

The Corps

Volume 18, Issue 3  
July 2017

# Environment

**Survey  
collaboration  
helps Corps  
update FEMA  
flood risk  
maps** **16**





# On the cover

Matthew Elsasser, an environmental technician with the Susquehanna River Basin Commission, calibrates an Acoustic Doppler Profiler as part of a collaborative project with USACE, Baltimore District, to help FEMA Region III update its flood risk maps.

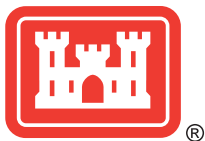
(Photo by Sarah Gross)

# 16



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# ENVIROPOINTS

## An Update on Energy Security in the Army

By J.E. “Jack” Surash, P.E.  
*Acting Deputy Assistant Secretary of the Army for Energy and Sustainability*

**E**nergy is key to everything the Army does. As the Acting Deputy Assistant Secretary of the Army for Energy and Sustainability (DASA (E&S)), my office provides strategic leadership, policy guidance, program oversight, and outreach for energy and sustainability throughout the Army enterprise. We work to enhance current installation and operational capabilities, safeguard resources and preserve future options.

The Army requires a reliable energy supply in order to conduct its mission. My colleagues in the Army, together with private industry, utilities, public utility commissions and local communities promote energy security and resiliency on our installations and in local communities. It remains the case, however, that energy supply shortfalls and power distribution failures – whether caused by acts of man or acts of nature – represent a strategic vulnerability for the Army.

The Army acknowledges these realities and is focusing on energy resiliency and security in its programs and investments. Across Army installations, we are working to assure access to energy, water and land resources through innovation, increased efficiencies, reduced demand, new power storage solutions, and the development of diversified renewable and alternative energy systems.

To underscore why energy security and resiliency are so important, let me put the Army’s installation energy use in perspective.

Secure and reliable access to energy are essential to the Army’s ability to perform its mission and support global operations.

The Department of Defense consumes a majority of the energy required to operate all of the federal government’s facilities. Army facilities are the largest consumers of electricity in the federal government. In fiscal 2016 alone, the Army spent more than \$1.1 billion on facilities energy.

Today’s Army continues to take an increasingly proactive approach to resource management and implementing ongoing programs and initiatives to ensure the Army continues to improve its energy security and resiliency posture.

I am pleased to report that the Army is making substantial progress on this front, particularly with respect to energy security and resiliency on Army installations.

The Army’s Energy Security and Sustainability Strategy, also known as the ES2 Strategy, represents a turning point. The Army is evolving from a historic view of resource considerations as constraints on operational effectiveness to today’s perspective, wherein the Army considers the critical role of energy, water and land resources as mission enablers. This strategy focuses on building a more adaptable and resilient force – a force that is prepared for a future defined by complexity, uncertainty, adversity and rapid change.

The ES2 Strategy envisions a ready and resilient Army, strengthened by secure access to energy, water and land resources in order to preserve future choice in a rapidly changing world.

It seeks to build the overall resiliency of Army installations through the implementation of the following five goals:

### **Inform Decisions**

Leverage Army culture to use resources wisely, improve mission effectiveness and preserve future choice.



J.E. “Jack” Surash, P.E.

### **Optimize Use**

Minimize demand and increase both efficiency and recovery to maximize resource and mission effectiveness for systems, installations and operations.

### **Assure Access**

Provide reliable access to energy, water and land resources and protect delivery mechanisms to mission-essential functions and applications, both domestically and to contingency bases abroad during operational deployments.

### **Build Resiliency**

Advance the capability for systems, installations, personnel and units to respond to unforeseen disruptions and quickly recover while continuing critical activities.

### **Drive Innovation**

Identify new concepts; develop, test and field new processes and technologies; and institutionalize and communicate best practices to maximize resource effectiveness.

In support of the ES2 Strategy, the Army published the Installation Energy and Water Security Policy (Army Directive 2017-07). This directive highlights the principles outlined in the ES2 Strategy and also conveys the importance of energy and water security within the Army.

**See EnviroPoints, page 4**



# ENVIROPOINTS

## Securing Critical Missions

*“The Army will reduce risk to critical missions by being capable of providing necessary energy and water for a minimum of 14 days.”*

## Sustain All Missions

*“The Army will improve resilience at installations, including planning for restoration of degraded energy and water systems and reducing risks of future disruptions, by addressing the following attributes: assured access to resource supply, reliable infrastructure condition, and effective system operations.”*

### Installation Energy and Water Security Policy (Army Directive 2017-07)

The directive establishes the requirement that the Army prioritize energy and water security requirements to ensure available, reliable and quality power and water to continuously sustain critical missions. The directive divides this policy into two components: “secure critical missions” and “sustain all missions.”

To support this directive, the Army is developing business rules for defining and assessing energy and water security risks and for prioritizing mitigation actions within existing authorities and programs. The Army is also reviewing programming resources to address gaps in critical energy and water security requirements. Commands at all levels are prioritizing energy and water security requirements to ensure available, reliable and quality power and water to continuously sustain critical missions.

Continuing to work with industry, utilities, public utility commissions and other stakeholders to improve the Army’s energy and sustainability posture is key to our success. As long as energy supply

shortfalls and power distribution failures, whether caused by acts of man or acts of nature, remain a strategic vulnerability, the Army will continue to focus its energy and water programs and investments on resiliency and security.

I look forward to ongoing collaboration with the teams at my office of the DASA (E&S), the greater Army staff, the Army land-holding commands – U.S. Army Installation Management Command, U.S. Army Materiel Command, U.S. Army National Guard Bureau, U.S. Army Reserve Command, all U.S. Army installations, U.S. Army Corps of Engineers — and other military services and government agencies to continue to improve the Army’s energy and sustainability posture.

With these initiatives and programs, and ongoing collaboration and teamwork, the Army will continue to bolster its energy security and resiliency posture, ensuring that our Soldiers are always equipped to perform their mission.



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**Lt. Gen. Todd T. Semonite**  
Commanding General  
Publisher

**W. Curry Graham**  
Director of Public Affairs

**Karen J. Baker**  
Executive Editor

**Gene Pawlik**  
Managing Editor

**David San Miguel**  
Editor

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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:

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*Volunteers work on building pollinator habitats during a pollinator party held at the Abiquiu Lake, New Mexico, April 22. The event was part of the Albuquerque District's Earth Day celebration.*



# Earth Day volunteers assist pollinators

Story & photos by Elizabeth Lockyear  
USACE, Albuquerque District

**ABIQUIU LAKE, New Mexico** – Approximately 25 people observed Earth Day at a Pollinator Party at the U.S. Army Corps of Engineers, Albuquerque District's Abiquiu Lake project office, April 22.

The party's theme was the importance of pollinators. USACE staff chose the theme to help the public learn more about the importance of honey bees, monarch butterflies and other pollinators, as well as supporting a 2014 presidential memorandum to "create a federal strategy to promote the health of honeybees and other pollinators."

A pollinator is an animal, such as a bee, bat or butterfly, that moves pollen from one part of a flower to another, causing the plant to make fruit or seeds. Pollinators play an important role in the reproduction of many different types of plants. A decline in the pollinator population would pose a risk to agriculture and many ecosystems around the world.

Natural resource specialist and event organizer Nathaniel Naranjo spoke about the importance of improving pollinator



*Natural resource specialist, Nathaniel Naranjo, speaks to a group of Earth Day volunteers on the importance of pollinator habitats and their ecological value to Abiquiu Lake wildlife, April 22.*

habitat. After Naranjo's presentation, 16 volunteers helped the district staff make pollinator houses.

"These houses were made by drilling a bunch of 3-inch deep, ¼-inch holes in what most people would consider trash,

old lumber and brush, putting on a roof, and attaching it to a wall or post. This type of house provides a much needed home and place to lay eggs for many species of native pollinators," said Austin Kuhlman, lead park ranger at Abiquiu Lake.



# Engineer staff hosts STEM students, provides education on Libby Dam

Story & photos by Patricia Graesser  
USACE, Seattle District

The U.S. Army Corps of Engineers, Seattle District, hosted the entire eighth grade from Libby Schools (98 students) for a daylong exploration of Science, Technology, Engineering and Math and Hydropower careers at the Libby Dam facilities, April 20.

This was the sixth time the Corps has hosted the annual STEM Careers event in partnership with Libby Schools GEAR UP for Graduation program.

Throughout the day, students were provided educational briefings on environmental stewardship, flood control and hydropower production as well as many other subjects related to science and engineering.

Students were also able to visit with Corps staff from every section, stand inside a generator, talk to an operator, dissect a fish and learn about spillways, sluice gates and more.



*Jake Williams, park ranger, partnered with Montana Fish, Wildlife and Parks and Montana Conservation Corps crews April 17-28 to plant thousands of riparian trees and native shrubs in Jennings and Blackwell campground areas downstream of Libby Dam.*



*Students met with USACE staff as part of the Libby Schools GEAR UP for Graduation program.*



# Installations evaluate wastewater treatment process aiming to meet Net Zero goals

By Charles Coyle

USACE, Engineering and Support Center

Anaerobic wastewater treatment processes are nothing new, but they are almost never thought of as the primary process for treatment of municipal wastewater, i.e., sewage.

Researchers, however, are working on changing that perception.

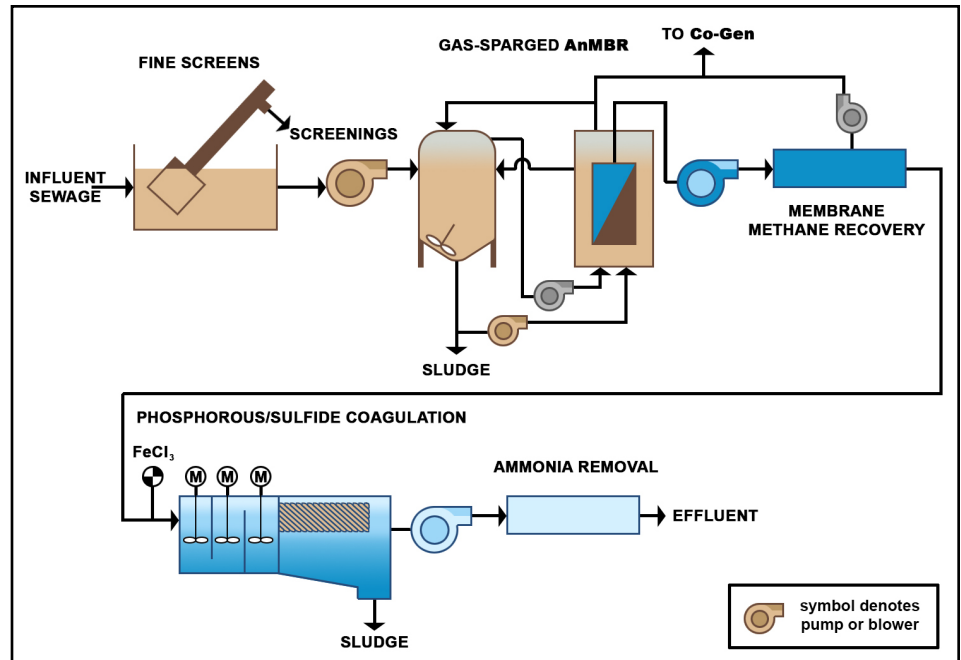
Pilot-scale demonstrations are underway at two Department of Defense installations wherein anaerobic bioreactors are used as the primary treatment process for municipal wastewater. These demonstrations are being funded by the Environmental Security Technology Certification Program.

