

**SPRING 2019** 

# **Restoring a River's Elm**

## Can river magic (with a lot of scientific help) save an iconic tree?

**MANY CITY DWELLERS REMEMBER** the tall, graceful American elm trees that used to shade their boulevards and streets. Those trees largely disappeared from the urban landscape with the onset of Dutch elm disease (DED) in the 1930s and its subsequent spread across North America. But the floodplain forests of the Upper Mississippi River harbor a reservoir of saplings that give hope for restoring the elm to its former role as a centerpiece for landscapes, both rural and urban.

"The Upper Mississippi River floodplain contains some of the highest densities of northern floodplain forests in the United

ABOVE: The thick forests of the Mississippi River approximate—in many spots—what the river looked like 200 years ago. They're great places to explore; they also offer spawning habitat for fish, filter out impurities, help control flooding and provide nesting habitat along the river's flyway. States," said Andy Meier, forester for the St. Paul District of the U.S. Army Corps of Engineers, based in La Crescent, Minn. "It's inherently one of the largest areas with a high density of elm." In fact, elm ranks in the top four tree species there, falling just behind silver maple, cottonwood, and green ash.

Once, elm towered as one of the dominant species. But today,

its presence is mostly little trees—the species you most find in the midstory of the floodplain forests. The current problem, as Meier explains: They can't quite grow up.

"Trees reach 12 to 13 inches in diameter and are then attacked by Dutch elm disease and die back. It just gets big enough to reproduce."

#### Learning from the survivors

Now the Upper Mississippi is the setting where government, university, and non-profit organizations are exploring opportunities to restore the elm to its full status in the landscape. The foresters, plant pathologists and researchers who nurture these pilot efforts are optimistic that they will succeed in restoring this iconic tree to this iconic river—and then well beyond.

Those hopes are fueled by the occasional findings of large elms still thriving in the floodplain forest. One such survivor, found in 1997 just upstream of the confluence of the Mississippi and St. Croix rivers, has been tested by the University of Minnesota and developed into a commercial horticultural success, the St. Croix Elm.

To help locate other such special trees, U.S. Forest Service researchers near Columbus, Ohio, created an online tool for reporting survivor elms in 2011. They specifically wanted to find *Continued on page 2* >>

Our Mississippi is a quarterly newsletter of the U.S. Army Corps of Engineers about its work in the Mississippi River Basin. It is published in cooperation with other state and federal agencies and other river interests with whom the Corps collaborates and partners toward long-term sustainability of the economic uses and ecological integrity of the river system.

American elm that were large, in good health, old enough to have been exposed to DED, and that had grown from seed.

"We were surprised by the results. We hoped for 40 or so responses and we got over 800 submissions," said Kathleen

Knight, research ecologist with the U.S. Forest Service's Northern Research Station. She and her U.S. Forest Service colleagues Leila Pinchot and Charlie Flower are seeking to pass the genetics of these survivor trees on to future generations of elm through a breeding program. The goal is to increase the diversity of DED-tolerant elms that are available and suitable for restoration plantings in a variety of settings.

It's a long process. Potentially tolerant specimens must grow old enough to produce flowers. Pollen from the flowers is used to pollinate other tolerant elms, and eventually seeds are harvested. The resulting new elm seedlings must grow for five to seven years before their DED tolerance can be tested by injecting the DED fungus. Tolerant varieties will typically show symptoms of the disease and then rebound in subsequent years. Trees that produce tolerant offspring can be planted together in seed orchards to produce seeds to grow trees for restoration and reforestation plantings. No trees have been found that are totally resistant to DED.

#### A forest pest adds urgency

The arrival of the emerald ash borer in the region has ramped up the urgency of finding elm that can thrive to maturity in the floodplain forest. This invasive insect kills virtually all North American ash trees. "Elm has the potential to capture sites where the ash are dying," Meier said. Without the water- and shade-tolerant elm,

## "We were surprised by the results. We hoped for 40 or so responses and we got over 800 submissions," - KATHLEEN KNIGHT, RESEARCH ECOLOGIST WITH

THE U.S. FOREST SERVICE'S NORTHERN RESEARCH STATION

"These sentinel plantings are helping us identify problems that could be encountered in establishing these special elms in wildland settings," said Linda Haugen, U.S. Forest Service plant pathologist based in St. Paul, Minn. "We are seeing that elm have many enemies, including deer, mice, voles, rabbits, pocket gophers, beavers, flooding, plant competition, diseases and insects." Haugen helped install the initial plantings and monitors their progress.

Since 2014, state agencies in Wisconsin, Iowa, and Minnesota and the U.S. Army Corps of Engineers have planted more than 5,000 American elm seedlings on floodplain sites to continue learning how to successfully grow these trees.

Haugen is currently involved with the latest U.S. Army Corps of Engineers elm planting on the Trimbelle River in western Wisconsin. Located within a wetland mitigation project, this trial will help discover whether seeds from DED-tolerant trees perform better than those from local elm. Another four years will pass before the first results will be known.

In the headwaters of the Mississippi, U.S. Forest Service researchers have teamed with the Chippewa National Forest to explore how the genetics of the DED-tolerant elm interacts with environment. Pollen was collected from local survivor elms in northern environments and used to pollinate known DEDtolerant trees. The resulting trees were planted in northern sites. The goal is to



ABOVE, FROM LEFT: U.S. Forest Service plant pathologist Linda Haugen labels one of the initial elm plantings on Stoddard Island Habitat Rehabilitation Project in Pool 8, Upper Mississippi River, in 2007. Large elms that have survived Dutch elm disease are crucial to current efforts. This one grows about a mile west of the Mississippi River along the Upper Iowa River.

the gaps in the forest canopy may lose trees entirely, taken over by invasive reed canary grass or marsh, shifting the structure and function of these ecosystems.

"The questions about restoring elm are pretty basic," Meier said. "What conditions are needed for elm seedlings to thrive?"

