MICHIGAN ARMY NATIONAL GUARD
ENVIRONMENTAL SECURITY AWARDS FY15
NATURAL RESOURCES CONSERVATION—SMALL INSTALLATION

Introduction & Background

The Michigan Army National Guard's (MIARNG) Fort Custer Training Center has long been recognized as a stellar example of coordinated stewardship in the service of the military readiness mission. Encompassing 7500 acres, Fort Custer (FCTC) blends excellence in natural and cultural resource management with innovation in sustainability and environmental quality to enhance and protect the training lands that support small arms, bivouac, and land navigation training as well as specialized convoy reaction and improvised explosive device training. FCTC is notable for the wealth of biodiversity contained within its border, including valuable and globally rare natural communities requiring comprehensive, landscape level management techniques. The installation environmental staff, moreover, are focused not only on conservation in the present, but also in the future, developing management plans that reflect both the anticipated needs for the MIARNG as well as the ecological changes that may occur as a result of changes in climate. In this regard and in the caliber of the installation's stewardship activities, FCTC is unequivocally at the forefront of modern natural resources conservation.

Program Management

Over the past two years, FCTC's Natural Resources Conservation (NRC) program has achieved a number of key milestones. One of the most innovative is the installation staff's participation in a Department of Defense climate change preparedness pilot program and in the Michigan Climate Change Coalition, both of which focus on delineating likely future impacts to natural communities and developing strategies to mitigate, proactively prepare, and responsibly respond to those potentialities. To this end, FCTC is developing an adaptation plan that incorporates readiness and training, resource management, wildlife and habitat protection, and human health and safety among other elements, with an emphasis on shovel-ready mitigation projects that could be launched immediately. In other accomplishments, FCTC received Strategic Environmental Research and Defense Program (SERDP) grant funding over the past two years to evaluate surface water bodies on post and conduct DNA analysis to determine species' presence. This innovative project in biological forensics is being conducted with support of Notre Dame University, ensuring that the resulting knowledge will reach the broader civilian environmental community as well. In addition, the installation continues to conduct critical monitoring of rare and threatened species with USFWS support, implement its in-house prescribed fire program to enhance habitat and wildlife health, and protect and enhance water resources and wetlands on post, all with a priority on supporting present and future training needs. The environmental program's integrated management approach has been essential in NRC successes.

FCTC's environmental office is well-staffed by program specialists with cross-functional areas of expertise, all of whom wear many hats. The program wildlife

specialist, for instance, also assists with native seed gathering, prairie maintenance, and prescribed fire activities as well as coordinating with USFWS and other stakeholders on wildlife support and restoration projects. In this way, the management of wildlife is embedded within a landscape-level view of habitat development and enhancement. Three environmental staff members are dedicated to the NRC section, with support from the Environmental Program Manager, GIS staff, and other environmental and compliance personnel. The installation's environmental program benefits additionally from the full-fledged support of installation command and trainers, who have helped to foster community and local government outreach and partnership. Within the broader installation and MIARNG organization, NRC activities have been integrated into planning and strategy from the outset to streamline the coordination among environmental, facilities management, trainers and range control, construction and public works, and MIARNG command.

This integration is reflected in the installation's environmental planning documents. The Integrated Natural Resources Management Plan (INRMP) was revised in 2012 and is updated annually; last year, FCTC implemented a new pest management plan as well. The post also maintains an integrated woodland fire management plan and a high quality natural community management plan. Adherence to these plans and the management protocols therein has in turn enhanced the installation's positive relationships with regulatory agencies. USFWS is a frequent partner and collaborator in wildlife monitoring. NRC staff also work closely with the state Department of Natural Resources (DNR) and Department of Environmental Quality (DEQ) to ensure full compliance, conduct permitting for resources and activities, and consult on proposed actions. In fact, due to the construction of new retention ponds on FCTC, the NRC program has successfully eliminated the need for storm water permits going forward, with all water being captured on post as part of larger net zero water goals.