The pilot test at Fort Riley, Kansas, uses a two-stage anaerobic bioreactor. Before exiting the anaerobic bioreactor, the wastewater passes through an ultrafiltration membrane, i.e., anaerobic membrane bioreactor. The membrane filters out suspended solids and biomass. Because of the membrane, the treatment process doesn't need to employ the conventional settling tank, clarifier and filtration processes that are used to settle out the biosolids generated during wastewater treatment.

A pilot test will also be performed at Mountain Home Air Force Base, Idaho, to demonstrate a different variation on anaerobic wastewater treatment, also employing an anaerobic membrane bioreactor. Both demonstrations seek to support DOD Net Zero water goals, to reduce energy use and reduce waste generation. There is also potential for the treated effluent to be reused for purposes such as irrigation and vehicle washing.

One limitation to using anaerobic treatment for the primary process is that it doesn't remove ammonia, or  $\text{NH}_3$ . However, the researchers are investigating alternatives for  $\text{NH}_3$  removal, especially adsorption onto clinoptilolite-based media, followed by energy recovery, via conversion of  $\text{NH}_3$  to nitrogen gas.

In the future, when the anaerobic-based wastewater treatment process becomes



*Process flow diagram for the gas-sparged anaerobic membrane bioreactor pilot-scale system being demonstrated at Fort Riley, Kansas.*

fully developed and commercialized, it is believed that there will be substantial cost savings for DOD.

The anaerobic-based wastewater treatment processes are expected to be much less expensive to construct and operate than conventional wastewater treatment systems. This may be an especially attractive alternative for installations with dilapidated wastewater treatment plants that are in need of upgrades or replacement. Because the anaerobic systems employ ultrafiltration membranes, the large, conventional settling tanks and clarifiers would not be needed. The anaerobic systems are low-energy, because there isn't a need to aerate the wastewater; and energy can be recovered from methane that is generated within the anaerobic bioreactors. Also, sludge, i.e., biosolids, generation will be reduced to approximately half of that of aerobic treatment processes, which reduces sludge disposal costs. Lastly, initial data from the pilot tests indicates that biochemical oxygen demand criteria can be achieved without the need to heat the anaerobic bioreactors.

While there are still several unknowns regarding effluent treatment, especially best alternatives for nitrogen and phosphorous removal, and selection of cost-effective disinfection processes, the initial data from the pilot-scale demonstration at Fort Riley are promising. Reuse of treated wastewater is another aspect that will need to be investigated in greater detail. Ideally, at installations near agricultural areas, treated effluent would be made available for local crop-land irrigation, in which case nutrient removal may not be required. Golf course irrigation or other landscape areas may be an option for some installations. Use of treated effluent for vehicle washing stations may yet be another option.

The principal investigators for these projects are: Pat Evans, CDM Smith, for the Fort Riley demonstration, and Kathryn Guy, ERDC-CERL, for the Mountain Home Air Force Base demonstration. Charles Coyle, U.S. Army Corps of Engineers, serves on the Environmental Security Technology Certification Program Environmental Restoration Technical Committee.





# Researchers assess concerns over small arms training, wildlife

Live-fire training is a necessity on Department of Defense installations.

Yet, large areas of high-quality terrestrial natural infrastructure exist downrange of these small arms training ranges. Projectiles can escape containment areas primarily through overshoot and ricochet.

Regulatory agencies have concerns about the potential impacts of live-fire training on downrange natural resources, namely: constituent contamination, wildfires, damage to critical habitat, and impacts on listed species. Additionally, bullet strikes on commercially salable trees degrade their value. Adjoining landowners also sometimes express safety concerns about bullets that might potentially escape the firing range. The question inevitably arises, “How many bullets escape the containment berm and end up downrange?”

The U.S. Army Corps of Engineers Engineer Research and Development Center, Construction Engineering Research Laboratory, undertook this effort to determine whether there are reliable documented methods to quantify the number of bullets that escape the containment berm and end up downrange, and to propose ways to address this problem.

Researchers made inquiries among natural resource peers and reviewed methods currently used to address the fate of bullets on firing ranges. Responses showed that natural resource personnel on military facilities, and those at other state or federal agencies, express a need for better tools or guidance to address the potential issue of small arms munition impacts within sensitive downrange areas, in addition to the methods currently in use.

The main method of controlling the

movement of ammunition downrange at small arms ranges is the use of bullet containment devices (berms, traps and backstops). The emphasis placed on containment sometimes depends on

whether the downrange area has viable habitat for threatened and endangered species.

Line-of-sight and trajectory analyses, when supported by vegetation impact assessment, can indicate whether berm construction is necessary or effective. When berms are not sufficient, bullet traps can prevent bullets from overshooting ranges, and these can be evaluated with similar analyses.

Currently, live-fire training operations are documented using the Range Facility Management Support System computer system. Military units enter the planned number of rounds fired per training event into the program to more closely connect operations to impacts allowing for better management strategy.

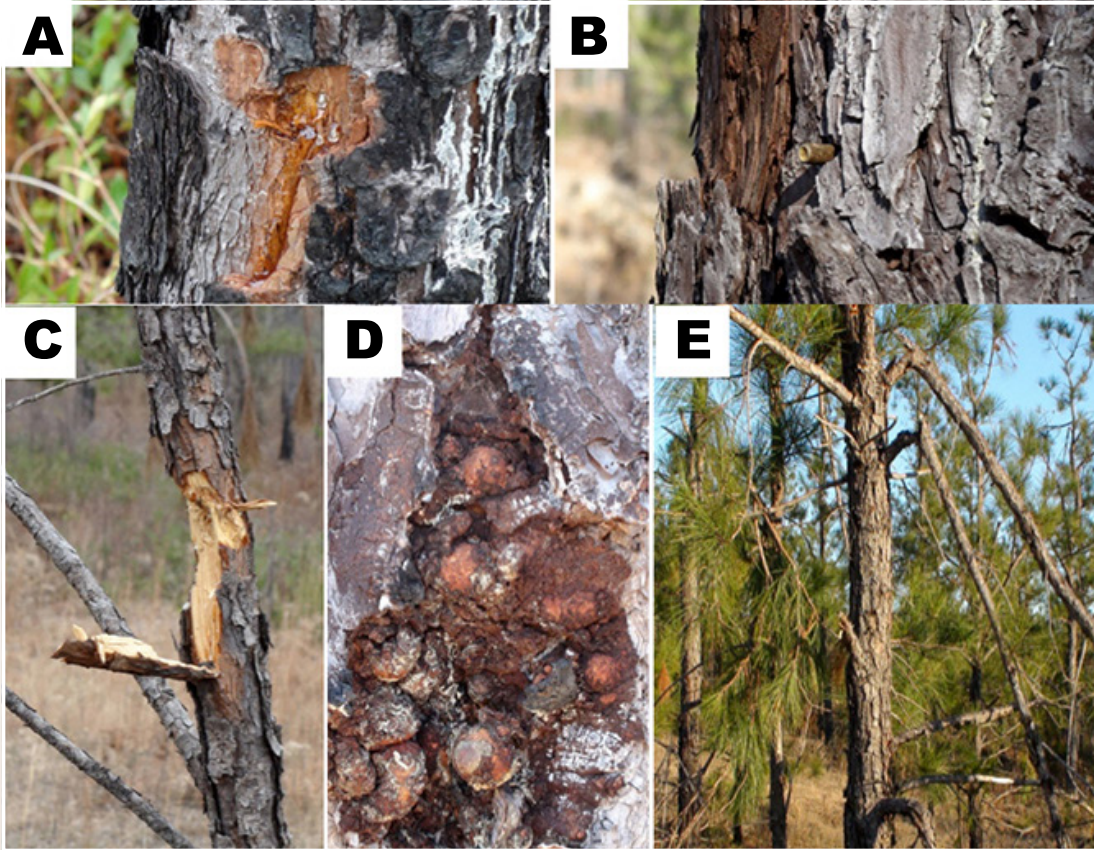
Methodology does exist to implement surface danger zones that estimate the probability of injury or property damage from “stray bullets,” but not to estimate the long-term likelihood of such occurrence, i.e., how many, or how densely, bullets are likely to strike a given area.

Acoustical and visual techniques can potentially quantify bullet overshoot and ricochets into sensitive wildlife areas, though neither approach is sufficiently developed. Acoustical techniques can quantify bullet intrusions into downrange areas, help identify ranges from which bullet ricochets originate, and help distinguish the types of ricochets. Quick identification of ricochets would lessen the potential for harm to persons or the environment.

***....landowners also sometimes express safety concerns about bullets that might potentially escape the firing range.***

**See Live-fire, page 9**





*Different types of tree damage caused by bullet strikes on Forts Benning and Stewart, Georgia. Multiple forms of tree damage were observed: (A) small scars, (B) bark bullet strikes, (C) large cambium cuts, (D) nodules and (E) broken branches, leader or stems.*



*Live-fire training can potentially cause considerable impact on natural resources.*

## Live-fire continued from page 8

Military natural resource managers need such information on impacts within sensitive areas downrange of live-fire ranges to make effective management plans, e.g., Integrated Natural Resource Management Plans; to effectively manage wildlife populations to meet conservation and regulatory requirements; and to adapt and synchronize land management plans with military training practices.

Improved control and monitoring of downrange impacts of firing ranges would help the Department of Defense improve range design, determine the fate of downrange munitions, and mitigate impacts to downrange natural resources. Moreover, related guidance and associated field techniques will be applicable to all service branches that share similar issues.

The future of noise monitoring on military installations lies in the ability to acquire data quickly using automated systems placed within the environment. ERDC is in the process of developing a prototype noise assessment toolkit, Real-time Adaptation, Prediction, and

Informatics for Dynamic Military Noise Environments, or RAPID, that uses data from automated noise monitors to provide installations with high quality data and real-time assessment of installation noise impacts. Long-term recording systems placed at multiple locations recording over multiple days would be possible and practical, and could document range use and noise in relation to biological activities of species of interest. If this technology and associated techniques prove to be effective, its use to monitor and detect downrange munitions in sensitive areas real-time would enable resource managers to more proactively respond to future problems.

