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Restoring diversity to Sandy River Delta

By Diana Fredlund
Portland District

About 70 guests gathered Aug. 15 to watch a backhoe take a bite out of the Sandy River Delta dam, located just east of Troutdale, Ore. That bite kicked off the final phase of a project to remove the dam as part of a habitat restoration project undertaken by the U.S. Army Corps of Engineers and its partner the U.S. Forest Service.

The 8-foot tall, 750-foot wide rock and timber dam was built in the 1930s to try to improve fish runs. According to a 1932 article in the *Gresham Outlook*, a barge sank in 1907 in the westernmost outlet of the river called the Little Sandy, which effectively blocked water passage. The obstacle forced the water to flow through the east channel, which was considered unfavorable to fish passage.

Although it took years to obtain funding, the Oregon Game Commission – now the Oregon Department of Fish and Wildlife – was able to raise funds more easily after the smelt run collapsed in 1931, when not a single fish entered the Sandy River. The dam was constructed in 1931, but the smelt runs continued to be very small through the 1930s.

Laura Guderyahn with the city of Gresham shows volunteer Callie Goldfield how to measure a female Western Pond Turtle at the Sandy River Delta Aug. 7. The U.S. Army Corps of Engineers is removing a dam on the Sandy River, and before ponds are disturbed, biologists are trapping turtles and moving them to ponds not disturbed by construction. *(Photo by Diana Fredlund)*

After the dam was built, the area downstream of the structure in the East Channel – the original Sandy River – began silting in and losing its complex hydrology.

"It was hard even to see where the dam stood after nearly 80 years," said Gail Saldana, Sandy River Delta Dam Removal project manager. "The stones on top of the dam looked more like a paved path through the trees."

Prior to the dam's construction, extensively braided shallow-water habitat in the East Channel and abundant backwater habitat throughout the Sandy River Delta provided excellent conditions for rearing juvenile salmon and steelhead. After the dam's construction, the East Channel gradually silted in and became a slough. The delta lost much of its hydrologic complexity and had fewer backwater habitat areas. The dam impeded access and limited cool water flow to the East Channel, resulting in summer ponding and an increased potential for juvenile fish stranding and death.

The Sandy River Delta dam removal was listed in the 2010 Federal Columbia River Power System Biological Opinion as one of the habitat restoration actions the Corps of Engineers was required to undertake. Planning began in 2010 by identifying the federal and state partners. The U.S. Forest Service manages the land surrounding the dam, the Oregon Department of State Lands manages the riverbed and banks up to the high water mark and ODFW manages the wildlife that calls the delta home.

The original plan was for the Corps of Engineers to cut a 60-foot notch in the dam, allowing water to flow freely. Representatives from the Portland Water Bureau learned about the project and wanted to participate.

"The Water Bureau provided funding and technical assistance for removing the rest of the 750-foot dam as part of its 50-year Bull Run Water Supply Habitat Conservation Plan," said Terry Black, public information officer for the Water Bureau. "The Habitat Conservation Plan enables the city to meet its Endangered Species and Clean Water Act obligations with 49 separate measures designed to protect and improve aquatic habitat in the Bull Run River and wider Sandy River basin. We are glad to be working with the strong network of local partners on salmon recovery in the Sandy basin."

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Jennifer Armstrong (right), a Norfolk District project manager, shows Jo-Ellen Darcy, the assistant secretary of the Army for civil works, fossilized oyster shell stored at the district's Craney Island Dredge Material Management Area in Portsmouth, Va. The shell will be used in Corps sanctuary oyster reefs in the Elizabeth River as part of the Craney Island Eastward Expansion project environmental mitigation plan. The mountainous piles of shell were obtained from the Commonwealth of Virginia through an agreement between the Norfolk District and the Virginia Marine Resources Commission. *(Photo by Patrick Bloodgood)*

Going big: District tackles oysters, Lynnhaven

By Patrick Bloodgood

Contractors for the U.S. Army Corps of Engineers are moving mountains of fossil oyster shell from Craney Island in Portsmouth, Va., to build 16 acres of sanctuary reefs in the Elizabeth River and some of its tributaries.

Construction began Oct. 7 on the first reef, located in Portsmouth's Hoffler Creek.

Mined from the James River, 39,000 cubic yards of shell are headed to five new reefs, which are part of the environmental mitigation for the impact of the Craney Island Eastward Expansion project.

"This project is a win for the country, the Corps, the commonwealth and the community," said Col. Paul Olsen, Norfolk District commander. "Not only is this project vital to the future of the port, but the restoration of oyster habitat is vital to the future and health of the Chesapeake Bay."

The mitigation effort benefits the commonwealth in two ways: experts forecast an improvement in the Elizabeth River's ecosystem and a positive economic impact on the local, state and national economies.

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The U.S. Army Corps of Engineers Sacramento District conducted a controlled burn of the central marine chaparral at Fort Ord, Calif., Oct. 15, to expose unexploded ordnance at the formerly used defense site. The burn, carefully coordinated with local agencies, lasted less than two hours and was timed so prevailing winds would help blow the smoke away from population centers.

The controlled burns, conducted on a near yearly basis for the last 19 years, are part of a comprehensive ordnance removal program at Fort Ord. This year's burn included a total of 767 acres, bringing the overall total to 3,692 acres.

"We still have approximately 3,000 acres to burn over the next 8-10 years," said David Eisen, project manager with the Sacramento District.

Environmental considerations for the burns are complex. Weather conditions have to be such that smoke is blown over the ocean, away from populated areas. Humidity is an important factor – wet vegetation will not ignite. If the humidity is too low, the chaparral will ignite too quickly and spread. Coordination is also an important part, Eisen said.

"The burns are a combined effort of the Presidio of Monterey Fire Department – Incident Command, Base Realignment and Closure Commission staff, Corps of Engineers staff, contractors and regulatory agencies," Eisen said.

Since the burns began, more than 6,100 unexploded ordnance items and approximately 830,000 pounds of munitions debris have been removed.

