## Our Mississippi Partnering to keep America's river great

## The Mississippi's 'Daredevil on Two Boards' still inspires river fun

**TRISTA FOSTER SAW HER FIRST WATER SKI SHOW** when she was five, watching enthralled as her babysitter of the time did river tricks on skis to lively music, moved in formation with other costumed performers, even climbed a pyramid on skis.

"They made it look like it was the best time on the planet," she said, "and I wanted to do that!"

ABOVE: The first-ever set of water skis, bottom right, are on display at the Minnesota History Center museum, where you can also find this collection of photos of ski inventor Ralph Samuelson doing the ski tricks he'd perform on Lake Pepin before adoring crowds. The Quad Cities area trust officer has now been twice named the country's top female show skier, in part, she says, for the way she can ski a complete circle around a moving boat. But while she attributes her inspiration to that babysitter, thanks also goes to another Mississippi Riverbased pioneer: Ralph Samuelson.

By all reports, Samuelson was just trying to put on an

entertaining show for friends and neighbors when in 1922, the day before his 19th birthday, he stood on a couple of boards and got hauled behind a ski boat as if walking (quite speedily) on water. That secured him the eventual honor of inventor of water skiing—and one earned on the Mighty Mississippi River.

Local lore ties the Lake City resident's inspiration to a sea creature he supposedly saw gliding across Lake Pepin one night, making him think: "If a large aquatic creature can skim across the surface, why can't I?" Another quote attributed to the then teen is likely a bit more accurate. "I decided that if you could ski on snow, you could ski on water."

From the look of early photos, he also liked the attention a bit. The born showman would put on one-man water skiing exhibitions, gathering crowds on shore. In one exhibition, he skied behind an airplane on floats. He garnered enough attention that in 1966, the American Water Ski Association officially recognized Lake City as the birthplace of water skiing.



SUMMER '17

ewsletter 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.



Samuelson's first skis are an attraction on display at the Minnesota History Center's museum in St. Paul, Minnesota. Clunky, huge and heavy by today's standards, they're literally eight-foot pine boards which Samuelson steamed in boiling water to round the tips. You'll find them, interestingly, in an exhibit on weather—a nod, says Adam Scher, the history center's senior curator, to the fact that the lives (and recreational habits) of Minnesotans revolve around the seasons. The skis are part of an exhibit of how those living along the Mississippi River's northern sections have adapted to frigid climates and also know how to celebrate when weather warms.

"He was from Lake City, Minnesota, and he used to go out on Lake Pepin like most people for summer recreation," Scher said. "So he got this crazy idea at the time I supposed it would be termed of trying to take bow staves (trimmed rods of wood generally made into shooting bows) and attaching them to his feet and be towed." That didn't work.

For his second try, he found some pine boards, steamed the ends so they curved and attached some snowshoes where his feet would go. He bought 100 feet of cord at the hardware store and had an iron ring made for a handle. And then he skied—and skied—becoming the star of weekend water shows, the first water ski jumper and later the first to successfully ski behind a World War 1 Curtis Flying Boat that was zipping across the water at 80 mph.

Samuelson kept competing, with others following suit and continuing to push the envelope of jumps and acrobatics, until he got a ski-related back injury in his 30s, Scher said. But perhaps the most interesting fact about this river icon and unsung state hero is that he wasn't really an inventor, Scher said. "He just decided to play on water and was the first one to really be successful at it. As a result, he was responsible for a sport known and enjoyed by people from all over the world, putting water skiing on the map" and ironically, so, from a state not as often associated with summer fun as winter cold.

#### Theater on skis

Water skiing remains a popular family activity on lakes near the Mississippi River and on the river itself—particularly in spots less traveled by larger commercial vessels. But wherever you venture, follow state rules and watch for signs denoting no-wake zones or protected wildlife areas.

You can also sit back and watch, be it the La Crosse-based River City Waterski Team, Twin City River Rats or Ski Otters of White Bear Lake—ski backwards, leap off jumps, climb pyramids and perform a play. Taking in a show of the Quad Cities-based Riverboat Gamblers—the home team of trust officer and top skier Foster—is even more fun when you hear the team's name origin. "When we started. we were skiing on the backwaters of the Mississippi," Foster says, "and we joked 'We're gambling with our lives when we go out there!" But that was really said in jest, she says, saying "If you respect it, you're fine."

Likely far riskier are the tricks performed by team members who range from five to 65 and include a chiropractor, firefighters, a police officer, attorney, construction workers and a dental student. Her first summer, Foster says, she learned to do ballet on a single slalom ski, the rope between her leg, synchronizing arm movements and has gotten to the point she can do a triple spin. Not many others in the country can do that.

Performances are part sport, part theater, with this year's show plotline revolving around a college football coach who was fired and rehired to coach the water ski team. The highlight, though, will be the attempt by the country's largest ski team to ski a pyramid four tiers high, four pyramids strong, or 48 people behind one boat. It's never been performed in a national competition.

You could just opt for a selfie with Samuelson's ski—or at least a fun replica in Lake City. The latest addition to this year's annual water ski days—an annual

celebration (with ski show) and more of the sport and its inventor this year includes a 10-foot photo opp, says Brandy Geolat, the event coordinator. More memorabilia can be found at the Lake City Historical Society. There, along with other memorabilia, is a letter from the American Water Ski Association, dated April 6, 1966, that recognizes Samuelson as "first water skier of record." It's a fun conversation item, if nothing else, Geolat says, to be from the birthplace of water skiing.

And today? "You definitely see some water skiers," she says, "But it's more a mix of summer water activities. For my younger generation, tubing is more the big thing." -K.S. Safety First

Before skiing on the Mississippi River or nearby waterways, check the boating safety regulations published by the state in which you'll be traveling. Guides outline rules on water safety, approaching larger vessels and towing skiers. Pay special attention when boating near wildlife refuges; many ban motorized vehicles in some sections or have designated no-wake zones. Intimidated by the process of going through river locks? Follow this easy guide: http://www.mvr.usace. army.mil/Portals/48/docs/Nav/ LocksAndRiver.pdf



### **CATCH THE SHOW** *Spend a perfect summer evening watching flips, dance lines and pyramids.*

Watch a water-ski show, and you'll want to climb into your Thunderbird and go get a chocolate malt.

