

The Corps

# Environment

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## Permits, planning lead to restoration

By Nancy Sticht  
Jacksonville District

Under the Clean Water Act of 1972, the U.S. Army Corps of Engineers is responsible for regulating dredge and fill activities in waters of the United States, including jurisdictional freshwater and tidal wetlands. Some minor activities, such as aquatic habitat restoration, boat ramp construction, agricultural activities and modifications to existing marinas may be authorized through a general permit, which may be issued on a nationwide or regional basis for projects that are substantially similar in nature and are anticipated to cause only minimal or no individual or cumulative impacts.

There are currently more than 50 Nationwide Permits available to authorize a variety of activities. Nationwide Permit (NWP) 27 specifically authorizes aquatic habitat restoration, establishment and enhancement activities, and it was this general permit, issued by Linda Elligott, project manager in the Jacksonville District Fort Myers Regulatory Office, that authorized a unique hydrologic and habitat restoration project in Charlotte County.

The Southwest Florida Water Management District (SWFWMD) Surface Water Improvement and Management (SWIM) Program and the Florida Department of Environmental Protection have partnered for the past decade to complete several habitat restoration projects on more than 4,000 acres of state-owned land within the Charlotte Harbor watershed. Two large-scale projects, the Alligator Creek Habitat Restoration Project and the Coral Creek Ecosystem Restoration Project, are currently under way, and are anticipated to provide a net benefit to regional aquatic resources and wildlife by restoring historic hydroperiods and overland sheetflow, improving water quality, enhancing shallow water habitat for the endangered Wood Stork, and providing an overall improvement to essential fish habitat in estuarine waters.

The SWIM program has partially or fully funded more than 40 research and restoration projects in the Charlotte Harbor watershed, leading to

nearly 1,100 restored acres.

The Coral Creek Ecosystem Restoration project consists of hydrologic and habitat restoration of approximately 2,600 acres of degraded and impacted wetlands on the Cape Haze peninsula. It is expected to provide water quality polishing for stormwater flows entering the project area from a nearby subdivision. Construction on Phase I, encompassing about 250 acres, began in May and six additional phases are conceptually designed.

The Alligator Creek Habitat Restoration Project design is now in Phase III, with a goal to restore approximately 90 acres of wetland and salt-tern area that had been historically impacted by human activities such as ditching for agriculture and drainage/mosquito control.

Once Phase III is completed, 12 individual projects will have been implemented within the 1,600 acre site. Future phases for this project have not yet been planned.

The filter marsh was completed in May, and Wood Storks and Roseate

Spoonbills already have been observed feeding in the marsh as it was pumped down, said Stephanie Powers, staff environmental scientist with SWFWMD's SWIM program. "Spoonbills were not generally detected in this area until construction began, and we anticipate continued use of the marsh by both of these wading bird species when the project has been completed."

Restoration monitoring designs are being developed by a cooperative partnership, including the Charlotte Harbor National Estuary Program, SWFWMD and the Corps, to assess the effects of the hydrologic restoration on ecological habitats, both in Coral Creek and in the receiving estuary, Gasparilla Sound.

"We have just solidified a monitoring plan for Alligator Creek that will be conducted in North and South Silcox Creeks, the discharge point of Project 16, which was constructed by the Corps. This creek system flows into Charlotte Harbor," Powers said.

"This is a great 'do-good' project story," Elligott said. "This project and the monitoring design will serve as a prototype for other similar restoration projects throughout the region."

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"This project and the monitoring design will serve as a prototype for other similar restoration projects throughout the region."  
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Linda Elligott  
Project Manager



Great White Egret (*Ardea alba*) foraging for food in a wetland at Wendell H. Ford Regional Training Center in Kentucky. (Photo by Jesse Helton)

## Protecting training lands

By Katie Newton  
Louisville District

The U.S. Army Corps of Engineers Louisville District has been working closely with the Kentucky Army National Guard at the Wendell H. Ford Regional Training Center in Muhlenberg County to identify and protect habitats of any endangered species found at the site.

The Kentucky Army National Guard requested support from the Louisville District to perform a Threatened and Endangered Species investigation of the center, where hundreds of National Guard Soldiers Train each year. It is the largest Army National Guard training facility in Kentucky and encompasses approximately 11,400 acres. Most of the training facility has been mined in the past; however the area still provides aquatic and terrestrial habitats for many state and federally protected species of plants and animals.

"They looked to us for the expertise to identify and conclusively determine whether threatened or endangered species are present on the site," said Glen Beckham, Louisville District project manager.

During the semi-annual Kentucky Tier 2 meeting, a meeting that allows the Army to meet face-to-face with its regulators, Beckham said he was asked to assist and quickly set up a meeting between the KYARNG and several leaders from the Louisville District to discuss the path forward.

USACE employees suited up, binoculars in hand, to take a closer look. Led by Ecologist Mike Turner, a four-person environmental team conducted multiple visits to the site between July and September 2012 to evaluate the property and gather data.

A Great Egret was observed by the team in wetland areas of

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*The first of three 275 kilowatt wind turbines is erected April 18 on Fort Buchanan, Puerto Rico. The turbines are part of a large, multi-project renewable energy/energy reduction and Net Zero Water effort. The U.S. Army Engineering and Support Center, Huntsville, awarded a \$34 million task order contract to Johnson Controls Government Systems, Milwaukee Wis., on Dec. 22, 2012, to install wind power generation, solar photovoltaic systems, water conservation measures, and other energy conservation measures at Fort Buchanan. (Photo by José L. López)*



## The Corps Environment

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Managing Editor  
**James Campbell**  
Editor

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



# Stewardship and success

## *Civil Works Operations and sustainability go hand in hand*

**By James R. Hannon Jr.**  
**Chief, Operations and**  
**Regulatory Division**  
*Headquarters USACE*

When I was asked to write this article, the only guidance I was given was to talk about "... things going on in the environment ..." from a Civil Works Operations perspective. When I stopped to think about it, I realized that Civil Works Operations is "... what is going on in the environment ..." when you look at the U.S. Army Corps of Engineers as an owner and operator of Civil Works projects, facilities and missions.

