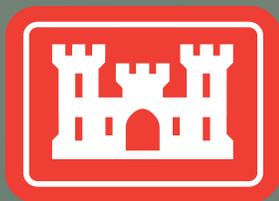


Highlighting partnership and collaboration



The Corps

# Environment

Volume 19, Issue 1  
January 2018



Standing ready,  
supporting  
disaster  
recovery efforts

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## Cover story

*The USACE Wilmington District stands ready to respond to natural disasters. When disasters occur, USACE teams and other resources are mobilized from across the country to assist local districts and offices.*  
(Photo by Hank Heusinkveld)

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### Submissions

The Corps Environment 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 [CEHNC-PA@usace.army.mil](mailto:CEHNC-PA@usace.army.mil).

### Deadline for submissions:

Nov. 15 (January)    Feb. 15 (April)  
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This issue highlights activities supporting Environmental Operating Principle #6: Leverage scientific, economic and social knowledge to understand the environmental context and effects of Corps actions in a collaborative manner.

<http://www.usace.army.mil/Missions/Environmental/Environmental-Operating-Principles/>

## COLLABORATION, PARTNERSHIP

### Road to preserving environmental principles

It is good to be back with the U.S. Army Corps of Engineers as the Chief of the Operations and Regulatory Division within USACE Civil Works. I had the privilege of serving in the Corps from 2007-10 as commander of the Memphis District and from 2010-13 as the “G3” for USACE, overseeing our military and civil response to contingencies in the United States and worldwide. Most recently, I had the opportunity to work on national strategy and planning for the Department of Homeland Security.

It is a unique time to be back with the U.S. Army Corps of Engineers. With respect to our regulatory program and environmental review processes, we are in the midst of one of the most significant efforts in recent memory. In partnership with other federal agencies and with non-federal stakeholders, we are focusing on streamlining the environmental review process to boost coordination and collaboration efforts. It also improves the timeliness of federal decisions on infrastructure projects while adhering to the law and preserving our environmental principles. Partnership, collaboration and transparency will guide our efforts to enhance the delivery of our environmental review processes.

Our regulatory program provides decisions on more than 80,000 permit and permit-related actions annually. These permit actions include the environmental review for critical transportation and energy infrastructure projects that also generate jobs. Developing a path forward that

upholds our environmental responsibilities while also delivering efficient and effective solutions to the nation requires comprehensive planning, partnership and collaboration.

Streamlining our environmental review process is a bipartisan issue and includes the efforts of our federal partners. As we look at our federal processes, we will collectively determine how we can take action faster, while also continuing to provide the necessary protections for our environment. There are two references providing both framework and guidance for the streamlining process. The first is Title 41 of the Fixing America’s Surface Transportation Act, often referred to as FAST-41. This initiative increases transparency and accountability within the federal environmental review and authorization process by improving coordination and synchronization among agencies.

FAST-41 codified into law new procedures to standardize interagency consultation and coordination practices in 2015. It established the Federal Permitting Improvement and Steering Council as a new authority to guide these collaborative efforts and to issue overarching regulations and guidance to implement the provisions of FAST-41. It also established the designation of Chief Environmental Review and Permitting Officers at each council agency. I personally serve as the CERPO for the USACE, and the Assistant Secretary of the Army for Civil Works serves as our steering council member.

The FPISC provides high-level oversight, supports implementation,

enhances interagency coordination and resolves disputes. This council ensures we collectively work together to review and provide permitting decisions within our given authorities. Representatives from the Department of Agriculture, Department of Commerce, Department of the Interior, Department of Transportation, Environmental Protection Agency and others all sit on the council. This council is helping bridge gaps others may have in understanding our processes. It also strengthens our relationships with other federal coordinating agencies.

Executive Order 13807, “Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects,” expands on the need for streamlined and disciplined environmental review. Issued in August, this executive order aims to increase the effectiveness and efficiency of our federal infrastructure decisions through the establishment of a “One Federal Decision” approach.

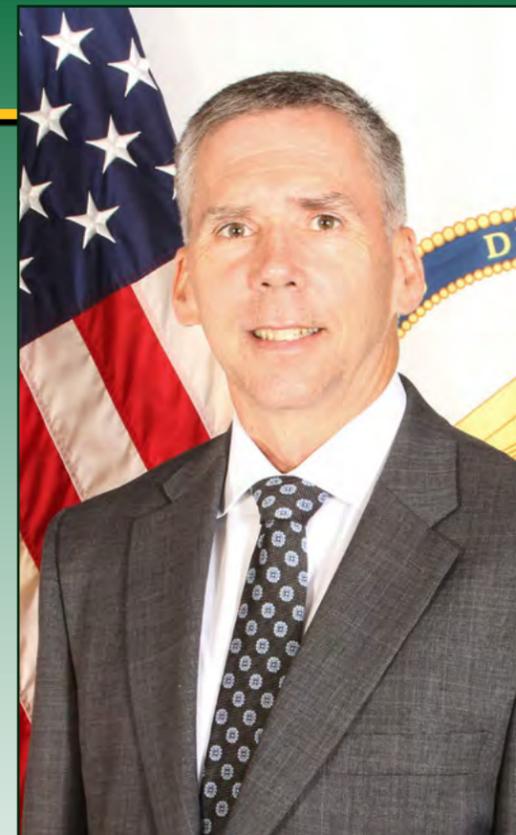
Under this approach, the NEPA lead federal agency works with other cooperating federal agencies to complete the environmental reviews and permitting decisions for major infrastructure projects. This involves signing a single joint Record of Decision and includes the goal of finalizing all federal decisions within two years. As a result, this will make our federal environmental review and decision-making process more coordinated, predictable and transparent to other agencies, applicants and the public.

The Council on Environmental Quality, in coordination with USACE and other

federal agencies, will be developing the framework for “One Federal Decision.” This will be done in consultation with the Federal Permitting Improvement Steering Council established under FAST-41. Major infrastructure projects are specifically addressed under this executive order, including energy production and generation projects, such as fossil fuel, renewable, nuclear and hydro sources, and electricity transmission.

We are off to a great start. I am optimistic the implementation of the executive order will have the intended effect of streamlined environmental review and permit decision-making while upholding and preserving the law and our environmental principles. My team and I are working alongside our fellow federal agencies to develop the path forward that embraces the concept of a coordinated project plan and front-loaded analysis. There are some challenges to implementation but we often find ourselves in agreement on what we believe needs to be done and how to do it.

Collaboration and partnership is key across all of our activities, not only within Civil Works, but across all mission areas. This collaboration often takes us outside of our program areas to acquire additional perspectives from subject matter experts. It is through this that we leverage scientific, economic and social knowledge to understand the environmental context and effects of Corps actions in a collaborative manner. If this sounds familiar, it should. This is one of our guiding values within our Environmental Operating Principles. The EOPs are engrained in all that we do, across all mission areas.



**Thomas Smith**  
*Chief, Operations and Regulatory*  
*U.S. Army Corps of Engineers*

Living the EOPs is nothing new, but something we continue to embrace and build upon. There are multiple articles within this issue that highlight the value of collaboration and partnership, including the Army Regional Environmental and Energy Offices’ successful implementation of a joint workshop with military installations and regulators on [page 8](#), and the Collaborative Wildlife Protection and Recovery Initiative on [page 35](#).

As we holistically move towards increased partnership and collaboration, it will increase efficiencies across all areas. Within Civil Works, it will enable us to streamline our environmental review processes. Equally, if not more important, is that through collaboration and transparency, we will work together to deliver regulatory actions that provide economic benefits and preserve environmental principles across the nation.

# Corps of Engineers cleans up, recycles hurricane debris

Story & photos by Ed Rivera  
USACE Southwestern Division

**SAN JUAN, Puerto Rico** – To save landfill space, the U.S. Army Corps of Engineers is recycling metal and wood chips in its removal efforts across the Caribbean island.

Through cooperation with leaders at local municipalities and the Federal Emergency Management Agency, USACE's Debris Planning and Response Team makes the collection process possible with teams working in nine separate locations.

In the city of Ponce, for example, more than 48 trucks have hauled 3,700 loads of debris.

*USACE estimates more than 3 million cubic yards of vegetative debris will have been generated from Hurricane Maria.*

"We have been actively removing debris from Ponce since Oct. 23," said Jasmine Smith, the debris mission manager from the New Orleans District. "We have removed more than 76,000 cubic yards via curbside pickup and temporary disposal sites."

The debris in Ponce is estimated to total more than 100,000 cubic yards, enough to fill Yankee Stadium more than 2 feet high.

John Fogarty, debris subject matter expert out of the New Orleans District, said USACE estimates more than 3 million cubic yards of vegetative debris will have been generated from Hurricane Maria.

Approximately 630,000 cubic yards will be reduced and used for compost, landfill cover, slope protection and more.

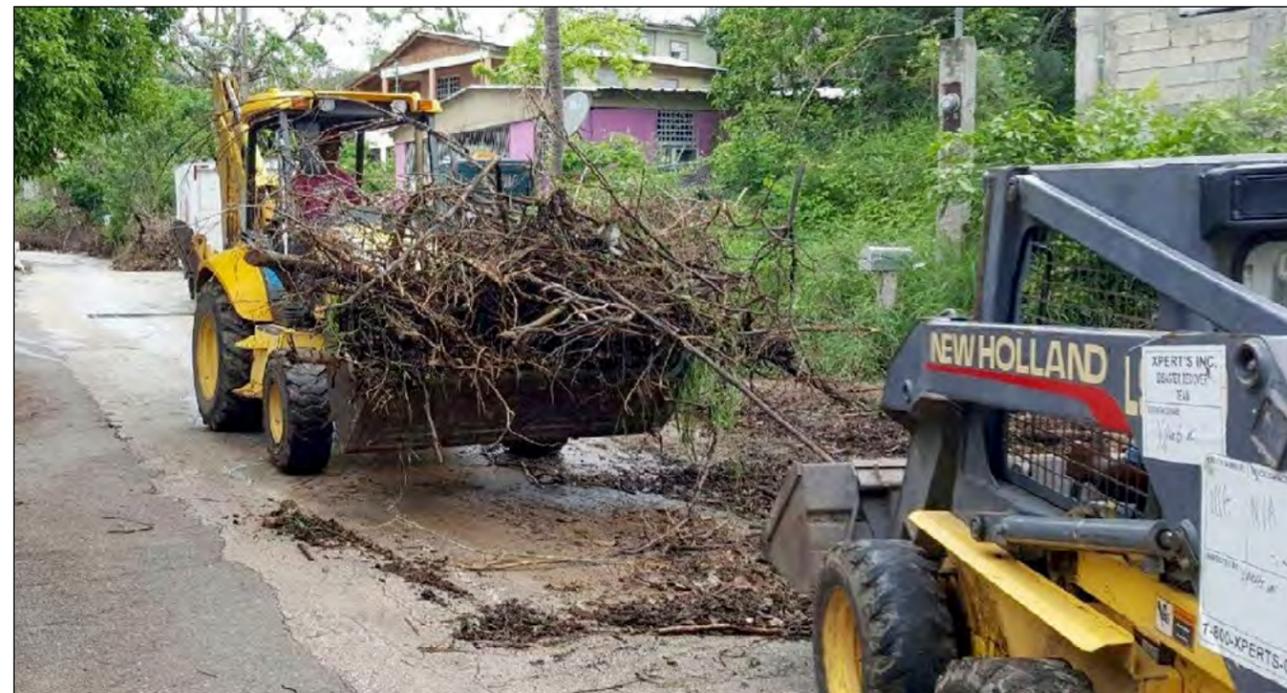
"There is an estimated 1.3 million cubic yards of construction and demolition debris, such as lumber and household furniture, which will yield approximately 1 million pounds of recyclable metals," he said.

Additionally, USACE forecasts close to 9,000 appliances are part of the debris, which may produce about half a million pounds of metals for recycling.

According to Fogarty, USACE is teaming up with the U.S. Environmental Protection Agency to handle freon removal from refrigerators, freezers and air conditioners, and to coordinate the collection and disposal of household hazardous wastes.