There's something deliciously retro about spending a balmy summer evening listening to '50s party music and the roar of marine engines as spangled, sun-bleached teenagers fly by. A corny comedy routine is part of the show, but it's the tricks that keep the crowd enthralled: double flips, dance lines and pyramids that can go up to five tiers. Ralph Samuelson, who invented water-skiing on Lake Pepin in 1922, was a showman, and Tommy Bartlett began putting on shows in the Wisconsin Dells in 1952. Now, Wisconsin has many more show clubs than any other state, and you'll find shows all along the northern stretches of the Mississippi River and across the Midwest.

Before going, check team schedules. A team may be away at a tournament or performing at a festival in another town. Sometimes, heavy rains affect lake levels and force teams to cancel shows. In August, as days grow shorter, many teams perform half an hour earlier. Later in the month, most teams lose some of their stars as they leave for college. Most shows are free, but many ask for donations to help pay for gas and costumes. You can also support the teams by buying concessions. Some teams have bleachers; to see others, bring a lawn chair or blanket. –B.G.



#### Here are just a few ways to catch a vintage river show:

- **River City Waterski Team**, La Crosse. Shows are at 7 p.m. Wednesdays from mid-June to mid-August. Find them: Airport Beach from French Island on the Mississippi River.
- **Twin City River Rats**, Minneapolis, performs at 7 p.m. Thursdays from early June to late August, with extra shows during Aquatennial. Located: on the Mississippi River just north of downtown Minneapolis, between the Broadway and Plymouth bridges.
- **Ski Otters Water Ski Team**, White Bear Lake, performs at 6 p.m. Sundays from mid-June through August at Little Goose Lake north of St. Paul.
- **Bald Eagle Waterski Shows**, Centerville, are held in the northern Twin City suburbs just east of Lino Lakes at 7 p.m. Thursdays starting in late June.
- **Backwater Gamblers**, Rock Island, perform at 6:30 p.m. Wednesdays and Sundays from Memorial Day through Labor Day. The team that finished fifth in nationals in 2016 performs on the Rock River, near its confluence with the Mississippi.
- **The Arch Rivals**, Lake Saint Louis Water Ski Club's competition team, performs on Fridays with exhibitions at 6 p.m., shows at 7 p.m. The ski site is at Jefferson Point, just west of Lake Saint Louis Boulevard off Civil Center Drive, I-64 North Service Road.



#### Toby Isbell, Visual Information Specialist, U.S. Army Corps of Engineers Little Rock District; creator of Bobber, the Water Safety Dog

I've always been involved in cartoon work. I started producing funny animated cartoons using Flash animation software, and those were getting shared. A friend of mine showed some to one of her friends who had an interest in water safety. He latched onto the idea that Flash animations would be a good medium for relaying water safety messages.

There were a variety of water safety characters at the time—Freddy Fish, Buddy Beaver and others, but there wasn't a consistent nationally recognized mascot. My parents had Labrador Retrievers at the time, and I thought that would be a good character. Kids are more used to being around dogs than beavers. Since Labs are water dogs, and they perform rescues, I had the idea that we could even have real dogs occasionally perform as Bobber, which has happened.

The character names are puns on what they do. Bobber floats like a fishing bobber. You've got other characters like Corkey. She wears her life jacket all the time. Sinker is the little puppy who doesn't wear his and has to get rescued sometimes. There is a grumpy old bulldog character named Tackle who wears a football jersey and a fishing hat.

There have been millions of Bobber coloring books handed out all over the country. Then there's the mascot suit. I worked with a Salt Lake City company to design it. In fact, I've worn it. A lot! Now there are more than 100 Bobber costumes around the country that go to school programs, special events, boat shows, Being Bobber is like being a Disney character. You get to go around highfiving people, hugging kids and posing for photos. I've been fortunate to go to Disney World a lot in my life, and I've always admired the performances of the costume characters there, and I like making costumes myself. I think I was a cos-player before they even called it that. The Bobber costume helps get the message across-except when they think it's Scooby Doo! That's why we always have one of our uniformed park rangers with Bobber to speak on his behalf.

Although millions of people have been exposed to Bobber and the Corps' safety message, there are still many who haven't. And with a new batch of little kids every year, we have a big impact. The most rewarding thing is when we hear stories about children saving family members because of lessons they learned from a Bobber program. I got into something because I loved doing art work and animation, but the fact it has a lifesaving cause behind it makes it a privilege to work on. -K.S.

#### WILD GOOSE CHASE

# Citizen volunteers help with goose banding

**Brenda Kelly, a wildlife biologist** with Wisconsin's Department of Natural Resources, starts out her goose banding mission with some recognizance, scouting out geese along the Upper Mississippi River. That way, she knows where to steer her team of volunteers during the annual goose banding mission—an operation that's not only crucial for setting harvesting limits, but also serves as an outreach opportunity for citizen volunteers. Essentially, they get to take a field trip with a biologist.

Over the course of five days in late June, Kelly led her team in the project, which was part of a larger operation happening throughout Wisconsin. The state of Wisconsin needed to tag 4,100 birds, and Kelly's team was responsible for meeting 15 percent of that quota.

She and her team met the goal for the 2017 banding operation, despite some curve balls that Mother Nature threw them. Thunderstorms appeared in the forecast, and about 200 geese Kelly scouted prior to banding operations in Pool 9 were nowhere to be found when it came time to band. Dare we say that's what makes it a 'wild goose chase'?

Migratory game birds like geese are banded to help determine the rate of hunting, harvest and annual survival rate. Data collected from banding operations helps the U.S. Fish and Wildlife Service along with the Wisconsin Department of Natural Resources set hunting seasons and harvest limits. Hunters are asked to report when they've harvested a banded game bird.

The banding also helps determine the migratory bird patterns.

This year, Kelly and her team of volunteers (which totaled 50, including private citizens and experts from the U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service) were able to hit their quota of banding more than 600 geese, doing so in six locations.

While the volunteers are essential in helping with logistics, Kelly said the banding operation is also a great outreach opportunity.

"People go away having had a good day out on the river," she said. "It's fun, they're excited and we've connected them with wildlife."

