

US Army Corps of Engineers,

MISSISSIPPI VALLEY DIVISION · FALL 2024

# Carp Control

Stopping voracious invaders at the last frontier

**ON A CHILLY DAY IN NOVEMBER 2023,** a small fleet of boats assembled on the upper Mississippi River near Trempealeau, Wisconsin, like a posse of police preparing for a bust.

In this case, though, the targets were invasive carp—those aggressive, hungry interlopers that have overrun much of the river, outcompeting native fish for plankton and other essential nutrients. Imported from Asia in the 1970s to cleanse algae from Deep South aquaculture farms and sewage lagoons, they escaped during flooding and have flocked northward ever since. They've even been spotted in Minnesota and Wisconsin sections of the mighty waterway. But

relatively few have gotten that far, and officials want to keep it that way. Minnesota, particularly its 200-plus Mississippi River miles north of the Twin Cities, is among "final frontiers" where federal and state agencies see a chance to stop the carps' advance. Others include Mississippi tributaries such as the Red and White rivers in Arkansas and the Missouri River, where the fish have ventured into lower ends but not far upstream. Also spared for now—but highly vulnerable—are the Great Lakes, where a carp onslaught would threaten fishing and boating industries worth more than \$20 billion a year.

Scientists and regulators battling the carp are testing or studying a variety of strategies, from electric fields and underwater noisemakers to advanced technology such as artificial intelligence and genetic manipulation.

"Prevention is the best method for dealing with invasive species," said Grace Loppnow, invasive carp coordinator with the Minnesota Department of Natural Resources.

But once they show up, there's still the tried and true tactic of netting and removing as many as possible.

Technicians with the Minnesota Department of Natural Resources and the U.S. Geological Survey fitted a half-dozen carp with transmitter tags last year in two northern sections of the



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Mississippi known as pools 6 and 8. Staffers with Wisconsin's DNR and the U.S. Fish and Wildlife Service later joined them for the November roundup. As hoped, the tagged fish led them to bigger groups and emitted signals that agency teams picked up with hand-held receivers. From their boats, they

barked instructions to commercial fishing crews in flat-bottomed craft who draped seine netting around planned for the Brandon Road Lock and Dam, a

ROM LEFT: These fish tagged, then netted, were part of a massive roundup that removed 408 silver, bighead and grass carp from a northern stretch of the Mississippi River, one example of ways resource managers are working to remove threats to high-value recreational fisheries. The bio-acoustic fish fence at the Barkley Lock and Dam in Kentucky emits bubbles, sound and lights and is testing some of the most promising technologies to halt the spread of invasive carp.



struggle against the wily carp. Experiments are underway in locations such as the Mississippi's Lock and Dam 19 in Keokuk, Iowa, where rows of submerged speakers blare sounds similar to revving boat motors to scare them away.

On the Cumberland River in Kentucky. the U.S. Geological Survey reports that a system combining underwater lights, sounds and air

bubbles in recent years has cut in half the number of invasive carp getting past the Barkley Lock and Dam. The Cumberland is a tributary of the Ohio River, which in turn flows into the Mississippi.

An even bigger array of deterrent technology is

crucial choke point on River, which leads to Lake Michigan. The project got a boost in July, when the U.S. Army Corps of Engineers' Rock Island District announced a

Experiments are underway in locations such as the the carp-infested Illinois Mississippi's Lock and Dam 19 in Keokuk, Iowa, where rows of submerged speakers blare sounds similar to revving boat motors to scare them away.

#### the heaving mass and dragged it ashore.

the highest number landed thus far in Minnesota. Silver and bighead carp threaten to unravel food chains with their voracious appetites for plankton, while grass carp gobble ecologically valuable aquatic plants. Another worrisome invader is the black carp, which feeds on mussels and snails.

The roundup was one success story in a battle that's far from won.

"We've learned that no one thing is sufficient to manage invasive carp," said Kelly Pennington, the state DNR's invasive species unit supervisor. "It's still uncertain how particular management actions will work."

One reason for cautious optimism, Loppnow says, is this. Annual water sampling has turned up no eggs, larvae or other evidence the carp have established breeding populations in Minnesota waters. Officials believe the high number netted in 2023 resulted from flooding that required opening dam gates, enabling the fish to swim farther upstream.

Government agencies are devoting hundreds of millions of dollars and years of research to the

funding agreement with Michigan and Illinois. Total catch: 408 silver, bighead and grass carp, The deal pledged \$274 million from the federal government and \$114 million from the states to get construction underway.

In addition to noise and bubbles, the Brandon Road gauntlet will feature an electric fish barrier and a "flushing lock" where fish eggs and floating to first do no harm. material that may be carrying life forms can be washed downstream.

Many or all of these tools eventually could be deployed widely in the Mississippi watershed, including major tributaries and the big river itself. Despite the carps' steady march northward, they haven't moved into every nook and cranny. Management agencies divide the Mississippi into six "sub-basins" and have identified key spots in each that are still carp-free.

"There's a lot of areas they haven't gotten into yet," said Greg Conover, big rivers coordinator with the U.S. Fish and Wildlife Service, including places with "high-value recreational fisheries, in the main stem or in some of the large reservoirs. We are very interested in keeping the fish from advancing into those areas." Still, there's no guarantee that the technologies

under development will work everywhere. The keep moving on all these different fronts," – J.F.

Mississippi and its tributaries have a variety of natural features and man-made obstacles that alter water flow and other characteristics.

For example, the Brandon Road complex near Joliet, Illinois, is part of an engineered environment dating to the early 1900s, when the Chicago River flow was reversed to flush the city's waste downstream instead of into Lake Michigan.

"The invasive carp problem is the same, but the solutions may be very different for those areas," said Mark Cornish, a U.S. Army Corps of Engineers senior biologist and technical specialist.

Another complication is the need to protect native fish while taking steps to stop invasive carp. The Mississippi has more than 160 species, some of which migrate long distances to spawn and have seen population declines because dams block their way.

The skipjack herring all but disappeared from the Upper Mississippi after construction of the lock and dam at Keokuk in 1913. That, in turn, devastated the ebonyshell mussel, which attaches to skipiacks in its larval stage for the journey north. Such experiences should inspire caution as authorities consider placing still more barriers to stop the carp, Cornish said.

"We as humans have really tried to shape the world around us to what we think it should look like," he said. "Without a more complete understanding of barrier projects and management practices, there's always a risk we're violating our Hippocratic oath"

Minnesota officials and federal partners are considering all this as they plan a new Mississippi barrier at Lock and Dam 5 near Winona, just upstream from where the 400-plus carp were snagged in 2023. The state approved \$12 million for the project this year.

