

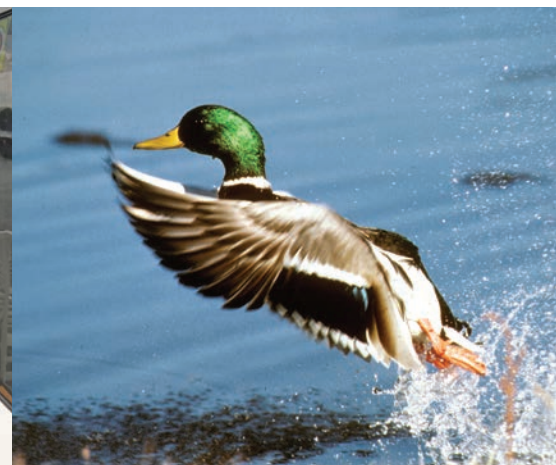
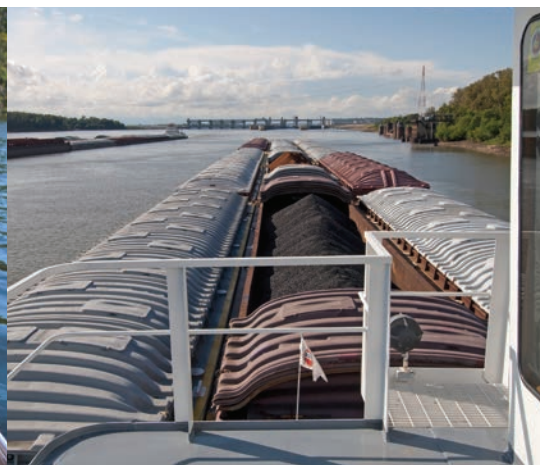


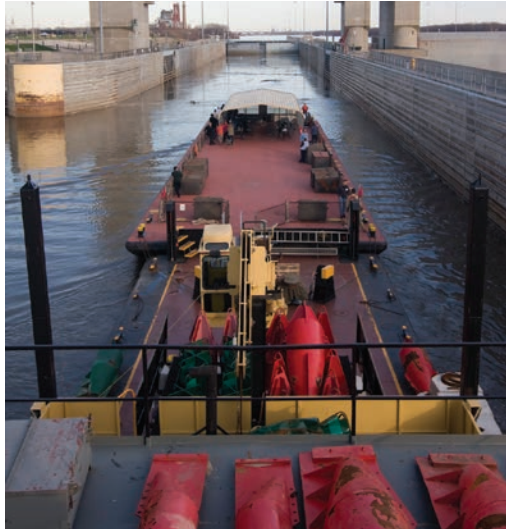
THE NAVIGATION and ECOSYSTEM SUSTAINABILITY PROGRAM

*The Key to Securing
the Vitality of the Upper
Mississippi River System*

The Upper Mississippi River System (UMRS) is the only river system designated by Congress as a “nationally significant ecosystem and a nationally significant commercial navigation system.” In 2007, Congress declared its commitment to modernizing this critical waterway system and restoring its ecosystem health by authorizing the Navigation and Ecosystem Sustainability Program, or NESP.

NESP is an unprecedented, dual-purpose authority allowing the U.S. Army Corps of Engineers to integrate the management of the navigation system and ecosystem of the UMRS. Federal investment is needed now to ensure the river system’s long-term economic and environmental sustainability.





The Mississippi River: America's Economic & Environmental Backbone

The Upper Mississippi River flows roughly 1,200 miles from northern Minnesota to the confluence with the Ohio River at the southern tip of Illinois, representing over half of the length of the Mississippi River.

A Natural, National Treasure. The Mississippi River supports 25 percent of North America's fish species, and nearly 300 species of birds migrate through the river valley in spring and fall, including some 40 percent of the migratory waterfowl traversing the U.S.

There are 16 national refuges along the Upper Mississippi River (UMR). Combined with conserved lands managed by states and open to the public, these areas attract people who take over 12 million recreational visits to the region annually—more than most national parks, including Yellowstone.

Critical to the Nation's Health. The 29 locks and dams on the UMR support 29 power plants and help provide water to 23 public water suppliers that combined serve approximately 2.8 million people along the river.