The success of every Civil Works Operations mission hinges on stewardship of the lands, waters and natural resources entrusted to us by our nation. We have a long and proud tradition of top-notch stewardship of the lands, waters and natural resources. Civil Works Operations team members are very close to the lands, waters and natural resources in their care, and they eagerly and expertly apply their diverse talents to advance the cause of stewardship as they do their jobs every day. Embracing our stewardship responsibilities is a key part of the culture of Civil Works Operations. Because of our team's incredible talent, whether we're operating a navigation lock and dam, a flood risk management dam, a hydropower dam or the facilities and activities that comprise our recreation and environmental stewardship missions, we will be successful in accomplishing the Civil Works Operations missions.

In today's challenging fiscal environment, all federal agencies are struggling to make ends meet and to successfully execute their

missions, and we're no exception. Civil Works Operations must continue to provide the navigation, flood risk management, hydropower, recreation and environmental stewardship services the public expects. And we must do so with smaller budgets and fewer team members and even higher expectations for performance — from the Administration, Congress and the American public.

### **Sustainability**

Meeting expectations in times like these requires change. Change requires learning new things and doing old things differently than we have in the past. Implementing the USACE Sustainability Program is a good example of how the Corps of Engineers in general, and Civil Works Operations in particular, is working to embrace change to make itself more capable and resilient in the face of fiscal challenges and global environmental challenges such as climate change.

A common element in both the fiscal and climate change challenges we face is uncertainty. We can't predict exactly what might happen to us, or when, or where. All we can do is prepare.

The investments Civil Works Operations is making today in energy, water and petroleum efficiency are preparing us to deal with mounting fiscal uncertainties. We are avoiding future costs by reducing our consumption while also contributing

to "climate change mitigation" by reducing the carbon footprint of our missions by making our facilities, vehicles and vessels more efficient. Gaining efficiencies takes an up-front investment in time and funding, and doing so in a cost-effective manner

means developing new, or expanding existing, energy and sustainability management capabilities. Civil Works Operations is tackling these challenges and implementing these changes in close coordination with the Environmental Community of Practice, Directorate of Military Programs, Directorate of Logistics, the U.S. Army Engineering and Support Center, Huntsville, and the U.S. Army Engineering Research and

Development Center (ERDC). By working together, we can effectively leverage the vast and diverse capabilities of the Corps of Engineers — both within and outside of Civil Works Operations.

Civil Works Operations also is working with our peers in Engineering and Construction and the Institute for Water Resources (IWR) to gain an understanding of how changing climate may impact our missions and facilities. As a first step, we are working with IWR to execute climate change vulnerability analyses at Civil Works Operations projects to identify possible future modifications of infrastructure and operating procedures that may be needed to enable us to accomplish our missions



**James R. Hannon Jr.**

through whatever future challenges climate change may present. We refer to this as "climate change adaptation." We are only now beginning to learn about it and how it may impact Civil Works Operations.

### **Environmental Stewardship**

"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise," said renowned conservationist Aldo Leopold.

That is exactly what our Environmental Stewardship program strives to accomplish on the almost 12 million acres of lands and waters administered by the Corps of Engineers. As a steward of public property, we have a responsibility and duty to ensure the resources entrusted to us are protected, used wisely and available for future generations. However, the task at hand is not easy. Spanning across 470 dam and reservoir projects, many in highly urbanized areas, protecting natural resources can be daunting. Within our footprint are 56,000 cultural resources sites, 270,000 acres of environmentally sensitive areas, 38,000 miles of boundary line and more than 100 different listed species of concern.

Stressors on natural resources include land use requests for economic development, an onslaught of aquatic and terrestrial invasive species and oil and gas exploration along with vandalism of archeological resources and timber theft.

The Corps of Engineers maintains more than 840,000 acres of mitigation lands and provides nearly 50 million hatchery fish annually to offset impacts of our authorized actions. Additionally, we spend nearly \$250 million a year on activities related to the Endangered Species Act to help protect and recover more than 500 species.

Annually, we expend approximately \$140 million on the treatment, control and management of invasive species. These costs are projected to escalate as species, such as zebra mussels, Asian carp, emerald ash borer, hydrilla and other established invasives continue to expand their range and newly introduced invasives impact our projects and military installations. An Invasive Species Leadership Team, supported by the recent creation of an Invasive Species Sub-Community of Practice under the Corps Environmental CoP is taking an active role in combating this problem. The sub-CoP's focus is to minimize the introduction and spread of invasive species, an ongoing process that involves developing and revising policies concerning invasive species, dissemination of information/best management practices, rapid response, providing educational information, web sites concerning the identification and control of invasive species and experts within the Corps of Engineers who have extensive experience and

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# ENVIROPOINTS

# Stewardship.....

*Continued from Page 3*

knowledge with specific invasive species. The goal is to protect Corps project/Army Installation missions and resources while reducing expenditures associated with invasive species control.

Under Civil Works transformation, new and existing environmental support costs are being more closely identified and moved to the appropriate business line as the cost of doing business. This process will better identify and align the environmental requirements of our major missions while maintaining an Environmental Stewardship program that supports our principles to sustain natural resources for future generations.

Being a wise steward requires a proactive approach. Working with many levels of different municipalities, government agencies and private entities, the Corps must ensure compliance of more than 34,000 real estate outgrant instruments with appropriate terms and conditions to protect the environment. Additionally there are another 68,000 shoreline management permits that require compliance inspections, renewal processes and corrective actions. To best manage all our activities, projects must keep their Master Plans updated. A Master Plan is a comprehensive document that outlines future development, provides land use classifications and describes resource protection objectives.

We recently updated and approved revised Master Planning regulations and pamphlets (ER/EP 1130-2-550 Chapter 3) in January to create more efficient ways to supplement or revise Master Plans resulting in time and cost savings. Current up-to-date plans help to ensure we manage land and water resources in the best possible manner to accomplish authorized project missions and respond to regional needs while protecting these resources for current and future generations.

Cultural Resources management and protection is another vital component of

our environmental portfolio. More than 47,000 cubic feet of archeological material has been removed from our projects. The Corps Mandatory Center of Expertise for Cultural Resources Management and Curation employs returning veterans to bring materials up to federal standards while providing them valuable experience and career training. In 2012, the Veteran's Curation Program graduated its 100th member.