The field operations can also teach important lessons, Kelly said. For example, geese are sometimes found with a fishing lure stuck in their foot, which can be removed. Seeing how humans can impact wildlife can have lasting impressions, she said.

The banding operations happen in June because that's when Canada Geese typically molt, meaning their primary flight feathers are replaced with new ones and they can't fly away. Wildlife officials and volunteers can round up the geese on the ground and quickly get their ankles banded.

Kelly has volunteers staged both on land and approaching via boats so they can corral the geese. Then, the team pops up panels that are connected with zip ties to create a temporary pen so they can get their ducks, err, geese in a row. From there, the geese are picked up and banded in an efficient process that minimizes stress on the birds. Kelly and her team determine whether each bird is an adult or juvenile, along with the sex of the bird. They also notate if the geese are "recaptures."

Curious what it's like to go on a goose hunt?

To help steer the geese where you want them to go, you've got to appear big—with outstreched arms. Oh, and the proper way to hold a goose during a banding operation? Just like you would a football, with it tucked under an arm. -B.A.



#### **CANADA GEESE 101**

- At least 11 subspecies of the Canada Goose are recognized, but only a couple of them are distinctive.
- In general, these geese get smaller as you move northward. As you go westward, they become darker.
- Curious why there are so many Canada Geese at your local golf course or park? They love expansive lawns because it's easy for them to digest grass and the unobstructed swaths allow them to spot approaching predators.
- The oldest known wild Canada Goose was a female. She was at least 33 years and 3 months old when she was shot in Ontario in 2001. She had been banded in Ohio in 1969.
- Canada Geese participate in "assortative mating," where birds of both sexes are likely to choose mates that are similar in size.



#### JoAnne Smiley, Mayor, Clarksville, Missouri

"I grew up in Southeast Missouri, where my parents farmed black-bottom land, a result of the New Madrid earthquake. We were cognizant of the river flooding situation even then, as I recall my father going in a boat to get the doctor for the birth of my brother in June of 1945.

"I dealt with flood issues in 1993 from a different standpoint. My husband and I had a home in Alton and sandbagged there and elsewhere along the river that year. In 2008, as Mayor of Clarksville, I received a call telling me that the water was coming and the residents asked "What are you going to do now?" The strong assistance of the Corps of Engineers is a prominent recollection from that experience.

"When you see the moon shining on the river, lighting up the world, or the sun rising over the river in glorious colors, there's no way you can be mad at the river. But as mayor, I'd like to accomplish a permanent way to defend the town in flooding times. Four times we have been promised money from the state (for a flood defense system) and four times the money has had to go elsewhere, and now we start all over again.

"When investors come, they exclaim that this would be a great place to live and work and then ask about flooding. When sandbags, sand and hundreds of helpers coming from everywhere to assist are a part of the answer, the response is often silence. The Mississippi River is one of the most valuable assets to this city and to this country ... I am just trying to help keep a 200-year-old town called Clarksville alive and well."



## **PARTNER FOCUS** U.S. Fish and Wildlife Service

**More than three quarters of the population** of the Midwest resides in urban areas, and many rarely venture into wilderness areas. Making sure city dwellers can enjoy wild spaces and then be inspired to protect the country's fish and wildlife heritage is the impetus behind the U.S. Fish and Wildlife Service's new urban refuge partnership program.

In St. Louis, a special partnership is pairing the expertise of major partner agencies like U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, National Park Service with other local organizations like the YMCA, Audubon Society, universities and school districts, local zoos and more to infuse city neighborhoods with nature learning.

The effort originated in a meeting in St. Louis with urban planners, state, federal and non-profit groups. As part of this developing urban partnership several summer camps were held in the St. Louis metro area, utilizing the resources and expertise from various partnering agencies like the staff at the Two Rivers National Wildlife Refuge. Bob Dietrich, the park's visitor services manager, took a break to talk about the program recently in the midst of leading "Critter CSI" at one such camp.

During some projects, students learn to fish, paddle, hike, identify birds, cook over a fire, use a compass and examine nature. They listen to bird calls, meet birds of prey and become migrating animals looking out for dangers on their journey south. All of these activities help the urban partnership educate kids to focus on increasing interactions with nature for better quality of life and to move toward a world "where humans, wildlife and natural processes can coexist in healthy and vibrant ways."

Getting agencies working in partnership is key, Deitrich says, because each has its own area of expertise and unique resources, whether that's a set of fishing poles or a park on which the group can be hosted. University research helps the partnership target kids with the least access to wild spaces. The National Park Service might share expertise on river ecosystem, Louis and Clark and Native American influence. The Corps might add information about the

movement of water and water as commodity highway. And the Fish and Wildlife Service is likely to contribute something on the migration flyway and wetlands and how all the subjects are intertwined.

"There are urban, low-income communities that are in and around the river but still have very little exposure to a natural environment," he said. "They have pockets of green space but don't understand the benefits of that, what it means to them. We're reaching out to develop that eco-literacy and understanding."-K.S.

## Stabilizing a stream—the natural way

Eroding stream banks can be a concern that regularly brings people to the office of Jaynie Doerr and her colleagues in the St. Louis District Regulatory Branch of the U.S. Army Corps of Engineers. Regulatory staff are charged with implementing the requirements of the Clean Water Act and issuing necessary permits. While their job doesn't involve acting as a consulting engineer, that doesn't mean they don't get asked to help solve tricky and often expensive problems.

When Doerr attended a streambank stabilization course offered by the Corps' Environmental Research and Design Center (ERDC) in Vicksburg, Mississippi, she had an idea. She'd bring instructor Dave Derrick, formerly of ERDC and now a private restoration consultant, to a streamside erosion site to hold workshops for landowners and public entities around St. Louis—for anyone dealing with too-common streambank erosion issues. ERDC's Wetlands Regulatory Assistance Program teaches ways to use natural materials and stream dynamics to let a river or creek naturally stabilize itself.

In the first area project on Haw Creek in Missouri, Derrick acted as project foreman and class members pitched in as crew members, placing rock and planting native vegetation along the streambank to stabi-

lize the county road shoulder. The method creates a live siltation fence that slows water and lets sediment drop out to create a new bank on its own and shows landowners how they can replicate the process with materials on hand. The project worked great, Doerr saysNow that same information can be shared with other permit applicants with similar bank stabilization issues, and since the first project in 2009, there have been people using the system every year since. –K.S.