Fort Ord closed in 1994 under recommendation from the Base Realignment and Closure Commission. The cleanup and remediation work is being conducted to prepare the land for future use as the Fort Ord national monument, which was established as a national monument by President Barack Obama in April 2012. (U.S. Army photo)

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Whenever possible, please enjoy *The Corps Environment* without using paper.

USACE to continue sustainability efforts in 2014

By Christine Godfrey
Deputy Director
Environmental Division

As 2014 begins, the U.S. Army Corps of Engineers continues to see changes in the sustainability arena. During the past two months, there have been a new executive order, a presidential memorandum and federal agencies, including the Corps of Engineers, have unveiled their latest Strategic Sustainability Performance Plans.

On Nov. 1, the Obama administration released Executive Order 13653 on Preparing the United States for the Impacts of Climate Change. As James Dalton, our chief of Engineering and Construction, noted, "Overall the message is consistent with expectations set from previous drafts and other guidance provided from the executive office. Highlights include USACE being named among 30 agencies in the new Council on Climate Preparedness and Resilience targeted to replace the existing Interagency Climate Change Adaptation Task Force."

The executive order is sub-divided into eight key sections: policy; modernizing federal programs to support climate resilient investment; managing lands and waters for climate preparedness and resilience; providing information, data and tools for climate change preparedness and resilience; federal agency planning for climate change related risk; council on climate preparedness and resilience; state, local and tribal leaders task force on climate preparedness and resilience; and the final section that offers definitions for several important concepts – preparedness, adaptation and resilience.

You can say that EO 13653 is a complementary executive order to EO 13514 Federal Leadership in Environmental, Energy, and Economic Performance, released in October 2009, which focused mostly on climate change mitigation and carbon. EO 13514 looks at conserving energy and water and reducing greenhouse gas emissions. EO 13653 is mostly about climate change adaptation, or to put it simply, water. As the Corps of Engineers is a water resources management agency, it follows that we are going to play a major role in how EO 13653 is implemented throughout the federal government.


Christine Godfrey

The Corps of Engineers is already a little ahead of the game in that we developed an overarching policy that requires the agency to mainstream adaptation, released by the Assistant Secretary of the Army (Civil Works) Jo-Ellen Darcy in June 2011, and have filed adaptation plans in 2011, 2012 and 2013. Now the task is to update by March 3 our USACE Adaptation Plan and add a new section addressing whether any climate change related risk is identified as impairing an agency's statutory mission or operation. Then, by Aug. 31, we must complete an inventory and assessment of proposed and completed changes to land- and water-related policies, programs and regulations.

The administration followed up EO 13653 on Dec. 5 by issuing the Presidential Memorandum on Federal Leadership on Energy Management, directing federal agencies to continue leading by example by implementing the Climate Action Plan released last June, and supporting the broader renewable energy goals President Obama set in his 2013 State of the Union address. This memo increases the federal agency renewable electricity target from 7.5 percent in fiscal year 2013 to 20 percent by FY20 and provides guidance on how agencies should pursue the target and complete reporting requirements. In FY12, 11.5 percent of the Corps of Engineers' electricity came from renewable sources. The memo also reiterates requirements for metering, and benchmarking, and encourages the use of Green Button (http://energy.gov/data/green-button), an industry-led effort that provides utility customers with easy and secure access to their energy usage information.

The changes to the Corps of Engineers' renewable energy goal will be reflected in the FY15 USACE Campaign Plan and the 2014 Sustainability Plan. We are also working to modify our database of record for energy and water consumption to capture renewable energy starting in FY15.

Also on Dec. 5, the administration released all the federal agencies' 2013 Sustainability Performance Plans, including ours. This year we are focusing on several focus areas:

- Completing energy and water audits at all Energy Independence and Security Act of 2007 Section 432 Covered Facilities;
- Implementing energy and water conservation measures identified by the audits;
- Implementing the USACE Non-Tactical Vehicle Fleet Management Plan;
- Issuing policy on sustainable buildings;
- Leveraging alternative financing tools to the maximum extent practicable; and,
- Influencing visitors' behavior at USACE recreation facilities to reduce energy and water consumption.

By taking these steps, we expect to continue to make progress toward achieving our EO 13514 goals, and we will see our annual Office of Management and Budget Scorecard reflect that progress.

And the progress the Corps of Engineers has been making in the sustainability arena is being recognized on the national stage. On Nov. 5, Corps of Engineers professionals were recognized by the White House Council on Environmental Quality during the fourth annual GreenGov Presidential Awards.

Jeanette Fiess, the sustainability and energy program manager for our Northwestern Division, was selected as this year's winner in the "Sustainability Hero" category, and Dr. Kathleen White of the Institute of Water Resources and Mark Huber of the Army Geospatial Center were part of an interagency team that won the "Climate Champion" award.

Fiess has been a sustainability champion and agent of change within the Corps of Engineers since 2003, serving as an advocate for training in sustainability related fields and inspiring others along the journey to sustainability. Under her leadership, the Northwestern Division has increased the number of employees with training in high-performance building standards by 70 percent. She also led the nationwide Corps of Engineers effort to update the USACE Unified Facilities Guide specifications, which had lacked critical sustainability requirements.

White and Huber were part of an interagency team that developed a Sandy Sea Level Rise Tool, being used in New York and New Jersey as rebuilding plans continue after Hurricane Sandy. The Sandy Sea Level Rise Tool incorporates the previously developed USACE sea-level rise calculator. Other members of the interagency team came from the National Oceanic and Atmospheric Administration, the Department of Homeland Security and the U.S. Global Change Research Program.

The GreenGov Presidential Awards honor exceptional federal personnel, teams, projects and facilities, and programs that exemplify President Obama's charge to lead by example in sustainability. The Corps of Engineers has been leading by example for a number of years, but hasn't always been recognized for those efforts.

Having three Corps of Engineers employees recognized with these awards is something to celebrate, and it's something that should happen every year. The first step is to participate in the annual Chief of Engineers Awards of Excellence program, which includes seven awards related to sustainability. I would encourage everyone to look at how you incorporate sustainability in your work and participate in the awards programs.

We are making a difference as we strive to be more sustainable in everything we do.

Essayons!