Not to be forgotten is the role of our Recreation Program, originally established to provide safe, low impact access to our beautiful natural resources. By providing established and defined recreational facilities along with interpretive services and visitor assistance provided by our 2,000 park rangers, we are able to greatly reduce the negative impacts of unabated damage from vandalism, trash, illegal access and encroachments. As the leading federal provider of outdoor recreation, balancing recreation use with resource protection is a huge challenge for us as we host more than 370 million visitors each year on only 2 percent of all federal lands.

## **Regulatory**

When you ask the American public about the Corps of Engineers, one of the first things they will mention is the USACE regulatory and permitting program, closely followed by park rangers. That's because we are charged with issuing or denying permits for the discharge of dredged or fill material into the waters of the United States under Section 404 of the Clean Water Act.

Clarifying the reach of our CWA jurisdiction has been a very time consuming effort for our Regulatory Program team, working in conjunction with the U.S. Environmental Protection Agency. Through authority given under the CWA, we have improved our permit decision-making efficiency while ensuring protection of aquatic resources. Our 1,300 regulators, working in 38 district offices, review about 80,000 permit applications and issue more than 57,000 jurisdictional determinations



*Army Reserve Officer Training Corps Cadets from North Texas schools listen to Ken Steigman, director of the U.S. Army Corps of Engineers Lewisville Lake Environmental Learning Area, as he discusses current ecological research and restoration projects. Explaining environmental stewardship and sustainable practices to the public is a part of the overall Corps strategy. (Photo by Denisha Braxton)*

annually.

Much of our recent regulatory work has focused on consistency, transparency and predictability so the American people will know what to expect when applying for a permit. We have been working with our districts to ensure our training modules are robust and all our regulatory personnel have the latest and greatest information available. We've also been working with our interagency partners, such as EPA, Fish and Wildlife Service, the National Marine Fisheries Services, the Department of Transportation and others, to ensure our processes are transparent. We are developing tools with IWR to put in the hands of our regulators. In addition to handbooks and guidance on how to implement a watershed approach, we've been putting "meat to the bones" of our Cumulative Effects Assessment Tool to expand it for use beyond Appalachia, Puget Sound and the Gulf region.

Our focus continues to be on being as transparent as possible in our decision-making process across all our districts and ensuring that, other than some slight regional differences, the public will be able to pretty closely predict what our decisions will be. We have included a great deal of information about how our program works and how we make our decisions, as well as a series of videos, on our Regulatory Program website: [www.usace.army.mil/missions/civilworks/regulatoryprogramandpermits](http://www.usace.army.mil/missions/civilworks/regulatoryprogramandpermits)

As you can see, Civil Works Operations is "what is going on in the environment." Because of our organizational culture, the strong tradition of stewardship, the capabilities of Civil Works Operations and the wealth of talent throughout the Corps of Engineers, I am confident we will learn, adapt and ultimately succeed in overcoming the challenges we face today and envision in the future. **Essayons!**

# Guard .....

*Continued from Page 1*

the property on several occasions. The large white heron is listed by the Kentucky State Nature Preserves Commission as threatened and by the Kentucky Department of Fish and Wildlife Resources as endangered.

“Protecting the Great Egret as a part of Kentucky’s natural heritage also serves to protect at least three other endangered species that use the same habitat and are likely to be present on the training facility,” Turner said. “Protecting its habitat — wetlands — also provides recreational hunting and fishing opportunities for the trainees.”

Potential bat habitat also was located in several areas including habitat for the gray bat, which is a federally listed endangered species.

“Sink holes were found in an un-mined portion of the facility and are likely interconnected through wet cave passages, which could serve as bat habitat,” Turner said. “This habitat has been destroyed on almost all of the facility and the identified sink holes are the only opportunity to protect cave resources, including the bat and many other cave dwellers, on the facility.”

Based on these findings, the district completed a Threatened & Endangered Species (T&E) Management Plan in December, which provided detailed management recommendations for 11 species including nine birds, one snake and one bat that have been documented on the training facility. Conservation and habitat restoration recommendations were made for the other 55 listed species that could potentially be found on the facility. The T&E management plan is designed to recommend a number of species-specific investigations to conclusively determine whether threatened or endangered bats,

butterflies or other species are present on the site. “All of our recommendations take the KYARNG training mission into full consideration as the primary purpose of the facility,” Turner said.

That understanding helped forge a great working relationship between the two organizations.

“Working with USACE was like working with someone in our own office,” said Ricky French, natural resource manager.

“The group knew the mission, the roles to achieve the mission and the path forward to achieve those goals.”

The \$100,000 investigation included completing the field work and a threatened and endangered species management plan by the end of the year. “This was a substantial achievement on a very tight schedule,” Beckham said. “The project delivery team and our planning section have really provided outstanding service with minimal direction.”

“Kentucky National Guard is a great partner to work with and we really appreciate the opportunities we have received from them to work together,” Beckham said.

The process went so well that the KYARNG anticipates contracting with the Corps of Engineers to conduct a wetlands delineation survey. It is expected to start in late summer 2013, following approval and funding by the KYARNG.

“Previous wetland surveys of the facility are of questionable value as relates to wetlands regulated under the provisions of the Clean Water Act,” Turner said.

“The survey by Louisville District staff will correct this deficiency and allow the Kentucky Army National Guard to focus on areas needing protection and to train in areas that are not of such concern.”

# Volunteers aid environmental mission

**By Sheila Tunney**  
*Pittsburgh District*

It’s no wonder Youghiogheny Lake’s Natural Resource Specialist Suzanne Estock received the Take Pride in America’s Federal Land Manager Award in 2012. She has been involved in volunteer efforts beneficial to the Corps of Engineers and caring for public lands for more than 30 years. And her combined efforts with volunteer missions have resulted in more than 10,000 hours of service.

“This award is great for the ‘Yough,’ combined with the project of the year award they won last year,” said Southern Area Ranger Rick Miller who nominated Estock. “All of our people are doing some really great things, which can make it challenging to determine which person to nominate. Volunteer programs affect the whole project and the whole team.”

One of the programs involving volunteers and bolstered by Estock was getting data loggers installed on the lake’s nine main tributaries. The data loggers measure temperature, conductivity and flow into the Youghiogheny reservoir — one of the most pristine, mountain spring fed lakes in the Pittsburgh District.

She coordinated with the Mountain Watershed Association, which oversees the Youghiogheny RiverKeepers Program, in order to obtain the equipment and recruited volunteers to install it. The volunteers have been downloading data on a recurring basis since November 2011.