FCTC has had remarkable success in developing projects with grant funding, allowing the NRC section to stretch its budget dramatically and embark upon ground-breaking work. The two-year study of surface water DNA, a revolutionary approach to aquatic sampling that captures species presence/absence over a two-week time period, has been launched using SERDP grant funds totaling around $1.3 million. The NRC program has also obtained grant funding to conduct regional monitoring on threatened cerulean warblers, partnering in this effort as a mentor with other installations that need assistance to improve their monitoring and management for the bird. Over the past several years, these grants have provided several hundred thousand dollars for the multi-state project. A Great Lakes Restoration Initiative grant for $90,000 was also awarded to the installation to support high quality natural community propagation.

Technical Merit

FCTC stands out for its commitment to a long-range view of land management, exemplified by its participation in the Climate Change Preparedness Pilot. While the

DOD has for years considered high-level aspects of arctic impacts and troop preparedness, FCTC is helping to lead the way on addressing installation-level preparedness contingencies. The post's strong existing network with the Michigan Climate Coalition, which encompasses municipal governments, the Michigan Land Use Institute, state regulatory agencies, and many environmental and public institutional partners, makes it an ideal case for adaptation plan development. The plan currently being written will be complete this fall and is tailored to FCTC's unique needs and resources, with additional installation-level plans being developed for Camp Grayling and Selfridge Air Guard Base. Based on current projections, the NRC staff anticipates climate change in the region that could result Michigan eventually resembling the kinds of habitat present in Missouri, and in response, land management in the long term may be adjusted to balance the protection of present habitat communities and wildlife with an eye to propagating those that will likely begin to dominate the ecological landscape in the coming decades. To that end, a number of proposed projects involving vulnerability assessments for specific species and habitat types are emerging out of the adaptation plan. In the meantime, the NRC program's activities are contributing to the preservation of uniquely pristine habitat and biodiversity.

Prescribed fire has been an important tool for training land management, particularly in prairie areas that are ideal for training activities and rely on fire to remain open, biologically diverse, and free of invasive/non-native species. FCTC has its own burn crew and conducts burns in-house; the prescribed fire specialist not only leads the post's program but also serves on the advisory boards for two regional consortia of the National Joint Fire Science Program. This year, she led the consortia in re-launching the "Burning Issues" symposium, presenting research and best practices on several topics, including invasive species control, insects and fire, oak savannah and prairie restoration, and herptiles and fire management, as well as general fire operations. Publication of the conference presentations is forthcoming, and another symposium has been scheduled for January 2016. At FCTC, between 500 and 1000 acres of land are managed with fire each year, encompassing both large blocks and specialty habitat burns that are adjusted according to emerging research on the best timing of fire with wildlife life cycles. FCTC and Michigan DNR work cooperatively on prescribed fire as well, trading assistance and equipment with each other to manage both the installation and adjacent public lands.

Forestry: FCTC partners with Army Corps of Engineers to conduct forest management, conducting timber sales when thinning is necessary for forest health and soldier access. Recently, the NRC staff oversaw clearing of selected trees from fence lines and roads to accommodate force security requirements. Timber proceeds are directed to a reserve account from which the NRC program may request funds for forest and other associated NRC projects. This year, forestry account monies have been used to fund bird surveys.

Fish and Wildlife: Managing for wildlife at FCTC is of course a key aspect of the forestry, prairie restoration, and general land management practices on the post.

FCTC is an excellent example of the ways in which pristine natural habitat provides for both natural biodiversity and the best possible training resources and access for MIARNG soldiers. Cerulean warbler monitoring has been an important project over the past several years. These birds have been in decline throughout the region, particularly as appropriate habitat has been eliminated by development. FCTC has worked diligently to protect this habitat and through a regional Legacy grant-funded project, the NRC staff has mentored other installations in best management practices to protect habitat.