The Debris Planning and Response Team, in cooperation with FEMA and working closely with leaders of 54 municipalities, has removed approximately 284,000 cubic yards of debris.

"We continue to make strides with our community partners and endeavor to remove debris in a safe, efficient and environmentally sound manner," Smith said. "Debris removal continues to be a high priority mission for FEMA and the U.S. Army Corps of Engineers."



*Bulldozers clear debris off the streets and into dump trucks, making the roads passable for the Puerto Rican population. In addition, the Corps forecasts that appliances picked up and collected may eventually produce about half a million pounds of metals for recycling.*



The U.S. Army Regional Environmental and Energy Office – Southern and U.S. Environmental Protection Agency Region 4 team received EPA Bronze Medals on Oct. 19 for their efforts in organizing and hosting an environmental workshop for the EPA and DOD military installations within the Southeast Region. (EPA courtesy photo)

## Collaboration improves Army readiness Efforts earn workshop organizers bronze medals

By Jenn Miller  
USACE Headquarters

The U.S. Army Regional Environmental and Energy Offices have developed strong partnerships throughout the nation for more than 20 years. These partnerships enable the REEOs to work closely with military and regional policymakers to set standards that improve Army readiness, safety and well-being.

The REEOs also facilitate partnerships among other federal agencies to help resolve shared challenges through collaboration and information sharing.

The successful facilitation of which were recognized Oct. 19 in Atlanta, when the REEO-Southern and U.S. Environmental Protection Agency Region 4 team received EPA Bronze Medals for their exceptional efforts in organizing and hosting an environmental workshop for the U.S. EPA and Department of Defense military installations within the Southeast Region.

The workshop in April brought together more than 120 attendees, including representatives from 45 military installations, into a forum to update them on the EPA's current environmental regulations and programs.

The workshop also included panel discussions on environmental challenges, success stories and collaborative opportunities.

Though the main objective of the joint workshop was to provide regulatory updates and training, it also provided attendees the opportunity to share lessons learned and foster effective communication between EPA regulators and the installation.

"There is tremendous value in bringing our state and military partners together," said Susan Gibson, REEO-Southern director and co-host of the workshop. "This workshop serves as just one of many examples of how federal and state agencies can work together to develop a common operating picture and identify

opportunities to collaborate in order to advance our collective efforts."

The REEOs represent DOD and Army environmental and energy interests at the state and regional level to support and advocate for military missions and facilities. Their close coordination between military and regional policymakers helps to resolve issues before they become laws and regulations in support of military readiness and mission sustainment.

There are four Army Regional Environmental and Energy Offices, which represent the 10 EPA Regions. The offices are REEO-Northern, REEO-Southern, REEO-Central and REEO-Western. The entire REEO team contributed to the success of this workshop by providing support to its planning and implementation.

Additional information on the REEOs is available at:

[www.usace.army.mil/Missions/Environmental/Regional-Environmental-and-Energy-Offices-REEOs.aspx](http://www.usace.army.mil/Missions/Environmental/Regional-Environmental-and-Energy-Offices-REEOs.aspx)

## USACE celebrates banner year, advances military cleanup efforts nationwide

By Jenn Miller  
USACE Headquarters

It has been a banner year for the Formerly Used Defense Sites Program.

The program, which restores environmental conditions at sites formerly used by the Department of Defense to build and defend our nation, successfully obligated 100 percent of its authorized \$243.1 million budget and met all major milestones for fiscal year 2017, advancing cleanup efforts across the country.

"The success in our mission execution extends beyond the financials. It is demonstrated in the on-the-ground benefits our cleanup program is delivering across the nation," said Christopher Evans, chief of the Department of Defense Environmental Programs Branch for the U.S. Army Corps of Engineers Headquarters. "This past year we have advanced cleanup efforts on over 780 active formerly used defense sites and continue to monitor more than 120 sites across the United States."

USACE executes the FUDS program on behalf of the Army and DOD. This includes the cleanup of properties formerly owned by, leased to or otherwise possessed by the United States and transferred outside DOD control prior to October 1986.

To date, the Corps has identified 5,357 cleanup sites at 2,716 different properties where cleanup actions are required. Of these, 3,513 have either been closed out or are currently in monitoring status.

In fiscal year 2017 alone, the Corps completed cleanup on nearly 70 sites.

"A key element of our ongoing remediation efforts is the integration of innovative technologies, such as advanced geophysical classification, into our remediation activities," said Evans. "This is enabling us to clean up sites faster and at a reduced cost."

USACE Fort Worth District recently awarded a remedial action contract for use at the Camp Fannin formerly used defense site in Tyler, Texas, which will utilize advanced geophysical classification

techniques. The technology enables the project team to identify items buried under the ground to a greater level of specificity, reducing the need to dig up every anomaly detected. It can distinguish if items are munitions, rebar or debris. It's projected to not only reduce the time of cleanup, but also reduce the total project cost by up to 60 percent, when compared to more traditional geophysical approaches.

Evans credits this success to the talented and dedicated team supporting the program.

Through the efforts of more than 380 teammates across the nation who work in coordination with state environmental and health offices as well as the public, the U.S. Army Corps of Engineers continues to advance efforts to set conditions for a sustainable future.

To learn more about USACE's environmental mission, visit the website: <http://www.usace.army.mil/Missions/Environmental/>



Integration of innovative technologies, such as advanced geophysical classification techniques, will reduce the overall time and cost of remediation activities within the Formerly Used Defense Sites Program. (U.S. Army file photo)

# DOD provides unique, critical support to Puerto Rico

**Story & photos**  
by John MacPherson  
USACE New England District

Hurricane Maria struck Puerto Rico on Sept. 20 as a Category 4 storm with maximum sustained winds over 150 mph. The storm dropped over 20 inches of rain and crippled virtually all the island's infrastructure.

Fearing the collapse of a heavily damaged dam, team members with the U.S. Army Corps of Engineers New England District joined the Jacksonville District, Mobile District and other Department of Defense personnel on the island to help stabilize the dam and to provide clean drinking water to residents.

Constructed in the 1920s, the Guajataca Dam is owned and operated by the Puerto Rico Electrical and Power Agency and is used to produce drinking water for 250,000 people in three different municipalities. A 1,000-foot-wide earthen structure, the dam forms Lake Guajataca.

After the storm, the lake flooded and water started to flow over an emergency spillway. The massive volume of flow spared damage to the earthen dam but exceeded the capacity of the concrete-lined spillway, causing it to erode and crumble.

The dam's failure was imminent if the erosion continued. The spillway damage also severed water connections to all three water treatment plants, leaving the residents without clean water.

The dam is located in the mountainous jungle region typical of the island's interior and where approximately 200 homes lie within its downstream flood plain. Complicating matters further, downed trees and power lines crippled cell towers causing landslides and flooding on roads all around the dam.

One landslide also blocked the dam's 96-inch outlet pipe and restricted the normal flow of water out of the lake to the Guajataca River. As conditions at the

dam deteriorated, local officials issued a flash flood warning and advised residents to evacuate. Without any electrical power or functional communication systems, police and fire personnel had to go door-to-door to warn residents.

Unable to halt the spillway flooding, PREPA reached out to the Puerto Rico Emergency Management Agency and the Federal Emergency Management Agency for help. FEMA tasked the Corps of Engineers to advise PREPA with subject matter expertise and management to help stabilize the Guajataca Dam.

Established in response to Hurricane Maria, the USACE Recovery Field Office and a team from Jacksonville District conceived a plan that would be executed in phases.

Phase 1 included immediate measures to lower Lake Guajataca's water level below the spillway crest, stabilizing the eroding spillway.

Phase 2 included further stabilizing and anchoring the remaining sections of the damaged spillway to make it functional should the lake's water level begin to rise and start spilling again.

Phase 3 would require the construction of a new and improved emergency spillway and repair of all known damage to the dam.

Phase 1 removed landslide material that was obstructing the discharge from the river channel. Maximizing the discharge was critical in lowering the lake's water level. Jacksonville District awarded an emergency contract to have 10 large pumps transported and set up at the dam. Each 18-inch pump had a capacity to discharge up to 25 cubic feet per second. To expedite pump installation, the first two of the 18-inch pumps were flown to Puerto Rico on military aircraft with the rest arriving via barges.

Next, the plan called to place concrete jersey barriers into the active erosion area to dissipate the water flow over the spillway. Placement of the barriers,

however, presented a challenge. The targeted area was out of reach of any excavator or crane that could make it to the dam. DOD quickly stepped up with a solution. Marines from the 26th Marine Expeditionary Unit used CH53 Sea Stallion heavy-lift transport helicopters to lift and deliver the concrete barriers. The barriers were trucked to the crest of the dam, sling-loaded below the helicopters and released into the eroding area of the spillway. In total, the Marines placed 505 barriers over several days from off of the USS Kearsarge, a naval amphibious assault ship.

The concrete barriers in place, the team moved to minimize the active erosion by constructing a check dam across the spillway downstream of the concrete barriers. This check dam would slow the water's velocity flowing over the spillway. FEMA quickly delivered 1,800 super-sized sand bags, each capable of holding a cubic yard of sand, to construct the check dam. Placement of the sand bags posed yet another challenge. DOD provided CH-47 Chinook tandem-rotor, heavy-lift helicopters flown by Army National Guard units from Pennsylvania and Georgia to lift and place 1,338 of the sand bags. USACE personnel on the ground directed the precise placement of the sand bags to ensure the dam would contain the water.

Roads near the dam were narrow with numerous trees, debris and downed power lines. After debris was removed on local roads, PREPA mobilized an excavator to the site and arranged for delivery of rock materials from a local quarry. Traversing the roads, particularly with large trucks, had been a challenge. The main access road to the dam had one section that remained flooded for weeks after the hurricane's landfall. Getting rock to the dam was critically needed to reinforce and harden the side slopes of the eroding area. PREPA and FEMA again reached out to the DOD for support.

See [GUAJATACA](#), page 32



*Hurricane Maria devastated Puerto Rico's Guajataca Dam and halted the island's water supply.*



*To prevent the Guajataca Dam from failing, the Corps of Engineers worked with Puerto Rico's Army National Guard to haul stone from the quarry.*

# Collaborative efforts, operational changes increase White River salmon runs

Story & photo by Bill Dowell  
USACE Seattle District

**SEATTLE, Wash.** – The White River’s 2017 Chinook salmon run numbers were the best seen in 71 years.

Runs consistently averaged 1,565 in the early 2000s but 2017s count as of mid-October was 15,565, a 67 percent increase from last year’s 9,347 total.

With historical lows of only a few dozen 20 years ago, White River Chinook are seemingly rebounding from the collaborative efforts in managing Endangered Species Act-listed fish and designated critical habitat by officials from the U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration Fisheries, Muckleshoot and Puyallup Indian Tribes, and Washington Department of Fish and Wildlife.

USACE fish biologist Dr. Fred Goetz said operational changes made by Corps officials at Mud Mountain Dam could be one part of the record-setting runs.

“We’re seeing a larger number of young males, called jack Chinook salmon, returning,” Goetz said.

Jacks are males returning to spawn after spending only one year in the ocean. Although young, jacks are sexually mature and important in the salmon life cycle. During low Chinook returns, when fewer female fish are on the spawning grounds, having more males present to find the female fish and eggs increases fertilization opportunities. It is rare to have early returning females, or jills.

Operational changes USACE made were a result of NOAA Fisheries’ 2014 Biological Opinion, referred to as a BiOp.

USACE and NOAA officials worked together hammering out details on how the dam operates before NOAA issued its BiOp in 2014 and its recommendations for some major improvements in the dam’s fish passage operations and related structures on the White River near Enumclaw, Washington.

These improvements were aimed at protecting Chinook and other ESA-listed fish species and their designated critical habitat.

“We began implementing the BiOp-



*Mud Mountain Dam’s Dan Robinson collects and loads a Chinook salmon into a U.S. Army Corps of Engineers truck ready for transport upstream.*

recommended improvements in 2015,” said Goetz. “For the first change, we began restricting openings of the Mud Mountain Dam tunnel between March 1 and June 30.”