*Contributing writers from the U.S. Army Corps of Engineers Engineer Research and Development Center include: David Delaney, research wildlife biologist/bioacoustician; Patrick Guertin, forester/researcher; Michael White, research acoustical physicist; and Richard Fischer, research wildlife biologist.*



# Recycling drives energized war efforts

Story by  
Suzanne Kopich & Barbara Taylor  
Fort Meade, Maryland

“Salvage For Victory,” doesn’t sound much like a recycling ad, though in a roundabout way, it was. During World Wars I and II, recycling was common practice and was done with great enthusiasm.

World War II ad campaigns like “Salvage For Victory” and “America needs your scrap rubber,” rallied Americans to collect their tin cans, scrap metal, bottles, waste fats, rubber, silk, papers — all to support and sustain the war effort.

Patriotism was the motivation behind recycling. It enabled Americans on the homefront to do their part while Soldiers served abroad.

Though it was done for a different purpose, it was still recycling.

At the time of war, mass-produced consumer goods and pre-packaged foods were not as plentiful and as common as they are today.

Complicating matters, the manufacturing capability of the United States was very limited and couldn’t meet the needs of a rapidly expanding Army. This put an enormous strain on the ability to supply critical war material and equipment overseas in a timely manner. It became necessary to be as frugal as possible with available resources and rely on already existing systems of reuse and recycling.

The focus wasn’t solely on recycling materials either. Conservation was every bit as important.

**See War efforts, page 11**





*Recycling has played an important role in Fort Meade's mission for decades, whether helping preserve our freedom by collecting scraps during both World War I and World War II to protecting our environment by conserving our natural resources. (Photos courtesy of Fort Meade Historical Archives)*



## War efforts continued from page 10

Americans were reminded of their wartime duty not to waste food or water, and to conserve gas by carpooling. Some ads went as far to say that riding solo meant you were supporting Adolf Hitler!

Recycling was an integral part of Camp Meade operations in 1917 also. Scrap metal and food scraps were collected at garbage collection points at the camp's mess halls. The steel-coated tin, or tinplate cans, were shredded,

melted down and turned back into new products. Tin and copper were both used to produce ordnance and in order to meet the wartime demand, recycling was the only option.

Food scraps had their own purpose. Bone and fatty meat scraps were collected and sold to rendering plants, which would process the scraps into a variety of products such as lard, tallow and glycerin. Glycerin was used

to produce nitroglycerin, a primary ingredient in explosives and propellants for ammunition.

Today, we're motivated by a different kind of battle – our troubled environment. Earth has limited resources so it's critical that we continue those early fundamental practices of recycling, conserving and reducing waste that were initiated during World War I. Recycling materials requires less energy and creates less pollution than manufacturing goods from raw materials. Preserving and conserving our natural resources is not just a nice thing to do, it's necessary to having a healthy environment tomorrow.

Recycling has played an important role in Fort Meade's mission for decades, whether it was helping to preserve our freedom or protect our environment. Fort Meade has been operating its own recycling facility since the late 1980s. Materials including paper, glassware, cans, plastics, cardboard, printer ink cartridges and CDs are collected across the installation, then crushed, shredded, baled and sold. The more trash that's diverted from the landfill and sold for recycling, the more Fort Meade can offset what it pays for waste disposal.

Although the purpose and meaning behind today's battle cry to recycle have changed at Fort Meade, the need remains critical for tomorrow's future.



*During World War I, food scraps and metal were collected at Camp Meade to support the war effort.*



# Teamwork, experience ensure destruction of war munitions

Story by Karen Jolley Nikol  
U.S. Army Chemical Materials Activity

**ABERDEEN PROVING GROUND, Maryland** – A World War II-era munition containing mustard agent, recovered in Illinois last year, was safely destroyed on-site May 14 by a team from Maryland that specializes in this type of mission.

The U.S. Army Chemical Materials Activity Recovered Chemical Materiel Directorate has decades of experience in destroying recovered chemical warfare materiel. In this case, the munition was recovered during a U.S. Army Corps of Engineers planned remediation at Savanna Army Depot Activity, Illinois.

“We have a team that worked for months to ensure all the requirements for safety, environmental compliance, logistics and funding were in place to accomplish this mission,” said Laurence Gottschalk, director, RCMD.

Nora Hawk, project manager, USACE, Louisville District, for SVDA, said the project was “truly an excellent and successful example of multi-agency and multi-discipline team collaboration.

“The SVDA base environmental coordinator, Cathy Collins, remained in close coordination with RCMD throughout the planning, storage and destruction efforts and USACE team members from both Louisville District and Huntsville Center provided necessary management support,” Hawk said.

USACE works closely with RCMD for remediation efforts at sites that may have buried chemical munitions. A great deal of historical research goes into planning for remediation, and researchers typically have a good idea of what could be recovered at a site. When items with unknown liquid fills are recovered, RCMD sends specialized assessment equipment and a team of experts from CARA, the Chemical, Biological, Radiological, Nuclear and Explosive Analytical and Remediation Activity, part of the U.S. Army 20th CBRNE Command. Assessment identifies the contents of munitions without opening



(Photo courtesy of U.S. Army Chemical Materials Activity)

*An operator places the World War II-era munition containing mustard agent in the Explosive Destruction System in preparation for destruction operations.*

them, which enhances safe, efficient operations.

After the item was assessed in December and confirmed to contain mustard agent, destruction mission planning began. Policy requires recovered chemical munitions to be destroyed at the closest defense department facility capable of hosting a mission, which in this case was SVDA. RCMD provided a temporary storage facility to SVDA, where the overpacked munition was secured until destruction.

In April, a team led by RCMD project manager, Derek Romitti, with personnel from the Edgewood Chemical Biological Center, arrived in Illinois to set up the site for the Explosive Destruction System, the organization's time-tested destruction technology to safely destroy the munition.

“Just to ensure the site was ready took months of coordination,” Romitti said. “We need to have power, water, security and personnel. Setting up the equipment and actually completing the EDS mission is the culmination of months of effort.”

The EDS is RCMD's primary method

for destroying recovered chemical munitions. First deployed in January 2001, the EDS has destroyed more than 2,600 recovered chemical warfare items in 12 states with an impeccable safety record. The system's main component, a sealed, stainless steel vessel, contains all blast, vapor and fragments from the process. The EDS uses linear shaped cutting charges to explosively access the munition's chemical payload for neutralization. Operators confirm treatment by sampling residual liquid and air from the vessel prior to reopening the EDS.

The process takes place in an environmental enclosure that operates under negative pressure and filters all air through a carbon filtration system. An extensive series of equipment checks, safety evaluations and regulatory approvals are required before operations begin.

Personnel are decontaminating the equipment before shipping it back to Maryland. Hazardous waste generated by this operation was shipped to a permitted treatment, storage and disposal facility.



# Renovation project will update 1940s era engineer facilities

By Chris Gardner  
USACE, Baltimore District

Though Soldiers may experience a deployment to support military contingency operations abroad, stateside deployments are unusual.

For Soldiers with the 249th Engineer Battalion (Prime Power), however, such deployments are quite common.

Part of the U.S. Army Corps of Engineers, these specially trained Soldiers help provide temporary emergency power to critical facilities in communities impacted by natural or man-made disasters, including anything from powering up the New York Stock Exchange after the 9/11 terrorist attacks to providing power to fuel depots in New Jersey after Hurricane Sandy in 2012. They also support military operations overseas, assisting with various power generation needs.

With four companies strategically stationed across the country, the battalion's headquarters sits in aging facilities on Fort Belvoir in northern Virginia ... but not for long.

The USACE, Baltimore District, is working with their Prime Power colleagues to renovate the three buildings that are home to the battalion's headquarters, as well as its C Company and a Reserve platoon.

"Our Soldiers provide outstanding support to contingency and emergency operations both at home and abroad," said Lt. Col. Julie Balten, commander, 249th Engineer Battalion. "The funding for and completion



(Photo by E.J. Hersom)

*Soldiers with C Company, 249th Engineer Battalion (Prime Power) install electrical generator equipment at a Carteret, New Jersey, fuel depot following the aftermath of Hurricane Sandy's destructive storm surge, Nov. 6, 2012.*

of these renovations lets our Soldiers know we are investing in them and that their mission is important."

Construction is ongoing at building 1417, the 249th's heavy maintenance facility, with its roughly \$6 million interior renovation slated to be completed within the coming weeks.

"The goal is to upgrade the battalion's post-World War II facilities to bring us into the future and provide us with the maintenance space we require to provide power support to the Army and the nation," said Capt. Brad Davis, logistics officer, 249th Engineer Battalion.

The contract for the next renovation is being discussed for possible bidding and award later this year.

The next two phases of construction will focus on the 249th's other two buildings, buildings 1416 and 1418.

"What we're finishing currently is phase one to enable the 249th to maintain its generators and vehicles," said Nhat Tran, project engineer, USACE, Baltimore District.

Building 1417, where the unit performs generator and vehicle maintenance, was originally designed for use as a storage warehouse with entrances in the front and back and an elevated office space dividing the open-spaced building.

"Previously, they couldn't move trucks or generators from one end of the building to the other without going outside," Tran said.

Improvements include

removing the office space in the middle of the building and adding built-in cranes to increase functionality and workflow.

The work not only improves the facility's functionality, it makes it more efficient by replacing aging mechanical, electrical and plumbing systems. It also improves Soldiers' safety by removing rust, lead paint and asbestos.

While the phased renovation progresses, the 249th Soldier engineers remain appreciative of the improvements and continue carrying out their missions.

"This renovation will update our 1940s era facility and enable us to continue our mission well into the future," Davis said.



*Participants of the DOD, EPA Environmental Regulatory Workshop were updated on issues ranging from air and water quality to waste disposal.*



*(Photo by Mikel Moore)*

# Joint DOD, EPA workshop draws crowd

**By Susan Gibson**  
*USACE, South Atlantic Division*

The Environmental Protection Agency - Region 4 and the Department of Defense Regional Environmental Coordinator for Region 4 co-hosted a workshop and environmental regulatory update, April 24-25 in Atlanta, Georgia, the first such meeting the two agencies have held together since 2009.

As many as 140 people attended the workshop. The primary purpose was for environmental representatives from military services in the Southeast to hear from the EPA on issues ranging from air and water quality to waste disposal. Another goal was to reaffirm a sense of partnership between the two agencies that has been difficult to maintain because of a lack of face-to-face interaction due to travel restrictions.

