

Fiscal Year 2009

Secretary of the Army Environmental Awards

U.S. Army Best Practices for the Environment

SUSTAINING THE ENVIRONMENT FOR A SECURE FUTURE

FISCAL YEAR 2009

Secretary of the Army Environmental Awards Winners

U.S. Army Best Practices for the Environment

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SUSTAINING THE ENVIRONMENT FOR A SECURE FUTURE



Wyoming ARNG

Camp Guernsey

Cultural Resources Management, Installation

INTRODUCTION

Located in east-central Wyoming along the historic Oregon Trail, Camp Guernsey Joint Training Center is the Wyoming Army National Guard's (WYARNG) premier training facility and the centerpiece of the WYARNG's cultural resources management (CRM) program. With 65,454 acres classified as a Maneuver Training Center-Heavy, the primary focus of Camp Guernsey is to provide a major training area for Wyoming Army and Air National Guard units as well as active duty Army, Navy, Air Force and Marines. The training site is also one of only five Air Force-designated regional training centers in the country and houses a Department of Defense (DoD) Joint Training and Experimentation Center for robotics research and development in unmanned air- and ground-based vehicles. Rolling hills, tablelands, and rough, broken terrain characterize the general area and as a result, Camp Guernsey has become known as an ideal location for military training because it shares similarities with the terrain in Afghanistan.

The town of Guernsey has a population of approximately 1,100 with Camp Guernsey employing 123 federal military technicians and state of Wyoming civilian personnel. With multiple units from all branches of the military services concurrently reliant on Camp Guernsey for training, stewardship of cultural resources is critical to mission readiness. All of Camp Guernsey's lands were or are currently being surveyed for cultural resources. Nearly 1,000 sites have been documented, including prehistoric and historic archaeological sites, several Native American traditional cultural properties, nationally significant Oregon Trail resources, historic homesteads and the New Deal-era Camp Guernsey Cantonment Historic District. The entire facility and all acres of Camp Guernsey's military training lands are covered under the WYARNG Integrated Cultural Resources Management Plan (ICRMP) for 2009-2013.

JUDGING CRITERIA

-  Program Management
-  Orientation to Mission
-  Technical Merit
-  Transferability
-  Stakeholder Interaction

On this page: From left, Pfc. Brian Ortiz and Cpl. Christopher Klemme with the Wyoming Army National Guard's 960th Brigade Support Battalion, work through close quarters combat exercises. (Photo by Brandon Qvester/Public Affairs Specialist, Wyoming National Guard)

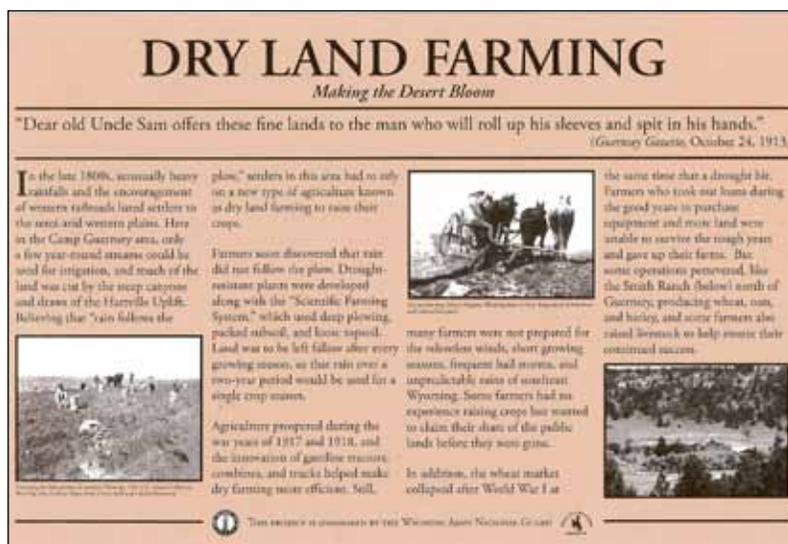
BACKGROUND

Camp Guernsey's CRM program, housed within the environmental section of the WYARNG Construction and Facilities Management Office (C&FMO), ably meets the challenge of balancing Camp Guernsey's cultural wealth with mission goals. The cultural resources manager works directly with environmental professionals, contract archaeologists and Geographic Information Systems (GIS) technicians. Environmental personnel coordinate daily with Camp Guernsey range control, Integrated Training Area Management, master planning, real property, engineering and command staff to ensure coordination of mission goals and operations with environmental sustainability. Camp Guernsey's initial ICRMP was prepared in 2004, and the comprehensive revision was completed in-house by the WYARNG cultural resources manager in 2009. Over the past two years, the Camp Guernsey CRM staff accomplished a number of program milestones, most notably: the successful completion of a DoD Legacy Resource Management Program funded project; increased preservation of Oregon Trail historic sites; preparation of a historic context and public education component for historic homesteads and ranching sites; and implementation of a Native American ethnographic study and traditional cultural properties survey.

PROGRAM SUMMARY

The CRM office developed the concept of shared resource stewardship with both internal and external stakeholders to encourage interest and participation above and beyond the required regulatory compliance process. In every respect, Camp Guernsey excels at balancing the WYARNG mission with an appreciation of state history. For example, one unique CRM project involved identifying the descendants of homesteading families, collecting oral histories and documenting the history of late 19th and early 20th century dry-land farming in the region. Interpretive signage and an educational Web site were developed as part of this project so this important time in Wyoming's history can be shared with Camp Guernsey personnel, troops training on the lands and the general public.

Cultural Resources Management, Installation
Wyoming Army National Guard, Camp Guernsey



Educational signs at Camp Guernsey, such as this one, document the historic homesteads of the late 19th and early 20th centuries. The creation of educational signs was part of an initiative to identify the descendants of homesteading families, collect oral histories and document the history of dry-land farming in the region.

The WYARNG ICRMP includes a detailed description of the Camp Guernsey installation, a historic and cultural context and an overview of inventory status, resource evaluation and compliance and management activities through 2013. The plan outlines six standard operating procedures (SOP) to assist all users of Camp Guernsey and provides basic guidance for the most common situations that have the potential to impact cultural resources. In addition, a seventh stand-alone SOP completed in 2008 presents a comprehensive plan for the protection of cultural resources in wildfire management including pre-treatment and fire prevention, fire suppression and post-fire rehabilitation.

ACCOMPLISHMENTS

Overall Cultural Resources Management

The Camp Guernsey CRM staff successfully employs many initiatives to better utilize funds and reduce operational costs. The cost savings of completing the ICRMP by a qualified staff expert is more than \$70,000. Completing a GIS cultural resource database and map in-house saved approximately 270 job hours between 2008 and 2009; this eliminates the time-consuming task of plotting military activity requests on individual



cultural resource inventory maps and cross-referencing each cultural site with paper survey reports. The WYARNG also entered into a cooperative agreement with the Wyoming State Historic Preservation Office (SHPO) Cultural Records Office to digitize nearly 20 years of inventory reports and site forms. These resources are now available online through a secure Internet Web site housed by the SHPO. This project was completed at a minimal cost to the WYARNG (\$20,000 vs. \$45,000 for a General Services Administration contract) and assists both agencies in CRM responsibilities.

Currently, 911 of 975 documented cultural resource sites at Camp Guernsey have been evaluated for eligibility to the National Register of Historic Places, leaving only 64 with undetermined National Register status. Of the 975 archaeological and historic sites, 190 are considered federally protected because of their National Register of Historic Places eligibility. An additional 122 sites contain features of interest and concern to Native American Indian tribes and therefore, are also considered protected under Camp Guernsey CRM.

The WYARNG C&FMO uses a Project Tracker system to assist in management of construction projects. The tracker system provides an easy-to-use spreadsheet of construction projects with funding and contract information, environmental review status, start date and estimated completion date. This management system allows environmental staff to integrate environmental requirements early in the planning process to ensure project sustainability and Section 106 compliance.

The installation's CRM program is proactive in seeking ways to expand and leverage environmental budget resources. The CRM office obtained DoD Legacy Project funds of \$44,400 to prepare an SOP to consider the effects of fire to Native American traditional cultural sites before, during and after wildfire incidents. The project, which provided a cost efficient approach in forward planning and prevention and is an example of proactive stewardship, was successfully completed in 2008. In 2009, the CRM office submitted an application to the Wyoming SHPO Historic Architecture Assistance Fund to obtain the services of a professional architect to recommend stabilization methods at a unique historic homestead



dugout structure in Camp Guernsey's North Training Area. The application was successful, and the SHPO provided \$2,500 to fund the architect.

Historic Buildings and Structures

Camp Guernsey has evaluated all buildings for historic and architectural significance, including their status under Cold War-era criteria. Real Property Historic Preservation Codes are current and accurate. A total of 37 buildings in the Camp Guernsey Cantonment Historic District are at least 50 years old, and 29 are eligible for the National Register of Historic Places. The National Register-eligible historic district was constructed during the New Deal era with Works Progress Administration labor. The 75th anniversary of the New Deal took place in 2008, and the CRM office developed a presentation highlighting the locally quarried sandstone structures built during that period. An educational poster visually displays the differences in stone masonry techniques between the beginning of Camp Guernsey's construction in 1939 (using cut stone blocks carefully laid in horizontal courses) and construction after January 1941 (when random rubble stone was laid in irregular patterns to increase the speed of construction because of the threat of war).



Building 301 is an excellent example of the unique historic stonework in Camp Guernsey's cantonment area constructed with locally quarried sandstone as a Works Progress Administration project in the New Deal era.

The Camp Guernsey historic district is managed in accordance with a Management Plan for Historic Properties and a Facilities Excellence Plan completed in 2007. Camp Guernsey has adapted several buildings in the historic district for reuse to meet the changing WYARNG mission. A



rehabilitation project at a WWII-era recreation facility and canteen remodeled the interior to become a state-of-the-art classroom facility. An interior rehabilitation project at another building changed its historic use as a latrine to a troop laundry. In 2009 a federally funded economic stimulus project was identified to upgrade the windows in 24 historic buildings at Camp Guernsey. Through sensitive project management, careful selection of replacement window material and close and constant coordination with the SHPO throughout the course of the project development, it was determined that the Camp Guernsey historic district and contributing buildings would not be adversely affected by the undertaking.

Archaeological Resources

Camp Guernsey is rich in prehistoric and historic period archaeological sites. The region has one of the highest prehistoric site densities in Wyoming. Indigenous people continuously visited and occupied Camp Guernsey lands for thousands of years. Types of prehistoric archaeological resources include rock shelters, open camp sites with teepee circles, ceremonial stone rings and alignments, stone procurement quarries, lithic artifact scatters and Native American pictographs and petroglyphs. Types of historic archaeological sites include mid-19th century Oregon Trail sites and structural remains of late 19th and early 20th century homesteads and ranches, as well as trash dumps and artifact scatters, mining prospect features, railway features, a packing plant, stone quarry, copper smelter and a Civilian Conservation Corps golf course segment.



Camp Guernsey has many sites associated with the nationally significant historic Oregon Trail, including wagon trail ruts and swales, potential emigrant grave sites, campsites and pioneer inscriptions. In June 2009, local and regional wagon train enthusiasts conducted a reenactment of emigrants traveling along the Oregon Trail across Camp Guernsey lands. Camp Guernsey supports members of the Oregon-California Trails Association to place trail markers along ruts and swales to delineate trail segments on the landscape. Recognizing the importance of the “Warm Springs” site noted in emigrant diaries and journals, Camp Guernsey has designated the area as “foot traffic only” so its historic character can be retained. CRM and natural resource staff are planning projects to manage and interpret the springs through funding sources such as the State of Wyoming Cultural Trust Fund and National Public Lands Day Legacy awards.

In 2008, Camp Guernsey began a 100 percent cultural resource inventory of the recently acquired 22,000-acre Gray Rocks Ranch adjacent to the South Training Area. The survey is essential for the WYARNG’s strategy of proactive protection of significant archaeological and historic sites through advance avoidance measures.

Native American Program

The WYARNG Native American program began in 2003. The CRM office now conducts annual consultation meetings with 18 participating tribes including the Blackfeet, Southern Arapaho, Southern Cheyenne, Cheyenne River Sioux, Chippewa Cree, Comanche, Confederated Salish and Kootenai, Crow,

Eastern Shoshone, Fort Peck Assiniboine and Sioux, Kiowa, Northern Arapaho, Northern Cheyenne, Northern Ute, Oglala Sioux, Rosebud Sioux, Shoshone-Bannock and Sisseton-Wahpeton Oyate. Meetings feature program updates, information sharing, discussions of management recommendations, project reviews and site visits. The 2009 tribal consultation meeting included a field trip,



Camp Guernsey’s Oregon Trail resources provide a unique opportunity for public interaction and education. Trail reenactments, like the one pictured above, are conducted across Camp Guernsey lands.

led by representatives of the Northern Cheyenne and the Rosebud Sioux Tribes, to two 19th century Indian Wars battlefields. This field trip provided a unique opportunity for both tribal and military representatives: *“Today we have an opportunity to stand on common ground. These battlefields are sacred to both the U.S. Army and the numerous tribes that fought for this land. It is a great privilege for me to learn from my brothers and stand on this sacred ground together, as friends,”* WYARNG’s MAJ Samuel House. The WYARNG encourages all deploying military personnel to attend Native American consultations because of the similarities between formal consultations and advisor or mentor missions in Afghanistan and Iraq.



American Indian tribal representatives hold a prayer at Warm Springs in Camp Guernsey’s South Training Area during a 2008 tribal consultation meeting field trip. Native American consultation is a key component of Camp Guernsey’s CRM program.

Tribes enjoy great access to Camp Guernsey. The Northern Arapaho have a sweat lodge on the South Training Area to conduct tribal activities and to share traditional ceremonies with the WYARNG. A tribal monitoring program is in place for ground-disturbing projects; tribes visit on a rotating basis to participate in fieldwork and surveys. The WYARNG staff discusses availability of camping, hunting, plant gathering and cedar harvesting at all consultation meetings. Tribal representatives often say the WYARNG leads the way and is a model for other military installations and government agencies.

Because of the extensive number and types of cultural resources identified during archaeological

inventories, tribal representatives recommended a Native American ethnographic study and traditional cultural property survey of Camp Guernsey lands be conducted. The project was completed in 2008. Traditional cultural sites identified during the survey are now managed following recommendations provided by tribal participants.

Curation

The WYARNG has a long-standing curation arrangement with the University of Wyoming Archaeological Repository and Curation Facility, the federally designated repository for Camp Guernsey’s archaeological collections, pursuant to 36 CFR 79. The facility is in a state-of-the-art building constructed within the last five years and is administered by the Office of the Wyoming State Archaeologist. The facility is open to researchers and Native American tribal representatives and has been visited in the past by tribal members. The WYARNG continues to offer tribal members the opportunity to visit the curation facility.

Through State of Wyoming interagency cooperative agreements, the survey section of the Office of the Wyoming State Archaeologist has served for 20 years as the WYARNG’s principle contractor for archaeological inventory projects at Camp Guernsey. This has resulted in a smooth, seamless process for curating archaeological materials during each field season. Native American Graves Protection and Repatriation Act inventories are complete, and no human remains or funerary objects were identified in the Camp Guernsey archaeological collections.

Cultural Resources Awareness and Education

Camp Guernsey CRM staff encourages education, communication and public awareness in several ways. Pocket-sized cards outline the types of cultural resources found at Camp Guernsey, the importance of protecting Camp Guernsey’s heritage and how users of the Camp can preserve its cultural sites. These cards are distributed to WYARNG personnel, troops training at the facility and the general public. A separate handout explaining proper procedures for protecting inadvertent discoveries is also available. It is provided to project managers, construction contractors and troop labor crews.

A video produced in 2007 by the WYARNG through a contract with the Oglala Lakota Tribal College TV Production Program is now an important part of the management strategy showing awareness of the importance of protecting cultural resources at Camp Guernsey. One segment of the video shows representatives from the Oglala Sioux and Eastern Shoshone Tribes describing how cultural sites are important to the tribes. Environmental staff includes the video in safety briefs provided to military units training at Camp Guernsey. Members of the 2-30 Mountain Infantry Battalion from Fort Polk, La., informed Camp Guernsey staff the video is useful to their cultural training for Afghanistan missions.



Camp Guernsey hosted interagency firefighting training events in 2008 and 2009, with more than 300 attendees from agencies across the state and region at each event. The CRM staff presented training briefs to bring awareness of cultural resource preservation issues to state foresters, fire incident commanders and others involved in fighting wildfires.

Community Relations

Several key communities surrounding Camp Guernsey gain both monetary and cultural benefits from their association with Camp Guernsey and its staff. Goshen County reaps an economic benefit of more than \$5.1 million from the National Guard, with approximately 90 Guard members and civilian personnel living in its communities. Platte County realizes more than \$7.2 million in economic impact and has approximately 123 Guard members and Camp Guernsey employees calling the county home.



With the proximity to Fort Laramie National Historic Site (approximately 15 miles), the WYARNG is very sensitive to the events that took place in conjunction with the Fort Laramie Treaties of the mid-1800s. A concerted effort is made to ensure park rangers are invited to WYARNG Native American consultations at Camp Guernsey, and likewise, CRM and tribal representatives have been invited to visit Fort Laramie.

The WYARNG continues to partner with the town of Guernsey and the Wyoming Department of State Parks and Cultural Resources in public interpretation

“Wyoming ARNG takes its responsibility as stewards of their land very seriously, respecting the history and traditions of the Native American tribes and settlers who lived there before, and protecting that heritage for future occupants.”

- Sarah Killinger, Liaison to the Army,
Advisory Council on Historic Preservation

and educational signs at the Guernsey Oregon Trail Ruts site. The public visitation to this well-known location contributes to the local economy.

The WYARNG cultural resources manager is a member of the Wyoming Archaeology Awareness Month Committee established by the SHPO. Camp Guernsey distributes archaeology posters and participates in other annual Archaeology Month events.

Environmental Enhancement

A number of projects have assisted cultural resource sustainment, including signage near significant cultural sites notifying users which types of military training activities are permissible and the placement of vegetation near a rock cliff with historic and prehistoric rock carvings. The vegetation provides a natural barrier and serves to protect the important cultural site.



The WYARNG C&FMO has accomplished a number of rehabilitation projects on the Camp Guernsey cantonment. Nearly every building contained asbestos floor tile, pipe wrap and plaster laced with asbestos fiber. Environmental staff at Camp Guernsey, certified in asbestos inspection, coordinates with CRM staff to ensure historic buildings are not adversely affected by remediation efforts.

Mission Enhancement

All CRM activities are coordinated with Camp Guernsey command staff to better support the goals of sustainable training. All lands have been or are in the process of being surveyed for cultural resources. By identifying the resources Camp Guernsey has well in advance, the CRM office helps military planners and project managers select project



locations and footprints avoiding resource issues. In this way, the CRM program directly contributes to ensuring training on Camp Guernsey is not threatened or interrupted. A WYARNG Intranet Web site contains Camp Guernsey cultural resource management plans, SOPs, design guidelines and preservation briefs for historic buildings, program announcements and more. This management strategy helps guarantee any WYARNG member can readily access cultural resource information.

The CRM office is firmly committed to sharing its lessons learned and management approach at Camp Guernsey throughout the military services and across agencies. The successful DoD Legacy project is among the most visible of these efforts. In the past CRM personnel have presented specific Camp Guernsey management strategies at the National Guard Bureau's National Environmental Workshops, the DoD Sustaining Military Readiness conference, regional historic preservation conferences and the Society for American Archaeology national conference.

Cultural Resources Compliance

External coordination helps Camp Guernsey maintain cultural resources compliance with Section 106 of the National Historic Preservation Act (NHPA), 36 CFR 800 regulations and other federal laws and executive orders. The cultural resources manager is a former Wyoming SHPO employee, who provides effective insight into interagency coordination. Because of the WYARNG's positive reputation for stewardship, the SHPO is more of a partner in CRM than a regulatory oversight agency. Periodic meetings and field visits keep the SHPO aware of upcoming projects or issues as they arise. A SHPO staff member regularly attends Native American tribal consultation events at Camp Guernsey.

The foresight in the completion of cultural resource surveys conducted under Section 110 of the NHPA has allowed numerous construction and training projects to occur without mitigation efforts. In



Camp Guernsey is a preferred major training area for deploying combat units due to its similar landscape found in Afghanistan. Here, the WYARNG's 115th Fire Brigade has established a logistical supply area in the draw during an annual training period in June 2008.



2009, development began on a draft Programmatic Agreement (PA) with the SHPO to formalize the Camp Guernsey Cantonment Historic Properties Management Plan and Facilities Excellence Plan. The PA will serve to streamline the Section 106 process for federal undertakings in the historic district by identifying projects about which the WYARNG does not have to consult with the SHPO on a project-by-project basis.

Between 2008 and 2009, the WYARNG received \$815,000 from state and federal sources for cultural resource compliance. The CRM program allocated approximately 60 percent of these resources for inventory and site evaluations, while the remainder was used to assist in Native American tribal consultation and monitoring of significant cultural sites during construction.

CONCLUSION

As evidenced by its numerous accomplishments and achievements, Camp Guernsey's CRM staff overwhelmingly demonstrates dedication to balancing the installation's mission with the study and preservation of the area's cultural resources. Stewardship of the installation's cultural resources is critical to mission readiness, and the CRM staff works tirelessly to ensure compliance, Soldier training and the abundant cultural sites on Camp Guernsey lands remain a top priority.