In other locations, deterrents such as sound and bubbles are placed around shipping locks that fish use to swim upstream. At Lock and Dam 5, they'd be put by the movable gates—something never done before.

Officials hope to finish designing the mechanism by mid-2026, with another three years for installation. They want the project to accommodate future technologies that might boost its effectiveness, possibly an artificial intelligence system that would sort native fish from invasive species.

"There is no silver bullet," Loppnow said, "so you



River watershed.

to continue their journey.

That's the idea behind the Emiguon project. It uses pumps and tubes to propel water down a metal fish ladder or "steeppass." so fish can swim up and enter the system. Once inside, they're directed past a scanner that can capture up to 18 images of each fish in less than a second, recording characteristics such as length and girth, said Jim Lamer, a river biologist with the Illinois Natural History Survey. Nearly 1,900 went through the system during initial trials in

invasive carp were detected.

An initial problem was that the mechanism's fixed position left operators unable to adjust when water levels were too high or low, Lamer said. So the device was placed on a barge, enabling it to be moved as needed. Now, the challenge is luring more fish—especially invasive carp—to enter the system, perhaps with artificial baits.

Researchers also are collecting data to refine the AI software. making it better able to identify fish types. They hope the technology eventually will determine an individual fish's species in an instant and direct it back into the river or into holding areas for removal.

Despite mixed results thus far, it's worth the effort to develop Al as one more weapon against invasive carp, said Kevin Irons, assistant chief of fisheries with the Illinois Department of Natural Resources. "We need to keep everything on the table because different things may work better in different places," Iron said. "It may be that multitasking will get us where we need to be."-J.F.

U.S. Army Corps of Engineers (USACE) Commanding General and 55<sup>th</sup> Chief of Engineers Lt. Gen. Scott A. Spellmon has signed a Chief's Report recommending the Hatchie-Loosahatchie Aquatic Ecosystem Restoration Study to Congress for authorization.

"Achieving this milestone for the Hatchie-Loosahatchie Ecosystem Restoration Study is historic for Memphis and the Lower Mississippi," U.S. Army Corps of Engineers Memphis District Commander Col. Brian Sawser said. "I want to thank the entire project delivery team (PDT) for taking the first Lower Mississippi large-scale ecosystem restoration project from a lofty goal to a feasible, constructible one."

## Can facial recognition work-for fish?

There's a futuristic idea in the works to rein in bighead, silver, grass and black carp, which have infested much of the Mississippi and parts of 30 other U.S. Rivers. And you'll find it in the works on the Illinois River. an hour or so southwest of Peoria.

There, an odd-looking contraption anchored near a restored wetland complex known as Emiquon Preserve is deploying artificial intel-

ligence to prevent the spread of invasive carp in the Mississippi

The experimental device has a scanner that uses AI software to determine a fish's species as it glides through the mechanism. Think facial recognition but for whole fish. The goal: develop a system that can be installed at crucial spots on the Mississippi and tributaries to nab unwanted carp while allowing native fish

The advantage here is twofold. While scientists and engineers are trying underwater noisemakers, bubble curtains and electric currents to scare carp from moving into new territory, the problem is that those deterrents can also affect native fish. So, what if it were possible to create a device that could sort "good" fish from "bad" ones and enable the latter to be caught?

2020-21, although most were native gizzard shad. Only a few

MISSISSIPPI



#### Mark Cornish, Davenport, Iowa Biologist/technical specialist and recipient, U.S. Army Corps of Engineers 2023 Civil Works Planning Excellence Award

"I've always loved flowing water. One of my earliest memories is making imaginary boats out of blades of grass after a rain and following them down the gutter in the street as they flowed through gravel rapids and over waterfalls made of sticks until they finally disappeared into the storm drain. I guess that love is what started me down the path to becoming a fisheries biologist."

"I received the award for my work on the Lock and Dam 22 Fish Passage, but I also work on a fish barrier project at Brandon Road Lock and Dam which is located near the junction of the Mississippi River and Great Lakes basins. The purpose of one project is to pass fish; the other is to stop them. On the surface this seems contradictory. However, connecting rivers and separating watershed basins is the best thing we can do for our native species. The fish, mussels, and aquatic plants found in each watershed have evolved over time to match their environment. We have unintentionally put these organisms in peril by isolating populations with dams, and by mixing them with new species from other basins

"The NESP Program has provided us the opportunity to improve fish passage on the Upper Mississippi River. We are plowing new ground with the first project at Lock and Dam 22. The lessons we learn will guide future projects around the country."

"At Brandon Road, we have an artificial system that was created when the Chicago River was reversed to handle the sewage problem

they had in Chicago. It made a lot of sense back then, but it was an artificial connection, and it had unintended consequences. Things started moving back and forth: zebra mussels and round goby moved into the Mississippi River basin and now invasive carp threaten the Great Lakes. The Brandon Road Interbasin Project will help close the revolving door of invasive species between the basins.

"The common thread between fish passage and barrier projects is fish movement. One of the coolest things that the natural resource agencies have built is a network of receivers that tracks the long-distance movements of tagged fish through the Midwest. We have an interagency collaborative group, called the RAFT Network, where research teams share data on fish movements throughout the Mississippi basin. Data sharing provides insights that no individual project could afford.

"One thing I've contributed is on the people side of things. Building relationships and collaborating with other agencies is important. Sometimes it's reaching out to that newer person who wants to do something great, listening and creating a shared vision of the future. I'm lucky to work with the latest scientific tools and the greatest minds in the region every day.

"I've worked on the Mississippi for 36 years, and I still find My Mississippi fascinating. There are so many things we don't know about the Mississippi River, and finding answers to some of those questions is really special." -K.S.

#### Lower Mississippi restoration plan moves to new stage

The study began in 2021 with a Feasibility Cost Sharing Agreement signing between the Memphis District and the Lower Mississippi River Conservation Committee. It was conducted to examine and address problems, opportunities, and solution-viability associated with Mississippi River ecosystem degradation along the Hatchie-Loosahatchie River reach.

The Chief's Report outlines the plan to address ecologically important habitats along this 39-mile Mississippi River stretch in Arkansas and Tennessee without causing conflict with existing USACE navigation and flood-risk management mission areas. The plan includes 38 different ecological restoration

measures and two recreational measures that will benefit 6,282 acres. If implemented, eight unique habitats would be improved.