Navigation that Drives Our Economy. More than 60 percent of America's corn and soybeans are exported on the Mississippi River and its tributaries. Approximately 850 miles of the UMR is commercially navigable, thanks to a series of 29 locks and dams on the UMR plus eight on the Illinois River that connect the Mississippi River to the Great Lakes and major cities like Chicago. Together, the Upper Mississippi and Illinois rivers, along with sections of four other rivers, provide a 1,200-mile commercially navigable river network in the upper Midwest—the heart of "America's breadbasket." Also, thousands of recreational boaters use these locks every year.

Navigation Challenges

Outdated, Single Cell Locks Limit Capacity. Locks only 600 feet in length require tows—most of which are 1,200 feet—to pull apart and lock through in two stages, and single chambers constrain traffic to one-way traffic. Both inefficiencies drive up costs and delivery time, hindering the nation's competitiveness and reducing market opportunities.

Gambling on 1930s Infrastructure. The 85-plus year-old navigation system is well beyond its 50-year design life. One of many examples is the LaGrange Lock on Illinois River, which is in extremely poor condition and has been waiting for major rehabilitation repairs for well over a decade.

Aging Locks Suffer Increased Closures. A closure at just one lock shuts down most of or even the entire system, and lock outages have increased 700 percent nationally over the past decade. A closure of Lock and Dam 25 for just one year would result in a loss of more than 7,000 jobs, \$1.3 billion of labor income and approximately \$2.4 billion of economic activity to the corn and soybean industry alone. In 2015, the average delay for tows at Lock and Dam 25 was nearly three and a half hours.

Environmental Challenges

Ecosystem Degradation Outpaces Restoration. Altered river flows and water levels, broken connections between the floodplain and flowing river, and excess sedimentation and runoff can kill plants and trees or prohibit their regeneration, which in turn drastically impacts wildlife, particularly species like many fish that need side channels or connected floodplains for spawning or use these areas for shelter or foraging, as do many bird species, like waterfowl.

Habitat Loss, Declining Water Quality. Sediment trapped by dams fills in wetlands, lakes and channels, which negatively impacts important habitat. Excess nutrients cause oxygen-depleting, toxic algal blooms that can adversely impact water quality, affecting both people and wildlife. In addition, the decline of overall ecosystem health is exacerbated by the presence of invasive plant and animal species.

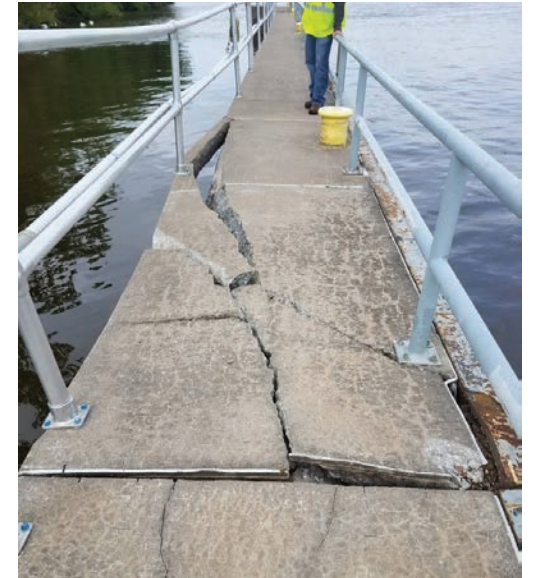
NESP Will Create a Healthier River Ecosystem

The NESP will improve water quality and ecosystem health through the construction of multiple fish passages, 65 backwater and island enhancements, 29 side channel reconnections and 92 modifications to channel structures as well as through the modified operations of dams that better mimic natural, seasonal water levels. These projects and their impacts on vegetation and wildlife will be closely monitored by biologists in order to assess the effectiveness of restoration efforts and guide those in the future.

NESP's authorization includes \$1.717 billion for a 15-year effort to restore the river's ecological integrity and ability to support fish and wildlife, plus \$10.42 million annually for monitoring. It's important to note that ongoing funding from the Upper Mississippi River Restoration (UMRR) program is imperative until NESP funding surpasses this annual investment for ecosystem restoration.