FY 2009 Secretary of Defense Environmental Awards

Fort Stewart and Hunter Army Airfield

Environmental Quality, Non-Industrial Installation

INTRODUCTION

Fort Stewart/Hunter Army Airfield (FS/HAAF) is well known as the home of the 3rd Infantry Division (ID) and serves as the U.S. Army's premier power projection platform on the Eastern Seaboard. FS/HAAF is located near Savannah, Ga., and comprises more than 284,000 acres of residential, garrison and training/maneuver area. Its mission is to train and rapidly deploy military forces worldwide. With the availability of year-round training support, access to a major port and an airfield makes FS/HAAF a prime East Coast training location for the Army, as demonstrated by several 3rd ID and National Guard Brigade training/deployment operations. FS/HAAF has a population of approximately 24,465 military tenants, including 5,817 3rd ID personnel. Army Family members and civilian employees make up the other 36,519 tenants on the installation, bringing the total population to approximately 60,984. FS/HAAF is also a leading mobilization station for Army units preparing for tours in Operation Iraqi Freedom as well as two-week National Guard annual training.

On this page: Soldiers out of Fort Stewart, Ga. prepare to conduct a patrol in Arab Jabour, southern Baghdad, Iraq. (U.S Army photo by Spc. Olanrewaju Akinwunmi)

JUDGING CRITERIA



Program Management



Orientation to Mission



Technical Merit



Transferability



Stakeholder Interaction

SUSTAINING THE ENVIRONMENT FOR A SECURE FUTURE

BACKGROUND

FS/HAAF is a recognized leader in global citizenship and sustainability values and is constantly striving to improve environmental quality of the installation and surrounding areas. The installation's sustainability efforts were a major contributor to FS/HAAF winning the Army Communities of Excellence Award for 2004, 2005, 2006 and 2009. In addition, FS/HAAF was recently awarded the 2009 Military Conservation Partner Award for partnering effectively with other environmental organizations to continuously improve environmental practices. These honors, among many more, were bestowed upon the installation for superb performance in using its resources to sustain the mission, increasing the productivity of its workforce and enhancing the FS/HAAF community quality of life.



Lower Ogeechee River Conservation Corridor encompasses 13,500 acres along the Ogeechee adjacent to the installation offering biodiversity and a buffer for the installation.

FS/HAAF is committed to supporting mission readiness and execution while enabling the well-being of approximately 61,000 Soldiers, Family members and civilians, improving infrastructure and preserving the environment. The installation complied with the requirements of Executive Order (E.O.) 13148 and the International Organization for Standardization (ISO) 14001 in September 2005. This was a significant accomplishment, and it launched the installation's efforts to focus on sustainability and improve the environmental conditions at FS/HAAF.

The Directorate of Public Works (DPW) Environmental Division is committed to supporting the Army's mission of enhancing the installation's power projection platforms in support of national security objectives while overseeing all environmental activities for the installation and providing

“FS/HAAF has demonstrated that by educating and involving every Soldier and civilian, a facility can reduce its environmental impact to a level that allows its mission to be sustained for the long term. This is the future of environmental protection, moving from preventing harm to operating in harmony with the natural environment.”

- Thomas Easterly, Indiana Department of Environmental Management

information and education to Soldiers and civilians on how their operations affect the environment as a whole. The division's staff is comprised of engineers, environmental protection specialists, biologists, archeologists, historians, foresters and contractors supporting the installation's mission, quality of life for Soldiers and their Families, and overall environmental quality. The division is comprised of three branches: Fish and Wildlife Branch, Forestry Branch, and Prevention and Compliance Branch. The Prevention and Compliance Branch oversees 16 different programs: Sustainability, Pollution Prevention, Air Quality, Borrow Pit Management, Cultural Resource Management, Toxic Substances/Hazardous Materials/Hazardous Waste Management, Emergency Planning and Spill Response, Remediation, Solid Waste Management/Recycling, Storage Tank Management, Noise Management, Stormwater Management, Water Quality, Wastewater Quality and Wetlands Management. The branch also coordinates the installation's National Environmental Policy Act (NEPA) requirements for the Environmental Division. Collectively, these programs all support the FS/HAAF training mission.

PROGRAM SUMMARY

FS/HAAF has an award-winning environmental program geared toward meeting the installation's environmental challenges in a way that supports Soldier readiness. The mission of the Environmental Division is to support military training by achieving and exceeding environmental, natural and cultural resources stewardship and legal standards.



Environmental Division Mission Goals/Objectives:

- Recognize changing environmental, natural and cultural resources standards and military training needs.
- Place environmental, natural and cultural resources management within an appropriate context which satisfies the training mission of the installation.

FS/HAAF is home to a number of threatened and endangered wildlife species. These animals include the American bald eagle (Federally protected), Red-Cockaded Woodpecker (RCW) (endangered), Eastern Indigo Snake (threatened), Wood Stork (endangered), Frosted Flatwoods Salamander (threatened) and Shortnose Sturgeon (endangered). The goal of the Fish and Wildlife Branch is to support the military mission by conserving, protecting, restoring and sustaining biological diversity and the ecosystem viability upon which fish and wildlife depend. This includes enhancing the quality of life for Soldiers, their Families and civilians through quality fisheries, game management and the conservation of threatened and endangered species.



A Fort Stewart biologist applies colored celluloid leg bands to a Red-Cockaded Woodpecker, one of the many protected species living within the boundaries of Fort Stewart.

Fort Stewart's Forestry Program is one of the largest in the Department of Defense. Fort Stewart is also home to the largest remaining acreage of longleaf pine-wiregrass ecosystem in Georgia. Notable accomplishments achieved include reforestation, endangered species habitat improvement and commercial forestry. The success of Fort Stewart's forestry management can be measured by the installation's immensely valuable timber resources and excellent training environment.



The Prevention and Compliance Branch oversees operational and administrative compliance of the numerous FS/HAAF state permitted facilities and vast wetland and cultural resources, while promoting pollution prevention and sustainability.

The DPW Air Program manages activities on post affecting air quality, such as painting, fueling, burning, engine testing, generator usage and heating and cooling. Managing these activities keeps the facility in compliance with federal, state and local environmental regulations. The Borrow Pit Program provides Fort Stewart with support to conserve resources and an on-site source of suitable soils for use as fill material. The Cultural Resource Management Program protects significant historic properties while maintaining the largest possible area for training. The Resource Conservation and Recovery Act (RCRA)/HAZMAT Program provides training on the proper handling and management of regulated materials to minimize the waste, while carefully monitoring how hazardous waste is managed. The Restoration Program identifies, investigates and cleans up hazardous substances, pollutants and contaminants on the installation. The Recycling Program manages solid waste, landfill compliance, the processing station, all recycling on the installation, the Solid Waste Annual Reporting System and pollution prevention. The Environmental Division's Noise Program monitors noise levels associated with various training maneuvers and has developed a Noise Complaint Management Plan to ensure that all noise complaints are correctly documented and addressed. The Water Program works to continually monitor the drinking water for contaminants; sampling is performed at various locations throughout the installation on a daily basis to ensure that the water is safe to drink. FS/HAAF contains a great deal of wetland areas – wetlands constitute roughly one third of the installation. The Wetlands Program reviews proposed construction projects, as well as timber harvests and training operations, and looks for the optimal site for such actions to minimize wetland impact.

All of these programs enable FS/HAAF to maximize training activities while maintaining environmental quality on the installation. Undergirding all these programs and the installation strategic plan is a Sustainability Management System (SMS) that provides an environmental management framework and policies for preventing pollution, conserving natural resources, improving environmental stewardship, and complying with federal, state and local regulations.

ACCOMPLISHMENTS

SMS Implementation

FS/HAAF is committed to simultaneously optimizing performance of the mission, the well-being of Soldiers, Family members and surrounding communities, and minimizing the impact on the environment. To achieve this goal, FS/HAAF has established, implemented and maintained an effective SMS. An SMS is an Environmental Management System which balances environment with mission and well-being to support the military's long-term ability to train and deploy combat-ready Soldiers.

The FS/HAAF Environmental Division works closely with the command to ensure environmental quality and sustainability issues are integrated into the installation's strategic planning process. Specifically, Quality Management Boards (QMB) have been established to embody the installation's mission objectives. The Environmental Division is involved in each of the five QMBs, which include Training Support; Power Projection and Readiness; Well Being; Safety and Security; and Optimizing Resources. The QMBs meet to review metrics and determine success in meeting the mission objectives and identifying projects/processes that would improve success. The installation's SMS has met ISO 14001 Environmental Management Systems and remained continuously conformant with the standard since 2005. Although the SMS is integrated installation-wide, it is administratively managed with three staff members that actively work to implement and promote the sustainability policy and requirements.

The Environmental Division's Fish and Wildlife Branch plays a critical role in the success of the installation's sustainability. For instance, the Fish and Wildlife Branch is responsible for conservation and recovery efforts associated with many threatened and endangered species, such as the federally endangered RCW. Since 1994, the Fish and Wildlife Branch has seen a steady increase in the RCW population on Fort Stewart. Currently, there are 315 potential breeding groups (PBG), and FS/HAAF is expected to reach their recovery goal of 350 PBGs in 2012. Through full implementation of the SMS and its land management focus, threatened and endangered species management has had much success. The installation's RCW management has



excelled to the extent that FS/HAAF contributes more than 30 birds per year to expand the effort of growing RCW populations in other areas such as the Talladega National Forest, the Avon Park Air Force Range and the Disney Wilderness Preserve. As a result, training restrictions have been significantly reduced. Once recovery is reached, training restrictions will be eliminated.



The Division's Forestry Branch maintains a proactive prescribed burning program which is renowned by national fire experts. Controlled burning is a managed burn which uses low-intensity fire to improve and enhance training lands, clear underbrush to reduce wildfire hazards, improve wildlife habitat and accomplish predetermined, well-defined management objectives. Extensive preparation and work goes into each planned burn. FS/HAAF's Forestry Branch began a controlled burn season on 5 November 2009. The Forestry Branch spent months developing burn prescriptions for each area that would be burned. These planned burns involve



An ignition device dropped from helicopter starts the prescribed burn that is ecologically favorable for fire-dependent plant and animal species living on FS/HAAF.

burning between 500 and 2,500 acres per day and can occur on any day during the burn season. Typically, FS/HAAF burns between 100,000 and 120,000 acres annually, primarily to improve and maintain the landscape for military training.

The installation also burns to reduce hazardous fuel, improve endangered species habitat, regenerate longleaf pine, control brownspot needle blight and suppress undesirable hardwoods. Thinning, burning and removing midstory hardwoods has increased visibility and maneuverability in the forest and greatly improved the landscape's suitability for mechanized maneuver training. Since FY 2000, Directorate of Plans, Training, Mobilization and Security (DPTMS) records indicate that military units training on FS/HAAF have not lost a single day of training due to wildfires or wildfire suppression.

Waste Reduction Efforts

Recently, FS/HAAF began to elevate its conservation efforts in the area of water usage. FS/HAAF initiated a number of conservation measures (e.g., installation of low flow water fixtures, leak detection surveys and system upgrades that included replacement of leaking water and steam lines, restrictions on outdoor water use) that resulted in a 9 percent reduction in water intensity over a two year period. In an effort to further conserve as much water as possible the installation and the city of Hinesville are partnering on an initiative to install “purple pipe” on FS/HAAF that will help achieve the goals of the Coastal Georgia’s Water and Wastewater Permitting Plan for Managing Salt Water Intrusion while continuing to meet the goal of E.O. 13514 (2 percent annual reduction from an FY 2007 baseline or a total of 26 percent reduction by FY 2020). Reuse water piping is purple in color to differentiate it from regular drinkable supplies, which are typically blue. Purple pipe is currently being installed to distribute reuse water from a Hinesville wastewater treatment plant to the golf course and Central Energy Plant to eliminate use of drinkable water for irrigation and industrial purposes. FS/HAAF’s Taylor’s Creek Golf Course uses about 121,000 gallons of drinkable water per day for irrigation. By taking advantage of reuse water treated to a very high standard, the installation will save a considerable amount of drinkable water, and because they will be substituting reuse water, the golf course will be allowed to consistently irrigate throughout the year, even during times of severe drought. This will permit groundskeepers to constantly maintain a beautiful landscape for Soldiers, their Family members and civilians alike



to enjoy on a daily basis while providing the city with a reuse customer for its wastewater treatment plant and closing the loop on the “water cycle.” The Central Energy Plant uses about 742,000 gallons of drinkable water per day for industrial purposes. Considering this water is constantly being circulated through pipes to heat and cool the installation’s industrial areas, this is an ideal facility to connect to a purple pipe distribution system, where drinkable water use is eliminated in favor of reuse water. In partnering with the city of Hinesville, the city constructed a reuse facility to reduce the demand on the existing wastewater treatment plant. This reuse facility will reduce FS/HAAF’s demand on the Upper Floridan Aquifer by another 860,000 gallons per day. This objective of water conservation will ensure growth potential for the installation and surrounding areas.

“By integrating environmental quality and sustainability into the Installation’s Strategic planning process, FS/HAAF has implemented projects that have reduced its waste generation.”

- William Dzeda, National Guard Bureau, Environmental Programs, Sustainability Branch, Water Program Manager

Environmental Compliance Assessment and Management Program

The Environmental Division assisted the Directorate of Logistics (DOL) with their Lean Six Sigma project establishing practices and procedures reducing the amount of hazardous waste generated by DOL Maintenance. The end result was a 73 percent reduction in hazardous waste and a 51 percent reduction in volatile organic compounds (VOC) generated by DOL Maintenance. The project evaluated hazardous waste management procedures and product substitutions to achieve these results. Water-dispersed (WD) Chemical Agent Resistant Coating (CARC) paint replaced solvent-dispersed CARC, thereby reducing VOCs; WD CARC does not contain methyl ethyl ketone and other harmful constituents, which allows for the management of dried paint and masking material as a non-hazardous waste. Used blast media is collected separately and returned to the supplier for recycling. The overall cost savings resulting from this



In 2009, FS/HAAF drilled a Lower Floridan well to reduce water usage from the Upper Floridan Aquifer helping to alleviate some of the regional stress of saltwater intrusion.

project is \$60,000 annually. This may seem like a small amount, but savings of this nature only means enhancement to the mission and its Soldiers.

Effective Use of Funds

With command emphasis placed on solid waste management through incorporation of the SMS and the QMB metrics, goals were initiated resulting in a robust and very successful installation Qualified Recycling Program (QRP). The non-putrescible landfill is expected to remain viable through 2049. During the award period, FS/HAAF's municipal solid waste diversion rate increased from 27.23 percent in FY 2007 to exceeding the Department of the Army's Measure of Merit (MoM) in FY 2009 with a 40.71 percent diversion due to the QRP. Similarly, the installation's construction and demolition (C&D) diversion has exceeded the MoM since FY 2007, when its rate was at 98.78 percent, and has remained high, with an FY 2009 diversion of 91.05 percent. With a total of 96,506 tons being diverted, FS/HAAF's overall diversion rate for FY 2009 was 83 percent. In FY 2009, FS/HAAF generated approximately \$868,774 in revenues and \$10,234,504 in cost avoidance, equating to a total FY 2009 Recycling Program value of approximately \$11,103,278. FS/HAAF diverted 40.21 percent and 89.16 percent of its municipal solid waste and C&D, respectively, for a total FY 2009 diversion rate of 83 percent, thereby expanding the useful life of the landfill. Due to the installation's success and proactive efforts, the FS/HAAF QRP provided advice and assistance to the city of Savannah in the development of their recycling program. In August 2009, a House Arms Services Committee delegation after touring the recycling facilities, praised FS/HAAF as one of the best operations they had seen.

Community Relations

FS/HAAF predicates sustainability on the primacy of the military mission and the belief that effective training can occur while protecting the environment and being good neighbors to the local community. The military community recognizes effective training, environmental stewardship and community well-being as mutually compatible and necessary for the maintenance of a quality military training. To attain long-term sustainability, FS/HAAF prepares for current and future impacts to the installation. FS/HAAF was most recently commended during the



August 2009 Installation Management Command Organizational Inspection Program for their SMS integration and the Environmental Division's exceptional effort in developing strong partnerships with the local communities. It was noted that these efforts by FS/HAAF have an obvious effect on the communities' sense of environmental stewardship. The success of the Environmental Program hinges on the involvement of many stakeholders in and around FS/HAAF. Hundreds of Environmental Compliance Officer courses and Recycling Compliance Officer training courses have been taught during the past two years, with approximately \$20,000 awarded to military units for excellence in establishing and maintaining their unit recycling program. Each quarterly Environmental Quality Control Committee briefing recognizes two military units' recycling programs with a \$1,000 incentive award.



The Garrison Commander presents the quarterly recycling incentive award.

FS/HAAF's robust and comprehensive community relations program reaches out not only to its Army community but also to its neighboring communities. Events, tours, presentations and classes are continually hosted on-post and off-post in support of the installation. During the past two years, a concerted media and community relations effort has produced more than 100 articles and has sponsored or participated in approximately 150 events, reaching more than 15,000 people. Efforts have expanded to include segments on local news stations, installation newscasts, commercials, outside publications, Facebook and Twitter. Work is being done to improve the individual program pages within the FS/HAAF Internet and Intranet Web sites. FS/HAAF staff have briefed sustainability efforts at such open forums as the Georgia Environmental Conference and the Georgia Water Professionals Conference and have participated in community meetings to assist in developing Wildfire Management Plans, Comprehensive Water and Wastewater Plans and a Coastal Georgia Supplement to the State's



Stormwater Management Plan. In September 2009, the FS/HAAF Stormwater Program Manager was invited to serve on the 25-member Technical Board for implementation of the Coastal Stormwater Supplement for the Southeastern portion of the state. Through such partnership and participation afforded to the local communities, surveys have shown that the public trusts the installation to care for public lands in a sustainable and sensitive manner that will not harm the public health or the environment.



National Environmental Policy Act

The division is committed to supporting the Army's customers by actively engaging installation staff while providing sound stewardship of installation resources and the environment. Environmental coordination is continuously ongoing with DPW Master Planning Division and the DPTMS's Training Division to assist in determining optimal siting alternatives for garrison and range control projects at early proposal stages. During these early planning initiatives, the Environmental Division begins preparing NEPA documentation to meet internally set suspense dates prior to a proposed action's contract award, often enabling early execution. The office consolidates environmental responses from subject matter experts after their completion of the internal project review and coordinates those responses with project proponents and their customers to ensure they are aware of the proposed action's environmental requirements. By proactively commenting on every project, proponents and designers are continuously reminded of the need to protect and sustain our environment and incorporate required local, state and federal regulations into design, construction and implementation of those projects. This process allows the Environmental Division program managers to better prepare for U.S. Fish and Wildlife Service coordination, account for the submission of Erosion Sedimentation and Pollution Control Plans and National Pollutant Discharge Elimination System permitting and coordinate with the Army Corps of Engineers Wetland Regulatory to successfully complete 404 permitting and associated mitigation. The process also helps to complete cultural resource coordination, explain when wet utility permitting is necessary, coordinate with the Georgia



Environmental Protection Division for any air quality notifications and notify the Forestry Branch when to remove merchantable timber from project sites.

Once coordination is complete, this information is also incorporated into the proposed action's NEPA document. Each Record of Environmental Consideration and Environmental Assessment explains project-specific environmental compliance regulations and documents alternatives analyses conducted during early planning of a proposed action. Because of the success of the division's coordination process, its NEPA documents have become much more legally defensible, are easier for the public to understand and have been praised by regulatory officials for their completeness. The installation's high degree of pre-coordination helps eliminate challenges. By using this methodology, FS/HAAF's Environmental Division is fully integrated in every aspect of the installation's decision making process for each proposed action and has efficiently prioritized its workload to support all projects IAW the MCA FYDEP, the Installation Planning Board, and the various QMB rankings.

CONCLUSION

FS/HAAF is at the forefront of integrating their SMS into an already well-established and robust environmental program. FS/HAAF has won the Army Community of Excellence Award for three consecutive years 2004-2006 and again this past year in 2009; FS/HAAF is the only installation to have won this honor four times. The installation bases environmental resources management on the importance of the military mission and the belief that effective training can occur while protecting the environment and being considerate of the local community. The level of quality outreach and communication, in combination with the program management employed by the FS/HAAF Environmental Division, has fostered strong partnerships with the community and emphasized FS/HAAF's continuing dedication to environmental quality and superior stewardship. Through their environmental initiatives and programs, FS/HAAF is demonstrating the Army is a valuable asset in sustaining the environment in Georgia and other areas of the United States.

U.S. Army Garrison, Daegu, Mr. Robert J. Chartier Environmental Quality, Individual

INTRODUCTION

U.S. Army Garrison (USAG) Daegu is headquartered at Camp Henry in the city of Daegu and is the southernmost component to the Installation Management Command's (IMCOM) Korea Region (IMCOM-K). USAG Daegu is primarily responsible for managing installation support for a diverse community of U.S. Soldiers and Marines, Korean Augmentation Soldiers, Department of the Army civilians, Korean National employees, contractors and American family members encompassing mission partner-troop units, non-industrial sites and industrial activities. The garrison also plays an integral role in the 19th Support Command (Expeditionary) mission for reception, staging, onward movement and integration of U.S. forces arriving in Korea and in non-combatant evacuation operations. USAG Daegu supports 16 sites, camps and facilities encompassing 10,000 square

miles stretching from Daejeon to Busan throughout the largest of U.S. Forces Korea's (USFK) four geographical regions. The garrison consists of three major hubs located in three distinct cities: Daegu, the fourth largest city in South Korea with Camps Walker, Henry and George; Waegwan, with Camp Carroll and the soon-to-open A'Po Defense Reutilization and Marketing Office; industrial and troop activities; and Busan, the second largest city in South Korea, with Busan Storage Facility and Pier 8 shipping and storage activities. The garrison also includes numerous other outlying sites, such as mountaintop signal nodes, storage warehouses and ranges. USAG Daegu provides support and services for units and agencies which perform a variety of missions in defense of the Republic of Korea (ROK).