These habitats support federally listed endangered aquatic species and critical vegetative habitats. The action plan would also contribute to the hydrologic restoration of meander scarps, which are rare geological features that no longer occur naturally due to engineering controls. Finally, the Ecosystem Restoration Plan provides significant benefits to disadvantaged communities by enhancing

nearby resource-managed areas. -J.H

For more: tinyurl.com/ mr2w378m



# **Designing the model lock**

Planning for long-awaited locks on the Upper Mississippi River system is leaving nothing to chance

A new lock—the first built on this particular site in 85 years—is an expensive proposition. You want to avoid the need to build it first and make costly changes later.

So as technical manager Thomas Mack works toward final design for the new Lock LaGrange Lock and Dam on the Illinois River, he turned to the next best thing to actual construction: precise and high-tech models—one made of concrete, the other of virtual reality.

In one section of the Coastal and Hydraulics Laboratory of the U.S. Army Corps of Engineers in Vicksburg, Mississippi, two employees of the Engineer and Research Development Center operated remote control boats in simulations that perhaps resembled play but was anything but. In another computer tion at the U.S. Army Corps of Engineer Research and Development Center. That was ship simulation model, actual river pilots took work shifts of 40 hours each. paired with simulations involving remote control tows on an actual concrete model of They entered and exited locks under various flow and weather conditions on the Illinois River. simulations rivaling what you might see in a Pixar flick but integrating advanced models that wrap in physics and flow.

When operators of the remote control tows (and later the virtual reality ones) found themselves unable to safely enter a lock or stuck on a turn, teams noted the problems and made the necessary tweaks.

"To me it was striking how seriously they took it," Mack said. "All the radio communication was very professional, as if they were doing it in real life. There wasn't a lot of chit-chat; they worked just like they had a job to do—get the towboat safely in and out of the lock chamber."

#### The plan

More than half the nation's 242 inland waterway locks and dams are nearing or have surpassed their 50-year life spans, with those built in the 1930s (as LaGrange was) in the worst shape. This lock passes the highest amount of traffic on the Illinois river leading to the largest delays. Delays are compounded



**BY THE NUMBERS Construction of the** LaGrange lock involves:

3.5 million cubic vards of excavation-the equivalent of 40 acres of dirt. 40 feet deep 120,000 cubic yards of concrete 5 million pounds of steel 840,000 hours of labor

by the fact that the existing lock has only a 600-foot chamber and most of today's tows are larger than they were decades ago, often carrying up to 15 barges and requiring tows to "lock through" in two parts.

Construction of seven new locks on the Mississippi River system was approved as part of the massive Navigation and Ecosystem Sustainability Program, and LaGrange was one of two (Lock and Dam 25 on the Mississippi is the other) selected for construction first. Design is scheduled for completion by September 2025, with construction beginning with the fabrication of steel miter gates.

#### The models

The U.S. Army Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi, is the rare



FROM TOP: A river pilot enters and exits a lock under design through this realistic simula-

laboratory across the world that uses simulators for engineering purposes, not just for training. The center boasts world-class facilities ranging from the world's fastest supercomputers to one of a kind physical models.

Among the models is a 1:120 scale representation of the river as it flows through the existing lock and dam, located just below Beardstown, Illinois, and approximately 80 miles upstream from the confluence of the Illinois and Mississippi rivers. The model was first built in 2009 during the study's feasibility phase and updated to reflect the current design. It's made of concrete as the base for a flowing river and aluminum and acrylic for the model of the lock. A pump and tailgate allow teams to control water levels and flow.

As Corps modeling expert Matthew Newcomb attempted to navigate one entrance to the scaled lock, he found himself getting stuck. That revealed the need to tweak the southern approach in a way that allowed a pilot to find a safe angle for entrance. The simulation led to other minor changes as well.

"It's fulfilling," Newcomb said. "You're getting something out of the model you didn't see coming. That's why you use physical models—to predict something vou couldn't predict otherwise."

Tweaks made from the physical model findings were then inputted into a virtual computer simulation based on the latest lock design, then four Illinois River pilots were brought in to pilot tows through the lock—just as they might regularly do on the Illinois. The mission: identify places where they are unable to navigate in a safe or timely way.

Richard Hunt, a former instructor of animation simulation and video game theory and now a Corps visual information specialist, says the simulation included "context clues" like you'd have in a video game-things like the existing lock, trees and things situated now along the actual shoreline.

But advanced numeric modeling adds the physics that creates the changes in wind currents and flow. And actual wheels and tillers let pilots operate as they would their particular vessel, whether they pilot military watercrafts, tugboats or deepwater ships.

ERDC has done ship simulations for 40 plus years, says Dr. Keith Martin, an ERDC research physicist. But the technology was not as visually exciting, he said.

"What we have now I'm calling the fourth generation of simulation at ERDC-11 screens on each bridge, each with a 270 degree view horizontally. Once you're at the controls, vou're immersed. Once it starts to move, if we turn up the wind or enhance the waves, you'd be convinced the room is moving." -K.S.

# Managing the Mighty for the next century

live along it had to say

The major themes mentioned in comments were flooding, coastal storms and flood risk management structures (33 percent), closely followed by ecosystem restoration and wildlife habitat (31 percent) and navigation topics (26 percent). Comments, according to the summary report, addressed: navigation, flood risk management, the ecosystem, water quality and supply, recreation and tourism, climate change, threatened wildlife, economic justice and more.

For example, commenters said the Corps needed to better address the management of sediment dredging for navigation, infrastructure updates for navigation and the impacts of floodway development on flood risk. In the ecosystem category, comments addressed the need to reconnect rivers to floodplains and ways to beneficially use dredged sediment in the Mississippi Sound. In the area of water quality, commenters expressed concerns about issues like contaminants, nutrient loading, hypoxia and water needs for agriculture, industry, tribal lands and national wildlife areas.

A listing of all comments including an attachment with comments submitted by letter is included on the project's website within the full report posted there. The public can also continue to post comments, easily submitted in writing via the project website. The study is slated to run through 2027, and through it the Corps will develop a series of potential alternative plans for comprehensive river management. -K.S.



*What the* **WE ASK MUCH OF THE MISSISSIPPI RIVER** and of projects *experts—the* designed to help people living in its watershed—and beyond. The U.S. *people who* Army Corps of Engineers and its partners operate massive infrastructure designed to help with such critical missions as hurricane and storm damage risk reduction, flood control and navigation, clean water supply, recreation, protection and restoration of the critical ecosystem and its international flyway, and much more.

After the Great Flood of 1927-one of the worst natural disasters in American history-Congress authorized the Mississippi River and Tributaries Project as a multi-faceted flood risk management and navigation improvement plan for the Lower Mississippi valley between Cape Girardeau, Missouri, and the Gulf of Mexico.