NESP Will Produce More Efficient Navigation

The NESP includes construction of seven new 1,200-foot locks at seven of the most congested locks—20, 21, 22, 24 and 25 on the UMR and at La Grange and Peoria on the Illinois River. The new locks, constructed alongside the existing 600-foot locks, would enable the typical 1,200-foot tow to pass without separating its barges, which doubles or even triples the amount of passage time. Also, the new locks adjacent to the original ones allow for two-way traffic and won't shut down all riverine transportation during times of routine maintenance. Congress further authorized smaller-scale efficiency improvements that will provide immediate benefits upon their implementation.



RIPPLING ECONOMIC IMPACTS

- ▶ Some **116 million tons of cargo pass through locks** on the Mississippi and Illinois rivers. That same amount would require 4,640,000 semi-trucks annually. That's 65,909 miles bumper-to-bumper, enough to circle the Earth more than two and a half times!
- ▶ **River transportation** on the UMRS provides 59,000 directly related shipping jobs, and **helps support some 541,000 jobs** across the entire system.
- ▶ From Lock and Dam 25—the southernmost 600-foot lock and dam on the system—**products are shipped to 132 counties in 17 states and global markets.** An outage here would cost nearly \$1.6 billion annually in additional transportation charges.

Cover: © Robert J. Hurt; © Willard/istockphoto; © Mark Godfrey/TNC; courtesy of USFWS; Opposite, from top left: Bicyclists © Mark Godfrey/TNC; Barge © Erika Nortemann/TNC; Farm on a tributary of the UMR © Mark Godfrey/TNC; Pool 8 on the UMR © Robert J. Hurt; This page from top: Aging lock © Hilary Markin/USACE; Lock15 (courtesy of USACE); Lock 15, Guidewall collapse (courtesy of USACE); Deteriorating lock wall at La Grange © Hilary Markin/USACE



Shown above are islands that were constructed at Pool 8 and have now become "naturalized." © Robert J. Hurt

Ecosystem Restoration

NESP will improve the structure and dynamic processes of the ecosystem by reconnecting side channels to the river, restoring fish habitat, rebuilding islands, reforesting lands, protecting shorelines from erosion, and mimicking natural cycles of seasonal water levels to help vegetation thrive—all of which are compatible with navigation. NESP's authorization includes \$1.717 billion for a 15-year effort to restore the river's ecological integrity and ability to support fish and wildlife, plus \$10.42 million annually for monitoring.

Fish Passage. More than 30 species of fish migrate the Mississippi River to spawning, juvenile and seasonal habitats. For instance, skipjack herring—which are important forage species for other fish like bass—move from the Gulf of Mexico to northern reaches of the river. Four locks and dams were initially selected to improve fish passage.

Floodplain Reconnection & Restoration. Hundreds of thousands of acres of floodplain habitat have been cut-off from the UMR by levees. Reconnecting *some* of this land would increase flood storage capacity, improve water quality and provide valuable habitat for fish and wildlife. NESP designates 35,000 acres to be reconnected in several locations where landowners are investigating options for retiring land for other uses.

Side Channel Reconnections. Side channels provide valuable habitat for fish and other wildlife. NESP calls for 29 projects that divert some flow from the main channel of the river into these side channels; most would reconnect 3-8 miles of side channel habitat, and most are recommended downstream of the lock and dam system.

Multi-Pronged Approaches. Sixty-five backwater areas, stretching from Minneapolis to Cairo, Illinois, along with portions of the Illinois River, would be restored using multiple techniques that collectively reestablish healthy flows, a better mix of shallow and deep marshes, and floodplain islands of varying heights that provide a wide array of habitat types.

Dam Point Control. There are locations where switching dam management from "hinge point" to "dam point" creates greater flexibility to manage for ecological benefits, such as summer reductions that can expose mudflats and spur aquatic plant growth. Locks and Dams 16 and 25 are two dams that could benefit from this change.

