

Our Mississippi

PARTNERING TO KEEP
AMERICA'S RIVER GREAT

SPRING '14



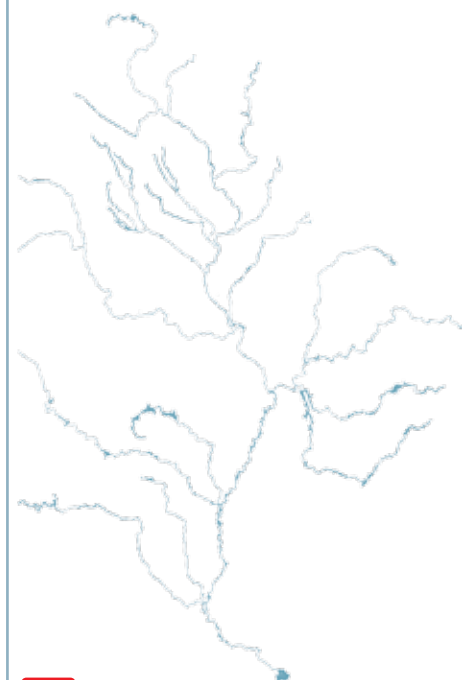
Aging Infrastructure *Still Pulls Its Weight*


The Mississippi River's interconnected locks and dam system plays a pivotal role in our economy. With more than 1,000 miles of open river and a deep-draft capacity for oceangoing ships, the infrastructure serves as the economic aorta for the 12,000 miles of navigable inland waterways that move one sixth of our country's freight. "The river is a vital resource for commercial transportation, with approximately 500 million tons of cargo passing through the system," relays Karen Watwood, Navigation Area Supervisor at the Rivers Project Office of the US Corps of Engineers, which helps keep navigation running as smoothly as possible. "The Corps of Engineers is responsible for maintaining a 9-foot navigation channel and the lock and dam infrastructure necessary to make navigation on the Upper Mississippi River possible," she relays. "Without the locks and dams along the northern portion of the river, the waterways would be too shallow for modern day towboats and barges," she explains. Furthermore, "If these structures were not in place, it would not be possible to transport commodities from Minneapolis to St. Louis."

So what would life be like without this navigation system? For starters, we would get hit where it hurts: our wallets, as prices would soar everywhere from the supermarket to the gas station. Grains and petroleum products are just a few everyday necessities that are transported in bulk via the locks and dam system, along with coal and steel, thereby reducing the cost to the consumer. Lynn Muench, Senior Vice President of Regional Advocacy at American Waterways

Operators, touts the economic significance of this bulk transportation method. "It's the most cost-effective way to move products, so that's good for the economy," says Muench, adding that this transportation method helps us stay globally relevant and competitive. "Over 60% of our grain products go down the Mississippi [River] and essentially we can't grow cheaper than other countries. Our advantage is our transportation system."

The locks and dam infrastructure remains eco-friendly, too, relieving congestion and improving air quality. "It has the smallest carbon footprint of any surface transportation and that's good for the environment," says Muench, pointing to the fact that the waterway has had the fewest number of oil spills of any major transportation system. "We move more ton miles per gallon of fuel than anyone else, and we're also very aggressive in upgrading our engines to make them more fuel efficient," she outlines, before listing two other advantages: First, an average 15-barge tow carries the load of 216 rail cars, 16 locomotives or the equivalent of 1050 trucks. "That's shipping the same amount of products, so that's a big deal," she explains. And second, the amount of carbon dioxide output per ton miles is 16.41 for a towboat, as compared to 21.35 for rail and 171.83 for a truck. "Very few people are ever caught behind a barge or have been in an accident with a barge so it's really good for quality of life," she says, adding that for every fatality caused by towboats, there are over 132 by truck.



 **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.

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Aging Infrastructure *Still Pulls Its Weight*

So with all of these wide-ranging benefits, why does the waterway remain underrated and underfunded? As the old adage goes: “The squeaky wheel gets the grease.” And unlike planes, trains and automobiles, the navigation system along the Mississippi River can be too quiet for its own good. “We make a lot of money for the nation because we perform the cheapest form of transportation, but you don’t see us unless you go sit by the river and watch for us,” Muench explains. “We don’t make noise. We don’t hold up traffic. We don’t put a lot of pollutants in the air. We don’t interfere with people’s lives,” she adds. So in other words, out of sight, out of mind. That is until the system, which has not been upgraded since its creation in the 1930s, hits a snag, as recently happened with the Melvin Price Locks and Dam in Alton, Illinois. In late December, a series of liftgate cable failures at the 1200-foot main lock chamber resulted in a closure, forcing river traffic to use the smaller 600-foot-long auxiliary chamber. “Any time there are issues at our locks and dams, we work with the navigation industry to develop a plan to ensure traffic keeps moving,” Watwood says. During the closure at Melvin Price, specifically, the temporary solution included helper boats, which were provided by industry to assist the larger tows in getting through the auxiliary chamber. “The closure of the 1200-foot chamber has meant that many vessels have had to perform double-cut lockages. This requires uncoupling barges at their midpoint and locking each section of barge through separately. This can increase the time it takes to lock through, from approximately a half hour in the 1200-foot lock, to somewhere between one and two hours in the 600-foot chamber. The helper boats are essential to the process at Mel Price, as the lock was not built with tow haulage units, which is a winch system to help pull the barges into and out of the chamber,” Watwood says.

Initially, the reopening of the main chamber was scheduled for June, but that has since been pushed to August 12, which could result in widespread repercussions, especially given Melvin Lock’s importance and position on the river. On average, over 7,000 vessels pass through, with a total of more than 54,000 barges in both directions each year. Vessels carry 56 million tons of cargo including more than 31 million tons of farm products, mostly for export overseas. Other major cargoes include: stone, chemicals, petroleum products and coal. (NOTE: The Corps’ lock performance monitoring system updates every half hour including vessel queues. It is available to the public at <http://corpslocks.usace.army.mil>)

The trickle-down effect of a closure can run deep. While growers enjoyed one of their most fruitful seasons yet due to the abundant rain, an inability to transport those grains due to closures caused a surfeit in the middle of the country, which ultimately cut into their bottom lines. And as the inevitable backups and delays occur, export prices could increase, resulting in a loss of competitive global market edge, along with a higher cost of food, electricity, gas and other goods at home. “Without the river transportation, we would not be competitive in the world’s agricultural market,” Muench says. “Essentially the river acts as a third coast for our nation. If that lock and dam system doesn’t work, we have a large portion of the US that is landlocked. [That is] very scary.”

There are many reasons for shutdowns, including Mother Nature’s unpredictability, but the major cause for concern remains the navigation system’s aging infrastructure, now several decades past its 50-year design life. In 2012, exceptionally low-water levels led to emergency repairs on Locks 27, located in Granite City, IL, after damage to one of its protection cells was discovered. The outcome could have been catastrophic, as this remains the busiest lock on the inland waterway system, moving more cargo than any other navigation structure on the Mississippi River and locking more than 70 million tons of cargo a year.

