The Corps
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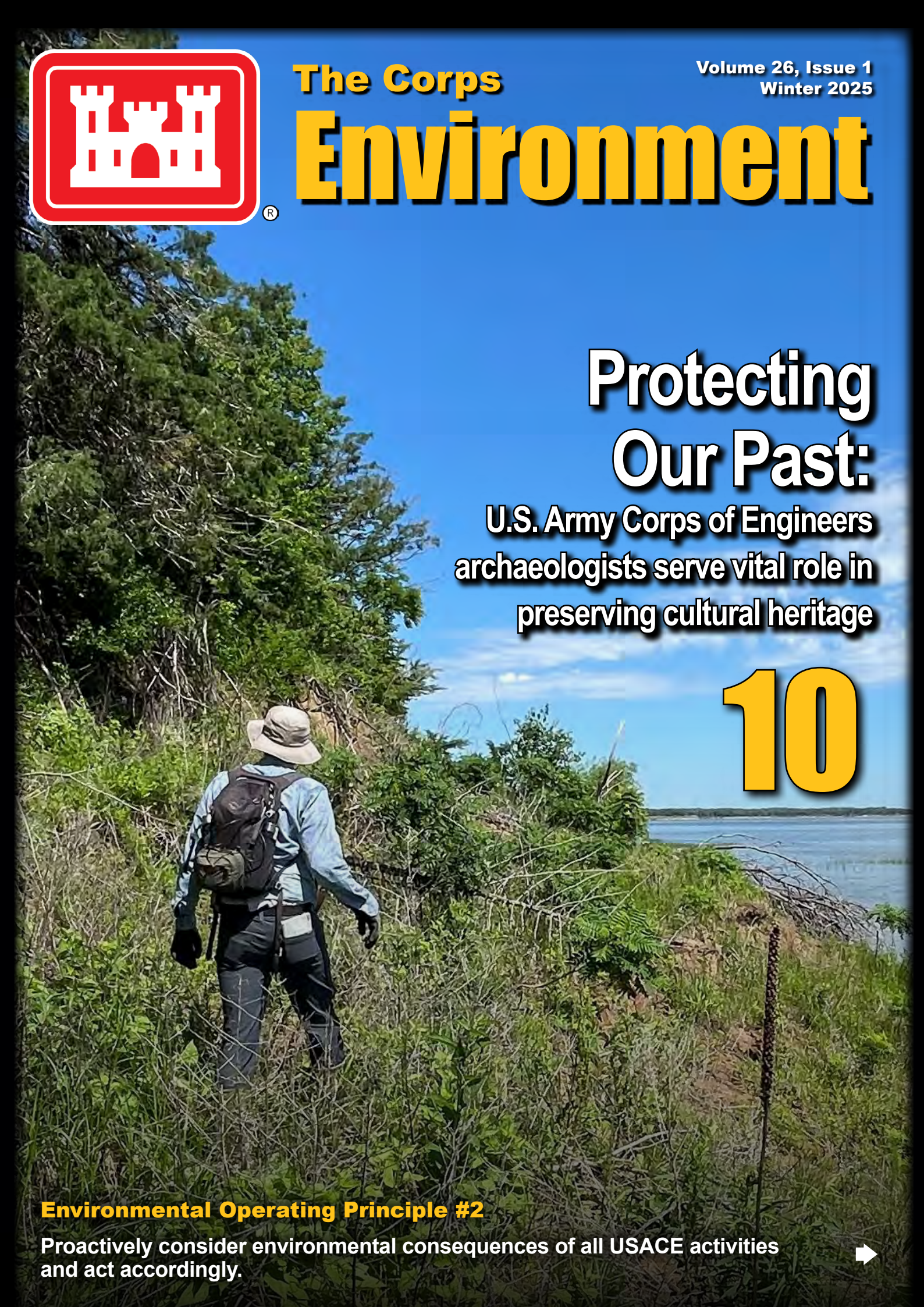

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Proactively consider environmental consequences of all USACE activities and act accordingly.

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Students from Jennie D. Blake School in Hill, New Hampshire, present their model of Franklin Falls Dam at the Association of State Dam Safety Officials Conference. (USACE Photo)

On the Cover: USACE archaeologist Phil Alig surveys a cutbank at Milford Lake, Kansas. Cutbank surveys search for archaeological remains that have been exposed by erosion along rivers and streams. (USACE Photo)

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The Corps Environment's editorial staff welcomes submissions with an environmental, sustainability or energy focus from USACE and Army units worldwide.

Send articles, photos, events, letters or questions to the editor at Corps-Environment-Magazine@usace.army.mil.

Submission deadlines are indicated in red:

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March 15	Spring
June 15	Summer
September 15	Fall

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Environmental Advisory Board

Member Feature: Dr. Terri Hogue

The Environmental Advisory Board (EAB), a subcommittee of the Army Science Board, provides the chief of engineers with outside expert and independent advice on environmental issues facing the U.S. Army Corps of Engineers. The members of the EAB are a diverse mix of professionals from academia, non-governmental organizations and other non-federal entities.

The chair of the EAB is Dr. Terri Hogue. Hogue is a professor and dean of Earth and Society Programs at the Colorado School of Mines. She also serves as a board member on the Army Science Board, a federal advisory committee that provides independent advice and recommendations to the Army on matters relating to the Army's scientific and technological functions and other matters the secretary of the Army deems important.

Dr. Terri Hogue, EAB chair

Hogue is an expert in civil and environmental engineering, including watershed hydraulic science and engineering, and her research interests include better understanding the interactions among water, humans and the ecosystem. Her expertise was pivotal in the successful delivery of two recent EAB study topics related to nature-based solutions and beneficial use of dredged materials.

What inspired you to join the EAB?

"As an educator, I have had numerous students choose the Corps as a career path, and I have been utilizing Corps models and programs in my courses and research projects throughout my career. When the opportunity arose to serve on the EAB and contribute to the Corps' mission, it was an easy decision. I was excited for the opportunity to learn more about the breadth of work within the Corps, meet employees within the organization and ultimately provide support to the activities of the Corps."

What is something that has surprised you about USACE?

"Seeing the diversity, breadth and scale of the projects within the Corps is truly impressive and has been incredibly enlightening. Even though I had worked with the Corps in the past (Los Angeles District), there is a much wider portfolio of activities within the Corps that I had not been exposed to. I am excited to continue to learn more about the Corps' work and provide whatever support from the EAB that we can."

What has been the most rewarding experience while serving on the EAB?

"The people! The EAB has a committed group of professionals that are truly enjoyable to work with and have so much to bring to the table. The USACE employees we have met and worked with and the projects they are working on have allowed us to see into the diverse portfolio of activities and help guide advice and outside views that we can bring to the Corps' mission."

Looking Forward

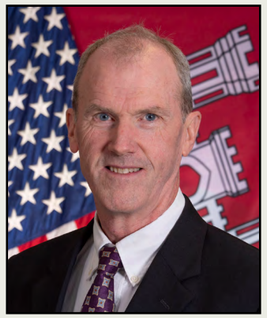
This year the EAB will be starting new study topics related to streamlining the USACE planning model approval and review process, Nature-Based Solutions training for USACE staff and Phase 2 of Nature-Based Solutions and Beneficial Use related to environmental benefits.

Learn more about the EAB at https://www.usace.army.mil/Missions/Environmental/Environmental-Advisory-Board/

Engineering Solutions

delivered through our people, project delivery processes and environmental considerations

Sound business processes and a proficient workforce — these are essential elements to achieving our vision of engineering solutions for the nation's toughest challenges at the U.S. Army Corps of Engineers (USACE).



Dave Morrow
Director, USACE Military Programs

Executing our diverse portfolio requires a wide array of skillsets and competencies to address conditions within both our physical and natural environments.

Since joining USACE Headquarters as director of Military Programs in December 2024, I have been keenly focused on the safe delivery of quality projects on time and within budget as we execute more than $25 billion worth of work each year across the many missions that make up our global Military Programs portfolio. This is a complex undertaking and our success in upholding this commitment is grounded in our people. It is through the dedicated efforts of our more than 40,000 dedicated professionals across this organization that we continue to advance the delivery of projects for our partners, our nation and communities around the globe.

Progress starts at the project delivery team level. It is my job as a leader — especially a leader at the Headquarters level — to support our project delivery teams. In my career, I have worked in various positions within USACE, to include serving as the deputy district engineer for Programs and Project Management and the chief of the Environmental and Munitions Design Center at the Baltimore District. Regardless of the leadership position I have been in, the attributes that have remained constant and that I have embraced are that empowering staff, communicating honestly and transparently, and taking care of our people are fundamental to building strong teams — and therefore, fundamental to project delivery.