To answer that question, the U.S. Army Corps of Engineers, U.S. Forest Service, and other federal and state partners have installed test plantings of DED-tolerant elms in the Upper Mississippi River since 2005. The initial collaboration included two upland agriculture field conversions (Carpenter St. Croix Valley Nature Center in Hastings, Minn. and Luther College in Decorah, Iowa) and two floodplain sites on the Mississippi River (U.S. Army Corps of Engineers' Eagle Island near Stoddard, Wisc., and U.S. Fish and Wildlife Service's Dago Slough near Cassville, Wisc.). Each site included 30 to 45 DED-tolerant elm saplings which were planted with protection from wildlife damage. These "sentinel" sites are revisited annually to observe survival, flowering, and growth.

learn whether some progeny will be tolerant of both DED and cold climate. The 2018 results look promising. Many of the trees lived, indicating useful levels of cold tolerance, and many of the progeny exhibit some degree of DED tolerance.

Growing new trees is being supplemented by work to better understand elm and the disease that afflicts it. The U.S. Army Corps of Engineers is starting a project with Anita Baines, associate professor of biology at University of Wisconsin-La Crosse, to look at the population dynamics of Mississippi River elm using standard forest inventory data. Examining interactions between tree size and distribution. elevation gradient, and other species present will help better understand the native elm population. U.S. Forest Service researchers are beginning to explore such questions as whether DED fungal strains being used in experiments match those that presently occur in the landscape and whether an elm's DED-tolerance trait holds up if the tree is exposed to DED via root grafting instead by exposure through the bark.

The knowledge gained in these projects, the researchers say, will benefit the health of the Upper Mississippi River ecosystem and contribute to a nationwide effort by many partners to create a suite of genetically diverse, DED-tolerant trees that can be planted in rural and urban settings and the management strategies that will help them thrive. Perhaps your community will one day have, so to speak, a piece of the river towering above. –D.D.



## Need a sandbag? This center's got 7 million

When record flooding on the Upper Mississippi broke levees at several construction) within two to five days. spots just over a decade ago, the U.S. Army Corps of Engineers—and many river And it's not likely they'll run out. The massive warehouse on Rock Island's towns—ran out of sandbags. They were able to find more, but the price quadrupled Arsenal Island houses 5–7 million sandbags stored in four-by-four-foot wooden by opportunistic suppliers. shipping containers, stacked one atop the other, some 5 miles of gabion baskets Rodney Delp, who worked in emergency management in the Rock Island District and 105 flood pumps of various sizes; many can pump 12,000 gallons of floodwa-

and soon after became chief, didn't just get mad-he got preemptive. With the ter a minute. Corps' support and provision of warehouse space on Arsenal Island in Rock Island, The newest piece of equipment, added just this spring, is an automatic sand-Illinois, he launched a flood flight center that would stockpile needed supplies and bag filler. The machine that can fill up to 1,000 bags per hour and do the work of negotiate contracts for emergency provision of sandbags and other essentials. It hundreds of volunteers made its way to Schuvler County. Illinois, after that state would not just save the government money, it would end up saving critical minutes requested it to fight flash flooding along the Illinois River. The machine can only be requested by a state, and then two mechanics are sent with the machine to train in the midst of fighting floods. "In previous years, each district maintained a stockpile of what they thought those on site

at that price

BELOW: A Hesco Bastion engineer teaches Army Corps flood team members the proper "We distributed some of everything we had—flood pumps, baskets, sandbags way to erect Hesco gabion baskets. and plastic, all within our district. We were even supporting ourselves." -K.S.





to be the appropriate number of sandbags for a typical disaster," Delp said. "Then they had to go to an emergency contract to buy more. I personally couldn't stand it

The center opened in 2009 as a regional flood supply center, but a few years later was designated the National Flood Fight Materials Center. Now, the provision of flood fight materials is fiscally responsible. It can also save lives by having supplies ready to send at a moment's notice. The center can provide sandbags within 48 hours to anyplace in the country and gabian baskets (used for flood wall

This spring, supplies were sent to flood-fight efforts around the country including to Omaha to help during devastating flooding across Nebraska. Sandbags when we were paying 45 cents a bag (typically 12–18 cents) and bought 15 million and pumps went to every district along the Mississippi River but St. Paul and were especially critical on the southern end of the river in Memphis. New Orleans and St. Louis. They were used closer to home, in Rock Island, too, and were key as the district experienced a flood of record duration

> Delp expects the center to become increasingly critical for the entire nation. "The frequency of flooding is not diminishing by any means; it's clearly increasing-and in intensity too. In Rock Island, we just broke the record for the duration of a major flood. Before, the record was 29 days, and this one went 52.





## Locks help with flooding by 'getting out of the way'

HE MAY NOT BE THE PAUL REVERE of Mississippi River floods exactly. But as the Primary Mississippi River Regulator for the St. Paul District of the U.S. Army Corps of Engineers, Daniel Fasching spends a lot of the year working with weather forecasters and other partners to figure out what kind of flood year is in store and then sharing word that's something to the effect of "the flood is coming, the flood is coming."

That allows his district's locks—and those downriver—to open gates and get out of the way of the coming "wave" formed by snowmelt from the Upper Midwest combined with spring rains.

Locks and dams aren't designed to help control floods, nor are they authorized to do that; in fact, they're designed to do pretty much the opposite, Fasching says. They're designed to, in drought conditions, hold back water and deepen the river channel. But doing that during high flows can exacerbate a flood-and create more damage for river communities and the lock structures themselves. The best way they can help is to get out of the way.

"When flows get over a certain magnitude and elevation, we pull all the gates out of the water at locks and dams," Fasching said. "That's important because they're not designed to retain all that water and we can't risk backing up water with damaging a community upstream of the dams. We get them out of the way and let all the water pass. We call that run of the river. We also call it open river." Coordination is key to getting out of the way and letting primary flood control

positions-like reservoir operators-do their jobs. It all starts with a winter planning session with partners like the United States Geological Survey and National



### Did flood spread invasive fish?

Did invasive bighead and silver carp enjoy the "welcome mat" offered into areas previously unexplored when floodwaters required locks to open gates and go into open river condition for well over a month this spring?