Managers of a new Lower Mississippi River Comprehensive Management Study are now leading a \$25 million reevaluation process to see if existing infrastructure and management processes are sufficient not just for today but for many decades to come. As a first step, they went to the public through a scoping process designed as a first step in updating the plan for managing the mighty.

Under guidance by Congress, the team was asked to look at potential operational modifications to the existing MR&T project and adaptive management to allow the project to respond to changing conditions over time. The team is to look at ways to mitigate the impacts of flood control operations on fish and wildlife habitat resources, to use more nature-based features and to improve efficiency of dredging. The project team was also instructed to be open to questions they may not have thought to ask.

Through some 30 meetings in 15 locations and additional meetings with private or civic groups, the study team heard from nearly 500 people, receiving 233 individual comments, 132 from individuals and 101 from organizations of various sorts.

#### For more, go to:

mvn.usace.army.mil/About/LMRComp/

Read the entire scoping report, including every submitted comment, and watch for update videos or add your own comment here:

https://www.mvn.usace.army.mil/ About/LMRComp/

#### **DID YOU KNOW?**

The Mississippi is the third-largest river basin in the world—outranked by only the Amazon and the Congo. t's home to 59 species of endangered birds, reptiles and mammals, many residing within the 44 national wildlife refuges that fall within its boundaries. In addition, the Mississippi River and Tributaries Project on the lower river protects 4.1 million people from massive flooding and enables 589 million tons of annual cargo movement.



#### Satellite system to test water quality at Loch Leven

It's an 11-mile boat ride north on the Mississippi from Baton Rouge to reach the Loch Leven floodplain reconnection project developed by The Nature Conservancy of Louisiana and Mississippi. Once there, scientists remove the in-water nitrate monitor and return to Baton Rouge where they download the sensor's data. It's a time-consuming way to track water quality and the success of the floodplain's use in removing nitrates from the water, said Bryan Piazza, TNC's director of science in Louisiana and in the Mississippi River Basin.

The two conservancies have teamed up with the water quality company Gybe to try a better way of monitoring water in the Lower Mississippi. Gybe uses satellite monitoring to measure the quality of the water released from Loch Leven, so data collected from space will be gathered quicker, more efficiently and in greater numbers, said Piazza.

"We'll be able to process huge amounts of data remotely," Piazza explained.

#### **Tracking Nitrates**

Every year, massive amounts of nutrients flow down the Mississippi River, mostly nitrogen and phosphorous, and the Nature Conservancy's goal is to reduce these nitrates by 20 percent by 2025. Loch Leven is one step, its floodplain the river's natural filtration ecosystem.

"Loch Leven is allowed to flood and de-flood naturally." Piazza said, adding that the wetlands are estimated to remove about 40 percent of nitrates. "The floodplains are the kidneys of the river system."

But exactly how much of the water returning to the Mississippi is nitrate free? Since nitrates are invisible on the light spectrum, it's difficult to track accurately.

Gybe's system places a sensor at Loch Leven and one on the Atchafalaya River. Satellites then use the sensors to detect nitrates that flow down the Mississippi and into the Atchafalaya Basin to Morgan City, La.

"I was interested in Gybe because they were looking at a different way to watch water quality," Piazza said. "We are making the invisible visible. And we're able to process huge amounts of data."

Gybe's data from space will allow TNC to create a river-wide nitrate data map and statistical algorithms to assist in future TNC projects. It also eliminates the need for in-water, on-site sensors at Loch Leven and other TNC locations in the watershed, ones that must be monitored by hand. -C.C.

# History of the Happiness Highway

ou might say the Great River Road was born of desperation. The idea of a "Happiness Highway" that stretched the entire length of the Mississippi River was floated first in 1936, in the middle of the Great Depression as river cities and towns were reeling economically—and for a variety of reasons.

Navigation on the Mississippi was plummeting, especially on the upper river. Steamboat traffic had largely disappeared, its shipping taken over by railroads. By 1917, there was no through commerce between St. Louis and St. Paul. While Congress authorized the 9-foot channel



project for the upper river in 1930—the project under which the U.S. Army Corps of Engineers would build most of the locks and dams—no one was confident that it would restore river traffic where all previous projects had failed.

At the same time, more than the river's economy was at stake. The river's hold over the American imagination was fading into myth and Mark Twain. The slap of the wooden paddlewheels would soon disappear from the Mississippi River, except for the nostalgic excursion boats.

Perhaps even more importantly, railroads were running along the riverfront, blocking access to the river. Levees, especially in the South, erected barriers to both floodwaters ering of a river connection had unintended consequences as cities and towns were not just turning away from the Mississippi, they were increasingly polluting it, emptying sewage and industrial wastes into a Mississippi they had increasingly ignored. In a presentation to a Parkways Conference.

speaker Robert Mooney declared, "The river was out. Indeed, the Mississippi River became passe, a sad commentary supported and named by the Congress." on one of the greatest waterways in the world ..."

To the rescue came an unlikely economic hero: the automobile.

Between 1900 and 1941, automobile production and ownership accelerated at a pace we only associate with cell phones and computers. In 1899, 30 American manufacturers produced 2,500 vehicles, largely a tiller drive, surrey style, or horseless carriages. By 1929, 23.1 million Americans owned cars.

As Henry Ford's idea of everyday families taking the car to explore the great outdoors took hold, the dream for a road that followed the Mississippi River from its source to Gulf of Mexico, was born.

#### **Origins of the Great River Road**

In November 1936, Missouri Governor Lloyd Stark approved a recreational survey by the state's Planning Board. Out of that came a recommendation that Missouri establish a parkway. Said planning board chairman A.P. Greensfelder: "Our particular parkway can develop into a 'Happiness Highway' whereon you and I and those who follow us will seek and find happy days in pleasurable pursuits."

Greensfelder reached out to the other Mississippi River states to explore the possibility of connecting to those to the north and south and received positive responses from all. In 1938, representatives of all 10 states agreed they'd form the Mississippi River Parkway Planning Commission, a collaboration that came at a time of "parkway fever" within the National Park Service.

The government was already pursuing formation of the Blue Ridge Parkway and Natchez Trace. For the Mississippi River project, a study authorized by Congress in 1949 set out to "reveal to the visitor to this valley every bit that we can of all that comes to mind with the word Mississippi." The route would pass through 10 states, eight botanical and climatical zones and move from the "moose and caribou to the Delta alligator."

This, the largest single landscape architectural study ever undertaken at the time, had planners looking at 90,000 square miles, taking 22,000 aerial photos to map the landscape and possible routes. The resulting "Parkway for the Mississippi River" conclusion considered three options. Those included a route situated on both sides of the river at a cost of \$1.45 billion, another that would traverse just one side, yet another that would focus on using existing routes and create new connections as and the river's perceived presence. That sev- needed, still a whopping \$81 million price tag.