Michael Cox, Chief of Operations in the Rock Island District, has also seen the strain caused by a lack of funds to update the 80-year-old infrastructure. “Most of our locks are

well beyond the 50-year design life, and as a result, the concrete and steel, and electrical and hydraulic components have significantly degraded because they’re beyond their useful life, and as a result there are more breakdowns requiring more emergency repairs which cost more money, too,” he says. “Not long ago, we had a fuse explode at one of the locks, and we were down for almost 24 hours until we could find a replacement part and fabricate new mounting brackets. That electrical component had been in place since the ‘80s, so the replacement part was a new size, so we had to fabricate new mounting brackets,” he says. Another recent closure at Marseilles Lock and Dam happened when two parts broke down, including a limit switch, which prevents the gates from closing too hard. “That just gives you an indication of some of the small things,” he says, which can really add up. “The repairs cause hours and hours of delay and increase the cost to us to maintain our facility and the cost to the navigation industry because of additional delays. That also increases the cost of the product to the customer,” he explains.

For now, his team has been employing the “band-aid and bailing wire” maintenance plan to keep the system functioning without a lot of funding. Part of that plan includes installing four new miter gates at Lock 17 and Lock 18 this summer. “We just started replacing gates 2 years ago. These are steel structure gates that have been in place since the 1930s and have been repaired and repaired and repaired. It’s so degraded that it can no longer be repaired. It has to be replaced,” he says. His team has already completed miter gate replacement at 20 in Canton, Missouri; 21 in Quincy, IL; and 22 in Saverton, Missouri. “Those are the first gates that have been replaced since construction of the 9-foot channel in the 1930s here in the Rock Island District,” he notes.

The St. Paul District has experienced less disruptions, thanks to a long winter, which allowed them to conduct preventative maintenance during non-navigation season. “We have that luxury to do that maintenance and not impact any navigation, but as you get further south, they don’t have that luxury,” says Bryan Peterson, Locks and Dams Operations Manager for the St. Paul District. Right now, his district is wrapping up the Lock and Dam Dewatering project, which began in December 2013. “We redid all the miter gates, painted and repainted them, and put in all new hardware. We did a bunch of concrete repairs for that lock structure, so hopefully that one will be in good shape for the next 20 years,” he says. But despite the proactive approach, he worries. “I think that we have a backlog of maintenance that needs to be addressed, and it takes dollars. There are things that are failing like with an 80-year-old anything. We know that their reliability continues to go down, and your risk goes up when your reliability goes down.” He asks the million-dollar question: “How much risk are we willing to accept for our customers?” He continues, “That becomes the challenge.”

DID YOU KNOW?

NATIONAL GREAT RIVERS MUSEUM

To learn more about the navigation system, Watwood suggests visiting the National Great Rivers Museum at Mel Price Locks and Dam and going on a lock and dam tour. “At the museum we tell the story of the river and the navigation system. We explain how the river is a shared resource and has to be managed and cared for to meet all of the different demands placed on her,” she says.

Muench weighs in, “Obviously there is normal maintenance and that’s just a part of having moving structures, but there have also been several unplanned closures because of their age, so until we’re at the point where we’ve upgraded our system and have things in decent shape, we continue to see an uptick in unscheduled closures which is very costly to the nation.” She says, “It was built in the 1930s and was cutting edge from an infrastructure perspective, but things are falling apart and it’s making us less competitive. Unless we as a nation decide to upgrade that infrastructure, we’ll start losing our ability to be competitive in the agricultural export market,” warns Muench, who supports an increase in fuel tax, which would go into the Inland Waterway Users Trust Fund and ultimately pay for “critical” updates.

Muench fears that if Congress and the people do not recognize the importance of the Mighty Mississippi’s crucial infrastructure and take immediate measures to improve the situation, there will be severe consequences. “That’s a huge cost to our society if you start moving more and more things off the river,” she insists, including putting more large trucks on the road, which would drastically reduce the quality of life.

CHAD PREGRACKE VOTED CNN HEROES AWARD RECIPIENT FOR 2013

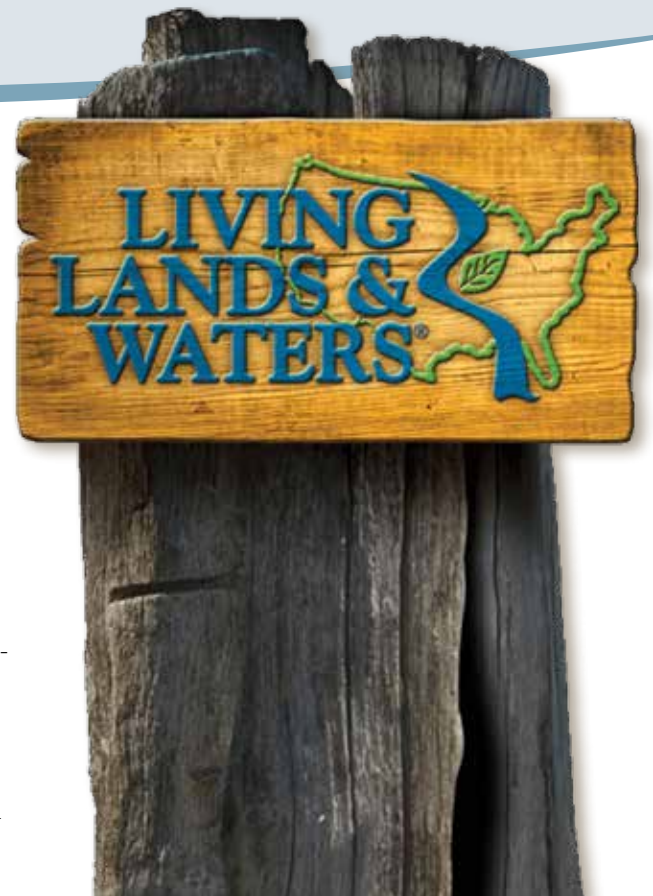
On the November night Chad Pregracke received the 2013 CNN Heroes Award in honor of his work to clean up America's rivers and streams, the unassuming man from Moline, Ill., immediately donated \$90,000 of the \$250,000 prize money to the other individuals nominated to receive the award.

As unusual as that gesture was, it is something that folks who know Chad have come to expect. After all, on his own at the tender age of 23, he simply decided he was going to clear the banks and depths of the Mississippi River of garbage and junk thrown into it over the past couple of centuries.

Since 1998, Living Lands and Waters, the organization Chad founded, has removed over seven million pounds of trash from a 435-mile stretch of the Mississippi River and has inspired both young and older Americans throughout the nation to join in an ongoing campaign to clean up America's rivers, streams, lakes and ocean shores.