That's something biologists are watching with the help of telemetry and a tagged group of so-called Asian carp that have long resided below Lock 15. Similar research is being done near the Bonnet Carre Spillway, opened a record two times this year, literally opening the floodgates of carp into Lake Pontchartrain.

In typical years, navigation control structures play a key role in slowing the movement of fish who are blocked by the gates that control water flow. When lock gates are opened during a flood, fish can pass through. While that's good news for native fish looking for foraging or spawning ground, it's not so good when it comes to these species so voracious that once they got established in the Illinois River, they outcompeted native sport fish and now make up 90 percent of that river's mass.

"We have an array of receivers around Lock 15 now," says Mark Cornish, a biologist with the Corps' Rock Island District. "Once we can gain access to the receivers we should know when the fish moved through if they did move upstream. That's going to tell us an awful lot about how we could potentially manage dams in the future to reduce fish movement."

Individual carp have been caught up to the Twin Cities, but biologists haven't found spawning populations of this invasive species first introduced on the lower reaches of the river that high in the system.

"Are they moving below 15 above 14 into areas uncolonized further up or falling back?" Cornish asked. "As a scientist, we get really excited. We're learning something because of change. As ecologists, we're very worried about what implications of that might be. Did we get a population of fish large enough that it could be a spawning population? We don't know yet."

Weather Service and ends with letting others know what comes out of the resulting forecasts—the "yelling out of a megaphone," as Fasching calls it.

#### WINTER

Snowfall totals and forecasts are key because what falls in the northern reaches of the floodplain will eventually melt. "We get more snow," Fasching said, "the higher the river gets."

At planning meetings with the USGS, cities and tribal communities, they discuss snowpack and winter conditions. There are check boxes. Lots of snow, that's one check, deep frost depth, that's another. Forecasted precipitation is another, as is how fast spring warming is expected to come. The weather service then produces a statistic-heavy probabilistic forecast that shares the likelihood the river will reach certain elevations and river stages—and word is spread.

This year, that forecast accurately predicted an abnormal year, Fasching said. The St. Paul district, like others farther down river, broke records for how long locks were kept in the open river condition.

The timing of gate openings was coordinated with teams releasing water from reservoirs. Those are flood control devices, strategically used to hold back snow melt and release it in a steady enough way that it doesn't overtop any banks. Some include spillways that send water to spots designed to be flooded and relieve pressure on the river's mainstem. It can take days or up to a week before the water, like a wave, shows up at the first lock—and lockmasters can scientifically predict and share its coming.

At Lock 4, the "megaphone" let staff know enough water was on its way that they removed safety handrails, shored up the lock with sandbags and otherwise "battened down the hatches," Fasching said. While water did overtop the walls, the lock incurred no serious damage.

"We have built up enough infrastructure on the mainstem that most people don't even notice the flooding when it's happening," Fasching said. "There are pluses and minuses to that. Overall, it's a good thing that people can go about their day and don't even notice how high the river has gotten. That means we've done our part." -K.S.

MISSISSIPPI-RIVER-FLYWAY.COM



### Check out the source

The river is less than 20 feet wide where the Mississippi Headwaters cam focuses—on the series of stepping stones that cross the Mississippi at its origin within Lake Itasca State Park. But there's plenty of wildlife (warblers, kingfishers, waterfowl and more) as well as human action, especially during warmer weather. Many days, you'll catch visitors stepping across the iconic river on this bucket list stop. It's here the river begins its 2,552-mile journey to the Gulf of Mexico and, as markers at the spot will share, it's changed very little since the day Henry Rowe Schoolcraft documented this river source in 1832. HTTPS://WWW.DNR.STATE.MN.US/ STATE PARKS/ITASCA/HEADWATERS.HTML

### Eagle cam—and beyond

### More

the King of Rock n' Roll, Elvis Presley.

GRACELAND-CAM

## River Cams let you e-explore the Mississippi River—in real time

Make sure the sound is on when you open the live Mississippi River Flyway Cam and enter a full sensory experience of the Mississippi River along the stately bluffs of La Crosse, Wisconsin. A viewer's blood pressure has to drop several points from the river flows, wing flaps and non-stop bird calls more reminiscent of a non-stop National Geographic special than what you expect to be seeing from a static cam. This project is run by the Iowa-based Raptor Resource Project, a non-profit that helps preserve and protect habitats for eagles, falcons, hawks and other birds. Viewing captures the day's changing light, and operators regularly pan the scene, zooming in and focusing on highlights that might include an eagle couple scouting for fish, an osprey hopping along the shore or flock of rare birds during migration. HTTP://EXPLORE.ORG/LIVECAMS/RAPTOR-RESOURCE-PROJECT/

The U.S Fish and Wildlife Service operates at least seven webcams in its Upper Mississippi River Wildlife and Fish Refuge, a number that seems like a lot until you realize they're offering only a peek at the 240,000 acres stretched over 261 river

ABOVE: The livestream viewing of an unorthodox trio of eagles that's been dubbed the eagle "throuple" has gone viral, with viewers from around the world watching the three eagles (two males and one female) work together to build a nest, take turns sitting on the eggs and feed the three fledglings that hatched this year. It's uncommon for bald eagles to parent in threes, and just a handful of previous trios have been spotted in other parts of the country.

miles from Wabasha, Minnesota, south. They offer a perfectly targeted peek, though. Says Stan Bousson, a Fish and Wildlife Service volunteer who set up the cams: "We've got them on eagle nests, on an island where the pelican rookeries are. We've got one looking over where eagles migrate in wintertime and one on a peregrine falcon's nest too. The one we do the most with of course is the eagle cam." That camera (with full audio) focuses on a nest in the backwaters near Fulton, Illinois, and the website also links to spellbinding "greatest hits" moments like the time a stranger eagle attacked the nest and another day when babies nearly tumbled out. HTTPS://WWW.FWS.GOV/REFUGE/UPPER\_MISSISSIPPI\_RIVER/SEASONS\_OF\_WILDLIFE/WEBCAMS.HTML -K.S.