Water Level Management. Seasonal variability in water levels is key to maintaining aquatic vegetation that serves as the base of the ecosystem by providing habitat cover and food, stabilizing river islands and banks, and helping improve water quality. There are 12 dams where this approach could be implemented without major modifications. In many cases, using dams to lower water levels as little as 6 inches during the summer can expose thousands of acres of mudflats and trigger the sprouting of dormant seeds.

Navigation

NESP Large-Scale Measures— Initial cost of \$1.948 billion

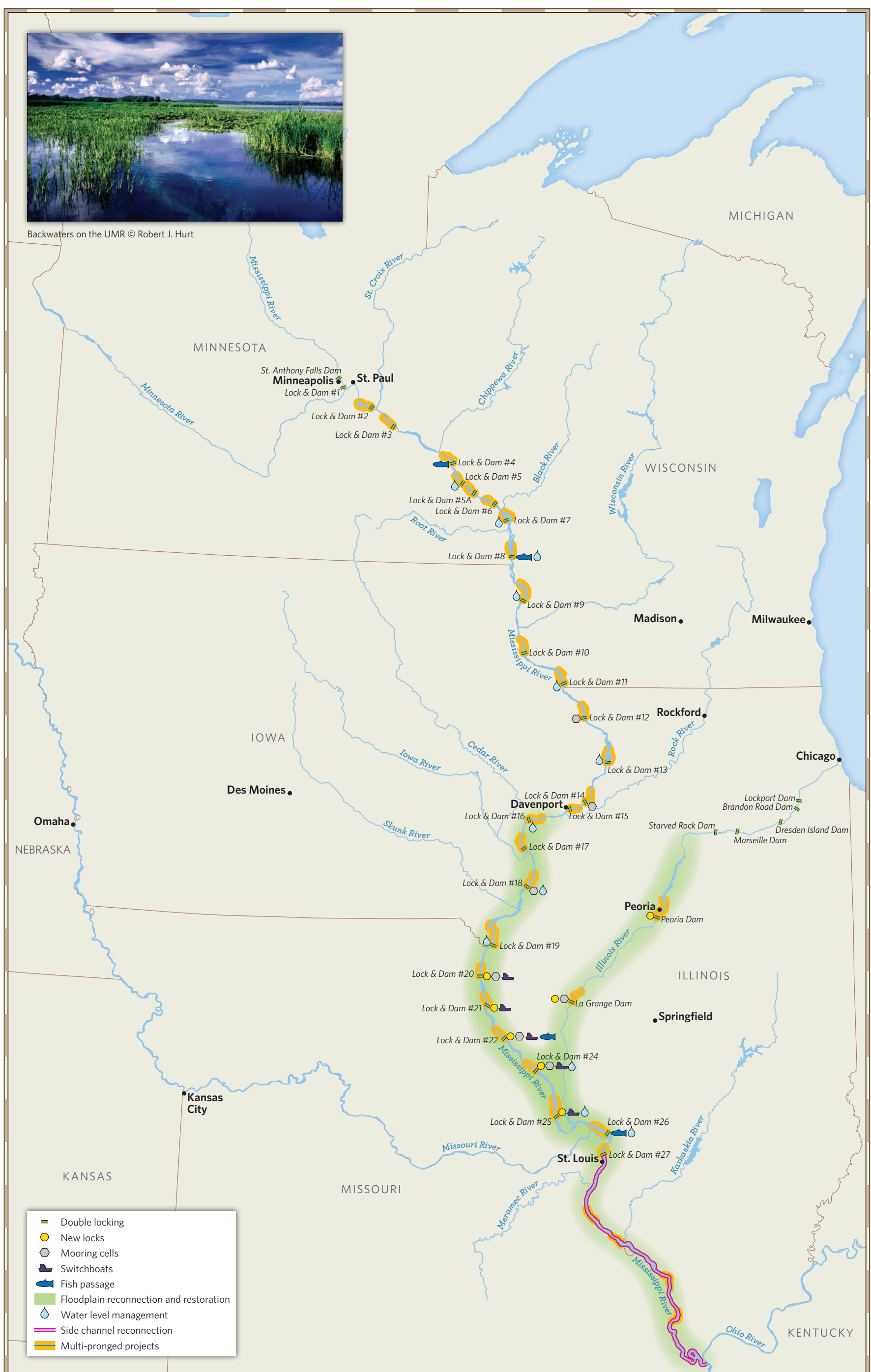
New, 1,200-foot locks: The UMR has more than half of the delayed lock sites in the nation's inland waterway system due to existing, undersized 600-foot, single-lock chambers. On average, it takes two to three times longer for a 1,200-foot tow to pass through a 600-foot chamber. This measure, approved by Congress, includes new 1,200-foot chambers constructed next to the existing chambers at locks and dams 20, 21, 22, 24 and 25 on the UMR and at LaGrange and Peoria Locks on the Illinois River. Also, the new locks adjacent to the original ones would allow for two-way traffic and won't shut down *all* transportation (including recreational and commercial fishing boats) on the river during routine maintenance on the locks.

