



# U.S. Army Environmental Command

Aberdeen Proving Ground, MD 21010-5401

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## **Fort Indiantown Gap provides refuge for rare butterfly while training Soldiers**

*Aberdeen Proving Ground, Md.*-- When it comes to military training in Pennsylvania, there's no better place than the Army National Guard's Fort Indiantown Gap. The installation is the key training center for 18,000 Pennsylvania guardsmen each year. Soldiers aren't the only inhabitants at the installation, however; it turns out that there is no better place for the rare, regal fritillary butterfly.

In fact, Fort Indiantown Gap supports the largest regal fritillary population east of the Mississippi River. The regal fritillary butterfly, a Pennsylvania state species of concern, exists there because of the installation's grassy ranges, but those grassy ranges provide the Army's only live-fire, maneuver training site in the state.

Therefore, the installation's natural resources conservation team has the challenge of protecting this beautiful insect while providing the landscape in which National Guard Soldiers train for war. And, the team has met this natural resource challenge so successfully that it earned the Army's highest honor for environmental stewardship in 2007, the Secretary of the Army's Environmental Award for Natural Resources Conservation,

Every acre of the post has is needed in some way to support realistic training for National Guard Soldiers. "If we could we'd just set the grassland aside for the regal fritillary butterfly," said John Fronko, environmental program manager for the Pennsylvania Army National Guard, and leader of the natural resources conservation team. "Since land is a finite resource around here, though, we put our heads together and found a win-win solution for our Soldiers and our butterflies."

One solution is virtual mine fields. Fronko said the installation avoids mechanized training on 219 acres to preserve butterfly habitat by assigning some of that area as virtual 'mine fields' in training exercises. "That way we are still able to maintain realism and meet our training doctrine requirements at the same time," he said.

Another solution to keep the regal fritillary butterfly off of the endangered species list is transplanting a colony of the regal fritillary butterfly elsewhere in the state. The Gap's natural resources team is working with The Nature Conservancy to introduce the butterfly at the Gettysburg National Military Park.

In addition to the regal butterfly, the natural resources team manages 96 other state species of concern on 17,000 acres of the most biologically diverse ecosystems in the state, including forest, grassland, scrubland, savanna, and wetlands.

The Secretary of the Army's environmental award will be conferred on the installation at a ceremony on May 12 for its success both in protecting precious natural resources and in sustaining Fort Indiantown Gap's capability to train Soldiers.

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*The U.S. Army Environmental Command supports environmental programs that sustain Army training and operations while protecting the environment.*

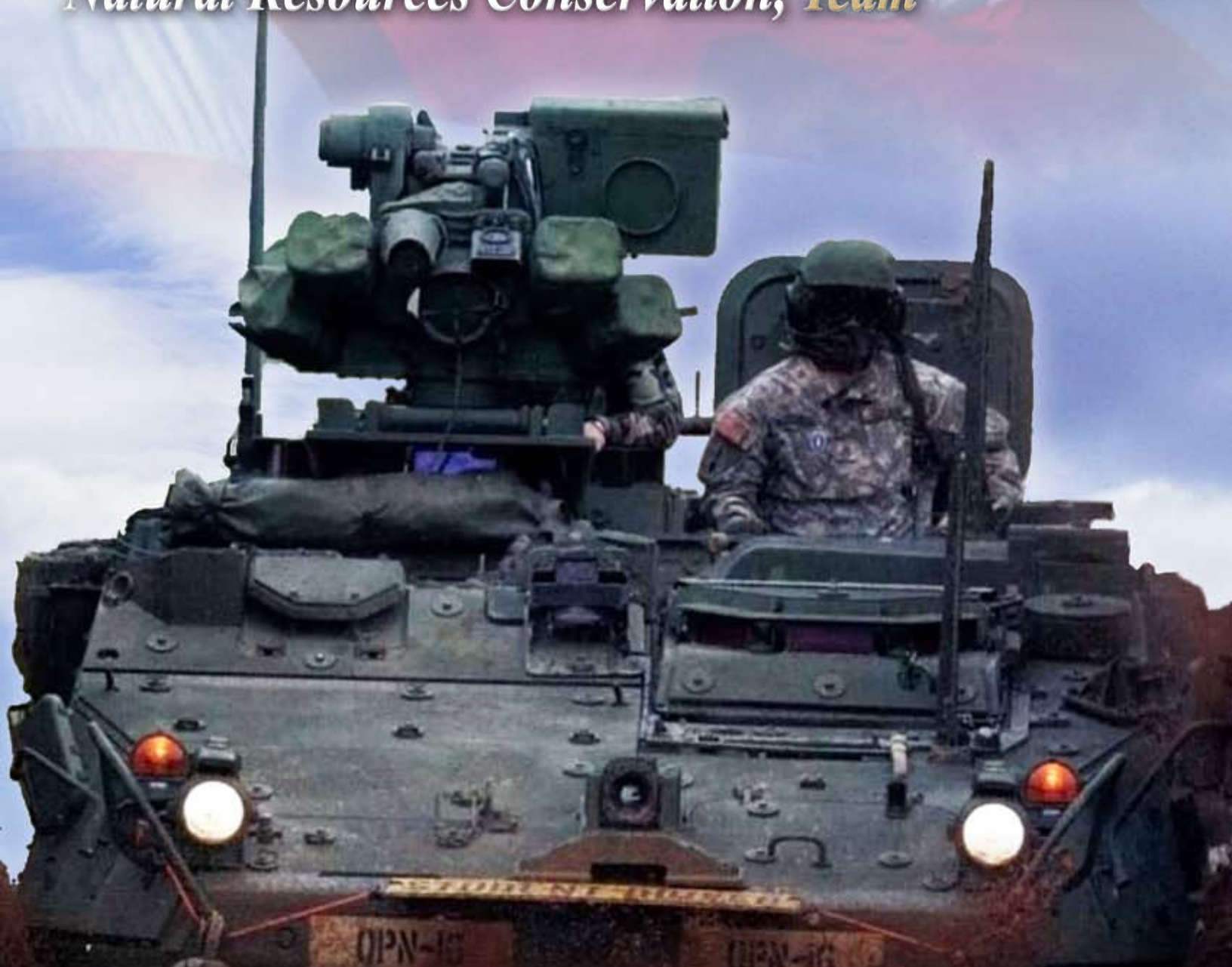
*"Sustaining the Environment for a Secure Future."*