Nature isn't the only draw to the Mississippi, so cams capture culture, navigation and more.

what you'll spot. HTTPS://WWW GRACELAND COM/ HTTP://MESONET AGRON IASTATE EDU/CURRENT/VIEWER PHTML#KCRG-020

The Graceland Cam takes you lowa State's cam at Prairie The Port of New Orleans cam to the doorway of the estate of **du Chien. Wisconsin.** points at captures the importance of this the river—and you never know river as a transportation highway. HTTPS://WWWWFBCAMSIN LOUISIANA.COM/2017/06/19/ WEBCAMS-LOUISIANA-PORT-NEW ORLEANS-CRUISE-SHIP-TERMINAL-WFBCAM/



#### Stan Bousson, photography volunteer, Upper Mississippi River National Wildlife and Fish Refuge

"About 30 years ago or so I started going out looking for nature to photograph. I would head out to any of the local areas along the Mississippi, and I'd see great egrets and great blue herons and pelicans, warblers in the springtime and again in the fall as they migrated back through, and basically lots of different types of birds. The birds are just, well, they can fly. It's something I always wished I could do. The eagles are magnificent, and the smaller birds, the acrobatics they can do, it's really neat to watch. It gives you a feeling of wonder

"I would work up ways to get my personal cameras up near bald eagle nests to document how the nesting season went. Ten years ago, we put up webcams, and at one near Lock and Dam 13. A few years later we noticed a trio (two male eagles and one female) working together. The male eagles we called Valor 1 and Valor 2, and when Hope—which was the first female—was lost, the two males raised the two chicks to fledgling. Now they've picked up a new female named Starr. She's been there the last two years.

"Audubon did a story on the trio nest earlier this year, and it spread all over the world. For me, it made me proud of what we were doing, but for the people who take care of dealing with the public, they were very busy! ... It's very interesting to watch how the eagles all interact with each other.

"In the evening, at night, mice like to come up into the nest to get food particles. They'll play cat and mouse with the eagles. The eagles will try to catch them; the mice keep taunting them. You also see what types of food they bring up to the nest for the eaglets to eat-fish to ducks to coots, muskrats. And we're getting ready to put our cams back out on islands for the pelican rookery.

"My Mississippi is a wonderful place to see nature, just enjoy myself, and I hope that those who look at my pictures get some enjoyment out of it also."



n a large Mississippi River island a few miles north of Grafton, Illinois, there is a several-acre stand of cottonwood trees. With one click of his mouse, U.S. Army Corps of Engineers forester Robert Cosgriff zeroes in on a single tree within the stand. As he does, its "biography" pops up.

trees. While it doesn't have a name, per se, it does have a story that (when combined with others) can help guide key forest management decisions as forests and particularly tall trees favored as perches for the American Bald Eagle and other birds are dving out.

"That big tree is stressed. A lot of the stress comes from all the flooding over the past couple of decades," Cosgriff says. "In that stand there are six mature trees and 16 over-mature trees that are probably in decline."

Cottonwoods were plentiful until changing conditions reduced their numbers



This cottonwood, 43 inches in diameter, is tall, and it dominates its neighbor and age diversity. Remaining cottonwoods tend to be nearing the ends of their 80- to 100-year lives, causing concern and subsequent action.

#### Taking inventory

There are 16 stands mapped on Cosgriff's computer. Each represents a community of tree types, and the most common found on the Corps-managed lands in the Mississippi River floodplain are cottonwood-willow, oak-hickory and maple-ash-elm. Each community, from a few to hundreds of acres, represents a small segment

of the 50,000 acres that have been mapped digitally in the St. Louis District. Nonetheless, Cosgriff can tell the life story and current health of that tree and about 159,999 others that have been inventoried by the district.

The resulting maps indicate elevations and soil types as well as presence of invasive species—information that helps to determine what forest community might be supported in the future and how it should be introduced. Such inventories are underway on the 120,000 acres in the Rock Island and St. Paul districts, too, and combined, these will guide rehabilitating forests and checking and recalibrating their work for decades.

#### Changing habitat

"The Corps wasn't involved in land management prior to 2007," said Cosgriff, a Montana State University graduate who joined the Corps in 2009. "As a Federal land management agency, there are laws and acts that require government agencies to manage forest resources for the benefit of multiple users and inhabiting wildlife species."

The river basin's forest diversity has been diminished by recent decades of recurrent flooding and, before that, the creation of pools upstream from locks and

### Seeing the trees for the forest lif a tree falls in the forest, this U.S. Army Corp of Engineers project will know—and record it If a tree falls in the forest, this U.S. Army Corps



6 Mississip

dams. That followed the impact of farming by European settlers, which followed the massive deforestation that provided wood to fuel steamboats from about 1820 to 1850.

Hundreds of years before that, the habitat was altered by the first settlers, Cosgriff said. "From the confluence at the Kaskaskia River north to St. Paul, the flood plain was 40 to 60 percent prairies. The Native Americans were managing the ground by burning."

#### Finding the trees for the forest

Foresters from the St. Louis, Rock Island and St. Paul districts devised plans to inventory their forest resources in a geographic information system (GIS). The foresters adapted available GIS software and created their own applications to plot tree and vegetation populations as well as ground conditions and flood histories. The foundation layers of their gee-whiz digital maps are totally analog-maps drawn by surveyors in the 1890s and aerial photographs taken in the 1930s.

"The Corps funded these studies because they were interested first in the impacts of elevation on navigation," he said. " In the 1930s they were looking at the locks and dams that would flood part of the land, so they needed to have an idea of what that was going to look like so they could acquire that land."

Now striving for the restoration of the forests to as much of a diverse and natural succession as possible, foresters expect to follow repeating 10-year cycles of data collection, data analysis, treatment prescriptions and actions. Forests are sampled within grids measuring 100 meters by 100 meters, about 2.5 acres. Field data are entered into personal digital assistants on sites identified by global positioning satellite receivers and accurate within a couple of feet.