At the project level, our teams are focused on day-to-day execution — as they should — but I would be remiss to not highlight that every project being executed is connected to and directly supports broader initiatives for our Army, Air Force and Department of Defense (DOD) partners as well as non-DOD agencies. These initiatives have far-reaching effects. For example, we have military construction projects on more than 287 installations around the world where we are building facilities such as hospitals, barracks and schools. These projects provide value beyond the physical infrastructure — these projects enhance the quality of life for active-duty service members, their families and retirees and support our nation's defenses at home and abroad. Similarly, we are managing over 30 construction projects that support the wellness and care of our veterans. We are also providing services in support of reconstituting the Army's industrial base. This provides critical material and sustainment support to our warfighters across the joint force. Every project we execute provides direct benefits to our physical and/or natural environments.

One-third of my career has been managing environmental cleanup programs, and just as taking care of people is core to our success in delivering on our commitments, so are our Environmental Operating Principles. These principles are not just "nice to have" or "bolt on" features — they are integral to everything we do every day in USACE.

The environment touches on every mission area within USACE, which is why it is so important that we continue to embrace environmental stewardship as a key part of our culture. This focus on stewardship will provide us with the solid foundation we need to meet expectations set by Congress to advance the use of sustainable design and construction practices, new technologies and materials, and energy efficiency measures to optimize performance and strengthen the resilience of our nation's facilities and infrastructure.

This will also help us to remain laser-focused on executing more than $2 billion worth of environmental compliance and cleanup work on an annual basis in support of our DOD and non-DOD partners. This work includes cleaning up sites degraded by activities that occurred throughout history in support of military readiness and national security. This also includes providing technical support to our DOD and interagency partners in achieving their programmatic goals for environmental compliance.

The theme of this edition of "The Corps Environment" is focused on proactively considering the environment, which is in support of USACE Environmental Operating Principle #2: "Proactively consider environmental consequences of all USACE activities and act accordingly." Environmental stewardship is not only important to me personally, but important for our Army and our nation. That is because the legacy we leave behind for future generations is incredibly important.

We are working numerous initiatives within USACE to ensure that the projects we deliver today are sustainable for years to come. These initiatives include leveraging high-quality data to not only see ourselves and our external environments more completely and accurately, but also to improve our decision-making and project delivery processes. Additionally, we are looking at ways to maximize how we share lessons learned. This is not limited to internally through our communities of practice, where we connect our geographically dispersed technical experts to share lessons learned and best practices, but also with our external partners so we can collectively address complex challenges and ensure the actions we take today will enhance our tomorrows.

USACE Environmental Operating Principles

1. Foster sustainability as a way of life throughout the organization.
2. Proactively consider environmental consequences of all USACE activities and act accordingly.
3. Create mutually supporting economic and environmentally sustainable solutions.
4. Continue to meet our corporate responsibility and accountability under the law for activities undertaken by USACE, which may impact human and natural environments.
5. Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.
6. Leverage scientific, economic and social knowledge to understand the environmental context and effects of USACE actions in a collaborative manner.
7. Employ an open, transparent process that respects views of individuals and groups interested in USACE activities.

Continuing Collaboration

Military munitions conference returns, underscores unified commitment to environmental excellence

By Lillian Putnam
U.S. Army Engineering and Support Center, Huntsville

For the first time in 13 years, the U.S. Army Engineering and Support Center, Huntsville's Environmental and Munitions Mandatory Center of Expertise (EM CX) hosted the Military Munitions Support Services (M2S2) Stand Down, Dec. 10-12, 2024, at Redstone Arsenal, Alabama.

The event brought together professionals from the U.S. Army Corps of Engineers, Department of Defense, other federal agencies, state regulators and private contractors to address military munitions response and environmental efforts.

The conference began with discussions led by key leaders in the munitions support services field including Brian Jordan, Munitions Program manager for the Office of the Assistant Secretary of Defense; Gunarti Coghlan, DOD Environmental Programs branch chief for USACE Headquarters; Nicole Toth, M2S2 action officer for USACE Headquarters; and Michelle Lordemann, EM CX director.

The presentations provided critical updates and outlined initiatives aimed at improving safety, efficiency and collaboration across military munitions response activities.

"Our primary objective under M2S2 is to provide safe, quality and consistent military munitions support," Toth said. "So regardless of the stakeholder, their geographic location or the scope of the job, we are working hard to drive consistency in the level of support our military munitions design centers provide to address the needs of our customers."

> "By working with DOD, federal land managers, regulators and contractors, we can better uphold the highest standards of safety and environmental stewardship."
>
> **— Michelle Lordemann, EM CX director**

Attendees explored a wide range of topics and initiatives related to munitions response cleanup. Presenters shared lessons learned, while designating time for questions and answers, creating a collaborative environment for advancing technical expertise.

"This is currently one of the few events that provides an opportunity for collaboration, which is essential for ensuring consistent and efficient execution of our mission," Lordemann said. "By working with DOD, federal land managers, regulators and contractors, we can better uphold the highest standards of safety and environmental stewardship."

An attendee asks a question during one of the sessions at the M2S2 Stand Down Dec. 10-12, 2024, at Redstone Arsenal, Alabama. (Photo by Lillian

Discussions focused on emerging trends, technological advancements and ways to improve coordination between federal and state regulators, land managers and contractors. With an array of experts in attendance, the conference underscored the importance of interdisciplinary collaboration in tackling complex challenges within the field.

Andrew Rebman, USACE South Atlantic Division Formerly Used Defense Sites program manager, emphasized the benefit of alignment between policy and practice.

"A conference like this helps us gain a better understanding of all the inner workings throughout the programs, while giving us the opportunity to hear senior leaders' perspectives on policies," he said.

M2S2 encompasses the full spectrum of work to address unexploded ordnance, discarded military munitions, munitions constituents and chemical warfare material. These activities span a variety of initiatives, including the Military Munitions Response Program (MMRP), operational range sustainment and support for construction projects.

Safety remains a priority in all M2S2 efforts, which involve addressing military munitions across various programs and project activities. Through the M2S2 community of practice, USACE maintains a highly specialized workforce dedicated to managing and mitigating the unique challenges posed by military munitions in the environment.

"The objective of M2S2 is to ensure that munitions response activities are performed safely, consistently and efficiently," Lordemann said. "This approach helps us address diverse needs while maintaining a unified commitment to safety and excellence."

Many discussions highlighted the importance of fostering strong partnerships among USACE, state and federal regulators, DOD leaders, federal land managers and contractors. The event provided a platform for exchanging knowledge and addressing pressing issues in the munitions response community.

"We will continue advancing our M2S2 efforts by building off lessons learned, leveraging innovative technologies, increasing personnel and training opportunities at our military munitions design centers and actively engaging with the contracting community to ensure we are ready and responsive to the evolving needs of our customers," Toth said.

Protecting Our Past

USACE archaeologists serve vital role in preserving cultural heritage

By Taylor King
USACE Kansas City District

Beneath the surface of infrastructure projects and flood control measures, a quiet but vital mission is underway. Federal archaeologists are uncovering hidden pieces of history as they work to preserve cultural heritage during modern development. From ancient fossils to long-forgotten Native American sites, these archaeologists are the stewards of our nation's past, ensuring that progress does not erase the stories that came before.

Preservation and exploration of local history are critical and often overlooked responsibilities of federal organizations. The National Historic Preservation Act of 1966 (NHPA) requires any project that might impact cultural or historic sites to conduct an archaeological evaluation. At the U.S. Army Corps of Engineers, archaeologists are dedicated to uncovering and protecting our cultural heritage, using construction and engineering projects as opportunities to discover artifacts and sites that are key to understanding our shared past.

Historically Significant Sites

Whether it be infrastructure construction, environmental rehabilitation or military support, archaeologists — working closely with engineers, environmental planners, tribes and state historical resource organizations — are tasked with ensuring USACE projects do not harm historically significant sites.

"We're federally mandated to act as stewards — to consider, protect and actively manage significant historic properties under federal management," said Phil Alig, an archaeologist with the Kansas City District. "Under NHPA, we have to consider adverse effects for any action that involves federal land, federal funding or federal permitting."

This consideration is crucial as many USACE projects are in areas rich with historic and cultural significance. As with any engineering effort, water management and environmental restoration projects can often alter landscapes that have long been home to Native American tribes or later colonial settlements. USACE archaeologists serve as custodians of these historical resources, working to mitigate damage and, when possible, preserve or relocate valuable cultural remnants.

"Basically every (USACE project) has to go through our shop," said Alig. "We don't have a heavy touch, but we touch everything we do, from planning to military construction to hazardous, toxic and radioactive waste removal."

Archaeological work with USACE is far from straightforward, and that light touch is a meticulous process combining fieldwork, research and expert analysis and evaluations. USACE archaeologists face challenges ranging from time constraints to environmental factors and legal complexities, but whenever USACE plans a new project in an area that could be archaeologically sensitive, USACE archaeologists roll up their sleeves.

It all starts with background research.

See PROTECT on p. 12

USACE and Missouri Archaeological Society (MAS) archaeologists manually search for artifacts using the surface survey method. Surface surveys are the most common method to search for artifacts on disturbed ground and consist of archaeological crews lining up and sweeping open areas searching for artifacts. (USACE Photo)

"We're federally mandated to act as stewards — to consider, protect and actively manage significant historic properties under federal management."