On this page: Soldiers of the 1-2 Aviation Bn and 837th Transportation Bn prepare 1-2 Aviation Bn Apache Helicopters for loading onto a Military Sealift Command ship for shipment back to the U.S. (U.S. Army photo by Mr. Jeffrey Nofzinger)

JUDGING CRITERIA



Program Management



Orientation to Mission



Technical Merit



Transferability



Stakeholder Interaction

BACKGROUND

Robert J. Chartier represents USAG Daegu, Korea, as the Chief of the Environmental Division and the Deputy Director of the Directorate of Public Works (DPW). He has been assigned in his current position for the last five years. As the Environmental Division's chief, Mr. Chartier is involved in all aspects of environmental media program area management. Mr. Chartier is the lead implementer and coordinator for the International Organization for Standardization (ISO) 14001 Environmental Management System and was involved in the development of the garrison's Strategic Sustainability Plan. Mr. Chartier also served as the Deputy DPW for the entire award period, requiring his involvement in all aspects of DPW operations including serving as the director when necessary. He was also asked to perform additional duties for a nine-month period as the Chief, Operations and Maintenance Division and the Energy Manager, due to a shortage of Department of the Army Civilian staff. Serving in these positions provided Mr. Chartier with an intimate understanding of DPW operations and how he can best interject environmental considerations and influence business practices.

POSITION DESCRIPTION

Mr. Chartier is responsible for the management of all environmental program areas for the garrison and is the primary facilitator for the garrison Environmental Management System (EMS) and sustainability initiatives. He also maintains active oversight of media program areas that were identified as Significant Aspects and Sustainability Goals tracked within EMS. Those areas include the heating fuel oil tank program, spills and the solid waste/recycling program and goals identified in Executive Order (E.O.) 13423. Mr. Chartier supervises a staff of 11 environmental professionals and serves as a Department of the Army EMS External Auditor for all of the other garrisons in Korea, as well as serving as the Installation Pesticide Manager. Mr. Chartier also supports environmental media management areas including water quality, overseas compliance cleanup, asbestos-containing materials, lead-based paint and environmental aspects of construction projects.



Mr. Chartier (right) inspects the 188th Military Police Company Hazardous Waste Accumulation Point at Camp Walker with PVT Mathew Hillbery. USAG Daegu strives to provide a clean environment for residents and a natural ecosystem by minimizing waste.

AWARDS AND SERVICES

In conjunction with his environmental staff, Mr. Chartier sponsored numerous education and public awareness events and participated in host nation city-sponsored events. These events included week-long environmental awareness campaigns celebrating Earth Day, a Chilgok County/Waegwan City tree planting, and plaque dedication ceremony celebrating the initiation of the Camp Carroll Wetland Project and Korean Arbor Day. Armed Forces Day open house including displays targeting host nation visitors; 5K runs celebrating Earth Day; installation involvement in Arbor Day mass tree planting events hosted by Daegu City; and displays throughout the installation for other special events such as National Recycling Day and World Water Day. He worked with Armed Forces Network Korea to develop three television commercials and two radio commercials targeting energy conservation, water conservation and recycling. The Environmental Division partnered with the installation Department of Defense (DoD) Dependent (K-12) School and the Army Community Service (ACS) School-Aged Services Program, providing educational instruction on recycling, sustainability, importance of plants



to the ecosystem and job opportunities in the environmental field. The division also conducted tours of environmental sites such as the drinking water and waste water treatment facilities, the contaminated soil land farm facility and the recycling area. Mr. Chartier also partnered with ACS to sponsor local Korean national university student interns and volunteers to work in the Environmental Division, with 2,000 total hours volunteered in FY 2008 and 2009. Mr. Chartier's involvement helped make the intern program a garrison success, and was directed by the USFK Combatant Command as a Best Management Practice (BMP) for the other garrisons and sister services on the peninsula. His environmental achievements significantly contributed to the garrison receiving the FY 2009 Army Community of Excellence (ACOE) award and placing it in the top seven for the 2010 award. The final 2010 award recipients will be announced in May 2010. Additionally, the division and garrison were certified as Integrated Pest Management (IPM) – Star Pesticide Management Certified. The use of these IPM practices resulted in less use of pesticides in childcare facilities, resulting in a safer environment for Army Families.

ACCOMPLISHMENTS

Mr. Chartier is a leader in the environmental field throughout IMCOM and is the driving force behind the successes of the environmental program in USAG Daegu, meeting every leadership and program management challenge. Through his leadership, the environmental staff and garrison significantly advanced environmental stewardship and fostered a trusting relationship with the host nation neighboring communities.

EMS Implementation

Mr. Chartier developed the first ISO 14001-conformant, fence-line-to-fence-line, mission-oriented EMS for an overseas garrison, covering 10,000 square miles with sites stretching across the Korean peninsula. This EMS was developed 15 months ahead of the DoD mandate. Mr. Chartier worked with unit environmental officers in the cross-functional team to ensure the EMS format was within their capability to support the units' missions. The EMS program and the manual he developed were used in whole or in



“Mr. Chartier has led USAG Daegu’s environmental program to a level of excellence while avoiding the costs associated with polluting the environment and then repairing that environmental damage. His restoration of the natural wetland and demonstration of electric vehicles will further reduce the environmental footprint of the facility while supporting the military mission.”

- Thomas Easterly, Indiana Department of Environmental Management



The Camp Carroll, Korea tree planting ceremony dedicated the first phase of the Wetland Restoration Project and Arbor Day 2009. Participating in the ceremony were COL Michael Saulnier, Garrison Commander and Waegwan/Chilgok County Mayor's Office representatives.

part by each of the other three garrisons in Korea. He further assisted each of the other garrisons with their EMS implementation by conducting site assistance visits and audits. With his assistance, USAGs at Red Cloud, Humphreys and Yongsan declared compliance with the ISO 14001 standard. Mr. Chartier has been recognized by the U.S. Army Environmental Command (USAEC) as an EMS expert and was invited to brief USAG Daegu Best Management Practices at EMS In-Process Reviews in Hawaii and Germany. His briefing received positive comments from the participants, who stated his discussion provided them with new ideas that would help alleviate some of their own EMS implementation challenges. He received a letter of appreciation from the



Commander, USAEC, for his assistance. Additionally, Mr. Chartier served as a Department of the Army EMS External Auditor for all of the other garrisons in Korea.

Mr. Chartier personally developed a new USAG Environmental Quality Control Committee (EQCC) meeting briefing format designed around EMS aspects and sustainability goals, aligned with the garrison's strategic plan. The format included a quad chart detailing the garrison's stated objectives and targets, current status, historical data and trends-charts. One of his most significant format changes and culture shifts, which increased the effectiveness of the process, was that environmental process owners would now brief the status of their programs directly to the Garrison Commander. This change in procedures provided managers with the opportunity to interface directly with the commander and receive immediate guidance with no filtering. The success of this format led the Garrison Commander to direct the objectives be included as garrison Key Performance Measures and the trends-charts be used as the example at the garrison's next Strategic Planning Conference.



Waste Reduction Efforts

Mr. Chartier recognized the garrison was not maximizing its Qualitative Recycling Program (QRP) profits with the current contract, so he worked with the DPW Contracting Management Division and the garrison contracting command detachment to align the stand-alone QRP contract with the garrison's solid waste contract. This resulted in increased line items for the more valuable commodities and 22.5 percent profit increase since the beginning of the new contract in July 2009. His involvement with solid waste and recycling helped reduce solid waste generation by 10 percent in FY 2008 and 2009. His program guidance led to an increased solid waste diversion rate of 42.5 percent for FY 2008 and 2009 from an average of 20 percent in FY 2006 and 2007. This was accomplished in part by developing a garrison-wide no-dumping policy, which kept household waste covered under the overseas living quarters allowance from entering the installation's waste stream, and by having his staff conduct a thorough analysis of all waste streams and diversion opportunities. He



also instituted a program rewarding units for their participation in the recycling program, sparking renewed interest at the unit level. QRP profits have increased by 34 percent in FY 2008 and 2009 from those of FY 2006 and 2007. Mr. Chartier and his staff continue to assess recycling points throughout the installation and look for additional opportunities. Recycling increased significantly upon his arrival in the garrison. This project promotes the Army's triple bottom line of mission, environment, community plus economics, and is one of Mr. Chartier's most noteworthy efforts. As a result of Mr. Chartier's leadership and direction, the QRP continues to be recognized as the best recycling program in Korea.



Mr. Chartier conducts a survey of an Army Family housing recycling point on Camp Walker, Daegu.

Mr. Chartier recognized a compressed timeline to ship transformers containing polychlorinated biphenyl (PCB) off-peninsula due to Basel Accord clearance and contractual requirements, although the Korea Environmental Governing Standard did not require removal of these devices until FY 2011. His leadership influenced the removal of the remaining 17 tons of PCB-containing devices in FY 2008, resulting in "zero" PCBs on USAG Daegu sites, three years ahead of the requirement. The expedited removal allowed him to readjust staffing to manage other high-risk media areas.

Environmental Compliance Assessment and Management Program

Mr. Chartier is a voting member on the Real Property Planning Board which prioritized Sustainment Restoration and Modernization (SRM) funded projects. His clear articulation of the importance of supporting environmental programs with SRM funds resulted in the execution



of more than \$2 million in SRM funding toward environmental-related infrastructure upgrade projects, such as new heating fuel oil storage tanks, oil water separator upgrades, replacement of an Imhoff tank with a more modern system and upgrades to the drinking water disinfection system. Mr. Chartier's suggestion to replace the Imhoff and an aged rotating biological contactor (currently under design) with a septic system will also reduce staffing requirements for DPW. His additional duty as the Energy Manager and primary Energy Savings Performance Contract Manager was another avenue in which he ensured the full scope of environmental considerations were included.

Mr. Chartier conducted research with the garrison Directorate of Logistics and received approval from the command to purchase a small fleet of Zero Air Pollution (ZAP) electric trucks to help the command meet its fleet vehicle management goal. The ZAP electric truck, a small pickup truck used on USAG Daegu, performs better than the Neighborhood Electric Vehicles issued to installations in the continental U.S. The installation purchased five trucks, providing them to the Fire Inspector, Department of Public Works, Environmental Division and the Safety Office. These replaced the gasoline-fueled non-tactical vehicles currently in use.



Mr. Chartier prepares a new Zero Air Pollution (ZAP) electric truck for a test drive. There are currently five ZAP trucks being used on USAG Daegu.

Mr. Chartier developed a wetland restoration project designed as a watershed protection buffer and attenuation zone for natural runoff and monsoonal storm water flow passing through the installation. The project also focused on restoring a historic wetland habitat on Camp Carroll to reestablish the hydrologic and vegetative community using a flood plain pond, stream channel and bank enhancements. Early



stages of the project have already reaped positive results, adding significantly to the faunal biodiversity of the installation. A number of aquatic-related invertebrate, water fowl and fauna, such as ducks, egrets, raccoons and other small mammals, have established footholds using the wetland resources. An added benefit has been an increase in the bee population at the site, which is expected to benefit local farms in the vicinity of the installation boundary. When completed in Spring 2010, the site will be designated as a conservation area and nature park with educational venues, walking trails and viewing platforms, providing the workforce and their Families an improved quality of life venue. This is the first true conservation project by a garrison in Korea and is designed to foster an ethic that goes significantly above and beyond strict environmental compliance while enhancing the well-being of Soldiers, civilians, Families, neighbors and communities through leadership in sustainability.

Effective Use of Funds

Through development of a strong and effective EMS, Mr. Chartier harnessed the appropriate resources to manage the garrison's environmental risks, providing natural resources benefits, tangible cost savings, cost avoidance and visibility to the environmental program. He conserved critical staff hours for those issues most significantly impacting the mission and the environment. The EMS provided visibility of the most significant environmental issues to the garrison command, resulting in a better prioritization of limited resources.

Mr. Chartier's involvement with solid waste management and recycling in FY 2008 and 2009 helped reduce solid waste generation by 10 percent and increased the solid waste diversion rate by 50 percent compared to the previous two years. Mr. Chartier also saved the garrison more than \$1.2 million by developing Lean Six Sigma Just-Do-It projects involving underground heating oil storage tanks. There were three outdated underground storage tanks which required costly replacement. Mr. Chartier investigated and found the contract did not require the garrison to provide on-site storage of heating fuel, but instead required the contractor to deliver directly to individual buildings. The substandard intermediate tanks were no longer



required and were subsequently scheduled for removal from Camp Walker and Camp Carrol. Mr. Chartier's actions not only avoided the replacement cost but also decreased the environmental liability risk of fuel leaks.

Community Relations

Mr. Chartier is a leader in the USAG Daegu community. As the Installation Pesticide Manager, Mr. Chartier worked with the Installation Pesticide Coordinator and the U.S. Army Center for Health Promotion and Preventive Medicine to improve pesticide management in Directorate of Family, Morale and Welfare Child Development, Youth Services and School Age Services facilities. His leadership in the program, direction to the Pesticide Coordinator and work with the facility managers resulted in these facilities achieving Integrated Pest Management-Star accreditation in 2008. Beginning in FY 2008, Mr. Chartier was invited to participate as a member of the host nation-sponsored regional semiannual EQCC meeting. This meeting involved representatives from the local ROK military installations (Army, Air Force and Marine) including the ROK Senior Mission Commanding General and Ministry of Environment Region Director as co-chairs (equivalent to the U.S. Environmental Protection Agency), as well as city and non-governmental organizations. Mr. Chartier's enthusiasm and his ability to effectively communicate garrison

environmental programs are often lauded by the co-chairs as examples for the Korean installations to emulate. As a direct result of his involvement, the relationship between the garrison and host nation partners has significantly improved and has laid the foundation for a future Regional Sustainability Strategic Plan.

Mr. Chartier sponsors numerous educational and public awareness events and participated in city-sponsored events. Events sponsored by Mr. Chartier include a tree planting ceremony at the Camp Carroll wetland project site, Armed Forces Day Open House displays targeting host nation visitors, 5K runs celebrating Earth Day, installation involvement in Arbor Day with mass tree planting events hosted by Daegu City and displays throughout the installation. For Earth Day, the Environmental Office installed displays in the Post Exchange and Commissary, as well as providing recycling yard tours. For Armed Forces Day, the Environmental Division provided local nationals attending the event with multi-lingual displays on recycling, sustainability and how the installation is helping the environment.



“Mr. Chartier demonstrates what one individual can do to obtain the commitment of others to environmental protection. His efforts make a difference for the mission and his community.”

- Brian Christian, Texas Commission on Environmental Quality

Mr. Chartier also developed community education and public outreach events, including two radio public service announcements and three television commercials by Armed Forces Network-Korea, as well as a quarterly news publication called “The Kestrel Quarterly.”

USAG Daegu is mindful and attentive to the environmental actions and impacts of the installation community on the host nation. As a result of Mr. Chartier's environmental communication and education and outreach efforts, a significant culture shift in the Daegu and Waegwan city areas has emerged with the Korean host nation neighbors. This was evidenced by positive articles in Korean news publications.



Mr. Chartier is working with the Camp Walker Troop 81 Boy Scouts of America during Phase 1 of the Camp Carroll Wetland Restoration and Conservation Project.

Environmental Planning and Analysis (Executive Order (E.O.) 12114, “Environmental Effects Abroad of Major Federal Actions”)

Mr. Chartier understands the relationship between the environmental program and other garrison processes, such as strategic planning, real property planning and ACOE. His incorporation of environmental aspects contributed significantly to the success of these other processes and ensured the concepts of environmental stewardship and sustainability entered the garrison lexicon. His personal involvement in the garrison strategic planning process resulted in the incorporation of environmental language into the garrison mission objectives and designation of tasks to support EMS and sustainability goals into the strategic plan. As a result of his development of a strong environmental program, a strong EMS and his work with Strategic Planners, the garrison command designated all environmental Significant Aspect and Sustainability Objectives as garrison Key Performance Measures.



The garrison is on schedule to develop the first Strategic Sustainability Plan in Korea and is the only garrison in Korea to include sustainability requirements of E.O. 13423 and E.O. 13514 into their EMS with the final goal being operational sustainability throughout the garrison’s activities. Successful implementation of EMS provided the mechanism for Mr. Chartier to successfully articulate his vision, define environmental goals, assess the effectiveness of procedures and align them with the garrison’s strategic goals. These are translated into projects submitted into the annual funding cycle. In 2008, Mr. Chartier worked closely with Marine Forces Korea in establishing a workable Table of Distribution and Allowances (TDA) staffing requirement for Camp Mujuk, Korea. Camp Mujuk was recently declared a Status of Forces Agreement facility in Korea. Previously, environmental support was provided by USAG Daegu through an inter-service support agreement. This support was not the ideal situation, as Daegu is two hours from Pohang, Korea, the site of Camp Mujuk. The suggested TDA is in the process of being approved by Headquarters (HQ) United States Marine Corps (USMC). He also provided assistance to Camp Mujuk during their first



environmental compliance assessment by HQ USMC. The support provided by his staff and his ability to clearly articulate Camp Mujuk’s environmental issues supported the request for development of environmental staff on their proposed TDA. Mr. Chartier worked with the Commander, Military Sealift Command Office on Pier 8, USFK’s Power Projection Platform, to examine the feasibility of installing a fueling station directly on the pier, given the proximity to the Busan Harbor and the risk of spills.

Mr. Chartier is the primary staff element working transformation issues associated with the Land Partnership Plan and base closure and return activities for the garrison, as many of the issues are environmental-related. His understanding of the Status of Forces Agreement and environmental contamination contributed greatly to the Environmental Joint Working Group discussions by keeping inaccurate information out of the discussions.

CONCLUSION

Mr. Robert Chartier is a leader in the environmental field in IMCOM-Korea and in the Army, meeting every leadership and program management challenge he encounters. He is the driving force behind the successes of the environmental program in USAG Daegu. Through his leadership, the environmental staff and garrison advance environmental stewardship and foster a trusting relationship with the host nation communities. Much of Mr. Chartier’s success can be attributed to his steadfast championing of a risk-based, mission-oriented EMS. His fiscal aptitude ensures funding is prioritized to those areas most likely to impact the environment, the mission and the community. This benefits the garrison as a whole through greater stakeholder involvement and sustainability practices beyond environmental compliance. Additionally, his community involvement leads to a better understanding of the environmental issues affecting the installation and the positive role the Army is taking to sustain resources in the local host community.

Oregon ARNG Camp Withycombe

Environmental Restoration, Installation

INTRODUCTION

Camp Withycombe is an Oregon Military Department installation located near the southern slope of Mount Talbert in Clackamas, Ore. Camp Withycombe was established in 1909 as a 23-acre range and training area for the Oregon National Guard and expanded to 235 acres by 1919. Range use ended in the early 1990s, and all but approximately 77 acres have been transferred to the Oregon Department of Transportation (ODOT) for a highway development project. In preparation, the Oregon Army National Guard (ORARNG) remediated six former small arms firing ranges (SAFR). The implementation of innovative cleanup strategies and green remediation technologies made this project an extraordinary success.

Camp Withycombe is a depot-level maintenance facility for the ORARNG and the site of the Oregon Sustainment Maintenance Site, Readiness Sustainment Site, a Field Maintenance Shop, 41st Infantry Brigade Combat Team Headquarters and the Oregon State Defense Force Headquarters. Camp Withycombe also hosts maneuver exercises for troops and civilian law enforcement. The installation has a population of 40 civilians and 585 military personnel.

The former firing ranges are located in the north-central portion of the property. Much of the site is flat-lying land, except for the lower, southern slopes of Mount Talbert, which rise to a peak elevation of approximately 750 feet above sea level. The south sloping hillside, which was the backstop for the former ranges, is relatively undisturbed native forest which provides a high-quality ecological habitat for many species. The flat-lying portion, which is largely undisturbed grassland and low-quality habitat, is the future location of the highway's right-of-way.

JUDGING CRITERIA

-  Program Management
-  Orientation to Mission
-  Technical Merit
-  Transferability
-  Stakeholder Interaction

On this page: Camp Withycombe is the site of maneuver training exercises for troops and civilian law enforcement. (U.S. Army photo)

BACKGROUND & PROGRAM SUMMARY

Environmental restoration at Camp Withycombe is managed by the Environmental Restoration Program of the Oregon Military Department's Environmental Branch, located at the Joint Forces Headquarters of the Oregon National Guard in Salem, Ore.

The Restoration Program is responsible for matters related to environmental condition of property, environmental baseline studies, compliance-related cleanup, military range assessments and proposed/pending real estate actions for 12 installations and 44 fixed facilities in Oregon. The Restoration Program staff is committed to streamlining and fast-tracking cleanup processes, exemplifying environmental stewardship, reducing risks to human health and the environment and improving partnerships between the Department of Defense (DoD) and other agencies.

The Camp Withycombe cleanup project was executed by an experienced team of 24 technical experts and field personnel, comprised of scientists, engineers, contracting partners and equipment operators. The project was supported by other program managers in the Environmental Branch, which provided National Environmental Policy Act, cultural resources, natural resources and contract support. The Oregon Department of Environmental Quality (DEQ) regulatory personnel included a project manager and a hydrogeologist.

