Our Mississippi

PARTNERING TO KEEP
AMERICA'S RIVER GREAT

WINTER '11

PHOTO: THOMAS PICKETT.

Navigating a River of Ice

"It's cold. There's a whole bunch of ice. There's a lot more trouble."

That's how one lock operator sums up river navigation come winter.

Thomas Pickett, assistant lockmaster at Mississippi River Lock & Dam 22, near Mark Twain's childhood home of Hannibal, calls it "an altogether different operation from summertime, that's for sure."

But trouble isn't the only word that applies as massive tows push through what often appears to be a solid wall of ice.

There's also a sense of wonder, in the grace of eagles scooping fish from the open water left in a boat's wake, of fox sneaking out to drink from the opened pool, in the power of boats to crumple ice.

Says Quent Harris, port captain with AEP River Operations and a long-time tow captain:

"I have stood on the stern of a boat as it's pushing through and seen no water whatsoever. There will be solid, crunched-up ice that looks like it came out of an ice machine. But the wheels are turning and the tow keeps shoving through. It's an experience like none other and I couldn't believe I was getting paid to do it."

Some of the Upper Mississippi River freezes solid come winter, stopping navigation all together. Locks are typically closed from Guttenburg (Lock and Dam 10) up through the river's northernmost lock in Minneapolis. Others, unless closed for maintenance, are open year-round.

That's good news to road crews and commuters in wintry Midwestern cities like Chicago, since road salt makes up the bulk of winter cargo heading up the Illinois River for companies AEP and Alter Barge Line Inc. of Bettendorf, Iowa. Fertilizer is also carried north in anticipation of spring, and corn and soybeans head south for export.

"When we can haul 80 semis full of salt on one barge, that's got to help a city," Harris said. "It keeps a lot of trucks off the road."

Continued on page 2 >>

Saving a threatened river basin—one crayon drawing at a time, PAGE 10

Our Mississippi is a quarterly newsletter of the U.S. Army Corps of Engineers about its work in the Upper 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.

Above: Ice at Lock and Dam 22. Right: Photographer Tom Boyd shot this dramatic photo while working as a deckhand on the Mississippi River.

"Navigating a River of Ice" continued from page 1…

But road salt isn't going to do much for a tow trying to navigate not on—but through—its own icy highway.

As a rule of thumb, said Larry Daily, president of Alter Barge Line Inc., companies like to get their last tow out of the Twin Cities area by around Thanksgiving. By mid-December that last tow should be below Burlington, Iowa, which is about halfway between St. Paul and St. Louis.

When ice does start forming, even on the always-open Illinois, the company might first reduce the size of tows, going from 15 barges being pushed to eight. One reason to reduce tow size, Daily said, is to simply fit inside of ice-laden locks. A lock might shrink from 110 to less than 105 feet across, too narrow for a typical tow that runs three barges wide. Instead, he said, tows will operate two barges across, at 70 feet, which gives everyone plenty of room to spare.

Passing through those icy locks can take as long as six hours on a particularly icy day, as compared to maybe 1½ hours on a typical summer day, says lock operator Pickett. Underwater compression systems or "bubblers" by lock gates helps push ice back enough to open lock gates, something lock personnel used to do by hand, with long pike poles. Sometimes, a tow can sneak around ice and into the lock. On bad days, though, the tow has to push ice into the lock. The ice then gets lowered in the chamber and flushed out the other side, as if it's a load of barges, while the tow waits its turn.

Companies also switch to ice couplings—that is, a different way of attaching barges to one another that allows them to re-attach even with ice buildup on the outside of the wet barges. Lock operators put out regular bulletins to describe ice conditions and requirements on couplings and tow size, often including "BE CAREFUL" in big letters.

While the initial freeze can make the river look daunting, Daily said, what's most worrisome is what happens slowly over time.

"Five to six inches thick is not enough ice by itself to stop a tow from going through," he said. "But when a tow goes through, the ice it breaks up then floats downstream until it catches in a river bend and refreezes. That happens over and over until we get what we call ice gorges. That ice can be 4-12 feet thick. Then you're talking about stuff that could sink the Titanic."

At that point, pilot skill becomes key.

"If you've got a big chunk of ice that's broken off and only 10 percent is above the water, the pilot doesn't know how wide or big it is," he said. "He's guessing. Ice doesn't show up on radar like bridges, banks and trees."

Cooperation is one key to successful navigation and safety, those on the river say, and a sense of camaraderie inevitably results.

Teams working atop barges are in constant communication, with rules requiring a buddy system and regular check-ins. Even competing companies work together when ice is bad, in something barge operators call mule training.

One tow moves out front as the ice breaker, and four to five others follow behind in the open water. Other boats in the area stay as close as possible to get through the open water before it re-freezes.

When Harris was chairman of the captains' committee of the Illinois River Carrier Association, his job was to facilitate communication among captains. They'd share the location of ice gorges or other winter trouble spots.

Paramount, as always, is safety, but winter is more challenging. Put on duty is the best equipment and the best pilots. Even so, when ice threatens equipment or crews, tows just stop. They might stay put for days, weeks or even the rest of the winter.

While it's cold up top, Harris says, "Inside is just like being in a house. . . except it's shaking and you can hear ice moving underneath your hull. Otherwise, it's like being at home with a family, working together, being safe."—K.S.

Regular bulletins from U.S. Army Corps of Engineers lockmasters provide updated condition reports, especially critical as river ice builds. Here's a sampling from a mid-December ice call on the Illinois River.

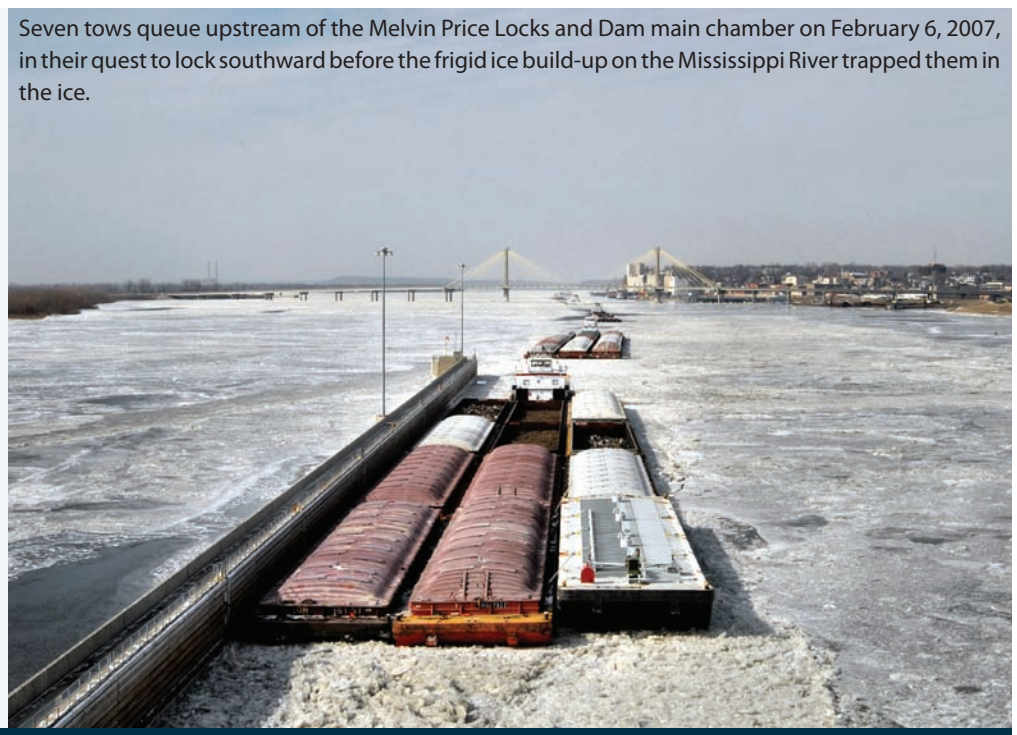
Dresden: 1 inch of ice in upper pool. Lower pool clear. Ice Couplings will be required at Dresden Island Lock.