FCTC has accumulated a vast amount of monitoring data on various birds since 1995, capturing and banding birds each year to more accurately track populations. This data contributes to a national database, Mapping Avian Productivity and Survivorship, which tracks change over time in many species. Currently NRC staff are investigating birds and ticks to determine whether birds could function as a potential vector for carrying the varieties of ticks that transmit Lyme disease; this research is being done in conjunction with Michigan State University. The installation also conducts long-term monitoring for deer management using enclosures and feeding plots, a project which helps to guide management of the post's hunting programs. A frog and toad survey was completed this year with DNR assistance, and bat acoustic surveys are conducted in both the spring and fall.

FCTC boasts an eagle nest at one of its wetlands, which has fledged at least one bird in the past two years. USFWS monitors the nest, collecting blood samples and banding eaglets. The post has also partnered with DNR to share that agency's results of an Eastern box turtle survey, a species that FCTC manages for primarily with prescribed fire and some limitations on some types of training access during sensitive times in the turtles' life cycle. The NRC staff have also negotiated a permit for take of pale fumewort present at a construction site and solar field in the cantonment area. The small yellow flower is listed as threatened in the state, and the NRC staff continue to study and monitor its populations elsewhere on post. The prairie vole is another species being monitored, with FCTC representing the sole population of vole present in the state. In the vole habitat, a 3.5-acre parcel is restricted from vehicle traffic, allowing the installation to research whether vehicle movement affects the animal; to date, the populations in the vehicle-restricted area show no demonstrable difference from the rest of the habitat, supporting the future expansion of training opportunities in the area.

Prairies, Wetlands, and Water Resources: FCTC contains some of the best prairie fen habitat in the region, cultivated through a careful regime of fire, invasive species control, wetland enhancement, and native seed plantings. Over the past two years, NRC staff have restored around 200 acres of wetlands, eliminating invasive phragmites with mechanical and chemical means. As the plants are removed from water, native aquatic plants can regenerate. The installation also supports a population of beavers that are key to the fen ecosystem: beavers naturally create dams that cause temporary pond draining, at which point Karner blue and Mitchell satyr butterflies are attracted to the areas. The dams eventually fail, allowing the

wetland to naturally regenerate and the cycle to begin again. The installation manages its own native prairie seed program as well to gather and propagate native grasses.

The SERDP-funded research on surface water bodies is perhaps the most innovative project at FCTC currently focused on water resources. NRC staff are working in collaboration with Notre Dame University on this effort, collecting water samples and submitting them to the school's lab for DNA analysis. The genetic material of aquatic wildlife remain present in the water for approximately two weeks, and evaluating these traces allows for a level of detail in determining species presence that conventional pond shocking, netting, and species counts often may not provide. The DNA analysis is also significantly less risky to wildlife, providing data without requiring any physical contact.

FCTC is actively seeking Massasauga rattlesnake DNA in these samples to determine whether that species has in fact made use of the post's habitat. More broadly, however, the DNA results are being used to confirm the presence or absence of species known to occur on the post. In the future, as the technology is refined, species density may be possible to ascertain using this method.

Invasive Species Control and Pest Management: In addition to phragmite removal, the NRC program manages for glossy buckthorn elimination using mechanical and chemical techniques. Purple loosestrife is biologically controlled using beetles, while prescribed fire is employed to eliminate multiflora, olive, and barberry trees.

Orientation to Mission

In every respect, the NRC program at FCTC is designed to serve the training and readiness missions of the post; FCTC, however, exemplifies the ways in which stewardship and preservation dovetail with the needs of MIARNG soldiers. Open prairies and traversable forests, for instance, are ideal for both natural communities and biodiversity as well as training activities. The NRC program's pursuit of alternative funding to launch new initiatives also ensures that the installation remains a leader in the environmental arena without diverting much needed funding resources from other areas of the mission. And, of course, the climate change pilot program is emblematic of the MIARNG's eagerness to take a long view to the protection of both training and the environment.

This summer, the NRC staff assisted with a project to remove lead from ranges, an effort that not only increased lead recycling rates, but also had a positive impact on groundwater samples for the post. Removal of lead-containing fragments from wetlands and ranges is also a best management practice emerging out of the post's Operational Range Assessment, on which the NRC staff have completed phases one and two. The NRC staff also work cooperatively with trainers and range control to manage the erosion and maintenance issues that may arise in the course of training. Two staff are certified by the state in soil erosion repair and control, and

they oversee known vulnerable sites for erosion, including corners and crossings used by the FCTC truck driver training school.