"We want data to tell us what the baseline resources are so that when we take action we will know if we are being successful," Cosgriff said. "If something is not working, we want to go back and change it."

Wetter soils are encouraging silver maples to proliferate on stands once dominated by hickory and oak. Where possible, foresters would like to replace maples with trees that provide hard mast (nuts) and soft mast (fruits and berries) that feed wildlife. Cottonwoods are a critical habitat, too. They shelter water birds and raptors such as bald eagles. A goal of rehabilitation is to re-introduce successional cottonwood stands of all ages, including the dead and dying.

"Over-mature cottonwoods are habitat for one of our endangered species, the Indiana bat," Cosgriff said. "It likes to roost underneath the bark as it flakes off." -R.S.



The iconic Louisiana black bear has been in the past century a symbol of wildness, of sportsmanship, of endangered species, and of species recovery. It inspired a toy that became a global phenomenon. But if you see this real "teddy bear" outdoors, wildlife managers would prefer you keep your distance. Only the stuffed toy versions are cuddly.

Teaching people how to coexist with the bears, which have been rebounding in population after a perilous slide to near-extinction, is a crucial component of the species' recovery. At the annual Bayou Teche Black Bear Festival, in between bowls of gumbo and kayak tours of the swamp, educational exhibits encourage celebrants to make sure the bear never gets any party invitations

toymaker to create "Teddy's bear."

Despite the presidential pardon, Teddy's real bears had a tough time for Safari Club International, a hunting-rights organization, filed a motion most of the 20<sup>th</sup> century. Over-hunting and habitat loss resulted in a populato intervene in the lawsuit as a defendant, arguing its interests were at stake tion that had plummeted enough to be listed as threatened in 1992 under the because the delisting creates the possibility the state could open a hunting Endangered Species Act. It was removed from the list in 2016 after the U.S. Fish season for the bears. and Wildlife Service pronounced it recovered, a success story attributed to the partnership of federal and private landowners in restoring more than 800.000 FOR NOW. those who want to hunt the bear must be armed with cameras, not acres of critical habitat. Voluntary programs compensated private landowners guns, as well as patience and luck. The shy creatures are not easy to find, absent to convert poor croplands into hardwood forests. Partners such as the U.S. a food-filled garbage bin. Public-access lands providing the best opportunities for Army Corps of Engineers also purchased acreage outright. glimpsing a bear include Bayou Teche NWR, Richard K. Yancey WMA, Big Lake The result was the rebounding of the bear population. Hard figures on the WMA, and Tensas River NWR.

### Louisiana Black Bear

Ursus americanus luteolus RANGE: Lousiana, Mississippi, Texas

**APPEARANCE:** A large mammal with long black hair and a short, well-haired tail. Their weight can vary; males may weigh more than 500 pounds. Compared to other bear subspecies, its skull is longer, narrower and flatter, with larger molar teeth. HABITAT: Prefer bottomland hardwood forest

communities. They den in trees or on the ground.

# **Bear-ly Back**

"IF A BEAR AND A HUMAN get into a conflict, the human is going to lose," said Catherine Siracusa, the black bear conflict officer for St. Mary Parish, one of the primary habitat areas for the species.

"It's so easy for bears to acclimate themselves to humans, and that gets scary," said Siracusa, who organizes the festival in her role as an educator with the Louisiana Department of Wildlife and Fisheries. "We really push no interaction between humans and bears'

The department even provides instructions for building an "unwelcome mat"—a slatted board designed to keep a bear from reaching a door or window. But its signature device is a bear-proof garbage can program. The department instructs bear country residents on simple methods of

securing garbage, which can prevent the most common nuisance behavior from bears. Bear-human interactions have been on the rise with this year's flood waters. Bears along with other animals have been displaced from their usual homes

"We've been at flood stages here since November. Our bear and wildlife issues have been non-stop," Siracusa said. "Definitely the high water this year has more animals in and around the human settlements."

**THE BEAR** is Louisiana's state mammal and a celebrated part of the state's culture and history. Back in the early 1900s, the bear was so numerous in the forests and canebrakes of the Mississippi delta that it attracted many hunters. President Theodore Roosevelt was a member of a bear hunting party in 1902, and an over-eager assistant tied a bear to a tree for the President to shoot. Roosevelt's refusal to do so was depicted in a cartoon, which inspired a Brooklyn

number of bears are almost as elusive as the creatures themselves. Some estimate



fewer than 200 bears lived in Louisiana at the time of the listing in 1992. The current population may be nearly quadruple that.

Prior to European contact, the species' range included eastern Texas, all of Louisiana and southern Mississippi. Although the bears have been spotted throughout Louisiana in recent years, most are restricted to four breeding areas along the Mississippi and Atchafalava rivers.

NOT EVERYONE WAS HAPPY with the decision to delist the bear. A coalition of environmental groups filed a lawsuit against the U.S. Fish and Wildlife Service, seeking to have the bear returned to the list.

"Delisting the Louisiana black bear was a premature claim of 'Mission Accomplished," said attorney Paula Dinerstein in filing the complaint. The lawsuit asserts the bears are still too low in numbers and the breeding areas too isolated from each other, with crucial habitat undergoing coastal erosion.

Just remember, don't feed the bears. -S.F.

## **Turn Around** Don't Drown

For important, life-saving information please visit http://tadd.weather.gov The second Accounter of

It flows to a varied beat

At the headwaters

of the Mississippi,

the average surface

speed of the water

per hour or roughly

one-half as fast as

Orleans, the river

flows at about 3

miles per hour. But

the speed changes

as water levels rise

or fall and where

the river widens.

more shallow or

the average flow

rate at Lake Itasca

is 6 cubic feet per

second, while at

New Orleans, the

average flow rate

is 600,000 cubic

feet per second—

perhaps inspiring

the lively jazz vibe

the Big Easy is well

MISSISSIPPI NATIONAL RIVER

known for. source:

AND RECREATION AREA.

narrows, becomes

some combination

of these factors. By

another comparison,

people walk. At New

is about 1.2 miles

# In a flood? Be smart!

Flooding is among the most dangerous weather events in the United States, second only to extreme heat in causing weather-related fatalities. About half of flood deaths occur in vehicles, which is why the National Weather Service emphasizes its "Turn Around, Don't Drown" slogan.