ABOVE: **20** species of plants and seven types of trees grew on this eroding bank after volunteers planted willows and changed stream flow.

the U.S. Army Corps of Engineers, the National Park Service and Fish and Wildlife Service is well on its way toward reaching its goal of getting more than 5,000 St. Louis area 4th graders into a park setting. Many programs are centered around birding and located in the Riverlands Migratory Bird Sanctuary, operated by the Corps.

**Every Kid in a Park** A partnership involving

## Army Corps protects 'Windows onto the Past'

You've heard the stories of Huck Finn and Tom Sawyer and their adventures on the Mississippi. As it turns out the river has its own stories to tell—much older stories. Often through the powerful forces of flooding and erosion, the river continues to reveal the ancient past, providing us with a window into ancient times.

#### Devonian Fossil Gorge; Coralville, Iowa; 375,000,000 BC

Coralville Lake was formed by a dam built in 1958 as part of a U.S. Army Corps of Engineers flood control project for the Iowa and Mississippi river systems. Floods which occurred in 1993 and 2008 had an unexpected benefit; the flood-ing revealed the fossil remains of sea life that inhabited the area 200 million years before the dinosaurs roamed. The gorge is named for the "Devonian" period or "age of fishes," 417 million to 354 million years ago, when a warm tropical ocean covered Iowa.

Visitors can walk down into the gorge and explore the sea floor left when floodwaters receded. Twenty "discovery points" provide geologic history and identify corals, sponges, crinoids (relatives of starfish) and brachiopods. The limestone created over millennia by the skeletal fragments of these marine organisms is still mined in the area and provides a large part of Iowa's economy.



#### Mammoth find; Lake Red Rock; Knoxville, Iowa; 12,000 BC

In September of 2014, shifting water levels at Lake Red Rock reservoir and recreation area exposed several huge bones sticking out of the mud. Iowa State Archaeologist, John Doershuk, under a permit provided by the U.S. Army Corps of Engineers, conducted fieldwork on the site in the spring of 2016. The team

### Look, don't take

Numerous federal and state laws prohibit taking anything off public lands without a permit. However, it can still be a challenge to keep "collectors" from stealing cultural resources, according to Jim Ross, supervisory archeologist for the Rock Island District. When archeological finds are made in areas that are not already public park land, the Corps works to keep it as secret as long as possible to avoid looting. Inside recreation areas, the Corps uses signage and asks visitors to report suspicious activity. If caught, looters are subject to stiff fines and penalties, including prison terms. The Corps is currently evaluating a looting along the Mississippi River, but still penalties have been applied for similar thefts elsewhere. In the Mobile (Alabama) District recently, authorities prosecuted several men for removing and then selling Native American artifacts from government land along the Tennessee River, resulting in prison terms and thousands of dollars in fines. removed 20 elements, including an eight-inch long tooth, a six-inch long toe bone, a three-foot long rib bone, and vertebrae that are more than nine inches in diameter.

Archaeological testing is ongoing, but some conclusions have already been made. Radiocarbon dating indicates the bones are from a 14,000-year-old mammoth that died in place. Doershuk says it likely stood 14 feet tall at the shoulder and another 14 feet long, and that it weighed about 10 tons. Its tusks alone were up to 16 feet long or roughly the size of three adult men standing atop of one another. Being under water likely played a key part in preserving the animal by preventing bacterial decay.

Mammoths co-existed with humans for about a thousand years before their extinction. Doershuk says such interaction has been proven in other parts of the country by "cut marks on the bone or spear points stuck in the bone," but that (until perhaps now) has never been documented in Iowa. Further tests are pending, but the team is optimistic that they will show this mammoth did indeed interact with humans.

"Analysis is still under way, and there will be more to follow, but the team is leaning toward a qualified 'yes' in answer to that question," says Doershuk. If so, it will be the first such find in Iowa history.

#### Gull Lake Mounds; Brainerd, Minnesota; 500 AD

Gull Lake Dam was the last of six Headwaters dams built by the St. Paul District of the U.S. Army Corps of Engineers as part of the nation's first reservoir system. It was built in 1912, and is the site of the Gull Lake Recreation Area. There are 12



mounds on the site, seven of which were excavated in 1969. A short interpretive trail leads visitors through the mounds, and shows the tools, pottery and weapons that were recovered. Human remains and funerary artifacts have since been returned to the Dakota people for reburial.

Perkl says artifacts such as projectile points found on site indicate that it was a settlement long before the mounds were built, dating back to at least the Archaic period, about 3,000 years ago. The Corps continues to make new archaeological finds, often due to natural disasters. In 2008

a levy broke on the Mississippi River in Iowa. When the Corps came in to survey, they found a 1,000 year- old village underneath. They recovered more than 270,000 artifacts, and the remains of approximately 40 houses from the late Woodland period. There were about 150 pits, some with food remains, which helped archaeologists learn details about the diet of the people who lived there.-K.S.

NOTE: Many Corps recreation areas have small museums or interpretive centers that display ancient finds unveiled on the site. If in doubt, ask a ranger.



**THE DUSTY 1,000-ACRE FIELD IN NIGER** slated to become a U.S. Zone of a Niger air base, wasn't known as the site of any ancient settlement. But when St. Louis-based archeologist Amy Williams and a colleague saw the first hunk of what resembled a sharp, carved tool sitting just outside their evaluation grid, they knew they'd found something important. And then they found two more of one of the same—of what would turn out to be hand axes crafted and used more than 1 million years ago.

We were in shock," she said. "We said, 'Is this possible? Did we really just walk across this in the middle of this thousand-plus acre plot of land?'"

The three carved and pointed tools, each about the size that fits perfectly when cupped into an adult's hand, are suspected to have been created by the earliest known users of stone tools, Homo Erectus—the precursor to modern man. Only a few such examples have been found in Africa and parts of Asia. These two-sided hand axes were possibly used, though there's ongoing debate about their purpose, to butcher animals, dig for tuber vegetables, chop wood or remove tree bark.