The ORARNG Restoration Manager worked in coordination with the Oregon DEQ, ODOT and other stakeholders to develop and execute an approach to remove lead-contaminated soil from the former SAFR and took the following actions to mitigate challenges:

- Managed the workflow and excavation sequence on a continuing basis to ensure the remedial action phase was completed prior to the rainy winter season. The team operated on a compressed schedule, July through September, to excavate and treat nearly 30,000 tons of soil located on 12 acres.
- Integrated technologies and logistics so remedial actions, equipment locations and truck routes would not adversely impact Camp Withycombe's maintenance operations and training missions.
- Ensured unexploded ordnance technicians were on site to reduce the risk posed by munitions potentially presenting an explosives hazard and coordinated notifications and actions with all related stakeholders.
- Designed an innovative soil treatment system which allows for variability of soil types and bullet density in the soil. The soil types encountered in the excavation area, located at the base of a volcanic hillside, included clay, sand, a mix of cobbles and organic matter. The types of bullets varied from range to range and included .22- to .50-caliber bullets.
- Conducted treatability studies to prove the efficacy of implementing the soil treatment system. Regulatory stakeholders were initially reluctant to support the technologies proposed, but studies were convincing, and given the project's success, regulatory stakeholders are now more receptive to green remediation solutions.

With highway construction set to begin in 2012, the ORARNG designed a sustainable cleanup for completion by 2011. Primary project milestones include: Remedial Investigation, 2008; Feasibility Study, 2008; Remedial Design, 2008; Decision Document–Record of Decision (ROD), 2008; Interim Remedial Action, 2008; Remedial Action, 2009; and Long-Term Monitoring, 2011. All milestones were completed on schedule, and long-term monitoring is on track for completion in 2011.



The multi-stage soil treatment process included a closed-loop water treatment system, allowing all process water to be reused.



All plans required by Army Regulation 200-1, ORARNGR 200-1, Oregon DEQ, Oregon Water Resources Department, Oregon Division of State Lands, Oregon Occupational Safety and Health Administration, Oregon State Historic Preservation Office, Clackamas County and the U.S. Fish and Wildlife Service were prepared and kept up-to-date.

The Camp Withycombe range restoration project effectively integrated all compliance and programmatic environmental Management Systems, as demonstrated by a “positive” Army External Compliance Audit System finding in November 2008. All Army compliance-related cleanup data calls, programming and execution requirements were completed on time and on schedule.

ACCOMPLISHMENTS

Accelerated Environmental Cleanup

The ORARNG used a combination of processes to remediate the contaminated soil: dry particle separation to segregate the size fraction containing the bullets, removing large stones and organic material and removing finer material; wet gravity separation to remove bullets and particulate lead and use of a phosphate amendment to prevent leaching of residual lead. The soil treatment process reduced the need for soil removal and transport to a hazardous waste disposal site using the traditional dig-and-haul approach. This process saved time, reduced fuel costs and eliminated emissions. As a result, the 12-acre restoration project was completed in less than six months, well in advance of ODOT timelines. Approximately 30,000 tons of contaminated soil were remediated, and only 130 tons required transport and disposal at a hazardous waste landfill.



“The ORARNG has successfully blended an efficient and innovative environmental restoration program with a concurrent emphasis on principles of sustainability, green remediation and mission support. The techniques used are of particular value to the Army and DoD environmental restoration programs in that they are simple in approach and directly transferable to other sites undergoing range cleanup of small arms ammunition.”

- Ray Fatz, President and CEO, Plexus Scientific Corp.

The restoration project accomplished all milestones by integrating green remediation technologies into project planning and incorporating regulatory stakeholders into the management system. This resulted in increased cooperation, streamlined regulatory reviews, shortened milestone timelines and saved more than \$5 million over traditional hazardous waste disposal-based remediation. This also ensured the restoration is fully compliant with environmental regulations and responds to every aspect of environmental stewardship and sustainability beyond the immediate remediation.

Innovative Technology Demonstration/Validation and Implementation

The Camp Withycombe range restoration project demonstrated readily available processing equipment from the gravel and rock mining, pulp and paper, and water treatment industries can be repurposed and engineered into a green remediation system capable of reducing the toxicity of lead-impacted soil sufficiently to render it non-hazardous. The approach is scalable to address varying project sizes and easily modified to address site-specific soil conditions and cleanup levels. As with this project, soil sampling and on-site testing can be used to track the percentage of contaminant reduction and validate the effectiveness of the soil treatment system so process adjustments can be made.



The gravity separation process shown here utilized recovered gold-placer mining equipment to remove the bullets.

The ORARNG Restoration Manager is actively transferring this knowledge through technical presentations at the 2008 and 2009 ARNG National Workshops, the Society of American Military Engineers, the ODOT 2009 Environmental Conference, the Northwest Environmental Business Council and the Portland State University Urban Ecology Research Consortium. He is also consulting with the Arizona ARNG and ODOT to modify these technologies for their projects. The manager also provided the Fort Lewis Department of Public Works with the Camp Withycombe range project ecological risk assessment details for evaluating risk associated with particulate lead in bullets, including the technical approach, relevant journal articles and supporting U.S. Environmental Protection Agency documents.



Partnerships Addressing Environmental Restoration Issues Between DoD and Other Entities

From the beginning, the ORARNG began engaging with the Oregon DEQ, ODOT, local government, the National Guard Bureau, the ORARNG tenants and the affected community to conduct advanced project planning, scoping and outreach.

The Restoration Manager provided regular updates to internal stakeholders, working closely with the garrison commander and updating him daily or weekly, as needed, regarding the restoration's progress. Weekly updates were also provided to the Environmental Program Manager, Funds Manager/U.S. Property and Fiscal Officer, Real Property Manager/Planner, Director of Installations and the ORARNG Adjutant General. Even now, personnel in the chain of command and the Army Compliance-Related Cleanup program are routinely updated on the long-term monitoring phase.



The success of this restoration project built further equity for the ORARNG with state environmental agencies and community stakeholders. By supporting the ODOT highway project, coordinating with the DEQ and restoring this land to a natural state, the ORARNG cemented its reputation as a responsible steward of the land, a reputation which will support future training developments, conservation efforts and restoration projects. As just one example of outside acknowledgment, the project's sustainability

and stewardship success received national recognition by a speech delivered on the floor of Congress by U.S. Representative Earl Blumenauer on 10 June 2008.

Restoration Advisory Boards (RAB)

Although a formal RAB was not needed for this project, the extensive engagement with all stakeholders provided the same benefits. There was a Freeway Corridor Committee consisting of ODOT, Oregon DEQ, ORARNG personnel, local businesses and public representatives. The ORARNG and restoration staff provided regular updates to this group and distributed press releases for public information. Internal and external ORARNG project meetings and one open house were conducted to discuss breadth of lead impacts, future beneficial uses, appropriate cleanup levels and benefits of green remediation technologies. Encouraging open dialogue between stakeholders resulted in the identification of critical paths/schedules, focused and accelerated project studies, reduced regulatory review times and cost savings. The Corrective Action Program and ROD, for example, were achieved in only 30 days. As another example, open dialogue with internal stakeholders identified the future beneficial use of treated soil as structural fill in the Armed Forces Reserve Center Military Construction project, resulting in savings of \$378,400.



ORARNG Restoration Program and Public Affairs office staff hosted a public outreach event to demonstrate the soil treatment system. The event



ORARNG Restoration Manager Jim Arnold was interviewed by the local NBC affiliate during a media event.

resulted in live radio and television broadcasts and a special environmental feature on the local NBC affiliate's 24-hour news channel. Such open engagement demonstrates transparency and reinforces the ORARNG's reputation as an excellent environmental steward.

Opportunities for Small and Small Disadvantaged Businesses in Environmental Restoration

In an effort to increase opportunities for small and small disadvantaged businesses, ORARNG selected a technical partner for the project which has an active Small Business Contracting Plan and Small Business Program Policy. These programs and policies actively sought, identified and included small businesses in the Camp Withycombe range restoration project. As a result, 22 percent of the work on the project was performed by eight small businesses, accounting for \$1.54 million. Of the dozen people working on site for the duration of the project, five of those workers were small business contractors. These businesses performed earthwork, trucking, laboratory testing and the reforestation of the post-target impact areas at the conclusion of the remedial action phase.

Reducing Risk to Human Health and the Environment

Results from human and ecological risk assessments were used to develop site-specific cleanup levels. The soil treatment system was designed to reduce lead concentrations below 400 milligrams per kilogram (mg/kg) for reuse in public areas or below 800 mg/kg for reuse as construction backfill on the Camp Withycombe post. Removing soil with lead concentrations greater than 400 mg/kg from the former ranges eliminated human and ecological risks.



The project team employed various methods to reduce risk:

- Quiet pack generators reduced the noise from the soil treatment plant.
- Soil piles were kept damp by spray trucks and kept covered, and transport roads were sprayed with water to minimize dust.
- Low-sulfur fuels minimized atmospheric pollutants from heavy equipment.
- The use of passive energy technology, such as chemical stabilization for “finishing steps,” minimized soil and habitat disturbance.
- Hydroseeding with native grass species, applying biodegradable geotextile materials and irrigating with water recycled from the soil treatment system facilitated erosion control.
- Risk to the environment was reduced by avoiding transporting 30,000 tons of contaminated soil 120 miles through a National Scenic Area to a hazardous waste landfill.

Green Remediation

ORARNG implemented a strategy to integrate Army sustainability initiatives as a foundational component of the project. The goals included fostering a sustainability ethic, strengthening Army operations, meeting mission requirements, minimizing impacts and total ownership costs, driving innovation, enhancing well-being and facilitating



Mulch was applied to cleared lands to encourage revegetation.

the transferability of technology. The planning, development and execution of each project phase were compared to these goals to ensure their integration and implementation. Early communication with the project stakeholders fostered a collaborative effort which built a sense of ownership and equity in the project, allowing for leveraging of partnerships in later project phases and successful implementation of the sustainability goals.

Green remediation technologies implemented on this project set it apart from other traditional cleanup actions and saved more than \$5 million. Cost-saving efforts (as well as recycling revenue) made these funds available for Soldier readiness and training. Beyond that direct mission benefit, the Camp Withycombe project demonstrates green remediation technologies are effective, transferable and readily implemented. In addition, the project demonstrates Army leadership in environmental stewardship and sustainability.

The ORARNG successfully applied and integrated green remediation technologies to the project objectives, as shown in the table at right.



Habitat reconstruction began during the restoration phase. Hydroseeding with native grass species, applying biodegradable geotextile materials, and irrigating with water recycled from the soil treatment system facilitated erosion control and laid the groundwork for this area's future use as hiking and biking trails.

Project Objectives	Green Remediation
Removal of soil containing bullets and lead presenting a risk	<ul style="list-style-type: none"> Approximately 30,000 tons of contaminated soil were excavated and remediated on site, eliminating the need for trucking and disposal as a hazardous waste at a cost savings of more than \$5 million. Soil sampling and on-site testing validated reduction in contaminants and allowed staff to immediately adjust the soil treatment system.
Demolition of buildings/concrete walls	<ul style="list-style-type: none"> More than 62 tons of scrap steel was recycled from the demolition of former range structures. All concrete was trucked to a concrete recycling facility near Camp Withycombe.
Clearing/grubbing of range areas (approximately 12 acres)	<ul style="list-style-type: none"> Trees removed from the project area were donated to the Oregon Department of Fish and Wildlife for a salmon bearing stream restoration project and to the Clackamas County School District for an outdoor education program.
On-site soil treatment and lead removal	<ul style="list-style-type: none"> The soil treatment process made the former range soil reusable, thereby avoiding the disposal of contaminated soil in a hazardous waste landfill. More than 1,480 truck trips through the Columbia River Gorge National Scenic Area to the landfill were eliminated, preventing 355,200 miles traveled and consumption of 83,000 gallons of diesel fuel, at a cost avoidance of approximately \$415,000. Particulate and greenhouse gas emissions were eliminated including 914 pounds of particulate matter, 1,859,200 pounds of carbon dioxide (CO₂), 141,605 pounds of carbon monoxide (CO), 36,543 pounds of nitrous oxide (N₂O) and 1,672 pounds of sulphur oxide (SO_x).
Dry particle separation, wet gravity separation, and stabilization	<ul style="list-style-type: none"> Combining soil treatment processes was an innovative approach, because the three processes are not commonly combined. Transferable and scalable, the ORARNG is actively briefing public and private sectors.
Recycling of lead bullets	<ul style="list-style-type: none"> Approximately 300 tons of bullets were recovered for recycling. Bullets were collected in reused, one-ton capacity sugar sacks.
Reuse of treated soil as construction fill	<ul style="list-style-type: none"> Remediation of 4,400 tons of soil for reuse as structural fill at a new Armed Forces Reserve Center project saved an estimated \$150,000.
Reuse of treated soil for regrading of excavation areas on affected Mount Talbert hill slope	<ul style="list-style-type: none"> Treatment of 6,700 tons of soil and other material to levels suitable for use in the reforestation phase resulted in savings of approximately \$228,400 for purchased fill and reduction of 335 truck trips for fill transport.
Planting of native vegetation and restoration of wetlands	<ul style="list-style-type: none"> Elimination of invasive species laid groundwork for habitat reconstruction. Reuse of more than 100 trees created native habitat during natural resources restoration. More than 60,000 gallons of system process water was treated and reused for irrigation and hydroseed application.

CONCLUSION

The ORARNG's environmental restoration of the former SAFR at Camp Withycombe serves as an excellent example of innovative thinking, comprehensive planning, green remediation solutions and successful partnering with its stakeholders, to include regulatory agencies, ODOT, installation personnel and the community of Clackamas, Ore. The ORARNG restoration focused on the 12-acre post-target impact area and successfully remediated approximately 99.6 percent of the 30,000 tons of contaminated soil, at

a cost avoidance of more than \$5 million and well in advance of ODOT timelines. With measurable results, the Camp Withycombe project demonstrates sustainability can be integrated into remediation projects. The innovative solutions applied to this project are scalable and easily modified to address site-specific soil conditions and cleanup levels at other locations. The ORARNG is sharing this knowledge so that others can adapt and use these technologies – a further demonstration of its environmental stewardship.

“The ORARNG environmental restoration program is an excellent example of a cleanup that considered green technologies for virtually every aspect of the project to conserve and protect environmental resources.”

- Dennis Druck, U.S. Army Center for Health Promotion and Preventive Medicine



Nearly 300 tons of bullets were reclaimed for recycling and collected in reused, one-ton capacity sugar sacks.

FY 2009 Secretary of Defense Environmental Awards

USACE, Alaska District, Tanaga Island and Ogliuga Island Formerly Used Defense Site Environmental Restoration, Team

INTRODUCTION

The Defense Environmental Restoration Program (DERP) Formerly Used Defense Sites (FUDS) program is responsible for the cleanup of environmental contamination released during the operation of historic military facilities. The U.S. Army Corps of Engineers (USACE) Alaska District is responsible for addressing more than 526 FUDS properties located within the state of Alaska. Alaskan FUDS projects present unique challenges due to both their complex site conditions and difficult logistics. In order to successfully investigate and remediate these extremely remote sites, the people at the Alaska District are continually searching for better ways to execute project investigations and cleanups.

On this page: Will Mangano (left) and Jacob Sweet (right), USACE-AK, operate the Ultra-Violet Optical Screening Tool (UVOST®) and Geoprobe™ drill rig on Tanaga Island. (USACE photo)

JUDGING CRITERIA



Program Management



Orientation to Mission



Technical Merit



Transferability



Stakeholder Interaction

SUSTAINING THE ENVIRONMENT FOR A SECURE FUTURE

BACKGROUND

Tanaga and Ogliuga Islands are both uninhabited and located in the Aleutian Islands Chain of western Alaska, approximately 65 miles southwest of Adak and 1,350 miles southwest of Anchorage. Tanaga and Ogliuga Islands are part of the Alaska Maritime National Wildlife Refuge administered by the U.S. Fish and Wildlife Service (USFWS). The nearest community to the islands is Adak, a former Naval installation, with a population of 178. Portions of both islands are designated as wilderness areas. Both islands are characterized by a maritime climate with frequent fog, high winds and rain. Features on Tanaga Island include waist-high grass and brush covered rolling hills, rugged coastlines and the very prominent Tanaga Volcano (which last erupted in 1914). The Tanaga project had 13 different investigation areas; Ogliuga had three areas of concern. The focus of the remedial project was to identify the presence of environmental contaminants, unexploded ordnance and buried munitions dating back to World War II.

Tanaga Island, approximately 128,000 acres, was established in July 1943 as a U.S. Navy auxiliary station to the Adak Naval Operating Base and operated until 1945. Facilities constructed by Navy Seabees included a 200 x 5,000-foot steel-mat runway, living quarters for 720 people, a pier, mooring area, hardstands, office and storage buildings, airway radio communications, galley and mess facilities, a dispensary, gravel roads and utilities. Ogliuga Island, approximately 2,300 acres, was the location of an Army emergency landing field from 1943 to 1945. The facilities were constructed by the Navy Seabees and consisted of a 100 x 3,000-foot steel-mat runway, an aircraft parking area and Quonset huts for living quarters. Additional facilities included Aircraft Warning Service radar and radio communications.

The USACE Alaska District executed three concurrent remedial investigations at FUDS on Tanaga Island and Ogliuga Island, Alaska. Travel from Anchorage to Adak involves a four hour commercial flight; travel from Adak to the Islands is another hour by helicopter or up to 12 hours by boat, and travel between the islands takes approximately 40 minutes by helicopter.

Environmental Restoration, Team

U.S. Army Corps of Engineers, Alaska District, Tanaga Island and Ogliuga Island Formerly Used Defense Site

Team Member	Title/Position
USACE, Alaska District	
Kenneth Andraschko	Alaska FUDS Program Manager
Richard Ragle	Project Manager
Neil Folcik	Project Engineer
Will Mangano	Project Engineer
Scott Kendall	Project Engineer
Jacob Sweet	Project Chemist
Sean Benjamin	Project Chemist
Michael MacMillan	Department of the Army Intern
Robert Glascott	Geologist
Aaron Wilson	Archaeologist
Christopher Floyd	Biologist
Lisa Geist	Environmental Scientist
Michael Boese	Chemist
Kelly Davis	Program Analyst
Nancy Patterson	Program and Reports Specialist
Greg Vanagel	Assistant District Counsel
Anita Dale	Contracting Officer
Ernie Woods	Contracting Specialist
Mary Abbott	Contracting Officer
Brad Leavitt	Purchasing Agent
Sheri DellaSilva	Contracting Specialist
Lisa Cunningham	Real Estate Specialist
USACE - Huntsville Design Center	
Dorothy Richards	MMRP Project Manager
Debra Edwards	Geophysicist
Mike D'Auben	MMRP Chemist
John Zimmer	Ordnance & Explosive Safety Specialist
Michael Gooding	Civil Engineer
AECOM, Inc.	
Mike Jones	Task Order Manager / HTRW Project Manager
Bjorn Bjorkman	Field Manager / Lead HTRW Technical Specialist
Rick Swahn	MMRP Project Manager
Other Major Contractors	
Steve Adamak	Dakota Technologies, UVOST Co-Developer
Justin Rucker	Hammer Environmental – Driller

POSITION DESCRIPTION

The project team included a broad range of cross-functional and technical experts including an archaeologist; a biologist; chemists; environmental engineers and scientists; a geophysicist; civil engineers; contract officers and specialists; an ordnance/explosive safety specialist; Hazardous, Toxic and Radioactive Waste (HTRW) specialist and many others. More than 20 personnel were involved from the Alaska District, and five team members from the Huntsville Design Center supported Military Munitions Response Program (MMRP) activities. One large business was contracted to provide overall management, planning, logistics and investigation support. Two major companies were also contracted to provide technology and drilling services, and more than a dozen subcontractors and vendors provided on-site field support including communications, waste and wastewater systems, heavy equipment, and ground, air, tug and barge transportation. Fourteen of these contractors were small businesses.



The Alaska District worked closely with the contractor team to develop comprehensive plans which guided the complex field efforts. These plans addressed the challenges of working at a site with no local services such as roads, emergency response, lodging and food. Resources were mobilized to the site using a helicopter, an Adak-based crab boat, and a tug and barge. Transporting more than 1 million pounds of equipment and supplies and 101,500 gallons of

“The Alaska District FUDS Team is to be commended for an extremely efficient use of resources and organization in the successful and concurrent accomplishment of two hazardous substances and one munitions response project on the Tanaga and Ogliuga Islands off the Aleutian Islands in Alaska in 2009. This team effort was able to overcome significant logistical challenges, use innovative technology for contamination screening and save the Army over \$5 million in mobilization costs with an effective restoration product that will be directly transferable to other environmental restoration efforts in Alaska.”

- Ray Fatz, President and CEO, Plexus Scientific Corp.

fuel 1,350 miles and maintaining a 40-person field camp for approximately five weeks required immense coordination between all persons involved. Adjusting travel and work schedules to deal with the adverse weather conditions during July and August 2009 was a constant challenge and required continual changes in contracting, especially for transport vendors.



A remote field camp set up in Lash Bay, Tanaga Island, supported concurrent investigations. All needed project equipment came in on a tug and barge.

AWARDS AND SERVICES

The Project team received the following awards and special recognitions over the past year:

- The Project Engineer, Neil Folcik, was selected as the Alaska District's 3rd Quarter Outstanding Engineer/Scientist, GS-12 through GS-15.
- The entire Tanaga Island FUDS Team was selected as the Alaska District's 4th Quarter Outstanding Team.

The primary contractor on the project won the 2009 Alaska District Celebrate Safety Award for Contractor of the Year. This competition recognizes those contractors who demonstrate the highest standards of safety and accident prevention while executing their contract work supporting the Alaska District's mission of approximately \$500 million dollars of work annually. This was the first time that an environmental remedial investigation project was selected for this award.