Susan Gibson, DOD regional environmental coordinator for Region 4, said the opportunity for subject matter experts from installations and the EPA to discuss challenges they have in common was a big draw for many of the attendees.

"We haven't been able to do this for many years, so everyone was excited about the chance to get together to hear about environmental regulations and programs implemented by EPA," Gibson said. "It was an opportunity for our installations to talk with their cohorts about the current

state of regulatory affairs."

Among the attendees was Col. Donald Walker, deputy commander, USACE South Atlantic Division, and Anne Heard, acting regional administrator for Region 4, almost 50 EPA policy experts from different media areas, and nearly 90 environmental staff from military installations throughout the Southeast. Gibson said about two-thirds of Region 4's installations were represented at the workshop.

The workshop included three separate tracks covering waste (Resource Conservation and Recovery Act/ Comprehensive Environmental Response, Compensation and Liability Act), water and air programs, along with a special section on National Environmental Policy Act issues. A separate session gave military service representatives a chance to update EPA on installation and service successes.

Following the workshop, the co-hosts discussed existing communication channels and whether new interagency work/discussion groups need to be established. They also said they plan to hold another workshop in 2018, responding to requests from participants to repeat the 2017 event.

For more than 20 years, DOD regional environmental coordinators have represented the military's interests to regulatory agencies and state legislatures.

DOD established its state legislative and regulatory coordination program in 1994 with Department of Defense Instruction 4715.02, setting up DOD REC programs in the 10 U.S. standard federal regions. The Army has lead responsibility for four of the regions in the Southeast, Great Lakes states, central states, and the Midwest. Its four regional environmental and energy offices there fulfill the DOD REC function for the Army.

When a law or regulation important to the services is being developed, RECs engage state legislators and regulators to assure that DOD and services' interests are represented. The RECs' close cooperation between the military and policymakers helps inform and shape state policies so those making the laws and rules understand the potential impact on military missions. Each year the REC offices review thousands of regulatory and legislative actions affecting every service in every part of the country.

The Army Regional Environmental and Energy Offices also facilitate partnerships among other federal agencies to help resolve shared challenges. Partners begin with the understanding that solutions must respect each partner's mission. The result is that partner teams often solve challenges faster, saving time and money.

For more information, contact [REEO@USACE.Army.mil](mailto:REEO@USACE.Army.mil).



# Corps volunteers aid search, rescue operations

By Dr. Michael D. Izard-Carroll  
USACE, Buffalo District

In the wake of a disaster, emergency response officials arrive on the scene to perform dangerous and risky rescue operations. Organizations such as the Federal Emergency Management Agency are commonly associated with disaster events but other entities help in these efforts as well. The U.S. Army Corps of Engineers is one such auxiliary agency.

Volunteers from across the Corps enterprise belong to a cadre of structures specialists who provide technical expertise in the area of structural engineering. The deployment of these specialists is imperative in disaster situations in which disaster victims may be trapped in collapsed buildings. Because of the tremendous risk to life and limb involved in post-disaster rescue operations, mitigating the potential for additional lives lost is one of the primary goals of the Corps volunteers. The team works in concert with other disaster response organizations in a coordinated effort to save as many individuals as possible.

Dustin Tellinghuisen, district engineer, USACE Buffalo District, recalled his deployment to Haiti in the aftermath of a major earthquake in 2010.

“Being there to help reduce lives lost in the rescue effort is why I’m there. It’s really important to ensure that rescuers can do their job safely and that is what we are there to help with,” Tellinghuisen said.

He was deployed to Port-au-Prince, Haiti, and assisted rescuers locating victims in the Hotel Montana. The Corps of Engineers team worked closely with international rescue workers from countries such as France,



*The U.S. Army Corps of Engineers boasts approximately 30 volunteers in the Urban Search & Rescue program, five within the Buffalo District. The program involves hundreds of hours of online, classroom and field training, including intense field training in the analysis of collapsed buildings in life-size simulations.*

Mexico and the Dominican Republic. While the Haiti deployment was a multi-agency operation, the Corps’ structural specialists may also deploy as a standalone unit.

Becoming a structures specialist involves a rigorous training program. Generally, volunteers are required to possess a professional engineer license to join the Urban Search and Rescue team and must have about five years of structural engineering or relevant construction experience. The program involves hundreds of hours of online, classroom and field training, including intense field training in the analysis of collapsed buildings in life-size simulations.

While the commitment of time for training is extensive, deployments are typically two weeks in duration.

“If a disaster happens, you have to be ready to travel to the site within six hours. The work day is often 12 hours, seven-days-a-week,” Tellinghuisen said. “For the first 72 hours, you’re on your own to find a place to sleep and secure transportation to the area. After that, FEMA coordinates where we stay and where we will be stationed.”

Adam Hamm, another Buffalo District engineer, has been a US&R volunteer since 2005. He volunteered because of the hands-on experience the program provided and the challenges of working in disaster sites.

No novice with respect to overseas challenges, Hamm was en route to Iraq when he too was asked to deploy to Haiti.

“Being part of US&R means serving my country in a time of disaster by using my knowledge in structural engineering to help save lives,” he said.

He encourages Corps members to volunteer because it diversifies and hones an engineer’s skills.

Disasters are unpredictable but the Corps of Engineers, Buffalo District US&R volunteers are always ready to take on a mission at a moment’s notice. The importance of these experts cannot be understated. Of approximately 30 US&R volunteers, five reside within the Buffalo District. The team consists of Dustin Tellinghuisen, Adam Hamm, Shanon Chader, Michael Baker and Robert Remmers.

For more information on becoming a structures specialist, visit [DisasterEngineer.org](http://DisasterEngineer.org).



# Survey collaboration helps Corps update FEMA flood risk maps

**Story & photos by Sarah Gross**  
*USACE, Baltimore District*

Matthew Elsasser picked up what looked like a futuristic yellow sled and dipped it up and down in a slow rhythmic dance while making two full rotations.

“I’m mimicking the pitch and roll of the water to calibrate our equipment,” said Elsasser, environmental technician with the Susquehanna River Basin Commission. “My movement is based on the current conditions of the water. The choppy the water is, the more I move.”

This tool is actually a small boat that carries an Acoustic Doppler Profiler, which uses a sonar beam to

technical specialist for floodplain management and Baltimore District environmental protection specialist. “An almost 500-year flood completely annihilated Hershey, Pennsylvania, and the surrounding area during Tropical Storm Lee in 2011.”

To complete the Swatara Creek portion of the study, the Corps is conducting on-land surveys while the commission is taking on the in-channel survey work.

“The river is so big, and we needed a boat and this specialized equipment to augment our capabilities,” said Thomas. “Luckily, the commission was able to help, and we were able to figure out a way to provide funding to them, which will only open the door for future collaboration.”

The Corps is documenting surface elevations and bridge dimensions for about 60 bridges along the Swatara Creek to determine potential flow restrictions and to conduct modeling that simulates the extent and depth of potential flooding. This survey work is crucial because bridges constrict water movement and create potential bottlenecks for water to flow freely during flooding.

The Corps was on hand for the commission’s first day in the field to provide operational support and to nail down shared project expectations.

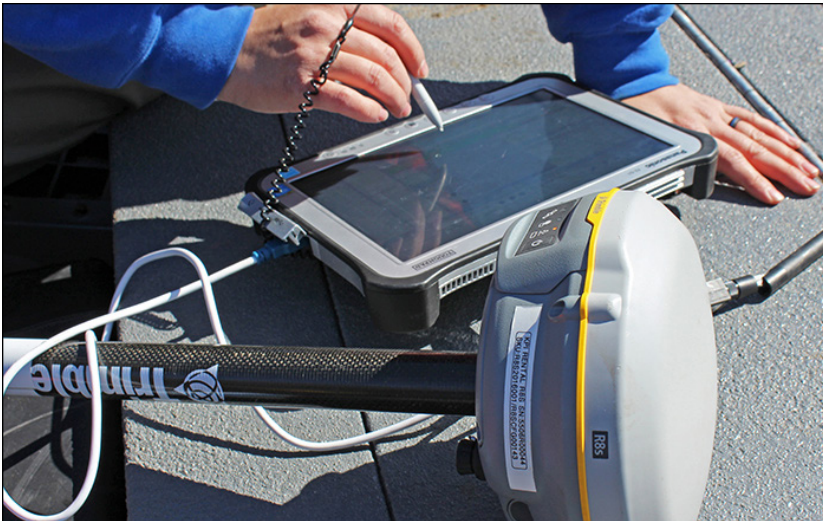
The Corps team provided the commission with ideal data collection points from within the creek. These locations are between bridges, so as to not duplicate data the Corps is collecting. The commission will collect depth data from the ADP per river mile in Swatara Creek, as well as one corresponding elevation reading along the bank per river mile using supplemental Real Time Kinematic equipment.

The Corps will compile the on-land and in-channel survey data to determine potential flood extents and depths and delineate the floodplain and regulatory floodway boundaries in the watershed under various flood events.

To perform the first channel survey, Elsasser tied a rope anchored atop the survey boat to the calibrated tool, dropped it in the water and guided it back and forth six times across the width of the channel. The depth data was then logged within the ADP collection software and averaged to obtain a more accurate number.

“Multiple crosses allow interpolation between the bottom elevations collected,” said Kimberly Dagen, environmental scientist with the commission. “This process helps smooth the data out to ensure a representative cross section of the channel is obtained.”

**See Survey, page 17**



*USACE, Baltimore District, technical specialists use the Acoustic Doppler Profiler to measure the depth and current of various waterways.*

measure the ground’s depth from the water surface.

This is the commission’s first day on Swatara Creek, a tributary of the Susquehanna River in east central Pennsylvania, for a collaborative project with the U.S. Army Corps of Engineers, Baltimore District, to update the Federal Emergency Management Agency Region III flood risk maps.

These maps will help surrounding communities better understand the flood risk and what appropriate actions they should take to help lower that risk.

While the Baltimore District will coordinate surveying other waterways within the Mid-Atlantic region as part of a larger project for FEMA, the Swatara Creek study accounts for about 40 percent of the total project.

“Swatara Creek is a high priority for FEMA,” said Craig Thomas, North Atlantic Division regional



# Survey continued from page 16

At the end of the first run, the team had collected data for one river mile along Swatara Creek by lunchtime — leaving 51 more to go.

The Swatara Creek study is anticipated to wrap up in summer 2017, at which time data from the Corps and the commission will be turned over to FEMA.

“We should get great modeling results from all of our data,” Thomas said. “We have a lot of historical data and high water marks, including data from Lee, to compare our current modeling to.”

This isn't the first time the Corps has partnered with the commission.