Marseilles: The water temperature is 35 degrees at this time and dropping. Normal locking conditions. Walkways are slick, use caution…
A layer of ice now exists in entire canal surface. This layer can build rapidly to greater thicknesses. ICE COUPLINGS ARE REQUIRED. Call ahead for lock conditions. Tows may be required to double trip or use a helper boat to pull cuts.

Starved Rock: We have 1.5˝–2˝ ice above the lock. North & South Bound doubles may require a helper boat or double trip due to ice conditions. Call the lock prior to locking for updated conditions.

Peoria: We do have 100% ice coverage here above the lock and forecasted lows below zero in the coming days. ICE COUPLINGS REQUIRED! The lake is iced over and getting thicker 8 inches plus.

Seven tows queue upstream of the Melvin Price Locks and Dam main chamber on February 6, 2007, in their quest to lock southward before the frigid ice build-up on the Mississippi River trapped them in the ice.



Read the ice calls at: www2.mvr.usace.army.mil/nic2/default.cfm

ABOVE, RIGHT: TOM BOYD. OTHERS THIS PAGE: COURTESY, CORPS OF ENGINEERS' ST. LOUIS DISTRICT.
OPPOSITE: GEORGE STRINGHAM.

It's report card time for country's locks and dams

As college students around the Midwest await their final semester grades, so—in a sense—do the locks and dams on the Mississippi River and across the rest of the country.

No worries here about graduate school admission or Mom and Dad's reaction. But that doesn't mean there isn't a lot at stake, or that people in high places won't be taking a look.

Assessment teams have been using a standard process that results in letter grades ("A" meaning great shape, "F" suggesting past and/or imminent failure) for the condition of navigation locks, dams and other supporting infrastructure at those project sites.

A follow-up determination of risk and related economic consequences will be added this spring. That final determination will be one of several new factors the Corps will use in its fiscal year 2013 President's budget to determine where to place limited funds for maintenance and repair of the nation's river-related infrastructure.

It's all part of a major federal government effort to move away from a "fix it when it's broken" mentality and toward a risk-informed approach to managing properties, says Dr. Elliot Ng, Chief of Asset Management for Headquarters of the U.S. Army Corps of Engineers.

The goal of asset management is both to reduce the probability of lock failure and related economic impacts and to add consistency and transparency to the decision-making process. That's done by ensuring every Corps district across the nation is using comparable rating systems.

"It takes the subjectivity out of decision-making a little more," Ng said. "We probably won't eliminate all bias and politics in the decision-making process, but we'll be able to say that from a rational, business and engineering point of view, this is where we should invest the limited dollars."

Nationwide, the Corps manages $232 billion in water resource infrastructure. Of all those assets, 84 percent relate to navigation, hydropower, flood control and recreation.

The Corps is one of several federal agencies moving to an asset management approach to its publicly-owned properties. As part of the process, an agency takes stock of what it owns, determines the condition of each asset, then evaluates how the asset relates back to agency's various missions. The Corps has taken the process a step further by attaching a qualification of risk to the condition or looking at the ultimate economic, safety, environmental and legal consequences if something were to fail.

The Corps also faces a more difficult task because of the wide range and uses of its properties, which might include a boat launch, a fish ladder, a laboratory or a lock as long as four football fields. In addition, one asset might have multiple functions—for example, a dam used for flood control, navigation and recreation.

Says Ng: "A lot of our infrastructure also falls within a watershed system. There's a lot of interaction between assets because what happens upstream affects what's downstream and vice versa."

Though ratings are mostly in, the potential risk of failure and subsequent economic consequence will be the more important indicator, Ng said. If one lock has a high probability of failure but also has a back-up chamber, for example, it might be assigned a lower priority than one that would totally shut down commercial navigation if something went wrong.

"Everything's aging to the point that the probability of failure is higher," he said. "There's more demand on our infrastructure, but not enough money is available to put into preventive maintenance."

Rick Granados, Regional Asset Manager for the Corps' Mississippi Valley Division, would agree. He's overseeing the "grading" of locks and dams at 62 navigation sites all along the Mississippi River and Illinois Waterway. Cross-district teams have evaluated components like miter and dam gates, anything electrical, structural, mechanical or operational—and he doesn't expect to see many "A's."

Most of the locks are more than 50 years old, well beyond their projected design life. Within the next decade, some 77 percent of locks managed by the Corps of Engineers will exceed their service life. A "B" is the best possible grade if a given asset shows even normal signs of wear. An "F" means there's been failure or that the equipment has a critical design flaw, and also that it's likely to fail again soon.

"Your major waterways like the Ohio and Mississippi Rivers and their watersheds are where many of the older structures are going to be," he said.

He's confident, though, that the process will lead to sound decision-making that doesn't give an edge to one waterway over another and makes it easier for decision-makers to compare needs across the nation.—K.S.

Above: This 100-foot-long steel gate at Lock and Dam 25 near Winfield, Missouri, fell earlier this year when a chain mechanism used to raise and lower the gate broke—the kind of emergency an asset management system seeks to avoid. The roller gate sits in the middle of the dam controlling the water depth in the pool above the lock. The aging chains, now fully repaired, were scheduled for replacement this summer using American Recovery and Reinvestment Act funding that's still being used for other major maintenance efforts.

DID YOU KNOW?

Cold water removes heat from the body 25 times faster than cold air, with about 50 percent of heat loss occurring through the head. Physical activity like swimming, or just struggling, increases heat loss, reducing survival time to minutes.

Return OF THE River Otter

Head out for a snowy hike along the river this year, and you may well be greeted by a message from a particular river mammal—Morse code–style.

Those dot-dot-looooooong-dash patterns in the fresh snow were likely made by river otters making a couple of bounding leaps, then taking playful slides. Their marks are so distinctive, in fact, that the "code" is what researchers looking to count the critters look for from helicopters above.

And the message being left in snow banks couldn't be clearer: The otter's back along the Upper Mississippi, in ever growing numbers.

River otters were nearly wiped out in many Midwestern states. Some 18 states in the United States have reintroduced river otters in the last 20 years. This effort and others led to the otter being removed from the endangered species list in states like Illinois, and many states now allow regulated trapping, says John Olson, furbearer specialist with the Bureau of Wildlife at the Wisconsin Department of Natural Resources.

In Wisconsin, where a native population has always remained, otter numbers are at about 11,000. In Iowa, where they've been re-introduced, there are between 6,000 and 8,000, with numbers growing at about 7 percent a year. Even in Missouri, the otter population stands at about 15,000, especially remarkable given how low it once shrunk.

There were only 70 otters in all of Missouri in 1982, when the state introduced 845 animals on 43 streams in 35 counties, said Jeff Berenger, furbearer biologist for the Missouri Department of Conservation.

The creature ranges from about 2 feet to 3.5 feet long—that includes its long tail—and weighs 11 to 30 pounds.

No one knows for sure why the otter is doing so well.

Berenger points to both suitable habitat and good wildlife management practices that closely track the harvest and regulate trapping in a way that is "friendly to the habitat and the people" including fishermen who occasionally complain about otter competition for fish.