Along with ushering groups of volunteers to clean up debris along the Mississippi, Chad's foundation works to educate the public about the importance of our nation's surface water resources. Since its founding, his organization has inspired nearly 70,000 volunteers to clean up garbage from twenty-three different American waterways.

Chad and his group have partnered with the U.S. Army Corps of Engineers from their beginning and the Corps is pleased to extend its congratulations to him and each of the volunteers who have assisted and continue to assist in keeping America's waterways clean and free of debris.



CHAD PREGRACKE ON A BARGE FULL OF GARBAGE. (PHOTO COURTESY LIVING LANDS AND WATERS)

DID YOU KNOW?

According to the World Water Assessment Program administered by the United Nations:

- About 40% of America's rivers are too polluted for fishing, swimming, or aquatic life.
- Nearly half of America's lakes are too polluted for fishing, swimming or aquatic life.
- Each year, plastic waste in water and coastal areas kills up to 100,000 marine mammals, 1 million birds and countless fish.
- About 85% of post consumer plastic products are thrown into landfills and not recycled.

Join Chad: Get Involved

Environmental stewardship is everyone's responsibility – whether it's something as simple as shutting off the water when you brush your teeth in the morning, or rolling up your sleeves to join us on the riverbank. We offer many unique environmental conservation and river cleanup volunteering program opportunities to get involved with LL&W – from our river cleanups and workshops to environmental conservation programs like the MillionTrees Project or the **Adopt-A-River Mile program**. There's truly something for everybody.



MAYORAL RIVER INITIATIVE

From left to right: Sen. Lamar Alexander (Tennessee), Mayor Copeland (Vidalia, La.), Mayor Slay (St. Louis, Mo.), Mayor Wharton (Memphis, Tenn.), Mayor Kenmore (Osceola, Ark.), Mayor Smiley (Clarksville, Mo.), Mayor Brown (New Madrid, Mo.), Mayor Vulich (Clinton, Iowa), Mayor Lattus (Hickman, Ky.).

Two years after mayors from municipalities bordering the Mississippi River came together to form the Mississippi River Cities & Towns Initiative, the group met for a three-day conference in Washington, D.C., this past March 24th through the 26th to advance both economic and environmental initiatives and express concerns to leaders of both parties in Congress.

Centered on the theme “Ten states, thirty-one Congressional Districts, 124 cities, one River,” the mayors’ initiative works to educate legislators as to the importance of the Mississippi River to the nation as both an economic and environmental treasure and to foster sensible legislation that will protect the resource and revive the economies of municipalities situated along the river.

The Congressional Mississippi River Caucus is comprised of thirteen senators and fifteen congressional representatives. During the three-day conference, mayors shared with those caucus members first-hand accounts of both progress and problems being experienced within their river communities. “The story of each of our towns and cities along the river is the story of the Mississippi River,” said Memphis, Tenn., Mayor AC Wharton. “Our initiative is not just about fixing what is wrong now, it is also about protecting a treasure for future generations.”

During the conference, mayors met with Brigadier General Duke DeLuca, commander of the Mississippi Valley Division of the U.S Army Corps of Engineers, and Jo-Ellen Darcy, Assistant Secretary of the Army for Civil Works, to discuss establishment of a general management plan for the entire Mississippi River. “It is vital that we recognize the Mississippi River for the unified economic and environmental resource that it is,” said Roy Buol, Mayor of Dubuque, Iowa.

Past efforts to improve economies along the river or mitigate environmental damage has generally been initiated and carried out on a local or regional basis. While many such projects have been successful, a goal of the mayors’ initiative is to think, plan and develop on a basis that views the entire river system from its tributaries to the delta. The goal of such an effort would be to eliminate waste caused by projects that, while seemingly beneficial to one area along the river, may cause problems to other parts of the river. In addition, the mayors want greater long-range planning that will anticipate calamities before they happen. Preparing for such events would permit resources to be put into place that would limit the extent of damage and more rapidly respond when disaster strikes. Ultimately, a long-range plan would pay for itself in savings from waste and in additional revenues derived from increased recreational and commercial use of the river.

The mayors met with a number of environmental groups including the Mississippi River Network, the American Rivers, The Conservation Fund, the National Wildlife Federation and the National Sustainable Agriculture Coalition. The mayors agreed to work to advance efforts to garner additional state-

revolving funds for clean water and drinking water and for increased funding for the Pre-Disaster Mitigation Grant Program.

One mayor sighted the Elk River chemical spill in West Virginia that occurred in January of this year as an early warning to every American living along the Mississippi River. In the Elk River incident, a chemical spill from an industrial facility released over 7,000 gallons of toxic chemicals into the ground near the river affecting over 300,000 residents in nine counties near and in Charleston, W. Va., who rely upon the river for drinking water. Over 18 million Americans rely on the Mississippi River for their drinking water. The mayors’ initiative includes resources and planning that would be put in place to immediately respond to spills or other events that might threaten drinking water supplies.

President Obama’s 2015 budget cut \$500 million from state-revolving funds. Pre-Disaster Mitigation Funding of \$400 million was requested in the budget as part of the Aspirational Opportunity, Growth and Security Initiative and the mayors are requesting that his funding be enacted.

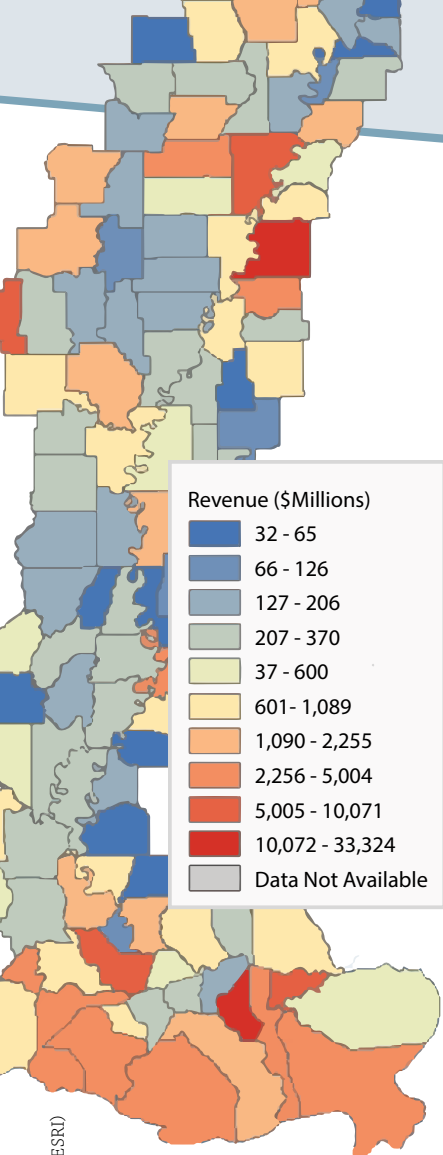
The mayors also point out that simply having an inventory of what critical city infrastructure exists upon the entire river could better inform management within municipal governments, reduce risk and potentially save lives. This argument is central to the mayors’ plan to establish a general management plan for the entire Mississippi River, develop a tributary transport model and expand the Inland Waterway Users Board to include more involvement with local governments along the waterway.