ENVIROPOINTS

Clearing ranges with robots helps improve line-of-sight

By William S. Farrow
U.S. Army Engineering and Support Center, Huntsville

Remote-controlled construction equipment developed by the U.S. Army Engineering and Support Center, Huntsville and researchers at the Air Force Research Laboratory recently cleared trees and brush from ranges at two Army installations.

The cleaned-up range now provides a clearer line-of-sight for weapons firing and forward observers.

According to Spencer O'Neal, Huntsville Center project manager on the program, following the initial work at Fort A.P. Hill, Va., the installation determined additional ranges should receive similar vegetation clearance to improve their utility.

"Huntsville Center used their 'innovative projects' task order contract with the Dawson Technical – Zapata Incorporated Joint Venture to perform this first-of-a-kind range vegetation clearance," O'Neal said.

During the second phase of operations, O'Neal said productivity again increased, the quality of work continued to improve and range operators found they have a valuable new tool for their ranges to provide safe and valuable training experiences.

"They plan on doing more range improvements in the coming year," O'Neal said.

O'Neal explained that live fire training ranges are a limited and valuable asset for Soldier training, and most of the Army's ranges have been used extensively for decades, leaving extensive amounts of unexploded ordnance on the ranges.

"While the targets and areas around them have often been stripped of vegetation by weapons training, the trees and brush in areas in front of these targets continue to grow with no acceptable technique for controlling or removing them. Manual removal methods are too dangerous or expensive to implement, and armored equipment can only protect the operator from fragmentation. Now the operator can be protected from the overpressure from larger munitions," he said.

According to O'Neal, a second, larger project at the Fort Polk, La., Redleg Impact Area provided opportunities to experience different conditions of tree size, type and density, weather and terrain.

The Bandit, a remote controlled vegetation mulcher, improves and speeds range clearance operations.

Range at Fort Polk before vegetation clearance. *(Photos by Spencer O'Neal)*

Range after vegetation cleared.

"Dawson-Zapata Joint Venture and Robotics Fabrication Incorporated, developed and expanded the maintenance program, identified and procured an essential list of spare and repair parts, special tools and auxiliary equipment and further modified the mulchers to improve their toughness and reliability," he said.

The Redleg Impact Area has been the target for aircraft delivered bombs and rockets, artillery, mortars, antitank rockets and grenades since it opened during World War II. O'Neal said relatively few detonations have occurred during vegetation removal, and these have all resulted in no damage or only minor damage that could be repaired inexpensively in a few hours.

"As a result of these improvements in equipment and procedures, productivity has increased significantly. Although productivity is heavily dependent upon the type, size and density of trees and other characteristics of the terrain, these experiences have provided a valuable basis for estimating productivity and costs," he said.

However, O'Neal said as expected in any innovative program, there were many lessons to be learned.

"Earlier work at AFRL had paved the way for many applications, but cutting and mulching mature trees on a schedule and budget presented some new problems," O'Neal said.

"Tree mulching is a violent activity normally moderated by an operator that doesn't want to be thrown around inside the cab. When the operator was isolated from that punishment, the machine took a beating. Maintenance and repair activities became a major part of the project and resulted in adjustments to operating procedures and modification of the equipment to toughen them for remote control operations. On their first project, productivity averaged about 1/4 acre per day per machine – mostly due to maintenance issues."

As experience with the remote controlled equipment increased and modifications made the equipment more reliable, O'Neil said productivity increased significantly to more than half-an-acre cleared per-day, per-machine in difficult areas and up to 2 acres per-day, per-machine on areas with brush and small trees.

"The demonstration of effectiveness of the mulching equipment on ranges has encouraged the Dawson-Zapata JV Team to invest in additional remote control equipment to perform vegetation removals and other innovative uses of remote control equipment," O'Neal said.

Part of the success of the program was dependent on taking advantage of Air Force robotics repair and unexploded ordnance clearance work already completed by the AFRL.

"AFRL purchased two Bandit forestry mulchers for the Corps of Engineers and outfitted them for remote-controlled operation," he said.

Following an initial demonstration of the systems at Joint Base Cape Cod, Mass., the mulchers were subsequently deployed to perform the clearance missions at Fort A.P. Hill and Fort Polk.

Oysters

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According to the Virginia Port Authority, the eastward expansion will generate more than 54,000 jobs with wages of $1.7 billion annually.

"Without the mitigation program, the project would have never been permitted," said Joe Harris, Virginia Port Authority spokesperson. "That would equate to a loss in $6 billion of economic impact through jobs creation and tax revenue to the state, as well as considerable savings to the federal government, which won't have to invest dollars into highway infrastructure."

The reef-building incorporates lessons learned from the Norfolk District's decade of experience in its oyster restoration program, which includes the 85-acre reef in the Great Wicomico River and 58 acres of reefs in the Lynnhaven River – the largest oyster restoration efforts constructed in Virginia waters.

"Our reefs in both the Great Wicomico and Lynnhaven rivers are very successful, with an estimated abundance of 16 million oysters on our Lynnhaven sanctuary reefs alone," said Susan Conner, chief of the planning environmental section. "These oysters are providing spat, which move within each tributary and contribute to a long-term sustainable oyster population in the Chesapeake Bay."

And the future looks promising.

Norfolk District scientists and environmental engineers, armed with successes and lessons learned from constructing Virginia's largest oyster reefs, recently won approval from Corps of Engineers senior leaders in Washington to complete the feasibility phase of the Lynnhaven Ecosystem Restoration Project, a $34.4 million comprehensive aquatic ecosystem restoration plan.

The Lynnhaven effort calls for the Norfolk District, in partnership with the City of Virginia Beach, to restore 94 acres of submerged aquatic vegetation, 38 acres for wetlands, 22 acres for the reintroduction of bay scallops and 31.5 acres of reef habitat.

"It's an unprecedented effort for Virginia," said Greg Steele, chief of the district's planning section. "This is the Norfolk District's largest aquatic ecosystem restoration."

For the district commander, the two projects – oysters in the Elizabeth River to ecosystem restoration in the Lynnhaven River – are about building on the district's proven strengths, building projects that embody the Corps' Environmental Operating Principles and about getting results.