Others believe the otter is the river's proverbial canary in the coal mine, an indicator of success in ecosystem restoration and pollution clean-up efforts, particularly in metropolitan areas like Minneapolis and St. Paul, where otters now play.

Efforts through the Corps' Environmental Management Program to improve water quality and create better habitat for fish has had fringe benefits for other species, says Marvin Hubbell, regional director of the multi-state and multi-agency collaborative partnership that focuses both on ecosystem monitoring and restoration.

"Every biologist recognizes there's no artificial boundary in ecosystem restoration," Hubbell said. "If there's a steadier stock of fish on the river, we're really helping to provide the base of the food chain. This is an example. What we're doing is providing healthy habitat, and otter are responding."

Whatever the reason for the comeback, the playful creatures know how to draw a crowd.

One Sunday this fall, for example, a local newspaper wrote about a family of river otters living in Nahant Marsh near Davenport, Iowa.

"When I got to work, there were a half dozen people standing around, wanting to see the otters," said Brian Ritter, marsh facilitator. "Of course, it's not a zoo. We don't have otter shows at 10 and 2. Like any wildlife sighting, it's all about timing and patience."

Thursdays are an especially good bet, he said. He's seen them in the same area each Thursday afternoon, swimming in the distance like playful dolphins.

High Mississippi River water levels likely helped the Nahant otter family, two adults and two young ones, find their new home. They likely enjoy it for the calm pools formed by beaver dams and the abundance of fish, Ritter said. As otter habitat grows, so does their range.

An unusual research project tracking otter populations through the DNA found in their scat has shown that Missouri otters easily travel more than 15 miles a day, Berenger said.

They're even being seen in metropolitan areas previously thought too polluted to sustain an otter population. A survey of eight sites around Minneapolis and St. Paul, conducted by the National Park Service, revealed signs of otters in half, said Allison Holdhusen, the biological science technician conducting the research. The survey will continue through this winter season.

The biggest surprise, she said, is how adaptable the creature can be, even if they are notoriously shy of humans. It was particularly surprising to find one near a train track.

"It's exciting to have them out there, and unexpected because they've been nearly extinct for so long," she said. "You think of them in the ocean maybe, but not in Minnesota."—K.S.

TOP: DANNY BROWN. TRACKS: HANNAH HUDSON, STONEHOUSE PHOTO. OTTER IN ICE: TOM TIETZ.

MY MISSISSIPPI

Scott Mehus, education director, National Eagle Center, and Harriet, ambassador

"In 1981, a biologist with the Wisconsin DNR crawled into a nest in the Upper Peninsula of Michigan and attached an aluminum band to two baby eaglets in a nest. The leg band on one of them was there 17 years until 1998 when she was unfortunately hit by a car while feeding on the side of a road. Local law enforcement was called, and she ended up here at the National Eagle Center.

"My first encounter with Harriet was when I arrived in November 2006. To work with massive bird like this was intimidating at first, but Harriet was like an old pro. I walked up to her, stuck a glove out and asked her to step up, and she did. She has a great, as I say, "bird-a-nality" when compared to other birds. She's is definitely the comforting senior statesman you go to first, even though Angel (another center bird) is the rookie who thinks she's boss.

"No matter who you talk to, there's a connection to the eagle, whether it's a Native American or a veteran. She's on the Minnesota Support our Troops plate because of her work at VA hospitals. She's been on the Today Show a couple of times, Jay Leno, and before that, the Colbert Report.

"The general public wants to see that symbol of freedom. You can take an owl out, and some people are interested, but an eagle? It's 'Oh, wow!' That gives you the opportunity to talk about a couple of different things, and as a naturalist, I like to talk about how we almost lost the eagle. On a 260-mile stretch of the river from Wabasha to Rock island, we had one nesting pair left. Now we have over 260 on that stretch. I like talking about how we brought the eagle back but that there are a lot of other creatures out there that still need our attention and respect , even if they may not be as cute as the eagle."

Repairs, habitat restoration all part of Lake Red Rock drawdown

The water levels of Lake Red Rock, Iowa's largest lake and both a popular Corps of Engineers recreation area and flood-control structure, have been dropped 10 feet so that contractors can replace gate cables on the Lake Red Rock dam.

These Tainter gates are part of the dam's controlled spillway, raised and lowered by cables during high pool levels to let out excess water. During the flood of 1993, several of the cables snapped and, following their replacement, were placed on a 15-year replacement schedule.

The process to replace the cables began in 2004 with an environmental assessment evaluating the impacts associated with the proposed drawdown. The Corps analysis found the drawdown to have no significant impacts and proceeded with the drawdown; Mother Nature, however, had a different idea.

Higher than normal amounts of precipitation delayed the project for nearly three years with 2010 finally cooperating. Cooperation also is occurring among several agencies, who are using the drawdown as an opportunity to complete other construction and environmental improvement projects.

The Iowa Department of Natural Resources, for example, has created two rip rap fish "reefs," to improve fish habitat near Marina Cove and Whitebreast Point. The Corps also dredged and stabilized the shoreline around the Marina Cove during the drawdown.

The normal pool is 742 feet above sea level. The Corps lowered it to 732 feet in October for contract cable replacement. The drawdown uncovered beds of sediment now visible on the upper end of the lake, leading to meetings held to discuss the lake's sediment build-up and possible solutions.

Lake levels will be returned to normal on Feb. 12. The lake remains open to the public, though the drawdown forced early closure of all boat ramps.—H.M.

What's your Mississippi?

Email responses to: editor@ourmississippi.org

ON THIN ICE?

As fisherman take to the ice and others head to the frozen Mississippi and its tributaries to spot eagles or take a brisk hike, it's important to keep in mind the dangers that exist as lakes and rivers freeze across the Upper Midwest.

Most important: Remember that no ice is ever completely safe, according to the St. Paul District of the U.S. Army Corps of Engineers. Rivers, lakes and ponds are dynamic places upon which water currents, springs, water control structures, snow cover, even vegetation like cattails affects the thickness of ice and how it forms.
As a general rule: 4 inches of ice can hold a person standing alone, 5 inches can hold a snowmobile, 10-12 inches can hold a small car and 12-18 inches can hold a light truck.

Learn more: watersafetycongress.org/resources.shtml

Before you go: Talk to someone familiar with conditions, let someone know where you are going, when, and when you will return, and take along an ice pick or nails to help you get back onto the ice in case you fall in.
If you do fall in:

- Hold onto something
- Pull out onto something
- Keep your back to the waves and face out of the water
- Stay still; don't swim. Physical activity, or struggling, increases heat loss, dropping survival time to minutes
- If wearing a life jacket, fold arms, cross legs and use the buoyancy to float quietly until help arrives.
- Don't discard clothing (and ideally, be wearing a dry or wetsuit). Any clothing, including shoes and hat, may provide some warmth and help you fight hypothermia.

FROM THE PROGRAM MANAGER

Chief, Emergency Operations

Mark Koenig supervises the management, planning and coordination of Corps response to natural emergencies and catastrophic response activities – mostly flooding -- in the St. Paul District. That District is the northernmost one in the Mississippi Valley, comprising about half of North Dakota, all of Minnesota, half of Wisconsin, part of Iowa and a bit of South Dakota. He oversees flood response in eight major drainage basins.


Mark E. Koenig

How do you know when to help?

We only go in after a community asks its state for help, and the state decides it needs our assistance. If we're asked to help build some earthen levees, for example, we would contract that work out of this office. Sometimes, though, communities just have technical questions about protecting themselves.