> In the end, planners proposed that each state develop its own section of this Great River Road as a scenic route. The Mississippi River Parkway Planning Commission endorsed the plan in 1952, and 1954, Congress authorized the Bureau of Public Roads to spend some of its administrative funds to help states plan the route, develop criteria for parkway design and construction and coordinate their efforts. Thus was born the Great River Road, conceived by the Mississippi River Parkway Commission, "fostered by the ten state highway agencies, and

> While planning for the Great River Road would continue into the 1960s and 1970s, some states, like Minnesota, began placing signs with the Pilot Wheel logo along the Great River Road during the late 1950s. In 1964 Congress passed legislation officially changed the road's name from the Mississippi River Parkway to The Great River Road. And some of the most iconic ways to experience the culture, history and beauty of the Mississippi River can still be found along its route.-J.A.

> Dr. John O. Anfinson is a former historian and cultural resources expert with the St. Paul District of the U.S. Army Corps of Engineers, later serving as superintendent of the Mississippi National River and Recreation Area. He sits on several boards including the National Mississippi River Parkway Commission.

EXPERIENCEMISSISSIPPIRIVER COM/ELAVORS

For maps, events and more along the route, go to experiencemississippiriver.com







#### TAKE TO THE RIVER'S BYWAY

The Great River Road, which runs for about 3,000 miles from Minnesota to the Gulf of Mexico, passes through 10 states and hundreds of river towns. Experts say it'd take 36 hours of straight driving to cover the entire route at once. But really, why would anyone want to do that?

There's so much to see along this scenic route that the Mississippi River Parkway Commission has broken the trip down by not just states but also by interest area, itineraries, seasons and more. Love tasting a place in your travels? Follow the "flavors" itinerary for the best spots for the famous Stockholm pie, Missouri wine, Delta hot tamales, and southern BBQ, catfish and beignets.

Go to the link on key attractions to find the location of the road's visitor cen-

ters and museums like the Dahl Auto Museum. one filled with stories of the way the automobile ushered the route into being. But come autumn, the bluff-top overlooks is where you want to head.







# Bringing back the bobwhite

On a summery June morning, wildlife biologist Dustin Thomason is greeted with a whistled "bob-WHITE" from the grassy underbrush near Lake Greeson in west-central Arkansas. It's a hopeful sign that nearly a decade of work is showing results. Thomason works for the Vicksburg District of the U.S. Army Corps of Engineers, and he is listening for northern bobwhite, specifically the male birds seeking mates.

This morning's outing is a part of an annual survey to gauge how many bobwhite inhabit the area's open woodlands and brushy fields. Bobwhite are the only quail native to the eastern United States, and their population has declined noticeably in the last 30-40 years. Although all the reasons for the decline are unclear, loss of brushy meadows and overgrown fields has contributed.

Bobwhite have been identified as a species of greatest conservation need in Arkansas, as well as in other states across the southeastern United States, according to Elev Talley, assistant regional supervisor for wildlife management with the Arkansas Game and Fish Commission.

Hunters noticed the decline in this game bird, but farmers were concerned about a different population decline. Habitat loss and pesticides were causing a decrease in bee population, which was affecting crop production, Thomason said.

To tackle this decline in both birds and bees, the Corps' Natural Resources Stewardship program instituted habitat projects around Lake Greeson, Lake Ouachita and DeGray Lake on Corps-managed lands in the foothills of the Ouachita Mountains.

"It was something that needed to be done to try to convert some of our forest into conditions that were closer to what they would have been prior to European settlement and into a diverse plant community that would benefit quail and pollinators," Thomason said.

The tool of choice to restore those conditions, other than cutting timber, was fire. This region's mixed forest of hardwoods and pines had historically experienced fire every five to 10 years. In recent years, that gap between fires stretched to 30, 40, and even 50 years, allowing trees to encroach on openings and shade out understory plants that previously provided food and cover for wildlife.

With carefully targeted use of fire, conditions have begun to improve.



"The areas that we first started on are taking the shape that we envisioned. It's now an open midstory and a reduced overstory," Thomason said. "That lets the sunlight reach the ground, creating an open woodland with grasses, forbs, legumes, and a brush component, which is of great value to bobwhite and pollinators.

"The land lets you know what species were there before. A year after a fire, there are tons of new species popping up. And it's not seeds that we broadcast or planted. It's seeds that were already there in the natural seedbank that are now in an environment where they can germinate and grow."

The bobwhite have responded to this new habitat too, with Thomason saying they hear at least three or four males every time they go out as compared to the one or two they typically heard in the past.

Since this work began in 2017, more than 3,000 acres of Corps-managed land have been restored in 20-acre to 300-acre patches across the three lakes. But partners on adjoining lands are expanding the scope to a broader level.

An example is the partnership of the Corps, Arkansas Game and Fish Commission, and Weyerhaeuser Company on Lake Greeson. "The real reason for the partnership was to be able to impact habitat at a landscape level," Talley said. "We're looking at almost 25,000 acres potentially between the Corps ground and Weyerhaeuser property. We've been able to bring everybody to the table and focus on some habitat work that is kind of unique."

Other collaborations on Corps property are happening with The Nature Conservancy, Arkansas Natural Heritage Commission, the U.S. Forest Service, Quail Forever, and Henderson State University.

These habitat restoration areas also serve as a showcase for other interested parties, Thomason said. Professional organizations and groups of private landowners have toured the project sites to see for themselves how using fire for restoration has worked and assess whether they might be able to do similar projects on their own property.

And the habitat restoration continues on Corps-managed lands. Some of the original sites have already been burned two or three times and new areas, such as Ozan Point on Lake DeGray, are scheduled to be burned this year. -D.D.

#### Angela da Silva **Director, Mary Meachum Freedom Crossing**

"I am a fifth-generation descendant of Missouri slaves on both sides of my family. I taught history for 14 years at Lindenwood University. For 23 years I have been associated with the Mary Meachum Underground Railroad site on the Mississippi River at St. Louis. The river played a big part in Black history because it was a transportation hub for so many reasons.

"We have always been mindful of the contributions the rivers have made to Black culture, historically and spiritually. One of the biggest transmitters of that culture was the riverboats. There were black roustabouts who traveled with the steamboats to load and unload freight, stewards, cabin attendants and firemen who stoked the boilers. The men who worked as stewards were able to send money back to their families in the South. If you were a steward on the river, you were one step above the rest of society and were much revered.