Several mayors spoke of the personal experiences of local citizens to recent drought conditions that have lowered the level of the Mississippi River. Mayor Wharton related the difficulties citizens of Memphis and the surrounding area experienced when low-water levels interfered with waterway delivery to their only regional fuel refinery. “Gasoline prices shot up as supplies dropped,” Wharton said.

Mayor Jo Anne Smiley of Clarksville, Mo., spoke of how disrupted river transport impacted local farmers. “In three counties, farmers could get no feed for their cattle,” she said. Mayor David Lattus of Hickman, Ky., told of how barges had to be repositioned because of low water at their terminal on the river.

Invasive species was another topic being addressed by the mayors. Mayor Buol spoke of a company in Grafton, Ill., that is developing a process to render Asian carp into a high grade fertilizer. “This is an example of how government can wisely invest in initiatives that can return revenue to taxpayers and assist in addressing environmental or other problems,” he said.

The mayors met with representatives from President Obama’s Rural Council, Export Council and Climate Action Task Force to discuss a variety of issues. The mayors said they were pleased with the administration’s overt actions



around climate resiliency that protect local economies. The mayors also recognized that about \$8 billion of the President's 2015 budget that addresses climate resiliency, energy production, research, air pollution, greenhouse gas emissions and clean water could be used to improve cities. Specifically, the mayors cited five areas where funds could be used:

- 1. Reclaiming the natural landscapes of waterfront areas, decreasing erodible zones and increasing the capacity of nature to absorb storm events;**
- 2. Shore-up existing infrastructure for water intake and distribution systems while improving ports and harbors;**
- 3. Engage in climate resiliency planning;**
- 4. Secure climate resiliency technical assistance resources;**
- 5. Create reliable inventories of ecological services and critical river-related infrastructure.**

The mayors also agreed to place the U.S. Army Corps of Engineers, Mississippi Valley Division Civil Works Budget into their priorities for 2014, recognizing the value and critical need of the projects addressed in the budget.

The Mississippi River Cities and Towns Initiative will hold its next meeting in New Orleans, La., in mid-September of this year.



From left to right: Mayor George Flaggs (Vicksburg, Miss.), Mayor A.C. Wharton (Memphis, Tenn.), Mayor Hiram Copeland (Vidalia, La.)



From left to right: Public Relations Director Sheri Rabb (Vidalia, La.), Senator Roger Wicker (Mississippi), Mayor Flaggs (Vicksburg, Miss.)

GRAPH: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE INC. (ESRI)

MY MISSISSIPPI

Phyllis Hand Bechtold; mother, writer, towboat cook



I grew up watching the towboats along the Mississippi River near Alton, Ill. When my friend, whose husband had been a towboat pilot for many years, suggested that I apply for a job as a cook aboard a towboat, I was both skeptical and excited.

It was 2010 and my three children were grown adults. Unexpectedly, my life, like the river, took me around a bend and I suddenly found myself needing a way to heal. So I applied for the job and soon found myself working aboard a towboat on thirty-day shifts, cooking meals for a hungry crew of 10 to 12. My floating cocoon healed my spirit and, in the process, sparked my creativity.

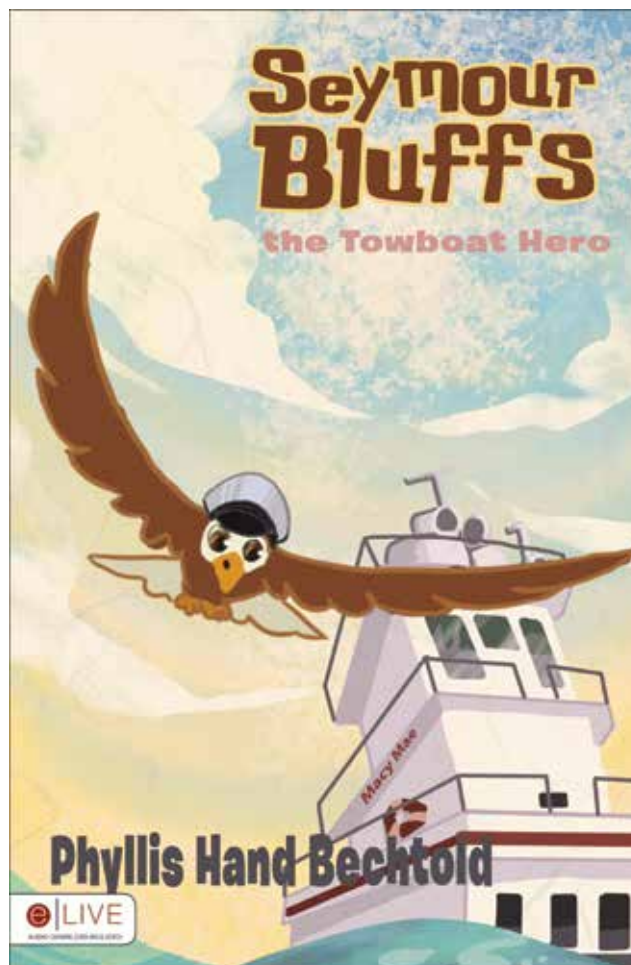
I had always been a writer and more as a hobby than anything else, I had published two books for children aged 10 and younger. My books always speak of legends, events or interesting people associated with the river and they always tell the story through the eyes of an American Bald Eagle I named Seymour Bluffs.

My experience on towboats led me to write my latest book titled Seymour Bluffs - The Towboat Hero. I use the book to explain to children what life and work is like upon the towboats that travel the river. Children learn a lot about eagles in my books and educators in local schools use the books to teach young students about interesting people and historical events.

The river, birds and wildlife I encounter on my days aboard are always calming and I never regret my decision to become a towboat cook. During my time off, I like to answer emails and letters from the children and parents who purchase my books at amazon.com or read them in the local schools near Godfrey, Ill., where I now live.

From my life living near and working upon the Mississippi, I have come to learn that like a journey upon the river, life may involve twists and turns, but it is surrounded by a beauty and wonder always there, waiting to be seen.

Phyllis enjoys responding to readers who contact her through her email address at seymourbluffs1@gmail.com



SPOTLIGHT ON PAST

The Mandatory Center of Expertise (MCX) for the Curation and Management of Archaeological Collections (CMAC)

Regime Crimes Liaison Office/Mass Graves Investigation Team

From 2003 to 2007, MCX-CMAC collaborated with the U.S. Department of Justice's Regime Crimes Liaison Office (RCLLO) to provide forensic support to other agencies and mass graves investigations and to assist with the prosecution of former Iraqi Regime members for crimes against humanity. MCX-CMAC performed technical field mapping, subsurface investigations, excavated nine mass graves sites, collected evidence from human remains, cultural items including documents, and integrated spatial, digital, and forensic data for published reports and court testimony.