— Phil Alig, archaeologist, Kansas City District

USACE archaeologist Dr. Gina Powell said the first step for an archaeologist preparing to survey a site is to hit the books. Using online databases maintained by each state's historical preservation organization, tribal historical preservation officers, historical archives, land transfers, maps and their own extensive experience, USACE archaeologists will cross-reference various sources to determine the likelihood of finding unsurveyed historical sites within the project area.

"We use historical documents and maps combined with our own expertise," said Powell. "We'll look at the land itself and previous knowledge of where sites tend to be found as well. For example, the terraces above the river are more likely to have sites compared to an active floodplain."

Surveys to find artifacts, settlements

Once a prospective location is identified, the archaeology team starts with a survey. Using a variety of tools — from traditional shovels and sifting screens to digital historical archives — they assess whether the land has any historical resources. If they uncover artifacts or evidence of an ancient settlement, it triggers a more detailed documentation and mitigation process.

Findings on historical sites can include artifacts as small as campfire soot stains or as large as an entire building, but regardless of the size, if any historical traces are found, it is the responsibility of USACE to reduce impact to the site as much as possible.

"Avoid, minimize, mitigate," said Alig.

The easiest way to steer clear of adverse effects to historical sites is simply to avoid them when working a project, Powell said. When that is not possible, the team will focus on minimization, or simply protecting the historical property as much as possible from damage during construction. The final option is mitigation, or compensating for any unavoidable impacts, in many cases either by excavation or through extensive academic documentation of the site prior to its removal.

Despite many challenges, there are triumphs. The unearthing of a centuries-old tribal site, the discovery of ancient fossils, the repatriation of lost artifacts, or the preservation of a historic structure help piece together forgotten chapters of American history.

These efforts reflect USACE's commitment to cultural resource management and collaboration. As part of that commitment, USACE has developed strong partnerships with tribal nations, local communities and state and federal agencies to ensure that historical resources are preserved and respected.

Tribal Partnerships

"We have 54 tribes involved along the Missouri River that have some tie to the river," said Alig. "There are four resident tribes in the district: the Sac and Fox Nation of Missouri, the Kickapoo Tribe, the Iowa Tribe of Kansas and Nebraska and the Prairie Band Potawatomi Nation. We also work very closely with the Osage Nation as the Missouri [River] is their ancestral land. We also consult with any tribes that have interests in our area, including tribes that were relocated during the Trail of Tears such as the Cherokee and Delaware."

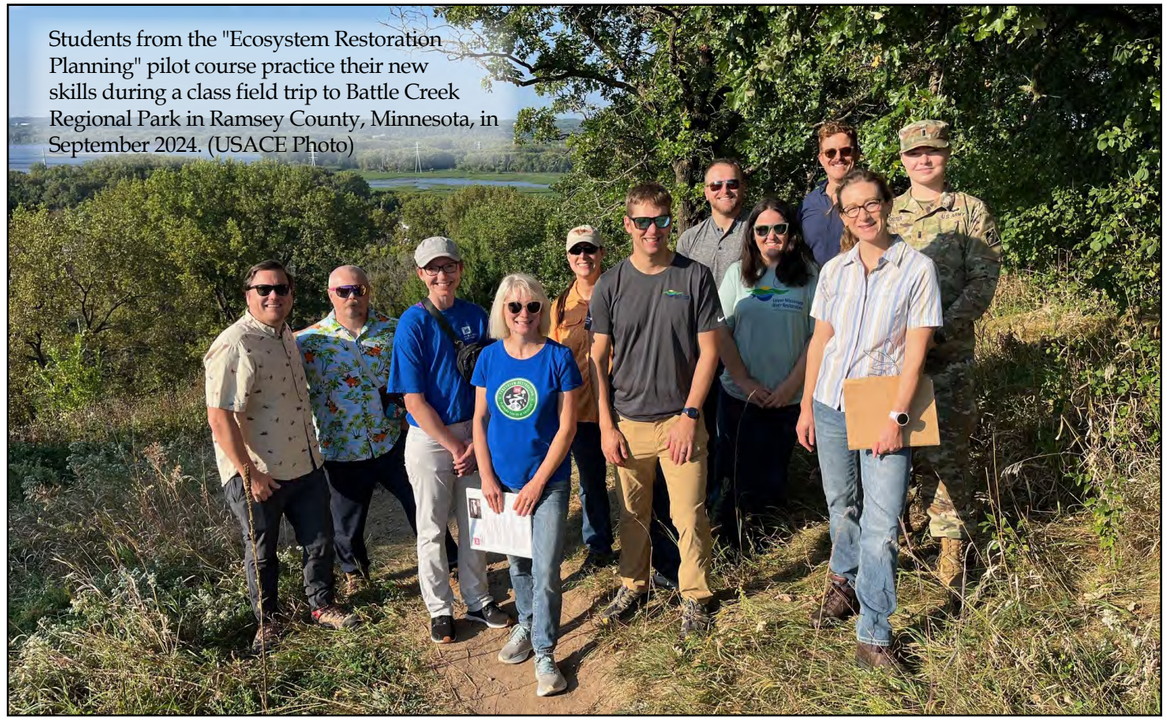
USACE archaeologists Gina Powell and Phil Alig screen a shovel test pit (STP) for artifacts with USACE park rangers at Rathbun Lake, Iowa. (USACE Photo)

Tribal sites can range from ancient camp sites to human remains that must be repatriated to their home nation. USACE archaeologists are responsible for excavating, preserving and interpreting these finds. Each discovery adds a piece to the puzzle of how Native American tribes and early settlers lived, worked and interacted with their environment and each other.

"As a federal agency, USACE has a responsibility to consult with Native American tribes on our undertakings," said Tim Meade, USACE archaeologist and Kansas City District tribal liaison. "Part of that responsibility is working with tribes to provide stewardship for Native American archaeological sites and consult with them on the effects, if any, that our projects will have on them."

Through these efforts, USACE archaeologists help preserve the stories of America's many diverse peoples — Native American tribes, early Euro-American settlers and the many others who have all contributed to the rich mosaic of our nation's shared history.

USACE is not only building our future, but also protecting our past. USACE archaeology teams are guardians of our history, ensuring that our collective past, in all its complexity, is not forgotten.



Students from the "Ecosystem Restoration Planning" pilot course practice their new skills during a class field trip to Battle Creek Regional Park in Ramsey County, Minnesota, in September 2024. (USACE Photo)

Training Today for Tomorrow's Success

USACE revises, renews course on ecosystem restoration planning to meet workforce needs

By Dr. Kat McCain
Director, USACE Ecosystem Restoration Planning Center of Expertise

The third largest mission area for the U.S. Army Corps of Engineers is Aquatic Ecosystem Restoration (AER). To ensure USACE continues to deliver projects and execute this mission, the Ecosystem Restoration Planning Center of Expertise (ECO-PCX) and the Planning Workforce Development Committee worked together to develop a new curriculum for the week-long course, "Planning for Ecosystem Restoration" (PROSPECT 348), which had not been taught in over 12 years.

This course will complement existing USACE training courses related to ecosystem restoration, which are focused more on design and ecological science, by providing unique content on what makes planning an AER study different than other mission areas. The course covers AER-specific planning topics such as AER policy, resource significance, conceptual and quantitative ecological modeling, cost effectiveness and incremental cost analysis, tradeoff analysis, and identifying the National Ecosystem Restoration plan. These topics will provide staff the tools and information they need to deliver AER planning studies efficiently and effectively.

The USACE development team, led by the ECO-PCX and subject matter experts from districts, divisions and USACE Headquarters, refreshed the course by reviewing the former curriculum; updating material based on current practices, policy and guidance; and creating new applied learning exercises.

The goal is for students to not only be informed by lecture material, but to also apply the material to real-work examples. This new format was "piloted" with students from the St. Paul District including planners, biologists, project managers, archaeologists, economists and engineers, who had USACE experience ranging from one month to 20-plus years.

The pilot course allowed the development team to test out the lecture material and applied learning exercises for clarity and level of detail for a diverse suite of experiences and disciplines. It also allowed a test of the field trip logistics. From this pilot, the development team determined prerequisites would not be needed to take this course.

Feedback indicates that all study team members working on AER civil works planning studies, or anyone interested in working on one in the future, would benefit from this training course.

"The course provided a useful summary of foundational guidance and planning tools relevant to aquatic ecosystem restoration and the opportunity to apply these in practical scenarios," said Collin Smith, a hydraulic engineer with the St. Paul District who attended the pilot course. "These provided an excellent window into the functioning of each student's role within PDTs (project delivery teams), and I left with fresh insight on how to incorporate PDT support early in the planning process to improve project outcomes."

The full course will be offered annually starting in fiscal 2025 with the next one scheduled for July 28 to August 1 in St. Paul, Minnesota.