"It's absolutely the oldest thing I've ever found," says Williams, a supervisor with the St. Louis District of the U.S. Army Corps of Engineers. "In the Midwest, I've worked on sites that are 2,000 years old. These hand axes may be up to 1.2 million years old."

Williams' day job involves working with older collections from her office base in St. Louis, preparing them to federal standards for permanent curation. But on occasion, experts from the Mandatory Center of Expertise for the Curation and Management of Archaeological Collections are called to other sites for assistance, as was the case during construction this early spring of a U.S. Use zone of a Niger Air Base. The Air Force follows the same cultural resource survey protocol they would follow in the U.S., she says, which means an official pre-construction survey of a site for potentially significant cultural artifacts.

sed archeologist and a colleague.

Williams was with survey partner James Wilde of the U.S. Air Force Civil Engineer Center, just at the edge of their survey grid, when Wilde called her over.

"He held something up, and I could see from 30 feet away what it was," she said. "It was a large hand ax. He pointed down, and there was another one right next to it. We started walking the area more closely, looking, and I found a third one about five meters away from these two. It was obvious what it was in that location. Those hand axes definitely looked different from anything else on the ground. I think we both just looked at each other and grinned. We were a little in shock."

Under a no-collection policy for the site, the artifacts will now be maintained by the Air Force presence at the site until the finds can be turned over to the government of Niger.

No one expected such a find at this location not far from the city of Agadaz but in at least recent history used for agriculture, not settlement. Also, other rocks found in the survey looked dramatically different from those used to make the tools, Williams notes.

"They do have seasonal rains, and because of the geology and how dry it is, water is not absorbed well into soil and it just runs," she said. "It's possible that water could have moved them from a different area."

However they got there, these tools with distinctive pear shapes known as Acheulean tools and produced as far back as 1.76 million years ago, seemed "waiting to be discovered" said Williams, and have generated a lot of attention in the professional archaeology world.

Their existence speaks to the significance of this region's prehistory, through its history as a caravan path and trade route, and onto its current development as an international airbase.

"Discoveries like this are for everyone to learn and enjoy," she said. "These artifacts tell part of Niger's rich history"—and that of humankind.— $\kappa$ .s.

**June 18, at five a.m.** We are said to be in the big woods; the wood all alive with pigeons and they are flying across our course... swallows, kingfishers, blue jays and warbling vireos along the shores...

The steamer approaching whistles, then strikes a bell about six times funereally, with a pause after the third bell; and then you see the whole village making haste to the landing—commonly the raw, stony or sandy shore—the postmaster with his mailbag, the passenger and almost every dog and pig in the town.



## **THOREAU'S JOURNEY WEST**

The grand feature hereabouts is the Mississippi River. Too much can hardly be said of its grandeur, and of the beauty of this portion of it, from Dunleith, and probably from Rock Island to Red Wing....

Henry David Thoreau is most known for his time spent as something akin to a hermit at his dear-to-him Walden Pond. Some credit the resulting tome— *Walden*—with launching a simplicity movement, even the current trend toward small houses. But had Thoreau lived even a year beyond his last grand journey, author Corinne Smith thinks the book about travels to the Mississippi River, one that might have included excerpts from journal entries like those above, might have been his most famous.

The 200th anniversary of the author's birth has brought renewed attention to the journey west that Smith covered in her book, *Westward I Go Free: Tracing Thoreau's Last Journey*. On that, Thoreau and a young scientist friend ventured by train and steamboat past Niagara Falls, Michigan's Mackinac Island and parts of Wisconsin and Minnesota along the Mississippi. Unlike other journeys focused more on contemplation, though, this one was partly about finding a cure for his consumption or TB. In a letter to a friend he noted "I have concluded it will be most expedient for me to try the air of Minnesota, say somewhere about St. Paul. I am only waiting to be well enough to start."

There's no question, though, that this was designed as at least one last grand scientific expedition, one that coincided with a dramatic expansion of the U.S. Civil War.

"He took his spy glass, botanic manuals and a plant press so he could bring samples home," Smith said. "He traveled by train by day and would botanize from what he could see out the windows." One journey entry written when he reached the Mississippi River read:

"The redwing blackbird, which I found was the prevailing bird till I reached the Mississippi, is also common here. Here, too, I see or hear the marsh hawk, or the prairie the nighthawk, swallows (in the bank), martins, a sereepa note (the particolored warbler, Maryland yellow-throat and night warbler). The horned lark is here very tame—white on the end of the tail, chestnut head and yellowish. The bluebird,

BELOW FROM LEFT: Thoreau climbed Barn Bluff and stayed at the Metropolitan House hotel, both in the picture, provided by the Minnesota Historical Society. He traveled up the Mississippi on the War Eagle. the thrasher and cat-bird, and the robin; the bay-wing, white-throated sparrow, chewink, tanager, lark, black-throated waxwing, and tufted kingfisher,; pigeons and I heard the flicker, who is such a telltale when near ..."

This listing of observed species wasn't Thoreau's first attempt at creating a list or phenology of the flowers and plants. Back in Concord, Massachusetts, he'd kept such detailed records on when plants flowered and bloomed that Boston College researchers used his records earlier in the century to help prove climate change, Smith notes.

There's a cultural significance to his writing too, evidenced by the many journal mentions of Native Americans he encountered along the Mississippi, either by accident or intention.

"We see Indians encamped below Wabasha, with Dakota-shaped wigwams; also a loon on a lake, and fish leaping," he wrote. He also paid \$10—a virtual fortune in days when hotel night was \$1—for a grand steamboat excursion that had as its focus the chance for tourists to see members of the Sioux tribe being paid their annual treaty allowance. He never did see the promised 5,000 tribal members, Smith said. But he did witness a ceremony, participate in an ox roast and return home with three pieces of buckskin clothing decorated with beadwork and quillwork, items now in the Thoreau collection at Concord Museum.

The casual observer may think it dumb to follow in someone's footsteps 150 years after a trip, said Smith, who traced Thoreau's westward journey by car. "But you do get a flavor of it, and eventually the journey you're taking becomes your own anyway. It becomes your own adventure layered over the historic one you were following."