FCTC is one of four potential sites for a new CONUS interceptor missile site, and the NRC program is assisting with the completion of an Environmental Impact Statement (EIS) to demonstrate the post's compatibility with implementing this strategic capability. The surveys for this project include wetlands delineation, groundwater modeling, bat surveys, and butterfly surveys for two federally listed species, all of which will be completed this summer in order to complete the EIS this fall. The NRC staff also assisted with hosting public scoping meetings last year to inform the installation's neighbors of the proposed development and streamline the outreach process if FCTC is selected as the CONUS site. Elsewhere on FCTC, the NRC staff have developed habitat communities that correlate with training priorities. A storm event several years ago that damaged a section of trees, for instance, presented the opportunity to clear that area as both prairie restoration and a site for maneuver training. When heavy equipment is employed by soldiers, the NRC staff coordinates their activities to construct diversion berms and retention ponds as well as to seed and plant trees in order to create erosion barriers between training sites and water resources. In this way, the NRC program is able to prevent potential environmental problems that could threaten training viability before they occur. In other mitigation, the NRC program has worked over the past two years to purchase a 1.6-acre mitigation bank of wetlands in order to eliminate a .7-acre wetland on a training range (DEQ permitting would not allow for wetlands rehabilitation elsewhere on post as a mitigating solution). This process was completed this spring, allowing range control to proceed with its redevelopment plans.

Transferability

Transferability is an area in which FCTC and the NRC program truly excel, consistently fostering widely applicable best practices, ground-breaking research, rewarding partnerships, and interagency collaboration. The continuity of the program internally, which is largely guaranteed by regulatory support, environmental planning, and integration into the broader MIARNG operations and strategic goals, is further served by the strong network of environmental partners and contributors the NRC program has established. NRC program staff from FCTC also serve on advisory councils or boards for the Michigan DNR, area fire management consortia, and climate change working groups. One staff member is on the Board of the National Military Fish and Wildlife Association as well as working groups for Climate and Outreach within that organization, actively disseminating NRC knowledge throughout all military branches. She also serves on the EAC Conservation Committee, focusing on the transfer of best practices and expertise throughout Guard and active duty sites.

The Climate Change Preparedness pilot program stands out for its transferable potential; FCTC is essentially the Army and the Army National Guard's test case for developing adaptation plans at the installation level. Based on FCTC's techniques and lessons-learned in this process, other Guard installations throughout the nation

can anticipate embarking upon a similar project. The NRC staff's participation in the Michigan Climate Coalition, with over a dozen governmental, conservation, academic, and corporate partners, also helps to ensure both that FCTC gets the support it needs in the broader community but also that its expertise travels widely throughout the state of Michigan and beyond. The coalition meets monthly to collaborate and share information, and this support has made the process of developing installation adaptation plans that much more sophisticated. The adaptation plans that are currently nearing completion at FCTC and other MIARNG installations will likely serve as templates for many, many others in the military community.

The DNA-testing program funded through SERDP is another example of ground-breaking work that could become the standard throughout the Guard. While this technique is new and still in its early stages, water sampling for species presence/absence represents a tremendous savings in time, resources, and wildlife risk over conventional surveying methods, particularly for aquatic life that are already difficult to monitor. FCTC's commitment to enhancing the knowledge-based around prescribed fire management is demonstrated by its leadership in the "Burning Questions" symposium, which brought together FCTC with state and federal environmental managers, academics, and conservationists to present the newest data and discoveries on best practices for fire to support wildlife and habitat goals. This year's topics are in the process of being published to encourage broader awareness and adoption of these recommendations, and the symposium is slated to meet again (and publish again) in winter of 2016. In terms of wildlife, FCTC is directly involved in transferring its expertise to other installations as well, serving as a mentor to other training posts in the region that are struggling with management of cerulean warblers and other bird species and as a collaborator with installations that have had their own successes. The techniques developed out of this program will be widely applicable to installations within the bird's range.