Restricted use of the 9-foot tunnel reduced potential injury and mortality of juvenile salmonids passing through the tunnel during their spring downstream migration. With lower mortality rates, this could be a reason more jacks are returning.

“The high returns of jacks is considered a good indicator for higher adult returns in future years,” said Russ Ladley, Puyallup Tribe.

Every year the Puyallup Tribe transfers thousands of the Muckleshoot hatchery’s juvenile spring Chinook, raising them in acclimation ponds in the upper watershed. The acclimation pond network is a real value in the recovery process, according to Ladley.

“In 2016, 64 percent of returning fish were of acclimation pond origin,” he said.

Another key improvement was making interim repairs in 2015 to a deteriorating diversion dam, also called a fish barrier, downstream of MMD. The fish barrier is a key structure of the Corps’ 1941-built trap-and-haul facility for capturing salmon and transporting them upstream.

Muckleshoot officials also collect

Chinook at the structure for their hatchery and saw a 10 to 20 percent pre-spawn mortality rate drop to less than 7 percent following repairs, according to an email from a hatchery official.

“The strong returns this year are evidence of the time, effort and resources the Corps has put into the much-needed improvements at Mud Mountain Dam and the deteriorating diversion dam downstream,” said Keith Kirkendall, chief of the Environmental Services Branch for NOAA Fisheries’ West Coast Region. “The fish are telling us that if we can work together to continue to provide them safe passage upstream and downstream, they will do the rest.”

The next hurdle is completing the third BiOp recommendation, a long-term project to replace the aging structure and related fish collection facility to allow for safer capture and transport of fish upstream. The present design and facility isn’t adequate for current conditions or salmon numbers, especially with recently increasing numbers, according to agency officials.

ESA-listed Puget Sound Steelhead, Puget Sound Chinook, and Coastal-Puget Sound and Coastal Bull Trout are all species needing to use the trap-and-haul facility.

See SALMON, next page



## USACE recognizes Jenna Roberson, Interior Designer of the Year

By Rashida Banks  
USACE Savannah District

While other children were playing with trucks or dolls, Virginia “Jenna” Roberson was decorating and rearranging furniture in her bedroom.

Fast forward to today and Roberson’s childhood hobby has blossomed into a successful interior design career, which has earned her national recognition by the U.S. Army Corps of Engineers.

A nine-year employee of the Corps’ Savannah District, Roberson was recently named the 2017 USACE Interior Designer of the Year. She competed with USACE interior designers throughout the world to receive the honor. The annual award recognizes a Corps employee for distinguished professional excellence, achievements and superior performance in interior design.

“Jenna is one of the most talented interior designers that we’ve ever had,” said Terri Dismukes, chief of the Architectural Section, USACE Savannah District. “She has received numerous compliments from clients all over the United States. Everything she does is top notch.”

Roberson’s nomination cited her superior accomplishments in managing more than \$400 million in interior design projects in various stages of design in 2016. Her effective leadership and management expertise resulted in the successful completion of projects that benefit military service members, civilians and families throughout the Savannah District’s area of responsibility.

Occasionally, Roberson does work for other districts when the need arises.

“It’s pretty exciting,” Roberson said of the honor. “It’s nice to be recognized for my contributions here and to know that someone was paying attention to nominate me for it.”

Roberson’s interior design projects range from Army family housing and large administrative, training and supportive war fighting facilities to flight control towers, renovations and various other facilities.

As the Savannah District’s only interior designer, Roberson says that time management and close collaboration with staff members and customers are key in accomplishing her mission.

“Time management can be very challenging because I’m the only designer, and I’m working on all of our projects,” said Roberson. “My portion of a project doesn’t take as much time as the architect’s portion but it’s still very stressful when all the deadlines are at the same time.”

Roberson says she spends the majority of her time meeting with vendors and collaborating with customers to ensure the Corps fully meets its requirements with the final product.

“One of the interesting portions of my job is dealing with the customer and making my vision of what we are doing jive with what they want,” she said.

This requires her to work closely with both in-house design staff members and architectural/engineering firms to establish program and project metrics for success.



**Virginia “Jenna” Roberson**  
2017 USACE Interior Designer of the Year

“I’m passionate about helping people with their space’s potential,” said Roberson. “My goal is for the military service members that occupy these facilities to have a space they can feel good about and can work more efficiently in. That’s a top priority of completing the mission, and I enjoy being a part of that.”

## SALMON

continued from previous page

The Muckleshoot and Puyallup Tribes hold treaty reserved fishing rights on the White River and have long sought the improved fish passage. The solution comes with a price, somewhere between \$100 million and \$250 million.

That’s the cost to build a new fish passage facility that protects passing fish and allows for safe capture and transport of ESA-listed fish upstream past Mud Mountain Dam. What complicates the

runs are the pink salmon that also migrate in odd years. Their numbers approach 500,000 each migration season and must be transported along with the ESA-listed species.

Corps officials are nearing design completion of the new facility that could see 60,000 fish a day during pink run years. They are preparing for a contract award in 2018 and officials hosted an Industry Day in August. Vendors received

more information on the project and requirements to construct the new barrier structure, fish passage facility, associated site work and appurtenances. Completion is expected in 2022.

“Ultimately, the Army Corps of Engineers is committed, as we know every one of our partners is, to improving fish passage conditions at Mud Mountain Dam and making the White River a place where fish can flourish again,” Goetz said.

Part of a national effort to improve pollinator habitats, the Corps of Engineers helps establish pollinator beds such as these at the Dewey Short Visitor Center in Branson, Missouri.



# Garden initiative invites visitors to explore, sustain pollinator habitats



Leah Deeds, natural resources specialist, USACE Little Rock District, inspects a pollinator at the Dewey Short Visitor Center at Table Rock Lake, Branson, Missouri. The center is in the process of completing pollinator beds that support conservation practices for pollinator habitat improvement.

**Story & photos**  
by **Bryanna R. Poulin**  
USACE Little Rock District

**BRANSON, Mo.** – For the thousands of guests visiting Table Rock Lake each year, no visit would be complete without stopping by the visitor center featuring a state-of-the-art interactive map of the lake, wall murals and a replica of an Ozark bluff.

Designed and built in 2012, the Dewey Short Visitor Center includes everything from 3 acres of creative landscaping to an up close look of the lake. Still, a key element was missing.

“We needed pollinator beds and planting areas,” said Leah Deeds, natural resources specialist, Little Rock District, U.S. Army Corps of Engineers. “We started with a trail from the parking lot to the building. It had a bridge and was fun but it wasn’t very interesting, and the trail didn’t get used very often.”

A pollinator bed is a garden that is planted predominantly with flowers that provide nectar or pollen for a wide range of pollinating insects. These pollinator beds, however, were not finished when the visitor center was built.

Cherrie-Lee Phillip, conservation biologist, Little Rock District, spearheaded the project with Deeds. She explained that contractual issues with the beds were never fully resolved. Subsequently, the beds fell into disrepair and were in urgent need of restoration.

This drove Deeds, who works at the visitor center, to reach

out to Phillip in June 2016 expressing her desire to replant some of the unfinished areas.

“Leah called with a plan in mind, and I was able to assist her in reaching out to potential partners. Together, we made it happen,” Phillip said.

Of course, time and resources were needed to plant new pollinator beds and revamp the area outside the visitor center.

So far the total cost to complete the entire project is \$4,772 plus 100 hours of volunteer service, donated seeds and plants, Phillip said.

Fortunately, the project gained outside support.

The Handshake Partnership program, which is available Corpswide, along with the Pollinator Conservation Initiative, helped make this project work, Phillip said. PCI was established by the previous administration directing agencies to develop plans to increase and enhance pollinator habitats.

She added that the visitor center was chosen since it’s a Leadership in Energy and Environmental Design certified facility with a gold rating. This means the landscape restoration project to establish a pollinator garden aligns perfectly with the facility design standards and LEED values.

More importantly, the pollinator beds support two of the Corps principles stemming from the June 2014 memorandum issued by former President Barack Obama creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators.

Since USACE is a federal land management agency, it was

directed specifically to incorporate conservation practices for pollinator habitat improvement on the 12 million acres of land and waters at resource development projects across the country.

“The establishment of a native plant pollinator garden at the Dewey Short Visitor Center aligns with two of the Corps’ Environmental Operating Principles by fostering sustainability and supporting environmentally sustainable solutions,” explained Phillip.

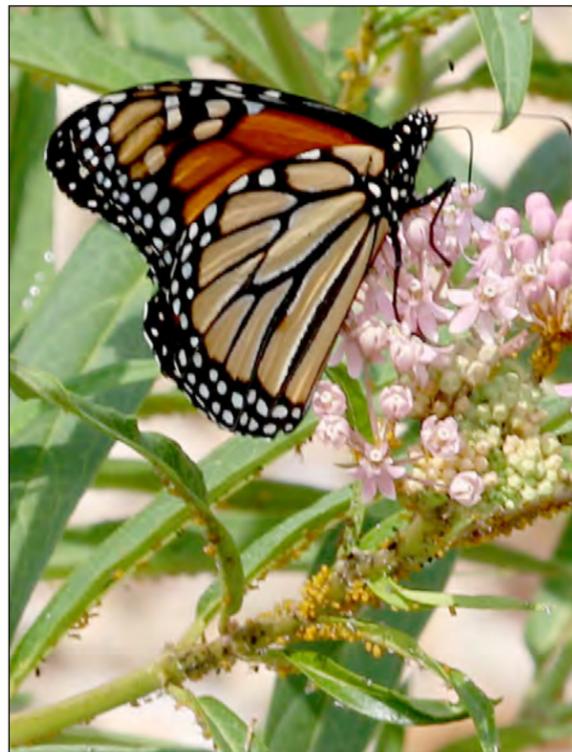
Even with outside help it would take a few months for the partnership to award funding.

“Table Rock staff knew they wanted this project done with or without the Handshake Partnership,” said Phillip. So, as they waited, the staff used their own funding to initiate the project immediately, purchasing and planting plants native to the Missouri ecoregion to get three of the flower beds started.

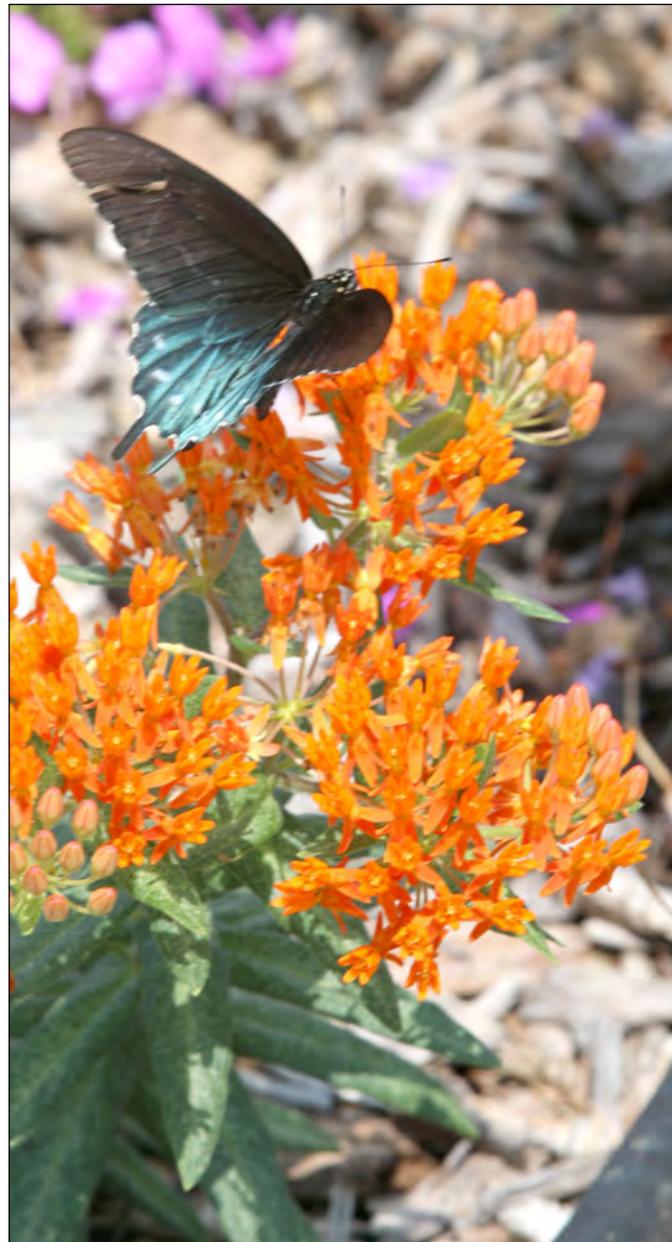
Once the \$4,772 is received from the Handshake Partnership program more plants will be purchased, as well as benches, interpretive signs for the flower beds and edge material for the gardens, Phillip said.

