

**ILLINOIS ARMY NATIONAL GUARD
ENVIRONMENTAL SECURITY AWARDS FY11
NATURAL RESOURCES CONSERVATION—SMALL INSTALLATION**

ABSTRACT

Marseilles Training Center (MTA) is a 2850-acre primary training area for the Illinois Army National Guard (ILANRG) and other military and state agencies. Co-managed between the Illinois Department of Military Affairs (DMAIL) and Department of Natural Resources (DNR), the installation has supported an average of 83,000 man-days over the past three years in training operations ranging from live arms and small arms training to land navigation to vehicle maneuvers. The installation has also posed some unique natural resources conservation (NRC) challenges over the past two years. Prior leases on the property for a sand and gravel quarry created significant erosion problems leading to deterioration of Kickapoo Creek on post. This deterioration not only harmed water quality and aquatic habitat, but also threatened a ComEd utility tower and several training-critical roads. Addressing this issue has been the core effort of the NRC program at MTC over the past two years.

ACCOMPLISHMENTS

Program Management

Successful implementation of the Kickapoo Creek restoration project has been a major milestone achievement for MTA. The project incorporates multiple partners and exemplar cost-leveraging strategies. In scope, it will correct extreme downcutting through construction of 15 pool and riffle structures to bring the stream back into equilibrium and as well as repair eroding streambanks. Thirteen of the fifteen structures were completed by the end of September, 2011, with the final two completed in October. Thus far, the structures have yielded promising results. Strong program management has been key to this success:

- NRC on the installation is jointly managed by the MTA environmental office and the DNR. The NRC program manager, environmental program manager, facilities manager, and project supervisor on the ILARNG side all work very closely with a DNR project coordinator. This team is further supported by the ILARNG environmental office, the MTA Garrison Commander, and project stakeholders from the Illinois State Water Survey (ISWS), and state. This level of internal and external coordination, between ILARNG offices and directorates and outside agencies, has required a focus on communication from the project beginning. All involved parties participate in weekly meetings and phone conferences to ensure the project remains on track and any issues are easily resolved. The DNR liaison also provides short reports following meetings to create a record that allows newcomers to understand where the project stands.
- The current INRMP for the installation is up-to-date and will undergo revision in 2013. This project directly addresses two goals of the IRNMP involving mine reclamation and soil stabilization and erosion control. The ILARNG and DNR

hold an annual meeting to review and make small updates to the INRMP to reflect NRC progress; they also coordinate on the five-year revision.

- The installation's close relationship with the DNR, ISWS, and state EPA have meant that MTA is regarded as a partner in NRC activities rather than as simply a regulatory object. The installation remains in full compliance with all requirements and statutes, and these regulatory partners help to address any new NRC needs or challenges that may arise.

One of the great demonstrations of the MTA's project success is the way in which interagency agreements have allowed the ILARNG to leverage expertise and funding resources to avoid costs and provide win-win opportunities for all involved. The total estimated cost for the materials for the 15 riffles was approximately \$578,000. The actual costs have been shared across agencies and reduced by the donation of labor and expertise over outside contracting:

- One of MTA's contributions has been the use of heavy equipment and equipment crews for excavating, hauling material, and grading along the creek bed. This element not only saved money, but also provided training opportunities for troops. The DNR also contributed equipment and equipment crews. The ILARNG and DNR estimate that the value of time, labor, and equipment usage they have contributed to the project would cost around \$2.3 million to date if outside contractors were utilized.
- The state EPA contributed the funding for early phases of the project to complete the necessary design analysis and construction plan. The state EPA has an interest in preserving the greater watershed and controlling erosion problems that may affect sedimentation and water quality in the Illinois River downstream.
- The DMAIL has contributed \$200,000 for materials purchased in order to see the project through to its completion.
- ComEd became a partner because the creek erosion was directly threatening an electrical tower. Without erosion correction, the bank beneath the tower would soon collapse. ComEd donated monies to the project to be used in their areas of concern.
- The ILARNG and MTA had also been stockpiling concrete debris from other construction or demolition activities. This material was reused in riffle construction and stream bed restoration, saving the project \$500,000 in avoided material purchase. DNR has also provided some concrete and is coordinating with a local company that builds bridge beams and has concrete material that will be available to the project free of charge.