Stakeholder Interaction

Indeed, it is difficult to capture the extent of FCTC's stakeholder interaction, as the NRC program's outreach is so comprehensive and multi-faceted. Public outreach events, like the one help in advance of the CONUS EIS, are the norm to ensure transparency and accessibility between the MIARNG and the public. The 2-hour CONUS event invited the community to ask questions and make comments as well as see presentations about the project's potential impacts, encouraging a two-way flow of information. FCTC has long supported public access to the post when possible. Annual National Public Lands Day grants, usually amounting to $6500, have been used to host public events with tree plantings, native seeding, and construction of outdoor recreational structures. Boy Scout groups and young men completing their Eagle Scout requirements are often participants in these events. FCTC also hosts the annual Boy Scout jamboree. The post also participates as a sponsor and host for the regional Michigan Envirothon program, a statewide environmental education program and event for high school students; every four years, the installation hosts the statewide Envirothon competition. This May, FCTC

welcomed 125 high school students on Envirothon teams to compete in their knowledge of forestry, wetlands, wildlife, energy, and agriculture.

The installation has a long-established hunting program for deer and turkey, and over the past two years was twice recognized as the "Best Cooperator Event" for the National Wild Turkey Federation's Wheelin' Sportsmen Program. Deer hunts are held each year for soldiers, disabled veterans, and the general public; youth turkey hunts are also held on post, along with hunter safety courses. The NRC program carefully monitors deer populations at FCTC, using enclosures and feed plots, to ensure a balance between population density and hunting permits issued.

FCTC's NRC partners and collaborators on the accomplishments described in this nomination include (but are not limited to):

MI Parks Service	MI DNR	MI DEQ	USFWS
Notre Dame University	Illinois DNR—Prairie Restoration	The Nature Conservancy	Lake States Fire Science Consortium
Kalamazoo Nature Center	Michigan State University	Huron River Watershed Council	MI Dept of Community Health
National Wild Turkey Federation	US Forest Service	MI Environmental Council	MI Farmers Union
MI Forest Service	Indiana Dunes State Park	MI Dept of Transportation	National Wildlife Federation
MI Conservation Districts (Envirothon)	Superior Watershed Partnership and Land Trust	MI Dept of Agriculture and Rural Development	University of Michigan

Awards presented to the MIARNG Environmental Office over the past decade include:

NGB awarded the MIARNG Environmental Office the 2009 Environmental Stewardship Award. Michigan is the only state that has received this award twice; 1997 and 2009. The Stewardship Award is given based on the best overall environmental program and outstanding performance in all aspects of environmental management. National Guard environmental offices from all 54 U.S. states and territories compete for the coveted award.

MIARNG Environmental Awards

Dept. of Defense

2009 Environmental Security Award Fort Custer - Natural Resources

2008 Environmental Security Award Lansing Env./CSMS - Pollution Prevention

Dept. of the Army

2008 Environmental Security Award Lansing Env./CSMS - Pollution Prevention

2005 Environmental Security Award Fort Custer - Natural Resources

NGB

2015 Environmental Security Award Fort Custer ENV – Natural Resources (First place)

2014 Environmental Security Award CFMO/ENV – Sustainability (First place)

2013 Environmental Security Award Fort Custer – Cultural Resources (runner up)

2011 Environmental Security Award Fort Custer - Natural Resources

2010 Environmental Security Award Camp Grayling - Sustainability

2009 Environmental Security Award Fort Custer - Natural Resources

1997 and 2009 - Environmental Stewardship Award - (Best Overall Environmental Office) Michigan is the only state in the nation to receive this award twice

2008 Environmental Security Award Lansing Env./CSMS - Pollution Prevention initiative for water reclamation system and conversion to water based CARC automotive paint reducing hazardous waste generation.

2005 Environmental Security Award Fort Custer - Natural Resources Program