"Foodways came up the river with cooks who were enslaved or free. There were Black entertainers on the river boats, and those came up the river. Black culture moved from the Deep South up the Mississippi and its branches. How positive that was! But the river also was a desolate avenue of misery. When we talk about slave families being split up, if you were being shipped from Missouri you probably went down South and went there by river.

"It is unimaginable: there were hired Blacks working on the same riverboats that were hauling slaves to very sure death in the South. When I take tours to the Mary Meachum site, I have everybody stand on that river edge, look across to Illinois and understand that the river was both boundary and horizon. It was a boundary if you were on the Missouri side but a horizon if you could get across it.

The 22nd annual Mary Meachum Freedom Crossing Celebration is being held Oct. 19, 2024. GREATRIVERSGREENWAY.ORG/ ARY-MEACHUM/



Like the river itself, the forests of the Mississippi are long-lived and constantly changing. A cadre of U.S. Army Corps of Engineers foresters and planners, together with partners, are seeking to restore and sustain those forest habitats on which wildlife and people depend. From the headwaters to the Delta, collaborative plans and projects are underway to create a more resilient future forest.

#### Minnesota/Wisconsin – Cottonwood and Willow

Andy Meier was the beaver.

way into the oaks.

But beaver are just one example of how the floods of 2019 are changing the forest management approach in the Corps' St. Paul District, where Meier serves as its lead forester, working out of the Le Crescent, Minnesota field office. By working with what's already there instead of fighting against it, Meier seeks to prioritize forest management so that dollars are spent effectively and the areas with the greatest potential are impacted.

That shift in perspective is part of the reason Meier is thinking more about Promoting the regrowth of cottonwood benefits forest diversity and bald

light seeded early successional species, like cottonwood and willows, which are a little bit more flood tolerant. A strong example is happening in the 500-acre Reno Bottoms Habitat Rehabilitation and Enhancement Project. At one site, managers successfully promoted natural regeneration of cottonwood and willow by controlling the invasive reed canary grass and then disking the site. The effort was so successful that it is being expanded to an additional 60 to 70 acres. eagles. "A majority of the bald eagle nests you find are in cottonwood trees, even though cottonwood only makes up about 10 to 15 percent of the total trees on the on the landscape," Meier said.

This spring, a group of Iowa turkey hunters were surprised by the arrival of six boats carrying Corps and Iowa Department of Natural Resources officials near the confluence of the Iowa and Mississippi rivers. Skepticism turned to enthusiastic conversation as the group considered what prolonged high water, as familiar as the great egret. increased flood frequency, and silt deposition had done to the site and the restoration plans in progress for the area.

The officials were visiting the site of the Pool 18 Forestry HREP, located on Corps-owned land that is managed by the Iowa DNR. The 1.200-acre project encompasses the Iowa River Delta and two islands where the forests have experienced more intense and longer duration flood events.

"The goal here is to reforest some of those areas and try and reestablish some more diversity in the areas where we've lost it. We want to try and rec-The identified project sites range from approximately 6 to 19 acres in size, reate conditions where trees want to naturally establish," said Jillian Harms, but the supplemental benefits to surrounding forested tracts can range up to technical forestry lead with the USACE Rock Island District. "Much of the 120 additional acres beyond the actual cypress-tupelo community, Thron said. project area has converted over to grass, herbaceous species, and invasive Collaboration is a key to project success. For the Minnesota/Iowa work. species. The remaining mature forest is really old, and we're not really seeing sponsors include the U.S. Fish and Wildlife Service, Upper Mississippi River the regeneration (of young trees) that we'd like to in order for the forest to National Wildlife and Fish Refuge; in Iowa/Illinois, the Corps partnered with the Iowa Department of Natural Resources; and for Tennessee/Arkansas the remain sustainable over time." Techniques for restoring diversity of the forest and improving understory Corps Memphis District joined with the Lower Mississippi River Conservation vegetation will include tree thinning, tree planting, and eradication of non-native Committee. –D.D.

The big surprise of the 2019 floods for U.S. Army Corps of Engineers forester

"You're in a boat after 2019 and see a bunch of dead trees, and you think, well, that must be flood mortality. And then you boat up to it, walk in, and every single tree has been girdled at the base. All the bark is chewed off by beaver." The high water had made the swamp white oaks more accessible to them. But rather than trying to exclude beaver, Meier is now working to include willow beaver buffers in upcoming projects. By planting willows around the oak trees, he hopes that the beaver get distracted by the willow and never make it all the

#### Iowa/Illinois – Kentucky Coffeetree

invasive species, says Jessie Dunton, Rock Island District project manager. Another technique will create ridge and swale habitat which has slight one- to two-foot differences in elevation.

Of particular interest to Andy Robbins, Iowa DNR wildlife management biologist, is restoration of Kentucky coffeetree. "It's a unique component of that forest and we want to do something to preserve the ones we have and provide for some natural regeneration," he said.

Although formal public comment has not yet started, Harms and Dunton anticipate a positive response to the project. Says Dunton: "Local people, especially those who use the islands for recreation, seem to be super excited about what we're doing."

#### Tennessee/Arkansas -**Cypress and Tupelo**

Cypress-tupelo swamps used to be common on the floodplains of the lower Mississippi but levees and agriculture reduced their presence. Now, a major ecosystem restoration study has resurfaced the value of these forests and identified potential locations to bring them back.

The Hatchie/Loosahatchie reach of the Lower Mississippi River is one of eight priority sections identified for habitat restoration by the Corps in a 2015 Lower Mississippi Resource Assessment.

Cypress-tupelo forests tied for third place on the study's list of most significant river habitats, said Mike Thron, lead biologist for the Hatchie/ Loosahatchie study. Overall significance was determined by a habitat type's scarcity and its significance to plant and animal species of concern in adjoining states. Cypress-tupelo was crucial habitat for 14 species as endangered as the northern long-eared and Indiana bats and

"Restoration on the identified sites should be a fairly simple process. Just take it out of agricultural production and plant cypress-tupelo,"

Thron said. "In the Meeman-Shelby Forest State Park, which has existing cypress/ tupelo swamps, we were looking to enhance them by installing a weir to back up some water into an existing depressional area to promote the trees and help control some of the unwanted species."



#### **OUR MISSISSIPPI KIDS**



# Help me, beavers!

Beavers are a "keystone species" meaning their presence affects the survival of other animals by changing some habitats and creating new ones. Match the species with the way beavers help them both survive and thrive. SOURCE: BEAVER TRUST



1 – Beaver ponds provide a home for my prey (fish), and I can use their old lodges as a home.