Technical Merit

The Kickapoo Creek restoration and erosion stabilization project has dominated the NRC program at MTC over the past two years. Without this aggressive effort to address the issue, Kickapoo Creek would have continued to degrade, risking training lands, an electrical tower, and stream, watershed, and river sustainability.

- Eventually almost all stream systems, especially in the Midwest, find available soil/stratigraphic materials to erode. Usually, this is a slow process when stream sediment load, slope, and hydraulic energy are balanced. In the case of

Kickapoo Creek, however, this equilibrium was disrupted in part by the impacts of previous quarry operations and lack of reclamation. . The creek had redirected itself into the quarry site, causing major erosion problems. Though some stopgap measures were undertaken, these were undermined by major rain and flooding events in 2005. By the time this project was begun, the creek's natural bank height of 8 feet had grown downstream to 30 feet, and its 40- to 45-foot width had widened to 100 feet because of extensive downcutting that deepened and widened the channel by washing



Riffle construction was undertaken at MTC to correct legacy erosion issues and achieve shared interagency goals for creek restoration.

- soil and sediment into the stream. This process was further exacerbated by Kickapoo Creek's natural high velocity, which was only increased as the erosion worsened. The soil and sediment washed away was also causing stream quality problems downstream and throughout the Illinois River basin and costing MTA substantial portions of habitat and training land.
- As previously described, this project was undertaken by a consortium of interested and invested agencies. But to address the magnitude of the problem at Kickapoo Creek, the solution had to be comprehensive. To that end, the project involves the construction of rock riffles and weirs, like small levees and pools, to slow the water velocity and minimize the sharp slope that has accelerated the creek. An estimated total of 26,000 tons of rock will be used by the time the project is complete—much of which is coming from the ILARNG's recycled concrete stockpile. MTC and its partners are also working to reconstruct and re-grade the eroded stream banks.
 - A total of 15 riffle structures with associated weir pools were installed. Because the project site is in the MTC training area, construction has to be coordinated with the weather, training schedules, and crew availability. Nearly all of these structures were complete by the end of FY11.
 - Once the stream has been stabilized, the riparian habitat will be able to recover with little interference. Where earth is bare in eroded or constructed areas, the NRC staff has put down native seed to re-vegetate the area. The weir structures are themselves providing needed habitat for various aquatic insects, birds, and fish. The pools reconstruct the natural stream system that was lost.
 - The subsequent lakes at the former rock quarry will also see improvements from this project. Prior to the creek changing its course and the resulting increase of sediment, the gravel pit lake supported a natural high quality fishery with a depth

of 50 feet and remarkably clear waters. Sediment loads from the stream filled in the lake so much that its current depth is now only about 20 feet, and the water is no longer clear enough to support fish. The stream restoration is expected to significantly reduce the sediment load to the lake.

Other NRC Activities at MTC:

- MTC's environmental staff partner with the DNR to conduct prescribed fire management. The installation has high quality natural prairie habitat, and prescribed fire has been extremely successful in maintaining this habitat as well as reducing fuel loads and controlling invasive species. The installation runs prescribed fire on three- and five-year burn cycles according to the needs of the specific habitat areas. The environmental staff is currently in the process of achieving its fire certification with training from the DNR.
- A combination of prescribed fire and mechanical removal is utilized to control invasive species, effectively limiting the use of pesticides to an absolute minimum.
- MTA also cooperates with the DNR forester to conduct timber stand improvement. Timber harvesting is not practiced on post, but the forest habitat is enhanced by the removal of some invasive or non-native trees, such as black locusts. This practice not only enhances forest quality, but also improves the quality of training in forested areas.
- Though MTA does not have any threatened or endangered species known to be on post, it does have habitat areas that could support some state species of concern. These valuable habitat areas are monitored and maintained as though these species were present.
- This year, 300 trees were planted on post to create natural wind breaks, broader roadways, and lane separators on the Modified Record of Fire Live Fire Range.

Orientation to Mission

All the NRC activities on MTA contribute, directly or indirectly, to the training and readiness missions of the ILARNG. Projects like tree planting or prescribed fire improve the natural habitats of the post, but they also enhance the quality of training land available for troops and make those lands more usable.