“We were concerned about the health of the lake because of increased development in this area of southwestern Pennsylvania. A stream monitoring program would allow us to get a pulse on river conditions. I got the idea that this might be something that would work,” Estock said.

She said her boss was immediately on board with the idea. She then contacted the



*Youghiogheny Natural Resource Specialist Suzanne Estock explains the signs of a successful wood duck hatch to volunteer Mike Thompson. (USACE photo)*

MWA and Pittsburgh District biologist Rose Reilly, who oversees water quality testing on the district’s 16 lakes. After that, Estock said, everything just fell into place.

Reilly, she said, was instrumental in getting more equipment and providing in-depth expertise on water quality monitoring.

“The Yough is the first lake in the district — possibly division or further — to have all of its tributaries monitored,” Miller said. “It’s a big deal!”

The monitors were central in determining the cause of a fish kill at the lake in September. Results of testing in the lake and from the data loggers on the tributaries confirmed the fish kill was not caused by a human source of pollution.

“We don’t have the personnel to achieve

our environmental mission without the help of volunteers,” Miller said.

Estock has been the project’s volunteer coordinator for the past seven years. Her efforts extend to other major volunteer events, including cleanup for National Public Lands Day, installation of wood duck boxes around the lake and the project’s annual Special Recreation Day, which has been held for the past 41 years.

“It’s one of the better parts of my job. It gets me out of the office more, and it’s nice to get to know people this way,” she said. “They come from all walks of life...former ministers, executives, homemakers...it runs the gamut.” Many of them, she said, are retired or near retirement age and are looking for ways to give back to society.

# Students explore wetlands with Corps regulators

Story and photos by Tracy Robillard  
Savannah District

What do you get when you combine 18 college students, seven federal regulators and a wetland? For students at Savannah State University, it was a chance to learn about the expertise needed to delineate and protect wetlands across the state of Georgia.

The students tested their abilities to identify wetlands during a field exercise hosted by the U.S. Army Corps of Engineers, Savannah District Regulatory Division, May 16.

Regulators with the Corps explained the Department of the Army permitting process and how to identify types of wetlands based on soil conditions, plant growth and the presence or absence of other determining factors.

The session was part of Savannah State's PRISM program — Proactive Recruitment for Introductory Science and Mathematics. Now in its fourth year, the program aims to increase the number of freshmen and sophomore students majoring in math and science disciplines at SSU and support them through graduation and to successful entry into graduate school or professional careers.

PRISM students receive academic scholarships to fund their education in science, technology, engineering and mathematics (STEM) career fields, said Dawn Howard, program coordinator.

The Corps has an ongoing partnership with the university to contribute to outreach and education activities in STEM fields of study. A member of the Corps Savannah District has served on the program's external advisory committee since it began four years ago, Howard said. The Corps also organizes a site visit every year during the summer portion of the program.

"It was an incredible success and allowed students to better understand and appreciate their own environment while offering an opportunity to learn more about the Corps," Howard said.

Quanasha Williams, a rising junior chemistry major, said she was surprised to learn the extent of the Corps' various missions.

"I knew they [the Corps] were military people, but I didn't know they did work with wetlands," she said. "It's cool. It's been really interesting."

Llor Robinson, a rising junior and computer engineering major, said he enjoyed learning about indentifying different types of soils and plants.

"It was interesting seeing this aspect of science compared to my studies in computer engineering," he said.

Savannah District manages permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for any projects affecting U.S. waters within the state of Georgia. The Corps is responsible for protecting aquatic resources and making permitting decisions.



**Above: Bill Rutlin (right), a regulatory specialist with the U.S. Army Corps of Engineers, helps students identify soils during a field exercise at Savannah State University. Right: Students gather in a wetlands area as regulatory specialists explain wetlands delineation and permitting.**

"When people ask what I do, I usually say I protect our nation's water; and they think of me in a Zodiac with a 50-caliber machine gun roving our waterways," said Forrest Vanderbilt, a regulatory specialist with the Corps who helped instruct the students.

While he might enjoy that analogy, Vanderbilt sums up his point more accurately. "Wetlands provide free functions and services to the public, such as nutrient cycling, fish and wildlife habitat, aesthetics and flood risk reduction," he said.

Vanderbilt is one of 36 members of the Corps' Savannah District regulatory team. Like many of his coworkers, he possesses a genuine love for the outdoors and an outgoing personality.

"We want to ensure that when development does occur on a public resource like a wetland, we can first avoid, then minimize the impact through appropriate planning, and compensate for the impact through proper mitigation through the permitting process," he said.

The Savannah District is designated as a Regional Center of Technical Expertise for natural resource mitigation banking in the southeast U.S.

The district assists federal, state and local agencies and governments with establishing mitigation programs, as well as facilitation, set-up and management discussions with the mitigation banking industry.



# Munitions cleared at former Camp site

By Tracy Robillard  
Savannah District

Earlier this year, the U.S. Army Corps of Engineers, Savannah District completed a two-year field effort to detect and safely remove 358 live munitions along a 72-acre stretch of power lines near Macon, Ga.

The power line corridor is part of a 14,160-acre tract of land that was once owned and operated by the Department of Defense for military training, known as Camp Wheeler.

"This was a significant amount of munitions to uncover, and they were all concentrated in one area, so it was definitely a challenge to detect and detonate them safely," said Chip Whitton, Savannah District project manager for former Camp Wheeler.

Camp Wheeler was initially established in 1917 as a temporary training camp for National Guard Soldiers, but it only served that role for two years before it was deactivated. Then 21 years later during World War II, the camp was re-activated and became a training hub for infantry Soldiers.

"It was used as an infantry replacement training center, where the new recruits received basic training and AIT (Advanced Individual Training) to replace Soldiers who had been killed or injured in combat," Whitton said.

At the height of its operations, Camp Wheeler had 17,000 trainees and 3,000 cadre, Whitton said. During training exercises, Soldiers fired an array of munitions — including small arms ammunition like rifle and pistol rounds, mortars and large projectiles. They also fired grenades, torpedoes, demolition charges and other explosives.

The ridge where the Georgia Transmission power lines are installed was once used as a firing range. Soldiers fired

weapons from lower ground toward the ridge. That's why so many munitions were concentrated along the power line corridor, Whitton said.