“The biggest challenge was the length of time from the announcement of winning the award in December 2016 to actually seeing the funds, which was one month before the close of the fiscal year,” Phillip said. “If we had waited and started the work when we received the handshake funds, I don’t think we would have kept the interest of our volunteers and other organizations who helped.”

See **TABLE ROCK**, page 16



Pollinator beds encourage the health and growth of honey bees and butterflies.



*Pollinator beds such as those found at the Table Rock Visitors Center promotes the health of butterflies and other pollinators.*

expands the visitor experience at Dewey Short.”

Phillip followed up saying, “It’s a teaching opportunity for the Corps and multiple learning opportunities for the visiting public, especially kids, to see and be able to ask questions about the natural environment that they live in. In this case, the project took a few months but in that short time span, the plants grew, bloomed and the habitat was restored and created for insects, birds and other wildlife.”

Deeds hopes that visitors to Table Rock take back what they’ve experienced and advance efforts to protect pollinators.

“In 2016, 160,000 visitors came to Dewey Short Visitor Center from all over the U.S. and the world,” Deeds said. “This year that number looks to be around 175,000. We are making progress if just a fraction of those visitors implement native landscaping and pollinator protection in their home communities.”

Another benefit is the impact the beds have on the pollinators.

Pollinators – bees and insects to include bats and other small mammals – are in decline for several reasons like invasive species competition, destructive pathogens or parasites and the use of pesticides, Phillip explained.

“They are vital to our existence as a species, not just from an agricultural perspective but also for flowering plants in our urban and natural ecosystems,” she said.

“Pollinators need the restored native flowerbeds. Somewhere between 75 and 95 percent of all flowering plants on the earth need pollinators

to pollinate,” Phillip said. “Pollinators provide pollination services to more than 180,000 different plant species and more than 1,200 crops. That means that one out of every three bites of food you eat is there because of pollinators.”

Not to mention the tiny critters perform billions of dollars in ecosystem services each year.

“If we want to talk dollars and cents, pollinators add \$217 billion to the global economy, and honey bees alone are responsible for between \$1.2 billion and \$5.4 billion in agricultural productivity in the United States,” Phillip added. “In addition to the food that we eat, pollinators support healthy ecosystems that clean the air, stabilize soils, protect from severe weather and support other wildlife.”

Now that the project is almost finished the future goal is for other field offices throughout the district to build pollinator beds in their area.

“All ideas are laid out in the USACE Pollinator Protection Plan,” Phillip said. “We can conduct prairie restoration, establish flowerbeds, make accommodations for beekeepers to keep their hives on acres that we own, and teach interpretive sessions to increase education and awareness.

“All the field office has to do is let me know or show me that they are interested, and I’ll get the ball rolling,” she said.

“When the Table Rock project is completed,” Phillip said, “5 acres of enhanced pollinator habitat would be included in the Pollinator Conservation Initiative’s 7 million acre goal.”

## Feasibility study to assess cost, environmental impact of widening Mobile Harbor

Story & photos by John Barker  
USACE Mobile District

The U.S. Army Corps of Engineers, Mobile District, will soon complete existing condition modeling as part of a study to determine the viability of widening and/or deepening Mobile Harbor to new dimensions.

The \$7.8 million study is a result of a 2014 request from the Alabama State Port Authority to conduct a comprehensive study to determine the costs, economic and environmental impacts of improving Mobile Harbor shipping channel.

As of 2015, Mobile was the 10th busiest harbor, by volume, in the United States, according to Waterborne Commerce Data.

“The proposed channel modifications are based on the economic viability and other factors,” said David Newell, project manager. “The modeling will help determine the environmental impacts of the proposed modifications.

“At present, the existing channel depths and widths limit vessel cargo capacity, restrict many vessels to one-way traffic and in some reaches limit transit operations



*Richard Allen, coastal engineer, USACE Mobile District, heads toward Mobile Bay to service gauges as part of the extensive data collection effort to assess the viability of widening and/or deepening Mobile Harbor.*

to daylight only for vessels transiting in and out of Mobile Harbor,” said Newell. “To address these concerns, in 2014, the Alabama State Port Authority requested that Mobile District consider widening and deepening the Mobile Harbor channel to its authorized dimensions. These improvements to the harbor would enable larger and more numerous vessels to safely use the port.”

Judith Adams, public relations officer for the Alabama State Port Authority, said these types of improvements will ensure the harbor continues to keep global business flowing.

“The Alabama State Port Authority’s obligation is to ensure the Port of Mobile continues to provide critical infrastructure necessary to our economy, jobs creation and international competitiveness,” Adams said. “Ships are getting larger and markets are continually expanding. Seaport infrastructure investments, like the deepening and widening of the Mobile Ship Channel, ensure both our agribusiness, mining, manufacturing and retail shippers have access to cost-efficient ocean carriage services necessary to compete in the global marketplace.”

Initiated in 2015, the four-year study is cost-shared with the Alabama State Port Authority, the project’s local sponsor. The study is investigating an array of

alternatives that include variations of widening and deepening the channel. The results will be presented in a General Reevaluation Report, or GRR.

The data developed during this study will enable the Mobile District to first develop an array of alternatives and, then, to narrow these alternatives to a tentatively selected plan. The overall study will determine whether it is environmentally and economically feasible to widen and/or deepen the channel.

In 1986, Congress authorized various modifications to Mobile Harbor, including widening and deepening the channel to 55-foot deep and 550-foot wide. Currently, most of the channel is 45-foot deep and 400-foot wide.

By late March 2018, the team will have developed sufficient information to designate the tentatively selected plan.

With additional analysis specific to that plan, the team will draft a general reevaluation report with a Supplemental Environmental Impact Statement that will be released for public review and comment in July 2018.

Marking the start of a multi-million dollar navigation project, participants toured a clamshell dredge and were offered a first-hand look at dredging operations in Boston Harbor. (Photo by Brian Murphy)



# Corps kicks off Boston Harbor Navigation Improvement Project

By Ann Marie R. Harvie  
USACE New England District

To kick start the Boston Harbor Navigation Improvement Project, Col. William Conde, commander, New England District, U.S. Army Corps of Engineers, his staff and a few members of Congress, state and local agencies, gathered for the Sept. 15 ceremony in Charlestown, Massachusetts.

Following a vessel tour and first-hand look at dredge operations, the group proceeded to a ceremonial signing of a propeller.

The ceremony aside, Conde remarked on the complexity and economic significance of the multi-million dollar project.

These improvements will directly contribute to the economic efficiency of commercial navigation in the New England Region, he said. Boston Harbor is New England's largest port, serving as the principal distribution point for the export and import of commerce for Massachusetts, New Hampshire and Vermont.

"This improvement deepening will make Boston Harbor more competitive in the navigation business, allowing larger container ships to dock at Boston facilities," he said. "This will be a major boost for Boston, the Commonwealth and the region."

Non-federal sponsors, Massport and MassDOT, will contribute \$120 million, while the federal government will pay \$210 million to complete the project.

The project will deepen the Broad South North Entrance Channel to 51 feet; the President's Roads, the outer Main Ship and the Lower Reserved channels to 47 feet; the Main Ship Channel between the Reserved Channel and Massport Marine terminal to 45 feet; and the Chelsea River and a small portion of the Mystic River Channel to 40 feet. The project will help the larger vessels navigate in and out of the harbor.

"About 11.6 million cubic yards of silt, sand and clay and 400,000 cubic yards of rock will need to be removed to deepen the channels," Conde said. "We anticipate the deepening work will start in the spring of 2018 and be completed late in 2022."

"The recommended plan involves placement of all dredged material and rock at the Massachusetts Bay Disposal Site," said Matt Tessier, project manager. "However, it is the policy of the U.S. Army Corps of Engineers to use dredged material, where practicable, for beneficial use."

According to Tessier, the district will investigate uses of rock for offshore reef creation and shore protection. The dredged material may have beneficial use as well.

"Use of the dredge material to cap the former Industrial Waste Site

in Massachusetts Bay also will be investigated in partnership with the Environmental Protection Agency and others," he said.

Tessier said that none of these beneficial uses should increase the project costs.

Conde said the Water Resources Reform and Development Act of 2014 authorized the improvement deepening of Boston Harbor for construction. The authorization includes deepening and widening of existing channels throughout the harbor from Broad Sound North Channel to Conley Terminal as well as potential future improvements to the upstream Mystic River and Chelsea River channels.

"This project has been a long time in the making, and I'm thrilled that we can all be here to celebrate that we're going to deepen Boston Harbor so it can remain competitive and be a vital hub for ocean freight for all of New England," he said. "This project would not have been possible without the combined efforts of all the partners involved, especially Massport and the Commonwealth of Massachusetts."

This project will go a long way toward supporting the needs of the city of Boston, the region and the state in meeting the growing navigation requirements to remain competitive within the navigation industry, he said.

# Disaster Management Exchange fosters U.S., China understanding, trust

By Airman 1st Class Nathan H. Barbour  
355th Fighter Wing Public Affairs

The 13th annual U.S.-China Disaster Management Exchange Table Top Exchange and Practical Field Exchange commenced on Nov. 16 with an opening ceremony at Camp Rilea, Oregon.

Hosted by U.S. Army Pacific, the DME allows hands-on and side-by-side interaction between U.S. Army and China's People's Liberation Army on Humanitarian Assistance and Disaster Relief operations and enables sharing of lessons learned.

The 2017 exchange focused on a notional flooding scenario in which both armies were requested to provide humanitarian assistance and disaster relief to a third affected state as part of a Multinational Coordination Center.

Maj. Gen. Susan A. Davidson, commanding general, 8th Theater Sustainment Command, welcomed attendees and highlighted how the event builds understanding and trust between the two armies.

"Disaster Management Exchanges like this are invaluable because as they expand in depth with each iteration, they allow us to truly recognize the importance of collaboration in addressing non-traditional security threats such as natural disasters," Davidson said. "Our ability to increase our practical de-confliction, and gain a better understanding of each other's procedures in the event of a real-world disaster response, could be what makes all the difference to the affected state."

Throughout the exchange, personnel simulated real-life scenarios in order to identify procedural gaps and practice techniques required for efficient and collaborative response, such as search and rescue techniques and the construct of the MNCC.

"The PLA and U.S. military both have dignified histories and glorious accomplishments. Although we are geographically far from each other, the respect for human life is beyond national boundaries and races," said Maj. Gen. Huang Taoyi, deputy commander, 75th

Group Army, PLA. "We are ready to join our friends from the U.S. to actively implement the consensus reached by our two state leaders and make concerted efforts to make this year's DME more practical, more in-depth and improve the two militaries' abilities in disaster relief."

Starting in 2005, the DME has been held in Hawaii; Washington, D.C.; New York; Washington; and multiple areas in China. The DME has also matured from basic visits and briefings into a substantive exchange that uses table top and practical field exchanges to focus and facilitate interaction and develop the capacity to de-conflict Humanitarian Assistance and Disaster Relief operations between the U.S. Army and the PLA.

In addition to providing a learning opportunity for the U.S. and PLA participants, this year the DME included

military and government observers from Bangladesh, Canada, Japan, the Philippines, Singapore and the People's Republic of China.