African Burial Ground

MCX-CMAC served as technical advisors to GSA during the final analysis and reburial of 400 enslaved African and African-American individuals recovered from a 17th century cemetery in Lower Manhattan. MCX-CMAC specialists provided diverse technical support, including physical anthropological review, reburial planning, project oversight, management of technical reports production, rehabilitation and organization of project artifact collections, and development of curatorial and records management plans.

U.S. Army Central Identification Laboratory Hawaii (CILHI)

During approximately six years in the mid-to-late 1990s, archaeologists from MCX-CMAC assisted CILHI, which is under the Joint POW-MIA Accounting Command (JPAC), in the search for, excavation of and recovery of missing military personnel in Southeast Asia. These efforts focused on individuals involved in the Vietnam War in Cambodia, Laos and Vietnam. During that period, MCX-CMAC archaeologists participated in over 85 recovery missions and 130 recovery excavations, resulting in the positive identification of at least 31 military personnel.

Kennewick Man

MCX-CMAC experts helped mitigate Kennewick Man, a set of prehistoric human skeletal remains discovered on Corps land along the Columbia River in Washington. MCX-CMAC assessed the remains, provided curation and conservation guidelines, oversaw the management and study of the remains, and offered testimony before U.S. Courts.



Jack Horner, Curator of Paleontology at Museum of the Rockies, provides scale for *Tyrannosaurus rex* fossils at excavation site near the Fort Peck Reservoir, Fort Peck, Mont., June 1990. Named for its discoverer, Kathy Wankel, the Wankel T.rex is estimated to have weighed six to seven tons.

Rare T. Rex

Skeleton Makes Long Journey from Montana to Washington, D.C., with help from USACE

As part of a loan agreement between the U.S. Army Corps of Engineers, Omaha District (USACE) and the Smithsonian National Museum of Natural History, a rare *Tyrannosaurus rex* skeleton housed at the Museum of the Rockies (MOR) in Bozeman, Mont., made a trek of more than 2,000 miles to Washington, D.C. in April to take up residence in its new home for the next 50 years.

The 38-foot-long, 66 million-year-old T. rex skeleton will be the centerpiece of the National Museum's new 31,000-square-foot national fossil hall, which will open in 2019. During much of the \$48 million construction project, the T. rex, along with several other dinosaur fossils, will be on display in other parts of the museum for more than 7 million visitors a year to see, Museum Director Kirk Johnson said. While pieces of the exhibition have been updated over time, Johnson noted, this will be the first comprehensive reimagining of the dinosaur hall to incorporate all the latest science. The refurbishment is being funded in large part by a donation from industrialist David H. Koch.

The Smithsonian is now referring to its latest exhibit as "the Nation's T. rex," though it previously had been known as the Wankel T. rex after its discoverer, Kathy Wankel, a rancher from Angela, Mont. While hiking on Corps property near the Fort Peck Reservoir in eastern Montana in 1988, Wankel spotted about 3 inches of bone sticking out of the ground. When she and her husband dug out some small bones, Wankel contacted paleontologists from the Museum of the Rockies in Bozeman who identified them as the arm bones of a T. rex—the first ever found. The rest of the T. rex skeleton was excavated in 1989–90 by a team

led by paleontologist Jack Horner, and the rare fossil was put on display at MOR, where it has remained for the last 25 years.

The Bozeman museum has used the Wankel T. rex to pioneer work on dinosaur histology—the nature of the material inside the bones—something few paleontologists had done before. They documented evidence of tissue and blood vessel composition in the T. rex bones. In addition, the skeleton is among the most complete T. rex fossils ever discovered, with 80–85% of the skeleton recovered, including one full forelimb and part of the second, rare for the majority of these fossils, according to Sonny Trimble, Director of the USACE's Mandatory Center of Expertise for the Curation and Management of Archaeological Collections (MCX-CMAC).

MCX-CMAC, the group charged by the Omaha District with overseeing the loan agreement and transfer of the T. rex, was established by USACE to provide technical expertise to carry out special purpose projects for the Corps of Engineers in support of laws and regulations set up by Congress to recognize the importance of our nation's archaeological and historic heritage. The laws require that archaeological collections from federal archaeological activities be made available to the public for research and education. The laws and regulations also call for the physical remains (artifacts) and the documentation associated with those remains to be curated in facilities that could properly care for the objects. MCX-CMAC is a group of 19 skilled professionals with state-of-the-art technical expertise in the curation of federal archaeological collections, providing services like collections management, special purpose designs and construc-



The final crate of the inventory and condition reporting for the Wankel T.rex before departing the Museum of the Rockies in Bozeman, Mont., for the Smithsonian's National Museum of Natural History in Washington, D.C. The Wankel T.rex specimen was found on lands managed by the U.S. Army Corps of Engineers, Omaha District near Fort Peck Reservoir in eastern Montana in 1988.

tion requirements of curation facilities, mass graves investigations, mass disaster fatalities recovery (in support of FEMA), forensic support to U.S. government agencies and archival/historic cartographic investigations to assist the Army.

Trimble said that many important archaeological and some paleontological finds have turned up over the years from 1947–1985 during the creation of reservoirs for nationwide water control projects undertaken by USACE, and that MCX-CMAC is responsible for managing them. “The Corps has the second largest collection of archeological material in the nation next to the Smithsonian,” he reported.

Trimble said the original request for the loan of the T. rex came from the Smithsonian to the USACE Omaha District, who then requested MCX-CMAC assist them in developing the loan agreement language and with the transfer operations. The Smithsonian originally planned to receive the skeleton in October 2013. However, a congressional budget impasse led to the 16-day shutdown of all non-essential federal government operations, several of which would play a role in the skeleton’s transfer. By the time the impasse ended, the window to move the fossil was no longer open due to severe winter weather conditions, and the transfer was put on hold until the spring.

According to Trimble, packing and moving such a fragile exhibit safely is not an easy task. The T. rex components must be carefully packed and crated to ensure no damage occurs during transportation. “In addition, we do an exit inventory with specialists from the Smithsonian and MOR, carefully packing all the pieces to control how they are shipped,” Trimble said. “The team has to look at each piece, take photos, evaluate the condition and fill out all the appropriate forms before it can leave the facility. Then, we have to do an entrance inventory of all the same materials once it arrives onsite before it can be put on display.”

On April 15, 2014, 16 carefully packed shipping containers in a special FedEx truck finally arrived in Washington, D.C., where each bone then had to be carefully unpacked and another inventory and condition assessment conducted. Trimble said that two USACE team members and 4–8 Smithsonian and MOR employees unpacked the T. rex over a four day period.