"As a federal engineer, I get enormous pleasure partnering with Virginia Port Authority and the Commonwealth of Virginia," Olsen said. "When it comes to projects of this scale, it is essential that we balance our passion to build our future port with our responsibility to sustain our aquatic resources. Nowhere else is that more clear than right here in Hampton Roads, where oysters will play a huge role. That is why I'm thrilled to be moving mountains of shell to where they can make a difference."

District uses stingless wasps to combat emerald ash borer

By George Stringham
St. Paul District

Since its discovery in Michigan in 2002, the emerald ash borer, or EAB, has spread to at least 13 states in the U.S., and the insect poses a serious threat to the Upper Midwest.

The U.S. Army Corps of Engineers, St. Paul District, and the U.S. Fish and Wildlife Service are partnering with Minnesota Department of Agriculture to develop a way to combat the insect.

With ash trees prevalent in bottomland and hardwood floodplains along the Mississippi River, as well as in Minnesota and Wisconsin, the Corps of Engineers' land makes for a great battleground location to develop ways to fight the invasive species. Following research and criteria developed by the U.S. Department of Agriculture, the Minnesota Department of Agriculture released stingless wasps this fall. The wasps attack EAB larvae.

The agencies designated an area on Corps land along the Mississippi River as a control site and a release site, too. Prior to releasing the wasps, scientists took an inventory of ash trees in both sites. They noted the existing conditions of the trees and the presence of the emerald ash borer.

The wasps, when released on ash trees, are in larval and adult form. As the wasps mature, they search the ash trees, using their sensitive antennae to detect the EAB larvae's feeding vibrations under the bark. While the wasps don't feed solely on EAB larvae; if larvae are present, the wasps will seek them out.

"The whole goal is to get [stingless wasps] established with EAB populations so [the wasps] can spread with the EAB and keep some of the population in check," said Jon Osthus, Minnesota Department of Agriculture EAB biocontrol coordinator.

Raymond Marinan, operations, measures an ash tree trunk near Reno Bottoms along the Mississippi River, near Genoa, Wis. The Corps and its partners are releasing stingless wasps in the area to help control the spread of the emerald ash borer, an invasive species. *(Photos by George Stringham)*

When the wasps mature in 7-10 days, they will seek out the EAB larvae.

The EAB larvae are inside the bark of the tree bolt.

Following the introduction of the wasps into the release site, the agencies will begin collecting data annually to determine the wasps' effectiveness to curtail the spread of the EAB. At the control site, where no wasps were released, tree trunks are measured and their canopies are observed to determine whether it is thinning. Osthus said, the bark, one of the more obvious tell-tale signs of EAB infestation, is inspected for larvae exit holes or discoloration caused by woodpeckers.

"Working with the Minnesota Department of Agriculture on this has been a great experience," said Raymond Marinan, operations. "As stewards of our natural resources, it is important that we do what we can to stop the spread of the EAB, just like we try to do with other invasive species."

Delta

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The two-year project proved to be nearly as complex as the delta's original habitat. The dam had long been used by Northwest Pipeline, a natural gas provider, and Bonneville Power Administration to reach Sundial Island. Once the dam was removed neither would have access to pipelines or transmission towers.

"BPA was very supportive in helping us explain the project and encouraging Northwest Pipeline to work with us toward a common goal," Saldana said. Both companies were concerned about being able to access equipment in the event of an emergency once the dam was removed.

"We had extensive discussions about access," Saldana said. "After lots of conversations, it was decided that the rock from the dam would be stored near the site. That way if an emergency road needed to be constructed, the rock would be easily available." Trying to accommodate the often competing needs of city, state, federal *and* commercial organizations made this one of the most complex negotiations she'd been involved with, Saldana added.

Once negotiations were complete, preparations for the big dig got underway. The Water Bureau managed a turtle relocation at the Sandy River Delta in the weeks before construction began. Twenty-four native Western Painted Turtles were captured and relocated to Company Lake, a Port of Portland habitat restoration site that is known to have a colony of Western Painted Turtles.

Although biologists searched the ponds in the East Channel they found no fish to rescue, Black said. "The biologists weren't completely surprised to not find any fish, since the warm water temperatures aren't conducive to cold-water fish species."

A 1930s-era dam constructed across the East Channel of the Sandy River was removed by the Corps of Engineers September 2013 during a habitat restoration project. Since its construction, sediment settled around the dam until it appeared to be a stone-filled path.

LKE, the Corps' contractor, began construction in the East Channel in early July, digging from the confluence with the Columbia River up toward the dam. "The contractor is digging a 60-foot wide pilot channel up to the dam, about a mile upstream from the mouth," Saldana said. "Once the dam is removed, the water should flow year-round through the East Channel for the first time in 80 years." While the dam was in place, water flowed over the dam on average about 90 days of the year, she added.

Restoring the delta's diversity will mean healthy habitat for the area's fish and wildlife species, Saldana said. "This restoration will provide cooler water, additional shallow water habitat and decrease the risk of stranding in the East Channel for ESA-listed species. The West Channel should benefit as well by encouraging healthier river banks and returning the channel to a more natural flow."

LKD finished removing the dam by late September and are replanting and seeding native plants and trees in areas disturbed by construction. Rootwads – trees with their roots still attached – will be placed along the newly created pilot channel to create shade and hiding places for young fish.

"The contractor should be finished with all work by the end of October," Saldana said. "In all, construction will have taken only about four months. We expect to see the delta start to meander and braid into small channels of its own choosing in the next few years. It shouldn't take long – Mother Nature is pretty dynamic."

The U.S. Army Corps of Engineers and its partners BPA, U.S. Forest Service and the Portland Water Bureau celebrated the first bite out of the Sandy River Delta dam Aug. 15. Corps contractor CEO Kim Erion uses a backhoe to take the first bite out of the dam. *(Photos by Matt Rabe)*

The East Channel of the Sandy River flows freely after Corps contractor LKE removed a 1930s-era dam. The restoration of flow will provide healthy habitat for young fish as the delta returns to a natural, braided river environment.

They're everywhere!

