Yankee Engineer

U.S. Army Corps of Engineers, New England District, Volume 45, No. 7 April 2011

Building Strong®

New England District Assists Mozambique to provide a trustworthy water supply for the population of Nacala

See page 4

Yankee Voices

Patrick Blumeris; Adama Nombre, MCC Engineer and Colin Boocock, MCC Geologist in Nacala, Mozambique

Sympathy

… to the family of Regulatory retiree **Ralph M. Atkinson**, who passed away, Feb. 12. Mr. Atkinson served in the U.S. Navy during World War II. He retired from the Corps in New England in 1988.

Don't cook up danger in the kitchen

Kitchens are comfortable places where families and friends can hang out, but they can be dangerous for small children. Here are a few basic safety precautions to implement so everyone stays safe:

- Keep knives, scissors, and other sharp instruments locked or in a location too high for kids to reach.

- When cooking, keep pots and pans on the rear burners as much as possible, or turn their handles so young hands can't grab them.

- Unplug appliances when you're not using them. Make sure their cords are out of reach. (Telephone cords, too.)

First Draft Magazine

Letter of Appreciation

I was taking my two Swedish cousins for a "tour" of the Cape Cod Canal. I first called, then visited the Operations Center at the Cape Cod Canal. I remembered a Ranger, John Pribilla, who worked with the Appalachian Mountain Club group to which I belonged some years ago. He was on duty with an Intern. He took us into the center and proceeded to "provide a concise talk" of the history of the canal and answered numerous questions... (I even learned new things!)

I wish this to be considered a commendation. I really appreciated the attention.

Sincerely,
Muriel Thomas
Centerville, Mass.

Take the right steps for staircase safety

When a clown falls down a flight of stairs as a gag, it's funny. In real life, though, falling down a staircase can be dangerous, even fatal. Here are some basic tips for preventing stairway accidents in your home:

Handrails. Railings should extend the full length of the staircase, on both sides.

Lights. The top and bottom of every stairway should be well lit, with light switches at both ends.

Rugs. Don't leave loose rugs or carpets on the landings. Either fasten them securely to the floor so no one can trip, or get rid of them.

Steps. Make sure they're not slippery. Put non-stick treads on each step.

Obstacles. Keep stairs clear of books, toys and anything else that might clutter the path.

Gates. If you have small children living in or visiting your house, gates to prevent them from tumbling down the stairs are a must.

Packages. Don't overload yourself when carrying items up and down the stairs. Be sure you can keep at least one hand on the rail as you ascend or descend.

The bottom step. Paint the lowest step white, especially for stairs leading into dark basements. This will make seeing the final step easier.

(First Draft Magazine)

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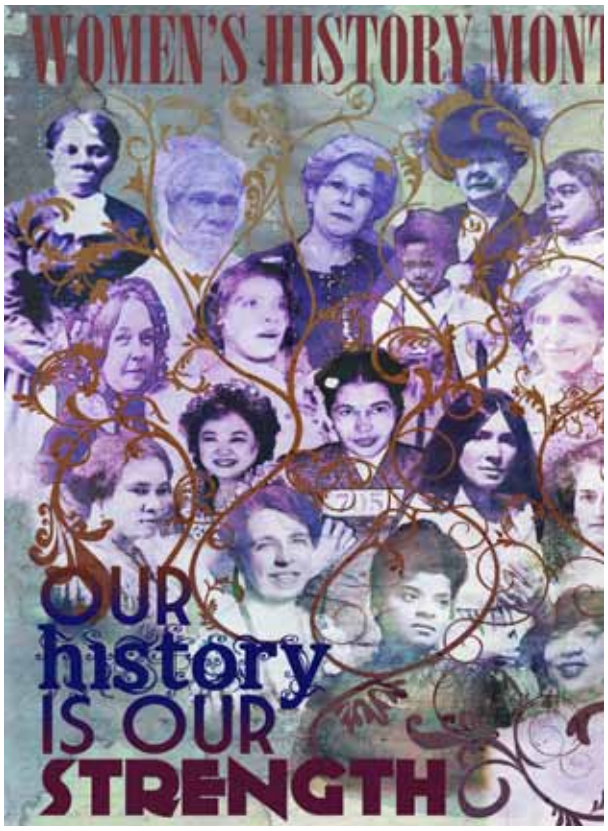
District Commander: Col. Philip T. Feir
Chief, Public Affairs: Larry B. Rosenberg
Editor: Ann Marie R. Harvie
Media Relations Officer: Timothy J. Dugan
Public Affairs Specialist: Sally M. Rigione
Web Content Manager: Andrew Stamer

Women's History Month celebrated at New England District

The New England District Team celebrated Women's history and accomplishments in an observance held March 31 in the Concord Park Theatre.