“We’ve been planning this transfer with the Smithsonian and MOR staff for more than a year, and the transfer was seamless,” a relieved Trimble said. And if the opening ceremony was any indication, all of MCX-CMAC’s, MOR’s, and the Smithsonian’s hard work was worth it. “The excitement was unbelievable, and the support was overwhelming,” he said. “People are just crazy about dinosaurs.”

Paleontologists from the Museum of the Rockies in Bozeman, Mont. remove the plaster case from the upper jawbone of the Wankel T.rex as part of the inventory and condition reporting process before the collection is shipped to the Smithsonian's National Museum of Natural History in Washington, D.C.



Veteran Curation Program Provides Training for Disabled Vets

In 2009, MCX-CMAC established the Veterans Curation Program (VCP), a group that provides vocational training and temporary employment to disabled veterans, while simultaneously providing USACE with a viable means of rehabilitating and preserving its archaeological collections to meet federal standards. With labs in Augusta, Ga., St. Louis, Mo., and Alexandria, Va., VCP offers services in database management, report writing, digital assets management, digitizing records, records management, photography and scanning, objects inventory and tracking, and objects and records processing.

Sonny Trimble, Director of MCX-CMAC, helped put the program together after he came back from Iraq in 2009. He wanted to give back to the vets that had helped him while he was working overseas investigating mass graves in Iraq.

“The VCP is building on skills that veterans acquire during military service, skills that include leadership, teamwork and attention to detail,” Trimble said. “We provide training to help these vets get back into a civilian environment after they’ve been soldiers for so many years.”

Since the inception of the program, 124 veterans have been trained and employed by the VCP. Trimble said a lot of the alumni come back and visit with the team to see how the new groups are coming along. “That’s a test of how well we are doing with the program,” he said. Trimble said he and his team find working with the people in the VCP even more gratifying than working with the artifacts at MCX-CMAC. “After all, artifacts don’t talk to you,” he said.

He noted, however, that he would like to get more support for the program. He expressed his hope that publicity for events like the T. rex transfer to the Smithsonian would shed light on programs like the USACE’s VCP and show that the public supports the program and wants to see it succeed.

In a quote on the VCP’s official website, **veterancurationprogram.org**, Major General John Peabody, former Commander, Mississippi Valley Division of USACE, summed up the intent of the program. “I am extremely proud of this program because it helps our veterans, while also preserving our Nation’s past. The effort is so inspirational because it repays a debt we owe to these brave men for their service and sacrifices, while also preparing them for post-service civilian employment and productive lives.”



The Rise of the TRUMPETER SWAN

Move over, bald eagle. Another rare, iconic beauty, the regal trumpeter swan, has become the sight to see -- and hear -- along the Mississippi River during the winter. During peak season, the largest North American waterfowl appeared in record numbers at the Riverlands Migratory Bird Sanctuary, an ideal habitat due to their wetlands and nearby agriculture fields for feeding. "Between January and February, we had 17,000 people come into the Audubon Center and well over half of them came in just for the swans," says Lane Richter, senior ecologist at the Audubon Center at Riverlands, which was named a Globally Significant Important Bird Area due to the large amount of overwintering swans. "They're a gorgeous bird and it's just awesome to see [visitors'] faces when they see the bird flying over and honking," says Richter, who lists their easy-to-spot features like pure-white plumage, contrasting black bill, legs and feet, and "rich, trumpeting sounds," which earned them their species name. He also asserts that visitors connect with the birds because of their relatable social behavior, including tight family bonds that encourage them to fly in smaller family groups and their practice of mating for life and raising their young together. For prime bird-watching, the ecologist suggests visiting from November-February before their migration to Wisconsin for breeding purposes. Also, he recommends staying alert right before the sun rises and sets so you can observe their majestic flights, made all the more awe-inspiring due to their average size of 25 pounds. "It's a lot of weight to get off the ground, so when they're taking off, you can actually hear them smacking against the water as they're using their feet to run, and their wings are hitting against the water as well, so it makes a really nice percussive sound. And then when they're landing, because there's so much weight behind them, you'll hear these big splashes, and swans come in and ski across the water." He adds, "They look like miniature airplanes coming in, and you'll hear them calling as they're flying overhead. It's a real joy to be able to see them fly into the sanctuary and to hear them. They certainly enhance the experience of being outdoors. They're beautiful to watch for sure."

Charlie Deutsch, a wildlife biologist at the U. S. Army Corps of Engineers, explains that their mythological background only contributes to their popularity with adults and children alike. "There's the whole thing kids hear about the ugly duckling turning into the beautiful swan," he points out. Indeed, their "great success story" from near extinction to last being counted at 46,000 in North America and over 10,000 along the Mississippi Flyway, has all the makings of a fairytale. In fact, it was the fowl's legendary beauty that nearly caused its demise centuries ago after hunters overexploited their snow-white skin and plumage for powder puffs, hat adornments and even pens. By the early 1900s, the number had dwindled down to a meager population of 69 in the lower 48 states, also caused by the trend of turning wetlands into agricultural fields starting in the 1700s.

TRUMPETER SWAN FACTS

- Largest waterfowl species native to North America.
- Most trumpeters weigh 21-30 pounds, although large males may exceed 35 pounds.
- Wingspan of 6-8 feet and height of about 4 feet.
- Adult birds are primarily white with contrasting black bill, legs and feet.
- The male is called a cob; the female is called a pen. Young swans are known as cygnets and can be harder to spot due to their sooty grey plumage.
- At 15 weeks, cygnets already weigh about 20 pounds.
- Adult swans eat aquatic vegetation, including leaves, seeds and roots - tubers of duck potato and sago pondweed are important food. Wild swans have also adapted to field feeding, eating grains and veggies that have been harvested. Newly hatched cygnets feed mainly on aquatic insects and crustaceans. At about 5 weeks of age, their diet changes to include more vegetation. By the age of 2 to 3 months, the cygnets' diet is basically the same as that of the adults.
- Their long necks allow them to uproot plants in 4 feet of water.
- They typically mate for life.
- Trumpeters can fly at 40-80 miles an hour, making collisions with power lines a mortal risk. Other major causes of death: lead poisoning caused by lead shots or fishing weights left by irresponsible hunters and fishers; getting mistaken for significantly smaller snow geese who are allowed to be hunted, unlike the swans.
- The three major US populations: Rocky Mountain, Pacific Coast and The Interior, which includes Central, Mississippi and Atlantic Flyways.
- A group of swans can be referred to as a bevy or game; in flight, wedge is the preferred term. Also, paired or breeding trumpeters can be extremely territorial, usually around 3-4 years when bonds are established.