According to the weather service, just six inches of fast-moving flood water can knock over an adult, 12 inches of rushing water can carry away a small car and two feet of rushing water can carry away most vehicles. It is NEVER safe to drive or walk into flood waters.

Don't assume you can safely boat through a flooded area. Flood currents can deceive experienced boaters. Always heed warning signs and barricades. Just because the danger isn't apparent doesn't mean it's not real. "A lot of times people violate [barriers] because they don't truly understand the impact," said Kelly Thomas, Natural Resource Management Section Chief for the U.S. Army Corps of Engineers' Mississippi River Project. "We close for public safety."

For those who live in flood country, staying safe requires precautions before, during and after a flood.

#### **BEFORE A FLOOD**

- Know your risk. Find a flood map of your community either online at FEMA (HTTPS://MSC.FEMA.GOV/PORTAL/HOME) or from local building or emergency management authorities
- If your property is at risk, purchase flood insurance. Standard homeowner policies do not include this.
- Have an evacuation plan in place, and review it with everyone in vour household.
- Assemble an emergency supply kit. Tips on what it should include can be found at www.redcross.org.
- If you own a home, have a professional install plumbing, check valves and elevate heating and electrical systems if possible. • Consider preparing sandbags. The Army Corps of Engineers
- conducts flood fight training in at-risk communities and provides instructions on the use of sandbags. • Monitor local weather reports. A flood watch means a flood
- could happen; a flood warning means it is already occurring or imminent.



### **DURING A FLOOD**

- Turn off the power and water mains if instructed by local authorities.
- Don't use any food that comes into contact with flood waters. · Avoid contact with flood waters.
- Don't allow children to play in or near flood waters.
- If caught on a flooded road, get out of the car and move quickly to higher ground.

### **AFTER A FLOOD**

- Let friends and family know you're safe.
- If evacuated, only return home when authorities indicate it is safe to do so.
- Beware of snakes and other animals that may be around or in vour home
- Make a thorough inspection of your home's structural elements. See www.redcross.org/get-help.html for tips.
- Wear protective clothing when cleaning up.
- Discard all food, beverages and medicines exposed to flood waters and mud.

### Captain Clarke "Doc" Hawley,

riverboat captain and calliope player, New Orleans "My Mississippi is a lifetime learning experience. I first boarded the paddlewheel steamboat Avalon 67 years ago in Charleston when I was about 17. It is now called the Belle of Louisville, and at 104 years old, it's one of the oldest vessels still flying the American flag. I began working on the boat making popcorn, and when the calliope player quit. I stepped into his shoes and started my own path. That first year we went on nine rivers in 17 states. It was a good geography lesson for a little boy from West Virginia. I was always looking out the window. I worked my way up the ranks as a deckhand, mate, pilot, and finally Captain or Master at age 22. It takes about as long to earn a Captain's license as it does to get a medical degree. The excursion boats I worked on were not air conditioned, so like a circus or carnival we stayed with the most favorable weather and traveled with the season. I've had a fascinating life. I was pilot of the steamboats American Queen and President, and captain of the Delta Queen, Belle of Louisville, and the Steamboat Natchez. I met lots of famous people, like President Gerald Ford, Dolly Parton, Muhammad Ali, Placido Domingo, and more. It's been an education, and if I had it all to do over again I'd do the same thing. I still play the calliope on the Natchez in New Orleans on most Sunday mornings. Today calliopes often use compressed air, but on the Natchez you can still watch the steam coming out of the whistle: it's the only music you can actually see. I live in the French Quarter just a few blocks from the Mississippi River, and from my house I can hear its music. I have probably traveled on more rivers than anyone living today and will always remember the Mississippi. I hope it remembers me as a colorful character."



#### **CAMPING WITH THE CORPS**

- Within just the Corps' Mississippi Valley division. there are some 862 recreation areas with nearly 12,000 campsites, 961 miles of trails. 582 boat ramps and 11,500 marina slips.
- Today, the Corps is the nation's largest provider of recreational opportunities—bigger even than the National Park Service.
- The U.S. Army Corps of Engineers was involved in national park work before even the founding of Yellowstone. America's first official national park. The Corps' St. Paul District built Yellowstone's first roads and trails. allowing for initial public access. Modern-day ranger uniforms actually evolved from the military uniform worn during the Yellowstone years.





# River camping delayed—but worth the wait

the wake of a weather event few have experienced.

The level of flooding on the Mississippi and its tributaries this year was the worst in a generation. Areas that do not normally experience flooding were inundated, forcing recreation managers to close an unprecedented number of sites at the start of the vacation season.

"This flood is going to be different because we have a lot of facilities taking water, like the restrooms. We try to build our facilities elevated so they don't get impacted by routine flooding, but this has inundated a lot of facilities," said Kelly Thomas, Natural Resource Management Section Chief for the U.S. Army Corps of Engineers' Mississippi River Project, one of the largest recreation areas managed by the Corps.

Of the 26 recreation sites in the Mississippi River Project, 22 were closed to flooding in May, and Thomas said some would likely remained closed through June. Getting them back into shape to welcome the public takes weeks after flood waters subside.

During a routine flood, most of the clean-up work involves clearing debris, muck and mud Electrical pedestals need to be cleaned and reinstalled. Water must be pumped from low spots behind camp sites so mosquitos don't breed. Docks that were removed for the season are reinstalled.

The flood of 2019 was far from routine. The last flood even approaching this level was in 1993, and "none of my staff was working here at that time, so we may find out some things we have to do that we hadn't anticipated," said Thomas. "This year will definitely be the test."