The Federal Women's Program and the Equal Employment Opportunity Office sponsored the event. Donna Ellis, Senior Extension Educator in the Department of Plant Science and Landscape Architecture at the University of Connecticut (UCONN), served as this year's keynote speaker. The 2011 theme was, "Our History is our Strength."

Col. Philip Feir, New England District Commander, talked about how the sacrifices made by women of the past paved a much better way for the women of the present and the future.

"This year's theme pays tribute to the millions of women who helped create a better world for the times in which they lived as well as for future generations," he said. "Knowing the challenges these women faced, grappled with, then overcame can be an enormous source of strength to all of us."

The Colonel concluded his remarks by talking about the important work that women have accomplished in the environmental field. He briefly listed accomplishments by Alice Hamilton, Caroline Crane, Ellen Richards, Rachel Carson, Marjory Douglas, Dian Fossey and Lois Gibbs.

Ellis followed Col. Feir and made a presentation that discussed invasive plants -- what they are, why they are bad for the environment and how to properly dispose of them.

Photo by Brian Murphy

Keynote speaker Donna Ellis discusses how to dispose of invasive plants during the Women's History Month event.

According to the United States National Arboretum, an invasive plant has the ability to thrive and spread aggressively outside its natural range. A naturally aggressive plant may be especially invasive when it is introduced to a new habitat. An invasive species that colonizes a new area may gain an ecological edge since the insects, diseases, and foraging animals that naturally keep its growth in check in its native range are not present in its new habitat.

Col. Feir presented Ellis with a Bunker Hill plaque in appreciation for her efforts during the Women's History event.

Donna Ellis has worked in the Department of Plant Science and Landscape Architecture at UCONN for 21 years. She is part of the Integrated Pest Management Program (IPM) and conducts IPM training programs for nursery growers. She teaches a course at UCONN on agricultural plant pests and is involved with educational outreach and applied research programs for insects, weeds and plant pathogens, with an emphasis on invasive plants and biological control.

Ellis began a Beetle Farmer Program in 2004 to train volunteers to raise beneficial insects as biological control agents for the invasive plant, purple loosestrife. Together with the beetle farmers, more than 1.8 million beneficial beetles have been introduced in Connecticut for control of this invasive species.

The keynote speaker has collaborated with other scientists to release beneficial weevils for biological control of another invasive plant, the mile-a-minute vine, since 2009.

In addition to her duties as an educator, Ellis serves as Co-Chairperson of the Connecticut Invasive Plant Working Group, a statewide organization whose mission is to provide invasive plant education.

Other presentations during the event included opening remarks by Heather Sullivan, Federal Women's Program Manager, and closing remarks by Ruthann Brien.

Photo by Thom Davidson

(MCA photo)

Inspectors perform a site visit to Nacala Dam. Right: The downstream side of the Nacala Dam spillway weir and the two tainter gates. The lake was unusually low at the time, and there is no flow through the spillway channel.

District team reaches around the world to assist in African dam rehabilitation

In the United States clean, reliable water is something we take for granted. It's everywhere – public bubblers in schools and parks – anyone who wants a drink of water has access to it.

In Nacala, Mozambique and surrounding villages, clean, reliable water is scarce. The Nacala Dam, the major source of their drinking water, is in serious disrepair.

The dam was overtopped due to lack of maintenance during the civil war in the 1990s, resulting in erosion, and there is also major leakage through rusted gates.

Halfway around the world, a team of New England District employees are working towards assisting the people of Nacala. They are working towards rehabilitation of the Nacala Dam and restoring a consistent, reliable water source.