U.S. participants included U.S. Army Pacific, the 8th Theater Sustainment Command, the Oregon National Guard, the U.S. Military Academy, the 351st Civil Affairs Command, the 13th Combat Sustainment Support Battalion, the 571st Sapper Company, the U.S. Coast Guard Sector Columbia River, the Center for Excellence in Disaster Management and Humanitarian Assistance, the U.S. Army Corps of Engineers Northwestern Division, USACE Portland District, the National Oceanic and Atmospheric Administration, the U.S. Geological Survey and the Pacific Disaster Center, an applied research center managed by the University of Hawaii.



Oregon Army National Guard Staff Sgt. Jason Cushman, with the 442nd Engineer Utility Detachment, instructs Joint Logistics Force soldiers from the People's Liberation Army on how to use a saw to cut wood for shoring structures at Camp Rilea Armed Forces Training Center, Nov. 17, in Warrenton, Oregon. Shoring prevents damaged structures from collapsing and enables rescuers to extract casualties. (Photo by Sgt. 1st Class April Davis)



Purple martins (*Progne subis*) are the largest swallow species in North America and have been a part of the continent's human culture even before the arrival of European settlers to the East Coast. (Photo by Garrett Dorsey)

# Corps reservoirs benefit purple martins

By Tom Conning  
USACE Portland District

**PORTLAND, Ore.** – An unladen purple martin swallow can reach the air-speed velocity of about 24 mph, which may be important information if you're trying to cross the "Bridge of Death" as you search for the Holy Grail.

It's also probably impossible for that 1.7 ounce bird to carry a 1.2 kg coconut, even if he gripped it by the husk (we are checking with the engineering department though).

Lost? Don't fret, you just need to watch more movies, or specifically, watch "Monty Python and the Holy Grail." But the movie isn't important, it's just a gimmick to get you to focus on swallows. And more specifically, purple martin swallows.

This particular species of swallow is found in large numbers in eastern North America while in recent years, their number west of the Rocky Mountains has declined.

Even though the population is in decline, according to Garrett Dorsey, Willamette Valley Project wildlife biologist, Fern Ridge Dam and Reservoir as well as other Portland District projects offer good purple martin nesting habitats.

"The Willamette Valley Project has the unique opportunity to provide nesting within

large open areas through the use of a nest box program," explained Dorsey. "We currently have three locations that have purple martin colonies: Cottage Grove, Dorena and Fern Ridge (dams and reservoirs)."

predators away; and provide abundant insect life for food.

Indeed, the Willamette Valley population is one of the largest in Oregon, making the valley a great place to study the birds.

In fact, the Corps has partnered with private citizens, non-profits, federal agencies and Oregon State University to study these birds.

Lorelle Sherman, OSU Department of Forest Ecosystems and Society graduate research assistant, is studying the dispersal of purple martins up and down the West Coast.

"These birds are highly charismatic and fun to watch interact with each other and with other species," Sherman said. "They put on a great aerial show while feeding, too. I was drawn to this project because there are still major gaps in our knowledge of purple martin natural history."

The Willamette Valley Project is one of the core members of the Western Purple Martin Working Group, an organization with

a goal of measuring how many purple martins are in the west and increasing or maintaining their overall number.



USACE has partnered with private citizens, non-profits, federal agencies and Oregon State University to study the purple martin. (Photo by Lorelle Sherman)

These project lands provide open skies for the birds to fly and see aerial predators; are located over water, which keeps land-based



Graduate research assistant, Lorelle Sherman of Oregon State University said she loves the purple martin song so much that she made it her ringtone. (Photo by Lorelle Sherman)



# USACE supports disaster recovery efforts

By Edward Rivera  
*USACE Southwestern Division*

SAN JUAN, Puerto Rico – Running water is still a scarce commodity for many Puerto Ricans in the aftermath of Hurricane Maria. But, in the past weeks residents in Isabella and Quebradillas have been able to wash, bathe, cook and drink from the tap again.

In addition to the more than 70,000 residents in the two cities, an estimated 30,000 people living in the vicinity of Guajataca Lake will soon have water as well. These areas were without running water since Sept. 20 when the storm damaged the Guajataca Dam and a nearby water treatment facility.

The U.S. Army Corps of Engineers quickly

engaged and moved to aid in the stabilization efforts at the dam in response to a request for technical expertise and assistance from the Puerto Rico Electric Power Authority who own and operate the dam.

“The entire Department of Defense was involved in stabilizing the dam following the damages from Maria. The U.S. Navy and U.S. Marine Corps dropped 500 jersey barriers and the Army dropped 1,300 super sacks to quickly halt erosion to the damaged spillway,” said Capt. Kenneth Skillman IV, action officer for the Guajataca Dam. “We continue the stabilization efforts with dump truck deliveries of riprap and gabion stone.”

While simultaneously working on the spillway, 12 dewatering pumps, flown in by the

U.S. Air Force, were installed to reduce the water level in the reservoir and re-establish supply to a 17-mile-long water distribution canal. According to Skillman, normally a 54-inch pipe carries water from the reservoir to the water treatment plant, but the pipe was severed during the spillway failure.

“We are using pumps to supply a water flow into the water distribution canal located at the base of the dam,” said Skillman. “When we began about three weeks ago, the flow was about 14 cubic feet per second. Today we are at 65 cfs and with an added sixth pump we will meet the Puerto Rico Aqueduct and Sewer Authority’s request for 75 cfs.”

Recently, PRASA moved a pump, generator and other necessary equipment

to the water treatment facility at the dam in the hopes of pulling water from the canal and pumping it to the water treatment plant. Once treated, the water will be distributed to the lake area communities, bringing them one step closer to life before the storm.

“This is another step on the road to recovery,” said Col. James DeLapp, Recovery Field Office commander. “The combined efforts between DOD, the Corps of Engineers, the Federal Emergency Management Agency, PRASA and PREPA has not only restored running water, but created a small spring of hope to more than 100,000 people around Guajataca Lake, Isabela and Quebradillas.”

See RECOVERY, page 30

# Beach project reduces storm risk, benefits threatened wildlife

By JoAnne Castagna, Ed.D.  
USACE New York District

This spring, Harry Strano, a wildlife biologist, was walking on the shore in Deal, New Jersey, when he was pleasantly surprised.

He saw a pair of clownish-looking birds building a nest. Others probably noticed them as well with their long legs, bright yellow eyes and long striking red-orange bills.

These birds are American oystercatchers and they're a State Special Concern Species – meaning their population is in decline and at risk of becoming threatened.

Jen LaStella, another wildlife biologist, believes the birds are returning to the shore because of a beach nourishment project being performed by the U.S. Army Corps of Engineers, New York District.

“The beaches created by the replenishment provide ample space and opportunities for shorebirds to rest, forage and even nest,” said LaStella who with Strano works for Amy S. Greene Environmental Consultants, Inc., providing construction monitoring services for rare, threatened and endangered species.

The Atlantic Coast of New Jersey Sandy Hook to Barnegat Inlet Beach Erosion Control Project is the largest beach nourishment project ever undertaken by the Corps.

The project will improve resiliency and reduce coastal storm risk to the shoreline, and as an added benefit will

provide habitat for various rare, threatened and endangered wildlife.

Initiated in 1994, the project is being constructed by the USACE's contractor Manson Construction Company and encompasses 21 miles of the Monmouth County, New Jersey, shoreline that extends from the Township of Sea Bright down the shore to the Manasquan Inlet.

The Corps is working on the project in cooperation with the New Jersey Department of Environmental Protection and in close coordination with the U.S. Fish and Wildlife Service.

The work includes pumping offshore sand onto the shore to reinforce the upland and reduce risk to the beach due to wave damage and inundation.

The completed project will widen the shoreline 400 feet and build up the beach 10 feet above sea level.

“This project is the world's biggest beach-fill project in terms of sand volume,” said Anthony Ciorra, chief, Hurricane Sandy Branch, USACE New York District.

The project also includes notching or removing rock, known as armour stone, from three existing groins from Elberon to Loch Harbour. Groins are rigid structures that extend out from the shore to prevent beach erosion and direct currents for scouring a channel.

In addition, 10 existing storm water outfall pipe extensions are being lengthened. These pipes carry storm water from the land to the ocean.

In 2012, 18 miles of the 21-mile project were completed.

It was then that Hurricane Sandy devastated the region, removing 5 million cubic yards of sand from the shore. This is enough sand to fill New Jersey's MetLife Stadium.

In early 2013, the Disaster Relief Appropriations Act of 2013, better known as the Sandy Relief Bill, authorized USACE to not only repair engineered beach projects by replacing the sand lost during Sandy but to restore them to their original design profiles.

Since Sandy, USACE has repaired the 18 miles of shoreline that was damaged and replaced 7.7 million cubic yards of sand to the shore. Work continues on the remaining 3 miles of the project, between Deal and Elberon.

On this project, as with all beach nourishment projects, USACE implements measures to protect and minimize impacts to rare, threatened and endangered species.

In addition to the American oystercatcher, these species of concern in New Jersey include the federally listed threatened and state endangered piping plover and the seabach amaranth plant as well as the state endangered least tern.

Though protective measures focus on the life and habitat requirements of federally listed species, other species benefit as well.

Peter Wepler, chief, Environmental Analysis Branch, USACE New York District, said these measures include performing work on the project only when the species aren't threatened.

For example, sand was not placed on the shore between

March 15 and Aug. 15 because this is when the piping plover nests.

“In addition, we place string fencing on the project property to delineate areas used by piping plovers, setting up protective buffers around the area,” said Wepler.

Another important measure is hiring environmental construction monitors, like LaStella and Strano.

These monitors design monitoring plans in cooperation with the project team, conducting regular field surveys to identify rare, threatened and endangered wildlife and plant species, recording behaviors, locations and potential threats to these species, and documenting all other wildlife and plant species observations within and adjacent to the project area.

In addition, they make recommendations for avoiding and minimizing potential impacts to wildlife and ecological communities as well as educate the public.

Strano said that public education is very important because hopefully the experiences will raise visitor awareness and understanding, and more tolerance of any inconveniences that are associated with protected beach areas.

While monitoring the project, LaStella spotted several species, but was surprised to see the oystercatcher nesting along the shoreline. She believes the newly replenished beach is the cause.

See WILDLIFE, page 26



In 2016, during her first season monitoring, she observed the shorebirds foraging and displaying courtship behaviors; however, none were establishing any nests.

LaStella said that over the course of the year, natural coastal processes – the ocean currents and weather – helped reshape the newly constructed beach to form tidal flats and gentler slopes. The beach now provides much better foraging habitat, particularly during low tide.

During the 2017 nesting season, the wildlife biologists observed three pairs of oystercatchers attempting to nest within the project area and several other groups frequenting the area to forage and rest.

Out of the three nests, one nest successfully hatched three eggs, which ultimately produced one fledgling. That success, she said, was likely due to

protective measures and buffers that were implemented during construction, as well as the presence of jetties immediately north and south of the nest that provided protection from predators, such as crows and gulls.

She believes the construction itself likely deterred some of the normal beach activities in the vicinity of the nest, which also likely contributed to the successful nest.

Strano added that the cooperation of the construction workers also helped.

“It was very exciting to discover the American oystercatcher nest inside the work area; however, we were a bit apprehensive,” he said. “We knew it would be a tremendous challenge for this pair to rear chicks at this location because of multiple threats, including foxes, dogs, storms, occasional vehicles and overly enthusiastic beach visitors.

“We were encouraged by the immediate

cooperation and interest in the birds expressed by the onsite construction crews,” he said. “The crews’ willingness to follow our guidance immediately appeased some of the concern we had. The adequate planning, cooperation and open communication of all stakeholders resulted in effective protections for these birds without major delays to the project.”