The Corps is one of the nation's largest federal

Reopening campgrounds and recreation areas after a record- providers of outdoor recreation. Many Corps-managed parks surround and incorbreaking flood requires an all-hands-on-deck approach involving staff, contractors, porate its reservoirs, many of which—somewhat ironically—began as flood control volunteers and even prisoners, with workers wading into unfamiliar territory in structures. Those tended to fare better than those on the Mississippi proper, especially within the Rock Island District, where the Corps runs many boat ramps and water access sites. High water also limited availability for recreation opportunities at reservoirs south of St. Louis. Some boat ramps, as well as a few low-lying picnic areas and camp sites, were closed due to high water, as were all beaches at the four lakes in the Vicksburg District. The northern section of the river escaped the worst of it, with only the low-lying Blackhawk Park near DeSoto, Wis., closed through late May.

> "We're kind of blessed that most of our recreation areas are at the headwaters of the Mississippi," said Patrick Moes, public affairs specialist for the St. Paul District. "Significant areas are impacted, but they pale in comparison to our brethren downstream."

> Restoring navigation to the river is the priority for the Corps after a flood. The natural resources section waits until clean-up is complete at the locks and dams before utilizing personnel and equipment for parks recovery.

> Although this year's epic flood presented epic challenges, crews are well-trained for post-flood restoration. Clean-up crews wear haz-mat suits, rubber boots and gloves. They are alert for wildlife that has been disturbed and relocated to unexpected places.

> "There are always some additional hazards after a flood," said Thomas. "But when you routinely do it, you understand what they are. This year, more areas affected and more parks."

> The recreation team makes use of volunteers when possible. Boy Scout troops, trail users and other community supporters can lend a hand. And in Thompson, Ill., near the largest recreation area, is a federal prison that provides a work detail of supervised prisoners. The natural resources section already has a large supply of regular volunteers who help at campsites. Most live within 100 miles of the parks and will be available to assist when needed. Others, such as

those who travel in campers and volunteer as hosts, will need to delay their arrival until a spot is ready.

"The goal is to get recreation areas cleaned up and useable so people can start enjoying the river," Thomas said. "We'll get pressure from people, but the overall goal is to make sure it's safe. We don't want to be closed any longer than we have to be." -S.F.

KNOW BEFORE YOU GO: f vou have camping reservations or plan to visit a Corps facility, call first or check recreation.gov for current conditions.

## OUR MISSISSIPPI KIDS BE FLOOD-SMART

Help Lucy and her family follow a safe route to get through the flood to a safe place! Your safe place should be on high ground away from low areas that could flood.



# How to press your own plants

#### What you'll need: Paper Newspaper (or the sheets of this newsletter!) Cardboard Heavy books

- 1. Before pressing, make sure your flower or plant that you will press is dry and clean.
- 2. Place a few sheets of newspaper on top of some cardboard, making sure both are larger than your plant
- 3. Place your plant flat on top of the cardboard and paper. If you are pressing flowers, try placing the flower face down—it is easier to flatten the petals this way!
- 4. Place a few more sheets of newspaper on top and then finish it off with another piece of cardboard
- 5. Put some books or other heavy objects on top of your pressed plant. The weight is what presses down the plant so try and put 15–20 pounds on top!
- 6. Wait at least 1 week before removing your pressed plant from between the pages.

#### Some tips:

- Press your plants as soon as possible after you collect it. Otherwise, they will start to wilt and won't look nice once pressed. If your plant does start to droop, try placing the stem in water and see if it perks up just make sure to dry it before pressing!
- Remember, you aren't allowed to take plants from national parks or nature preserves! Try going to your local public park or explore your own back-yard and neighborhood.
- Want to keep a better record of your plant? Write on a piece of paper where and when you found the plant, its name if you know it, and your name as the collector. Place this paper with your pressed plant or add it into a nature journal.

### What to do with your new pressed plants:

- Glue them to a piece of sturdy paper using Mod Podge or clear drying glue to make some wall art!
- Tape them into your notebooks
- Use them for arts and crafts, such as making a flower bookmark

ACTIVITY WRITTEN BY KATELYNN DEARTH AND INSIYAA AHMED PARK RANGERS WITH THE CORPS' RIVERS PROJECT OFFICE



### Campfire tale with a scary twist

Storytelling is fun, whether you're sitting on the river's edge around a campfire, hiking a trail or cruising in a riverboat. Impress family and friends with this Mississippi River tall (or true?) tale.

#### The bird that devours men

You give a little more credit to a legend when its image is painted on the bluffs above Alton, Illinois— and some version has been since at least 1672 when

explorer Father Jacques Marquette spotted the image of the birdlike monster. The Illini Indians named the creature *Piasa*—the bird that devours men—and legends say that a famous chief was almost a victim of the monster "as large as a calf with horns like a deer, red eyes, a beard like a tiger's, a face like a man, the body covered with green, black and red scales and a tail so long it passed around the body, over the head and between the legs." He saved his people, though, after he was instructed in a dream to surround himself with armed warriors.





### Here, plantations—and a new museum—tell a complicated story



Walk past a giant paddlewheelshaped sign reminiscent of a Mississippi riverboat, and enter the new Great River Road Museum and Interpretive Center, opening this autumn just outside Baton Rouge on the grounds of Houmas House Plantation and Gardens (PICTURED ABOVE). Linked by a pedestrian bridge to a promenade atop a levee edging the Mississippi, the museum is but one exciting stop along Louisiana's Great River Road, home to more than a dozen antebellum plantations.

Mark Twain writes that the waters of the Mississippi have a new story to tell every day, and this new river-centric museum is poised to stand at the center of such storytelling. Since 2003, Louisiana real estate developer Kevin Kelley has owned Houmas House, a sprawling plantation established in the late 1700s, which still stands today in Darrow, Louisiana, approximately 16 miles from Baton Rouge and 50 miles from New Orleans. A good steward of the plantation's story, Kelley dreamed of creating a museum

there where the rich and sometimes turbulent history of life along the Mississippi may be shared and new memories can be made.