Our District is also one of six that provides help with temporary housing for catastrophic disasters anywhere in the country. We've provided response to hurricanes in the Gulf, wildfires in California, tornados – anything that FEMA responds to with a housing mission. It's their mission, and they provide the money, but they tag us to execute it.

Three people work with me in the Emergency Management office, but when emergencies occur, others in the District who do not work for me become part of the response organization – anywhere from a handful of people to more than 100.

When can you predict how bad flooding might be each spring?

The first forecasts are typically made in late January. A team in our water control section works with the National Weather Service to monitor conditions. But earlier, as winter approaches, they look at what conditions are like at freeze-up in the fall. If there's a lot of rain in the fall and the soil is saturated, and you get extremely cold temperatures right away before it snows, the frost will be deeper and there will be no capacity for the soil to absorb moisture. All of it will run off.

As 2010 ends, I'm told that in the headwaters of the Mississippi it's wetter than normal for this time of the year, and discharges from the reservoirs are higher. But that doesn't mean that can't stabilize by mid-March, when we typically see the heavy melt.

Our big area is the Red River of the North basin, the worst one, where we have flooding most often. But they had a very dry November, and hopefully were able to dissipate a lot of the moisture they got before that.

What affect will global warming, or climate change, have on your work?

I stay away from that issue. If you look at weather patterns long term, over hundreds of years, it's cyclical anyway.

What misunderstandings might people have about the work you do?

No levee ever built is 100 percent flood-proof. Or, we could go in every year and build emergency levees that never get tested, but then have to be taken down. It's for each community to evaluate where the risk threshold should be, so time and effort isn't wasted. There's nothing exact about this whole effort. The National Weather Service has very good models, but there are also unknowns. It's not negligence or anyone's fault. It's Mother Nature.

What's new and promising in flood control?

Hesco barriers, which we call Hesco baskets, are a rapidly deployable product, faster than volunteers filling sandbags. Each one is 3- or 4-feet high, and three feet wide, with a synthetic liner, light enough so one person can lift it off a truck. A front-end loader can dump a lot of sand or rock to fill it very quickly.

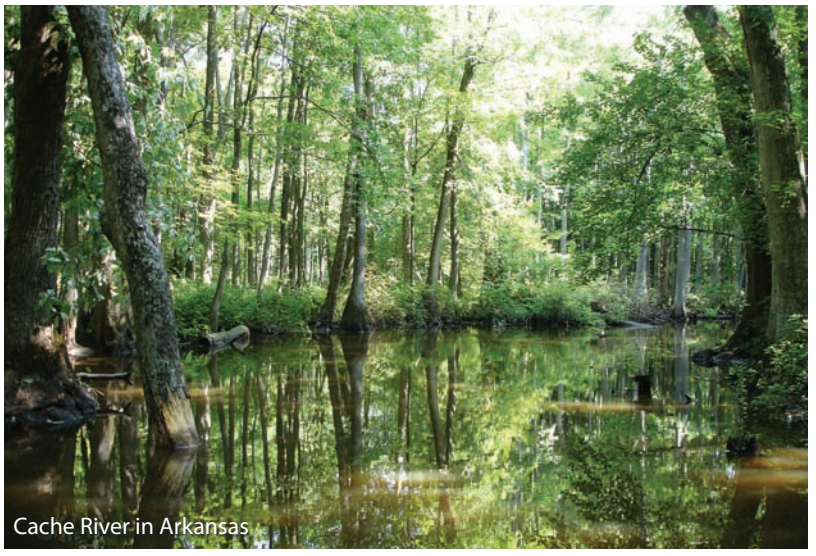
Other companies are selling reusable, portable flood walls you can put up and then take down for the next time.

What is your biggest ongoing challenge?

It's a unique, 15-year, ongoing flood. Devil's Lake in North Dakota is a large lake with no natural outlet. Over the past 15 to 20 years, it has risen 30 feet or better. We're now building levees that are acting as dams, because the water will stay on those embankments for years. It's a very large lake that has quadrupled in size. This has become a regional, state and even international concern because, if it were to rise another six feet, it could spill into the Sheyenne River basin, then into the Red River of the North and find its way to Canada. Its high sulfate content could affect drinking water and the river ecosystem..

How about day-to-day issues?

It's never the same from one event to the next. That itself is half the challenge.


Cache River in Arkansas

Teaming up for river restoration

Partnerships being forged to better coordinate ecosystem restoration work on the Mississippi River system took another step forward in early December.

At a meeting in Memphis, representatives of all six Corps districts met with representatives of several non-governmental organizations that have formal partnerships with the U.S. Army Corps of Engineers. Those included Ducks Unlimited, Inc., The Nature Conservancy, the National Audubon Society, the University of Minnesota, the Sand County Foundation, the Upper Mississippi River Basin Association, the National Great Rivers Research and Education Center, the Lower Mississippi River Conservation Committee and Delta F.A.R.M.

The meeting represented the first time the Corps has brought all the Districts in the Division together to meet with a majority of non-governmental partners, according to Dr. David Vigh, the Corps' senior regional biologist.

"We're here to try and improve regional communications and develop some out-of-the-box projects and programs to leverage resources and improve partnering results," Vigh told the group. "We also want to put names and faces together, and find ways to work together as one team."

Memphis District Commander Col. Vernie Reichling kicked off the meeting by highlighting cooperative efforts now underway between the Memphis District and The Nature Conservancy. This partnership is beginning to work on a proposed ecosystem restoration project on Arkansas' lower Cache River, pictured.

The meeting is another step toward meeting the challenges of a 200-year vision of "bringing people to the river and supporting a sustainable watershed," a project being championed by Maj. Gen. Michael Walsh. It also reflects the Corps' new way of doing business, Col. Reichling said.

"We've already done some great work together," he said, "and there's more great work ahead here in the Mississippi River watershed."—J.P.