When Camp Wheeler was deactivated after the war in 1946 and transferred to private ownership, there were hundreds of undiscovered, unexploded munitions buried in the ground.

"At the time, DoD performed the best munitions removal it could with the existing technology before releasing the property," Whitton said. "But munitions have repeatedly been discovered in the area since it was turned over. That's when the Corps of Engineers became involved."

The Corps is responsible for managing and executing the Formerly Used Defense Sites (FUDS) program. Congress created the FUDS program in 1986 to provide a framework for environmental clean-up and munitions removal at sites that were once owned or operated by DoD, Whitton said.

The Corps' Savannah District oversees FUDS actions in seven Southeastern states, including Georgia. While Camp Wheeler is just one of many FUDS sites in the district, it's a big one. The Corps has been involved in clean-up projects at Camp Wheeler for decades. The power corridor project is one portion of a large, multi-faceted clean-up effort at Camp Wheeler, Whitton said. The Corps awarded the \$2.7 million contract to SES Construction and Fuel Services of Oak Ridge, Tenn., in 2011. In two years' time, the team safely detonated 358 60mm M49A2 munitions.

As part of this project, the team also investigated 10 acres of nearby farm land at the request of the property owner and uncovered one 105mm illumination round.

While the removal portion of the work is complete, the team still needs to complete a removal action report and conduct a public meeting to reveal the findings. The overall



Workers install wiring to detonate unexploded munitions discovered at the power corridor site on former Camp Wheeler. (USACE photo)

completion for the project is scheduled for the end of July.

"We used the best technology we have available to us to remove everything to the depth of detection," Whitton said.

The successful removal also allows Georgia Transmission to safely service

and upgrade its transmission line infrastructure — a project it has waited to initiate for several years due to the threat of unexploded ordnance, Whitton said.

"The power line corridor project was a huge success, but we've still got a lot of work to do at Camp Wheeler," Whitton said.

# Keeping track of Asian carp

By Sarah Gross  
Chicago District

What do positive Asian carp DNA samples mean, and where are the fish? The U.S. Army Corps of Engineers is teaming up with other members of the Asian Carp Regional Coordinating Committee to help answer this perplexing question.

“The ACRCC is committed to preventing these invasive fish from becoming established in the Great Lakes to include participating in extensive monitoring of the waterways and increasing the understanding of the link between DNA detection and presence of live fish using Asian carp environmental DNA surveillance programs,” said Great Lakes and Mississippi River Interbasin Study Program Manager Jack Drolet.

Asian carp environmental DNA (eDNA) analysis has been used since 2009 to help determine the presence of the fish in waters where the abundance is concluded to be low or zero by detecting the genetic material in water samples.

“Partnership is key in successful planning, research and implementation of a comprehensive aquatic nuisance species prevention plan,” said USACE eDNA Program Manager Kelly Baerwaldt.

USACE, U.S. Fish and Wildlife Service and U.S. Geological Survey are conducting a three-year Asian Carp Environmental DNA Calibration Study (ECALS) to improve the understanding and interpretation of eDNA results.

“Our goal is to make this relatively young and complex monitoring tool the most effective to detect live Asian carp and to provide real, tangible and empirical data to the resource managers, so they can make informed decisions, perhaps for response or other management efforts,” Baerwaldt said.

The majority of the ECALS work accomplished so far has focused on sources for Asian carp DNA to enter the Chicago Area Waterway System without, or in addition to, originating from a live, free-swimming bighead or silver carp.

“In the Chicago Area Waterway System, when results indicate positive detections for Asian carp eDNA, yet hundreds of hours of netting and electrofishing turn up no actual fish, we have the ecological and fiscal responsibility and duty to determine what the sources beyond a live fish could potentially be,” Baerwaldt said.

“We acknowledge that collecting positive detections for eDNA certainly could mean a live Asian carp, but as demonstrated through several lab and field studies, there are several other ways DNA can get into the water.”

Preliminary objective findings outlined in a recent peer-reviewed ECALS interim report are: storm sewers, fisheries sampling gear, fish-eating birds, dead fish carcasses, barges and sediments may contribute to a positive eDNA detection without a live fish being present; DNA can stay on these sources for a number of days; tagged-bird studies show large variations in bird movement, some more than 800 miles, and consumption of Asian carp in the wild, which may lead to positive detection of Asian carp eDNA in bird feces; shedding rates of DNA from Asian carp were not affected by different temperatures or flow rates of water and DNA from Asian carp sperm can be detected for two weeks after release from an Asian carp.