Invasive species a major, and costly, problem for Corps of Engineers

By Candice Walters
HQ USACE Public Affairs

What do quagga mussels, hydrilla, armored catfish, purple loosestrife, Brazilian pepper, water lettuce and bighead carp all have in common? What about navigation, flood control, environment, hydropower, regulatory, recreation, planning and engineering?

Quagga mussels, hydrilla, armored catfish, purple loosestrife, Brazilian pepper, water lettuce and bighead carp are all different types of invasive species (plants and animals) that are impacting U.S. Army Corps of Engineers missions such as navigation, flood control, environment, hydropower, regulatory, recreation, planning and engineering.

"It's not glamorous, especially when you are talking about some of these invasives like marine algae that covers coral reefs," said Mark Cornish of the Regional Planning and Environmental Division North, based in the St. Paul District and chair of the USACE Invasive Species Leadership Team.

But it can be a major problem and a costly one for USACE, as between $110 million and $160 million a year from fiscal years 2009 and 2013 has been spent to control or combat invasive species. USACE costs associated with invasive species for FY 2014 are estimated at $144 million. To help combat those costs by not only trying to control invasive species, but by preventing their introduction into non-native habitats, USACE has developed an Invasive Species Policy.

That policy, issued in 2009, is focused on establishing a consistent, nationwide policy across all Corps of Engineers districts to either prevent or reduce the establishment of invasive and non-native species. That policy also established the Invasive Species Leadership Team, charged with providing support for the exchange and sharing of information and to develop and provide strategic recommendations concerning invasive species.

The Invasive Species Leadership Team combines 24 geographically and professionally diverse individuals with a common task of implementing the Corps' Invasive Species Policy, which is applicable to all Civil Works projects and programs, and the National Invasive Species Management Plan, a part of Executive Order 13112 Invasive Species.

The Invasive Species Leadership Team uses the goals of National Invasive Species Management Plan as the general framework for planning and decision making. The eight goals are:

- Leadership and Coordination
- Prevention
- Early Detection and Rapid Response

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One of the invasive species found in the Everglades. *(Photo by Julie Marcy)*

Invasive

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- Control and Management
- Restoration
- Research
- Information Management
- Education and Public Awareness

Under each goal, the team has developed USACE-specific objectives that correspond with the national plan.

The policy is focused on planning for how to prevent the introduction of invasives and managing those that are already here, Cornish said. "We have to prepare, prevent and protect, but experience has shown that we're not going to solve every problem. If we consider invasive species in planning our actions, we can avoid their introduction and save the money we're now spending to combat and manage them."

Cornish said the first step is to be aware of one's own environment and what is naturally occurring in that environment. "If you are working with a project, follow the 'Come Clean, Leave Clean' rule, before you arrive at a work site and before you leave," he said. "Just washing off your boots and equipment can help reduce the spread of invasives, and will help minimize your impact to the environment you are working to improve."

Introducing invasive species isn't a new phenomenon, it's been occurring for quite some time, Cornish said, noting that starlings were introduced into New York City's Central Park as "an almost romantic gesture," with a nod to Shakespeare's plays. And the Florida Everglades has seen the introduction of Burmese pythons as an unfortunate by-product of the pet trade.

A shrink-wrapped helicopter sits at a loading facility just south of Kuwait City in Kuwait. The shrink wrap on the helicopter helps protect the helicopter and prevent dust and invasive species from entering the equipment once it has been cleaned. *(Photo by Al Cofrancesco)*

"Actually, it's surprising that there's not a bigger problem than there is with invasive species," he said.

"Every year thousands of species are introduced into new environments, but very few of them actually become established and even fewer become invasive. The biggest problem is that those that do become established displace native species and are difficult to remove.

"And it's not just a North American problem, it's all over the globe. In fact, we're seeing examples of where our North American species are becoming invasive in other parts of the world, and that's something that the Army is looking at in overseas operations," Cornish said. "We have had examples of where the Army is washing tanks, shrinkwrapping helicopters and spending big dollars to ensure that its equipment is not contributing to the problem by either bringing in invasive species or bringing them back home."

While much of the USACE focus has been on how invasive species are impacting its environmental restoration and navigation missions, another mission, emergency management, is taking a look at the issue as well. "When you have a hurricane and teams and equipment are being brought in from across the country, you have to think about the soil that is caked on that equipment and the possibility that critters within that soil that are foreign to the new environment are being brought in," Cornish said.

"During Katrina, there was a great deal of concern about the Formosan termites in the wood and ensuring that the wood wasn't removed from the area. And just recently, during Hurricane Sandy, people were looking at the downed trees in the New York and New Jersey area to make sure firewood and more importantly the insects inside firewood were not removed as well. So again, we have to consider invasive species as we plan our actions during emergency management operations."

There have been some examples of success in combating invasive species. The New Orleans and Jacksonville districts have seen a reduction in the water hyacinth populations that hinder navigation, water intake and habitat. Cost-effective management procedures have been developed that have reduced the water hyacinth populations in Louisiana by more than 900,000 acres.

The electric barriers operated by Chicago District have thus far prevented the movement of Asian carp between the Mississippi River and Great Lakes basins. The focus on controlling Asian carp, which have been reproducing in the wild for 40 years, has resulted in a new study area and innovative technology – environmental DNA (eDNA), Cornish said. "Ten years ago, eDNA was not even dreamed of. We have learned so much about it in the last five years that now eDNA is being applied to rare or threatened and endangered species to help them survive."

With the development of the leadership team program management plan, the team now is looking at ways of getting more traction for its newly formed Invasive Species Community of Practice, looking at drafting a formal charter and expanding its educational efforts.

What is eDNA?

Every organism, plant or animal, leaves snippets of its DNA in the environment. DNA can be left behind from tissue, mucus or as waste in processing food.

Most commonly the DNA is retrieved from fecal matter as scats or dispersed in water from the gut lining of the animal.

Environmental water samples are collected and processed by extracting the genetic material, which is usually present in very small amounts.

The DNA sections are chemically amplified thousands to millions of times and chemically separated, and the output is read for presence or absence of a gene sequence associated with that species or genera.