2 – By creating areas of slow-moving or standing water, beavers create perfect habitat where I can live and raise my young.



3– By creating wetlands, beavers increase the amount of plants I can eat and burrows I can live in.

4 – By increasing the habitat of insects, beavers increase the amount of food I can catch on the wing.

5 – Beaver dams slow the flow of water,

reducing the risk of my home being flooded

downstream and helping fight drought.

6 - By creating ponds, beavers create

more habitat that I can live in and

more invertebrates I can eat.

7 – By creating homes for small

mammals and amphibians, beavers

increase the quantity of prey I can eat.

8 – By creating stable wetland

areas, beavers increase

my breeding habitat.







10 – Beaver ponds provide me with food, shelter and a perfect place for my tadpoles.

plants to eat at water's edge.









### **BUILDING AMERICA** The Story of the North American Beaver

Castor canadensis

Tothing says America like the beaver. Found all across North America, this semi-aquatic animal has been a part of the American story since the beginning. But the flow of history has not been smooth swimming for the beaver. Around 60-400 million beavers lived in North America before the mid-1600s. Their network of streams and wetlands has shaped the landscape as well as the people.

In Native American culture, the beaver is a central figure. They not only provided food and clothing to early peoples,

they played an important spiritual role too. For many tribal nations, they symbolize resilience, hard work, and community unity through their dam building and family lodging. Many indigenous communities look to the beaver for inspiration in sustainable living, honoring them in hunting rituals, ceremonies and songs, as their connection to land and water represent living harmoniously with the natural world.

Once Europeans began to arrive in North America between 1500 and 1700. the role of the North American beaver began to shift. The pelt of beavers was popular in fashion at the time, particularly for hat-making.

Beaver hats were a sign of status and wealth in Europe and America. The demand was so high that Eurasian beaver populations in Europe were decimated to supply the trend. Fueled by abundant North American beaver populations, a booming fur trade between Natives and Europeans in America formed. It was so large that most early westward expansion across America during the 1700s-1850s was due to traders and trappers seeking beaver populations. Unregulated overhunting caused rapid declines in North America's beaver population. Some companies, like the Hudson's Bay Company, recognized this issue and attempted to implement conservation efforts. But by the 1900s, fewer than 100,000 of these iconic creatures were left.

Just as the fashion industry drove beavers to the brink of extinction, it kickstarted their rebound. The production of silk in the early 1900s reduced the demand for beaver pelts as beaver hat popularity declined. The long road to recovery was aided by conservation actions such as reintroduction of beavers, habitat protection, and water quality preservation. Today, the North American beaver population is steady, with 6 to 12 million individuals managed across most of their historic range. Despite the rebound, beavers still face pressures due to conflicts with humans.

Coexistence is the name of the game when it comes to addressing the modern relationship between human and beaver. Flooding and tree destruction are the main damages caused by beavers in human environments. Solutions range from exclusion efforts (e.g., caging trees to deter chewing and installing "beaver deceiver" structures on dam culverts that reduce flooding) to relocation or lethal removal. While destructive, the beaver is best at doing what it's known for: building. Across America beavers are becoming a tool to restore habitat and waterways. From creating wetlands to improving water quality and flood control, the beaver has been busy shaping modern conservation. Shifting our perspective from nuisance to coexistence, the beaver can help continue building the future of America-one beaver dam at a time. -M.T.



# Mississippi River style.

some breathtaking views." along the river.

**St. Paul District** 

Natural Resources."

to one of our partners, the Wisconsin Department of The Alton Pool is formed by the Army's Lock and Dam 26. A protected trail, known as the Sam Vadalabene Trail, The 24-mile trail crosses the Black River on a 287parallels the Great River Road along the Mississippi foot former railroad trestle and visits the stunning Upper River. From the famous Piasa Bird painting on the bluffs Mississippi and Trempealeau National Wildlife Refuges north of Alton, Illinois, cyclists can cruise for 20 scenic with views of river islands and bluffs. miles to Grafton along limestone bluffs carved by the river. To the west are the wide waters of the Alton Pool. **Rock Island District** A few miles further north is Pere Marquette State Park The 17-mile Volksweg Trail in Iowa takes bikers through on a bluff overlooking the last bend of the Illinois River.

"Cyclists enjoy the trail because it links the quaint Dutch community of Pella with the largest lake in Iowa," said Hugh Howe, supervisory natural resources specialist for the Rock Island District. "They can enjoy the serene environment of nature and bike into town for a famous Dutch Letter (an almond-filled puff) pastry." The 13 miles of loops on the Sugar Bottom Mountain Bike Trail are set in rugged terrain surrounding the Corps' Coralville Reservoir on the Iowa River. Or go for river scenery with the 66-mile Great River Trail which runs parallel to both the Mississippi and the

Great River Road.

#### **St. Louis District**

The Corps of Engineers built the Rend Lake Dam near Benton, Illinois, to control flooding and create community water supplies. But it ended up offering the community much more. The lake is surrounded by grasslands, forests and wetlands that are connected by 20.7 miles of paved and gravel cycling trails plus a six-mile mountain bike track maintained by the Rend Lake Bike Club. The Rend Lake Trail is now designated a National

# **HAPPY TRAILS!**

# and take to the great outdoors,

#### Load up your bike—or rent one— DEDICATED BIKING AND HIKING TRAILS keep

cyclists safely separated from motorized traffic and let millions of Americans pedal through the scents of seasonal flowers, past wild birds and mammals, through cooling breezes and yes—along the Mighty Mississippi. Within the

Mississippi Valley, many of those trails occupy or visit lands stewarded by the U.S. Army Corps of Engineers, the nation's leading provider of outdoor recreation.

While fulfilling its primary mission of supplying engineering solutions for national priorities such as flood control and river navigation, the Corps also hosts 5,045 recreation areas with 3,575 trails stretching 7,684 miles. Countless more trail miles roll alongside the Corps' lakes, reservoirs and lock-and-dam pools.

"In 2022 the Mississippi Valley District had more than 27 million recreational visitors, which is about 10 percent of visitation for the entire U.S. Army Corps of Engineers," said Amanda Kruse, natural resource specialist in the St. Louis District. "The primary purpose of most of our lakes and rivers is not recreation, but it is the reason most people visit a USACE site. We have many recreational opportunities so we draw in a wide user group. For bicyclists, I think it is the location and condition of our trails. They are usually well-maintained and provide

Depending on where your travels take you, check out these options, divided by Corps district—north to south

"The Great River State Trail runs from La Crosse to Trempealeau, Wisconsin, with scenic views along Mississippi River Pools 6 and 7," said Randy Urich, the St. Paul District's operations manager. "The trail belongs

timber stands, prairies and views of Lake Red Rock, which was created by a flood control dam.