USACE continuously works to provide the most up-to-date curriculum in training courses and looks for ways to keep courses relevant and fresh to ensure staff have the tools they need to effectively do their jobs. USACE strives to deliver training today to ensure successful project delivery tomorrow.

Students from the "Ecosystem Restoration Planning" pilot course learn from real-world examples during one of the classes held in the St. Paul District training room in September 2024. (USACE Photo)

Drayton Dam partnership propels

Win-Win Solution

By Melanie Peterson
USACE St. Paul District

On a sunny fall day, with the smell of sugar beet production lingering in the air, the U.S. Army Corps of Engineers, St. Paul District celebrated safety, the environment and partnerships within the region. With the rock rapids of Drayton Dam in North Dakota as a backdrop, speakers spoke to a strong testament to science and a commitment to the greater community on the Red River of the North.

The Drayton Dam fish passage mitigation project was a $7.7 million project that aimed to remove the last impediment to fish passage between the source of the Red River between Wahpeton, North Dakota, and Breckenridge, Minnesota, to the St. Andrews Lock and Dam in Manitoba, Canada. The new dam structure includes a sloping set of rapids with a rock passageway. Rocks and boulders were placed in patterns to create pools through which fish can easily pass.

In addition to environmental benefits, the removal of the low head dam also ensured better safety at the popular recreation area. Known for their dangerous hydraulic roller currents, low-head dams have been associated with several safety incidents.

USACE, along with its partners, celebrated the completion of the project Sept. 25, 2024, with a dedication ceremony that featured speakers from the North Dakota Department of Water Resources, the Minnesota Department of Natural Resources, the Metro Flood Diversion Authority, the North Dakota Game and Fish Department, and the city of Drayton, North Dakota, as well as congressional representatives.

"I'm proud to say that the Corps (of Engineers) with all of you collectively came together to deliver this project for the people of North Dakota and Minnesota along the Red River," said Col. Eric Swenson, St. Paul District commander.

Audience members listen to speakers at the Drayton Dam dedication ceremony in Drayton, North Dakota, Sept. 25, 2024. (Photo by Shannon Bauer)

The Drayton Dam fish mitigation project in Drayton, North Dakota, pictured here Aug. 29, 2023, removed impediments to fish passage between the source of the Red River between Wahpeton, North Dakota, and Breckenridge, Minnesota, to the St. Andrews Lock and Dam in Manitoba, Canada. (Photo by Elizabeth Stoeckmann)

John Paczkowski, North Dakota Department of Water Resources state engineer, touched on both the safety and environmental aspects.

"For decades, Drayton Dam has been a popular fishing hole, as well as a reliable water supply intake location on the Red River for the city of Drayton," said Paczkowski. "Unfortunately, as is commonly the case with low-head dams, it has also negatively impacted river connectivity for fish and other aquatic species, as well as, tragically, was a public safety hazard. However, today we celebrate the completion of the dam mitigation project. This is truly an important milestone and achievement for the Drayton community."

Barb Naramore, deputy commissioner of the Minnesota Department of Natural Resources, emphasized the important environmental impacts of the project. She said there has been extraordinary progress on reconnecting the Red River. In 2002, the Minnesota Department of Natural Resources identified 72 impediments to fish passage in the basin and, 22 years later, 48 of those have been removed or modified so they no longer present a barrier to fish passage.

"We are seeing that response in the system," she said. "In 2022, we documented the first spawning of lake sturgeon in the Red River basin in over 100 years. We've seen spawning this year in multiple locations."

The Drayton Dam project was a mitigation element of the Fargo-Moorhead Metropolitan Area Flood Risk Management Project. This overall flood risk management project provides flood risk reduction for nearly 260,000 people and 70 square miles of infrastructure in the communities of Fargo, Moorhead, West Fargo, Horace and Harwood.

Robert Wilson, co-executive director of the Metro Flood Diversion Authority, lauded the partnership of the project.

"This certainly is a celebration of partnerships," he said. "It's about local, state and federal entities working together with civilian contractors to accomplish something that will benefit people and aquatic life really for generations to come."

Louisville District employees help to relocate mussels at Green River near Brownsville, Kentucky, Sep. 6, 2024. (Photo by Kelsie Hall)

Mussel Mania

USACE, partners complete large-scale effort to save mussels on the Green River in Kentucky

By Kelsie Hall
USACE Louisville District

U.S. Army Corps of Engineers Louisville District employees, along with other state and federal agencies, have completed mussel salvage efforts along approximately 14 river miles on the Green River in Kentucky.

"The Green River is a unique ecological resource for the state of Kentucky," said Jeff Hawkins, Louisville District wildlife biologist. "The river has more than 150 fish species and 70 species of mussels, including 43 species existing nowhere else in the world."

Due to the recent removals of aging infrastructure no longer needed for commercial navigation, such as Green River Lock and Dam No. 5 and Green River Lock and Dam No. 6, USACE completed an environmental impact analysis as a requirement of the National Environmental Policy Act to assess the impact the removals would have on the human and natural environment.

Freshwater mussels are one of the most imperiled groups of animals in North America. They are critical components to Kentucky's aquatic ecosystems, and many are unique or endemic to specific streams or watersheds.

Some species of mussels are indicators of good water quality and overall health of an ecosystem; they have complex life cycles that require host fish or amphibian species to complete their life cycles. Many of these host species are also threatened by habitat loss or alteration and pollution. In addition, freshwater mussels are filter feeders that effectively "clean up" rivers by filtering out particles and chemicals in the water.

"Although freshwater mussels have some ability to maneuver short distances, they mostly stay put their entire lives," said Zac Wolf, limnologist for the Louisville District Water Resources Section of the Engineering Division's Hydraulics and Hydrology Branch. "They can easily get blocked by obstacles, such as logs or rocky shores, and get stranded and die."

Adam Taylor, a park ranger from the Louisville District's Rough River Lake, holds a mussel at Green River near Brownsville, Kentucky, Sep. 6, 2024. (Photo by Kelsie Hall)

The removal of aged infrastructure on the Green River and Barren River collectively makes it one of the largest stream restoration projects in the country, reconnecting dozens of river miles without manmade barriers.

"These changes will improve passage for aquatic organisms and restore instream habitat for riverine fish, mussels and other invertebrates," Hawkins said.

Wolf noted that the salvage efforts will have a significant impact on the local ecosystem for decades to come.

"Our efforts to salvage mussels gives the ecosystem a leg-up when it comes to recovery," he said. "It's a really unique opportunity to save the environment in a direct way."

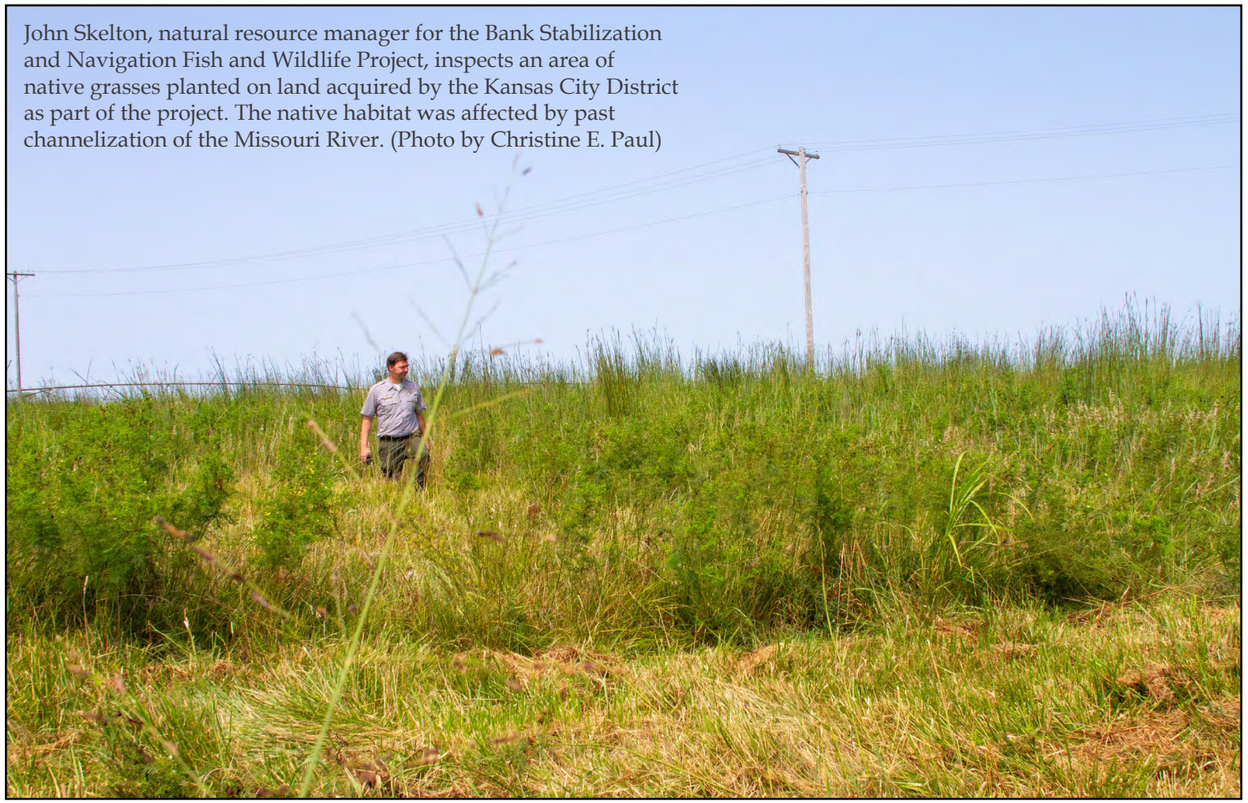
The 2024 mussel recovery effort resulted in the salvage of more than 13,000 mussels, including a few rare species which provided critical information for conservation efforts.