The Mississippi River was the nation's far west when Thoreau visited, and still a relatively wild west. But New Englanders were already flocking to river towns to find soils more amenable to farming than the rocky lands back home. Plus here, John Deere was making plows, Cyrus McCormick, reapers, Smith says.

Some towns actually were larger when Thoreau visited than they are today—notably Galena, Illinois, and Prairie du Chien, Wisconsin.

"It is the smartest town on the river," Thoreau wrote of Prairie du Chien. "It exports the most wheat of any town between St. Paul and St. Louis. There is wheat in sacks, great heaps of them, at Prairie du Chien, covered at night, and all on the ground."

While some of the plants and animals are different—passenger pigeons, for instance, were plentiful then—Thoreau's writing themes on the environment, simplicity, civil rights and travel—continue to resonate. Another lesson is that Thoreau's favorite places (be it Walden or the Mississippi) shouldn't necessarily become ours. "The lesson is to find our own place," Smith says, "to figure out where our Concord and our Walden Pond are." -K.S.



#### **HIGHLIGHTS FROM THOREAU'S 1861 TRIP**

June 6 Thoreau says he "walks westward" from Lake Calhoun Minn.; he sees a big passenger pigeon nest; and he talks to local lumberjacks about timber biz. **June 8** Thoreau finds a rose-breasted grosbeak nest that contains 4 green & brown spotted eggs, and notes in his field journal, "Male bird on nest & keeps within 3 feet."

June 13 Henry Thoreau studies the sand at Lake Calhoun (now part of the Minneapolis parks system). He finds that some of the grains are "minute but perfectly regular oval pebbles of white guartz." **June 17** Thoreau & Mann board the steamboat *Frank Steele* & join a "grand pleasure excursion" up the Minnesota River to see the Dakota Indians.

8 Mississippi

## A fleet blessing for modern river needs

**IN MEDIEVAL TIMES,** European village priests would head to the water each early summer to bless the fishing fleet. The goal was to ensure the safety of fishermen and bounty of the catch. In Vicksburg, Miss., that ancient protection was extended recently by a local Episcopal priest to the crew and families of the dredge *Jadwin* and nine other boats that work to keep some 800 miles of navigation channels operational, protect levees and reduce flood risks.

To maintain navigation channels, the Corps needs a whole fleet that includes the mat sinking unit, towboats, quarter boats, and a dredge. The *Jadwin*, a dustpan dredge originally built in 1933 to operate under steam power, but since converted to modern diesel-electric power, is a key part of the operation. Its 50-man crew spent 235 days on the river last year working to keep navigation channels open on the Lower Mississippi River. Among the other vessels blessed in the ceremony were the crew boat, the Muddy Water, which serves as a water taxi to ferry workers to and from job sites.

The mat sinking unit, of which the vessels all play a part, is the only unit of its kind in the world and one responsible for one of the most important jobs in the U.S. Army Corps of Engineers' river stabilization program. So large that it's known as a floating city that houses and feeds its employees (see below), the unit is out for many months at a time, dredging channels and waterways and preparing for spring floods. It's also a unique floating plant that places articulated concrete mat on the riverbanks to control erosion.

The Rev. Sam Godfrey of Christ Episcopal Church blessed the crew and families in this fourthever event reinstated to recognize the efforts and sacrifices of deploying teams. The fleet includes 300 crewmen who will travel between 900 and 1,000 river miles and lay 260,000 squares of reinforced concrete matting, enough to cover 600 acres of shoreline. That will be double the amount of matting the team placed last year. -K.S.



#### The Mat Sinking Unit 5Ws

- Who: An Army of more than 300 men and women begin four months on the river each summer in the annual struggle to maintain riverbanks for levee protection and a safe navigation channel. The crew lives and dines on quarter boats that tie off to the bank, with galley cooks providing the meals. The seasoned pros on the team include clerks, deck hands, drag line operators, electricians, gantry crane operators, mechanics, surveyors and more.
- What: Cranes move 16-block sections of mat from a supply barge to a matboat where workers wire sections together and to launching cables. The sections are tied together to make a square concrete carpet designed to cover 300 to 600 feet of long sloping river banks. Once a carpet is laid, the crew moves upstream and repeats the process.
- When: During traditional low-water months of August, September, October and November, the crew works 10-hour shifts over 12-consecutive-day work periods.
- Where: Over 1,000 miles of the lower river system.
- Why: The mat forms a protective overcoat to shield the riverbank from erosion caused by channel currents and turbulent water associated with river flood stages.

### AN OUNCE OF PREVENTION Experimental wicket dam wins innovation award

 omposite materials have become a popular low-maintenance alternative to wood for homeowners looking to save time on upkeep of things
like decks, fences and docks.

But whether there's a similarly appropriate replacement for the massive wood and steel timbers that make up a special type of river dam is the subject of a collaborative experiment by the Rock Island District's Illinois Waterway Project, the Inland Navigation Design Center and the Engineer Research and Development Center (ERDC). New composite wicket gates have been installed at the Peoria Lock and Dam, part of the set of planks used to hold back water when needed and lowered to allow boats to pass when not in use.

Historically, these wicket gates have been constructed from wood and steel and need frequent replacing due to rot and corrosion. The experimental planks, installed at Peoria in September 2015, were made of Fiber Reinforced Polymer composites, 16 feet long, four feet wide and eight inches thick—a size that allows them to fit into existing hardware in place at the dam. The U.S. Army Corps of Engineers is looking to the new material as a potential savings in a maintenance budget that's under stress.

"One thing that is typical of all the locks and dams up here is they were built in the 30s with a 50-year or so life span, and they're well past that," says Mark Burton, Illinois Waterway Operations Manager. "Maintaining aging infrastructure has become more challenging as the years go on. What these do—if they pan out—is they're a material that will last a long time. It'll help at least minimize the labor and time and effort needed to repair each one."

Providing a link between Lake Michigan and the Mississippi River, the waterway consists of the Illinois, Chicago, Des Plaines and Calumet Rivers, the Chicago Sanitary and Ship Canal, and the CalSag Canal. It connects the Great Lakes with the Gulf of Mexico. Eight navigation dams and locks built in the 1920s and '30s create a "stairway of water" that drops 163 feet over 333 miles between Chicago and Grafton, Ill. Each dam in the system produces a pool, or long, narrow lake with a depth of nine feet in the main navigation channel. Locks provide river traffic with safe passage around the dams, while raising or lowering vessels one step along the stairway.