With its main salon decorated in the style of an 1800s steamboat ballroom, the museum will be filled with fun, interactive, hands-on exhibits and multi-media displays. Visitors will browse maps and ancient artifacts while learning about trade and commerce, river folklore, the story of steamboat travel, and the river's role in the creation of Louisiana culture.

The \$15 million venue, funded in part by a \$5.8 million federal scenic highway grant, includes a 28,000-square-foot museum, café, events stage and amphitheater for live music and special performances on the 38-acre plantation grounds. A broad path will lead from

the museum to a 24-foot-high pedestrian bridge spanning River Road, reaching the top of a levee created by the U.S. Army Corps of Engineers. There, streetlamps and benches will line the wide waterway.

You can also stay for dinner or the night. Houmas House offers three restaurants and a bar, a large gift shop and bookstore, a nearly 200year old house, exquisite gardens and luxury guest cottages, and more. Popular for weddings and special events, Houmas House has been a filming location for several movies, including 2019 Academy Award–

winner, Green Book

The Great River Road Museum and Interpretive Center will be located at Houmas House Plantation & Gardens, 40136 Highway 942, Darrow, Louisiana. HOUMASHOUSE.COM

#### A road trip with a story

Along the almost 70-mile-long River Road between Baton Rouge and New Orleans, a dozen historic plantations easily reached by car or by tour bus. Here are just a few with fascinating stories:

**Oak Alley Plantation:** Picture Twelve Oaks from "Gone with the Wind," and that's what Oak Alley looks like, especially its iconic entrance canopied by 28 enormous 300-year-old Live Oak trees. A National Historic Landmark, its landscape reveals a quarter mile alley of oak trees, lush gardens and lawns, and a Greek Revival mansion built in 1839. Exhibits at the plantation include, Slavery at Oak Alley, Sugarcane, Civil War, Life Inside the 'Big House,' and the People of Oak Alley, telling the story of the people who once resided there.

**Nottaway Plantation and Resort:** This Greek and Italianate-style "White Castle" mansion is said to be the largest antebellum home still standing in the South. Built in 1859, it offers luxury overnight accommodations and is open to the public for self-paced audio tours and tours led by costumed guides.

**San Francisco Plantation:** One of the South's most ornate and colorful plantation houses, this mansion dates to the 1850s. Its outbuildings include an 1840s slave cabin and a school house dating to the 1830s.

**Laura Plantation:** The home to Louisiana's Creole Heritage Site features an informative permanent exhibit dedicated to interpreting the experiences of the enslaved people who lived and worked on

this once sprawling sugarcane plantation. Just four miles from Oak Alley, it features an award-winning tour exploring the Creole culture of four generations.

**Evergreen Plantation Home:** One of only eight large Greek revival plantation houses still standing along River Road, Evergreen features one of the most complete intact collections of slave cabins in the country, which visitors may tour along with the mansion. —J.T.





US Army Corps of Engineers, St. Paul PM-E Sterling 180 East Fifth Street, Suite 700 St. Paul, MN 55101



## **SPOTLIGHT** Marshall Plumley, program manager UMRR



Marshall B. Plumley is entering his second year as regional program manager for the Upper Mississippi River Restoration Program (UMRR) based at the Rock Island District offices of the U.S. Army Corps of Engineers. Our Mississippi talked to Plumley about UMRR's work.

#### What is UMRR?

UMRR was authorized by Congress in 1986, primarily to implement ecosystem habitat rehabilitation and enhancement projects. The projects restore some of the ecosystem functions, structures and processes that have been impaired along the Upper Mississippi River system over the last 150 years or so from settlement and the use of the landscape. Another component is carrying out science and monitoring so we understand what is going on in terms of ecological health and how our projects are doing at repairing the degradation.

#### What is the importance of the UMRR mission?

The Upper Mississippi River system is the heart of the United States. It is the fourth-largest watershed in the world and is one of the most ecologically productive resources in the world. Its commercial navigation system is unparalleled in its efficiency and ability to move goods throughout the country and out for export. This resource has been recognized nationally and internationally, most importantly by Congress in 1986 when it said the upper Mississippi River is a nationally significant navigation system as well as ecosystem. I think it is the only part of the U.S. that has that unique designation.

## Restoring habitats for the ecosystems, wildlife and people of the next century

#### What projects does UMRR undertake?

Over 32 years we have completed 56 projects and have another 20 or so in planning and design. The completed projects have accomplished restoration goals on about 106,000 acres. That represents more than half of the acres that the Corps of Engineers has restored nationwide.

Every project has a team from the Corps and our partners within the states and other federal agencies. They look at an area and determine the most pressing habitat needs. In quite a few projects, we have a problem with sedimentation and will have dredging done to restore some of the lost depth. That benefits fish that use that habitat for refuge during over-wintering. Often we will use that dredge material to build up areas so we can plant hard mast-producing trees. A side effect of having a navigation system is raised water levels. When we have opportunities to raise some areas and get the root zones of trees a bit drier, we can reintroduce important species. In some areas where habitat is not as productive as it could be, we manipulate water levels. We may create areas that at times are isolated from the river and at times have access. That promotes the growth of plants that are food and refuge resources for waterfowl.

#### In your presentations, you quote a proverb, "A society grows great when old men plant trees in whose shade they know they shall never sit." How does that reflect UMRR's work?

We have to take a long view. When we are spending federal dollars, there is an expectation for immediate benefits. Our projects provide that, but we also have to be mindful that when we are restoring a forest, some of those plantings will need 50 to 75 years to reach maturity. It may be 100 years before the forest's full health and resilience are delivered. We have to think beyond our own careers and lifetimes.



#### Questions or Comments:

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This newsletter is a quarterly update of ongoing efforts in the Mississippi River Watershed and does not necessarily reflect the views of the U.S. Army.

Send story ideas to editor@ourmississippi.net