The creek restoration project was also important to the ILARNG mission. The creek's accelerated rates of erosion were costing the installation training land and endangering roadways and training lanes on driver and combat convoy courses. A number of embankments have been armored and reinforced in order to save adjacent training resources. The loss of soil and sediment upstream on post had also caused problems washing downstream, clogging outflow culverts, and causing flooding across training roads. Clearly, eliminating these issues is a benefit to training sustainability.

What is more, the ILARNG took the opportunity to incorporate the creek project into soldiers training. Transportation units were able to train in their skills by transporting rock and construction material to MTA. On-post engineers were able to practice with heavy equipment in the field, and units were able to take part in heavy equipment use during their annual training. This summer, a unit constructed a vehicle turnaround at the South Kickapoo range site; this was one of 10 annual training projects that corrected, repaired, or minimized erosion, or ensured proper drainage to prevent erosion across the installation. For the last structures to be completed on the creek this fall, the installation used donated bridge beams to create weirs. The ILARNG and MTC coordinated to develop an aviation training exercise in which soldiers used helicopters to move these concrete beams and place them in the stream. In these ways, MTC is a prime example of the many ways that NRC commitments and military readiness can work in concert.



Training activities were incorporated into the restoration construction; here, helicopter training is used to move concrete beams into place.

Transferability

The environmental office of MTA is fully integrated with facilities, engineering, range, and training staff to ensure that all NRC undertakings are integrated into the broader plans for installation needs and development. This kind of organization-wide cooperation also means that projects are implemented with the support needed to carry them through to full completion. It also means that the environmental office has successfully cross-trained a number of NRC operations across internal departments; exotic species removal and invasive species management, for example, include the environmental office and engineering and range control departments, and all the departments integrated with environmental take part in prescribed burns.

To share its experience and take part in the broader environmental community, MTA will be hosting the Region 4 Training Area Council Meeting this January, during which representatives from Minnesota, Illinois, Wisconsin, Michigan, Ohio, Indiana, and Tennessee will take share information and exchange lessons learned in environmental conservation. Installation staff members are also part of the Environmental Advisory Council, the National Military Fish and Wildlife Foundation, and the Arbor Day Foundation. In addition, because of MTA's close relationship with the DNR, any innovations or successes achieved on post are readily transferred to other DNR properties throughout the state.

Community Interaction

As a joint ILARNG and DNR use property, MTA serves an important role in the community as a provider of recreation and a resource for environmental education. The installation hunting program is administered by the DNR with cooperation and support from MTA environmental and range staff. Over the past year, the 2515 acres opened for hunting provided for 2386 hunting trips over all seasons for deer, quail, duck, turkey, geese, and more. This year, areas for disabled veteran hunting were also expanded.

As previously described, the success of the Kickapoo Creek restoration is due in no small part to a successful partnership between MTA, the DMAIL, the DNR, the Illinois EPA, and the ISWS. These partnerships have helped to further establish the reputation of MTA and the ILARNG as environmental stewards. An article about the project was published earlier this year in *Illinois Outdoors*, further enhancing the installation's public visibility.

MTC also hosts high school groups, football teams, junior ROTC, Boy Scouts, and local non-profit organizations on its training lands. The vast majority of the installation is open to the public, and these groups frequently contact the post to arrange for use of training resources. The Boy Scouts frequently schedule their camping, land navigation, and wildlife experiences at MTC, and local schools often visit for science class field trips. The Audubon Society visits MTC to monitor the post's bird populations and shares its findings with the DNR and the MTC environmental office.

Educational opportunities are also offered for more advanced students. Southern Illinois University has been contracted to conduct forest inventories, and MTC has also worked with them and the Natural Resources Conservation Service (NRCS) to conduct soil surveys and develop databases.

MTA is committed to wider community involvement as well. An annual motorcycle memorial ride is sponsored by the post along with a Freedom Ride, one of the largest motorcycle rallies in the state. When local schools or organizations hold events, troops and environmental staff will frequently attend or host booths in support of the event, often in conjunction with Earth Day, Memorial Day, or Veterans Day. The installation also hosts an annual tractor convoy with a banquet for attendees. Through this consistent outreach, MTA is well-established not only as an environmental leader in the state, but also as a good neighbor and valued part of the community.