Wicket dams can be used where the drop from one pool to the next is relatively small; that's the case at both the Peoria and LaGrange locks. If water is high enough, the wicket dam is just laid down flat so that boats can glide overtop, Burton says.

The dam has been nationally recognized for innovation in design, fabrication and installation. Structural experts also recently assessed the condition, and personnel from ERDC conducted thermal imaging and other methods to search for design voids. None were found.—K.S.

#### **OUR MISSISSIPPI KIDS**

## **Bee'** a good river steward

**Honey bees** play an important role in getting food to our tables. As worker bees visit flowers to gather nectar and pollen to eat, their feet accidentally collect small amounts of pollen that falls off when they visit other flowers. This process, called pollination, causes fruit to grow and produces seeds necessary to grow more plants. In the United States, bees help pollinate crops, including apples, almonds, watermelons and beans, valued at about \$15 billion.

About 10 years ago, beekeepers began reporting large number of bee hives dying off. Many hives experienced Colony Collapse Disorder, where the majority of bees in the hive disappear and leave their queen behind. Others experienced mite infestations. These tiny, external parasites attack honey bees and their eggs, which hurts the insects and shortens their lifespan. It can cause bees to emerge with missing legs or wings. Some beekeepers expressed concerns that the problems were, in part, related to

pesticides or substances that are sprayed on crops to kill other insects.

Scientists and others are working to help bees by developing treatments for bee diseases and eliminating the use of some pesticides. You can help make your yard more bee-friendly by planting a variety flowers native to your area and making sure that you have flowers blooming throughout the growing season.

#### A BEE'S LIFE

Unscramble the words to find the names of the four stages of a bee's life then number the stages in the order in which they occur, 1-4.

#### \_ UPPEA

The time when you can see the shape of a bee's body form.

#### \_\_\_\_ GEG

The initial stage of a bee's life when it looks like a tiny grain of rice.

#### LATUD

The final stage of a bee's life.

#### \_ ERVALA

The bee spends most of its time eating during this stage because it is growing quickly.

Answers: Egg; Larvae; Pupae; Adult

#### **MEET THE BEES**

*Queen,* mother to all the bees in the colony; she is a fertile female.

*Ophkeh:* an infertile female that works to make the hive successful. Workers guard the hive, feed other bees and heat and cool the hive.

an unfertilized egg. Its only purpose in the colony is to mate with a queen. About one in a thousand get the opportunity to mate.

-SOURCE: AMERICAN BEEKEEPING FEDERATION



In 1854, Henry David Thoreau first published his book *Walden*, a reflection on simple living in natural surroundings. Though Thoreau, if alive, would have celebrated his 200th birthday this summer, his work is particularly timeless, partly because of his practiced ability to pay attention (and record) what he saw around him. Practice becoming Thoreau in your own Mississippi River version of *Walden* by trying one of these activities.

Thoreau

#### Make a sound map

Get a piece of paper and writing utensil, draw a picture of yourself in the center of the page (leaving room around the edges), then

stand outside, close your eyes and listen. Over the course of 10 minutes, draw what you hear and where. If you hear a bird to your left, draw the sound, what you think it's coming from or just write a name like "bird." Thoreau wrote about sounds a lot, and plants too. Because he was usually by himself, he could be aware of the natural world. One quote I like is "To be awake is to be alive" meaning "Pay attention."

#### **Envision small house living**

Thoreau's house at Walden Pond (a reconstruction of it is pictured above) measured 10 feet by 15 feet. Recreate his experience by marking off a 10 by 15 foot rectangle on the ground and pretend that it's your house, maybe even create the house using cardboard for your floor. Picture a door on one end, a window on either side and a fireplace. How would you live in that house with one bed, three chairs and a desk?

#### **Observe animal behavior**

In writings like his notebook from a trip to the Upper Mississippi River, Thoreau would write about the animals he would see and what he watched them doing. Of two different types of gophers, for example, he wrote "Both have feet like a marmot and large pouches and sit up by their holes like a woodchuck. The first is not shy." Try to carve out 30 minutes, sit in one place quietly (and without any electronics around) and watch for a living creature (squirrel, bird, bug or larger mammal). What is it doing? Is it eating? Looking for food? Gathering material for a nest? Watch closely enough that you could draw it later and also explain to others what you saw.

-Corinne Smith, author of "Henry David Thoreau for Kids"

To use the Mississippi River in a more formal way, teachers can request a free copy of the "Our Mississippi Teacher Guide" geared for grades 5 and 6 with extensions for upper and lower grades. For copies, contact the National Great Rivers Museum, 618-462-6979; Our Mississippi facilitators can provide workshop training, or find activity pages at http://www.ourmississippi.org.





## Must-visit museums share river stories

#### OUR MISSISSIPPI TRAVEL

The Mississippi River is a remarkable teacher. Along the river, one could learn how to identify a sandhill crane by its bugle, watch levees and spillways in action and witness the landscape change from wetlands to swamps as the river winds south to the Gulf of Mexico.

But, complementing all of the lessons on the river itself are more than 70 museums, visitor centers and interpretive centers that are treasure troves of information about all-things-Mississippi River. The museums that dot the river run the gamut—covering science, history, art, wildlife and with others paying homage to known fixtures, like Mark Twain and Buffalo Bill.

As a sample, the New Madrid Historical Museum in Missouri will teach you about, how, after a series of earthquakes in the early 1800s, the river actually flowed backwards for several hours. The Mississippi River Visitor Center Locks & Dam 15 draws visitors from around the world who want to see the Bald Eagles that flock to the locks and dams along the river during the winter months to feed. And at the National Great Rivers Museum in Alton, Ill. visitors can learn all about the Mississippi Lock and Dam System, and can even try to steer a barge.

Corps visitor centers cover a variety of river topics and have similar education and outreach missions. They help visitors and nearby residents better understand and, in turn, appreciate the river. Also, many have volunteers who help keep them running and who are excited to help tell the story of the Mississippi.