In 2008, the Millennium Challenge Corporation (MCC) asked the New England District to provide technical expertise related to dam rehabilitation and repair to support the ongoing water supply improvements in Mozambique. MCC is an innovative United States established foreign assistance program designed to reduce poverty by promoting sustainable economic growth. The MCC operates on the principle that aid is most effective in countries that promote good governance, economic freedom and invests in people.

"MCC is an agency that provides grant money to developing countries," said New England District Project Manager Scott Acone. "There's a grant with Mozambique that's primarily centered around infrastructure improvements, most of it is related to road repair and drinking water."

New England is a long way away from Africa, but the reputation of its engineers is world renown. "MCC has a nationwide agreement with the Corps of Engineers to provide technical support," said Acone. "We were asked to do the project because of our expertise in dam rehabilitation and construction. New England District is a good fit because of the expertise of our engineers with design and construction of dams, as well as with rehabilitation of dams, for example at Hodges Village and West Hill, and we're looking at our other projects. We are providing engineering and technical guidance and are reviewing designs as they come in."

The Nacala Dam is located on the

Muecula River, about 30 kilometers upstream from Nacala. It serves as the primary water source for the town. Construction on the dam was completed in 1975. Problems with the dam started in 1982 when the dam embankment was overtopped for 10 hours due to a spillway gate failure. Some repairs were attempted in 1983, 1995, and 2002. A preliminary study was completed by Michael Baker, Jr., Inc., in 2006. An MCC contractor, Jeffares and Greene, performed a geotechnical inspection program to assess the dam and reservoir for rehabilitation and augmentation. "Based on the reports, the dam is inherently unsafe and needs to be rehabilitated," said Acone.

The rehabilitation project will not only provide drinking water for its people, but it will also help commercially develop that part of the country.

"Nacala Bay is the deepest naturally occurring harbor on the eastern coast of Africa," said Acone. "So there's a lot of potential there as a commercial center. One of the things that are limiting the development so far is a consistent reliable supply of clean water. Both the dam and all of the related infrastructure of piping and everything else is intended to provide that water so that the city can grow and develop as a commercial hub and provide income for the country of Mozambique."

Patrick Blumeris is the project's hydraulic engineer and has been to the project on two occasions and says it has some things in common with the New England District dams. "The dams here are earth fill dams and so is the Nacala Dam," he said. The New England Dams, like Nacala, have a spillway at the end of the structure with a bridge structure that can take an inspector from the dam crest to the control tower."

Essentially, that's where the similarities stop. "The project is not a flood damage reduction dam as many New England dams are," said Blumeris. "We don't typically worry about touching water in our reservoirs, but the Nacala Dam is home to a few crocodiles. Even without crocodiles, it would be important not to touch any standing water. It might harbor mosquitoes (think malaria) or snails (schistosomiasis)."

Photo by Adama Nombre

Inspectors on the Nacala control tower bridge during the July 2009 inspection.

Rehabilitating the dam is going to be about a $27 million project. "The preferred option is to move the existing National Road N12 off the embankment crest and move it onto a new embankment downstream of the dam wall," said Acone. "By removing the national road from the dam crest, the crest width can be narrowed by about 5.5 meters (18 feet). The dam embankment can then be raised by 4 meters (12 feet) by making the slopes of the dam faces steeper (about 1:2) and not significantly increasing the footprint of the dam on the ground."

According to the Nacala Dam Feasibility Study – Main Report, the impervious dam core will also be raised to within one meter of the crest level. The downstream face will be widened by the addition of a gravel aggregate layer, and by the inclusion of a mid slope berm. "Internal sand filters will be installed on the downstream face which will connect into a gravel drain that will link into a surface drain running along the berm to allow for any seepage through the dam to be safely collected," said Acone. "A new rock toe will be incorporated into the downstream face, which will connect into seepage detection weirs at specified intervals so the dam's performance can be monitored. Since the goal of this dam is to hold a permanent pool of water, we want to be sure we can monitor how much seeps through the dam and is lost to future consumption."