Organizing a large-scale, multi-agency effort over four days with more than 35 volunteers created the largest challenge for the team. Weather and on-site conditions, including water levels, determined when teams could act. In addition, participants needed to use canoes and kayaks to closely inspect the riverbank.

To accomplish the task, despite these challenges, the team placed a strong emphasis on communication and planning and the river was broken up into sections so that teams could spread out to cover larger areas in less time.

This concerted effort involved coordination with The Nature Conservancy and multiple federal and state agencies, including USACE, U.S. Fish and Wildlife Service, National Park Service, Kentucky Department of Fish and Wildlife, Kentucky Division of Water and the Office of Kentucky Nature Preserves.

"Freshwater mussels appear to be boring, but if you just do a little bit of reading into them, you find they are surprisingly charismatic and dynamic animals that have adapted to survive in very creative ways," Wolf said. "Because the Louisville District is situated in a global hotspot for freshwater mussel diversity, they certainly deserve our attention."



John Skelton, natural resource manager for the Bank Stabilization and Navigation Fish and Wildlife Project, inspects an area of native grasses planted on land acquired by the Kansas City District as part of the project. The native habitat was affected by past channelization of the Missouri River. (Photo by Christine E. Paul)

'Our Responsibility'

Missouri River project mitigates lost habitat, displaced wildlife caused by channelization

By Christine E. Paul
USACE Kansas City District

After Lewis and Clark ended their journey westward in 1806, an expedition known as the Corps of Discovery, the Missouri River would prove to be a vital link between the East and West. Flowing right through the heartland, the Missouri River is the longest river in the U.S. and is an important economic resource to the region, the nation and the world.

Before the Missouri River became the navigation hub it is today, it was an untamed, wild body of water prone to flooding, known for changing paths, with a floodplain as wide as a mile in some places. By the late 19th century, the government realized the value the river could have on westward expansion and began the process of taming the river.

The Bank Stabilization and Navigation Project aims to stabilize the river by establishing a 9-foot-deep by 300-foot-wide navigation channel on 735 miles of the river. This is done by using river structures known as dikes and revetments.

"You can say that the (U.S. Army Corps of Engineers) has been on the Missouri River for a significant period of time," said John Skelton, natural resource manager for the Bank Stabilization and Navigation Fish and Wildlife Mitigation Project at the Missouri River Project Office. "They started doing significant channelization … (using) dikes and revetments … to pen in the channel."

While these river structures have been successful in stabilizing the navigation channel, there have been consequences to their construction.

"You have these structures … to build up the floodplain, and over time that fills up with silt … and the next thing you know, you can farm it," said Skelton. "But what happened to the wetlands and all the species that called that home?"

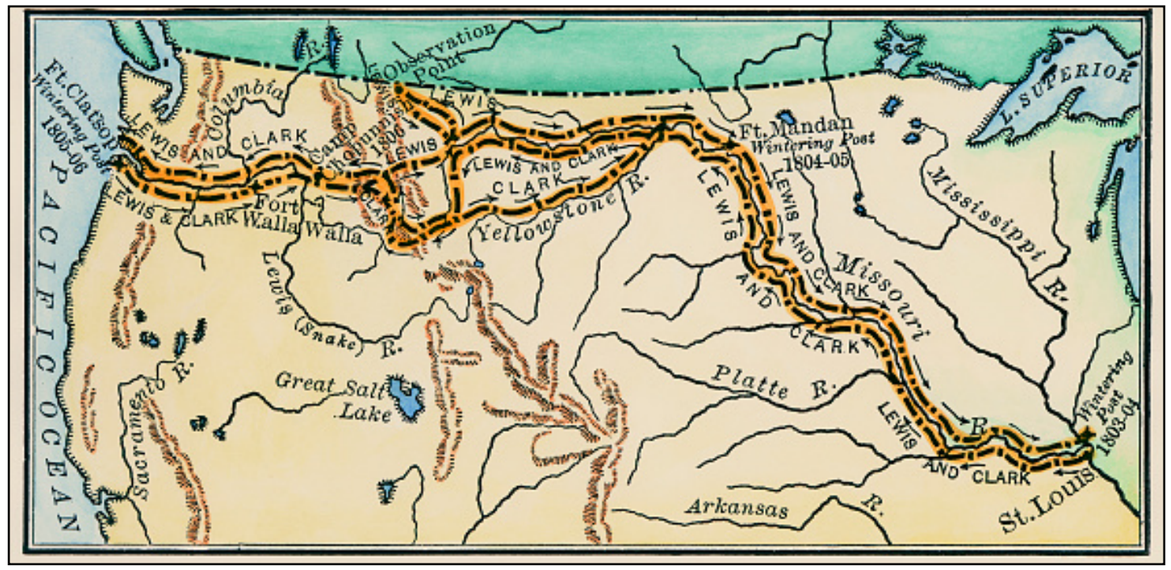
Wildlife Displacement

After acknowledging native habitat was being destroyed and wildlife was being displaced because of federal projects, multiple pieces of legislation were passed directing the federal government to mitigate for lost habitat and displaced wildlife. Congress authorized the Bank Stabilization and Navigation Fish and Wildlife Mitigation Project in the 1980s, and USACE has been working to acquire land and develop aquatic and terrestrial habitat along the river ever since.

"The goal is to provide habitat, but the issue is we have a landscape that is significantly modified," said Skelton. "We have a different hydrograph so we need to be able to … provide something that resembles habitat that could be utilized by species that would have been out there."

This is no easy feat, for several reasons. First, in order to establish terrestrial mitigation for the program, land must be publicly owned and accessible. Much of the 522,000 acres of lost habitat resulting from the past channelization efforts is not owned by the federal government or otherwise considered public land, so USACE has been

See HABITAT on p. 22



A map of the Northwestern United States depicts the route taken by Meriwether Lewis and William Clark on their first expedition from the Missouri River near St. Louis, Missouri, to the mouth of the Columbia River at the Pacific Ocean in Oregon, as well as their return trip, from 1804 - 1806. (Graphic by Getty Images)

able to perform less than half of the 166,750 acres of mitigation authorized along the river.

"Anytime you're talking about government acquisition and real estate, it is a slower process," said Skelton. "If someone's interested in selling, a lot of times they'll just give us a call."

Second, it can be difficult to determine how best to modify it to mitigate for lost habitat and wildlife. The Missouri River has eight congressionally authorized purposes including navigation, irrigation, flood control, water supply, water quality, recreation, hydropower, and fish and wildlife.

"There's so many different stakeholder interests that it's a balancing act," said Mitch Roberts, operations project manager at the Missouri River Project Office.

Third, of the 498 river miles the Kansas City District manages, there is only one person who manages the habitat of the Bank Stabilization and Navigation Fish and Wildlife Mitigation Project.

"We have over 41,000 acres in our mitigation project. (John Skelton) manages all of the lease agreements, goes out and does inspections and identifies where we need to work on signs or boundaries, all that kind of stuff," said Roberts.

What are the goals?

Once USACE acquires public land for the purpose of habitat and wildlife mitigation, there are several different ways the land can be modified and managed. Rather than seeing the various options as a challenge, both Skelton and Roberts see it as an opportunity.

"Mitigation is a lot of different things, and I think one of those things is diversity," said Roberts.

Mitigation can include planting native species, creating food plots for wildlife or establishing wetlands, which are not only a native habitat but can also help reduce flooding. While much of the project has been focused on aquatic habitat and wildlife, the focus on terrestrial mitigation is increasing, said Roberts.

Ultimately, the goal of the mitigation project is to modify the land back to something that resembles its original state. The theory is once the land is in a more natural state, it will encourage native species to return and thrive.

"We're doing habitat, so if you build it, hopefully they show up," said Skelton. "We have to mitigate the negative impacts. We're trying to provide something that would be a semblance of the vegetation that would have occurred (naturally)."

While mitigating the negative impacts the past channelization project had on habitat and wildlife is one of the primary goals, there is another, lesser known, benefit of the Bank Stabilization and Navigation Fish and Wildlife Mitigation Project.