ACCOMPLISHMENTS

Accelerated Environmental Cleanup

The Project Team was tasked with the mission of implementing the FUDS program for Tanaga and Ogliuga Islands. The DERP goals were to reduce risk to human health and the environment through implementation of effective, legally compliant and cost-effective response actions. The FUDS program requires projects to progress to various stages by specific dates (i.e., milestones).

To achieve these DERP goals and FUDS requirements, the Tanaga and Ogliuga Islands Team managed and implemented three separate projects simultaneously:

- HTRW project on Tanaga Island
- HTRW project on Ogliuga Island
- MMRP project on Tanaga Island to identify and investigate areas with potential munitions and explosives of concern (MEC) or munitions constituents (MC)

The team designed a complete remedial investigation (RI) and feasibility study focused on delineating the presence of environmental contaminants, unexploded ordnance and buried munitions dating back to World War II. The planning stage involved preparation of detailed, comprehensive plans to

implement a logistically complex field effort on these two remote uninhabited islands; ensure site safety; perform soil, water and sediment sampling and testing; assess site risks; and evaluate cleanup alternatives. A concurrent effort used geophysics to evaluate and delineate potential munitions areas over difficult and obstructed terrain, resulting in the collection of 81 miles of transect data.



Many collapsed historical structures remain on Tanaga Island. The building remnants allowed the field teams to verify identified contaminant sources.



The team worked diligently to implement cost-saving measures and project efficiencies during development of the collaborative field investigation. This effort included:

- Upfront and proactive identification of potential logistical problems and planning appropriate contingency actions to overcome challenges posed by the remote sites.
- Compliance with regulations and stringent special use permit (SUP) requirements using innovative approaches to project challenges.
- Scheduling the three projects so only one mobilization was required and building a unified team to implement the three projects, including multiple contractors, common work plans, sharing of resources, and sequencing field work to maximize data gathered, minimize risk and avoid any remobilization to recollect data.
- Use of real-time field screening techniques to identify and fully delineate petroleum contamination during the field effort.



As a result, achieving multiple project goals in one field season and fully characterizing the sites during the first RI trip to the islands accelerated the project time to completion. The HTRW projects were executed three to five years ahead of plan, and the MMRP project was executed more than 10 years ahead of plan. Future liabilities and costs have been reduced, because areas with no contaminants or unacceptable risks were identified. Reducing the number of locations requiring further action allowed the FUDS program to plan a well-defined site remedial action. Additionally, the cost savings and other efficiencies accelerated progress to site remediation.

Innovative Technology Demonstration/Validation and Implementation

Several innovative technologies, including the Ultra-Violet Optical Screening Tool (UVOST®), portable X-Ray Fluorescence (XRF) analysis and Dart System were employed at Tanaga. The challenge of using these technologies was amplified by the remoteness of the site. Due to the remoteness of Tanaga's location, the team evaluated how all field work would be completed without any outside support. This was a challenge because all previously investigated sites with the UVOST® technology have been located on a road system or had nearby towns with regularly scheduled flights.

The Alaska District uses UVOST® to delineate petroleum contamination across the state. UVOST® uses laser-induced fluorescence to identify the presence of petroleum, displaying real-time results on a computer screen. These results provided an accurate view of the location of petroleum in the subsurface, allowing for optimal placement of soil borings and monitoring wells. Additionally, by using UVOST®, the FUDS team was able to investigate 250 percent of the anticipated daily sites, significantly reducing costs for transportation and fuel and greatly reducing the time needed for the investigations. The portable XRF system allowed on-site screening for metal (i.e., lead) contamination associated with batteries and other sources. The XRF sample results were then used to guide collection of samples sent for off-site laboratory analysis. The Dart System quickly screened for polycyclic aromatic hydrocarbons and polychlorinated biphenyls, and was deployed in



Will Mangano, USACE, operating the UVOST® innovative technology. Laser-induced fluorescence is detected by the oscilloscope, which then displays the results on a nearby computer screen in real-time.

sediments, soft soils and beaches where UVOST®, traditional borings and other sampling techniques were difficult to conduct or not allowed by the SUP.

Partnerships Addressing Environmental Restoration Issues Between DoD and Other Entities

Early in the planning process, the USACE Alaska District realized the multiple phases of the project mandated a unique approach. The lessons learned and changes initiated from combining these projects have been developed into a program management model which will be followed on other remote Aleutian Island projects facing similar coordination and logistical challenges. This approach allows more data to be collected during a field season and saves money by making the most of the mobilization expense, which accounts for a significant portion of the project cost.



The Alaska District FUDS Program has more than 20 other Aleutian Island sites to address in future years. Because of the extremely high site mobilization costs, initial investigations must be as efficient and maximized as possible to limit future cost growths

and achieve program objectives in a reasonable timeframe. The relationships established with the USFWS, the Alaska Department of Environmental Conservation and State Historic Preservation Office are critical to future success in implementing investigations and cleanups in the Aleutians. The trust earned by the team in achieving anticipated outcomes ensures expectations can be met and understood when working at new and sensitive remote locations.

The team solved logistical challenges directly applicable to future work in the Aleutians. Site access required obtaining a SUP from the landowner, USFWS. Operations were restricted based on land use, critical habitat for threatened/endangered species (i.e., seals, otters and Steller's eiders), archeological sites and designated wilderness areas. The field team ensured compliance with the SUP through daily safety briefings, a greatly minimized camp footprint, the restricted use of heavy equipment and use of tracked utility vehicles to protect the fragile tundra environment. The operation of motorized equipment required significant coordination and evaluation by the USFWS. Motorized vehicles were not authorized for use in the wilderness areas of Ogliuga Island, which required field teams to travel by foot from the beach to each sampling location. Due to bird nesting, the field work could start no earlier than 15 July.



“The logistics for accomplishing these activities are quite extraordinary considering that the cleanups were conducted in a very sensitive and fragile natural environment at geographically remote sites.”

- Dennis Druck, U.S. Army Center for Health Promotion and Preventive Medicine

The Tanaga Island FUDS project investigation approach was also very unique in that a portion of the HTRW remedial investigation was conducted using in-house USACE resources (two USACE-owned and -operated UVOST® units) in conjunction with the contractor. USACE personnel shared the UVOST® results with the prime contractor daily, allowing them to target additional sample



collection and installation of monitoring wells at sites with identified fuel contamination. This interaction between the government and the contractor permitted more efficient use of resources on site and resulted in complete investigations of each area.

Proactive planning, active regulatory agency and landowner involvement, and acceptance of fresh ideas have consistently enhanced the performance of the team. For a team to perform two HTRW and one MMRP RIs in a single field season on two remote islands in the Aleutian Chain is an incredible effort. Implementing these projects simultaneously saved the FUDS program more than \$5.2 million in mobilization/demobilization costs alone. Additional future cost savings and avoidances of \$5 – \$15 million can now be realized with an opportunity to combine the remedial action phases of these sites. The accurate and real-time data that the UVOST® provided minimizes subsurface surprises and data gaps.

Restoration Advisory Boards (RAB)

Because the Tanaga and Ogliuga Islands are uninhabited, there is no standing RAB. The nearest community at Adak is 65 miles away, and there has been no public interest expressed in forming a RAB. However, the FUDS project team has engaged the public in their Technical Project Planning Meetings. Public notices were sent to the local communities and the Aleutian Pribilof Islands Association during the public review period of the environmental assessment and finding of no significant impact.



Opportunities for Small and Small Disadvantaged Businesses in Environmental Restoration

Fourteen of the 17 contractors used on the FUDS project were small businesses, including:

- North Wind, Inc. – HTRW Tech Support
- Brice Marine LLC – Barge Transport
- Air Logistics – Helicopter Services
- Alaska Mariner – Marine Transport
- Taiga Ventures – Field Camp
- Tester Drilling – Auger/Direct Push Drilling
- Beacon Occupational – Field Medic
- Bristol Environmental – Explosives Management
- Aleut Corporation – Vessel/Fuel/Lodging
- Dakota Technologies – UVOST® support

- Hammer Environmental – Direct Push Drilling
- Inlet Petroleum – Fuel
- Surveyors Exchange – Sat. phones and Internet
- TTT Environmental Instruments – Sampling supplies and equipment

Reducing Risk to Human Health and the Environment

All of the known containerized wastes were removed from the site during 2007. The 2009 field effort was undertaken to define the nature and extent of prior releases, it also resulted in locating several batteries and a transformer that had been missed previously. In addition, a mercury switch was removed during the 2009 field season.



Reduction of risk to human health and the environment was realized by scheduling three projects to be performed during a single mobilization. Round trip travel by barge took approximately 20 days, and round trip travel by helicopter, when weather permitted, took six days. Field staff exposure due to travel was also significantly reduced by having a single mobilization. The combined project data will be thoroughly evaluated and risks can be mitigated during a future single removal action.



Field operations were significantly impacted by collapsed bridges, adverse weather and large amounts of scattered debris, requiring a helicopter to sling-load vehicles several miles.

The USFWS SUP contained environmental mitigation measures the FUDS team followed while executing the project. These measures included:



- No harassment of marine mammals or birds
- Avoiding dozens of archaeological sites located within the project areas which predate Western contact, early Russian contact and later eras
- Helicopters and tracked/wheeled utility vehicles were permitted in the wilderness area on Tanaga

- No use of motorized equipment in the wilderness area on Ogliuga
- Vessels were required to be rat-free. Tanaga and Ogliuga islands are rat-free, and once rats are established, they decimate the bird populations
- Avoiding sea lions, which are of grave concern to National Marine Fisheries Service
- Vessel and helicopter operations were forbidden when marine mammals were present

Green Remediation

During the course of these FUDS projects, the FUDS team's unique approach to their mission resulted in several benefits for green remediation on the project sites. Executing three projects concurrently saved two additional mobilizations and more than 400,000 gallons of diesel fuel and shows the potential of further savings in future remedial actions. MMRP used towed geophysical instruments instead of human-carried rigs, allowing for three to four times the area to be covered by the same number of staff and reducing the field time by several weeks.



The team's hope is once the project site is remediated, the area can be rejoined with the rest of the island which is currently classified as part of the wilderness area of the refuge and subsistence food-gathering activities can continue without risk.

Also, the USFWS SUP did not allow the clearing of vegetation. During prove out of the geophysical approach, it was quickly discovered the tussocks and high grasses made use of magnetometers difficult. After changes in approach, the operators overcame these difficulties and found 100 percent of the test rounds while remaining compliant with USFWS environmental guidelines.

CONCLUSION

As evidenced by their many accomplishments and achievements, the USACE FUDS Team has demonstrated their excellence in environmental restoration with their use of innovative technologies and inventive cost-saving practices. In the future, other environmental restoration teams will surely be able to employ these same methods in their projects, ensuring no resources are wasted and productivity and safety are maximized thanks to the pioneering efforts of the USACE Alaska District FUDS Team.

Michigan ARNG

Fort Custer Training Center

Natural Resources Conservation, Small Installation

INTRODUCTION

Fort Custer Training Center (FCTC) is a 7,500-acre Michigan Army National Guard (MIARNG) installation which provides trained and ready forces in support of state, local and regional emergencies and in support of the National Military Strategy. FCTC employs 150 military personnel and 74 civilians and trains approximately 160,000 Soldiers annually.

The FCTC Integrated Natural Resource Management Plan (INRMP) covers the entirety of the installation. FCTC has a number of significant natural features which lie nested in a matrix of woodlands, wetlands and remnant prairies covering approximately 7,300 acres. Significant natural features of FCTC include several rare and at-risk communities such as Prairie Fens, oak savanna, oak forests, southern wet meadows, southern hardwood swamps, dry sand prairies and mesic prairies. These communities provide habitat for threatened and endangered species and support many plant alliances.

On this page: U.S. Soldiers from the Michigan Army National Guard exit a simulated Iraqi building after clearing it during a combat training exercise. (DoD photo by Staff Sgt. Helen Miller, U.S. Army)

JUDGING CRITERIA

-  Program Management
-  Orientation to Mission
-  Technical Merit
-  Transferability
-  Stakeholder Interaction

BACKGROUND

FCTC's INRMP was completed and approved in September 2001 and was revised and approved in 2009. Objectives listed in FCTC's INRMP have either been attained or are ongoing activities.

FCTC's Environmental Office is fully staffed and supported by the greater MIARNG Environmental Office at the headquarters. The Environmental Office reports directly to the Michigan Assistant Adjutant General and is part of the command decision-level process team. This decision-level authority was allotted to the office because of its history of excellent environmental and natural resources management programs and its proven provision of a high-quality Soldier training environment.

Staff members participate on a variety of boards and committees for environmental organizations, including Michigan Prescribed Fire Council, National Guard Bureau (NGB) Education and Outreach Committee, NGB Cultural and Natural Environmental Advisory Committees, the Michigan Stewardship Network, Michigan Invasive Plant Council, National Coalition of Prescribed Fire Councils, Kalamazoo River Watershed Council and Technical Working Group, Calhoun Conservation District and the Michigan Association of Conservation Districts and Potawatomi Resource Conservation and Development Council.

ACCOMPLISHMENTS

Overall Natural Resources Conservation Management

The FCTC's Natural Resources (NR) staff is committed to maintaining balance between environmental management requirements and MIARNG mission support. The NR staff is closely integrated with FCTC's Facilities and Engineering, Range Control and Integrated Training Area Management (ITAM) Offices to best coordinate environmental activities with training priorities and construction requirements. A range complex master plan was created jointly between these offices, which meet weekly, and its implementation will help enhance each office's awareness of FCTC's environmental goals.



“I was very impressed with the way the MIARNG balanced the work of managing a diverse natural resource program with excellent coordination with their partners. I liked the emphasis on cost savings and focus on accomplishing work with the installation mission in mind. They have developed an innovative program that includes an emphasis on restoring endangered species, and preserving migratory birds, as well as reaching out to the community and providing outdoor recreation opportunities to the disabled.”

- Laura E. Henze, National Sikes Act Coordinator, USFWS

FCTC recently collaborated with the Michigan Natural Features Inventory to update the installation's planning-level survey, initiated under the first INRMP developed 14 years ago. The survey results confirm an exceptional amount of restoration and enhancement, illustrating the strength of FCTC's natural resources management program. The updated inventory demonstrates approximately 80 percent of Michigan flora and fauna species are present at FCTC, including 14 new species, and all recommendations from the original planning-level survey were fully implemented.

FCTC uses innovative and cooperative management approaches to enhance its conservation program and lower costs. The NR staff looks for ways to partner with other agencies that share the same environmental challenges, meeting these challenges at a lower cost to everyone. In collaboration with The Nature Conservancy (TNC), Southwest Michigan Land Conservancy, Kalamazoo Nature Center, Pierce Cedar Creek Institute and Western Michigan University, FCTC formed the Great Lakes Ecological Management Team to provide field crew support for invasive species control activities. The team conducts work within the partnership for much less than the cost of hiring a private contractor, making state-of-the-art invasive species management techniques available to FCTC and other organizations throughout the state.



The NR staff actively manages current and future environmental challenges. FCTC is aware there may be imminent impacts on individual species, communities and ecosystems due to climate change. To that end, NR Specialist Michele Richards serves as a Michigan Climate Policy Fellow, making climate change policy recommendations to state and local governments, businesses and other stakeholders to help mitigate anticipated effects of global climate change. She also stays current on climate change topics by participating in technical working groups for all of the endangered species for which FCTC has suitable habitat, including the Karner Blue and Mitchell's Satyr butterflies, the Eastern Massasauga Rattlesnake, the Indiana Bat and the Cerulean Warbler.

Mission Enhancement

The FCTC's Environmental Office supports the installation and the MIARNG mission in a number of ways. The NR staff directly manages range and training land to the benefit of the Soldier through the use of prescribed fire and forest restoration and indirectly provides technical Geographic Information System (GIS) and Global Positioning System (GPS) support to Range Control and the Facilities and Engineering Office. These offices use GIS and GPS to map ranges and range features for use in future planning and to comply with installation status reporting requirements.

Prescribed fire is a critical tool used by FCTC to enhance Soldier training by increasing visibility and maneuverability in training areas. Prescribed fire also reduces the likelihood of wildfires, as well as the spread of wildfires, due to range usage and training activities. FCTC's forest restoration activities, particularly understory restoration and management, make land navigation and bivouac training exercises far more practical, increasing the success of Soldier training in these areas. FCTC also works to enhance and expand habitat on the installation, including wetlands expansion. This creates an abundance of pristine communities which could provide mitigation credit if necessary training expansion leads to environmental impacts in the future.



Land Use Management

Land management activities at FCTC intentionally improve vegetation on training lands, protect and conserve native plants, restore ecologically unique areas and reduce re-vegetation and long-term land maintenance costs.

Soil erosion and sedimentation control Best Management Practices (BMP) are aggressively implemented for construction activities, eliminating more than 90 tons of sediment deposition in installation wetlands annually. These BMPs include silt fencing, the use of geo-textile grids and fiber mats on slopes and deliberate land contouring. FCTC also uses a number of stormwater management techniques to control erosion and sedimentation, including sediment traps in individual stormwater inlets, diversion channels for roadside ditches, stormwater retention ponds and vegetated trail ditches planted with native species for soil stabilization.



The FCTC ITAM re-vegetation program maintains and improves vegetation on training and range lands using native species. FCTC's NR staff collects native plant seeds from the installation's flora and grows the collected seeds into plugs in partnership with Natural Resources Conservation Service (NRCS) - Rose Lake Plant Materials Center. Plugs grown by FCTC were planted on 170 acres of the Convoy Reaction Course training range, providing necessary erosion and dust control.



FCTC's ITAM revegetation program consists of collecting native plant seeds from installation flora to maintain vegetation genotypes native and true to the region. In partnership with the NRCS, the collected seeds are grown into plugs and then replanted on training ranges and throughout the installation to repair impact damage, control erosion and maintain native species health.

Partnering with Native Connections, FCTC also began forb seed collection and propagation. These seeds and the resulting seedlings are used to restore prairies, increase grass cover for erosion control and repair trails. The seed collection plots yield around 40 20-pound bags of grass seed each year, which represents an avoided seed purchase cost of approximately \$10,000 to \$12,000 annually. A combination of volunteer and paid labor to harvest the seed results in an additional \$2,000 to \$4,000 in savings every year.



This will provide unique and special forest areas for decades to come.

In addition to this cost savings, FCTC also received nearly \$20,000 from U.S. Fish and Wildlife Service (USFWS) to seed more than 40 acres of FCTC's Convoy Reaction Course with native species prairie flora.

Forest Management

FCTC manages forest restoration programs and maintains an extensive prescribed fire program. Restoration work includes managing the canopy density to the liking of birds that require a particular amount of cover and managing the understory to assist ground and shrub nesting birds. Managing in this way also removes thick and thorny understory growth for the benefit of the Soldier, making land navigation and bivouac training exercises far more successful and feasible.

Prescribed fire is an extremely valuable management tool benefitting the ecological health of prairies and forests on FCTC and one that the NR staff has worked diligently to master. The NR staff completed required training to conduct burns independently, which is a major cost saving initiative. Building off of the U.S. Forest Service - FireMon program, FCTC also developed its own fire monitoring program in 2008 to track fuel loads and habitat effects for forest and prairie regeneration and invasive species control. The NR staff hires members of the Great Lakes Ecological Management Team at low rates to serve as a fire team. This year, 3,700 acres were managed with fire, a record for FCTC, making it one of the top three entities in Michigan for fire management.



Each year FCTC participates in National Public Lands Day, conducting urban reforestation projects as part of the event. NR staff plant trees around barracks and buildings in the cantonment area. The trees have two major benefits, aiding in force protection by making access to the buildings by anything but foot traffic more difficult and growing to improve energy efficiency by providing the buildings with shade to the south and cover to the north.



The Army Corps of Engineers conducts timber harvesting for FCTC. However, in the past, timber harvesting operations have caused damage to the forest ecosystem. FCTC is now working to strengthen its timber harvest regulations and conducting research to help identify low-impact timber harvest techniques designed for the eastern forest types found on the installation.

Fish and Wildlife

FCTC's restoration programs, especially wetlands and prairie restoration, provide habitat for a number of ecologically important species, including the Indiana Bat, the Cerulean and Hooded Warblers, and the Eastern Box Turtle. FCTC restored the natural hydrology of a 45-acre wetland site in partnership with Ducks Unlimited, USFWS, Potowatomi Resource Conservation and Development Council, and Kellogg Biological Station. This additional wetland area offers a reserve of wetland acreage if other wetlands on the installation are ever impacted due to training requirements. Expanding the wetlands also creates additional habitat for the Mitchell's Satyr Butterfly.



Ecosystem management using prescribed fire not only improves habitat quality, but also improves training land viability and accessibility for Soldiers. 2009 was a record year for FCTC, in which a total of 3,700 acres were managed with fire and a new fire training program was implemented.

Prescribed fire is used to restore vegetation in Prairie Fen communities at FCTC. The Prairie Fen is a unique ecological community and a globally vulnerable community. The prairie community provides food and habitat for the Federally Endangered Species Mitchell's Satyr Butterfly and the federal candidate species Eastern Massasauga Rattlesnake. Because of the high-quality habitat restoration and maintenance and the large swath of ideal habitat in a low-disturbance area, FCTC is one of two top sites being considered for reintroduction of the Mitchell's Satyr Butterfly from a captive rearing program. FCTC is also being considered for reintroductions of the Eastern Massasauga Rattlesnake and the Karner Blue Butterfly.