Required Mitigation. Mitigation for project site impacts will be conducted concurrent with the construction of each site. Impacts resulting from traffic increases associated with new construction are expected to occur and grow throughout the planning horizon. Mitigation measures for navigation traffic effects will begin immediately and be implemented adaptively throughout the project life.

NESP Small-Scale Measures— Initial cost of \$256 million

Mooring Cells at seven Lock and Dams. These are either buoys downstream of the dam or sheet-pile cells upstream of the dam that provide a closer location to the lock for tows awaiting lock turn.

Switchboats. This measure provides for two full-size towboats referred to as "switchboats" to be permanently stationed at select lock sites. Switchboats allow sections of a tow to be removed and moved to reduce passage time or to transfer to a different tow. Switchboats can also perform as helper boats to assist down-bound tows with their approach to the lock.



Backwaters on the UMR © Robert J. Hurt

Pool 8: A Replicable Success Story for the Upper Miss



Tundra swans at Pool 8 during spring migration © Robert J. Hurt



Gretchen Benjamin © Jay Harrod/TNC

Gretchen Benjamin, who was born and raised in the La Crosse, Wisconsin area, says some of her best childhood memories were summer trips spent on her friend's houseboat on the nearby Mississippi River, where the pair would swim and collect mussel shells.

In 1984, after earning a degree in biology at the University of Montana, her love for the big river brought her back to Wisconsin, where she began working as a field biologist for the state's Department of Natural Resources. In 1988, her "office" became Pool 8 near La Crosse on the Mississippi River, where she monitored aquatic vegetation, water quality and fisheries.

"It was during this time I saw firsthand how the habitat was declining," she says. "It was evident, even from month to month, and certainly over the years. It was heartbreaking."

Degradation Decades in the Making

In fact, the 1980s and early '90s proved to be the low point of ecosystem health for the Upper Mississippi River, or UMR. The 1930s brought about the completion of most of the 29 locks and dams on the UMR that created pools enabling towboats and barges to traverse the river. And while this infrastructure created an efficient way to ship goods to and from the Upper Midwest, it also created some unintended consequences.

Over time, the water these dams backed up began eroding the myriad of islands that were intertwined by channels rich with vegetation that provided food for waterfowl and other wildlife and cover and spawning habitat for fish.

By the 1980s, there was nothing more than a vast span of open water at the lower end of Pool 8, just above the lock and dam. And upstream from the pool wasn't much better. The islands had been completely eroded by decades of wave action that became progressively worse as winds increased with the disappearance of each one. And with the islands, so, too, disappeared the smaller channels and the vegetation that once lined them. The erosion also increased the amount of sediment, which in turn filled deeper channels and "holes" that provided important habitat for fish. And the constant wave action also caused more suspended sediment, which diminished water clarity and quality. Combined, these things took a dramatic toll on waterfowl and fish and other wildlife.

Reversing the Decline

Fortunately, the people who lived in area took notice and demanded something be done. They and the elected officials who represented them were successful in working to pass the UMR Restoration Program in 1986, which was part of the Water Resources Development Act. Because of the people's voice, the U.S. Army Corps of Engineers—which receives the program's funding—first focused their restoration efforts on Pool 8. A second reason Pool 8 was chosen was because there existed data from long-term monitoring, meaning it would be easier to gauge the effectiveness of the restoration efforts and techniques on plants, fish, birds and other wildlife.