"Mitigation areas should provide a lot of things," said Roberts. "We should be managing them to try and give back some native species, … help areas that could be flooded, … provide a place for wildlife to come in … and I think a big thing people forget is the opportunity for public recreation — whether it's bird watching, whether it's hunting, whether it's being able to access the river and go fishing, hiking, all of those things."

Hope Among the Challenges

Even when land has been acquired, has been modified to mitigate for lost habitat and Skelton has the time and resources to manage it, there still exist challenges. The sites, often prone to flooding, can be modified and managed, but Mother Nature will still have the final say in what happens.

"Sometimes it can feel like a never-ending uphill battle,' said Skelton. "But we can't let those types of things always deter us from doing something."

Although it's challenging, Skelton remains positive the work he's doing will ultimately make a difference. For him, success of the mitigation project can be measured by seeing native species thrive in areas once destroyed by the past channelization project.

"Anything native that I see … that's what keeps me going," said Skelton.

For Roberts, knowing he is helping provide opportunities for both native species and the public helps him stay positive when things get tough.

"For me, success overall on the project is … actively working to develop native species and diversity, and through those practices, we are providing good recreation opportunities for the public because it's their land," said Roberts. "If we can do those things, then that's the ultimate success that I see."

Bootlegger, an area of 1,294 acres near Napoleon, Missouri, was acquired by the Kansas City District as part of the Bank Stabilization and Navigation Fish and Wildlife Mitigation Project. The site is an example of the diverse techniques the project uses at its mitigation sites. The Bootlegger mitigation site uses a mix of food plots, native grasses and mowing, among others, to mitigate for previously lost habitat and wildlife due to the past channelization efforts of the Missouri River. (Photo by Christine E. Paul)

One Fish, Two Fish

Alabama Fish Passage Study aims to increase size of native fish populations by restoring connectivity

By Jenny Jacobson, Heather Bulger and Terry "TJ" Rickey
USACE Mobile District

The U.S. Army Corps of Engineers and The Nature Conservancy (TNC) are partners in a feasibility study regarding improved fish passage at both Claiborne and Millers Ferry locks and dams on the Alabama River in southern Alabama.

These two dams restrict access to historical spawning grounds on the Cahaba River from species present in the lower Alabama River. This disruption of natural fish migration patterns has resulted in a decline in native aquatic species populations.

The Claiborne and Millers Ferry Locks and Dams Fish Passage Study, also known as the Alabama Fish Passage Study, seeks to establish fish passage by reconnecting over 230 miles of the Alabama and Cahaba rivers to the Mobile River Delta into the Gulf of America, providing connectivity for multiple species of fish, crayfish, mussels, turtles and more. The Alabama River System provides one of the last habitats for many of these species, which are critical to sustaining biodiversity and a healthy ecosystem.

Successful Partnerships

Partnering with TNC allows USACE to benefit greatly from the non-federal partner's extensive public outreach, considerably raising the project's visibility both locally and nationally. USACE has also been fortunate to utilize TNC's vast network of scientific experts to capture key species requirements that factor into design elements.

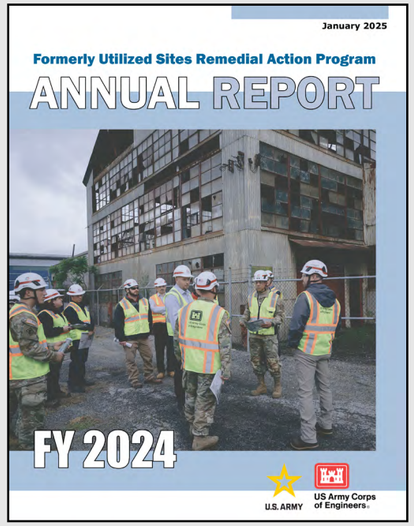
TNC and other cooperating agencies, such as the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Alabama Department of Conservation and Natural Resources, and Alabama Department of Environmental Management, have been critical in defining screening and success criteria. These partnerships have strengthened the project delivery team's modeled outputs, screening criteria, the semi-quantitative risk analysis, National Environmental Policy Act compliance and impacts analysis.

Using the planning and guidance criteria, as well as cost effectiveness and multi-criteria decision analyses, the draft report identified a tentatively selected plan consisting of a natural bypass channel at each of the two locks and dams.

In response to agency and public comments on the Draft Integrated Feasibility Report and Environmental Assessment, the fish passage alignment at Millers Ferry was adjusted to avoid crossing private land. The final integrated report underwent state and agency review in August 2024.

Public involvement and collaboration with TNC and state and federal partners have strengthened and will continue to strengthen the analysis and preliminary design of this project.

Millers Ferry, left, and Claiborne, right, locks and dams in Alabama restrict access to historical spawning grounds on the Cahaba River. USACE, The Nature Conservancy and other agencies seek to improve fish passage by reconnecting over 230 miles of the Alabama and Cahaba rivers to the Mobile River Delta. (USACE Photos)



USACE releases annual FUSRAP report for FY24

The Formerly Utilized Sites Remedial Action Program (FUSRAP) Annual Report for Fiscal Year 2024 is now available. The report provides information about progress the U.S. Army Corps of Engineers (USACE) is making in completing projects being executed under FUSRAP. Under this program, USACE cleans up contamination from sites in the United States resulting from work performed as part of the nation's early atomic energy program.

Public health and safety are USACE's top priorities. At the active FUSRAP sites located across eight states, remedial action is planned, underway or pending final closeout. These sites do not pose an immediate threat to human health or the environment. Read more at www.usace.army.mil/Media/News/NewsSearch/Article/4063112/annual-fusrap-report-available-online/

Big Win, Big Smiles

Park ranger helps winning student team design, build model of Franklin Falls Dam for national competition

By Briana Edwards
USACE New England District

Each year, the Association of State Dam Safety Officials (ASDSO) holds a national competition for students of all ages to construct a dam model and create a plan for using the model to educate others.

When the principal of Jennie D. Blake Elementary School in Hill, New Hampshire, caught wind of this challenge, he looked to the staff at Franklin Falls Dam for a technical advisor. As a U.S. Army Corps of Engineers park ranger, I could offer firsthand knowledge on the structure and function of the dam, as well as its significance to the local community. In December 2023, I joined a group of eager 4th and 5th grade students and their principal, Brian Connelly, to begin our journey.

The community of Hill and the students at the school have a personal connection with Franklin Falls Dam. This competition gave them a unique opportunity to bring their town history to life.

The town of Hill was relocated in 1941 due to the construction of Franklin Falls Dam. The dam was built between 1939 and 1943 to mitigate flooding in New Hampshire and Massachusetts following major flooding events in the late 1930s and the subsequent Flood Control Acts of 1936 and 1938.

Old Hill Village is now part of a recreation area within the project land of Franklin Falls Dam. The history of Hill and its relocation is an important part of the curriculum taught at the elementary school. With this shared history as their inspiration, the students came up with a plan to create a scale model of Franklin Falls Dam and its storage basin while highlighting their former village.

The first step of this competition was to create a proposal of their model with design plans, materials, budget, and a plan for using the model to promote dam safety in the community.

They competed against elementary school students across the country for the winning prize of $500 to fund model construction, an invitation to present their model at the ASDSO Dam Safety Conference in Denver, a travel stipend for the team members, and a $1,000 honorarium to the team.

On the day of our first meeting, the pool at Franklin Falls Dam was nearing its peak following recent heavy rains and a mid-winter thaw. For a run-of-river dam that holds a normal pool of about 7 feet of water, a peak pool level of 60 feet was an impressive sight.

When the principal heard this, parents were called, and an impromptu field trip to the dam commenced, demonstrating the school's enthusiasm for the project.

The following day, the students walked down to see the site of the old village, which is completely underwater. This visual solidified their understanding of the need to relocate their town during the construction of Franklin Falls Dam.

The students made a few more field trips to the dam during the planning stages of the project, and I led them on tours of the dam, taught them about important flood control structures and helped them to understand the floodplain.

Their dam model proposal was completed and submitted in February 2024, and the students awaited the results with anticipation.

Briana Edwards (back row, center), a USACE park ranger, joins the Jennie D. Blake Elementary dam model competition team and school officials at a community event to celebrate the team's win at the Association of State Dam Safety Officials Dam Model Competition. (USACE Photo)

The following month they learned that their proposal had been selected, and they were the winning team in the elementary division. I continued to support the students as a technical advisor throughout the build.

The students worked through lunch breaks, after school, and even during their summer vacation to construct their dam model. Most of the model is made to scale, complete with realistic topography and the Pemigewasset River running through the middle. Their town history is also on display with the addition of old building foundations along the river and a small representation of their relocated town.

With the model completed, they traveled to Denver for the ASDSO Dam Safety Conference at the end of September. There, they presented their project to conference attendees with assuredness and pride. The students confidently fielded questions about the structure and function of the dam, as well as the impacts flood control dams have on communities both upstream and downstream.