OUR MISSISSIPPI KIDS

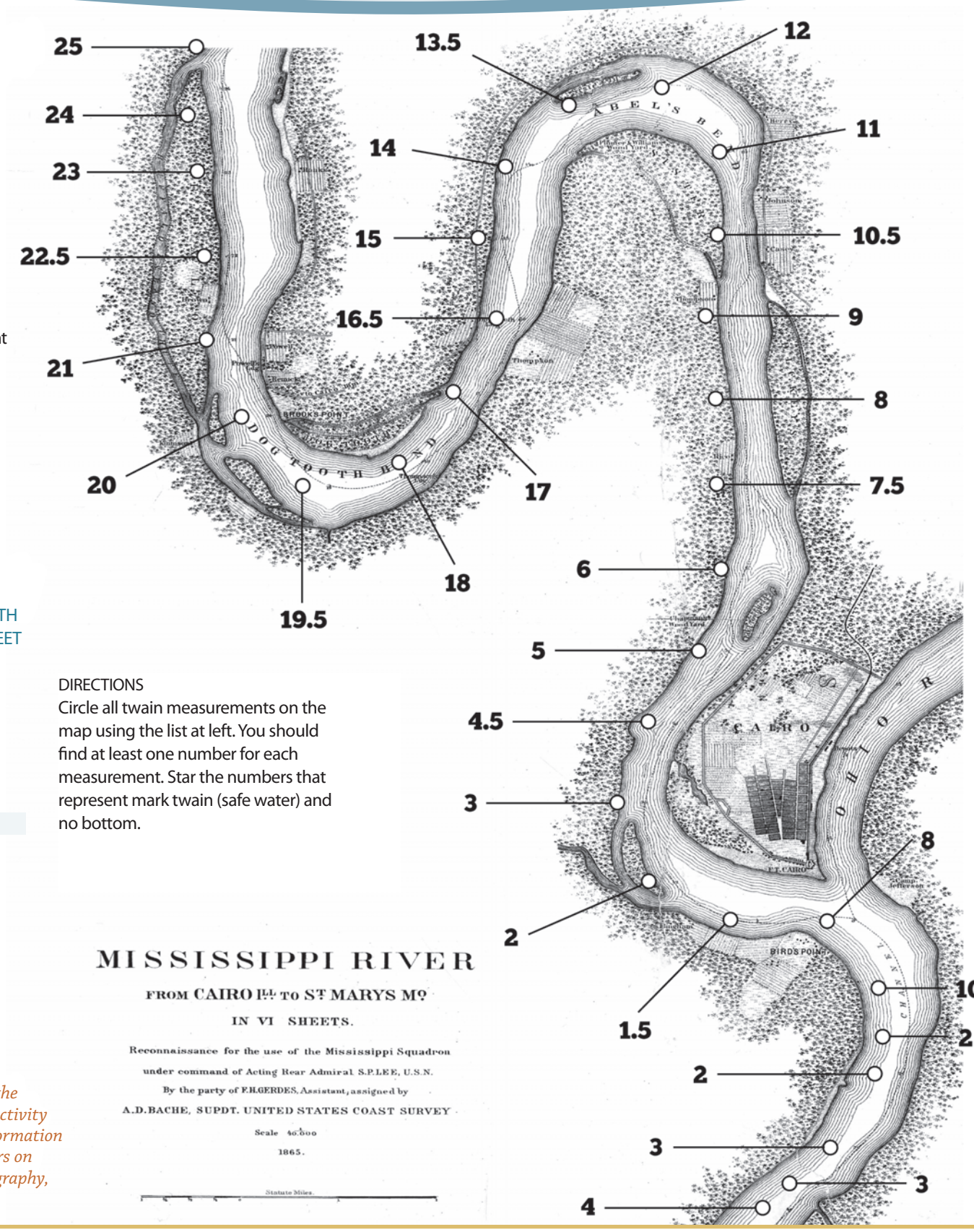
Mark Twain: a man or a measurement?

"Mark Twain," the pen name of American author Samuel Clemens, was the call the leadman made when the boat was in safe water. It meant the water was two fathoms (12 feet deep).

A fathom was a unit of measurement the length of the outstretched arms (approximately 6 feet). Twain is an archaic term for the number two, so Mark Twain means "mark two."

A leadman determined the depth of the river using a leadline, which was a 30-foot-long weighted rope with incremental distances marked on it. He shouted these measurements to the pilot:

	LEADMAN'S CALL	DEPTH IN FEET
	Quarter	1.5
	Half	3
	Quarter Less	4.5
	Mark One	6
	Quarter One	7.5
	Half One	9
	Quarter Less Twain	10.5
Safe Water	Mark Twain	12
	Quarter Twain	13.5
	Half Twain	15
Quarter Less Three		16.5
	Mark Three	18
	Quarter Three	19.5
	Half Three	21
	Quarter Less Four	22.5
	Mark Four	24
	No Bottom	>24



DIRECTIONS

Circle all twain measurements on the map using the list at left. You should find at least one number for each measurement. Star the numbers that represent mark twain (safe water) and no bottom.

Find more activities like this one in the new "Our Mississippi" educational activity guide. See ourmississippi.org for information on how to order or download chapters on river history, natural resources, geography, hydrology and more.

MY MISSISSIPPI

Charlotte Johnson, Underground Railroad historian,
member Alton Museum Committee on Black Pioneers, Alton, Il.

"I've always had an interest in how people lived, what they will do under certain conditions. In Illinois, there were well over 100 Underground Railroad sites that I can actually verify. What it all taught me was that where there's a will, there's a way. When you're running for your life, there's usually a will.

"I know that Alton (Il.) was a major Underground Railroad site. One site I wrote up for the National Park Service's Network for Freedom was Rocky Fork. The Spaulding and Hawley families allowed freedom seekers to come in there. They could work and earn land if they wished. At one time, in the valley between the bluffs, where they were protected, there were over 280 people.

"I used to teach junior high. I told kids the other day at this reunion they are the survivors of the fittest. If you can make it with nothing, you can surely make it with everything you have today.

"My Mississippi is an avenue for people to cross. I think of the many ways they used it—by boat, by ice, even herding cows and chickens and walking across. I think of a friend of mine who told me about her great uncle who walked from South Carolina, west, until he came to the Mississippi. He said, 'It's too big for me to cross' and turned around and walked back. He just wanted to see that river people had been talking about. It was a means of transportation and a bridge between freedom and slavery. It was a bridge."

Catch the Winter River Flight Show

TRUMPETER SWAN

Thanks to protection laws, the population of the trumpeter swan has swelled to some 16,000. The species nearly vanished in the 1920s when it was hunted for its feathers and meat. Today, those traveling to open water along the Mississippi River can again see North America's largest flying bird and hear the trumpet-like call they make as they fly over marshes before coming in for a graceful landing.

These birds mate for life and return each year to the same nesting wetlands, making their presence predictable in spots like Monticello, Minn., where more than 700 swans are expected each winter. An estimated 400–500 trumpeter swans also winter around Ellis Bay in the Riverlands Migratory Bird Sanctuary in West Alton, Mo., where numbers peak in January and fall off in mid-March.

Swans in Magic Morning Light—Serial thoughts while capturing the images above, photographer Danny Brown writes:

0415 (hrs): can't sleep… thinking about trumpeter swans…North America's largest waterfowl…recovered from the brink of extinction; 0445: off to Riverlands Migratory Bird Sanctuary…still looking for my first decent image of one these giants; 0615: at the Riverlands, donning chest waders, blind, portable chair, shoulder bag, camera and tripod…about 40 pounds of gear for my slog into the wetland…I feel loaded down like a soldier…0635: oh yeah…trumpeters…24 of them…adults and juveniles…creatures of habit…uh-oh…they're paddling away from me to the west end of the pond as I set up my blind; 0650: OMG [texting talk] they're swimming back toward me and morning light is washing over them…think…check your exposure comp…don't blow out the highlights…shutter speed high and ISO low—nobody likes grainy images…image stabilization switch on…stay with AI Servo in case they blast off; 0700: nice images on the card, the last few as they take off to their feeding area…0701: liftoff…they're headed for breakfast…

SEE MORE: DANNYBROWNPHOTOGRAPHY.COM

BALD EAGLE

Come early January, nature puts on an air show along the Mississippi River in the form of the awe-inspiring bald eagle. The regal birds flock by the thousands to places at which open water—and tasty dinners—can be found.

Between January and March, below any of the river's locks and dams are great bets for eagle sightings, according to Randy Urich, a Corps of Engineers forester. Many locks have public viewing platforms that allows for an up-close look; but check with the lock you want to visit, Urich advises, for information on possible closures for construction work.

Other favorite spots for eagle viewing are in Corps-owned or other state and federal parks and natural areas. Many towns along the river offer eagle viewing days and festivals. (See page 9).