With input from biologists from Minnesota and Wisconsin and the U.S. Fish and Wildlife Service, the Corps began restorative efforts in 1990 with the building of islands that would provide habitat for fish and wildlife and, importantly, help reduce

erosion from wind-driven wave action. By 1993, the Corps had built three islands extending nearly two and a half miles in total. By 2002, the Corps had constructed seven more islands that stretched over two miles in length, and they improved fish habitat by deepening channels and creating deeper pockets of water. With promising results from these projects, the Corps constructed 17 additional islands from 2006 to 2012.

Proven Results for People and Nature

Now, 30 years after the first restoration efforts at Pool 8, Gretchen says the outcome is clear. "You don't have to be a biologist to see it," she says. "You can see the water is clearer now. You can see more native vegetation. And you can see more birds and wildlife."

Data from ongoing monitoring backs up Gretchen's claim. Science shows the restoration projects have attracted more birds and fish—lots of them. For instance, recent monitoring at Pool 8 accounted for approximately 300,000 waterfowl and 24,000 tundra swan at peak migration, as opposed to about 100,000 and 1,000 respectively, in the 1990s during peak migration. And migratory birds and waterfowl also stay longer than they did in the past, because they now have the food needed to fuel their remaining journeys.

Also, electro-shock monitoring (which doesn't harm the fish) near the restored areas now turns up 300-400 fish per hour, versus "next to nothing" in the early 1990s, according to Gretchen. And these are species like large and smallmouth bass, bluegill bream and black crappie that are highly sought after by anglers. Tim Kabat, the mayor of La Crosse, can attest to this.

"Because of the productivity of fish at Pool 8, we now host the Bassmaster Elite Tournament, and that tournament alone draws as many as 10,000 people and has an economic impact of more than \$936,000 every year," Kabat says. "Bassmaster also produces annually a 'Top 100 Bass Lakes' article, and the nearby pools here—4 through 8—are highlighted in that. These pools also draw recreational anglers, birdwatchers and hunters,

all of which have an enormous impact on our local economy. Having lived in the area for more than 30 years, I can say without a doubt, the restoration efforts here have made this possible."

Kabat also says the restoration not only improved the health of the environment and boosted related tourism, but it's also been embraced by the barge industry.

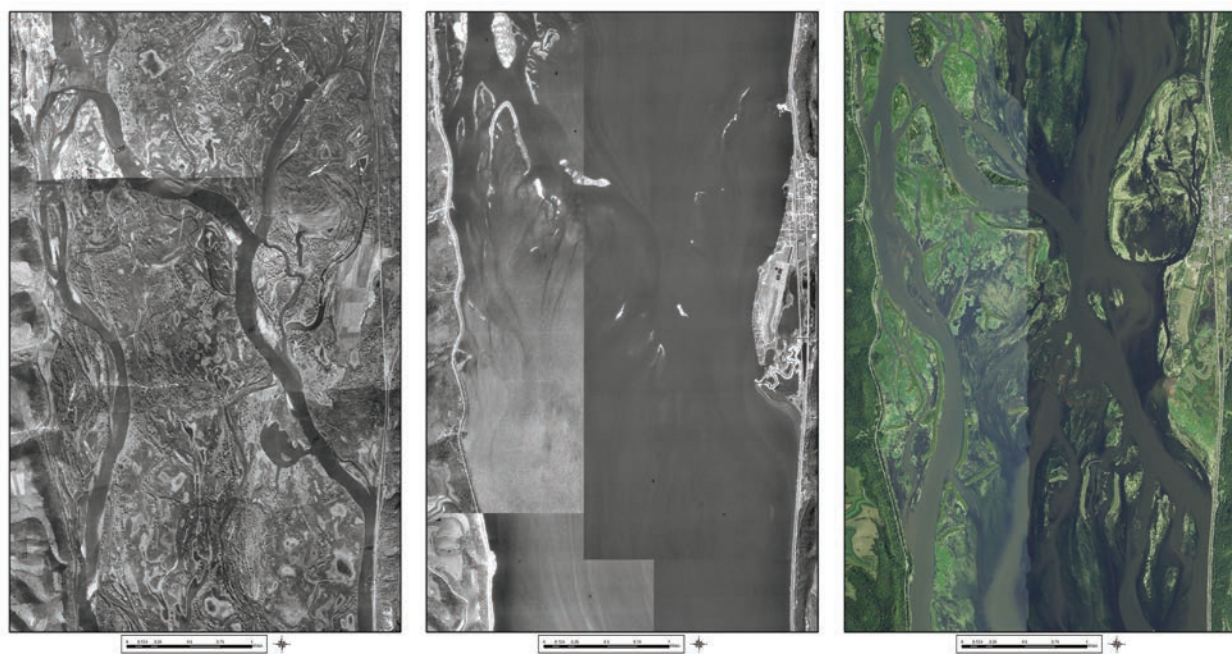
Jeff Webb, president of Cargo Carriers (a subsidiary of Cargill Inc.) says his company has operated barges for decades through Pool 8 as well as other pools where similar restoration efforts have taken place.