FCTC serves as a major flyway and nesting site for a wide variety of migratory bird species. FCTC's NR staff and local experts manage an ongoing migratory bird monitoring program in which nest success, predation and point count data have been collected over the past decade. In a display of adaptive and effective management, FCTC and the Kalamazoo Nature Center adopted an updated monitoring methodology called Mapping Avian Productivity and Survivorship, which will allow FCTC to capture a better, broader picture of migratory bird health.

The NR staff at FCTC has an excellent relationship with USFWS and the Michigan Department of Natural Resources and Environment. Representatives from these organizations attend FCTC's annual INRMP working group meetings, and the NR staff attends USFWS species-specific meetings for every species present at FCTC.

FCTC manages spring and fall hunting seasons for military personnel, the general public, disabled hunters and youth hunters. Formal standard operating procedures (SOP) have been approved for all hunting activities, and there is a standardized application fee of \$5. FCTC recently expanded its hunting program to include turkey, deer and raccoon seasons, and dedicated days for bow, firearm and black powder hunting. Fishing is also available for active military personnel and Family members as well as retirees.

Other Natural Resources

The NR staff at FCTC consistently looks for ways to

directly engage and educate the greater community, and FCTC sees about 1,500 recreational visitors to the installation annually. In coordination with sponsors such as the National Wild Turkey Federation, Whittails Unlimited and Michigan Paralyzed Veterans of America, FCTC organizes an annual two-day deer hunt for disabled veterans and wheelchair-bound individuals: the Freedom Hunt. FCTC provides a 950-acre site which has been carefully selected to maximize hunting opportunities for the disabled, equipped with wheelchair-accessible blinds and heaters. Volunteers are teamed with each hunter to assist them throughout the weekend, and all meals, lodging and deer processing are provided to participants free of charge.

There is no overnight camping at FCTC due to security issues, but the public can engage in daytime bird-watching and nature walks, which are guided so as not to interfere with military training. To protect its natural resources from unnecessary damage, FCTC does not allow off-road vehicle use, and the staff works proactively with range control and facilities engineering to prevent natural resource damage when heavy equipment training occurs.

The adjacent state park hosts bee farmers, and FCTC's restoration and conservation efforts promote the establishment of habitat for native pollinators, thereby increasing these pollinator populations and their viability.

FCTC conducts research and validation programs, often in partnership with academic institutions, such as a current garlic mustard bio-control research project with Michigan State University (MSU) and



FCTC hosts an annual Freedom Hunt for disabled veterans and wheelchair-bound individuals, providing food, lodging and volunteer aids at no cost to participating hunters. Pictured above is a member of the Grand Rapids Home for Veterans, transported to FCTC through MIARNG assets and provided with an all-terrain vehicle by Outbound Mobility.

long-term monitoring of Yellow Fumewort, a state-listed plant species, in partnership with the Michigan Department of Natural Resources and Environment (MDNRE). The NR staff conferred with MDNRE to develop a Yellow Fumewort monitoring protocol as a mitigation measure for construction of an armory in the species' habitat, thereby providing MDNRE with information to aid the species in recovery.

Invasive Species Control and Pest Management

FCTC supports integrated pest management through its participation in the Purple Loosestrife beetle project. FCTC partners with Kalamazoo Nature Center in an effort to use biological insect control instead of traditional chemical pesticides, and the partnership further engages a local high school to participate by raising beetles in their greenhouse. The students get an unparalleled, hands-on educational opportunity as they propagate beetles and work with FCTC to release them in affected areas. At an annual cost of only \$1,000, FCTC obtains 5,000 to 6,000 beetles for the installation, while tens of thousands of other beetles are raised and released regionally through this program. The area of Purple Loosestrife eradication continues to grow, with 30 acres currently managed with beetles and another 15 acres to be added soon. This method of Purple Loosestrife management reduces FCTC's use of herbicides by approximately five gallons each year.



FCTC participates in the Purple Loosestrife beetle project, an integrated pest management approach to controlling Purple Loosestrife invasions in installation wetlands.

Conservation Education

FCTC hosts and/or teaches at the annual Envirothon, a regional educational event for area high schools, and also participates in National Public Lands day with students and scouting groups to plant trees, establish nurseries and control invasive species. Twice a year, FCTC NR staff also hosts a science field day for members of the Michigan Youth Challenge Academy, a MIARNG program for at-risk youth. Science field day usually consists of presentations from local experts, researchers and NR staff on a wide variety of natural resource topics.

FCTC coordinates with students at all academic levels to deliver environmental education. The NR staff works with Kalamazoo Public Schools to bring students on the installation for field trips and lectures, and NR staff also visit local schools to give presentations on ecology, conservation, energy, geology and species preservation. The installation is also currently sponsoring an Eagle Scout project involving construction of Osprey platforms.

Hunter safety training for youth is offered by FCTC staff as well. The two-day youth safety program is managed by NR staff, deer hunt volunteers and safety instructors.

Community Relations

The NR staff presents at military and environmental conferences and workshops in an effort to share its expertise with other National Guard and military units, and with environmental agencies. FCTC management plans, SOPs and BMPs on erosion control, and environmental restoration are frequently adopted by other National Guard units.

FCTC also raises environmental awareness and shares its expertise on natural resource conservation topics in the local community. In cooperation with the Michigan Prescribed Fire Council and TNC, FCTC provides fire training for state agencies, non-governmental organizations and other National Guard employees. The five-course program prepares participants to be crew bosses and incorporates engine training, ignition and leadership in incident simulations. FCTC also sponsors basic firefighter-level courses, and FCTC NR specialist Michele Richards chairs the Michigan Prescribed Fire Council Outreach and Education Committee.



FCTC also offers research opportunities to graduate students from MSU and Purdue University. Recent graduate-level research projects have focused on milkweed and butterfly species, White-tailed Deer, Eastern Box Turtle, water quality, plant genetics and entomology.

Environmental Enhancement

FCTC's natural resources management program improves the quality of life for FCTC personnel and members of the surrounding community by creating a green space which is a haven for flora and fauna, including unique ecological areas and recreation opportunities.

FCTC's wetlands and Prairie Fens are unique and valuable ecological communities which are not well represented elsewhere in the state, offering visitors and students educational opportunities which would otherwise not exist for them.

The installation serves as a stopover and nesting site for migratory birds and is one of three sites in a regional migration flyway. This not only contributes to the environmental education opportunities which FCTC offers, but also provides excellent recreational bird-watching opportunities.

NR staff makes every effort possible to include the public and students from surrounding communities in the natural resource activities which take place on the installation, and FCTC works with a wide variety of local environmental organizations and academic institutions to share and transfer knowledge, advance research, increase regional biodiversity and decrease the cost of resource management.



The variety and integrity of FCTC's habitat, especially wetlands and Prairie Fens, provides an ideal habitat for federally listed and ecologically important species such as the Cerulean Warbler.

Natural Resources Compliance Program

FCTC reviews its INRMP and other written management plans annually to help ensure the NR program remains robust and on track. FCTC goes above and beyond the requirements for INRMP review by inviting all partners and regulators to provide input regarding projects to be included in the upcoming year.

The environmental projects undertaken by FCTC are adequately funded through federal and private sources and through the cost savings and cost avoidance measures which are a cornerstone of the FCTC's NR management program. FCTC's partnership in the Great Lakes Ecological Management Team and its seed propagation and collection programs highlight the installation's innovative cost savings and cost avoidance techniques. The NR staff also obtained \$50,000 in Legacy money as part of the DoD Partners in Flight program. Through Partners in Flight, FCTC participated in a regional survey of the Cerulean Warbler, which resulted in an unprecedented and comprehensive list of natural resource managers on all military land east of the Mississippi River.

FCTC also received \$5,000 in in-kind funding from NRCS, \$15,000 in in-kind donations from Ducks Unlimited and \$15,000 in in-kind donations from USFWS for wetlands restoration. In-kind donations include consultation, materials, equipment and labor. A North American Wetland Conservation Act grant was also approved for FCTC, and using funding from Ducks Unlimited and USFWS, the NR staff will stabilize, enhance and secure a nearly 500-acre wetland complex.

CONCLUSION

FCTC's Environmental Office continually demonstrates its achievements in every aspect of program management, from rare ecosystem restoration to community involvement to fiscal responsibility. The NR staff not only executes its objective of conserving FCTC's natural resources, it works to increase these resources by introducing endangered species onto the installation, creating wetlands mitigation banks, sharing management costs with partner organizations and transferring its expertise to students, the general public and other National Guard installations.

Fort Bragg, Natural Resources Team

Natural Resources Conservation, Team

INTRODUCTION & BACKGROUND

Fort Bragg encompasses approximately 161,000 acres within the Sandhills Region of North Carolina. The natural vegetation of the Sandhills Region is characterized by plant communities associated with the globally imperiled longleaf pine/wiregrass ecosystem; this ecosystem supports some of the greatest species diversity in temperate North America.

The Natural Resources Team (NRT) at Fort Bragg is dedicated to maintaining an exemplary natural resources management program to ensure military lands support present and future training requirements while preserving, improving and enhancing ecosystem integrity. The NRT is comprised of Jackie Britcher, Endangered Species Branch Chief; Bill Edwards, Range Control Branch Chief; Rod Fleming, Senior Wildlife Biologist; Dave Heins, Environmental Division Chief; Erich Hoffman, Senior Wildlife Biologist; Mike Lynch, Director of Plans, Training and Mobilization; Glen Prillaman, Master Planning Division Chief; Alan Schultz, Wildlife Branch Chief; Joe Stancar, Forestry Branch Chief; and Paul Wirt, Environmental Branch Chief.

On this page: Soldiers assigned to the 82nd Airborne Division's Company C, 2nd Battalion, 504th Parachute Infantry Regiment, 1st Brigade Combat Team proceed over a dirt berm under the cover of smoke at a training range during an air-assault, live-fire exercise on Fort Bragg, N.C. (U.S. Army photo by Spc. Benjamin Watson)

JUDGING CRITERIA

-  Program Management
-  Orientation to Mission
-  Technical Merit
-  Transferability
-  Stakeholder Interaction

POSITION DESCRIPTION

Ms. Britcher is responsible for rare and endangered species programs at Fort Bragg and for implementing the Endangered Species Management Component and the Integrated Natural Resources Management Plan (INRMP). Mr. Edwards maintains, schedules and uses Fort Bragg's training areas and ranges. Mr. Fleming and Mr. Hoffman manage execution of the installation's INRMP and assure compliance with federal regulations. Mr. Heins ensures units and the garrison are in compliance with federal and state environmental laws. Mr. Lynch is responsible for planning and executing all garrison and tenant training and mobilization activities. Mr. Prillaman plans all military construction at Fort Bragg and coordinates with regional planners to ensure compatibility between on-post and off-post development. Mr. Schultz manages fish and game resources, and hunting, fishing and law enforcement operations. Mr. Stancar plans and executes Fort Bragg's forest management program in accordance with the INRMP and Mr. Wirt is responsible for execution of the Sustainability Program.

AWARDS AND SERVICES

The NRT won two Secretary of the Army Sustainability Awards in 2008, one for the team and one individually for Mr. Paul Wirt, and the Secretary of the Army Environmental Award for Environmental Restoration in 2008. Fort Bragg was also runner-up in the 2007 Secretary of the Army Environmental Award for Natural Resources Conservation, Team. Fort Bragg's Endangered Species Branch, and Ms. Britcher individually, were both presented with U.S. Fish and Wildlife Service (USFWS) Red-Cockaded Woodpecker (RCW) Recovery Program Awards for outstanding accomplishments contributing to the successful recovery of the federally-listed RCW. Fort Bragg hosts one of the safest and most recognized hunting, fishing and wildlife law enforcement programs within the Department of Defense (DoD).

ACCOMPLISHMENTS

Overall Natural Resources Conservation Management

Fort Bragg implements a progressive environmental management system in which sustainability is the

Natural Resources Conservation, Team
Fort Bragg, Natural Resources Team

“I was very impressed with the pioneering work Fort Bragg has conducted for the RCW. Fort Bragg has developed recovery practices that have been adopted by other military installations as well as other agencies that manage RCW habitat. In addition to the very high profile RCW management program, Ft. Bragg has a very diverse and rich natural resource management program that includes timber management, prescribed burning and outdoor education programs. All of this is done under an umbrella of cooperation and coordination with their partners. This legacy will last for many years.”

- Laura Henze, National Sikes Act Coordinator, USFWS

garrison's primary strategic goal, as illustrated by its triple bottom line ethos that focuses on mission, environment and community plus economic benefits. The installation INRMP was written in 2001 and is currently being revised to cover Fort Bragg from 2010 – 2014. The INRMP revision has a goal of 100 percent implementation, and concurrence from USFWS and North Carolina Department of Environment and Natural Resources is expected June 2010.



The NRT implements innovative techniques to streamline natural resource management, such as its RCW Nest Check and Banding System. Nest check, observation and banding data are collected to analyze the health, structure and size of the RCW population at Fort Bragg. Once a labor-intensive and time-consuming process, in 2007 the NRT designed and adopted a more efficient computer program which limits transcription and banding errors, increases on-site accessibility and expedites the data entry. The program saves the NRT an estimated 500 job hours and \$15,000 annually. Recognizing the advantages of the RCW Nest Check and Banding System, Natural Resources



professionals for Fort Benning, Ga., have developed a similar program using Fort Bragg's template.

Fort Bragg's Habitat Management Working Group (HMWG) exemplifies a unique, cross-functional natural resources management approach which maintains considerations for the installation's environmental and training needs while increasing efficiency by using shared resources. The HMWG consists of primary internal stakeholders from the NRT, Directorate of Public Works (DPW) Environmental Division, Integrated Training Area Management (ITAM) Division, USFWS and U.S. Army Corps of Engineers Savannah District Forest Resources Office. The group focuses on large-scale restoration and ecosystem maintenance by identifying habitat management areas (HMA) on regional and watershed levels and prioritizes HMAs based on endangered species habitat and critical demographic links or gaps.

Since 1967, the NRT has maintained consistent and intensive fish and wildlife monitoring programs to provide baseline and long-term trend information which will support investigations and predictions for climate change. Data from various partnership studies and historical monitoring programs, such as the Army Land-Condition Trend Analysis, also provide a valuable basis for wildlife and habitat relationship change analysis.

Mission Enhancement

With operational readiness exercises ranging from the platoon- to division-level, Fort Bragg supports the highest concentration of combat troops anywhere in the world. More than 2.3 million personnel were trained at Fort Bragg in FY 2009 alone. However, a 1990 USFWS Jeopardy Biological Opinion regarding the status of the installation's RCW population restricted training on 9,600 acres of critical maneuver lands due to their proximity to RCW clusters.

Fort Bragg has successfully recovered RCW to the extent the installation was allowed to remove these training restrictions on 3,100 acres – approximately 50 percent of the installation's RCW clusters. This marks not only a critical expansion of viable training land, but also a significant increase in the variety, intensity and duration of military training activities.



The NRT also manages Red Imported Fire Ants (RIFA) to the benefit of the Soldier. Fire ants are an invasive insect species at Fort Bragg that can colonize open disturbed habitats, such as training ranges and drop zones, at the level of hundreds of ant colonies per acre. Soldiers training in these areas often receive multiple painful stings, and susceptible Soldiers could experience anaphylactic shock due to RIFA. NRT is investigating treating approximately 5,579 acres on Fort Bragg using aerial pesticide applications to control RIFA.

Land Use Management

Ecosystem management and biodiversity conservation at Fort Bragg are implemented at the natural community scale, which provides protection for the majority of species and promotes expansion and recovery across the landscape.

The North Carolina Heritage Program recommended registering 14 of Fort Bragg's proposed natural areas, and one special management area, which are maintained under

integrated management schemes. Integrated management schemes include allowing prescribed burns to spread into adjacent wetlands, avoiding further fragmentation by new roads or trails and implementing revegetation measures. Fort Bragg also requires all projects, except ground disturbance activities associated with military training, submit erosion and sedimentation control plans and storm water management plans to the Water Management Branch for approval.

Fort Bragg recently created an Arbor Board, through which it developed a new initiative to foster native species and implement tree mitigation techniques for future environmental impacts due to training activities and construction. The NRT has identified numerous strategically located areas throughout the main post which it is leaving unmown to allow



The Red-Cockaded Woodpecker is a federally-listed nonmigratory bird native to the longleaf pine forests of the southeastern United States.

to return to a natural state. These areas will be repopulated with native trees, vegetation and wildflowers indigenous to the southeastern U.S. in accordance with the NRT's native species planters guide for landscape plans. Allowing these unmown green spaces to flourish conserves valuable green space connectivity and reduces DPW ground maintenance and labor costs.

Forest Management

The longleaf pine ecosystem was once the most common forest across the southeast, but only about 3 percent of the once 90 million acres of old-growth, fire-maintained ecosystem exists today. Fort Bragg contains 81,200 contiguous acres of longleaf pines, one of the largest remaining blocks of this forest type in the country.

Prescribed fire is the most significant ecological tool Fort Bragg uses to enhance the regional longleaf pine ecosystem and improve RCW habitat. Since October 2007, Fort Bragg has thinned 1,818 acres of pine, conducted 117,433 acres of prescribed fire and mechanically removed 769 acres of hardwood midstory. Fort Bragg conducts more controlled burns than any other land owner in North Carolina. The NRT is a major stakeholder in the North Carolina Prescribed Fire Council, and the installation helped set up and implement a prescribed fire program at Fort Rucker, Ala.



Fort Bragg's longleaf pine ecosystem is dependent upon a cyclic fire regimen, and controlled burns are conducted on one to three year cycles to keep hardwood regeneration to a minimum, thereby preserving Red-Cockaded Woodpecker habitat.



The NRT also instituted a strict replacement program for longleaf pines that are cut down due to construction activities. Replacement requirements are dependent upon the acreage of the project, the size of the trees taken down and whether or not impacts occurred in sensitive or RCW-designated forests. Since 2007, 1,151 new trees have been planted to offset native ones lost due to project impacts, and that number is expected to triple in the next three years.

Fort Bragg is also home to scattered old-growth pine trees, and forest remnants which represent high-quality examples of the rare and historic ecosystem in the region. The NRT surveyed these trees across the installation, documenting their locations using a global positioning system so planners, military trainers, natural resource management organizations and the DPW can conserve these unique trees.

Fish and Wildlife

In 2006, owing to the success of its RCW recovery program, Fort Bragg surpassed its goal of 350 potential breeding groups (PBG), making it the first DoD installation to reach RCW recovery. The installation currently has the second largest RCW population in the world and the largest population on any DoD land. Fort Bragg's robust RCW population continues to thrive, as demonstrated by the emergence of three new pioneered groups, four new recruitment clusters and 10 budded groups since 2007. Additionally, more than 500 new trees bearing a start or cavity initiated by a RCW have appeared since 2006. The installation's 2009 RCW population reflects a 4 percent increase in PBGs (estimated 389) from last year's data, which was collected while all clusters were still protected and full training restrictions were still in place.

There are 23 vegetative communities present at Fort Bragg, an illustration of the strong diversity of flora and fauna on the installation. The installation contains 56 plant taxa listed as rare in North Carolina, 67 plant taxa that occur on the state watch list, three federally endangered plants and 16 federal plant species of concern. More than 1,200 floral species have been documented, along with 50 species of fish, 51 reptiles, 44 amphibian species, 41 mammals and almost 200 resident and migratory bird species. Fort Bragg contains populations of



four federally listed species in addition to RCW: Saint Francis' Satyr Butterfly, rough-leaf loosestrife, Michaux's sumac and American Chaffseed. The NRT is leading research and recovery efforts for the Saint Francis' Satyr Butterfly through development of population management objectives and a viable monitoring program with North Carolina State University researchers.

The NRT monitors population trends and analyzes habitat preferences for migratory birds and many resident land bird species whose numbers are declining. Fort Bragg participated in the formation and implementation of DoD's Partners in Flight (PIF) program to maximize avian conservation across the services on DoD lands and water. Such programs benefit RCW, Bachman's Sparrow, the bald eagle and the 18 other special-status species which exist on the installation. As a contribution to PIF and other programs, Fort Bragg supports Monitoring of Avian Productivity and Survivorship, and ecological management across the installation provides habitat features such as food sources and cover for native resident and migratory bird species and other faunal and floral species.



Other Natural Resources

Fort Bragg seeks to promote public access through its outreach programs and recreational opportunities, including the first Audubon International-certified Army golf course and the All-American Trail project. A registered North Carolina Birding Trail, the All-American trail is an 18-mile long nature trail that runs adjacent to several active RCW clusters, providing interpretive signs and a swamp boardwalk. The Audubon Society has also recognized Fort Bragg as an Important Bird Area for the third consecutive year because of the integrity of the installation's bird habitat due to its effective ecosystem management program. The All-American Trail was also recently incorporated into the North Carolina Birding Trail Guidebook.



Camping is also provided at morale, welfare and recreation-established campgrounds, and Fort Bragg offers a full line of affordable equipment rental for use both on and off the installation. Boy Scout group camping, including programs with NRT participation, is provided regularly across various locations on the installation.

Fort Bragg attracts more than 5,000 fishers and hunters annually, and the installation makes many provisions for its disabled fishers and hunters. Volunteer partners provided a hydraulic elevated hunting blind available for disabled hunters, and the installation's disabled ground blind system and Wounded Warrior mentored hunts are continually expanding. The NRT regularly provides disabled and elderly hunter support such as finding hunting mentors, ensuring independent hunters return safely each day, and assisting however needed with game tracking, animal recovery and meat processing.