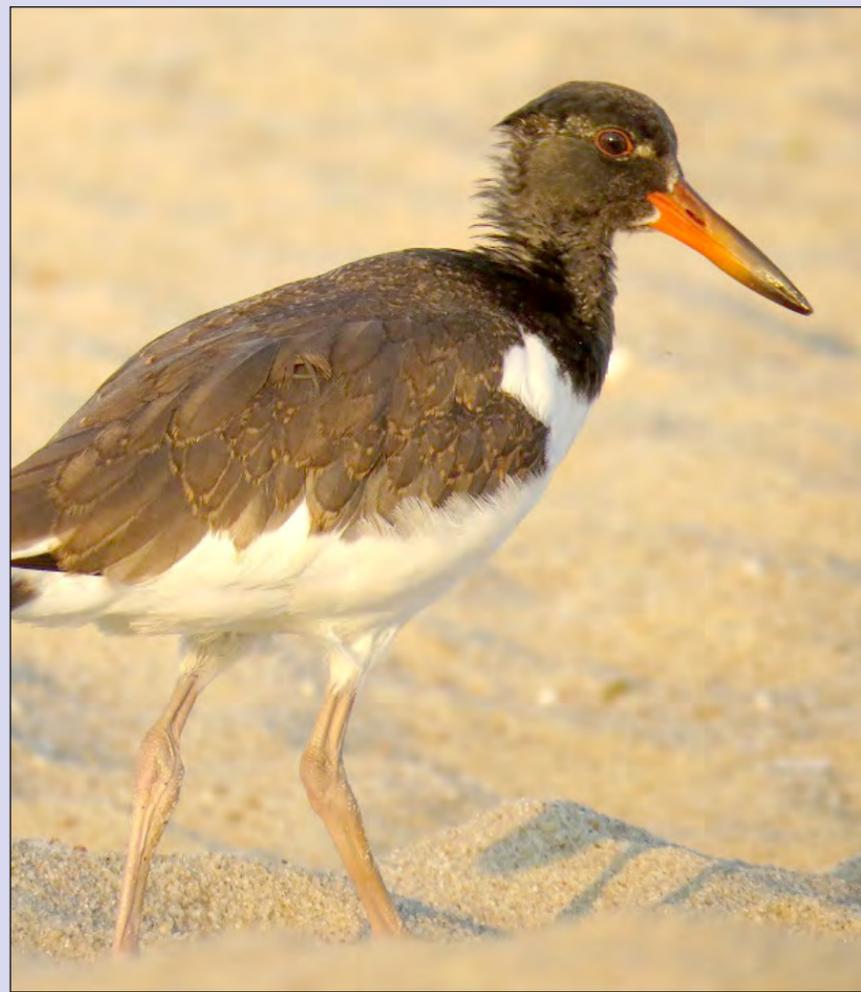
“The NJDEP’s Endangered and Non-Game Species Program and the New Jersey Audubon expressed their excitement about the nesting success of these American oystercatchers, a bird that is part of their shorebird protection plan,” LaStella said.

“Development and construction projects will continue as long as we inhabit the earth, so finding a balance between progress and protecting the natural world is essential and rewarding in so many ways,” she said.

### A Few Facts about the American Oystercatcher

- American Oystercatchers stand a foot and half tall, have black and white feathers, bright yellow eyes and a long bright red-orange bills. They make loud calls and exhibit gregarious behavior.
- The shorebirds are listed as a Species of Special Concern in several coastal states, including New York and New Jersey.
- They are threatened by human disturbances, habitat loss from coastal development, a host of predators and flooding events.
- Their primary food sources are oysters, clams and mussels; using their strong beaks and tongues to pry open the shells.
- They breed in March on New Jersey’s coastal beaches, inlet systems and salt marshes.
- Adults typically lay 1-3 eggs and after their chicks are fledged most migrate to the southeast.

For more information, visit: <http://www.conservewildlifenj.org/species/field-guide/view/Haematopus%20palliatius/>



# Study helps state prepare for storm surge threat

By Sarah Gross  
USACE Baltimore District

Maryland typically has to deal with the impact of tropical storms or nor’easters rather than hurricanes. However, the state is not immune, explained Thomas Lacro.

Lacro is a coastal engineer with the U.S. Army Corps of Engineers, Baltimore District. Maryland was significantly impacted by Hurricane Isabel in 2003. The state experienced substantial storm surge of 6 to 8 feet above normal tide levels in some areas and even breached the Corps’ ecosystem restoration project at Poplar Island.

So, how is Maryland getting prepared for the next major storm?

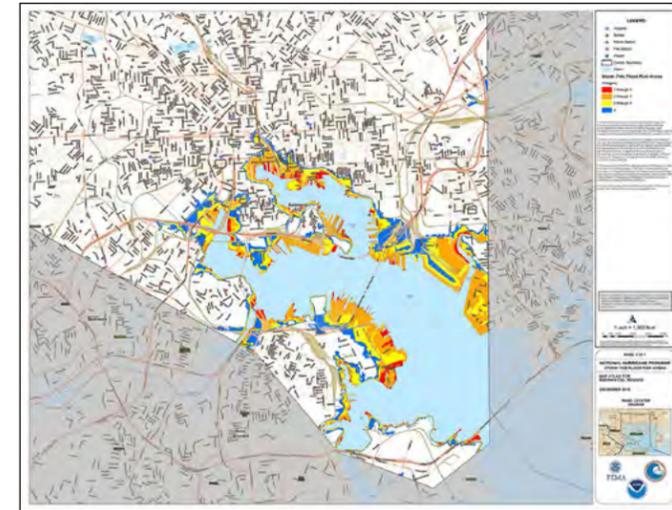
Lacro is currently managing a Hurricane Evacuation Study for the state through the National Hurricane Program.

Administered by the Federal Emergency Management Agency in partnership with the National Oceanic and Atmospheric Administration’s National Hurricane Center and USACE Baltimore District, the program is part of the Corps’ Planning Center of Expertise for Coastal Storm Risk Reduction. Its mission is to support citizens and first responders in building, sustaining and improving the nation’s hurricane response capabilities.

“As part of the National Hurricane Program, the Corps helps develop and maintain products and tools to help with planning and decision making for emergency managers,” said Carla Quinn, NHP lead, USACE Baltimore District.

The study consists of four main parts: hazards analysis, evacuation zone development, vulnerability analysis and transportation analysis.

“The hazard analysis helps decision makers at the Maryland Emergency Management Agency understand the maximum flooding associated with storm categories for hurricanes,” said Debbie Hardick, environmental protection specialist, Baltimore District. “We concentrate on storm surge because it is typically the most life-threatening hazard



Maryland’s Hurricane Evacuation Study will help emergency managers gather the necessary information to make tough evacuation decisions.

that coastal communities face during a hurricane.”

To calculate the maximum potential storm surge, the hurricane center uses the Sea, Lake and Overland Surges from Hurricanes model. To create the products used for evacuation planning, the model runs through several thousand hurricane simulations under different storm conditions.

“The peak high-water value at each particular location is recorded to capture a worst case snapshot for a particular storm category,” Quinn said.

The hurricane center also provides model outputs for specific locations focused by storm category, forward speed and trajectory.

Based on information pulled from these simulations, the Corps creates maps that show inundation areas associated with each storm category, along with the maximum potential depth of water in those areas.

“These maps provide great input for developing evacuation zones,” Hardick said. “For instance, we know that on the eastern shore of Maryland there is more surge risk potential in a hurricane heading northwest rather than northeast. Therefore, when forecast information is available to identify the category and direction of an incoming storm, this knowledge could potentially help reduce over evacuations, which is particularly important during tourist season.”

Evacuation zones are usually developed by the local county government with technical support from the state, FEMA and USACE. Storm surge inundation areas form the basis of the zones, but are adjusted to local conditions. The boundaries oftentimes are based on major roads, water, zip codes and local landmarks, so they’re easier to communicate to the public.

The vulnerability analysis follows evacuation zone development. This analysis identifies the population, critical facilities, shelters, roadways and mobile home communities within each inundation area and evacuation zone.

“This information helps identify what kind of shelter demand is needed as well as the number of potential evacuees, with the main intent of saving lives,” Hardick said. “It is also valuable data for operational and recovery planning.”

The final step in the study process is the transportation analysis that uses data from the other analyses to determine evacuation clearance times – the time required for all vehicles to get out of the evacuation zone and into an assumed point of safety.

“We gather input from local emergency management, key traffic law enforcement officials and the Department of Transportation to gain an understanding on how the roadway network can support evacuation decisions,” Hardick added.

This analysis includes not only evacuation routes and scenarios, roadway capacities and travel destinations, it also includes demographics and behavioral assumptions.

“One great thing about this study is that it lets you envision things you may not have otherwise been ready for, such as transportation bottlenecks created by mass evacuations and the need for strong interstate communications,” Lacro said.

Expected to be completed by the start of the 2019 hurricane season, data collected from the study will feed into a Corps-operated Hurricane Decision Support Platform that provides emergency managers with the necessary information to make tough evacuation decisions.

# 'Sustain the Mission - Secure the Future' Environmental Support Teams seek new members

By Arleen Kreusch  
USACE Buffalo District

Providing environmental support during war, contingency operations, disaster relief operations and operations other than war is an important U.S. Army Corps of Engineers area of responsibility.

One way USACE meets this mission is through the Environmental Support Team, or EnvST, that is comprised of trained environmental engineers, environmental specialists and employees working in the environmental field.

While deployed, the team implements the Army Strategy for the Environment "Sustain the Mission – Secure the Future" and can act as the inspection and enforcement arm of the military commander.

EnvST training is conducted annually at the Readiness Support Center in Mobile, Alabama.

When asked about the training, Richard Dabal, manager, Certified Hazardous Materials for the New York District and nine-year EnvST member, said, "It gets you in the mindset of what to do and what is expected."

Although there are no physical requirements for participating on the team, Dabal works out before each assignment because he says he never knows what it will be like when he gets to the mission location.

"A 10-hour workday is standard, but sometimes you work seven days a week," he said.

Team members usually know two to three months in advance about an assignment and volunteers that best fit the mission are selected.

For his deployment to Liberia, however, Dabal had one week to get ready before going overseas.

"In that case, a lot of loose ends had to be wrapped up very quickly," he said.

Assignments can be anywhere from three, six, nine or 12 months. The duration depends upon the mission and can change, he said.

Dabal's EnvST travels have included assignments to Liberia in 2014-15 and Afghanistan in 2010-11 where his chief task was to make sure land used for the troops was clear of environmental issues that would impact the mission.

"You are the subject matter expert while you are there, and they're looking at you to pull from all of your experience to answer that particular question and move forward," he said.

Questions need to be answered. Can you build in this area? Is the area clear of past environmental damage, such as oil or garbage dumping and pesticide problems?

His previous assignments have included evaluating areas for base housing, support facilities and hospitals.

The team is usually made up of environmental subject matter experts, and civil or mechanical engineers that work together. They may also be joined by members of a Forward Engineer Support Team.

"You go where the team is needed, assisting and helping each other with the mission," Dabal said. "You have to think on your feet. Not everything fits in a box, you have to adapt as you go along."

The team works together to handle the assignment in the timetable given.

"Take a deep breath, focus on one thing that will make it better and make a dent in it," he said. "It's rewarding when the assessment is finished, a recommendation is written and accepted."

Dabal admits deployments can sometimes get monotonous, and he does miss biking and kayaking on weekends.

Teams are usually confined to the base unless escorted or on an assignment, so you can't explore the area.

He suggests loading up music and to be



Richard Dabal collecting soil samples using a steel pipe and sledge hammer during his 2014 EnvST deployment in Liberia. (Courtesy photo)

resourceful.

"We once made a universal weightlifting set up using cinder blocks and plywood," he said.

Adapting and learning from various interactions with military organizations, government agencies and the challenges sometimes presented by working with local contractors has helped him during follow up assignments.

Dabal said he can usually draw from these lessons learned to handle situations at his New York District office.

He encourages individuals who want to grow professionally and who seek experience working with other people at overseas locations to consider joining an EnvST.

For more information or to join, contact the National Program Manager at 202-761-1762.

The next EnvST training will be conducted February or March 2018 in Mobile, Alabama.

