risk of bodily harm or fatality increases.



## International Competitiveness

The Upper Mississippi River System is a vital part of the national economy, significant both for the key exports and the nation's balance of trade. In 2000, the river system carried 60 percent of the nation's corn and 45 percent of its soybean exports—at roughly 60-70 percent of the cost of shipping over the same distance by rail.





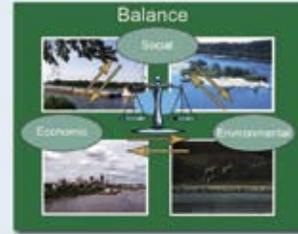
# UPPER MISSISSIPPI RIVER SYSTEM SUSTAINABILITY



*"To seek long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System"*

### Ecosystem Problems

### Ecosystem Solutions



### Navigation Problems

### Navigation Solutions



### Ecosystem Restoration

**OBJECTIVE**  
Address cumulative impacts including ongoing effects of the operation and maintenance of the UMR-IWW Navigation System.

**RECOMMENDATION**  
• Fish Passage @ Dams 6, 9, 22, and 26  
• Changes in Water Level Control @ Dams 25 and 18  
• Adaptive Implementation of 225 small projects of less than \$25 million each  
• Wetland Building  
• Water Level Management  
• Wetland/Dike Channel Restoration  
• Wing Dam/Canal Alterations  
• Habitat Structure Protection  
• \$1,000 Acre of Floodplain Restoration  
• Continued Study and Monitoring

### Navigation Efficiency

**OBJECTIVE**  
Provide for a safe, reliable, efficient, and sustainable UMR-IWW Navigation System over the planning horizon.

**RECOMMENDATION**  
• Moving Facilities @ Locks 12, 14, 16, 20, 22, 24 and Ladang  
• Switchlocks @ Locks 20 through 25  
• Adaptive Implementation of 1200' chambers at Locks 20 through 25, La Grange, and Peoria  
• Mitigation for Site Specific and System Effects  
• Continued Study and Monitoring

## Dual Solutions

### Dredging

### Island Building

### Water Level Management

### Side Channel Restoration

## Public Information

For more information visit us on the web at [www2.mvr.usace.army.mil/umr-iwvns](http://www2.mvr.usace.army.mil/umr-iwvns)

Public Involvement

The Upper Mississippi River System is the only large river system recognized by Congress as *"a nationally significant ecosystem and a nationally significant commercial navigation system."* – Water Resource Development Act, 1986