“This effort represents an extension of a long-standing partnership the commission has with the Baltimore District to provide flood-hazard reduction strategies to communities in the Susquehanna River Basin, including flood inundation mapping, enhanced flood warning tools, and flood-damage reduction studies,” said Benjamin Pratt, P.E., CFM, water resources engineer, Susquehanna River Basin Commission.

The commission is funding work for the Corps to conduct a Floodplain Management Services study for the Chiques Creek, also a tributary of the Susquehanna River in Lancaster County, as part of an effort funded by the Pennsylvania Department of Environmental Protection to evaluate “green” flood-hazard reduction strategies.

“We have a great collaboration with the commission,” said Thomas. “They recognized our expertise in hydrologic and hydraulic modeling and mapping, and we performed all of the in-channel survey work for the Chiques study.”

Though not a flood risk management study, the Corps has also worked with the commission to study stream flow at Bald Eagle Creek, which is a part of Foster Joseph Sayers Reservoir, to evaluate the modification of reservoir operations to provide environmental enhancements.

“We have this specialized equipment for channel surveys, and we are always looking for more ways to use it,” Pratt said. “This particular collaboration on the Swatara Creek study started with a conversation between Craig and me while working on the Chiques Creek study. The opportunity just presented itself.”



*Karl Kerr, geographer, USACE, Baltimore District, provides instructions on how to use Real Time Kinematic equipment to Benjamin Pratt, water resources engineer, Susquehanna River Basin Commission.*





(Photos by Jeff Harwk)

USACE, Pittsburgh District, is partnering with the town of Worthington to reclaim an eroded bank along a 1,400-foot stretch of the West Fork River. The more than \$880,000 project is designed to protect a sanitary sewer line that runs along the riverbank. The project included installing R5 riprap at the toe and R3 riprap on the bank to help stop the erosion and protect the sewer line.

## Corps studies aging infrastructure impacts on water quality

By Carl Nim  
USACE, Pittsburgh District

Crumbling concrete, equipment repairs and restrictions on the movement of goods and services are all too familiar for Army Corps of Engineers employees who deal with the challenges of aging infrastructure on a daily basis.

What may be lesser known is the impact of aging infrastructure on water quality in the Pittsburgh District. Like many large cities that built sewage systems in the late 1800s and early 1900s, Pittsburgh built sewer systems that combined sewage and surface runoff.

During periods of high rainfall, the sewage pipes are inundated with surface water and overflow into local bodies of water. These discharges are called combined sewer overflows. In addition to CSOs, many of the sewer lines that run from Pittsburgh houses, built nearly 100 years ago, used clay pipe that broke or crumbled after years of use and may or

may not carry all of the sewage to where it is supposed to go.

As a result of these two pathways, during high rainfall events, a measurable amount of pollutants — nutrients being one of them — is transported via surface and groundwater to Pittsburgh's rivers.

Recently the district's water quality unit joined efforts with Emily Elliott's lab at the University of Pittsburgh (<http://www.pitt.edu/~ce Elliott/index.html>), which is researching the sources and loads of nutrients to regional water bodies.

Using GPS technology, water-quality sonde measurements, flow cells, peristaltic pumps and an ultraviolet nitrate sensor, the Corps and experts from the university were able to map nitrate concentrations in the three rivers around Pittsburgh.

The survey was taken on just two days after about 2.5 inches of rain had poured over the region on Oct. 20-22, 2016, resulting in increased gage heights on both rivers and a CSO advisory from

Allegheny County Sanitary Authority.

The nitrate measurements provided interesting spatial trends. The Monongahela River had nitrate levels nearly double that of the Allegheny. Two factors support these findings: the increased population in the Monongahela River basin as compared to the Allegheny and the amount of CSOs that drain into both rivers' main stems, 245 and 149 respectively.

The Elliott lab also collected water samples for nitrate isotope analysis, which allows the researcher to pinpoint the source of the nutrient, e.g. fertilizer, animal waste or atmospheric in the case of nitrate.

In low concentrations, nitrate is not problematic and is necessary for primary production. However, with the increased amounts found in the Monongahela River, the survey indicated the pathways by which nitrate may be carried into waterways.

**See Waterways, page 19**





*Matt McKissick, project engineer, and Bob Tramontina, construction control representative, oversee the more than \$880,000 shoreline reclamation project.*

## Waterways

continued from page 18

This is especially important in light of the large algae bloom that occurred on the Ohio River in the summer of 2015 because it identifies the nutrient sources and pathways by which these algae blooms are supported. In addition, it highlights the need for renovating the existing sewer infrastructure of Pittsburgh and the beneficial contributions of “green infrastructure” that take up nutrients and slow or reduce the flow of surface water to waterways.

There are still many questions about nutrient pollution, algae blooms and the processes by which they are supported. However, with additional studies like this, those monitoring water quality on local rivers are able to understand a little more.



*Bob Tramontina, construction control representative, Pittsburgh District, talks with a riprap dunk-truck driver working to protect a sanitary sewer line that runs along the West Fork River bank.*





# Corps protects town's sanitary system

By Carol E. Vernon  
*USACE, Pittsburgh District*

Although stream bank erosion is a natural process over time, the result can be problematic.

In the town of Worthington, West Virginia, an eroding river could result in changes to the water flow rates, but more importantly, it could possibly cause exposure of a vacuum sanitary sewer line.

The U.S. Army Corps of Engineers, Pittsburgh District, is partnering with Worthington to reclaim an eroded bank along a 1,400-foot stretch of the West Fork River. The more than \$880,000 project is designed to protect a sanitary sewer line that runs along the riverbank. The project is being funded in a 35-65 percent split between Worthington and the district.

"The work entails basically clearing and grubbing the entire bank, installing a geo-textile layer down, putting riprap down at the toe and the bank, and laying some top soil and seed," said Matt McKissick, project engineer, Pittsburgh District.

In addition to the physical work, the team has to consider the environmental aspect of the project.

"Excessive erosion leads to loss of vegetation, woodlands or wetland; it can also cause a loss of topsoil and habitat, which then pollutes receiving waters and

degrades in-streams habitat and aquatic life," said Rosemary Reilly, biologist, USACE, Pittsburgh District.

According to McKissick, a major environmental concern is minimizing the amount of sediment entering the river. He said the crew installed turbidity curtains to any of the areas where the earth is being disturbed to ensure it stays out of the river. Other sediment control measures include erosion control blankets and catch basin inserts.

Additionally, the in-stream work had to be completed before the fish spawning season, which started around April 1.

Bob Tramontina, construction control representative, Pittsburgh District, said although the West Fork River is smooth flowing, its levels can vary quite a bit.

"The river can change pretty quickly," Tramontina said. "From day-to-day, they might get 6 to 8 feet difference in water elevation."

Because of the river's dynamics, workers have to remain cognizant of the changing levels and be ready to react, sometimes quickly. Even with the safety challenges, he says the project has been going smoothly.

"Everyone is looking out for each other. We're keeping the roads clean, the workers are watching for the neighbors, watching the environment; I really think we have a good project going here," Tramontina said.

*Photo by Jeff Hawk*



# Study adapts to new coastal flooding reality

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

A hurricane passes directly over New York City. In just one hour, the harbor rises 13 feet and floods over wharves, causing rivers on each side of the island city to converge.

New York residents might assume this was Hurricane Sandy that devastated the region just a few years ago. It's actually the Great Hurricane of 1821.

"This is not the first time the region faced a hurricane the size and strength of Sandy, and it goes to show that another Hurricane Sandy could occur in the future," said Bryce Wisemiller, project manager, U.S. Army Corps of Engineers, New York District.

He said coastal storms like Sandy aren't new, but what is are the stakes. Today, we have more development and people living on our coast. We also face an unpredictable climate change and sea level rise that could further compound coastal flooding.

Wisemiller is project manager on what could possibly be one of the largest studies ever undertaken by the Corps to look at ways to safeguard communities in the New York and New Jersey metropolitan region from future hurricanes.

A multi-agency team will work with communities to recommend a combination of risk reduction measures to enable adaptation to an unpredictable future. Those on the team express that what will also be required is an adaptable mindset.

The study is entitled the New York and New Jersey Harbor and Tributaries Focus Area Feasibility Study.

It is an offshoot of a comprehensive study that was performed by the Corps of Engineers right after Hurricane Sandy that identified risks and vulnerabilities along the North Atlantic Coast from Maine to Virginia.

"From this comprehensive study, several regions were identified for further study including the big sleeping elephant in the room that was basically ground zero for Hurricane Sandy – the New York and New Jersey Harbor and tributaries area," said Joseph Vietri, who headed the comprehensive study and

who is the director of Coastal Storm Risk Management National Center of Expertise, North Atlantic Division, USACE.

Wisemiller said, "An additional study will be done in this region of approximately 16 million people because it was one of the hardest hit areas during Hurricane Sandy. Not only that, the region

## ***Each community can help guide the plan that will most adequately benefit them and what they value.***

is also apt to still have those same risks going into the future. Even though there are a number of projects and studies on the way."

The Corps will work with many agencies on this study from New York and New Jersey including the New York State Department of Environmental Conservation, New Jersey Department of Environmental Protection and the New York City Office of Recovery and Resiliency.

### **Will work be done in my community?**

"The geographic scale of this study is vast," said Olivia Cackler, lead planner for the study and coastal section chief, USACE, New York District.

"Typically our studies focus on a municipality or a watershed; this one encompasses many watersheds and 900 miles of coastline in New York and New Jersey with the New York and New Jersey Harbor as the focal point."

This will include communities in New York including the South Shore of Staten Island, Jamaica Bay, Rockaway Peninsula and Western Long Island Sound.

Communities in New Jersey including the Raritan to Sandy Hook shoreline, Arthur Kill, the Kill Van Kull, Newark Bay, and the Passaic and Hackensack rivers will also be studied, as well as the harbor area including the Upper Bay of the New York Harbor, the Hudson River, East River and Harlem River.

Wisemiller added that more communities may be added as the study progresses.

### **What risk reduction measures are going to be constructed?**

Vietri said each community can help guide the plan that will most adequately benefit them and what they value.

A full range of risk reduction measures is going to be offered to communities, including structural, nonstructural, and natural and nature-based features.

Cackler said the structural measures are designed to reduce the frequency and intensity of flooding. These measures can include putting up a floodwall, levee, beach fill, dune or an offshore barrier.

Nonstructural measures focus on reducing the amount of damages without addressing the flooding. This can include such things as elevating or buying out a house, wet or dry flood proofing, evacuations and zoning changes.

Natural and nature-based features try to reproduce natural defense mechanisms. This can include creating marsh islands and wetlands, aquatic restoration and placing sand on beaches.

Communities can assess these measures and alternatives and make decisions based on what they value. Vietri said, "You have communities that value natural and nature-based features a lot more than structural alternatives. They can increase what they see as important and downplay what they value less. To say that everything should be the same is totally not correct."