"The benefits of these projects are evident," Jeff says. "There are a lot more birds and other wildlife here now," Jeff says. "I think we've found a balance between commercial navigation and the ecosystem. The channel now requires less maintenance and dredging, and that adds to the efficiency and sustainability of the transportation of commodities on this river system in the Upper Midwest."

A Self-Maintaining Solution

According to Gretchen, the real beauty of the restoration work—beyond the sight of majestic swans or pelicans nesting on islands—is that the system has proven to be even better than self-maintaining. "These actions not only halted erosion, but have created conditions that enable the river to create habitat between built and existing habitat," she says. "The deep spots the Corps constructed are engineered to be self-scouring, and some of the islands they built help funnel water into self-maintaining channels with varying depths. We're seeing new mosaics form with channels, islands, mudflats and sandflats, and they're filled with the type of vegetation we want—native plants."

Several times a week, Gretchen, who has worked for The Nature Conservancy since 2008, rides her bicycle along Pool 8 and says she often thinks to herself just how much good the restoration has done over the past 30 years. But then, she says, she also finds herself wondering just how much more good could come to the entire Upper Mississippi region if funding for NESP is secured.



Left: These images show—from left to right—the lower end of Pool 8 in 1930, 1991 and 2017.



There now once again exists within Pool 8 islands intertwined by side channels that support a wide variety of fish and wildlife. © Robert J. Hurt



Pool 8 attracts recreational paddlers and anglers alike. Courtesy of Explore La Crosse

Congressional Support for NESP

The following are excerpts from a press release distributed by the office of U.S. Senator Tammy Baldwin (Wisc.) in January 2018.

U.S. Senators Tammy Baldwin (D-WI) and Roy Blunt (R-MO) led a bipartisan group of Senators in sending a letter to Office of Management and Budget Director Mick Mulvaney urging the administration to include sufficient funding in its FY 2019 budget request to continue preconstruction engineering and design for the Navigation and Ecosystem Sustainability Program (NESP).

"In 2007, Congress recognized the national significance of the Upper Mississippi River System (UMRS) and authorized NESP to ensure that the nation continues to benefit from this vital resource," the Senators wrote. "Further investment in NESP would strengthen infrastructure and navigation for the entire river and recognize the significance of the UMR ecosystem to surrounding communities and wildlife. With appropriate

funding, many NESP projects could be ready for construction within a year, immediately improving the economy and environment, and affirm the importance of the program."

The Senators continued, "With the expansion of world food and energy needs, the Mississippi River is poised to be more important than ever. The river already moves large volumes of agricultural and energy products between U.S. markets and ports, and serves as the country's busiest waterway. However, the overwhelming majority of UMR infrastructure was constructed in the 1930s and has exceeded its design life by decades, causing closure and limiting overall capacity. Improvements are necessary."

In addition to Senators Baldwin and Blunt, the letter was signed by Senators Bill Cassidy (R-LA), Tammy Duckworth (D-IL), Dick Durbin (D-IL), Chuck Grassley (R-IA), John Kennedy (R-LA), Amy Klobuchar (D-MN), Claire McCaskill (D-MO), and Roger Wicker (R-MS).