Upon their return and in culmination of their hard work, the school held a presentation for the community where the students shared their experience and were celebrated one final time. The students hope the model will be used as part of their existing school cirriculum and to teach other schools about flood control dams.

Strengthening Ties

Brazilian Army leaders return for second environmental exchange with U.S. Army Environmental Command

By Lally Laksbergs
U.S. Army Environmental Command

In a dynamic exchange of environmental expertise, U.S. Army Environmental Command (USAEC) Commander Col. Vance Brunner and Command Sgt. Maj. Francisco Cardenas hosted representatives from the Brazilian Army Department of Real Estate and the Environment (DPIMA) during the week of Oct. 28, 2024, at Joint Base San Antonio–Fort Sam Houston, Texas.

The Brazilian Army delegation, led by Col. Andre Luiz Cardoso Marinho, head of the Environmental Office, included Lt. Thaisa Sant'Anna Lacerda, biologist/technical officer, and 1st Lt. Joana Albuquerque Di Lucia Cerqueira Leite, technical translator, as well as Brazilian Army Col. Sergio Matos, liaison officer, and U.S. Army Maj. Alfredo Carrillo, engineer planner, both with U.S. Army South. This visit continued the exchange of insights, fostered collaboration and helped participants gain a deeper understanding of environmental management within military operations.

USAEC's comprehensive presentation highlighted its mission and showcased the organization's diverse areas of expertise, such as natural and cultural resource management, National Environmental Policy Act compliance, pest management, and the Conservation Reimbursable and Fee Collection Program (CRFCP).

Col. Vance Brunner, USAEC commander, presents a hand-carved wooden plaque with representations of the Bald Eagle, USAEC and eight different types of woodcuts to Col. Andre Luiz Cardoso Marinho, head of the Environmental Office, Brazilian Army Department of Real Estate and the Environment (DPIMA), during the mutual gift exchange concluding the two-day collaboration Oct. 30, 2024. (Photo by Lally Laksbergs)

The exchange underscored that, despite differences in operational contexts, the shared challenges faced by environmental professionals transcend geographic and organizational boundaries. Drawing on years of professional expertise within USAEC, the discussion highlighted common themes such as resource management, sustainability and regulatory compliance, showcasing the universal nature of these issues and the value of collaborative problem-solving.

"It's clear that we share many similarities in our approaches, even though we may implement them in slightly different ways," said Brunner. "Despite these differences, we are united by a common goal: striving together toward a more sustainable future."

Col. Vance Brunner (center, left), USAEC commander, speaks to members of a delegation from the Brazilian Army Department of Real Estate and the Environment during opening remarks of the second annual exchange of environmental expertise at USAEC on Fort Sam Houston, Texas, Oct. 29, 2024. The intent of this coordinated information exchange is to share insights, foster collaboration and gain a deeper understanding of collective environmental challenges that transcend borders. (Photo by Lally Laksbergs)

Beyond the technical discussions, the camaraderie built through shared challenges, practices and humor added a personal connection to the professional exchange. Stories of life experiences and lessons learned created a sense of community, reminding everyone that the mission is not only about overcoming obstacles but also about fostering enduring relationships along the way.

Brazil's Unique Approach

Brazil's military integrates environmental stewardship as a fundamental aspect of national security, reflecting the nation's deep connection to its diverse natural landscapes. Spanning six distinct biomes — from the Amazon rainforest to the Pampas — Brazilian soldiers receive rigorous training designed to equip them with the skills needed to navigate, preserve and thrive within these unique ecosystems. This training underscores their dual role as both defenders of the nation and guardians of its natural heritage.

"To protect the environment, you have to know the environment," said Marinho, summarizing Brazil's philosophy.

By fostering an intimate understanding of the country's ecological wealth, the Brazilian military ensures that its operations not only respect but also contribute to the preservation of all the country's vital natural resources.

The delegation emphasized Brazil's legal framework that mandates strict protections for trees, wildlife and biomes. For example, it is illegal to cut down a tree without authorization or capture or kill wildlife unless life threatening. This emphasis on compliance is deeply embedded in the culture of the Brazilian army.

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Lt. Thaisa Sant'Anna Lacerda, a biologist and technical officer with the Brazilian Army Department of Real Estate and the Environment, investigates a used oil containment holding tank while Chief Warrant Officer 3 Dylan Lewis, battalion maintenance officer, 2nd Chemical Battalion, 49th Chemical Brigade, describes the procedures, protocols and processes for used oil capture and pollution prevention on Fort Cavazos, Texas. This USAEC–hosted visit to Fort Cavazos provided the Brazilian Army environmental delegation insight into strict U.S. environmental protocols, essential to ensuring both environmental sustainability and operational readiness. (Photo by Lally Laksbergs)

A traditional gift exchange concluded the two-day collaboration at USAEC and continued the growing partnership between the two nations and underscored their mutual commitment to environmental sustainability.

Through a translator, Marinho expressed his gratitude on behalf of the Brazilian delegation for the opportunity to travel to USAEC and learn from the U.S. Army's civilian environmental professionals.

Showcasing Environmental Excellence

Following their visit to USAEC, the Brazilian delegation traveled to Fort Cavazos, accompanied by the USAEC leadership team of Brunner and Cardenas. They were welcomed to the installation by Col. Lakicia Stokes, garrison commander, and Christine Luciano, environmental outreach coordinator, Directorate of Public Works (DPW) along with subject-matter experts from the DPW Environmental Division

The delegation received an overview of Fort Cavazos's Environmental Program, which emphasizes sustainability through compliance, conservation and innovative recycling practices. Highlights included energy efficiency programs, renewable energy initiatives, and resource management efforts to protect ecosystems, endangered species and cultural sites.

"A key component of Fort Cavazos's environmental policy is maintaining the balance between sustaining mission readiness and the environment," Luciano explained, emphasizing the importance of integrating sustainability into all aspects of military operations.

The Brazilian delegation shared insights into their own resource management initiatives, enriched by indigenous soldiers' unique cultural knowledge. They noted parallels and opportunities for shared learning.

During tours of key facilities, the delegation observed Fort Cavazos's innovative single-stream recycling program, pollution prevention protocols and waste management processes, all supporting operational sustainability.

One stop included the 48th Chemical Brigade motor pool which provided an example of how Fort Cavazos has implemented rigorous pollution prevention protocols regarding above-ground storage tanks and stormwater drainage systems to ensure they are carefully managed. These protocols are critical to maintaining both environmental compliance and operational integrity.

Adding to the experience, the delegation felt fortunate to have U.S. Army Spc. Lucas Deoliveira, a native Brazilian and Soldier with the 48th Chemical Brigade, serve as an unofficial translator during the tour of the motor pool area. His presence not only bridged the language gap but also brought a unique and personal connection to the exchange, making the experience even more memorable.

The visit concluded at the DPW Environmental Division's Bird, Bee, Butterfly and Bat Garden, which includes a variety of sustainable landscaping practices designed to conserve water and promote biodiversity. The garden serves as an educational space for visitors and Soldiers alike, illustrating the importance of native plant species and conservation efforts on military lands. It is a testament to the installation's dedication to preserving local wildlife and promoting environmental education.

The Brazilian delegation was impressed by how Fort Cavazos integrates environmental conservation with operational needs. From innovative recycling to pollution prevention and resource conservation, the base exemplifies how military installations can promote sustainability while fulfilling their mission. The hands-on visit highlighted Fort Cavazos' commitment to balancing military readiness with environmental stewardship, offering a model of sustainable practices for global partners.

> "Together, we can create a more sustainable future for our militaries and the environments we are entrusted to protect."
>
> **— Col. Vance Brunner, commander, USAEC**

Building Bridges for Future Collaboration

This second exchange between the Brazilian Army Environmental Directorate, USAEC and Fort Cavazos environmental programs continues to strengthen bonds and open doors for future collaborations. The visit underscored the shared dedication of both nations to environmental stewardship and the potential for innovative, cooperative solutions to global environmental challenges.

"Together, we can create a more sustainable future for our militaries and the environments we are entrusted to protect," said Brunner.

As the collaboration between the two nations continues to strengthen, the exchange of knowledge and shared environmental values holds the potential for a lasting impact on global military environmental management. The shared insights and practices will contribute to a deeper commitment to sustainability and foster greater cooperation moving forward.

Steps to Success

USACE Operations teams share how to maximize benefits of Sustainable Rivers Program partnership

By Tom Zikmund
USACE Kansas City District
and **Jim Howe**
Sustainable Rivers Program

One of the hallmarks of the Sustainable Rivers Program (SRP) is its ability to bring together a cross-section of U.S. Army Corps of Engineers (USACE) teams and partners to achieve the goal of generating multiple benefits from USACE infrastructure.

USACE Operations teams are vital to SRP's success. Successful examples of these teams leading and engaging in SRP projects can help guide future applications to the program.