You can find out more about eDNA at these sites:

http://www.asiancarp.us/edna.htm
http://www.fws.gov/midwest/fisheries/eDNA.html

Responding to emergencies

USACE installs solar power to save lives

By JoAnne Castagna, Ed.D.
New York District

After the water receded and wind settled after Superstorm Sandy, the New Jersey National Guard was out rescuing citizens. Whether they found that young child under the rubble or safely guided an elderly man out of his home, was a direct result of the work being performed by the task force at the Homeland Security Center of Excellence, Headquarters in New Jersey.

"Emergencies are our number one priority," said Sgt. 1st Class Richard E. St. Pierre, who works at the center that is part of the New Jersey Department of Military and Veterans Affairs. "It's our responsibility to find roads that are safe for our teams to go out on to rescue people. Without an emergency operations center like ours, quick and efficient response to any emergency would be hindered if not incapacitated completely."

The effective operation of this center includes making sure it has power. Last summer the Corps of Engineers New York District completed the construction of a solar power project to provide power to the center. This is the fifth solar power project the Corps of Engineers has helped construct for the New Jersey Army National Guard.

The project is not only supporting a center that is saving lives during natural and man-made disasters, but also providing the center 61 percent of its annual energy needs and saving the National Guard and taxpayers considerable money.

"This project is enhancing homeland security," said Jose Diaz, project manager, Corps of Engineers, New York District. "The overall effort in the use of renewable energy resources is to provide a level of energy security that will allow operation of our military facilities against any future fuel shortages or embargoes, as well as natural disasters."

Corps of Engineers contractor P&S Construction, Inc. of Lowell, Mass., performed the work that involved installing 300 solar power panels on a 16,775 square foot area of roof on a warehouse adjacent to the center.

These panels were added to a panel system that was already on the warehouse roof, boosting their renewable energy capabilities from 321 kilowatts to 550 kw.

Sgt. Maj. Terrence Taylor, left, and Sgt. 1st Class Richard St. Pierre update hurricane response plans in preparation for Hurricane Sandy at the Homeland Security Center of Excellence in Lawrenceville, N.J., Oct. 26, 2012. *(Photo by Master Sgt. Mark Olsen)*

Panel arrays comprise modules made up of several solar cells or photovoltaic cells that absorb sunlight that produce electricity. The larger the panel, the more electricity is produced.

Electricity in the form of direct current is produced by the panels, which is not directly usable energy for a building. Most buildings require alternating current at a higher voltage. To make usable building power, the solar panel's direct current is fed into an inverter that transforms it into alternating current at a higher voltage.

This alternating current power is then sent to the building's main transformers where it can be used by the building for its energy needs.

The enhanced solar power system is providing the center approximately 61 percent of its annual energy needs and reducing the center's demand on the electrical grid during the highest and most costly energy demand days during the peak summer months.

Solar power project at the Homeland Security Center of Excellence in Lawrenceville, N.J. *(Photo by N.J. National Guard)*

"These roof-mounted systems will provide future cost avoidance to the National Guard and save taxpayers approximately $110,000 annually," Diaz said.

This project is also tied to the public power grid so that excess energy can be shared with the community.

Like all of the New Jersey National Guard's solar power projects, this project is under New Jersey's Solar Renewable Energy Certificate Program. Under this program, solar system owners who generate more than 1,000 kw of electricity per year that's connected to the public power grid receive certificates.

These certificates are then publicly sold and traded to New Jersey businesses and individuals, enabling them to receive solar power benefits without building a solar power system themselves. The revenue is returned to the solar system owners.

This won't be the last solar power project the Army Corps of Engineers creates for the New Jersey National Guard. They are starting another project at the New Jersey National Guard's National Training Facility Headquarters in Sea Girt. They are constructing a 500+ kw carport system to help create a Net Zero installation, an installation that produces as much energy on the site as it uses during the course of a year.

"These projects are helping the New Jersey National Guard reach its renewable energy goals. The guard wants 25 percent of its power to come from renewable energy sources by 2020," Diaz said. "In addition, this solar power system will also help conserve valuable natural resources, improve air quality due to the fuel free nature of solar electricity generation and serve as a showcase for integrating renewable energy into military facility operations."

District releases Final EIS on South Coast Rail proposal

By Timothy Dugan
New England District

The New England District has released the Final Environmental Impact Statement (FEIS) on the Massachusetts Department of Transportation's South Coast Rail proposal to establish commuter passenger rail service between Boston and the cities of New Bedford and Fall River, Mass. The FEIS was prepared in cooperation with the Commonwealth of Massachusetts to serve as a joint FEIS/Final Environmental Impact Report (FEIR) pursuant to the Massachusetts Environmental Policy Act (MEPA).

The project proponent, MassDOT, is seeking a Corps of Engineers permit under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act to perform work in navigable waters and discharge fill material in waters of the United States, including wetlands, incidental to establishment of passenger rail service between Boston and the cities of New Bedford and Fall River. Because the proposal constitutes a potentially significant environmental impact, the Corps of Engineers determined that a Federal Environmental Impact Statement (EIS), an in-depth environmental study, was required by the National Environmental Policy Act (NEPA).

The joint EIS/EIR allowed the MEPA review to be conducted simultaneously with the federal NEPA process. It evaluated a range of alternative transportation routes, including three principal rail routes, one bus route and a no-build alternative.

As the proposed project is not funded by a federal agency, the Corps of Engineers is the lead federal agency for purposes of the NEPA review and has coordinated the environmental review with cooperating agencies, including the U.S. Environmental Protection Agency, the Federal Transit Administration, the Federal Railroad Administration and the Federal Highway Administration.

Work is proposed in U.S. waters, including adjacent wetlands, along existing active and out-of-service railroad corridors between Boston and New Bedford/Fall River.

The proposal now under active review by the Corps of Engineers would result in permanent loss of approximately 12.3 acres of waters of the United States. (including wetlands), and follows (roughly, north to south) the existing Stoughton Commuter Rail Line from Boston to Stoughton Station; an existing rail line that has been out of service since 1958 from Stoughton to MA Route 138 (Broadway Avenue) in Raynham; an existing rail line that has been out of service since 1916 from MA Route 138 (Broadway Avenue) to Longmeadow Road in Taunton; and existing, active (in-service) freight lines, from Longmeadow Road to New Bedford, and from Myricks Junction (Berkley) to Fall River.