Join the Count

The Eagle Nature Foundation's holding its 51st annual mid-winter bald eagle count, the morning of Jan. 29. Recent counts indicate a decline in eagle populations, and particularly in the proportion of juvenile eagles to adults. The birds are showing some movement away from the river, to fields, apparently to find food, says Executive Director Terrence Ingram. Join the count and help further identify eagle trends by calling 815-594-2306, or visiting eaglenature.com. Or follow the numbers via the winter count done regularly by staff at U.S. Army Corps lock and dam facilities along the river: www.missriver.org

GOLDEN EAGLE

Those pointing to the flying machine in the skies of southern Minnesota or western Wisconsin this winter may be saying, "Is it a bird? Is it a plane?…" but they're more likely saying, "Is it a bald? Or is it a golden?" Both of the country's two indigenous eagle species can be found around the Mississippi River. But there are distinct differences in both look and preferred habitat, according to National Eagle Center Director Scott Mehus, who has a particular research interest in the golden.

To spot a bald eagle, for example, look to the river, and a golden, to bluff country prairie. Golden eagles like to cruise along the back side of the bluff and come stealth-like to prairies. There, they surprise their prey, he said. To spot one in the air, look for the shallow "V" or "U" shape made when the wings are held up against the horizon (not as flat as a bald eagle profile, but not as pronounced as that of a turkey vulture).

Join the Count

A golden eagle count will be held Jan. 15 across southeastern Minnesota, western Wisconsin and northeast Iowa, led by staff of the National Eagle Center in Wabasha, Minn. Bone up with a visit to the eagle center, particularly for a Jan. 8 golden eagle seminar/field trip. Anyone confident in the difference between a bald and golden eagle can sign up for a route by emailing scott@nationaleaglecenter.org. One count goal is to evaluate the regional habitat upon which the birds rely to get through winter; last year, some 140 observers counted 100 birds.—K.S.

SWANS AND BALD EAGLE: DANNY BROWN. GOLDEN EAGLE: RICHARD BARTZ. DIVERTERS: U.S. FISH AND WILDLIFE SERVICE.

Eagle Events

Where there are eagles, there are parties – and that's pretty much everywhere the Mississippi runs through the Upper Midwest come winter. Most are free, and many include eagles and other birds of prey in live programs. Here's a sampling, organized from North to South by state.

ILLINOIS

Galena: Bald Eagle Bus Tours. Four-hour tours hosted by Eagle Nature Foundation. Jan. 15, Feb. 12 and 26. Fee $75-85. Call 815-594-2306.

Rock Island: Eagle Watch, Mississippi River Visor Center. Jan. 15 through Feb. 20, weekends only. Call 309-794-5338 for reservations.

Rock Island: Quad Cities Bald Eagle Days, QCCA Expo Center. Jan. 7-9. Call 309-794-5338.

Alton: Eagle Meet and Greet, National Great Rivers Museum. Feb. 6, 13, 19, 20. Masters of the Sky, National Great Rivers Museum. Feb. 19, 20, 21. Call 877-462-6979.

Pella: Red Rock Bald Eagle Day. At Lake Red Rock and Central College. March 5. Call 641-828-7522.

Muscatine: Bald Eagle Watch. Outdoor viewing at Lock & Dam 16, programs at Riverside Park, including Eagle Dance. Jan. 29. Call 563-263-7913.

Keokuk: Bald Eagle Days. Outdoor viewing at riverfront, programs at River City Mall. Jan. 15-16. Call 800-383-1219.

MINNESOTA

Red Wing: Eagle Spot Weekends, Colvill Park. February and March. Call 800-498-3444.

Wabasha: Soar With the Eagles Festival. National Eagle Center. Weekends in March. Call 877-332-4537.

IOWA

Dubuque: Bald Eagle Watch. Outdoor viewing at Lock & Dam 11, programs at Grand River Center. Jan. 15. Call 563-582-0881.

Clinton: Bald Eagle Watch. Outdoor viewing at Lock & Dam 13, programs at Clinton Community College. Jan. 8. Call 815-259-3628.

LeClaire: Bald Eagle Watch. Outdoor viewing at Lock & Dam 14, programs at Mississippi Valley Welcome Center. Jan. 29-30. Call 309-277-0937.

Saylorville (near Des Moines): Bald Eagle Watch. Driving tour begins at Saylorville Lake Visitor Center. Feb. 27. Call 515-276-4656.

MISSOURI

Clarksville: Eagle Days. Jan. 29-30. Call 573-242-3771.

St. Louis: Eagle Days. Old Chain of Rocks Bridge. Jan. 15-16. Call 314-877-1309.

West Alton: Eagle Viewing. Rivers Project Office, Riverlands Migratory Bird Sanctuary. Call 636-899-2600.

WISCONSIN

Prairie du Chien: Bald Eagle Appreciation Day. Feb. 26. Call 800-732-1673.

Cassville: Bald Eagle Days. Jan. 29-30. Call 608-725-5855.

"Diverters" steer migrating swans away from power lines

Charlie Deutsch, Willdife Biologist for the U.S. Army Corps of Engineers, displays one of the swan diverters. Below: Helicopters deliver diverters to the power lines.

Some 1,000 "swan diverters" were installed on high-voltage power lines that cross the Riverlands Migratory Bird Sanctuary near West Alton, Mo., this fall, in an effort to protect trumpeter swans.

Each fall, some 500 swans from various Upper Midwest breeding grounds head to their winter home on the sanctuary. Agents from the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers, as well as officials from Ameren Missouri (the owner of the lines), became concerned about evidence of swans injured or killed by flying into the transmission wires.

To help divert the swans away from the power lines, they installed 12-inch-long diverters, resembling giant yellow corkscrews, via helicopters that hovered above the Corps-owned sanctuary. They were placed on the highest static wires of non-electric transmission towers as a means of alerting swans to potential danger.

Nearly extinct at the turn of the 20th century, trumpeter swan populations have risen by 400 percent due to conservation efforts.

Charlie Deutsch, of the U.S. Army Corps of Engineers, said the help given to the wintering swans was in line with the sanctuary's and the Corps' commitment to stewardship, environmental education and expanded outdoor recreation opportunities.

"The swan project allows us to balance the role of the rivers in a national transportation corridor, the environmental attributes of the area and the modern-day need for power," he said. "It's a very unique and creative project."

DID YOU KNOW?

In 1986, Congress recognized the Upper Mississippi River System as both a nationally significant ecosystem and a nationally significant commercial navigation system and mandated that "the system shall be administered and regulated in recognition of its several purposes." It remains the only river system in the nation with such a designation.

Saving a threatened river basin—one crayon drawing at a time

When Matt Fisher was asked to draw his vision for the Iowa-Cedar River basin, he picked up a green marker and sketched a rich natural area upon which cows grazed.

A farm field and a silo were backed by a distant skyscraper, a vision for a state with both vibrant cities and thriving rural areas. A rich blue creek flowed down into another, illustrating, he'd later explain, the way every drop of water that starts in Austin, Minn., eventually flows downstream by The Nature Conservancy's Eastern Iowa Project Office, where he works.

Iowa Sen. Rob Hogg, on the other hand, colored in downtown Cedar Rapids. He drew places in which water could be diverted so at flood time it'd pour into spots other than the heart of the city. Yet another participant drew a large floodwall to illustrate the need to live with the unpredictability of nature, while others focused on a balance between rural and city life, wildlife and recreation by depicting canoeists paddling past wildlife or a farm and toward a city.

If the exercise seems a bit more like kindergarten than government project planning, consider the truth of the adage, "A picture speaks a thousand words."

That was the message shared by facilitator James Waddell, who created the Vision to Action concept, now being used throughout the Corps of Engineers as a way to find some community consensus on tough planning projects. With the process, used more than 40 times across the United States, amateurs' drawings are combined by a professional artist into a visual, shared community vision that local groups can start bringing into action.