At the National Great Rivers Museum—a U.S. Army Corps of Engineers visitor center that works in conjunction with The Meeting of the Rivers Foundation visitors will get an overview of the Mississippi River. The congressionally authorized visitor center opened in 2003.

"We take a broad brush stroke to tell the story of the Mississippi River," says Kimberly Rea, who is with the U.S. Army Corps of Engineers Rivers Project Office in West Alton, Ill. "We touch on everything that makes the Mississippi River what it is today."

For example, visitors will find exhibits such as "Mississippi in Motion," which shows the different river cycles; a river timeline that is a sweeping 60-foot wall display that presents the history of the Mississippi. There's an aquarium that includes many common river fish. The museum also has popular interactive exhibits, including the "Stairway for Boats" that allow visitors to control the flow of water between four stair-stepped pools to help demonstrate the Lock and Dam system. Visitors can also try their hand at steering a barge in the lifesize replica of a towboat pilothouse and take daily Lock and Dam tours that start at 10 a.m., 1 p.m. and 3 p.m. Also, each President's Day weekend in February, the museum partners with The Meeting of the Rivers Foundation to host a "Masters of the Sky" birds of prey demonstration that features eagles, falcons, owls and other birds.

Rea says that educating people about the Mississippi River is important, since many people—even nearby residents—will cross over the river and not know what they're crossing.

"It's important for people to know how the river impacts their lives," Rea says. "When they make that connection that the river is where they get their drinking water, for example, it encourages them to be good stewards of the river and embrace public lands."

The National Great Rivers Museum is also near the Audubon Center at Riverlands, which is thousands of acres of restored prairie marsh and forest at the U.S. Army Corps of Engineers' Riverlands Migratory Bird Sanctuary. Visitors here can see 325 or so species of songbirds that live in, or migrate through, this habitat and include bald eagles, egrets, herons and waterfowl species.

Further down the river is the Jesse Brent Lower Mississippi River Museum, a U.S. Army Corps of Engineers museum in Vicksburg, Miss. that gives visitors a glimpse of life on the Mississippi. Visitors at this museum can hear what the 1927 flood was like from a family that lived through it, tour a towboat and see some of the river's native and invasive fish in a 1,515-gallon aquarium.

"I like to think that when visitors walk through the front doors, they are taking a step back in time to explore the fascinating history of the USACE's past," says Kathy Mabry, park ranger with the Jesse Brent Lower Mississippi River Museum.

That history dates back to when Colonel Richard Gridley became General George Washington's first Chief Engineer after Congress established the Continental Army in 1775, she explains.

A visitor favorite is the dry-docked towboat, the "Motor Vessel Mississippi IV," which is on display at the museum. The 271 foot long towboat was decommissioned in 1993 due to the arrival of the new "computer age," Mabry says. It had served the Mississippi River Commission and the U.S. Army Corps of Engineers for 32 years.

"It by far seems to leave a lasting impression with every visitor," Mabry says. -B.A.

### A MUSEUM FOR EVERY INTEREST ...



At the Mark Twain Boyhood Home & Museum in Hannibal, Mo., you can see the writer's personal artifacts, including

MARK TWAIN

his typewriter, writing desk and chair and his famous white jacket.

#### BEER BREWING

Beer connoisseurs, there's a national brewery museum that showcases an eclectic mix of beer bottles and cans, glasses, coasters and collectibles at Potosi Brewing Company in Potosi, Wis.

#### NATURAL HISTORY

Exhibits at the Mississippi River Visitor Center in St. Paul, Minn. cover the culture, biology and history of the Mississippi River, and is nearby the Science Museum of Minnesota. At this visitor center, you can learn about popular programs, including "Bike with a Ranger" and "Fish with a Ranger."



Learn about William Cody, more commonly known as

Buffalo Bill, at the Buffalo Bill Museum in LeClaire, Iowa. The museum preserves river pilot artifacts, Buffalo Bill memorabilia and items common to homes in the early-1800's in the region.



BLUES MUSIC At the Delta Cultural Center in Helena, Ark., a popular exhibit is one that's devoted

to King Biscuit Time, which was the longest running daily blues radio show in the United States.



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#### **PLANTS** K DRATION ΗY -510

Nature has, for the most part, evolved a plant for every growing condition. This is the mantra of the Nature Resource Conservation Service, one organization working to design and engineer marshes best suited to help slow land loss in Coastal Louisiana. Plants define the wetlands, trapping sediment, holding solids together and providing organic matter that builds marsh elevation and supplies nutrients for the food chain.

But if nature can offer the ultimate test anywhere, it does so here. Storms and high tides bring flooding (and plant breakage), drought kills vegetation, and plants and animals uproot them. There's value, though, in experience. The Coastal Wetlands Planning, Protection and Restoration Act is drawing on 26 years of experience in finding and developing the right plant for the right purpose.

"CWPPRA's history demonstrates that we cannot always assume the desired plant community will simply emerge on its own," says Cindy Steyer, a coastal vegetative specialist with the Natural Resources Conservation Service. But thoughtful design fosters success, she says. Marsh projects require certain conditions—not too wet nor too dry, and the planting calendar has to be timed to ensure vegetation survival.

For the best chance of success, the project has turned to the Golden Meadow Plant Materials Center in Galliano, Louisiana, which has developed plants for challenging conditions. A smooth cordgrass with high saline tolerance has proven to grow well in salt marshes, while California bulrush grew better in freshwater marshes. When young plants were continually destroyed by wave action, plantings were coupled with shoreline protection measures. Through a new Coastwide Vegetative Planting program, new locations are picked annually based on need and feasibility of success.

"Challenges lie ahead," says Garret Thomassie, manager of the plant materials center. "We are frequently asking how best to mimic what nature does. Our disappointments challenge us to find better ideas and improve the plant technology available for restoring our natural resources."

Authorized by Congress in 1990, CWPPRA was the first major federal program to fund Louisiana coastal wetlands restoration projects. CWPPRA is managed by a Task Force comprised of the State of Louisiana and five federal agencies: the Environmental Protection Agency, U.S. Fish and Wildlife Service, the Natural Resources Conservation Service, the National Marine Fisheries Service and the U.S. Army Corps of Engineers. - ADAPTED FROM WATERMARKS MAGAZINE



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