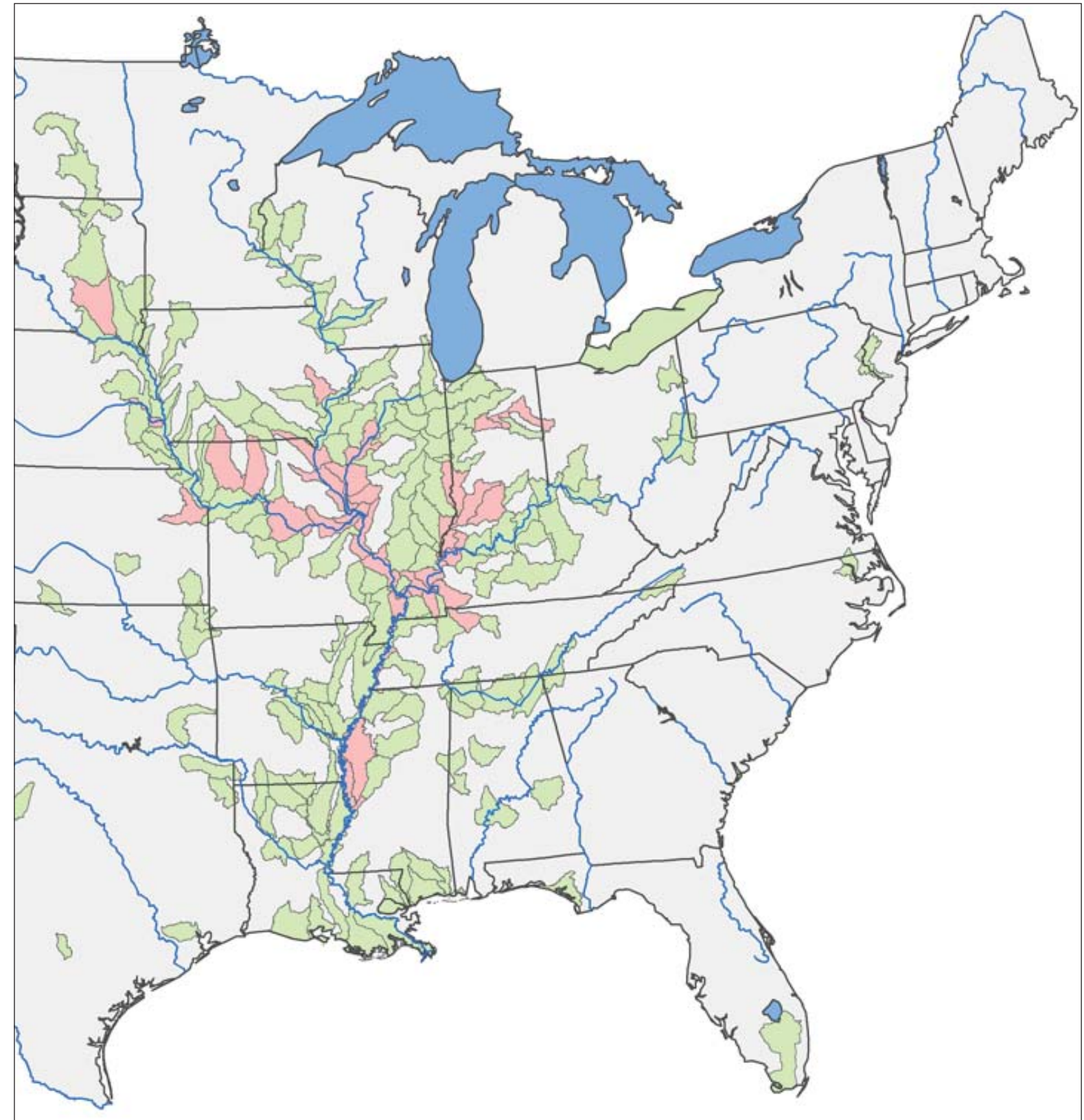
“At the end of next year, we plan to have a fully calibrated tool, along with the ability to quantify the likelihood of sources, including a live fish,” Baerwaldt said. “This will give managers the ability to use eDNA as one of the primary tools for assessing early detection of Asian carp, and the work we complete in ECALS can also be used in other species applications throughout the nation.”

Future ECALS work and interim reports will focus on increasing efficiency of the eDNA process and looking at how fish size, number, behavior and diet as well as water temperature influence eDNA loading or shedding by an Asian carp.

“The reason we put out these products in an interim fashion is so that we can use this data immediately in the field,” Baerwaldt said.

For example, based on preliminary conclusions from this study, the Illinois Department of Natural Resources is purchasing new nets to be used strictly above the Chicago Sanitary and Ship Canal electric barriers to minimize any contamination that may cause a positive eDNA detection in monitoring samples.

Since 2002, the Corps has been pulsing electricity through the man-made canal that connects the Illinois River with Lake Michigan to deter the inter-basin establishment of Asian carp and other aquatic invasive species.



Current data on the distribution of both bighead carp and silver carp in the Mississippi River, Ohio River and Great Lakes in North America, released by the U.S. Army Corps of Engineers, Illinois Department of Natural Resources and U.S. Geological Survey, April 26. Green indicates adult presence of at least one individual fish in each delineated watershed, while red indicates young-of-year capture locations or where eggs have been collected, indicating natural reproduction. (Illustration by USGS)

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# Carp.....

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**DNA seeps into water from a dead silver carp on a barge.** (Photo by Matthew Shanks)

“Great inter-agency strides have been taken in aquatic nuisance species prevention efforts and research, and we will continue to work diligently towards finding the best solutions,” Drolet said.

The Corps of Engineers, in consultation with other federal agencies, Native American tribes, state agencies, local governments and non-governmental organizations, also is conducting the massive Great Lakes and Mississippi River Interbasin Study to explore options and technologies that could be applied to prevent aquatic nuisance species transfer between the Great Lakes and Mississippi River basins through aquatic pathways, to include 18 intermittent potential pathways outside of the Chicago Area Waterway System. A report will be submitted to Congress in December that will present analyses of these controls.

“Though the Corps and its partners are taking the threat of Asian carp as very real, we also continue to weigh the threat of these invasive fish,” Baerwaldt said.

It is important to note that no bighead or silver carp were captured or observed above the barriers in both 2011 and 2012 after several interagency monitoring outings and hundreds of routine monitoring trips to include 192 hours of electrofishing and 81.7 miles of netting, which collected nearly 100,000 fish of 65 different species.



**Construction workers complete electrical connections on phase two of a solar microgrid project at Fort Hunter Liggett, Calif. Sacramento District managed construction of the project, awarding contracts of \$8.4 million for phase one and \$9.7 million for phase two.** (Photo by John Prettyman)

## Pilot site goes solar for net zero, sustainability

**By John Prettyman**  
*Sacramento District*

**A**rmy and sustainability — using those two words in the same sentence several years ago would have probably been considered the punch line to a joke. But today, a military base that is both environmentally friendly and meets the needs of war fighters, is quickly becoming a reality.

Fort Hunter Liggett — with nearly 162,000 acres of forest, mountains and rivers — is located in Monterey County, Calif., and is one of several U.S. Army pilot installations selected to be net zero energy and net zero waste by 2020. This means the installation will create as much energy as it uses, and reuse and recover all of its waste products.

“The net zero initiative is going to provide energy

security for this installation and it’s also a priority for the Army,” said Col. Donna Williams, garrison commander for Fort Hunter Liggett.

The U.S. Army Corps of Engineers is leading the way in managing construction on major energy projects at Fort Hunter Liggett and is nearing completion on the second phase of four solar microgrids.

“Phase one of the solar project was completed last year and it’s generating one megawatt of power. Phase two is going to add another one megawatt of power,” said Bob Roy, project engineer with the Corps’ Sacramento District.

One megawatt is enough energy to power up to 300 homes.

Phase two is expected to be completed in August, and like phase one, serves the dual purpose of providing a shaded carport for military vehicles as well.

“It’s not very complicated and is a very simple conversion system,” Roy said. “The panels absorb the sunlight energy; it gets transferred into an inverter system which immediately converts it to AC energy and generates the power.”