The design work for the project was finished in fall of 2010. At the time of this article, Blumeris was overseeing the bid evaluations for the construction contractors that called for proposals on the design. The team hopes to award a construction contract this spring.

Other members of the team include Thomas Davidson (Geologist); Siamac Vaghar (Geotechnical Engineer); Ben Piteo (Civil Engineer) and Dave Descoteaux (Structural review along with Europe District). If all goes well, the project will be completed in the fall of 2012 and everyone in Nacala will be able to count on a glass of water anytime they want it.

Photos by Paul Marinelli

(above) Farrell McMillan presents Don Wood with his retirement certificate. (right) Tony Firicano reads the citation on Don Wood's Commander's Award for Civilian Service.

Water Management Section Chief retires after 31 years of service

By Farrell McMillan, Chief, Engineering/Planning

Don Wood, Chief, Water Management Section, Engineering/Planning, made a plan for a quiet retirement exit from the New England District after 31 years of service. After a small lunch attended by a selected group of friends and coworkers on March 22, Wood and his group moved to the Concord Park offices for an official retirement ceremony.

Farrell McMillan, Chief of Engineering/Planning Division, presented Wood with the Commander's Award for Civilian Service, a Bunker Hill Plaque and his official retirement certificate. Wood has enjoyed an outstanding career with the Corps of Engineers, New England District. He came to the New England Division in 1980 as a Hydraulic Engineer, progressing to Chief of the Water Management Section in 2008, where he has been a leader in hydraulics and hydrology (H&H), and a mentor to an entire generation of New England District H&H engineers. Wood has had a long career in environmental and H&H engineering. He has been a team member and H&H technical expert on Corps projects for many years, including providing support to overseas contingency missions and volunteering in December 2004 for a four month tour in Gulf Region South, Tallil, Iraq.

During his tenure as Chief, Water Management Section, his experience and personal commitment were critical to the successful completion of many important New England District projects. The benefits of his contributions to the New England District will continue to be realized for many years to come, both in his contribution to individual projects and the technical expertise extended to those personnel who had the good fortune to work with him.

Don Wood shows off his retirement pin he received during the awards presentation at the Engineering/Planning Offices at Concord Park.

Bat Research Efforts in the Upper Connecticut River Basin

Photos and story by Kristy King
Wildlife Management Intern

Vermont's Endangered Species Committee recommended that little brown bats and northern long-eared bats be added to the state's endangered species list on Feb. 2. The decision was made based primarily on data collected by the United States Army Corps of Engineers (USACE) in the Upper Connecticut River Basin. Bat populations in the Northeast have been decimated due to the introduction of White-nose Syndrome.

Addition to the endangered species list provides some protection for these bats. State law makes it illegal to kill any individual within the species. Developers can be required to protect the habitat of an endangered species as a condition of their development permits.

White-nose Syndrome was discovered in New York in 2007. It is a cold-loving fungus that causes skin irritation in hibernating bats. Bats are roused by this irritation causing them to deplete their fat reserves. Bats have been seen foraging for food in the middle of winter causing them to freeze to death. Even if the individual bats survive the winter, their ability to reproduce could be impacted. It has been estimated that more than a million bats have died in the eastern United States. Some of the most important bat wintering sites in Vermont have seen mortality between 90 and 100 percent.

During the summer of 2010, USACE Biologist Gary Pelton led a team of seven wildlife interns in conducting bat mist net surveys on USACE land in Vermont. Approximately 75 percent of the data used in the decision making process was collected by Pelton and his crew.

Pelton has been netting in Vermont since 2003, but the state halted all bat surveys in 2008 to prevent stress to possibly infected bats. Netting was allowed in 2010 to gather data for the state.