Recreation Trail, so named for being a high-caliber trail that offers economic development through tourism and healthy recreation opportunities. This offers a bonus, according to the lake's brochure: "over 10 restrooms along the entire trail system!"

#### **Vicksburg District**

The Vicksburg District of the Corps has partnered with the North Mississippi Trail Alliance to develop the Area 51 and Bayou Point mountain bike trails adjacent to the Arkabutla Lake on the Coldwater River. The 11-mile Area 51 trail and 5.6-mile Bayou Point trails have sections rated for novice to advanced bikers. They are links in a larger trail network in the remote forested hills of northern Mississippi.

#### **New Orleans District**

For daring bicyclists, the USACE oversees trails in the Indian Bayou, part of the Atchafalaya Basin Floodway System in southern Louisiana. The basin holds more than half a million acres of forest wetlands and swamplands as well the 1.5-mile Alligator Trail and the 3.25-mile Indian Bayou Loop.

"The Oxbow parking area has a trail when the Atchafalaya River is low," said Michael Saucier, natural resources manager for the New Orleans District. "It is definitely for a more adventurous biker. We try to keep it clear but logs and other debris often float up." And gators? -R.S.



# Learn the Lore

Oh, the stories the Mississippi River can tell-and that others can tell about it. Learn the sometimes spooky, sometimes poignant, always fascinating lore on these river-related travel options.

- The Mississippi River National River and Recreation Area offers "Mystery on the Mississippi," an immersive murder mystery theater experience, at various time throughout the fall. The hosts of "Monsters of the Mississippi" brings to life tales of mythical monsters said to have frequented the river. The mystery unfolds as you walk through Crosby Farm and help solve the case. NPS. GOV/MISS/
- The Creole Queen, the only historic river cruise in New Orleans, lets you sit back and listen to tales of the Louisiana Purchase, city expansion and the Battle of New Orleans as you sail into the Jean Lafitte National Historic Park and Chalmette Battlefield. CREOLEQUEEN. СОМ
- Hear the fascinating history of Alton, III., from ghost tale author Troy Taylor on options from his "Ghosts of the River Road" dinner tour to "Night Behind the Museum" which features stories behind eerie objects inside a museum of oddities. DINNERANDSPIRITS COM/







U.S. Army Corps of Engineers, Rock Island PM-Acuff Clock Tower Building, P.O. Box 2004 Rock Island, IL 61204-2004

More benefits of river forests discovered

Wanting to clear that stretch of the river of those logs, branches and gnarly trees left behind by receding floods or carried by the current? Not so fast. That debris is an important link in the ecosystem.

Molly Van Appledorn and KathiJo Jankowski of the U.S. Geological Survey's Upper Midwest Environmental Sciences Center have just published "The Where and Why of Large Wood Occurrence in the Upper Mississippi and Illinois Rivers" based on 25 years of data collected by the Long-Term Resource Monitoring element of the Upper Mississippi River Restoration Program (UMRR).

What did they find? Large wood (between 4 and 40 inches) plays important roles in rivers and floodplains in shaping diversity and abundance of habitat and filtering nutrients.

The wood data was gathered on six reaches of the river as well as side channels and impounded areas, its presence dependent on water flow, flooding duration, the complexity of the river borders and connectivity to floodplain forests.

"Our results underscore the importance of maintaining forested floodplains for sustaining large wood in great rivers. Floodplain forest restoration and management has been an important priority for the UMRR Program because of the numerous threats to forest health and coverage," the paper concludes. "Our work contributes to a broader understanding of large wood dynamics, particularly in great river systems where such studies have been lacking."

#### Sturgeon reef formed

Robinson Lake is destined to become an attractive destination on the Upper Mississippi River for sturgeon—and for species that spawn in similar ways. A sturgeon spawning reef is part of feasibility plans for a Habitat Rehabilitation and Enhancement Project (HREP) being undertaken by the U.S. Army Corps of Engineers. Robinson Lake is downstream of Wabasha, Minnesota, on the river's lower Pool 4.

Island loss and related sediment deposition has led to changes in flow and depth diversity across an area used by native fish and mussels. The HREP would protect, enhance, and restore backwater habitats to improve flow conditions, said Kacie Grupa, engineering lead for Upper Mississippi River Restoration Program projects in the Corps' St. Paul District.

The plans will look to positive experiences with spawning beds on other rivers to establish optimum water flow, depth and temperature along with clean substrate. Cobblestones will be placed on the river bottom and designed to protect eggs from predation and sedimentation.

The title of the feature calls out sturgeon but the reef will benefit other species that spawn as sturgeon do by broadcasting eggs onto rocks and into crevices on the river bottom. Spawning reefs also benefit mussels by providing stable substrate for colonization and attracting large fish that host and disperse mussel larvae.



#### MVD leader promoted

The commander of the Mississippi Valley Division was in August named the U.S. Army's newest Major General. Maj. Gen. Kimberly Peeples was honored in a ceremony led by Maj. Gen. Kimberly M. Colloton, the Deputy Commanding General for Military and International Operations, Headquarters, U.S. Army Corps of Engineers. The Vicksburg, Mississippi ceremony was attended by family, friends and division employees.

The designation was confirmed by Congress on July 31. Peeples is the senior military officer of the division, responsible for water resources and engineering solutions in a 370,000-squaremile area. She assumed command of the division in July 2023.

#### We want to hear from you!

Have thoughts on our current issue? Story ideas you'd like to see us research? Email thoughts or letters to the editor to: editor@kimschneider.net



#### Questions or Comments:

U.S.A.C.E. REGIONAL OUTREACH SPECIALISTS Insiyaa Ahmed, St. Louis, Mo. Kately 636.899.0076 630 Vanessa Alberto, St. Paul, Minn. Allen 1 651.290.5388 309 Kenneth Williams, Memphis, Tenn. 901.544.3360

Katelynn Dearth, St. Louis, Mo. 636.899.0086 Allen Marshall, Rock Island, III. 309.794.5204

#### Mailing list changes:

Kim Schneider, editor@kimschneider.net To read online:

https://www.mvd.usace.army.mil/Media/ Publications/Our-Mississippi/ Click "Subscribe here" to subscribe via email.

#### Contributors this issue:

EDITOR/ LEAD WRITER Kim Schneider GRAPHIC DESIGNER Diane Kolak

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CONTRIBUTING WRITERS John Anfinson J

Chere Coen

John Flesher

Debra Dietzman

Jessica Haas Richard Stoff Madeleine Thompson

US Army Corps of Englneers,