The early December workshops were held in Cedar Rapids and Cedar Falls. The focus was on creating a shared vision for the Dry Creek, Dry Run Creek and Lime Creek Watersheds within a river basin that the group American Rivers in 2010 named one of America's most endangered.

Here, epic floods have threatened the region's population of around a million, and landscape changes have contributed to nitrogen and phosphate in the Upper Mississippi River basin,

The Corps of Engineers has partnered with several state, federal, university and other non-governmental partners to launch one of the country's most ambitious study projects, looking at issues including water quality and availability, agriculture, jobs, quality of life and more, and how those affect a region spanning some 12,000 square miles. This project will even include pioneering research on how climate change might affect America's rivers.

The group is targeting summer 2013 for its completed watershed plan. But it wants to be sure the public is actively involved in the process from the beginning, says Project Manager Jason Smith, and indeed helping to steer it. From those qualitative ideas will follow a more quantitative stage, Smith says.

"If in the first round people say, 'Why doesn't the stream have as many fish as it used to?' the question becomes, 'How do we quantify what fish are there now? Why did the fish leave? What stressors caused them to leave? Was it temperature change, nutrient overabundance, lack of dissolved oxygen?' There are quantitative things we'll have to do once we understand the concerns."

As participants drew their basin visions with markers or crayons, sophisticated ideas flowed, even in relatively simple drawings. Initial pictures were expanded upon as facilitators made copies of each group member's drawings, shrinking them down and making copies for the others to use. Additional pictures were added. There were storage areas for compost, farmer's markets, farm fields teeming with cows, pictures of renewable energy sources, others of kids playing in a stream populated by diverse species of fish.

If the exercise seems a bit more like kindergarten than government project planning, consider the truth of the adage, "A picture speaks a thousand words."

Participants then glued others' pictures that captured their own visions onto a large poster—one step in creating that shared community vision. Then they talked about what they had created and remarked upon how similar visions actually were; most just wanted a nice, safe place to live and to do the right thing for their soil and water.

Greg Walston, a Benton County extension specialist, said: "My vision is we all need to work together. It's not just one person's problem. It's all of us together."

Facilitator Waddell told group members that the professional artist's eventual composite would be shared with each of them, as well as with study planners and community leaders.

But vision comes with responsibility, Waddell said, asking them to share what they might do in the coming week to bring their vision into being, rather than expecting other groups or agencies to make it happen.

One participant planned to start composting table scraps, another to continue to talk to others about reducing runoff.

"My action plan is to continue talking about storm water management," said Tom Watson, the City of Palo infrastructure manager, who drew detailed solutions, including rain gardens, into his design.

"We need to work more in harmony with Mother Nature," he said. "We have fought Mother Nature for too many years." —K.S.

DRAWINGS BY MEETING PARTICIPANTS. HISTORICS: COURTESYRON DEISS.

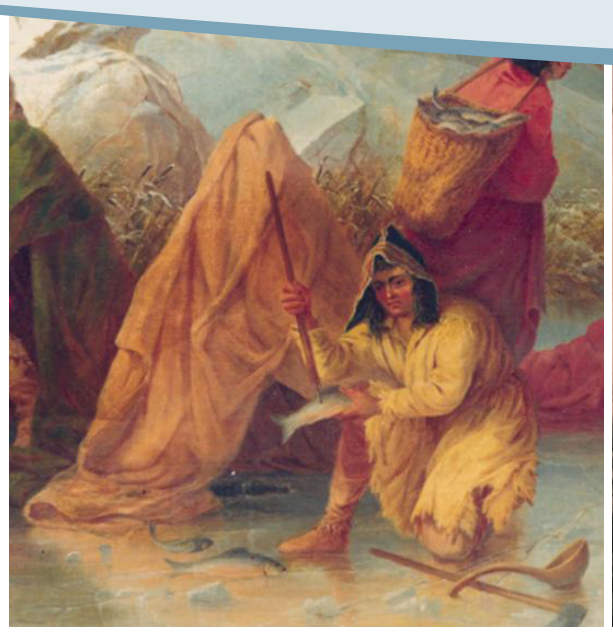


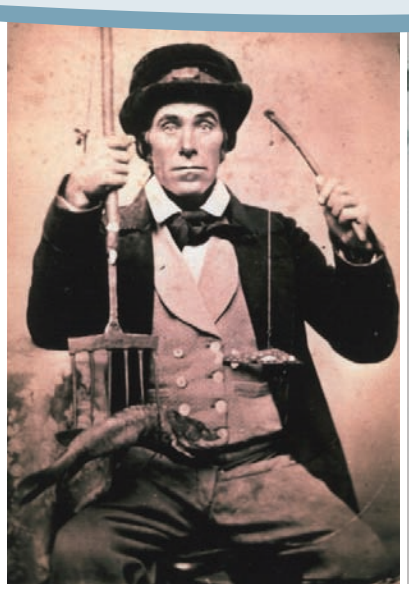

Iowa-Cedar at a Glance

The Iowa-Cedar Rivers Basin study is an ambitious watershed sustainability initiative being taken on by the Corps of Engineers and its interagency partners that has the potential to serve as model for other tributary watersheds within the Upper Mississippi River Basin. The project spans an area of some 12,000 square miles and is one of the most exhaustive in terms of incorporating climate change and policy, floodplain management, water quality and urban development.

The area is being targeted because its rivers and streams have produced massive floods in recent decades and also have been primary contributors of nitrogen and phosphorus to the Upper Mississippi River Basin, causing hypoxia in the Gulf of Mexico.

The project brings together many state, federal and non-governmental partners. In March 2009, it got a major boost when designated part of the United Nations Educational, Scientific and Cultural Organization's Hydrology for the Environment, Life and Policy (HELP) program. The basin is one of only five in the United States to achieve United Nations help in bringing together water law and policy experts, water resource managers and scientists together to work on a watershed-scale collaboration.—K.S.





Once, spearing was the way to fish

Ronald W. Deiss, archeologist and historian, Rock Island District, U.S. Army Corps of Engineers

Above, from left: This painting depicts an era when ice spearing was generally done within tepee-shaped shelters using mussel shell decoys. When the shot of the Wisconsin ice spear fisherman (center) was taken in the 1880s, ice spear fishing was practiced as both sport and commercial venture. By the more modern era, depicted in the final photo, the sport had been made illegal in some states though still enthusiastically practiced in others.

The oldest way of harvesting fish on the Upper Mississippi River was with a spear through ice. I've had the privilege of studying and even continuing this tradition, although it is now banned on the river.

Native Americans began spear fishing here more than 1,000 years ago, documented by more than 40 decoys recovered by archeologists. These primitive decoys were made of mussel shells. In the late 18th and early 19th centuries, British and French explorers and traders described the natives' ice fishing as they huddled on the ice inside tepee shelters covered with blankets or tree boughs.

The basics of spear fishing have been virtually unchanged since antiquity. It requires a hole in the ice, a shelter, a spear and a fish decoy. The hole is cut or chiseled two to three feet in diameter, through the ice to open water. A shelter is moved over the hole to eliminate direct light and glare. The spearing hole is illuminated by sunlight that penetrates the ice and snow around the shelter. The contrast between the shelter's pitch-dark interior and the illuminated water makes for good visibility.

A contemporary decoy is carved out of wood in the shape of a fish, weighted with lead and then attached to a jigging stick. The fisherman lowers then raises the decoy in the water to attract pike and musky.