Fort Bragg has a long history of adaptive management and state-of-the-art scientific research through university and agency partnership projects. One of the latest of these cooperative efforts includes creating detailed habitat modeling projects to expand forest inventories into predictive habitat models and application of those models in adaptive burning experiments and demonstration aimed to maximum conservation for diverse floral and faunal needs.



Fort Bragg manages and restores wetlands to enhance habitat for migratory birds, butterflies and many rare or endangered flora and fauna to include rough-leaf loosestrife.

Hunting and fishing opportunities are extensive on the installation. Native game fish are regularly managed and stocked, and eastern wild turkeys were successfully reintroduced and are effectively managed across the installation. The NRT provides special recreational opportunities for novices and youth, deployed Soldier Families and Wounded Warriors to learn to hunt and fish.

In 2007, Fort Bragg NRT staff also conducted research and presented an abstract on native pollination of the Sandhill Pyxie Moss at the Association for Southeastern Biologists.

Invasive Species Control and Pest Management

Thirty-nine non-native invasive plants have been identified on Fort Bragg. The NRT uses three approaches to invasive species control: a species-specific approach for early-stage infestation, an approach to target invasives on training and range land and a site-specific approach in high-priority areas with rare plants and/or RCW clusters in coordination with North Carolina Division of Parks and Recreation and North Carolina Wildlife Resources Commission. These targeted management techniques limit the amount of pesticides and insecticides used on the installation. Fort Bragg also embraces the use of Integrated Pest Management practices in facilities where children are present which use cultural, mechanical or physical pest control techniques over chemical controls.

Invasive species control efforts at Fort Bragg are complementary to efforts made by the North Carolina Sandhills Weeds Management Area (NCSWMA), a collaborative partnership of local and national organizations including the USFWS, Natural Resources Conservation Service and the Sandhills Ecological Institute, which targets invasive species on a regional scale. The NCSWMA builds on invasive species management strategies developed by Fort Bragg, such as species identification and early detection/rapid response control efforts. Fort Bragg and the NCSWMA reduced the populations of 13 highly invasive species in the region last year alone.

Conservation Education

The effectiveness and viability of Fort Bragg's natural resources management and RCW programs are also contingent upon the team's proactive approach to environmental education and outreach. The NRT teaches a monthly class to incoming civilian and military personnel on ecosystem conservation including RCW recovery efforts and compliance-related issues. Since October 2007, the team has trained nearly 1,200 Soldiers. With the assistance of Oak Ridge Institute for Science and Education, Fort Bragg's NRT also



extends internship opportunities to North Carolina college students to educate future generations regarding ecological concepts, habitat restoration and protection, and surveying and monitoring of RCW and other endangered and rare species.

The NRT typically hosts or participates in about 40 annual endangered species events including education programs for Boy Scouts, installation and local elementary schools and universities. Other outreach activities include NRT staff guest-speaking at media events, community festivals, field days with state and nonprofit agencies and state Wildlife Commission events.

Fort Bragg offers extensive hunting and outdoor safety training. The NRT maintain certifications as state hunter safety instructors, sponsoring state hunter safety classes and mandatory installation hunter safety training. Special pre-hunt safety briefings are provided for every youth, novice or special hunter. Gun handling, boating and other outdoor safety briefings and event booths are provided regularly throughout the year to military units and civic and conservation groups.



Fort Bragg promotes public access to the installation by providing a number of recreational opportunities, such as bird-watching, on its 18-mile All-American Trail, a registered North Carolina Birding Trail.



Community Relations

Fort Bragg's NRT ardently shares its innovative programs and management techniques with other installations. Lessons learned are also presented at meetings such as the annual U.S. Army/USFWS RCW Coordination Meeting, during



which Fort Bragg hosts guided field trips, RCW group tours and educational presentations on its recovery program. Fort Bragg's RCW recovery efforts led to the development of regional and national programs such as the Army Compatible Use Buffer program, and the NRT was asked to evaluate potential RCW translocation efforts for the Military Ocean Terminal at Sunny Point, N.C.



Fort Bragg is actively engaged in the North Carolina Sandhills Conservation Partnership, formed in 2000 to facilitate collaboration between the USFWS, U.S. Army Environmental Command, North Carolina Division of Forest Resources, The Nature Conservancy, the Sandhills Ecological Institute and others for the purpose of conserving the longleaf pine ecosystem and recovering the RCW population in the North Carolina Sandhills. NRT staff also sit on the RCW Strategy Working Group, Resource Management Working Group and Reserve Design Working Group.

Fort Bragg also supports the Southern Range Translocation Cooperative, a partnership dedicated to facilitating RCW translocation among U.S. Army installations located in North Carolina, South Carolina, Florida, Georgia, Alabama and Mississippi.

Environmental Enhancement

Fort Bragg partners with the surrounding military community including Fort Stewart, Fort Gordon, Fort Jackson, Fort Polk, Fort Benning, Sunny Point, Camp Lejeune and Camp Blanding to transfer knowledge benefiting RCW population levels on the regional scale. The incredible diversity of biological species associated with the longleaf pine forest on the installation affords the public the opportunity to interact with aspects of nature at Fort Bragg that are rare, threatened or exist nowhere else in the world.

To encourage involvement and interaction with the surrounding community, the NRT regularly participates in local activities and outreach events such as the city of Fayetteville's Clark Park Spring Nature Fair, Harnett County's Second Annual Environmental Field Day, Fort Bragg's Children's Fest and Scotland County's Environmental Awareness Field Day.



Natural Resources Compliance Program

The NRT ensures Fort Bragg's Natural Resources Conservation Program is adequately funded through public and private sources to meet its management and conservation goals. Funding for the updated INRMP will come primarily from revenues generated from the sale of hunting and fishing permits, forest product sales, environmental funds, operations and maintenance funds and training funds designated for implementation of the ITAM program.

Fort Bragg also initiated the formation of sanctioned volunteer conservation groups to accomplish outreach, Soldier and Family support and ground conservation projects at great savings to the government. The NRT created the Fort Bragg Quail Unlimited Chapter and the Fort Bragg Quality Deer Management Branch, and the installation receives volunteer support from large organizations such as the Boy Scouts, Bragg Bass Masters and Ducks Unlimited. The NRT uses volunteers to provide labor for habitat enhancement projects at an annual cost savings of about \$65,000. The All-American Trail was also created and funded through partnerships with local governments, regional land planning entities, other agencies and volunteers.



CONCLUSION

The accomplishments of the NRT at Fort Bragg go far beyond the successful recovery of RCW and the reinstatement of 3,100 acres of previously restricted training land. Fort Bragg is a haven for rare and endangered flora and fauna illustrated by the presence of the Saint Francis' Satyr Butterfly and largest contiguous block of longleaf pine forest in the country. The strength of Fort Bragg's natural resources management program is further illustrated through the adoption of its conservation programs by other agencies. This strength comes from Fort Bragg's focus on regional ecosystem management and its partnerships which led to long-term balance between the military mission, environmental stewardship and the community.

U.S. Army AMCOM, G-4 E-Team

Environmental Excellence in Weapon System Acquisition

INTRODUCTION

From FY 2008 – 2009, the U.S. Army Aviation and Missile Command (AMCOM) G-4 Environmental Team (G-4 E-Team) excelled in incorporating environment, safety and occupational health (ESOH) requirements into their supported weapon systems' decision-making processes.

The G-4 E-Team consistently demonstrated sustained superior performance in assisting and providing guidance to AMCOM Program Executive Offices (PEO) and Program, Project and Product Managers in reducing, or eliminating altogether, their use of hazardous materials (HAZMAT). These efforts ultimately led to corresponding reductions in the hazardous waste (HAZWASTE) generation and disposal from the various manufacturing, sustainment and repair operations.

The G-4 E-Team's single focus is to ensure that AMCOM systems and equipment are manufactured, maintained and repaired in the safest and most environmentally sound manner possible while increasing system affordability and maintainability, thereby improving Warfighter readiness.

On this page: A Blackhawk UH-60 shown in flight. The G-4 E-Team's single focus is to ensure that U.S. Army Aviation and Missile Command systems and equipment are manufactured, maintained and repaired in the safest and most environmentally sound manner possible.



JUDGING CRITERIA

-  Program Management
-  Orientation to Mission
-  Technical Merit
-  Transferability
-  Stakeholder Interaction

BACKGROUND

The AMCOM G-4 E-Team's success is due to the contribution and capabilities of its team members. Team members and their respective positions during FY 2008 – 2009 are as follows:

- Dr. David Branham – Chief, AMCOM G-4
- Mr. Ronald Hagler – Chief, Environmental Division
- Ms. Sandy Olinger – Team Lead, Acquisition and Compliance Team
- Mr. Kerry Blankenship – Engineer, Acquisition and Compliance Team
- Mr. Glenn Williams – Team Lead, Technology Integration Team
- Ms. Kim Granger – Engineer, Technology Integration Team
- Mr. Frank Showalter – Contract Lead, Stanley, Inc.

“AMCOM’s team has tackled the big problems, like hexavalent chrome and industrial solvents, and has come up with solutions. They’re focused on maintaining safety and exposure, issues that Program Managers should be most concerned about.”

- Dave Koehler, Chairman,
SECARMY EEWSA Selection Team

POSITION DESCRIPTION

Dr. Branham serves as the executive manager for AMCOM G-4. He reports directly through the AMCOM Command Group and provides overall direction and strategic management for all AMCOM G-4 personnel. Mr. Hagler serves as the manager for all Environmental Division personnel. He directed each of the Team Leads in FY 2008 – 2009 in support of the project management and support facility operations. Ms. Olinger led the project management support effort at AMCOM G-4 during FY 2008 – 2009. Her group provided direct acquisition ESOH support to AMCOM and AMCOM-supported weapon systems. Milestone review documentation, Programmatic ESOH Evaluation (PESHE) preparation, National Environmental Policy Act (NEPA) documentation preparation/review and materiel release requirements were primary functions of

her group. Mr. Blankenship provided engineering support to the weapon system acquisition effort in FY 2008 – 2009. His efforts primarily revolved around HAZMAT substitution and Class I Ozone-Depleting Chemical (ODC) elimination. Mr. Williams and Ms. Granger, as team lead and engineer, respectively, for the Technology Integration team, reviewed and evaluated Engineering Change Proposals, maintained a database of existing material technologies and monitored emerging technologies. Mr. Showalter leads a substantial contracting team which performs work at all levels for AMCOM G-4. Other participating companies include NeXolve Corporation and Teledyne Solutions, Inc.

AWARDS AND SERVICES

- Dr. Branham is a member of The Alabama Planning Commission; the Huntsville, Ala. Board of Zoning Adjustment; the Alabama River Alliance Board of Directors and Leadership of Huntsville/Madison County; he received performance awards in 2008 and 2009 for execution of position requirements.
- Mr. Blankenship received performance awards in 2008 and 2009 for execution of position requirements.
- Multiple members (Dr. Branham, Ms. Olinger, Mr. Williams and Mr. Blankenship) are members of the Army Acquisition Corps.
- Dr. Branham and Mr. Williams are members of the Society of American Military Engineers.
- Ms. Granger and Mr. Blankenship are members of the Army Aviation Association of America.



ACCOMPLISHMENTS

Weapons System Acquisition Program

Part of the G-4 E-Team's mission is to serve as AMCOM's point of contact and subject matter expert for weapon system environmental support throughout the entire acquisition life cycle, from early development and fielding until ultimate disposal.

The G-4 E-Team functions as an element of the PEO's or project manager's staff and provides technical assistance and system documentation reviews to identify the environmental requirements and



issues for both Continental United States (CONUS) and Outside CONUS aspects of weapon system acquisition.

The G-4 E-Team maintains environmental support contracts to provide the PEOs and project managers with any requested environmental support, including preparation/review of NEPA documentation. During the design process, HAZMAT contained in systems are documented to support the system's demilitarization and safe disposal. The AMCOM G-4 E-Team assists the weapon systems project manager in determination of these materials by reviewing prime contractor Hazardous Material Management Program (HMMP) reports. These reports are contractually binding by requiring Contract Deliverable Requirements Lists (CDRL) in the contract statement of work (SOW). The CDRLs require prime contractors submit all end item hazardous constituents. AMCOM G-4 provides occupational health support and works closely with the AMCOM Safety Office in providing system safety support via Military Standard (MIL STD)-882D, "Standard Practice for System Safety."

G-4 E-Team members were very proactive in their approach to the systems engineering and program management processes. They integrated themselves into the development process and worked closely with the PEO and project manager personnel early in the design phase of program modifications. G-4 E-Team engineers assisted project manager personnel in identifying HAZMAT requirements, minimizing their use, evaluating alternatives, recommending substitute materials and implementing substitutes for aviation maintenance and operation. By doing so, they helped green the environment, eliminate HAZMAT handling requirements and saved on disposal costs.

For example, the G-4 E-Team has helped minimize the use of Halon 1301, a gaseous flooding agent used in fire suppression, restricting its use to only critical operational requirements. Team personnel also tracked the issue of product availability from the Army Ozone Depleting Substances Reserve to ensure that Halon remains available for use in Army aviation until a suitable alternative is tested and approved. The G-4 E-Team has continued research into new fire suppression agents and new delivery systems.



The G-4 E-Team provides ESOH oversight for the recertification of Army Tactical Missile System. The G-4 E-Team is responsible for and influences all ESOH facets of Army aviation and missile acquisition, sustainment and disposal.

Incorporating ESOH Integration into Systems Engineering

The G-4 E-Team's matrixed and integrated personnel support includes analyses of program documentation and assistance in the interpretation of all of the environmental requirements under DoDI 5000.2/5000.02, *Operation of the Defense Acquisition System*; Army Regulation (AR) 70-1, *Army Acquisition Policy*; 32 CFR Part 651, *Environmental Analysis of Army Actions*; AR 700-142, *Type Classification, Materiel Release, Fielding, and Transfer* and Presidential Executive Orders (E.O.). This responsibility includes Acquisition Strategies, Integrated Program Summaries, Integrated Logistic Support Plans, Supportability Strategies, contract requirements packages, pollution prevention plans, HMMP plans/reports, PESHE preparation, SOW ESOH language and materiel release statements.

The G-4 E-Team regularly attends weapon system Integrated Product Team (IPT) meetings ensuring ESOH considerations are included in the systems engineering process. During FY 2008 – FY 2009, they attended more than 50 meetings, primarily in the safety, test or logistics arenas.

G-4 E-Team personnel ensured that HMMP SOW language was included in more than 150 contract



packages. This practice continued the precedent that any HAZMATs contained in end items or used in the manufacturing process would be identified. In this manner, multiple groups within the G-4 organization were better able to identify HAZMATs and recommend suitable replacements. This specific SOW language serves as risk management for demilitarization and disposal requirements at the end of the system's life cycle.

The G-4 E-Team reviews aviation and missile HMMP reports and technical maintenance documentation to identify requirements for the use of ODCs and HAZMATs, and where possible, recommends suitable environmentally friendly replacements in keeping with the established material compatibility requirements. These change recommendations are provided to the Army Materiel Command Research, Development and Engineering Command, the AMCOM Life Cycle Management Command Safety Office and the Integrated Materiel Management Center for concurrence and implementation.



The G-4 E-Team provides ESOH oversight for the recertification of Army Tactical Missile Systems at the Letterkenny Munitions Center. Where possible, the team recommends suitable environmentally friendly replacements.

The team prioritizes research and development (R&D) projects based upon life cycle cost assessments and cost benefit analyses which are performed based on best business practices and maximizing cost efficiency.

ESOH Risk Management

During FY 2008 – 2009, MIL STD 882-D was used as a template for evaluating environmental risk; safety risk assessment categories were rigorously subjected to MIL STD 882-D by the AMCOM Safety Office. Safety and human health issues at the weapon system level were addressed by the AMCOM Safety Office with input to the PESHE via the G-4 E-Team.



The G-4 E-Team provided direct support to more than 20 weapon system PEO acquisition milestones and Army System Acquisition Review Council (ASARC) reviews during FY 2008 – 2009. One of the primary goals in supporting weapon system acquisition is the successful completion of acquisition milestone reviews by weapon system customers. Aspects of the G-4 E-Team's matrixed ESOH support include using DoD Instruction (I) 5000.2/5000.02 as a broad mandate to the weapon system project manager for tracking hazardous materials, maintaining a NEPA schedule, maintaining a PESHE, and planning for eventual system demilitarization and disposal. The G-4 E-Team and their supported weapon system jointly used the PESHE, IPTs and frequent interaction to identify and track ESOH risks. Attendance of multiple IPTs ensured a total systems approach by identifying any pertinent ESOH risks to various disciplines within the Project Office (PO).

The G-4 E-Team provided NEPA oversight for more than 20 AMCOM G-4-supported Project Offices. Creating and maintaining a NEPA schedule is a DoDI 5000.2/5000.02 requirement. Further, NEPA is a statutory requirement for all federal actions, including weapon system development. Although the team's matrix support for weapon system acquisition and development does not usually involve site-specific NEPA analyses, the team served as a liaison between its weapon system customers and future test/training/support facilities. Preparation of NEPA schedules for G-4 E-Team customers involved interaction with multiple divisions within the PO such as Test and Evaluation, Logistics and Production. Additionally, it involved the team's interaction with NEPA compliance personnel at specific facility locations and federal, state and local agencies, as required. Key risks identified included multiple



test locations, which required additional NEPA analyses prior to testing. In most instances, mission completion delays were averted due to preemptive action to resolve NEPA requirement concerns.

The G-4 E-Team prepared or provided oversight for more than 20 PESHE documents during FY 2008 – 2009 for missile systems, aviation systems and ground support equipment. Risk was evaluated in the general areas of Environmental Compliance, NEPA Compliance, HAZMAT and Waste Management and Safety. MIL STD-882D was used as the risk assessment template when evaluating risk factors within these PESHE documents. Also, guidance from the *System Safety – ESOH Management Evaluation Criteria for DoD Acquisition, January 2007*, was used for PESHE preparation and review. Although the G-4 E-Team did not directly perform the system safety risk analysis, they worked closely with the AMCOM Safety Office in including this information in the PESHEs.

As a guideline, G-4 E-Team stipulates to all supported systems receiving a materiel release statement that DoD Directive 5000.1, The Defense Acquisition System, and DoDI 5000.2/5000.02 requirements must be followed. As the environmental materiel release authority for AMCOM, the G-4 E-Team evaluated weapon system ESOH status (compliance, NEPA and HMMP) prior to preparing a materiel release statement. The actual statement represents weapon system coherence to current DoD ESOH requirements. System safety materiel release statements were supplied by the AMCOM Safety Office.

The G-4 E-Team identified and evaluated key risks, implemented mitigation measures and met success in reducing risks using the total systems approach. For example, in the area of HAZMAT tracking, they worked directly with project manager technical and contract management personnel to ensure SOW

language was not diluted or omitted. They directly interfaced with original equipment manufacturers at IPTs, to accelerate and simplify the process of HAZMAT reporting, as well as reviewing HMMP Plans/Reports and submitting comments to project managers. Additionally, the G-4 E-Team maintained a universal definition of what constitutes a HAZMAT for HMMP reporting purposes.



Recertification of Guided Multiple Launch Rocket Systems is completed at the Letterkenny Munitions Center, located at Letterkenny Army Depot in Chambersburg, Pa.

The G-4 E-Team prepared more than five materiel release statements for AMCOM-supported weapon systems during this award period. AR 700-142 stipulates environmental requirements must be fulfilled in order to obtain a full materiel release.



This Blackhawk UH-60 is being overhauled in Hangar 43 Corpus Christi Army Depot, Corpus Christi, Texas.

The G-4 E-Team addressed pollution prevention requirements through recommended and justified actions which minimized and/or eliminated the use of hexavalent chromium conversion coatings and minimized the use of Halon 1301, restricting its use to only critical operational requirements. They coordinated assignment of national stock numbers with the General Services Administration for new products and prepared documentation to authorize the use of these products on Army aviation assets. They also maintained direct support with weapon system project offices as well as other agencies such as the U.S. Army Environmental Support Office, Naval Air Systems Command, National Defense Center for Energy and Environment (NDCEE), Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP).



Hazardous Materials Management and Pollution Prevention

The G-4 E-Team reviewed more than 80 HMMP Reports to identify safer, less toxic and more environmentally-compliant alternatives, determined if the alternatives had been evaluated and approved, and if so, provided the data necessary for their implementation. This included HAZMATs used in manufacturing processes and residual HAZMAT contained in delivered equipment. Demilitarization/disposal plans can effectively use this data. Likewise, life cycle costs for disposal, design and process changes should be resultant. Pollution factors such as effluents, emissions, discharges and noise were incorporated within either life cycle, programmatic or site-specific environmental assessments.



To comply with NEPA, the G-4 E-Team worked closely with test and evaluation, production and logistics within the project offices in order to more accurately track activities which might qualify for NEPA documentation. They communicated directly with test sites and depots to discuss upcoming weapon system activities and potential NEPA implications. They also interfaced with ESOH points of contact within the project offices in order to clarify NEPA funding and documentation needs.

In meeting weapon system milestone review completion requirements, the G-4 E-Team maintained both a HAZMAT tracking system and NEPA schedules. They prepared and reviewed PESHEs for their weapon system customers to ascertain DoDI 5000.2/5000.02, *Defense Acquisition Guidebook* and *System Safety – ESOH Management Evaluation Criteria for DoD Acquisition* stipulations were incorporated. The G-4 E-Team also worked directly with the U.S. Army Environmental Command (USAEC) and the Deputy Under Secretary of Defense (Installations and Environment) to ensure timely completion of appropriate ESOH acquisition documentation.