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*FY 2007 Secretary of Defense Environmental Awards*

# Natural Resources Conservation Team, Pennsylvania ARNG

*Natural Resources Conservation, Team*



*Sustaining the Environment for a Secure Future*

# Natural Resources Conservation Team, Pennsylvania ARNG



## Natural Resources Conservation, Team

### SUMMARY

The Pennsylvania Army National Guard (PAARNG) Natural Resources Conservation Team is located at Fort Indiantown Gap National Guard Training Center in Central Pennsylvania. Fort Indiantown Gap is the only live fire, maneuver military training facility in the state. It is also a critical habitat location for a federal species of concern, the regal fritillary butterfly, and home to an additional 96 state species of concern. The Fort Indiantown Gap Natural Resources Conservation Team has been able successfully to balance one of the region's most ecologically diverse areas with a military mission that supports over 18,000 PA Army National Guard personnel each year.

The Natural Resources Conservation Team is responsible for all management associated with natural resources, including:

- Land rehabilitation and maintenance
- Planning, designing and implementing all monitoring programs for flora and fauna
- Managing the installation's hunting, fishing and forestry programs
- Supporting the overall military mission



*Stryker driver training in the engineer dig site which has three permanent sediment control structures.*

Additionally, some of the team has responsibilities for the 112 statewide Department of Military and Veterans Affairs (DMVA) facilities (armories, readiness centers, maintenance shops and veteran's homes) throughout the Commonwealth.

*On the cover: Stryker driver training at Fort Indiantown Gap in an engineer dig site, which has three permanent sediment control structures.*

The Natural Resources Conservation Team's accomplishments include:

- Prevented the designation of the regal fritillary butterfly (a Pennsylvania state listed species and Army Category 2 species at risk) as a federally endangered species by increasing the number to roughly 1,000 animals by relocating mechanized training around butterfly habitat.
- Adjusted training times and locations to minimize the impact to vegetation, soils and waterways.
- Restored five acres of wetlands to functioning status and constructed a wetland interpretive trail.
- Applied dust palliative on gravel combat trails to keep it out of waterways and air, which reduces the impact on Soldiers and wildlife.
- Addressed soil erosion issues and possible stream siltation.
- Tracked forest inventories on GPS-enabled tablet field computers, reducing paperwork and decreasing the amount of time it takes to prepare timber sales.
- Conducted prescribed burns to manage fuel loads, forests and regal fritillary butterfly habitat.
- Built and monitored over 150 nesting boxes used by more than 12 species, including owls, ducks, kestrels, songbirds and bats, to track the migratory patterns of birds.
- Reduced the unsustainable deer population to 17.4 deer per square mile by issuing antlerless deer tags to hunters.