Modern "darkhouses," as they're called, have been built of wood and include a seat, a small stove and spearing equipment—a saw or spud to make the hole in the ice, a chipper to shape the edges, and a skimmer to remove floating debris.

Tribes that fished like this, throughout the Upper Midwest, included the Potawatomi, Ojibwa, Ottawa, Sauk, Fox, Menominee, Winnebago and Sioux. Later, settlers realized spear fishing was easy, inexpensive and highly successful, and it became quite popular in the mid-1800s.

La Crosse, Wis., became the epicenter of ice spear fishing. The local newspaper published an article in 1895 headlined, "Gigging for Fish: A Popular Pastime Among Men of Leisure Just Now":

> Of all the queer forms of fishing – and there are many of them – that of "gigging"…is undoubtedly the funniest. No less than one hundred persons now follow the sport hereabouts, and the bulk of the fish monger's stock at this time is supplied from that source….The fish are easily seen at a depth of fully ten feet and, at this time of the year, when food is scarce, they are easily decoyed to the hole in the ice.

I'm proud to have a collection of 20 or 30 old decoys, as well as spears, some of which have been on exhibit at the National Mississippi River Museum in Dubuque, Iowa.

On the Mississippi, spear fishing was banned in 1937. Fishermen were already unhappy that the building of the locks and dams, as well as the dropping of water levels during the winter, had hurt the fish population, ruining spawning grounds. Then catch-and-release became a more popular way to fish, and critics called spear fishing inhumane and unsportsmanlike.

I do not consider it that at all. I consider myself lucky to see these noble fish in their own habitat, and marvel at their prowess beneath the ice. There is nothing between the fisherman and the fish but a spear, whereas some fishermen have speed boats, sonar, and other expensive equiptment to increase their chances angling for fish. Ten years ago I began to carve decoys myself, and for several of the past winters enjoy spear fishing in the Upper Peninsula of Michigan, on a small lake. It's still legal there, as well as in Alaska, the Dakotas, Minnesota, Montana and Wisconsin.

My spear was handmade for me by a Michigan friend who does blacksmithing. It weighs about 10 pounds. Typically I manage to spear one or two northern pike, over the 24-inch limit, and consider this fish to be one of the best eating nature has to offer. I filet and cube it, then soak it in milk and dust it in flour to fry up, then freeze the rest to enjoy until next winter.—R.W.D.

MY MISSISSIPPI

Sigurd Anderson, engineer and ice-boater, Lake City, Minn.

"I was 13 when a friend and I, living near Lake Minnetonka, Minn., experimented with sailing on ice. We made sails with plastic sheeting and broom sticks, then laced up our hockey skates and zoomed across the bay. Boy, was that exciting! Years later, here on Lake Pepin, I became sailing buddies with Dr. Gunnar Stickler, a retired Mayo Clinic pediatrician. He introduced me to real ice boating, and I was hooked! It's the most fun you can have in the winter.

"I have a DN ice boat—12 feet long with 75 square feet of sail—that will move 60 miles per hour over ice. I named it Friluftsliv, Norwegian for 'life in the open air.' Other guys got their old ice boats out of their garages. In Pepin, Wis., fellows have restored ice boats their grandfathers built in the 1920's and 30's.

"I'm 70 now, and only got out six times early last winter before the snow came. We like at least six inches of ice and not too much snow. I've been out in minus 15 degrees, with 15 to 20 mile per hour winds. You've got to wear a helmet with a face shield, and I've got some old Army surplus arctic gloves.

"You're only six inches off the ice, the tiller between your knees, hanging on with both hands to the line of an 8-part tackle that controls the sail. The boat seems like it's alive, reacting to every nuance of the wind and the ice.

"My friend sailed until he was 81. He died this year at 85. I'll always remember what we liked to do, near the end of the day, when the sun was low and the wind was dying. We would stop our boats in the middle of the lake and lift off our helmets, then just sit and listen to the wind and the ice, groaning and cracking and booming."

What's your Mississippi? Email responses to: editor@ourmississippi.org

Our Mississippi
PARTNERING TO KEEP AMERICA'S RIVER GREAT

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

RETURN SERVICE REQUESTED

PRSRT STD
U.S. POSTAGE
PAID
GREENVILLE, MI
PERMIT NO. 338

News Briefs

Minnesota wetland bank restores waterfowl habitat

A one-time prairie pothole complex, a thriving habitat for waterfowl before being drained for agriculture, has been restored to its natural condition as Minnesota's largest wetland bank to date.

Located in a North American migratory bird flyway, the 1,800-acre site near Mahnomen is returning to wetlands under a joint agency project involving the state Board of Water and Soil Resources and the Minnesota Department of Transportation. Both are required under state and federal law to compensate for damage to wetlands caused by road construction. The water and soil board completed field assessment work for its part of the program in June.

More than 150 wetland basins that had been converted to farmland became wetlands, with each restored acre generating about $1,500 worth of wetland credits. The long-term plan is for the site to be transferred to the Department of Natural Resources and managed as a state wildlife area. Watershed approaches to wetland mitigation like this is a concept backed by the National Academy of Sciences and is now required under federal wetland conservation rules.—K.P.

YouTube the river's story

The Mississippi has inspired some of the world's great stories, and no wonder. The stories never end, whether they're of prehistoric cultures who lived and worshipped on the river shores and surrounding bluffs or of the work-a-day world of the mighty tows that transit the more modern-day locks and dams. Now, an even more modern tool is showing those stories, as well as telling them. Here's how to find some YouTube river moments:

The Power of the River: This 25-minute film is shown at the Discovery Theater at the U.S. Army Corps of Engineers' National Great Rivers Museum. Divided into three sections, these films discuss both our spiritual, natural and economic connection to the river. youtu.be/jXA6S6HftMk

America's Inland Waterways System: What's carried on the river, how, and how that's balanced with the river's other uses are explored this film. Highlights: listening to people who work on the river describing life there in their own words. youtu.be/rxHIk5ARHLI

The Big Muddy: Corps historians kick off this July 2009 film that covers river navigation by explaining its evolution. youtu.be/Gp62nr2oKlg

Sustaining the Mighty Mississippi: Click here to watch river sustaining in action as crews shore up river banks, and more, in this up-close look at what it takes to make the river work: youtu.be/l4yFFEtcvWM


Congressman Jerry Costello

River research center gets new name

A new river research center in Alton, Il., has been named after Illinois Congressman Jerry Costello for his efforts to develop the city's riverfront. The center at Lewis and Clark Community College is now named the Jerry F. Costello National Great Rivers Research and Education Center Confluence Field Station. The center was established to study environmental issues on the Mississippi and other great rivers. ngrrec.org.

Our Mississippi

Send story ideas to editor@ourmississippi.org

Questions or comments:
U.S.A.C.E. REGIONAL OUTREACH SPECIALISTS
Kevin Bluhm, St. Paul, 651-290-5247
Angela Freyermuth, Rock Island, 309-794-5341
Hilary Markin, Rock Island, 309-794-5730
Laurie Farmer, St. Louis, 314-331-8479
Kimberly Rea, West Alton, 636-899-0050

Mailing list changes:
U.S.A.C.E. REGIONAL OUTREACH SPECIALISTS
Marsha Dolan, Marsha.G.Dolan@usace.army.mil

To read online:
OURMISSISSIPPI.ORG
Click "Subscribe here" to subscribe via email.

Contributors this issue:
EDITOR/LEAD WRITER
Kim Schneider
DESIGNER
Diane Kolak
CONTRIBUTING WRITERS
Susan Ager
Ron Deiss
Hilary Markin
Jim Pogue
Ken Powell

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