Over the last two years, G-4 E-Team engineers assisted in the development of more than eight test programs to evaluate alternative materials to replace HAZMAT and assessed the results from these and other test efforts to determine applicability of the new materials. They also worked closely with other Army, DoD and federal government offices, such as the USAEC ASARC reviews as well as commercial industries, to identify promising technologies and evaluate these new technologies as potential substitute materials.

The G-4 E-Team applied a “cradle to grave” approach in their assessments, considering not only sustainment but also, ultimately, demilitarization and disposal.

External Coordination

At the request of the project managers and depot personnel, the G-4 E-Team participated in the review and evaluation of the Engineering Change Proposals as well as draft revisions and newly published draft documents. To support this function, the engineers and scientists maintained a knowledge base of existing materials technologies and monitored and evaluated emerging technologies. The evaluation of emerging technologies requires the identification of the applicable technologies for R&D followed by the funding justification process for qualification and validation testing. R&D projects are coordinated with multiple services programs such as the NDCEE, SERDP and ESTCP.



The G-4 E-Team also developed a new Environmental Life Cycle Support Team to expand the evaluation of all AMCOM G-4 facilities.

CONCLUSION

Over the last two years, the AMCOM G-4 E Team provided Army Aviation and Missile PEOs and project managers a single, cohesive focal point for ESOH support. They consistently supplied superior technical and management support to all AMCOM-managed weapon systems and reduced or eliminated a significant amount of HAZMAT in the manufacturing, operation, sustainment and disposal processes. The team's results fully incorporated the spirit and intent of E.O.s and Army policy, and used the federal, state and local regulatory requirements as a framework to accomplish these goals.

All of these actions, when fully implemented, ensure AMCOM systems and equipment are able to satisfy all aspects of their designed operational requirements with minimal ESOH impacts. Many of

these actions will result in long-term cost savings and cost avoidance, and ultimately eliminate the potential for facility violations of state and federal environmental regulations.

The AMCOM G-4 E-Team is responsible for and influences all ESOH facets of Army aviation and missile acquisition, sustainment and disposal. The G-4 E-Team significantly reduced the presence of HAZMAT throughout all life cycle phases of these weapon systems. The initiatives of the past two years represent a proactive approach with continuous, focused efforts providing PEOs and project managers, depots and Warfighters with tools for effective HAZMAT/HAZWASTE reduction/elimination, now and in the future, while reducing overall life cycle system requirements and costs, and increasing mission readiness and reliability.



An OH-58D is being serviced at Fort Hood, Texas. The G-4 E-Team successfully tested, evaluated and gained approval for transition to a non-hexavalent chromium coating system for Army aviation systems and equipment.

Letterkenny Army Depot

Sustainability, Industrial Installation

INTRODUCTION

As the Center of Industrial and Technical Excellence for Air Defense and Tactical Missile Systems, Letterkenny Army Depot's (LEAD) primary mission is providing the U.S. Army and other services with worldwide, reliable, responsive and cost-effective depot-level maintenance. LEAD also provides field support, systems integration, and product support integration for weapon systems, components and ancillary equipment to ensure the readiness, sustainability and safety of these military forces in the full spectrum of operational environments.

The approximate total depot population is 3,400, including a LEAD population of approximately 2,000 civilian and 100 military personnel. Tenants and contractor support at the depot employ an additional 1,300 people. The depot covers 17,793 acres, a large portion of which is used to conduct maintenance, modification, storage and demilitarization operations on tactical missiles and ammunition.

Located in south central Pennsylvania, LEAD is situated in the Cumberland Valley in Franklin County, five miles north of Chambersburg, the county seat. The depot is surrounded by lightly populated residential areas, agricultural land and the Broad Mountain to the west. The depot's location provides easy access to seaports, air travel and major highways.

LEAD remains among the top three employers in Franklin County, fueling an economic engine which propels more than \$250 million annually into the region through payroll, contracts and retiree annuities. LEAD has frequently partnered with industry, leveraging its unique capabilities and skills. LEAD supports the growth and development of the local community through its active participation in community planning. Local community planning groups include the Chambersburg Area Development Corporation, Franklin County Area Development Corporation, Chambersburg 2000 Partnership, the Letterkenny Industrial Development Authority, Council of Governments, Greater Chambersburg 21st Century Partnership and the Franklin Science Council.

JUDGING CRITERIA

-  Program Management
-  Orientation to Mission
-  Technical Merit
-  Transferability
-  Stakeholder Interaction

On this page: Lines of refurbished high-mobility multipurpose wheeled vehicles await shipment. LEAD's primary mission is to provide the U.S. Army and other services with worldwide, reliable, responsive and cost-effective depot-level maintenance.

BACKGROUND

The U.S. Army, and in particular LEAD, currently faces the significant challenge of finding sustainable sources of energy. With each transformation at LEAD comes an increasing demand for energy to fuel new missions and operations. In response, LEAD recognizes energy independence as a foundation of its future.

Significant environmental aspects and impacts have been evaluated as part of the depot's International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) implementation to include hazardous waste generation, air emissions, industrial wastewater treatment and solid waste management. Another environmental challenge is the effect of more restrictive environmental regulations.

Developed in FY 2008, LEAD's Sustainability Plan guides LEAD's environmental goals for the next 25 years and beyond. LEAD's Sustainability Plan consists of three overarching goals: water conservation, energy conservation and solid waste reduction. Under the plan, by the year 2033, the depot will subsist solely on renewable energy and self-sustaining water and other natural resources with no waste discharge into the local landfill.

The Sustainability Plan is an integral part of the Commander's Strategic Plan objective to become the Army's premier "Sustainable Green Depot." Progress on sustainability goals and objectives is tracked through quarterly Environmental Quality Control Committee meetings, attended by top management.

PROGRAM SUMMARY

LEAD has more than 69 years of service to our nation's Soldiers. While it has sustained a record of distinction across multiple mission changes, the depot's Chambersburg location has been constant. Commands change, programs come and go, and buildings are constructed, repaired and replaced, but the environment remains the foundation on which the depot depends. The depot has been transformed from its roots as a munitions storage facility into a modern, multi-capable provider of manufacturing and technological products and services. Maturing with each mission has afforded



the depot the wisdom needed to sustain operations well into the 21st century.

The depot found success by institutionalizing sustainability planning into its regular maintenance and capital budgeting processes. Because they are planned and funded by the Directorate of Public Works, sustainability projects are the first priority of all of the depot's infrastructure upgrades. Over the past two years, the depot upgraded and enhanced its infrastructure, incorporating a comprehensive energy conservation strategy, and completed numerous projects, such as installing high-efficiency lighting, air conditioning units, boilers, updated operation controls and additional advanced monitoring systems.

ACCOMPLISHMENTS

Material Substitution

As part of their ISO 14001 EMS, LEAD established an objective to "reduce the quantity and toxicity of hazardous chemicals used at LEAD." LEAD has been targeting and replacing hazardous materials which contain the following chemicals: Methylene Chloride, 1,1,1-Trichloroethane, Trichloroethylene and Tetrachloroethylene. Additionally, LEAD reduced the use of paint thinner as a cleanup solvent for paint guns by replacing it with gun cleaning systems which use a safer solvent that is recirculated within the machine. This reduces hazardous waste disposal as well as fugitive emissions of volatile organic compounds (VOC).



LEAD purchased electric vehicles to replace gasoline vehicles on the depot. They are used to support LEAD's mission by transporting parts and personnel, reducing CO₂ emission and saving fuel costs.

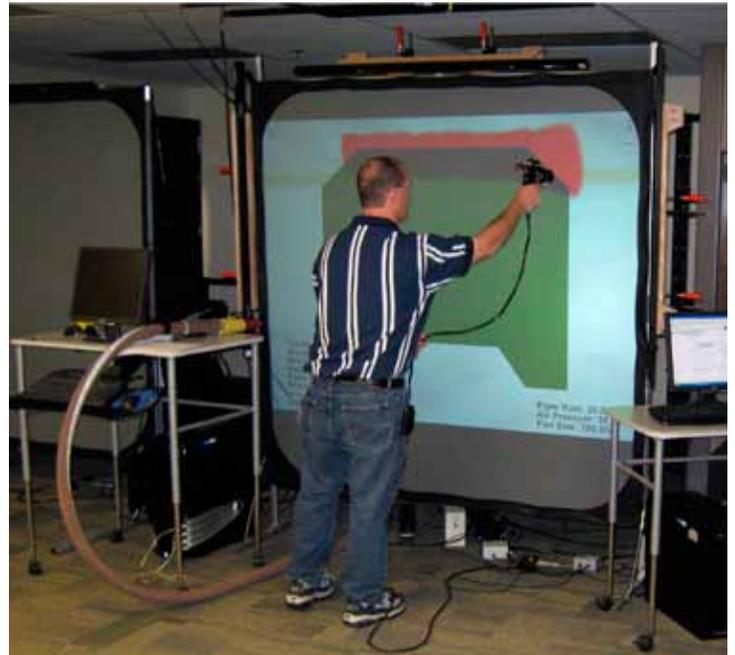
As part of a pilot program, the depot procured two electric passenger vans and three electric pickup trucks in FY 2009 to replace the previous gasoline trucks used to transport parts and personnel within the depot. The conversion to these vehicles will reduce CO2 emissions by 3.5 tons and save \$9,400 in fuel costs annually. As a collateral benefit, because the vehicles are electric, they can enter enclosed buildings and transport people and parts directly to work areas, saving time and increasing production. Upon performance and cost/benefit evaluation of the vehicles, LEAD will decide how best to use additional vehicles throughout the depot and document lessons learned for transferability of the program to other installations.

As of September 2009, 55 of the depot's 237 General Services Administration (GSA) vehicles had been replaced with ethanol-based, or E85, fueled vehicles. The depot's fleet of non-military GSA vehicles presents an ideal opportunity for conversion to E85 fuel. The depot plans to convert all of its gasoline-fueled GSA vehicles to dual fuel E85 or gas/electric hybrids by FY 2015.

Process Modification or Improvement

LEAD recently launched a painter training program in cooperation with the University of Northern Iowa based upon the latter's Spray Technique Analysis and Research for Defense (STAR4D) methodology. The STAR4D program is focused on enhancing a painter's ability to improve the overall quality and effectiveness of military coatings systems. Improving painter efficiency allows LEAD to reduce material and labor costs associated with excessive paint utilization and all associated wastes, including reduction of VOCs via air emissions, reduction of paint and solvent waste disposal, and reduction of material costs related to poor transfer efficiency (coveralls, booth maintenance and filter replacement). STAR4D training will be implemented depot-wide, with all painters to be processed through the program. Analysis of past trainee performance indicated:

- 16.61 percent increase in transfer efficiency
- 13.33 percent savings in coatings
- 9.52 percent reduction in VOC emissions



Painters at LEAD are trained on the Spray Technique Analysis and Research for Defense system. This program will reduce volatile organic compound emissions and improve the quality and effectiveness of military coating systems.

Another minor process modification resulted in additional unexpected benefits to LEAD. To reduce heat loss from open overhead doors during the winter, the depot retrofitted 16 industrial doors with high-speed doors at two high-traffic buildings. Originally planned as an energy saving effort, the rapidly opening and closing doors also produced labor savings. Workers no longer have to wait significant times for the old doors to open and close. Between labor and energy costs, the depot will save an estimated \$19,000 annually.

Improved Material Management

In the past two years, to reduce water use and discharges, the depot used three closed-looped vehicle cleaning systems, preventing thousands of gallons of oil-contaminated water from being discharged to the industrial wastewater treatment plant. Additionally, water is cleaned and recycled, reducing the annual demand on current water supplies. Water conservation is the first leg of LEAD's Sustainability Plan. By 2018, the depot will use 50 percent less water than is currently being consumed, and by 2033, the depot will be self-sustaining, with all water usage coming from sustainable resources.

Compliance with Executive Order (E.O.) 13423 “Strengthening Federal Environmental, Energy, and Transportation Management”

LEAD has several systems and programs currently in place, as well as planned projects, to achieve compliance with E.O. 13423.

- Purchase and use of electric vehicles
- Qualified Recycling Program (QRP)
- Wind turbine project
- Bio-mass boiler project
- New constructions to achieve Leadership in Energy and Environmental Design (LEED) certification
- Geothermal heating and cooling systems
- Municipal waste-to-energy project
- Heating, venting and air conditioning chiller replacements

Recycling Program

LEAD has a very mature and robust QRP. It operates with a dedicated staff of three full-time and six part-time employees.

The depot actively recycles scrap metal, cardboard, paper, used oil, aluminum cans, steel cans, #1 and #2 plastic bottles, scrap wooden pallets, empty plastic drums, nonhazardous antifreeze and batteries. Their recycling rate for FY 2008 was 73 percent and for FY 2009 was 72 percent.

Green Procurement

LEAD conducts and maintains a healthy green procurement program. It has many initiatives in place to become “greener” and more environmentally conscious in day-to-day activities, as well as to make green purchases the norm rather than the exception.



An employee is shown cleaning a vehicle with a high-pressure closed looped system. This system conserves water and minimizes discharge to the industrial wastewater plant.



For example, all LEAD contract solicitations specify Energy Star rated equipment in the statement of work. This ensures any new equipment purchased will meet Environmental Protection Agency energy saving standards. Additionally, the depot requires all contractors working demolition projects to recycle as much material as possible through its Recycling Center. LEAD also requires all office copy paper to have a minimum of 30 percent recycled content. These small, easy to implement actions result in considerable progress towards LEAD’s sustainability goals and help sustain the environment.

Education, Outreach, and Partnering

Originally developed during the energy crises of the 1970s, Energy Savings Performance Contracts (ESPC) provide an additional source of “off-balance-sheet” financing to help the depot become energy self-sufficient.

Under an ESPC, to fund a project’s initial capital costs, the utility company or equipment supplier shares future energy cost savings associated with those capital investments. Currently, the depot is partnering with Northeast Energy Services Company,

Inc. (NORESCO) on two shared energy projects: the construction of a 4.5 megawatt (MW) wind farm and the installation of a 300 boiler horsepower (BHP) bio-mass boiler.

Through an ESPC, the depot has teamed with NORESCO to install several wind turbines and create a 4.5 MW wind farm which could provide the depot with 100 percent of its current energy use. NORESCO has completed its initial wind studies and identified a preferred spot for the turbines just outside of the depot. Plans are in development to conduct stakeholder meetings for the wind turbine initiative, with the objective of gaining community support and ensuring smooth project development. The depot will next study the project's economic feasibility. If it deems the project is viable, the depot will partner with NORESCO and the Pennsylvania Department of Conservation and Natural Resources to erect the turbines. Cost savings would be shared between NORESCO and LEAD.

As part of a second shared ESPC, also with NORESCO, the depot will install a 300 BHP bio-mass boiler to convert waste wood to steam for heating. The boiler will go in Building 349, in the space formerly used for a coal-fired boiler, and will provide high-pressure steam to the existing boiler

plant header, allowing a natural gas boiler to be taken offline during the summer. This \$5.5 million project will use waste wood generated at LEAD and from surrounding businesses to generate heat in the winter. Benefits include landfill cost avoidance (transportation and tipping fees), extending the life of the municipal landfill and offsetting the costs of natural gas for heating. Total annual savings are estimated at \$670,000, with a remuneration timetable of 15 years. Additionally, the bio-mass boiler is expected to reduce CO2 emissions by 9,027,430 tons per year.

Reductions Achieved

To achieve its sustainability goals, the depot must uncover and track what had previously been hidden energy and water use, as well as their associated costs. The depot has metered water use at all of its buildings since the 1990s, and all new construction has also been metered. Additionally, the depot installed an additional 26 electric meters and five gas meters in 12 buildings, with a monitoring system to track and shift the demand for electricity to off-peak, lower cost hours. As of September 2009, the depot had 88 meters tracking 90 percent of electric costs. It is on track to meet the Army's goal of having all buildings metered by the end of FY 2013.

In the past two years, the depot removed aged chillers totaling more than 300 tons in cooling capacity at Building 370 and installed 270 tons of new high-efficiency chillers to serve more than 120,000 sq. ft. of space, reducing electric costs by more than \$3,000. It also replaced four large steam boilers, totaling more than 11 million British thermal units (BTU), with new energy-efficient boilers, saving \$40,000 in natural gas and fuel oil costs annually.



As part of LEAD's Qualified Recycling Program, employees use equipment on site to compact material.

LEAD made the changes through its regular capital reinvestment planning, through which it replaces and upgrades equipment as it reaches the end of its economic life. The depot estimates the average equipment efficiency has increased by more than 15 percent, saving both energy and maintenance costs.

Additionally, over the past two years, LEAD installed 80,000 sq. ft. of new lighting in Buildings 41 and 51, replacing the existing lighting with high-efficiency fluorescent bulbs and occupancy sensors, which saved an estimated \$17,000 in electric costs. By replacing old ballasts and T-12 fluorescent bulbs with electronic ballasts

and high-efficiency T-8 fluorescent bulbs, the depot reduced both the energy used as well as the number of bulbs required. Three of the new high-efficiency bulbs produce the same light output as four of the old bulbs. In Building 41, where open areas use High Intensity Discharge lighting, efficient T-5 conversions were made, and motion detectors and timers were installed in product work cells. The original lighting consumed approximately 240 kilowatt hours (KWH) per day. By operating the new energy-efficient fixtures and motion detectors, the depot reduced consumption in Building 41 by an estimated 90 KWH per day.

The depot recently upgraded its compressed air plant and repaired its compressed air distribution system in the main manufacturing/assembly buildings, which comprise more than 500,000 sq. ft. of production space, saving an estimated \$11,000 in electric costs. LEAD replaced the low-efficiency air compressors with high-efficiency compressors, which are equipped with variable frequency drives and two air plants featuring sequencers to match compressor output with demand. In addition, the depot repaired and replaced more than 800 feet of 1- to 4-inch-diameter distribution lines and fittings, significantly reducing line losses within the system.



“Letterkenny developed the most comprehensive sustainability program in the Army by installing meters to monitor electricity consumption, driving electric vehicles, adding solar panels and geothermal heating, replacing inefficient boilers, and making a host of other improvements. Letterkenny is a model for sustainability.”

- Tom Lillie, Consulting Fellow, Army Environmental Policy Institute

Master Planning and Green Buildings

In 2009, LEAD began constructing its first major LEED project: the 40,335 sq. ft. Army Reserve Center, which is designed to the LEED Silver standard. In FY 2009, the depot completed a LEED-certified project with the construction of a 34,630 sq. ft. Tactical Missile building, which houses the operations for PATRIOT and HAWK missiles. The cost will be slightly more to construct the building to LEED standards than to traditional standards; however, the life cycle cost savings from energy efficiency alone are estimated at more than 30 percent. From these two LEED standard buildings,

the depot will save \$68,000.

Sustainability projects require substantial capital investment and take years of planning. A project begins with a needs assessment followed by project identification, concept development, feasibility studies and engineering designs. The depot continuously feeds its pipeline of long-term sustainability projects.

For example, in the last two years the depot initiated steps toward installing passive solar and geothermal heating and cooling using Energy Conservation Investment Program (ECIP) funding. Additionally, the depot has partnered with the National Defense Center for Energy and Environment (NDCEE) to demonstrate emerging technologies in waste-to-energy conversion and methane gas recovery.

LEAD is pursuing ECIP funding to pay for geothermal heating and cooling systems, a proven energy saving technology, for as many as 28 of its buildings. The systems function by capturing the earth’s constant temperature of 55 degrees to produce heat in the winter and cooling in the summer. More importantly, geothermal technology represents a truly sustainable energy source. The life cycle cost analysis for the proposed heating systems suggests a savings of approximately



\$491,734 per year in heating oil and a decrease of approximately 19.627 million BTU of energy use per year, further reducing carbon emissions by approximately 1,760 tons.

LEAD and NDCEE have partnered to demonstrate a portable waste-to-energy system which could be deployed at forward operating bases to eliminate large amounts of waste and produce energy for deployed troops. LEAD and the NDCEE plan to demonstrate a 10 ton per day gasification furnace which converts low-value waste material to synthesized gas. Preliminary design estimates place costs at \$2.9 million, with an annual forecasted savings of \$171,000, resulting in a payback period of approximately 17 years.

LEAD has also partnered with the NDCEE to install a demonstration methane gas recovery system, a technology currently employed at Fort Knox, Ky. LEAD sits on top of large deposits of Devonian shale, an organic matter. The shale produces methane gas, which can be recovered and used as fuel. The depot is currently considering the feasibility of installing a pumping and preparation system to tap this abundant supply of natural fuel. Perhaps most importantly, the shale is cleaner for the environment and reduces the depot's reliance on foreign oil suppliers. LEAD expects the system will be operational as early as FY 2012.



CONCLUSION

Over the past several years, in order to support Soldiers, LEAD experienced a steady increase in its production levels and a corresponding increase in energy demand. However, through the efforts outlined above, the depot reduced energy per labor hour by 13 percent compared to the previous two years, reduced costs by \$167,400 annually for the past two years and positioned itself to achieve its goal of energy independence.

LEAD will stay mission ready, meet its surging production demands, deploy its core capabilities to the battlefield and earn its title as the Army's premier "Sustainable Green Depot."



This aerial view shows LEAD industrial facilities and surrounding area. LEAD encompasses 17,793 acres, which are used to support the installation's missions. This includes the maintenance, modification and storage of assets and the demilitarization and storage of tactical missiles and ammunition.

For more information about the Secretary of the Army
Environmental Awards program, go to
<http://aec.army.mil/usaec/newsroom/awards00.html>
or call the U.S. Army Environmental Command
public affairs office at (410) 436-2556.