Mary Birdsong, shorebird monitor, and a team of Pennsylvania Game Commission biologists Patti Barber, Stacey Wolbert, Tim Hoppe, Cathy Haffner and Jerry McWilliams (center), author and naturalist, band and collect data, documenting the species' nesting progress. (Photo by Tracy A. Graziano)



# Endangered species' return reflects power of federal, state partnerships

By Dr. Michael Izard-Carroll  
USACE Buffalo District  
& Rebecca Sayers  
Presque Isle State Park

Having been absent from Presque Isle State Park since the 1950s, the endangered piping plover has made a modest, yet significant return.

The sighting of two pairs of these sand-colored, sparrow-sized birds have drawn particular interest because up until that time only about 15 pairs nested regularly on its shores.

"This is a testament to dedication and teamwork not only in Pennsylvania, but throughout the species' range," said Dan Brauning, chief, Pennsylvania Game Commission Wildlife Diversity Program.

The species' return was the culmination of a collaborative effort among organizations such as the Presque Isle Audubon; Audubon Pennsylvania; the Department of Conservation and Natural Resources; the Pennsylvania Game Commission; the U.S. Army Corps of Engineers, Buffalo District; the Regional Science Consortium; the U.S. Fish and Wildlife Services; the Western Pennsylvania Conservancy; and the Cleveland Museum of Natural History.

"The strong partnership these organizations share has paid off," said Lt. Col. Adam Czekanski, commander, USACE Buffalo District. "From the top down, our leadership reiterates the benefits of working together with local and state partners. To see an endangered species find its home again at Presque Isle is truly inspiring and reminds us of the benefits of collaboration."

See SHOREBIRDS, page 31



The Great Lakes Piping Plover was granted federal protection in 1986 by the U.S. Fish and Wildlife Services when they were put on the Endangered Species List. Since then, the species has made a modest yet significant return. (USFWS file photo)



Capt. Kenneth Skillman IV, action officer for the Guajataca Dam, stands in front of the damaged emergency spillway, illustrating the effects of Hurricane Maria on the Caribbean island.

## RECOVERY

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Following Hurricane Maria, USACE employees volunteered to man FEMA's Emergency Operations Center to help address a multitude of issues surrounding disaster recovery operations in Puerto Rico.



Brig. Gen. Diana Holland, commander, South Atlantic Division, U.S. Army Corps of Engineers, surveys the Guajataca Dam, which was compromised when Puerto Rico was devastated by Hurricane Maria. (U.S. Air Force photos by Airman 1st Class Nicholas Dutton)

## SHOREBIRDS

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Presque Isle was not the only area to show a decline in the shorebird population. The last recorded pair to nest in the Erie Basin was in 1977 at Long Point in Ontario, Canada.

The Great Lakes Piping Plover was granted federal protection in 1986 by the USFWS when they were put on the Endangered Species List. At that time, only 17 breeding pairs remained, and all of them were found along the Michigan shoreline.

In 2001, fewer than 3,000 piping plovers were left globally. By 2009, there were just 71 breeding pairs found in the Great Lakes region, covering three states and Ontario, Canada.

Presque Isle is a sandy peninsula located on the southern shore of Lake Erie, Pennsylvania. It is a natural breakwater that forms and protects Erie Harbor and is home to Presque Isle State Park. The park, which extends the full length of the peninsula, includes 13 miles of roads, 21 miles of recreational trails, 13 beaches for swimming and a marina.

At the end of the peninsula lies Gull Point, a designated natural area and the most ecologically sensitive area within the park that has been carefully monitored by a variety of organizations.

In 1994, the Presque Isle Audubon Society spearheaded a campaign to designate Gull Point as a natural area, thereby closing it to public use during the breeding and nesting season.

To encourage the return of the piping plover, plans involved focusing on particular areas along the beach, stretching about 4 miles from the lighthouse to the southern end of the hiking trail on the southeast side of the Gull Point Natural Area. After evaluating each site, Gull Point was identified as having the greatest potential for providing a habitat suitable for nesting piping plovers. Criteria included which site would have the lowest human disturbance while also having sufficient cobble and woody debris cover. Gull Point met six out of the seven criteria, with its one deficiency being that the site was not more than 50 meters to the shoreline.

Ongoing beach nourishment activities along the peninsula are being performed by USACE and DCNR under an agreement signed in 1989. This

agreement established a partnership for the construction of 55 segmented offshore breakwaters and 50 years of annual sand placement to nourish the peninsula shoreline. The project concept was developed to protect the peninsula from severe erosion in a manner that would allow the lake littoral flows to move the sand along the shoreline in a natural manner. So while the primary purpose of this \$2 million to \$3 million per year nourishment effort was to mitigate shoreline erosion, the project also established increased habitat for the piping plover through wider, consistent beaches.



A 9-day-old piping plover chick gets banded before it's released to rejoin the nest.

(Photo by Tracy A. Graziano)

One of the major changes in the Gull Point Natural Area was the encroachment of two invasive species – phragmites and narrow-leaf cattail.

Shortly after 1997, two other invasive species started to take root, canary grass and purple loosestrife.

In 2011, after several attempts failed to rid the area of these invasive species, the Great Lakes Restoration Initiative was granted by the U.S. Fish and Wildlife Services, establishing an annual vegetation control program within 33 acres of Gull Point Natural Area.

To improve the habitability of the area, Presque Isle State Park developed an extensive piping plover recovery plan.

Though initially, the park ranked as having a low-to-moderate likelihood of supporting the re-colonization effort, the probability of success increased as the

species' population increased.

In 2005, largely due to this resurgence, USFWS increased its enforcement effort to manage the critical habitat area.

In addition, the Game Commission, DCNR, Audubon Pennsylvania and other partners prepared to evaluate the habitat and prepare it for colonization.

In 2011 and 2012, the nesting habitat for piping plovers was restored, and by 2015 enough of the species were sighted at Gull Point to classify them as an active colony, though no successful nests were yet identified.

In 2016, portable trail cameras were installed on Gull Point to monitor nest activity. Plans to move forward hinged on a successful nesting. Though nesting occurred, the plovers left the area after their eggs were eaten or destroyed by predators.

Two pairs of piping plovers nested on the shores of Gull Point during the 2017 season. One nest was successful, with two out of three eggs hatching. The second nest was overcome by waves. Fortunately, nest eggs, however, were recovered and transported to the Detroit Zoo, where two out of three eggs were hatched and released on the Michigan shoreline.

The piping plover species tends to return to successful nesting grounds, and therefore the federal and state partners will continue to monitor its activities in the months and years to come. Officials are hopeful that the pair will return to Presque Isle State Park for the 2018 season.

With a global population of only 4,000, the success of the species in Presque Isle State Park may dictate its survival worldwide.

An umbrella species, the piping plover indirectly protects other species in the same environment, and so its return reflects the overall health of the ecosystems at Presque Isle State Park.

"This collaborative effort exemplifies that conservation does not happen in a vacuum," said Catherine D. Haffner with the Pennsylvania Game Commission.

"It is through these great partnerships that piping plovers have once again found their way back to the shorelines of Pennsylvania."

## CPCX, public involvement specialists support FUDS Program

The U.S. Army Corps of Engineers Collaboration and Public Participation Center of Expertise and public involvement specialists have started supporting the Formerly Used Defense Sites Program. This work highlights partnership and collaboration, in support of Environmental Operating Principle 6.

Located at the Institute for Water Resources, the CPCX mission is to ensure that the interests of the public are addressed in the decision-making process and to help USACE staff anticipate, prevent and manage water conflicts.

Dwayne Ford, affiliated with the Environmental Munitions Center of Expertise before his retirement, spent the summer of 2016 on detail to the CPCX.

During this time, he realized the close similarities between USACE's risk communication efforts for FUDS and risk communication for levee safety.

He helped form bridges between the CPCX and the FUDS program, and as a result, CPCX began supporting the program through training and expert review as well as continued exchange of staff through developmental details.

After Dr. Stacy Langsdale served on

the instructor team for an Environmental Cleanup course for the Army National Guard in August, she was invited to serve as the lead instructor for FUDS 102 – Communication in FUDS, which will be held May 15-17, 2018, in Omaha, Nebraska.

Langsdale is also contributing to the after action review of the Interim Risk Management process.

In 2014, the CPCX established a cadre of public involvement specialists who represent each division and whose purpose is to serve as subject matter experts and provide services that support facilitation, collaboration, communication and public engagement.

Currently, the cadre of 23 specialists serve as a resource to their respective districts but also provide regional and national support to all eight divisions. The cadre assists with the development and implementation of communication and public participation plans for a variety of projects and studies across the varied agency missions.

For example, Eileen Takata, Los Angeles District public involvement specialist, provides stakeholder

engagement, facilitation and collaboration support services to her colleagues at Los Angeles District for a variety of business lines including planning, master planning, construction, real estate/asset management and FUDS.

Takata was recently tapped by the district FUDS program manager to review community relations plans for informal "District Quality Control."

Each division's public involvement specialists are able to provide the expertise directly or connect you to others who have the talent to get the job done. They will coordinate with district public affairs to define the levels of support and division of responsibilities appropriate for a specific project. Project managers and teams are encouraged to consult with one of these specialists early about the value of public involvement to help keep projects on schedule and within budget.

For more information or to locate a specialist, please visit: [https://cops.usace.army.mil/sites/PPP/Shared%20Documents/Public%20Involvement%20Specialists/Collaborative%20Services\\_Value%20to%20Business%20Line%20Fact%20Sheet\\_Oct%202017.pdf](https://cops.usace.army.mil/sites/PPP/Shared%20Documents/Public%20Involvement%20Specialists/Collaborative%20Services_Value%20to%20Business%20Line%20Fact%20Sheet_Oct%202017.pdf)

## GUAJATACA

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Most local trucks were fully engaged in other recovery work to remove debris or distribute food, water or other essential supplies. The 130th Engineer Battalion of Puerto Rico's Army National Guard with support from the 44th Infantry Brigade Combat Team were tasked with hauling stone from the quarry. Using 10-ton dump trucks and traveling in convoys, the Soldiers delivered over 100 tons of rock material per day to the dam.

The engineer battalion with support from the 44th also worked alongside PREPA civilian work crews to clear obstructions and landslide material from a canal needed to re-establish the flow of water from the lake to downstream treatment plants.

To help with short term water distribution, the Army's 3rd Expeditionary Sustainment Command mobilized reverse osmosis water purifying units to a location adjacent to Lake Guajataca.

There, the Soldiers pumped water from the lake and filtered it through the



Puerto Rico's Army National Guard strategically places sandbags at the Guajataca Dam.

ROWPU to produce clean water. Local residents in the remote communities near the dam picked up the clean water in improvised bulk containers or smaller containers provided by FEMA.

The emergency stabilization work at Guajataca Dam was a unified effort

performed by municipal, government and non-governmental organizations. The work performed demonstrates the unique capabilities that well-trained and prepared troops can offer FEMA during Defense Support to Civil Authorities events.



Typically several hundred floating oyster cages are roped together and span across several acres of open water.

## New method ensures plentiful oyster harvest

Story & photo by Sara E. Corbett  
USACE Charleston District

Oyster season in the South Carolina Lowcountry means only one thing, the roasting and eating of lots of oysters. It's a long standing tradition eagerly anticipated each year from September to April.

However, before oyster lovers can take that first bite, two critical steps are necessary: oysters have to grow and be harvested.

Traditional methods include letting them grow naturally along tidal and marsh banks and harvesting them when they are mature or growing in cases that rest on the bottom of waterways, but a new method is quickly becoming popular.

OysterGro® is a relatively new concept in shell mariculture where native, single-select oysters can be grown in floating cages that are roped together in rows and anchored to the bottom of waterways. The floats are approximately 60 inches long, 40 inches wide and 20 inches high, and typically several hundred floating cages are roped together, spanning across several acres of open water.

The floating cages are routinely flipped to prevent oyster fouling. Oyster fouling occurs when marine organisms colonize the oysters and reduce their growth which requires costly work to clean and make them marketable. By using this method, single oysters grow faster and bigger, which is ideal for commercial oyster farmers and harvesters to sell to restaurants and individual clients to enjoy.

So just how does the U.S. Army Corps

of Engineers Charleston District fit into all this, aside from having several oyster-loving employees?