A commuter train makes its way toward a station. *(Photos by NAE Regulatory Division)*

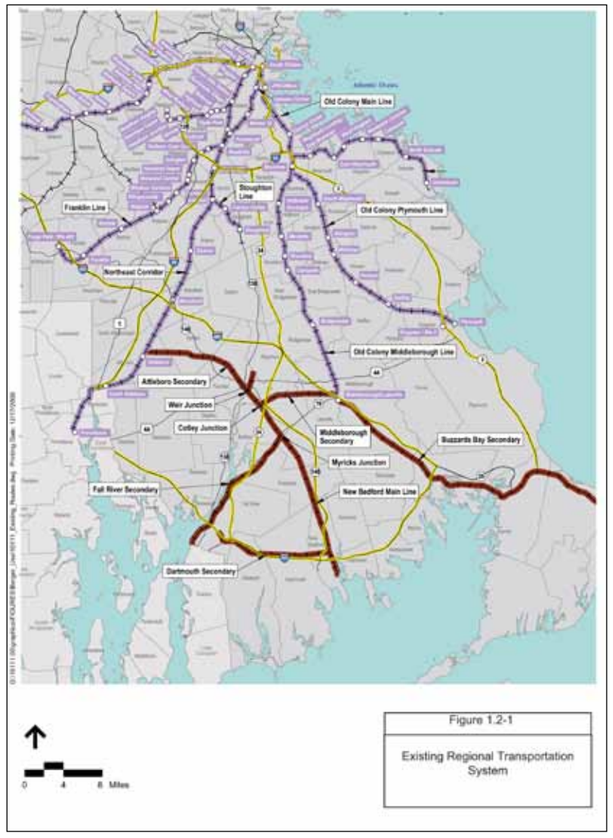
The FEIS/FEIR compares the direct, indirect and cumulative impacts of the practicable alternatives on the natural, cultural and socioeconomic environment.

The FEIS is intended to provide the information needed for the Corps of Engineers to perform a public interest review for the Section 404 permit decision.

The EIS/EIR evaluates several transportation facilities and corridor alternatives to implement the proposed transit service over a distance of about 50 to 60 miles. Transportation modes considered included rail (diesel or electric) and rapid bus. Corridors considered included a rail corridor through Attleboro, Stoughton or Middleborough or a rapid bus service along MA-24, MA-140 and I-93. MassDOT's preferred alternative is the Stoughton commuter rail alternative (using electric or diesel powered locomotives) which involves using the active freight lines from New Bedford and Fall River to Taunton, then using the inactive rail bed north to Stoughton, then using the active commuter rail tracks to South Station in Boston.

The application for the federal permit was filed with the Corps of Engineers under Section 404 of the Clean Water Act, which requires a Department of Army permit for the discharge of dredged or fill material in waters of the United States, including adjacent wetlands; and under Section 10 of the Rivers and Harbors Act of 1899, which requires a DA permit for any work in, or affecting navigable waters of the United States.

A Record of Decision (ROD), not less than 30 days after the FEIS/FEIR is released, will need to be completed prior to a permit decision by the Corps of Engineers. The MassDOT Wetlands Mitigation Plan design will need to be finalized; and a Programmatic Agreement must be signed to ensure that the requirements of the Section 106 of the National Historic Preservation Act will be met. Also, state approvals on water quality certification and coastal zone consistency are needed before the Corps of Engineers can make a final permit decision.



Existing regional transportation system

The FEIS/FEIR is online at: http://www.nae.usace.army.mil/Missions/ProjectsTopics/SouthCoastRail.aspx

The public notice is available at: http://www.nae.usace.army.mil/Missions/Regulatory/PublicNotices.aspx

Re-living history

West Hill Dam presents Lewis and Clark campfire adventure

By Ann Marie R. Harvie
New England District

New England District park rangers are experts at putting on interpretative programs. So much so that they can hold them almost anywhere – even around a campfire.

West Hill Dam Park Ranger Viola Bramel led a Lewis and Clark Campfire event, Aug. 24 at the project. Forty-eight people attended the two-hour travel back into time to learn about the adventures of Capt. Meriwether Clark and 2nd Lt. William Clark, who took a two-year trek from May 1804 to September 1806. The Lewis and Clark Expedition, also known as the Corps of Discovery Expedition, took them across the western portion of the United States, starting in St. Louis, and ending in Fort Clatsop, Ore., before returning the same way. During their adventure, which was commissioned by President Thomas Jefferson, the two men took extensive notes on what they discovered along the way.

A child tries on a uniform that Lewis and Clark would have worn in the 1800s. *(Photos by Kevin Burke)*

Time travel takes a lot of energy, so before the journey, Bramel and her assistant Park Ranger Shannon Schaefer and some of the adult participants helped the children build the fire for weenie and marshmallow roasting and s'mores making. "Everyone pitches in to help build the fire – we don't eat until we all build it – just like the Corps Soldiers," Bramel said. "We make an inner safety ring and teach fire safety so the children can help too."

Bramel said that after the snacks had been eaten and tummies were happy and full, the story began. The audience heard about President Jefferson's vision for the nation, the purpose of the Discovery Team, and the exploration of the Louisiana Purchase to include recording plants and animals found along the way. President Jefferson loved plants and animals according to Bramel. "The Corps Team brought back two live animals to President Jefferson," she said.

Walking around the circle, Bramel walked around the fire, weaving her story of the really bad times on the trail as well as the good times. "I talked about the nights in camp, how they celebrated holidays, encounters with Native Americans and what their encounter with a grizzly bear was like," she said.

Although the storytelling is an important part of the adventure, there is also a large interactive component. Participants got to touch and examine items such as animal pelts, and children were able to try on hats and coats similar to those that Lewis and Clark would have worn in the early 1800s. Questions were encouraged and Bramel, a 10-year veteran of the Lewis and Clark Campfire event, was only too happy to answer.

The campfire adventure ended with visitors picking a date – usually a birthday – and reading from the Lewis and Clark journal about what happened that day on the trail.