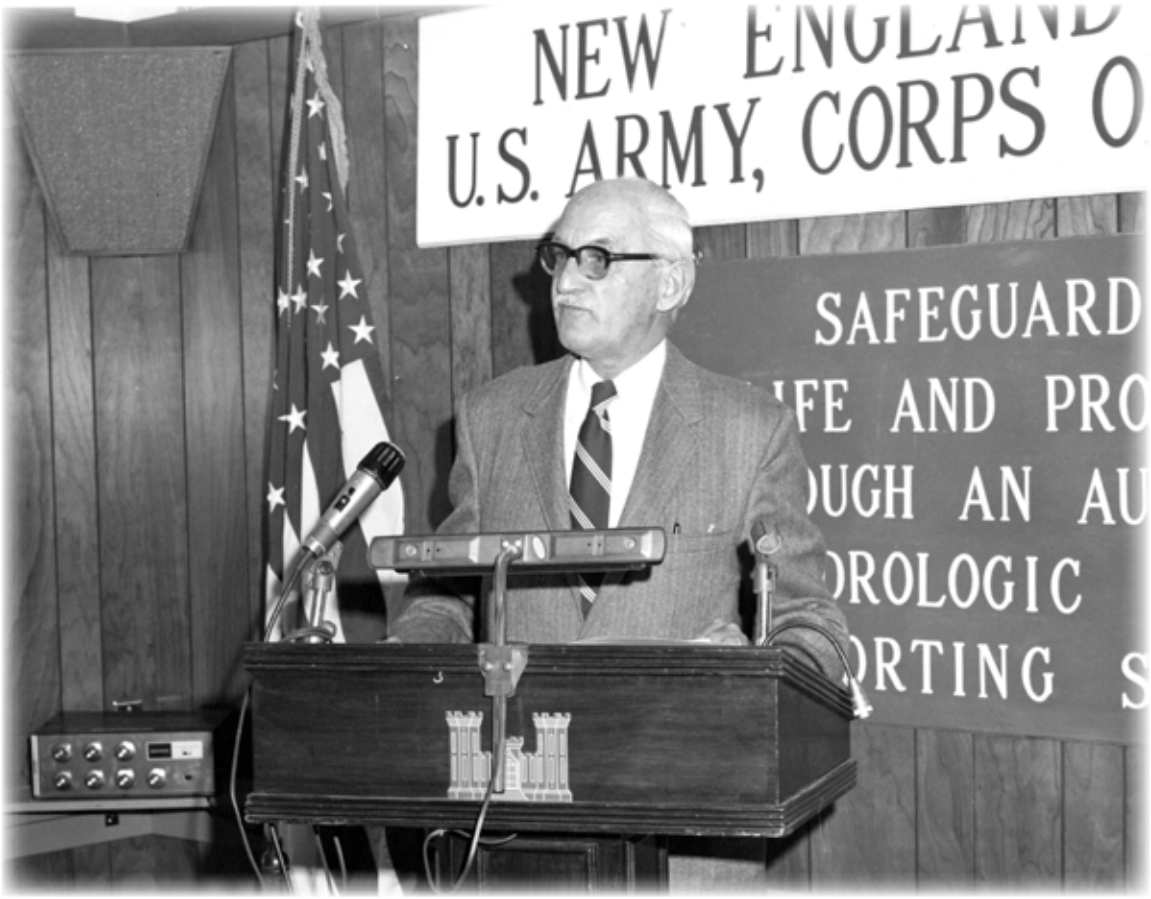
To accurately show the impact of the disease, sites were chosen to compare data from previous years. Seventeen sites from 2003 to 2007 were selected to compare. The 2010 survey data showed an 82 percent decrease in the total number of bats caught. As the most abundant bat species in the eastern U.S., little brown bats were also the most common bat species netted in Vermont. A total of 196 little brown bats were captured at the comparison sites.

Only one little brown bat was captured in 2010 at a net site at Ball Mountain Lake located in Londonderry. This is a 99.995 percent decrease in the number of little brown bats caught on USACE land in Vermont. Bats often have a bad reputation as an animal that carries rabies and drinks your blood while you sleep. The truth is bats are extremely beneficial to have around.

A big brown bat can eat up to 3,000 insects (depending on the size) in one night. With such a great loss to the bat population, there will certainly be greater impacts on the environment. White-nose syndrome could bring an end to the little brown bat population in the Northeast.

Little brown bat caught at Ball Mountain Lake. (Above) USACE interns removing a bat from the mist net.

Dredging up the past



Norman H. Burrows, Chief, Supply Division, gives his presentation, "Ordering Officers' Responsibilities," during the Annual Dam Operator's Conference in this November 1970 photo.

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