Cackler agreed that a one-size-fits-all approach doesn't work.

"We have a very diverse study area in terms of topography and land use," she said. "Using a combination of risk management measures allows us to tailor our approach by using the most appropriate measures for that community."

By having a wide range of alternatives, communities can also compare various levels of protection.

"We want them to compare doing a breakwater versus a wetland. Both do two different things. Yet both working together provide even something much more different," Vietri said. "We want them to not just engage and review the alternatives in the study, but to help advise the Army Corps, and to me this is a pretty significant change in how we resolve these problems."

**See Flooding, page 22**



# Flooding continued from page 21

Before communities weigh in on what blend of measures they want, the Corps of Engineers performs a cost-benefit ratio.

Wisemiller said this ratio must show that the benefits of the project outweigh the costs. The plan with the most net economic and environmental benefits to the nation becomes apparent through this process.

“There are benefits and risks with all combinations of coastal risk management measures,” said Wisemiller. “The study will look to evaluate and weigh the different approaches with the full involvement and input from the regional stakeholders and the public.”

## Did you learn anything from Hurricane Sandy that will be part of this study?

“Yes and you’ll see it in everything we do for generations to come,” said Vietri. “When you have something like Sandy that cleans the slate, you have an opportunity to do something in a different and smarter way.”

He added that projects in place now are already benefiting from what was learned from Hurricane Sandy.

Wisemiller agreed, “Hurricane Sandy illustrated, all too well, the risks that this area faces from coastal storms, both in terms of property loss as well as the unfortunate loss of life.”

“Places that people thought they could go to get out of the high water turned out not so much,” Vietri added. Hurricane Sandy upturned a lot of what we thought was the floodplain. Because of it, the team will take a relook at the scale and scope of the floodplain that could lead to improved hurricane evacuation planning, mapping of evacuation routes and shelter in place locations.

Sandy also confirmed that some existing measures are already working.

“It was discovered after Sandy, areas that had an Army Corps project in place, such as beach fill or levees, fared a lot better than areas that did not have a project. Even when there was some flooding, it was substantially reduced from what would have happened without the project in place,” Cackler said.

“There are places in New Jersey where there were healthy beach and dune systems. After Sandy, the people in these areas had minimal damages,” Vietri said. “Literally, 200 yards down the beach where there was no project there was complete devastation. Houses and roads gone.”

## Will this study factor in possible climate change and sea level rise over the next 50 years?

“Whatever you think is the cause of climate change, the fact is the seas are

rising. And we are going to have to take it into account in our future plans,” Vietri said.

He added that it’s predicted that future sea levels could rise anywhere between one to six feet over the next 100 years. “That’s a pretty big envelope in which you’re trying to plan a design,” said Vietri.

“How we deal with planning uncertainty is with resilient adaptation,” Cackler said. This allows us to adapt to the changing conditions as we see them in real time.

“There are three sea level rise scenarios that we have to consider when we look at our risk reduction measures. For example, let’s say we assume that there is going to be low or moderate rate of sea level rise and we design a seawall to hold up to this,” she said. “Years go by and we actually see a high rate of sea level rise. If we keep in mind resilient adaptation, we can construct the seawall with a larger base so that it would be possible to add to its height instead of having to build a new, larger seawall.”

Vietri said that many people ask him why the Corps doesn’t just construct measures to cover the highest sea level rise scenario so that it will cover everything.

**See Flooding, page 23**



*As illustrated in this video, the U.S. Army Engineer Research and Development Center offers solutions to some of the nation’s environmental issues through workshop field instruction, harvesting of native plants and providing erosion control demonstrations.*



# Flooding continued from page 22

He tells them it's counter intuitive. "If you go with the bigger plan that means you're assuming more damages. This also means your environmental footprint will be larger and your environmental impact greater," said Vietri. "For example, instead of needing 100 yards of sand to replenish a beach, you might need a thousand. Bigger impact to the environment."

## Are we actually going to see something happen from this study?

Cackler said there is definite interest to get this study started.

"This study is so important that multiple staffs from New York, New Jersey and the U.S. government worked tirelessly to execute the agreement to start the study," she said.

Vietri agreed. He said funding is coming at a faster rate to do these studies even in this era of tight funding.

Vietri believes for the study to be successful, everyone has the responsibility to look at these changing conditions and to make better decisions.

He said this requires an adaptive mindset and he is happy to say that he is seeing it.

An example of this is that he is seeing more agencies get

tougher on developers who want to build in flood zones.

"I haven't seen this in my 30-year career with the Army Corps," said Vietri.

He said he also sees this changed mindset in himself and in his colleagues. Like many in the Corps of Engineers, he worked on several critical missions for the agency, such as Hurricane Sandy.

"What gets me the most is the impact to people. The look on their faces and the helplessness. I'm also struck by their resiliency. It pushes you to try to do something bigger and better, to search for answers that would help to reduce or eliminate this human tragedy. If you think I'm passionate about it, I am. We have to be. Otherwise we will cease to exist as an organization," he said.

Wisemiller said the team will strive to complete the study as quickly as possible, without undercutting the quality or level of rigor in the analysis. He said studies typically take about three years, but that this study will need more time. The study is expected to result in a report of implementable solutions that will be presented to Congress.

## How can I get involved?

Wisemiller said they are seeking public participation throughout the entire study.

"The goal at the end of the day is not to have a controversial report that doesn't lead to anything productive and useful," he said. "We want something that not only informs the region of the risk

that exists now and will exist further into the future, but also to provide solutions that we can implement with them."

For more information about the New York and New Jersey Harbor and Tributaries Focus Area Feasibility Study and upcoming community meetings, email [CENAN-PA@usace.army.mil](mailto:CENAN-PA@usace.army.mil).

## The Complete RCRA Course offered in FY2018

Looking for something new and challenging to sign up for when planning your fiscal 2018 training?

If so, then consider this. There is a new course being offered under the PROSPECT Program called, **The Complete Resource Conservation and Recovery Act Course**. This is intended to be a comprehensive course covering all aspects of hazardous waste management under RCRA and RCRA underground storage tank requirements too.

### Topics include:

- Making hazardous waste determinations
- Complying with generator standards
- Managing hazardous waste at treatment, storage and disposal facilities
- Determining if land disposal restrictions apply
- Determining treatment standards
- Applying for RCRA hazardous waste permits
- Managing recyclable materials under RCRA
- Conducting the RCRA corrective action process – RCRA Facility Assessments, RCRA Facility Investigations, Corrective Measure Studies, etc.
- Managing underground storage tanks under RCRA Subtitle I

The first offering of this PROSPECT course is scheduled to be held in San Diego, California, Aug. 7-9, 2018. The course control number is 226.

For more details, visit the USACE Learning Center's FY2018 Purple Book at <http://ulc.usace.army.mil/>.





# *Fast* & *FURIOUS!*

## Bike enthusiasts hit Warrior Creek trails

Story & photos  
by Hank Heusinkveld  
*USACE, Wilmington District*

More than 300 riders participated in the Six Hours of Warrior Creek mountain bike race on the grounds of the Wilmington District's W. Kerr Scott Dam and Reservoir in Wilkesboro, North Carolina, April 3.

Rated as "Epic" by the Boulder, Colorado-based International Mountain Bike Association, the trail system offers professional and experienced mountain bikers a challenging ride with breathtaking beauty.

"In the foothills of western North Carolina we've got some nice rolling hills and that just makes for some world-class mountain biking," said Scott Graham, ranger, W. Kerr Scott Dam. "Along with the topography you have the rolling hills, all kinds of natural obstacles like boulders, rocks, roots and trees all around. So you have a beautiful natural setting that really lends itself to some fun and exciting mountain biking."

Mountain bike enthusiasts like to use the term "flow" when describing a trail like Warrior Creek. There are numerous areas where they can meander down sloped grades with minimal effort, or huff and puff their way up steep inclines. The big draw of the Warrior Creek Trail is not only spectacular scenery, but a trail system that offers professionally built berms, hard packed trails and natural obstacles like strategically placed rocks.

**See Bikers, page 25**



# Bikers continued from page 24

Jim Horton of the Brushy Mountain Cyclist Club in Wilkesboro designed the trail. A mountain biker himself, he knows exactly what makes a good ride.

“When I’m building a trail I’m thinking about making a trail that’s fun for me to ride,” he explained. “It’s just lucky that everyone else enjoys the same thing so it works out well.”

Horton said professional and advanced riders keep returning to Warrior Creek because of the key ingredients that make up the trail. It tests their competitiveness through endurance, and more importantly their skills.

“We have some good examples of some of the more technical features for a rider to enjoy like a section called the Rock Garden. I like to give them a little bit of everything. We’ve got fun, flow, berms and a smooth, single-track trail that seems endless. And we’ve got certain small sections of the trail that zigzag like a roller coaster ride. They can also enjoy views of the lake and mountains around them.”

The partnership between the Corps of Engineers, the Brushy Mountain Cyclist Club and other volunteer groups have made excellent use of the public lands at W. Kerr Scott. Volunteers regularly

maintain the trail system and keep aesthetics in mind when they tend to it.

“That’s one of the things that the U.S. Army Corps of Engineers has really liked with the Brushy Mountain Cyclist

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## ***The partnership between the Corps of Engineers, the Brushy Mountain Cyclist Club and other volunteer groups have made excellent use of the public lands at W. Kerr Scott.***

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Club, the work that they’ve done, because sustainability and keeping the land ‘as is’ is very important to us,” said Graham. “And if you go on these trails a lot of times you will not even notice them because they blend in so well with the land itself. They’re like a natural part of the existing land. Another thing is sustainability. These trails are meant to weather all kinds of people riding them as well as impacts from the elements. So when we get a big thunderstorm, for example, the next day the trails have drained, have dried and

there’s no sedimentation in the water sources.”

Although W. Kerr Scott is gaining a reputation as a mountain bike mecca in western North Carolina, Corps of Engineers park rangers encourage the public to take advantage of other recreational opportunities.

“This is a great place for families. We’ve got camping, excellent fishing, boating opportunities, and of course the great mountain biking trails,” Graham said. “And one thing about our mountain bike trails, these are multi-purpose trails. So you can get out there on your bike, go take a hike, go bird watching. These trails are for everybody. You don’t have to have a mountain bike to come enjoy these trails.”

Graham said that applies to all of the trails at W. Kerr Scott.

Although the Warrior Creek Trail draws the bulk of attention because of its popularity with experienced mountain bike riders there are two other trails for novices.