"Since OysterGro® can impact waterways, a Corps permit is necessary," said Tracy Sanders, biologist and project manager. "We have issued two permits, are currently reviewing another permit and are working with two potential applicants. It's evident that this method is becoming more popular with oyster harvesters in South Carolina since it produces such big delicious single select oysters."

For issued permits and pending permits, the district received comments during the public comment periods for those projects that impact recreation, general navigation, aesthetics and marsh erosion. Other areas of concern are potential effects to endangered sturgeon and sea turtles that often entangle themselves in the ropes, how to secure the equipment during hurricanes and abandonment of the floats and equipment.

"Similar to permits issued for typical construction projects on land, permits issued for OysterGro® projects may include special conditions to address concerns that arise during the permit review process," Sanders said.

Special conditions include marking the project area with navigation signs, knotting the ropes a certain way to prevent entanglement and following specific hurricane response plans that describe when and how the floats and equipment will be secured during a hurricane.

Applicants must obtain authorization from three different agencies prior

to installing OysterGro® floats and equipment. Permits are required from the Corps, the Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management and the South Carolina Department of Natural Resources.

While the permitting processes are separate, the Corps, OCRM and SCDNR work closely together during project review.

In fact, it is recommended that applicants request a pre-application meeting with the agencies to discuss the permit process as well as any potential issues that they may be concerned with before submitting their application. The intent is to provide potential applicants with project specific information that can be used during the project planning stage and, ultimately, streamline the permit application process.

The first issue a potential applicant may face is identifying a project location. Applicants should first contact SCDNR to determine which areas may be available for cultivating oysters. Contacting SCDNR first is strongly recommended as any conflicts of use of project areas from a mariculture perspective could result in a delay in the Corps permitting process and may result in project relocation and redesign.

Once the permit has been issued, the OysterGro® floats are subject to random compliance checks by the Corps to ensure they are meeting all the special requirements.

For more information, call the district's Regulatory Division at 843-329-8044.



Col. James DeLapp, commander, USACE Mobile District, and Lt. Col. Frankie Flowers, deputy district engineer for Latin America, meet and offer the Brazilian officials assistance in waterway development and management. (Photo by Raylton Alves)

## Mobile District, Brazilian officials meet, discuss waterway development, partnership opportunities

By John Barker  
USACE Mobile District

Two representatives from the U.S. Army Corps of Engineers, Mobile District, visited cities in Brazil to discuss waterway development and management as well as the possibility of future partnerships, Aug. 7-11.

Col. James DeLapp, commander, USACE Mobile District, and Lt. Col. Frankie Flowers, deputy district engineer for Latin America, visited the cities of Brasilia and Araguari, and joined Mobile District Engineer Calvin Creech who is based in Brazil.

“Since 2012, Mobile District has partnered with the Brazilian government on waterway development and management,” Creech said. “We’ve shared technical knowledge and training programs with the government of Brazil’s Departamento Nacional de Infraestrutura de Transportes; Companhia de Desenvolvimento dos Vales do São Francisco e do Parnaíba, or CODEVASF; and Agência Nacional de Águas with an estimated value of \$17 million.”

Cooperation between CODEVASF and the Mobile District, for example, was formalized in 2012 and included 12 projects.

The district created modeling in the

São Francisco basin which was used for planning and policy proposals, as well as transfer of knowledge and other support activities. The collaboration focuses on stabilization of river banks and improvement of navigation.

“The Brazilian government has expressed extreme satisfaction with the professionalism and expertise provided by the Mobile District and wish to continue to grow our partnership well into the future,” said Flowers. “This partnership came at a critical time for Brazil as they are facing a severe 7-year drought. The drought is causing strain in the São Francisco River’s ability to produce hydropower, supply crop irrigation, provide household water and to remain navigable for commerce.”

Another example of the partnership was building the Campo de Provas, a pilot project for erosion control in the Barra region.

“This interaction between technicians and engineers in CODEVASF and the U.S. Army is very positive,” said Inaldo Guerra, director of Revitalization Area Watershed, CODEVASF. “[This is] a professional relationship in which both sides gain knowledge and exchange experiences. The results are projects that benefit the environment and the population.”

“In addition to discussing our current projects, we want to identify possible future collaborative efforts appropriate for the district,” Flowers said. “The Army and the Corps remain interested in seeking opportunities with the Brazilian military that would be of mutual benefit to our long-standing partnership. The Brazilian military is a leader in regional security within South America and beyond. Brazilian Army engineers are well suited to partner with developing regional armies and to support engineer work to promote regional and international security.”

“In the future, we hope to do more work supporting the country’s waterways,” said Creech. “These range from flood risk management, budgeting and benchmarking for the impacts of floods, river modeling, wastewater treatment, environmental impacts from mining and regulatory management.”

Opportunities to enhance the partnership come through invitations to symposiums, conferences, site visits and technical exchanges,” Creech explained. “For example, DeLapp has already been invited to attend the World Water Forum, the world’s biggest water-related event, which will be held in Brasilia in March 2018.”



Dave Derrick, potomologist with River Research and Design and course co-instructor, provides onsite instruction to workshop attendees on planting techniques in riparian areas. (Photo by Dr. Richard Fischer)

## Using Endangered Species Act, collaboration for species recovery

By Dr. Richard Fischer  
U.S. Army Engineer Research and Development Center

A collaborative effort is underway to develop alternative solutions to address federally listed species on Department of Defense lands and as a result, reduce mission impacts and aid in species recovery.

The U.S. Army Corps of Engineers Threatened and Endangered Species Team is implementing this effort in collaboration with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. The team is focused on threatened and endangered and at-risk species that currently affect, or have a high likelihood in the future to affect, USACE mission sustainability.

As part of the Corps’ TEST strategy, the U.S. Army Engineer Research and Development Center, Environmental Laboratory, is conducting riparian restoration demonstration projects in the southwestern United States, including Prado Reservoir near Los Angeles, California, and Cochiti Reservoir, near Santa Fe, New Mexico. The objective of these projects is to demonstrate the feasibility of establishing vegetated riparian areas along reservoir shorelines and tributary rivers that provide habitat improvement for regionally sensitive riparian-dependent species.

The focus is on testing and demonstrating various habitat rehabilitation techniques that ultimately could be used internally, and by partners, for the conservation of listed riparian bird species (southwestern willow flycatcher,

Least Bell’s vireo and the western yellow-billed cuckoo). The TEST is beginning to collaboratively work with other federal and non-federal partners to reduce the stressors on listed species, build habitat and monitor, all in the name of working toward recovery of those species where they have collective management capabilities.

A big part of TEST is to develop strategic collaborations both internally and externally as a way to build partnerships and facilitate progress. The TEST is working with the military services to refine and implement a framework for initiating and coordinating species recovery efforts. This framework includes the development of proactive conservation plans within the Corps and with coordination among other federal agencies. This allows greater control over species/management interactions (and possibly, lower costs) than the terms and conditions that typically result from increased Endangered Species Act listings or consultations.

The Endangered Species Act requires all federal agencies to strictly adhere to its requirements of protecting imperiled species. The DOD, including both the Corps of Engineers and the military services, collectively spend about \$400 million annually on listed species conservation and compliance and is responsible for protecting approximately 430 threatened and endangered species and over 550 at-risk species. This is more federally listed species per acre than any other federal agency.

See COLLABORATION, page 36

## Increasing Proactive Conservation Efforts

Under the Endangered Species Act, Section 7 is the mechanism federal agencies follow to consult with either the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to ensure their actions do not jeopardize the continued existence of threatened or endangered species, or adversely modify their critical habitats. Section 7 is split into multiple parts that relate to how action agencies cooperate with the services to protect species. The Defense Department works with these services primarily via formal and informal consultations under Section 7(a)(2) of the Endangered Species Act, and this can lead to the issuance of biological opinions by the services that mandate special measures agencies must follow to protect threatened and endangered species in the course of their actions.

There is significantly less familiarity with, and utilization of, the preceding Section 7(a)(1). Increasing the use of 7(a)(1) is a major objective of the TEST program. Many of the proactive conservation activities that have been implemented during the past several decades on both USACE and military lands pertain directly to this section, which describes voluntary conservation measures by federal agencies for federally listed species. This section specifies that agencies' duties to conserve threatened and endangered species can apply widely to programs and is not limited to individual actions. Thus, agencies can distribute conservation obligations programwide, as well as achieve conservation opportunities outside of defined action areas to attain compliance with the Endangered Species Act in a way that promotes efficiency, cost effectiveness, ingenuity and improved conservation outcomes through increases in species baselines.

This provides DOD the flexibility to conduct conservation programs and take advantage of conservation opportunities outside of defined action areas. This holistic systems approach to conservation can be used to encourage investment in activities that provide the highest conservation return to threatened and endangered species populations and habitat baselines, in lieu of minimization or mitigation strategies at an individual action area under 7(a)(2) standard operating practices. This approach already has proven successful with the interior population of least tern. A proactive and collaborative effort among the Corps of Engineers, USFWS and American Bird Conservancy, which included

development of rangewide 7(a)(1) Conservation Plans, directly contributed to a recent USFWS recommendation to remove the tern from federal protection under the Endangered Species Act.

## Improving Operational Efficiency

The military services use Integrated Natural Resources Management Plans to promulgate conservation actions under the Endangered Species Act.

In the United States, the military manages more than 23 million acres of land across hundreds of military installations – 65 percent of those installations have natural resources significant enough to require an INRMP.

The Defense Department has, in total, 341 INRMPs, and 240 of them contain management actions for at least one listed species.

Through conservation actions guided by information from each installation's INRMP, and promulgated primarily through broader-scale and formalized conservation plans, it has the potential to benefit both the regulatory process and species involved. This includes: providing an opportunity to reduce regulatory disagreements during consultations, more readily increase

species baselines (which will be considered during consultations), making proactive commitments to actions installations would be predisposed to undertake anyway under Section 7(a)(2), and most importantly, allow DOD to improve operational efficiency and flexibility in executing mission requirements.

## Interagency Collaboration

The TEST's riparian restoration demonstration efforts are part of a larger interagency effort to identify opportunities for conservation planning, habitat restoration, and monitoring of multiple threatened and endangered species that are affecting agency missions.

Established in 2016, the Collaborative Wildlife Protection and Recovery Initiative aims to increase the effectiveness, efficiency and predictability of conservation, management and consultation. The interagency team promotes innovative approaches to wildlife protection, mitigation and recovery, and works collaboratively to reduce agency mission impacts and protect or recover imperiled species.

CWPRI is comprised of federal agency threatened and endangered species leadership, including the Corps, Office of the Secretary

of Defense, military service branches, Natural Resources Conservation Service, Bureau of Land Management, U.S. Forest Service, and U.S. Fish and Wildlife Service, with contributions by the National Fish and Wildlife Foundation.

The CWPRI has a current focus on riparian-dependent species in the southwest, such as Least Bell's vireo, southwestern willow flycatcher and Arroyo toad. DOD installation management of riparian habitats, as promulgated through INRMPs, and Corps' management actions on rivers and around reservoirs, will contribute significantly to regional and rangewide recovery efforts.

By developing strategies to assess threatened, endangered and at-risk species on a national scale and applying the 7(a)(1) approach to reduce adverse impacts on missions, the TEST aims to improve species conservation – including in some cases, recovery. Recovery is not only good for species, but also for the Defense Department, as it reduces restrictions on our important mission areas, which includes navigation, and shore and flood protection for the Army Corps of Engineers, and for the military services, the ability to train and prepare warfighters to protect our great nation.



*Dave Derrick, potomologist with River Research and Design, and Al Cofranceso, ERDC Environmental Laboratory Civil Works technical director, plant mule fat in an excavated trench. Mule fat is a preferred nesting shrub for the federally endangered Least Bell's vireo, an abundant bird species on the Corp's Prado Reservoir project. (Photo by Dr. Richard Fischer)*



*Dr. Richard Fischer, ERDC Environmental Laboratory workshop leader, plants cottonwood and willow pole cuttings along the Santa Ana River in Corona, California. The cuttings were placed within the riparian area in deep trenches excavated to the water table. (Photo by Dave Derrick)*