The Nature Conservancy
Jimmy Hague
Senior Water Policy Advisor

(703) 841-2097
james.hague@tnc.org

Upper Mississippi River Basin Association
Kirsten Mickelsen
Executive Director

(651) 224-2880
kmickelsen@umbra.org

Waterways Council, Inc
Paul Rohde
Vice President, Midwest Area

(314) 422-2268
prohde@waterwayscouncil.org

Ducks Unlimited
Mark Flaspohler
Manager of Conservation Programs

(573) 234-2132 ext. 178
mlaspohler@ducks.org





Waterfowl on a pool on the Upper Mississippi River. Courtesy of Explore La Crosse

All the “Infrastructure” We Need

BY LYNN SCARLETT AND MIKE TOOHEY

Our nation is now considering major and long overdue investments in its infrastructure. Yes, the waterways of the Upper Mississippi River are exceptionally valuable to this nation and worthy of major investments related to navigation in order to ensure America maintains its status as a leading, global economic power; doing so is critical to our national security.

At the same time, this great river provides incredible value to the nation through its natural resources—particularly its birds, fish and other wildlife—as well the economies these resources fuel, including a multi-billion-dollar recreational industry. Clean, vibrant water depends on a river’s “natural infrastructure.” Major investments in this river and in the restoration of the degraded wetlands and woodlands the river and its tributaries flow through will produce returns many times over—for economies, communities and the environment.

The mighty Mississippi can provide these multiple benefits, which is why conservation organizations are united alongside agriculture, shipping, manufacturing, tourism and other industries in supporting the Navigation and Ecosystem Sustainability Program (NESP) for the Upper Mississippi River System. NESP will invest in both the navigation system and ecosystem health of the Upper Mississippi, affirming what Congress intended when it designated the Upper Mississippi River System as a “nationally significant ecosystem and a nationally significant commercial navigation system.”

Search the web for “maps of the best agricultural land in the world,” and you’ll quickly see the upper Midwest is a major breadbasket. A closer look at these regions of the world reveals that few have major rivers flowing through them, particularly rivers with infrastructure to support shipping. The Upper Mississippi River System boasts a 1,200-mile network of commercially navigable rivers where goods are shipped to and from

the upper Midwest, thanks to more than 35 locks and dams, most of which were built in the 1930s. This and other infrastructure along the Mississippi and its navigable tributaries enables the system to support to an enormous agribusiness industry that accounts for 92 percent of the nation’s agricultural exports and 78 percent of the world’s exports in feed grains and soybeans. Also, some 60 percent of U.S. grain shipments and 22 percent of oil and gas shipments depend on this infrastructure.

Indeed, it is this fertile land and the rivers that flow through it, combined with the wise and forward-looking investment this nation made in infrastructure, that has given the U.S. an economic edge on a global scale for over eight decades.

Next, search the web for “major flyways of the world,” and you’ll find the Mississippi River Flyway is a vital corridor for nearly 300 species of migrating birds each spring and fall, including some 40 percent of the migratory waterfowl traversing the U.S. The Mississippi River also supports 25 percent of North America’s fish species. The 16 national refuges along the Upper Mississippi, along with conserved lands managed by states and open to the public, draw people who take over 12 million trips to the region annually, more than most national parks, including Yellowstone. This adds a tremendous boost to local economies.

Fully funding NESP is necessary to secure the sustainability of these critical benefits for our nation and for future generations. We strongly urge Congress to take action now as bills are written that pertain to investments in the nation’s infrastructure.

Lynn Scarlett, Co-Chief External Affairs Officer of The Natural Conservancy and former Deputy Secretary of the Department of the Interior under President George W. Bush, was the only representative from a conservation non-profit organization invited by the Trump Administration to participate in Cabinet-level discussions on infrastructure in March 2017.

Since 2011, Mike Toohey, who has more than 30 years of federal government expertise, has acted as president and CEO of Waterways Council, Inc., or WCI. President George H.W. Bush nominated Toohey as Assistant Secretary of Transportation, where he served in 1992 and 1993.