Energy independence at Fort Hunter Liggett has both an environmental and tactical advantage.

“Prior to the installation of these solar projects, we were susceptible to power outages quite frequently,” Roy said. “That interrupts the ability to train the troops indoors and outdoors.”

In addition to Fort Hunter Liggett, the Corps of Engineers has a key role in helping the U.S. military meet its energy goals across the nation. The Corps is working with the Army and Air Force to develop 3 gigawatts of renewable energy on installations by 2025, enough to power about 250,000 homes.

# Oyster habitat restoration gets results

By Hank Heusinkveld  
Wilmington District

In 2003, the Wilmington District made innovative use of generally undesirable silty dredged material by mixing it with sand to increase its workability and usefulness as a foundation for marsh and oyster restoration. The restoration project, located immediately north of the Wanchese Harbor in Wanchese, N.C., was constructed under the authority of Section 204 of the Water Resources Development Act of 1992 as amended. This method resulted in a successful project where one might not have otherwise been achieved. Using this procedure, the Wanchese Marsh Creation and Protection Project, North Carolina now protects 12 acres of valuable estuarine habitat.

According to the Wilmington District project biologist Chuck Wilson, the selective mixing of dredged materials allowed the site to be configured to significantly increase the shoreline length and topographic complexity.

"This allowed for the establishment of a diverse ecosystem ranging from subtidal oyster reef to high marsh species," he said. "This increased the project's ecological output compared to traditional construction methods."

After the sediments stabilized and marsh plantings became established, Wilson said the district completed the project this spring with the placement of 4,000 bushels of oyster shells purchased from a nearby shucking house and delivered to Wanchese, in four 18-wheeler loads. The shells were placed by the North Carolina Division of Marine Fisheries adjacent to the marsh, and will provide roughly 1/2 acre of new oyster reef habitat.

"Oysters are free-floating in their larval stage, but once they attach to a bottom they develop into small oysters called spat. In subsequent years the new spat attach to the existing adult oysters to form oyster reefs."

Wilson said that in most North Carolina oyster growing waters, the larvae are abundant. What is lacking, he said, are clean attachment surfaces. That's why shell placement early in the oyster spawning season is needed to establish new oyster reefs.

Oysters along coastal North Carolina have been declining for several years, Wilson said. Historic



Workers scatter oyster shells into the water May 14. The area was primed for future oyster reef habitat during the last several years. (Photo by Hank Heusinkveld)

overharvesting and water quality are the main culprits. Oysters are important not only as a food source, but they also improve water quality by filtering organic materials and provide fish habitat and refuge from predators. In addition, they break waves and help slow down erosion.

In North Carolina various federal and state agencies, and environmental groups are working with commercial fishermen and university scientists to find ways to increase the populations back to sustainable levels. They have assisted the North Carolina Division of Marine Fisheries in the establishment of Pamlico

Sound Oyster Sanctuary Program, constructing protected oyster reefs providing a reliable source of oyster larvae. This will help sustain natural oyster reefs in the region in spite of other stressors.

The Wanchese Marsh Creation and Protection Project is located only a few miles from the northernmost Pamlico Sound oyster sanctuary and will contribute to goals of the state sanctuary program.

"We believe that the Wanchese project, through consistent monitoring, will develop into suitable habitat for oysters," Wilson said. "We have to do everything possible to keep oysters in North Carolina waters."

## Capturing meter data

By James Campbell

U.S. Army Engineering and Support Center,  
Huntsville

The U.S. Army Corps of Engineers Meter Data Management System is helping Energy Managers keep tabs on resources and reduce waste as 74 gateways are being installed this year at Army installations.

The MDMS is an enterprise energy information system for the collection, analysis and display of energy data at the installation, regional and headquarters levels.

MDMS collects meter data about the consumption and production of electricity, gas, steam and water and allows that data to be analyzed and viewed, giving experts an opportunity to spot savings and fix problems much faster, said John Trudell, MDMS program manager at the U.S. Army Engineering and Support Center.

The MDMS gateways being shipped to Army installations this year are essentially a bridge between the installation's energy data reporting system and the top level enterprise-wide system the Army envisions, Trudell said.

"This system gives the energy manager a comprehensive display of their energy footprint using a web portal," he said.

The MDMS gateways, once installed, transmit the raw meter data to a system that runs sophisticated analytics. The software allows for the energy manager to compile and view easy-to-understand graphs and charts.

The systems are secure, accredited for enterprise networks and designed to enable a centralized reporting system, something the Army has wanted for quite a while, Trudell said.

Trudell said the system has already helped customers track down the source of power outages at two facilities and identified the cause of a spike in water use at another.

"MDMS will provide the integrated view," said Paul Robinson, chief of the Center's Energy Division. "This system is capable of bringing multiple Army enterprise systems together, providing a holistic view of energy data in a way that will empower energy and facility managers across our installations."

# Invasive pythons hunted

## Multi-agency, public effort for Everglades ecosystem

By Annie Chambers

Jacksonville District

A hunt for Burmese pythons (*Python bivittatus*) in south Florida is not a hoax; this non-native invasive species is threatening Everglades ecosystem restoration efforts and native wildlife. The one-month "Python Challenge" organized by the Florida Fish and Wildlife Conservation Commission allowed anyone older than 18 to hunt the snakes on state land.

The intent of the event was to raise public awareness about Burmese pythons and how this invasive species threatens the Everglades ecosystem. Nearly 800 people registered from 30 different states to harvest the pythons earlier this year. The hunt takes place in late winter, prior to spring rains and maximizing opportunities to spot the Pythons.

Due to their large size, Burmese pythons have few predators; alligators and humans are the rare exceptions.

Burmese pythons feed on mammals and birds and are known to prey on native species, such as the endangered Key Largo woodrat (*Neotoma floridana smalli*), and American alligator (*Alligator mississippiensis*). They may also compete with threatened native species, such as the indigo snake, according to United States Department of Agriculture's National Invasive Species Information Center website. Even deer have been consumed whole by these snakes.

Known for their docility, Burmese pythons were sold as exotic pets. The release of unwanted pets led to an introduction of the exotic species in south Florida, mostly in Everglades National Park. In the last 12



An American alligator struggles with a Burmese python. The pythons compete directly with the top predators in the Everglades ecosystem. (Photo courtesy Everglades National Park.)

years, more than 1,950 pythons were removed from Everglades National Park and adjacent lands, according to the National Park Service website.