“We have three trail systems with more than 30 miles of trails. You have the Dark Mountain trail system, the Overmountain Victory Trail, as well as the Warrior Creek trail system. If you ride these trails you will see the progression the Brushy Mountain Cyclist Club has made in their building skills. When you ride from one trail to the other you can see that their skill level has increased in the finesse of the trail, and the surrounding land becomes more apparent. The club is said to have milked it for everything its worth. They have been taking the land that is here and really just maximized the riding opportunities on them.”

Slow and steady or fast and furious is what the experienced or novice mountain biker can find on trails at W. Kerr Scott. And as long as the Warrior Creek course keeps providing a good adrenaline rush for those experienced riders, it will continue to keep its reputation as a world-class mountain bike destination.

For more information about the Warrior Creek trail system go to the following link: <https://www.imba.com/epics/kerr-scott>.



*Slow and steady or fast and furious, experienced or novice bikers will find trails at W. Kerr Scott engaging.*





## Soil sorting technology saves taxpayer money

By Figerald Garcia  
*USACE, St. Louis District*

The Formerly Utilized Sites Remedial Action Program executed by the St. Louis District has realized an 87 percent reduction in contaminated soil shipping and disposal, and associated costs at the Iowa Army Ammunition Plant over the past three years as a result of using a highly effective material sorting process.

The IAAAP is an active, government-owned, contractor-operated facility that occupies approximately 19,000 acres or approximately 30 square miles, in Des Moines County, Iowa. The facility is under the command of the U.S. Army Joint Munitions Command in Rock Island, Illinois.

Since 1941, the IAAAP has produced projectiles, mortar rounds, warheads, demolition charges and other munitions components as part of its load, assemble and pack operations. From 1947 to 1975, portions of the IAAAP facility were under the control of the Atomic Energy Commission for development of nuclear weapons and additional weapon-assembly operations on approximately 1,630 acres of the plant.

The FUSRAP is being used to 1) identify and remediate, or otherwise control, sites where residual radioactivity remains from AEC activities conducted in the past, and 2) to comply with the requirements under the Comprehensive Environmental Response, Compensation, and Liability Act.

The FUSRAP Operable Unit 8, completed in September 2011, outlines the remedial activities that will be undertaken at IAAAP to address contamination resulting from AEC activities. The OU8 ROD selected remedy includes excavation of depleted uranium-contaminated soil with physical treatment and off-site disposal, along with decontamination/replacement of structures.

The Remedial Design/Remedial Action Work Plan, completed in February 2013, outlines a comprehensive process that follows the governing CERCLA requirements for implementing the selected remedy in the OU8 ROD. A pilot study in 2013 determined whether the ScanSort<sup>SM</sup> system (a conveyor-assisted, automated soil surveying and sorting system) could effectively detect and isolate DU fragments from bulk soil while confidently satisfying the remediation goals.

**See Contaminated soil, page 27**





During the first shipping campaign at the Iowa Army Ammunition Plant, approximately 1,900 cubic yards of depleted uranium-contaminated soil were loaded onto railcars and shipped out of the installation.

## Contaminated soil continued from page 26

The pilot was a resounding success, and as of today, decontamination of structural surfaces and/or replacement of structural components, e.g., Building 1-11 floor grate and Building 1-63-6 air filters, have been completed, and excavation, processing/ sorting and disposal of reduced amounts of DU-contaminated soil continues.

The soil sorting method used at IAAAP is a conveyor-based system that accurately surveys, monitors and sorts material by segregating scanned material that is above remedial goals from material that is below RGs into two separate discharge stockpiles. Custom detectors, proprietary scanning spectroscopy software, a rapid reversing conveyor and customizable reporting software are unique to this technology. It provides all-weather scanning and sorting of wet or dry material, including soil, crushed stone and concrete, and slurry.

The following results have been

obtained to date at IAAAP: 26,218 cubic yards processed.

- *22,628 cubic yards below soil remedial goals and re-used or will be used as backfill*
- *3,505 cubic yards above soil RG*
- *Approximately 3,863 cubic yards have been shipped out to Utah for disposal/ storage, including an additional 6 inches in depth of scraped off soil under the stockpile area.*
- *87 percent recovery*

Benefits of this system include:

- *100 percent assay of material by lab-quality gamma spectroscopy*
- *Bulk sorting for disposal or re-use as clean backfill*
- *Faster processing*
- *Lower shipping and burial charges*
- *Reduced manpower requirements*

This 87 percent recovery is resulting in cost savings that more than offset the cost of the physical treatment. For example, one of the most costly elements of this remediation work is transportation and disposal. Approximately 26,218 cubic yards have been excavated and processed in the three previous construction field seasons. The current cost of T&D is \$229 per cubic yard or about \$6 million. Instead, because of the sorting and scanning process, approximately 3,863 cubic yards have been shipped as of October 2016 at a cost of \$885,000. That accounts for 85 percent cost savings on T&D only without the cost of hauling and backfilling clean soil needed to replace 26,218 cubic yards of material.

The technology being used is applicable specifically to DU contamination and comes highly recommended to other FUSRAP site managers as a proven technology that can save taxpayer money.



# Army Reserve reduces energy use

By Jonelle Kimbrough

*Army Reserve Sustainability Programs*

Energy touches nearly every aspect of the Army Reserve's mission, from the electricity that powers its centers to the fuel that powers its vehicles. To maintain readiness and adapt to a constantly evolving global presence, the Army Reserve strives to conserve energy and other vital assets.

In fiscal year 2016, the Army Reserve proved its commitment to that goal.

According to the USAR fiscal year 2016 Annual Energy Management Report, the Army Reserve achieved a 17.9 percent reduction in energy use intensity last year, compared to the fiscal year 2015 baseline. The reduction far exceeded a federal goal of a 2.5 percent annual reduction in energy use intensity.

"The Army Reserve is a leader in the Department of Defense's charge to save natural, fiscal and operational resources and to accomplish goals toward energy security," said Paul Wirt, chief of the Army Reserve Sustainability Programs Branch.

Nine of the 10 Army Reserve-funded installations, regional support commands and mission support commands reported a reduction in energy use intensity, and seven of those 10 sites reported reductions of at least 12 percent.

Furthermore, the enterprise's reduction in energy use intensity translated into a significant cost avoidance of \$6.7 million in fiscal year 2016 – a cost equivalent to staging nine Army Reserve training exercises.

"If we can conserve energy in our facilities, we can ensure that our resources are directed to our most critical missions," Wirt explained. "If we are reducing the energy consumption and cost for services such as lighting and heating, we can focus our efforts and attention on energy security and resilience for our facilities."

Diverse initiatives throughout the enterprise contributed to the Army Reserve's efforts to save energy, increase energy efficiency and reduce America's dependence on foreign fossil fuels.

For instance, the 99th RSC leveraged a portion of its Energy Savings Performance Contract to replace fluorescent lights with light emitting diodes at the Tech. Sgt. Vernon McGarity Army Reserve Center in Pennsylvania, where the improvements reduced energy consumption by 51 percent and conserved an estimated 184,000 kilowatt hours of energy.

The Army Reserve implemented solar projects at the 9th Mission Support Command, the 88th Regional Support Command and Fort McCoy, Wisconsin,

contributing to the generation of 46.3 million British thermal units of renewable energy in fiscal year 2016.

Fort Hunter Liggett, California, used heat pump technologies and other holistic energy recovery opportunities to increase the energy efficiency of four transient training enlisted barracks and push the installation toward Net Zero, when it will produce as much energy as it consumes.

In addition, the Army Reserve continued its endeavors to create an energy conscious culture among the Soldiers, civilians and families who are uniquely positioned to serve as stewards in the ranks of the Army as well as the ranks of their communities.

Wirt believes the successes will continue to charge the Army Reserve's energy program.

"Last year's achievements are remarkable," he said. "They are inspiring our installations, regional support commands and mission support command to be even more ambitious and to expect even more robust results over the coming year. The Army Reserve is taking action to protect our energy resources because an energy secure Army Reserve is a resilient Army Reserve that is increasingly capable of accomplishing our mission today and into the future."

## Army Reserve environmental adviser lauded, awarded 2016 FEMP award

*Army Reserve Installation Management Directorate*

The Federal Energy Management Program honored Christine Ploschke of the Army Reserve Installation Management Directorate with a 2016 Federal Energy and Water Management Award.

Ploschke is the ARIMD senior environmental adviser at Fort Belvoir, Virginia. The FEMP award lauded her achievements in contracting during her tenure as energy manager at the 99th Regional Support Command at Joint Base McGuire-Dix-Lakehurst, New Jersey.

Under her leadership, the 99th RSC secured \$5 million through Federal Prison Industries and UNICOR for

energy efficient lighting projects and \$2.3 million for energy conservation initiatives that are projected to save nearly \$200,000 every year. Ploschke and her team also implemented an Energy Savings Performance Contract, which will save an estimated \$57 million over a 21-year period and result in three Net Zero sites that will produce as much energy as they consume over the course of one year.

"I am honored and humbled to receive this award," she said. "It is one of the highlights of my career, especially because Katherine Hammack (former Assistant Secretary of the Army for Installations, Energy and the Environment) specifically mentioned me in her keynote speech (at the award presentation)."

Ploschke praised the entire energy team at the 99th for their invaluable support and collective efforts that garnered a Federal Energy and Water Management Award in 2016.

Since 2001, the awards have commended individuals and groups for their outstanding contributions to energy efficiency, water conservation and the use of advanced and renewable energy technologies. Other 2016 awardees included professionals from the Department of the Navy, Department of the Air Force, National Guard, National Parks Service and General Services Administration.

For more information about Army Reserve Sustainability Programs, visit <https://sustainableusar.com/>.





# Deforestation, urban encroachment threaten snake species' survival

Story & photos by  
Jonelle Kimbrough  
*Army Reserve Sustainability Programs*

Actor Nicolas Cage once quipped, "Every great story seems to begin with a snake."

At Fort Buchanan, Puerto Rico, the story of wildlife conservation begins with the island's boa.

The Caribbean Islands host some of the most biologically critical and diverse snakes on Earth. The Puerto Rican boa, also known as *Epicrates inornatus*, is important to the environment and natural heritage of Puerto Rico. However, the U.S. Fish and Wildlife Service has listed the snake as endangered since 1970.

Fortunately for the boa, the U.S. Army Reserve "has its six." Fort Buchanan – an Army Reserve-funded installation near San Juan – is leading the charge for its protection.

The boa is crucial in its habitat, the lush forests of limestone hills called mogotes. Adult snakes prey on pests such as rats and invasive reptiles such as green iguanas. Boas are a vital component of the food chains of island birds, including the Puerto Rican lizard cuckoo and red-tailed hawk.

As necessary as it is to the island's ecological balance, the boa is vulnerable to some formidable threats.

Introduced, non-native animals such as mongooses and other snakes are competing with the boa for habitat and food. In some cases, the interlopers are turning the snakes into meals.