Enter the Trumpeter Swan Society, formed in the 1960s, who swooped in to save the extraordinary birds by uniting with biologists and natural resource managers to raise trumpeters using eggs from Alaskan swans, the largest remaining population. Young birds were released in Midwest states, including Minnesota and Wisconsin, and finally found their way to the Riverlands in the winter of 1991. "I've been here for 23 years, so I was actually fortunate to be one of the few folks to see the first group come here and see the population grow fairly slowly," Deutsch relays. "They showed up with these neck collars on so they could be identified and biologists could get a better idea of where they're going during the winter. We started calling about the band numbers and figured out that they were birds that were released in Wisconsin through a partnership with the Trumpeter Swan Society," he says, adding that he has watched the population double in size from 500 to over 1,000 in just a year. The biologist continues, "The swans are large, they're iconic and they were once here in the Flyway, and then they were extirpated and now they have made a great recovery, so the swans are a good ambassador species for people to think about why conservation is important."

MY MISSISSIPPI

Nancy Purington; artist, naturalist, free-lance photographer

I grew up in Iowa where the Mississippi River meets the Wapsipinicon. During my young life, I wanted to explore the local wetlands in search of the beauty I felt must be there. What little I could see did not meet my expectations. A darkness seemed to dominate the Wapsi-bottoms in the 1950s. It was a place for hunters. Gunshots warned young seekers of beauty to stay away. My artist's eye turned upward to the mysteries of the sky and its reflections on an inky surface reaching faraway. Flotsam and jetsam held fascination. Floating chunks of unidentified shapes, appearing then disappearing, channeled my attention to the nature of change amidst arrays of geometric patterns. At Davenport, the metropolis of our culture, the river was bound by concrete and iron. One could not ignore the struggle between industry and the river's untamed nature, which shaped my compositions in mid-20th century modernism.

Last fall while traveling up the river to exhibit artwork at the Minnesota Marine Art Museum, my eyes opened to hundreds of acres of living wetlands and marshes revealing the beauties I longed for. Thanks to the Upper Mississippi River Restoration Program efforts outlined in the Special Edition of Our Mississippi Winter 2014, we can once again experience natural events that fill our hearts and minds with wonder and awe. Inviting roads are paved to journey into the riverlands. Educational avenues opened. I am happy to be alive to witness this transformation. Thank you to everyone who helped turn back the clock to a time of beauty and health in our great river life.

Curving lines, new colors and imagery are infusing my studio work with greater energy and new forms. It is not easy to change, but I am committed to trying as these restorative efforts deserve to be celebrated forever.

Works from **Seasons of the River: Meditations on the Upper Mississippi** will be on view in a group exhibition called "ABOUT THE RIVER" at the McGregor-Marquette Art Center, McGregor, Iowa, May 16 through June 23, 2014.

www.mmcenterforth-arts.weebly.com



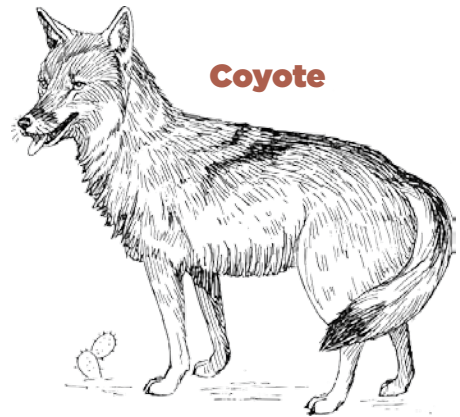
Nancy Purington Artwork

- 1. MEDITATION ON ICE AND SNOW**
9" x 7 1/2", palladium leaf and watercolor on paper.
- 2. PRELUDE TO SPRING**
5 3/4" x 7 1/2", gold and palladium leaf w/ watercolor on paper
- 3. POOL 8, AUTUMN SUNSET II**
6" X 4", watercolor on paper
- 4. WATER LILIES III**
10" X 10", oil on gold leaf
- 5. Detail from WATER LILIES I**
oil on gold leaf



Animal Tracks

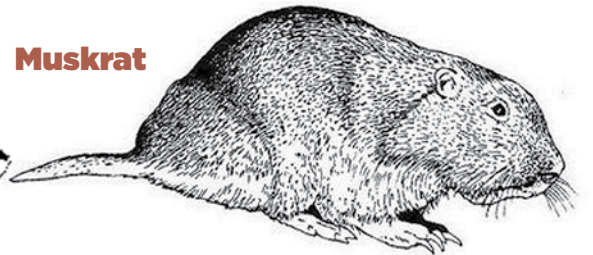
Can you guess which animal left tracks? Draw a line from the animal to its tracks.



Coyote



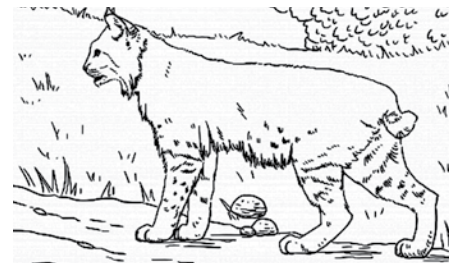
Deer



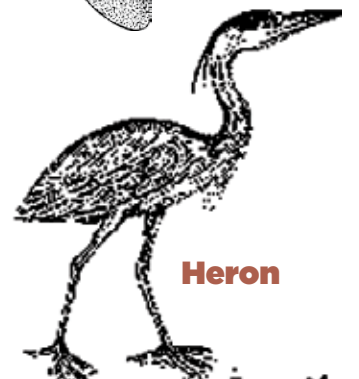
Muskrat



Beaver



Bobcat



Heron

There are many different scientists that study animals, and there are separate zoologists to cover different types of animals and their lives. Match the name of the animal experts to what they study:

- | | |
|--------------------|---|
| 1. ICHTHYOLOGIST | A. Study how animals function and adapt to their environments |
| 2. ORNITHOLOGIST | B. Discover and describe new species or animal |
| 3. ENTOMOLOGIST | C. Study animal behavior |
| 4. HERPETOLOGIST | D. Study the spread of diseases |
| 5. MAMMALOGIST | E. Study fish populations and ways of growing fish for commercial use |
| 6. PALEONTOLOGIST | F. Study fish |
| 7. ETHOLOGIST | G. Study insects |
| 8. PARASITOLOGIST | H. Study parasite groups |
| 9. AQUACULTURIST | I. Study mammals |
| 10. TAXONOMIST | J. Study birds |
| 11. PHYSIOLOGIST | K. Study relationships between fossil animals |
| 12. EPIDEMIOLOGIST | L. Study amphibians and reptiles |

Your River, Your Lifeline - Get Connected

The Middle Mississippi River Regional Corridor (MMRRC) includes about 195 miles of river and 673 thousand acres of floodplains. Historically, the river and plains supported abundant vegetation, fish and wildlife. After Europeans settled the area in the 1800s, the MMRRC became a major transportation passage and slowly began to deteriorate. Major changes have occurred over the years resulting from urban developments, construction of levees, roads, ditches and rail lines. These changes have affected the state of the water, the quality of the environment and the surrounding ecosystems.