The Florida Fish and Wildlife Conservation Commission's website lists Burmese pythons as one of the largest snake species in the world. The largest Burmese python captured in Florida measured more than 17 feet long and weighed 152 pounds. They are exceptionally difficult to locate, due to their camouflaging capabilities.

"I fear that the impacts from Burmese pythons in the Everglades could wipe out all the good things we've accomplished and are trying to accomplish, such as setting conditions to restore the habitat for native plants and animals," said Jon Lane, chief, Jacksonville District Invasive Species Management Branch.

The Corps of Engineers is one of five signatories for the Everglades Cooperative Invasive Species Management Area (ECISMA). Everglades restoration poses new challenges for invasive species management

and has created a need for a more defined commitment to cooperation among agencies and organizations at higher levels of policy and management.

ECISMA published a "Field Identification of Select Native and Non-native Reptiles in Florida" to help prevent the spread of non-native species by following three steps: be prepared, make detailed observations and report what you see.

A mobile phone and tablet computer application, I'veGot1, facilitates identification and reporting of invasive animals and plants in Florida. There also is an I'veGot1 hotline and website to report sightings.

Corps employees received python safety training to help them identify and handle pythons, if necessary. The snakes appear to be traveling north from the Everglades toward Corps operations at Lake Okeechobee, with one Burmese python already impacting operations at a Corps water control structure.

"If we don't manage Burmese pythons, Everglades restoration will not be fully successful," Lane said.

# Biologist combats harmful algal blooms

By Katie Newton  
Louisville District

Harmful algal blooms, or HABs, have been plaguing the Salamonie Watershed in Northern Indiana since 2009, and Jade Young, U.S. Army Corps of Engineers Louisville District water quality biologist, has been working for more than three years to combat the problem.

Due to the concerns raised by HABs in the Salamonie Reservoir, the Louisville District Water Quality Team, which monitors water quality in the district's reservoirs, decided that an intensive study of the Salamonie Reservoir was needed to help determine the potential causes of these HABs.

The samples taken in 2009 at the reservoir, determined that the main inflow to the Salamonie Reservoir — the Salamonie River — was contributing high levels of nutrients and pollutants to the lake.

"We know that algae growth is fueled by nutrients, just like when you fertilize your yard," Young said. "It's the same concept." To better understand the sources of these pollutants and the Salamonie Reservoir Watershed itself, Young organized and led field work to collect samples from the entire stretch of the Salamonie River in 2010 and continued in 2011 and 2012. She printed maps, scouted out the best sampling sites and collected samples at more than 20 sites along the river three times a year for analysis. "I hoped to figure out the cause of the algae blooms," Young said, "It seemed like an interesting puzzle."

Ultimately the data showed high levels



Jade Young poses with a water sample. Her work and research combating harmful algal blooms helps preserve water quality for reservoirs managed by Louisville District. (Photo by Katie Newton)

of nutrients through Salamonie River and a significant amount of run-off in the watershed.

"Jade's research has been presented to several Indiana state and county agencies as well as various watershed stakeholders," said Chris Kareem, Louisville District environmental branch chief. "The samples and data collected under her guidance and management have aided Huntington County in attaining a 319 grant that will hopefully be utilized to improve water quality conditions in the Salamonie River and Reservoir."

In February, Young attended a meeting of the Lower Salamonie River Watershed

Steering Committee to present the Corps of Engineers data from the past three years.

The meeting gathered partners from USACE, Indiana Department of Environmental Management (IDEM), Indiana Department of Natural Resources, The Nature Conservancy, Natural Resource Conservation Service, Salamonie Watershed Soil and Water Conservation Districts, Huntington board of tourism, Taylor University and the Huntington County department of Health to discuss a 319 grant that was awarded to Huntington County.

The grant provides money to the county for research and implementation of best

management practices and has already helped to hire a watershed coordinator for the project.

IDEM explained the basics of the 319 grant and the processes the committee would have to follow. "We have a diverse number of agencies working together, and any issues we run into will be quickly addressed," Young said, who is fulfilling an advisory role to the committee.

"This is the start of a long journey to improve water quality at Salamonie," she said. As of early May, no harmful algae blooms were present at Salamonie.

Water samples collected from the lake by John Scheiber, Salamonie project manager, indicated that the lake was not experiencing a blue-green algae bloom, which can take on various appearances and look like scum or green paint. "Last year because of the drought and such warm weather we had significant algae blooms," Young said.

In case the HABs return, there is a response plan in place requiring notification to the public.

Agencies involved are collaborating to post warning signs at the beaches, boat ramps and park entrance.

"We have to notify the public of the risk they are taking by recreating in the reservoir when algae blooms are present," Young said.

In addition to leading the water quality team for the Louisville District, Young is also researching water quality issues at William H. Harsha Lake in Ohio. Young, who has worked with the district for almost four years, received both of her degrees in Biology from Tennessee Technological University.

## Firm earns award

By Ann Marie R. Harvie  
New England District

Working for the U.S. Army Corps of Engineers New England District, contractor Nobis Engineering, Inc., recently won the American Council of Engineering Companies 2013 Engineering Excellence Award.

Nobis Engineering, Inc., a small, disadvantaged company from White River Junction, Vt., received the honor for its outstanding work as part of the New England District's Elizabeth Mine Superfund Site Clean Up team.

"The Elizabeth Mine Team completed \$21 million in field work over the fiscal years 2011 and 2012 construction seasons, completing the 45-acre engineered cap last fall — weeks ahead of schedule and \$654,000 under budget," said New England District project manager Stephen Dunbar. "In addition, at the close of 2012 construction season, Nobis Engineering, Inc., recorded roughly 96,000 man hours without an OSHA recordable event or lost time."

The Elizabeth Mine Superfund Site, located in Strafford, Vt., is an abandoned copper and iron-sulfate mine that operated from 1806 until 1958. The operations were open-pit type mining. At the end of its operation, the mine was abandoned without any closure measures to restrict access or to prevent run-off from entering the mine. In addition, there were 40 acres of exposed tailing piles that were still producing acid mine drainage. The acid run-off was causing water quality problems in receiving waters of the drainage, Copperas Brook, and downstream in the west branch of the Ompompanoosuc River.