Deforestation, urban encroachment and pollution have damaged the boa's environment. As an island species, habitat loss is especially troubling for the snake. Quite simply, they have no other place to go.

"Its limited geographical distribution

makes the Puerto Rican boa prone to local extinction by any change created by humans or natural causes," said Victor Rodriguez-Cruz, an environmental protection specialist with the Directorate of Public Works at Fort Buchanan.

Furthermore, poaching has contributed to the boa's decline. Hunters have coveted the snake for its meat and skin. As early as the 1700s, Puerto Rico exported the oil from the snake's fat as a major commodity.

The boa was hunted and killed due to the belief that snake oil provided relief for aching joints, Rodriguez-Cruz explained.

If the boa faced extinction, the biological diversity on Puerto Rico would be imperiled. Natural cycles would be disrupted and the environment would certainly suffer. Nevertheless, the people of Fort Buchanan are working to ensure a hopeful future for the snake.

**See Snakes, page 30**



# Snakes continued from page 29

Initiated in 2013 and guided by a memorandum of understanding with the USFWS, Fort Buchanan's comprehensive, ambitious boa program includes the management of both the species and the land on which it lives. The installation's DPW and its partner agencies are capturing, measuring, tagging and performing other monitoring activities that help wildlife biologists determine boa populations, activity patterns and habitat uses. They are also enhancing the boa's environment through reforestation and native plant restoration initiatives.

Innovative projects are driving boa conservation forward.

For instance, Fort Buchanan is investigating the use of an advanced technology called a passive integrated transponder tag to study the boa. A PIT tag for a boa is similar to a microchip for a dog. It is essentially a "barcode" for an individual animal that can provide biologists electronically transmitted information on snake growth, migration and survivorship.

Also, the Department of Defense Environmental Security Technology Certification Program recently issued a grant to the Army Corps of Engineers' Research and Development Center

Laboratory to examine "soft release" for snakes that require translocation at Fort Buchanan.

According to Rodriguez-Cruz, Puerto Rican boas have very cryptic habits. People rarely see them, but they occasionally venture into urban areas. Wildlife biologists must translocate these wayward snakes. With the soft release method, biologists capture boas in urban areas and move them to designated forests. There, the boas briefly live in man-made pens prior to their full release into the wild. Soft release allows the snakes to acclimate to the forests and thus raises their probabilities for survival.

Rodriguez-Cruz said that the ESTCP project has the potential to increase the effectiveness of capture and translocation efforts and to reduce snake-human encounters. The installation could also benefit financially since the ESTCP grant would cover all expenses associated with the soft release demonstration.

Outreach and awareness are essential components of Fort Buchanan's boa conservation program, too.

"By educating the public, we are eliminating a lot of misconceptions about snakes in general and especially the boa," said Rodriguez-Cruz. The installation is

identifying snake habitat with signage, encouraging its residents to report boa sightings and training contractors who work on the post on boa protection procedures – to name only a few of the efforts.

Committed to the protection of its largest indigenous snake, Fort Buchanan serves as an example of conservation to the Caribbean as well as to the entire Army Reserve and active Army, both of which play a critical role in the stewardship of our military's lands and the world's precious natural resources.

"What we do inside of the installation for Puerto Rican boa conservation, if deemed efficient, can be useful to the management of the snake outside of the installation," Rodriguez-Cruz said.

The environmentally essential Puerto Rican boa has managed to survive despite the forces that jeopardize its very existence. With the Army Reserve in its corner, the snake now has the chance to thrive, and its story will be great for generations to come.

Visit <https://sustainableusar.com/> for more information on Army Reserve environmental programs.

*(Contributing writers include Victor Rodriguez-Cruz and Eneilis Mulero Oliveras.)*

## Documents solidify Reserve's environmental commitment

By **Jonelle Kimbrough**

*Army Reserve Sustainability Programs*

Maj. Gen. Peter Lennon, deputy commanding general (support), U.S. Army Reserve, has signed the Army Reserve Environmental Quality Implementation Strategy and the Army Reserve Environmental Quality Policy.

The documents solidify the Army Reserve's commitment to environmental stewardship with four strategic goals: to conserve natural and cultural resources; to ensure compliance with environmental laws and regulations; to prevent pollution of land, air and water resources; and to strengthen an integrated environmental quality program foundation.

The strategy and policy also bolster command support of sustainability objectives that will ensure continued readiness. Furthermore, they encourage Soldiers, civilians and families at all levels

of the Army Reserve and its surrounding communities to foster a conservation-minded culture.

"The execution of these guiding documents will serve to strengthen the Army Reserve's ability to sustain the environmental quality of our land, air, water and natural and cultural resources, and therefore ensure the resiliency of our installations and facilities across the Army Reserve," said Paul Wirt, chief of the Army Reserve Sustainability Programs Branch, which is a part of the Army Reserve Installation Management Directorate.

All four of the Army Reserve sustainability programs – energy, water, solid waste and environmental quality – now have signed implementation strategies.

The Army Reserve relies on dependable energy, clean water, accessible land and viable air to fulfill its role as a capable and resilient defense force, as well as its role as a good neighbor.

"Sustainability enhances our readiness and resiliency for the mission and warfighters of today as well as the mission and warfighters of tomorrow," said Wirt. "Sustainability allows us to adapt to constantly evolving military objectives, maintain our relevance, allocate our resources efficiently and reduce our environmental impacts.

"Army Reserve leadership support for sustainability has been tremendous," he said. "Such support lends invaluable credibility to our programs and will further the Army Reserve's position as a pioneering leader in the Department of Defense. While there is still much to do going forward, our entire team is proud of the accomplishments we have achieved so far in establishing a solid foundation of culture change in the Army Reserve."

Visit <https://sustainableusar.com/> for more information about Army Reserve Sustainability Programs.





*Daniel Leavitt, herpetologist with the Arizona Game and Fish Department, attempts to capture the fringe-toed lizard.*

## Yuma wildlife biologists seek to conserve elusive Mojave lizard

**Story & photos by Mark Schauer**  
*Yuma Proving Ground, Arizona*

As a natural laboratory, U.S. Army Yuma Proving Ground, Arizona, has a vested interest in responsible stewardship of the land.

It is the busiest of the Army's six test centers in terms of direct labor hours and boasts the longest overland artillery range in the United States, yet a relatively small portion of the proving ground's vast ranges are subject to the impact of artillery projectiles.

YPG is located in one of the nation's most extreme desert climates, but is home to a huge diversity of wildlife, including Sonoran pronghorns, desert tortoises, wild burros and bighorn sheep.

Smaller creatures like 15 different species of lizards are also in abundance here, and one in particular, the Mojave fringe-toed lizard, is of particular interest to wildlife officials.

"The Mojave fringe-toed lizard is a part of YPG's Integrated Natural Resources Management Plan," explained Daniel Steward, YPG wildlife biologist.

"It's considered a species of greatest conservation need due to its special habitat requirements."

Other species of fringe-toed lizard not on YPG have faced major conservation concerns. This is in part because many

habitat specialist that the distribution of the lizards is naturally very, very fragmented. One remote dune system might be 30 miles away from the next."

Ranging in length from three to four inches, the fringe-toed lizard has a unique fourth toe on each foot. Their scales help provide traction on sandy ground, and a shovel-shaped snout makes them adept diggers. They primarily eat ants and other desert bugs, and wait for their prey to pass by before striking. Scales over their eyes, nostrils and ears protect them from sand, and an oscillated tan coloration heavily camouflages them against the desert floor.



*Mojave fringe-toed lizard*

other dune systems in the American West have faced threats from development, off-road vehicles and invasion by non-native plants. The few remote sand dunes at YPG, on the other hand, are far away from any populated areas and rarely traversed by people or equipment. This gives YPG an incredible opportunity for conservation.

"These lizards are specific to wind-blown sands," Steward said. "The challenging thing is that it is such a

limited to the dunes, and sand dunes are a very unique system for North America and deserts in general," said Daniel Leavitt, a herpetologist with the Arizona Game and Fish Department. "Some folks acknowledge that there is a great deal we don't understand about the world we live in, including what animals may have to offer. It's probably best to not allow these lizards to disappear."

**See Mojave lizard, page 32**





## Video News Releases

### Day at the lake makes for one special day

*John P. Kelly, public affairs specialist with USACE, Pittsburgh District, reports on the 45th Annual Special Recreation Day held at Youghiogheny Lake, May 12.*

*Co-hosted by the district and the Confluence Lions Club as well as members of the local and business community, the day offered children and adults with special needs an opportunity to enjoy bay rides, boating, games and fishing.* ▶



### Reclamation project revitalizes Ohio River wildlife refuge

*Jeff S. Hawk, public affairs officer with USACE, Pittsburgh District, reports on the reclamation project taking place at the Ohio River National Wildlife Refuge.*

*Teaming up with the U.S. Fish and Wildlife Service, the district reuses clean dredged material from navigation channels to reclaim Ohio River Islands for wildlife.* ◀

*(Videos by Dan Jones)*

## Mojave lizard continued from page 31

Steward recently hosted Leavitt for a study of the Mohave fringe-toed lizard population at YPG. The pair was particularly interested in seeing how the habitats had fared during the region's relatively rainy winter. One concern was the possible growth of an aggressive invasive weed called Sahara mustard, which crowds out native flora and sometimes grows more than a yard tall.

"We want to ensure the long-term viability of the fringe-toed lizard population," Steward said. "For example, if there are any ecological conditions that could harm that ecosystem, such as Sahara mustard and other invasive species, we may need to do weed control."

A look around the dunes, however,

showed nothing but native species like desert creosote, palo verde trees and ocotillo plants in radiant orange and green bloom.

"The plant life in the dune system is rich," explained Steward. "The great thing about dunes is that every drop of rain goes into the ground. You don't think of sand holding moisture, but it really does."

The business of tracking the creatures takes patience. It was a still, calm day and the otherwise pristine sands were pocked with the unique tracks of a variety of creatures, from sidewinders to field mice. The pair circled for long minutes in the growing heat, once catching sight of a lizard fleeing into a burrow hole. Finally, the pair found one sunning in the open. Leavitt approached with a small noose attached to

a long pole and lassoed the lizard.

After a brief visual inspection that showed him to be a healthy male, Leavitt released the creature onto the sand, whereupon it ran away leaving a miniature sand cloud behind. Afterward, the two inspected other sand dunes at different spots within YPG with similar results.

"It's a fascinating creature," Steward said. "Everybody's ultimate goal is to prevent the species from being placed on an endangered list, to conserve it on our own. This research gives us the information we need to be able to assess possible future impacts on this species and allows us to better support YPG's mission while ensuring conservation."