In the early 2000s, Ducks Unlimited, the Illinois Clean Energy Community Foundation, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Missouri Dept. of Conservation, the Illinois Dept. of Natural Resources and other state and federal agencies recognized that MMRRC's eco-conditions were suffering. Each of these entities was working on their own projects in their respective specialties to do their part. While they were all doing different work, they were all working towards a similar goal: to restore the conditions of the Mississippi River and floodplains.

"We decided to get together and review the work that each of us was doing," said Steve Widowski, former partnership chairman and the partnership's part-time coordinator. "A representative from each organization and agency presented their area of focus, past projects and projects they were hoping to fund. It became very clear that there was a lot of overlap in the work we were doing and we could get more done if we pooled our resources."

The Corps of Engineers was focusing on ecosystem restoration and sediment management and the U.S. Fish and Wildlife Service was working to restore the area's habitats. The USDA Forest Service, Ducks Unlimited and others were all looking to acquire land in the floodplains. While some of the agencies had already been making a huge impact on their own, Ducks Unlimited had already been awarded \$260,000 for the purchase and protection of 440 acres of forest and wetland in the Middle Mississippi River Valley. The group knew that if they worked together, they could receive even more grants, perform scientific studies, acquire more land and make targeted impacts.

"It's easier to restore a river and its floodplain when you have folks on both sides of the river and floodplains working together," explained Widowski.

When the group signed a federal Memorandum of Understanding (MOU) in 2005, they defined themselves as The Middle Mississippi River Partnership, a collaboration of 21 state agencies, federal agencies and non-profit organizations. The partnership's vision was to restore many of the natural conditions of the Middle Mississippi River Corridor (the 195 miles from St. Louis, Mo., to Cairo, Ill.) by developing a diverse network of sustainable, natural resources to support wildlife and provide conservation benefits. Each of the 21 different partners contributes to the greater good of the partnership by fulfilling their respective roles through economic development, land conservation, education and outreach.

"We became a group of individuals and agencies committed to working together to advance and improve recreation, education, economic, and environmental opportunities in the middle Mississippi region," said Brian Johnson, U.S. Army Corps of Engineers and past partnership chairman. "We knew that while we all had slightly different missions and goals, we would accomplish more together. We wanted to do something special."

Also in 2005, The U.S. Army Corps of Engineers received an influx of funding for watershed planning in Arizona, Delaware, the Great Lakes and Mississippi River. It was an opportunity for the Corps to use their funding in the region towards their work with the Middle Mississippi Partnership and the St. Louis District of the U.S. Army Corps of Engineers. They knew the MMRRC needed water restoration, but they weren't sure where and how. The Corps of Engineers engaged representatives from other agencies and non-profits in the partnership to perform an extensive scientific study to learn more about the conditions of the river and surrounding plains.

The Middle Mississippi Partnership and the St. Louis District of the U.S. Army Corps of Engineers used hydrogeomorphic modeling (HGM) to analyze the conditions in the MMRRC. The HGM-based assessment determined the MMRRC's pre-European settlement ecosystem conditions baseline data for the ecological



systems in the MMRRC. This baseline data showed major differences between the pre-European settlement and the current conditions of the MMRRC.

"The river and its floodplain have been altered so significantly it was hard to picture what it looked like historically. HGM was able to help us understand that historic condition and begin to identify places where restoration to those conditions was still possible," said Johnson.

After the MMRRC's previous and current state was determined, the team was able to identify the extent and types of specific alterations in hydrology, vegetation community structure/distribution and resource availability to fish and wildlife species that happened over time. Despite the many alterations to the MMRRC ecosystem, the Middle Mississippi Partnership and the St. Louis District of the U.S. Army Corps of Engineers were able to identify numerous opportunities to restore parts of the region.

The Corps used the same HGM finding to identify different eco-communities that may have been lost from the MMRRC and the specific locations where each of these communities "belong." They began to understand the constraints to restoring specific eco-sites and best opportunities to do so. The partnership then developed the right ecological processes needed to restore and sustain those eco-communities and specific habitats within them.

"This information was vital for each agency in the partnership to do the right things in the right place at the right time," said Johnson. "We were ready to use these findings to improve new and ongoing restoration projects."

The Middle Mississippi National Wildlife Refuge was a large project that greatly benefited from the MMRRC's findings. The refuge includes about 4,000 acres islands in the middle of the river that are managed by the U.S. Fish & Wildlife Service. Agencies were slowly improving the area, but weren't sure where to focus the bulk of their attention. The HGM study provided findings that showed that the floodplain was likely to redevelop on its own, but the areas on Rockwood Island needed forestation. Instead of building unnecessary structures along the water, the partnership focused all their resources on tree planting.

The East Cape area also benefited from the study's findings. Historically, the Cape was a floodplain. It wasn't until later generations repurposed the area into farmland that its ecosystems began to suffer. The partnership used the HGM study to distinguish the Cape's farmland from its historic floodplains. The partnership was able to block side drainage ditches while preserving the major drains for the farmland and, as a result, they restored some of the historic water table. They restored some of the wetlands and recreated some of the historical ridge and swale topography and associated ephemeral wetlands, which change seasonally. Almost immediately, the Cape saw a return of plants and animals that once occupied the region.

"You would never know that some of these areas were farmland. It's amazing how quickly the native animals and plants have reestablished," said Widowski. "I could take you places where cypress trees grow in the swales and you'll find green tree frogs and cottonmouth water moccasins. These places were farmland just eight years ago."

The Middle Mississippi River Partnership continues to work for the greater good of the Middle Mississippi River Region. The 21 different state agencies, federal agencies and non-profit organizations involved in the partnership use the original HGM study and new, more recent findings to guide future restoration projects. As long as the partnership continues to work as a whole, they will find more opportunities for restoration and the means to do so.

For more information visit www.midmiss.org

Great Rivers Festival

The U.S. Army Corps. of Engineers, St. Louis, District's Rivers Project Office and the Meeting of the Rivers Foundation will host the inaugural Great Rivers Festival, May 17 at the National Great Rivers Museum in Alton, Ill., and the Riverlands Migratory Bird Sanctuary in West Alton, Mo.

Experience what working and living on the great rivers of America is like by touring a working towboat and barge; connect and celebrate the rich history of the environmental treasure known as the Mississippi River.

The Great Rivers Festival celebrates the confluence of the Mississippi, Missouri and Illinois Rivers. This one-day event provides activities for adults and children including tours of the Dredge Potter, music, tours, sand art sculpture, animal exhibits, community mural, paddling in the Sanctuary and more. On Sunday, May 18th, tours of the Dredge Potter will be offered from 11 am - 4 pm at the National Great Rivers Museum.



MAY 17, 2014
10 am - 5 pm

For more information, contact the National Great Rivers Museum at **(618) 462-6979** or go online to: www.mtrf.org



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