The Lewis and Clark Campfire events are held annually, typically the last Saturday of the month in June, July and August. According to Bramel, all of the campfire events are well attended and Junior Rangers working on their Level 2 patches get a chance to earn their cultural resource points.

Park rangers and event participants prepare for a pre-Lewis and Clark weenie and marshmallow roast at West Hill Dam.

West Hill Dam is open year round and the park rangers hold special events throughout the year. Check their website for an updated special events calendar at http://www.nae.usace.army.mil/Portals/74/docs/Recreation/WHD/WHDEvents.pdf.

District, partners sign In Lieu Fee Agreement for Connecticut

By Ruth Ladd and Barbara Newman
Regulatory Division, New England District

Col. Charles Samaris, New England District commander, traveled with Barbara Newman and Ruth Ladd from the District's Regulatory Division to join the National Audubon Society's Vice President Francis Grant-Suttie and Audubon Connecticut Director of Bird Conservation Patrick Comins at the Connecticut State House for the Aug. 21 signing of the Instrument (legal agreement) for a Connecticut In-Lieu Fee (ILF) Program.

The program, which will allow permittees to pay a fee instead of attempting mitigation themselves, is the first program of its kind in Connecticut.

"Prior to this agreement in Connecticut, those seeking permits for wetlands impacts were required to perform their own compensatory mitigation and monitor and maintain it for several years," Samaris said.

"This was difficult for them to accomplish and there were many failures," Samaris said. "Now this In-Lieu Fee Program offers the option of paying a fee 'in lieu' of permittee conducted mitigation."

The district commander also said this approach will enhance the Corps' ability to protect the environment and is in keeping with Lt. Gen. Thomas Bostick's vision for the Corps of Engineers.

The National Audubon Society - Connecticut Chapter (Audubon-CT) as sponsor of the program will, with district and interagency team oversight, collect the fees; identify projects for wetland restoration, enhancement, creation, and/or preservation; oversee execution of the projects; and assure long-term stewardship of the sites.

The ILF instrument, under which Audubon-CT and the Corps of Engineers will operate the program, is a living document that will be reviewed on a regular basis and amended when necessary to comply with rules and regulations.

The Corps of Engineers first began to explore the ILF concept for Connecticut in 2004. Audubon became involved in 2010 and submitted a prospectus, which is an outline of the proposed program, in January 2011. The process reached fruition at the recent signing ceremony.

Many dignitaries attended the signing event including U.S. Senator Richard Blumenthal, State Representatives Mary Mushinsky and Tom Vicino, and Audubon Connecticut Board Chair Marty Cannon.

Barbara Newman of Regulatory watches as Col. Charles Samaris signs the In Lieu Fee Agreement for Connecticut with Sen. Richard Blumenthal.
(Photo by Ruth Ladd)

New Engineer Regulation outlines procedure for managing Chemical Data Quality

Engineer Regulation (ER) 200-1-7, Chemical Data Quality Management (CDQM) for Environmental Restoration Activities, is in the process of being published.

This regulation prescribes CDQM for environmental restoration projects to ensure the quality and quantity of the chemical data will be appropriate for their intended uses. It applies to Headquarters, U.S. Army Corps of Engineers (HQUSACE) elements, major subordinate commands (MSCs), districts, laboratories and separate field operating activities responsible for Hazardous, Toxic and Radioactive Waste and Military Munitions Response Program activities conducted under the Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act. ER 200-1-7 integrates other USACE guidance on environmental CDQM and replaces ER 1110-1-263, Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities (April 1998).

The ER allows the Project Delivery Team (PDT) the flexibility to design a comprehensive and multifaceted approach to CDQM for each project while mandating minimum quality requirements to ensure project Data Quality Objectives (DQOs) will be met. These requirements include the following:

DQOs must be developed using the Technical Project Planning Process described in EM 200-1-2, Technical Project Planning (TPP) Process.

Quality Assurance Project Plans (QAPP) must comply with the Intergovernmental Data Quality Task Force Uniform Federal Policy for QAPPs.

Analytical services providers (e.g., commercial environmental testing laboratories) need to be accredited under the Department of Defense Environmental Laboratory Accreditation Program. However, laboratories under the Contract Laboratory Program may be used for analytical support for projects under the Superfund program when requested by the U.S. Environmental Protection Agency.

Project-specific laboratory reviews must be conducted as described in the updated version of Engineer Manual (EM) 200-1-1, Project-Specific Review of Analytical Chemistry Laboratories (which is being prepared for publication) when new laboratories are contracted for analytical support, new Measurement Performance Criteria are established or new test methods are proposed.

> Questions regarding ER 200-1-7 may be directed to Dr. Thomas Georgian (CEHNC-EMS).

PDTs with USACE project chemists must conduct technical reviews of all project deliverables (e.g., QAPPs, Site Inspection Reports and Remedial Investigation Reports).

Independent Technical Reviews (ITR) (second-tier quality assurance reviews) must be conducted by qualified (USACE or external) personnel that are not members of the PDT and independent of the project's sample collection, testing and data review activities.

The USACE project chemist consults with the project manager and other members of the technical project planning team to determine the need for additional CDQM activities on a case-by-case basis (field audits, proficiency testing sample analyses and so forth). Each project must also possess a designated quality assurance manager (QAM) that is independent of the PDT. The QAM is responsible for verifying products and services are performed in accordance with program and project management plans and HQUSACE policies and meet the needs of customers.

ER 200-1-7 also requires organizational and programmatic requirements for CDQM to be documented in a Quality Management Plan (QMP). The QMP, which may be written by the MSC or each subordinate district separately, must explain how the requirements for CDQM will be satisfied by addressing the 10 major Quality System elements described in the Uniform Federal Policy for Implementing Environmental Quality Systems. Each MSC must designate at least one quality assurance coordinator (QAC) to assist and assess CDQM for its subordinate districts. The QAC may be a member of an interdisciplinary team of technically qualified individuals (e.g., from the MSC, PM districts or Environmental and Munitions Center of Expertise) that is established to evaluate a district's quality processes for chemical data (e.g., by periodically conducting on-site audits). The QAC is responsible for oversight of corrective actions for systematic problems and coordinating the resolution of significant comments raised during ITRs.