In the Kansas City District, Conservation Biologist Kyle Ruona is using SRP funding and tools to explore environmental pool management opportunities at six reservoirs – Milford, Kanopolis, Wilson, Harlan County, Tuttle Creek and Perry lakes – on the Kansas River. Ruona coordinated SRP activities with a cross-section of USACE teams in the district, as well as with operations project managers at each of the six sites and with the chief of operations for the district. External partners like The Nature Conservancy, Ducks Unlimited, Friends of the Kaw, and state agencies in Kansas and Nebraska are also engaged.

The district used both geographic information system (GIS) data and the USACE Hydrologic Engineering Center's Regime Prescription Tool (RPT) to model how water level changes could improve habitat. In many cases, nominal adjustments in lake level can yield major benefits for fish spawning, migratory birds, and wetland vegetation, Ruona said.

"We're exploring ideas for adaptive management at each reservoir, including a potential conservation band that could be applied at each lake," said Ruona.

In the Mobile District, Tim Rainey, operations project manager at Lake Sidney Lanier on the Chattahoochee River in Georgia, is leading an SRP initiative at Buford Dam. This SRP-funded effort is designed to improve water quality and dissolved oxygen levels on a 35-mile section of the river upstream from Atlanta.

Lake Lanier stratifies during the summer, resulting in low dissolved oxygen levels in water released from the dam.

"We wanted to see if we could combine normal releases from the reservoir with flows from sluice gates, which would provide a source of aerated water to the river," said Rainey.

Working closely with USACE teams in Operations, Hydropower, Water Management, and Planning, and the Georgia Department of Natural Resources, the team collected and analyzed data so that Operations teams could identify the appropriate level of flows from the sluice gates. In 2023 and again in 2024, the team tested different combinations; data show that dissolved oxygen levels below the dam increased from 4.0 to 6.0 mg/L, a significant improvement.

In the Rock Island District, Perry Thostenson, supervisory natural resource specialist, has incorporated SRP recommendations into operations at Lake Red Rock and Saylorville Lake on the Des Moines River. In 2016, the team started by engaging a cross-section of USACE staff and partners -- including state fish and wildlife agencies, universities and non-governmental organizations – to help identify opportunities.

Migratory waterfowl like these black-bellied whistling ducks have benefitted from SRP-recommended environmental flows that help restore wetlands. (Photo by Evan Lowenstein)

The group recommended that USACE consider management options for fish and mussels, water quality, recreation, waterfowl and shorebirds, among others. An environmental flows workshop fleshed out the details.

In a 2019 water control manual update, USACE added a new conservation band to both reservoirs, which has enabled the Operations teams to raise the pool in the spring for fish spawning, draw down the reservoir in late summer for shorebirds, and hold water levels steady over the winter to protect hibernating reptiles and amphibians.

Thostenson said the SRP work on the Des Moines River has resulted in a healthier river, enhanced collaboration within USACE and with other agencies in Iowa, and improved knowledge of the river's ecology and hydrology.

"There are a lot of things we can do with our infrastructure to bring about a healthier aquatic system," he said.

Drawing from these examples, USACE Operations teams have identified several key ingredients for ensuring the success of SRP projects, including:

- Coordinate SRP projects with a cross section of USACE teams in the district. All SRP proposals need approval from each district's chief of operations, and each SRP project should have a consistent point of contact.
- Know how SRP recommendations might affect existing management practices in water control manuals, basin agreements and authorized project purposes.
- Ensure the district team has capacity to deliver within the proposed timeframe.
- Brainstorm internal and external partners who can provide information and expertise. That includes USACE teams, as well as local and regional stakeholders.

"These are just a few examples of how the Sustainable Rivers Program can support activities that contribute to a more sustainable and resilient Civil Works project," said Meg Gaffney-Smith, deputy chief USACE Operations and Regulatory Division.

"SRP provides opportunities to explore actions to enhance environmental outcomes that can be accomplished with little or no cost to the project, while continuing to deliver our congressionally authorized missions."

Creative thinking

leads to substantial savings on Nebraska restoration project

By Christine E. Paul
USACE Kansas City District

The Harlan County Lake Ecosystem Restoration Project aims to reconnect Methodist Cove, a popular recreation spot at Harlan County Lake in Nebraska, to the main resevoir and create new habitat for black crappie. (Photo Courtesy of Olsson)

The past few years have seen significant increases in the cost of many things like labor, materials and supplies. Construction projects have not been immune to these rising costs. So, when federally funded construction projects can save taxpayer money, it's worth celebrating.

The government is a steward of taxpayer dollars and, as such, has the responsibility to spend those dollars in the most cost-effective way. Sometimes this requires thinking outside the box.

Through collaboration and creative thinking, USACE Kansas City District, in partnership with the Nebraska Game and Parks Commission, was able to save about $1 million on an aquatic ecosystem restoration project at Harlan County Lake located in south central Nebraska. The construction effort, which totals over $11 million and was largely funded by the federal government, will restore vital parts of the aquatic ecosystem at the lake. In the face of rising prices, the team was able to cut costs while simultaneously improving the effectiveness and sustainability of the project.

One of the main goals of the Harlan County Lake Aquatic Ecosystem Restoration Project is the restoration of several coves. Many of the coves, which are popular spots for recreators, have been closed off due to years of erosion and sedimentation at the lake. When this happens, important fish habitat is lost.

Arguably the most important habitat lost is that of the black crappie, said Jeff Jackson, Aquatic Habitat Program manager with the Nebraska Game and Parks Commission.

"Crappie are really important to our anglers," said Jackson. "It's one of the top species anglers fish for."

While the Kansas City District operates and maintains Harlan County Lake, the Nebraska Game and Parks Commission manages the fish populations found in the water and provides valuable fisheries expertise to the project. According to Jackson, the increased sedimentation found in the coves of Harlan County Lake makes it difficult for black crappie to reproduce.

"A lot of these aging reservoirs, over time, their coves get closed in and get separated from the main reservoir," said Jackson. "What we've found is coves are really important for crappie recruitment and spawning. Restoring some of these coves is a really important part of maintaining crappie populations."

Methodist Cove, which is one of the most popular recreation spots at Harlan County Lake, was closed off from the main reservoir due to increased sedimentation. The project team has been working hard to dig a 200-foot channel reconnecting the cove to the main reservoir, as well as excavating the cove to a depth of about 12 feet. Not only will this provide a better recreation experience for those who enjoy fishing and boating at Methodist Cove, but it will allow black crappie to use the cove once again for spawning.

"There's been a lot of excavation — over 100,000 cubic yards of material — to reconnect (Methodist Cove) to the lake," said Leigh Mitchell, Kansas City District project manager for the Harlan County Lake Aquatic Ecosystem Restoration Project.

But creating an environment suitable for black crappie to spawn requires more than just excavating silt from the cove. It also requires replacing the lost habitat. Both the Kansas City District and the Nebraska Game and Parks Commission saw this as an opportunity to get creative.

According to Mitchell, the original design of the project used only artificial habitat. The type of artificial habitat the team decided to use is often referred to as "spiders" because of the long legs jutting out of the body. However, the spiders are not cheap. The team decided to turn the project into an experimentation of sorts, using both artificial habitat and felled cedar trees to see which habitat the black crappie prefer, and which is the more sustainable option in the long term.

The cedar trees, which are an invasive species, had already been removed as part of the larger ecosystem restoration project. By using the cedar trees for two-thirds of the habitat in lieu of the more expensive artificial

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habitat, the team was able to save close to $1 million on the project.

"There were a lot of cedar trees that needed to be taken out as part of this project. If we hadn't used them as habitat, they were going to get burned or taken off-site for disposal," said Mitchell. "So the project team thought, 'Well, instead of doing that, this stuff makes really good habitat. Let's put it to use in the lake,' and we were able to substitute a lot of that artificial fish habitat for what essentially was going to be a waste product."

Sinking cedar trees to create new fish habitat is not unique to this project. Many USACE lake projects use the removal of these invasive trees as material to create natural fish habitat. What's unique about the Harlan County Lake Aquatic Ecosystem Restoration Project is its ability to study both the artificial habitat and the cedar trees to see which is most effective in supporting the black crappie population.

"We want to know whether these habitats are successful — the artificial habitat versus the cedar trees. We want to know which one of those is a preferred habitat. It's a multipronged approach," said Jackson.

For Jackson and his team, this project goes beyond reconnecting Methodist Cove to the main reservoir. According to Jackson, it will likely impact species beyond the black crappie, which in turn will lead to a better recreation opportunity for those who love to fish at Harlan County Lake.

"There are other species that will benefit from the habitat as well," said Jackson. "There's a decent walleye population and white bass fishery and all those other species — bluegill and crappie — that will all benefit from the habitat in the reservoir."

The aquatic ecosystem restoration project at Harlan County Lake is expected to be complete in April 2025.

An aerial view of a section of Methodist Cove at Harlan County Lake in Nebraska shows artifical fish habitats called "spiders," left, next to felled cedar trees, right. Both the spiders and the trees will be placed under the water to create fish habitat for black crappie. (Photo Courtesy of Olsson)