**“The PAARNG team, balancing a dramatic increase in operational tempo with a sustained focus on managing their natural resources, once again demonstrates that accomplishing the mission and sustaining the environment are not independent goals.”**

*– Mr. Jeff Hatch, Attorney,  
U.S. Army Environmental Command*

## INTRODUCTION

The Pennsylvania Army National Guard (PAARNG) Fort Indiantown Gap National Guard Training Center is the only live fire, maneuver military training facility in the state. Located in Central Pennsylvania, Fort Indiantown Gap has a military mission that supports over 18,000 PA National Guard personnel each year, including the largest and most deployed Army and Air Guard, the 56th Stryker Brigade Combat (SBCT) and the 28th Infantry Division. Guard, Reserve, Active Army, Navy and Marine units, law enforcement entities from Pennsylvania and other states, as well as Joint Services with the Air Force, swell the training lands and facilities users to over 130,000 personnel each year.

Fort Indiantown Gap is also a critical habitat location for a federal species of concern, the regal fritillary butterfly, and home to an additional 96 state species of concern. With 17,150 acres of grassland, scrubland, savanna, wetlands and forest, it is the largest landholding in the Swatara Creek Watershed. Fort Indiantown Gap also features 112 miles of streams and two mountains. The Fort Indiantown Gap Natural Resources Conservation Team has the weighty responsibility of balancing one of the region's most ecologically diverse areas with an important military training and support mission.

## BACKGROUND

Key members of the Fort Indiantown Gap Natural Resources Conservation Team include military and government civilian personnel and environmental contractors from the Pennsylvania State University.

- Lieutenant Colonel William Yearwood, Director of Plans, Training and Security, PA Army National Guard
- Michael Ney, Integrated Training Area Management (ITAM) Coordinator, Penn State University
- David Walton, Training Site GIS Manager, Penn State University
- Captain John Boggan, Range Officer, PA Army National Guard
- Steve Snyder, Range, Training Land Program Coordinator, Penn State University
- Sergeant First Class Luke Long, Range Control, NCOIC, PAARNG



*Native Grassland on Fort Indiantown Gap.*

- Michael McAllister, Range Complex Technician, Department of Military and Veterans Affairs
- Lieutenant Colonel David Edwards, Training Site Engineer, PA Army National Guard
- Staff Sergeant Russell Mohle, Facility Manager, PA Army National Guard
- Eric Drupp, Grounds Manager, Department of Military and Veterans Affairs
- Shannon Henry, Forestry Manager, Department of Military and Veterans Affairs
- Tim Haydt, Forester, Department of Military and Veterans Affairs
- Joseph Hovis, Wildlife Manager, Department of Military and Veterans Affairs
- David McNaughton, Wildlife Biologist, Penn State University
- Mark Swartz, Monitoring Biologist, Penn State University
- Nick Hoffman, Habitat Biologist, Penn State University
- Virginia Tilden, Regal Biologist, Penn State University

## POSITION DESCRIPTION

The Natural Resources Conservation Team is responsible for all management associated with natural resources, including:

- Land rehabilitation and maintenance
- Planning, designing and implementing all monitoring programs for flora and fauna
- Managing the installation's hunting, fishing and forestry programs
- Supporting the overall military mission

Additionally, some of the team has responsibilities for the 112 state-wide Department of Military and Veterans Affairs (DMVA) facilities (armories, readiness centers, maintenance shops and veteran’s homes) throughout the Commonwealth. The first forester, biologist, ITAM coordinator, GIS manager and the second training site engineer for the training site are still in place, helping to maintain institutional knowledge. In fact, the team ITAM Coordinator has over 30 years of experience working at Fort Indiantown Gap.

## AWARDS AND SERVICES

In 2006, Fort Indiantown Gap was awarded the Army National Guard’s Environmental Security Award for Natural Resources Conservation on a Large Installation. The award lauded the installation, interns and the team, for their work integrating land management practices with military training, and for providing recreational opportunities for the public. Team members are active in multiple organizations in support of natural resources:

- Shannon Henry is the Vice-chair of the PA Prescribed Fire Council.
- Joseph Hovis is the current Chair and David McNaughton is the Secretary of the National Military Fish and Wildlife Association (NMFWA) Herpetology Working Group.
- Tim Haydt recently completed a GIS Fire Atlas for his Master’s Degree in GIS that tracks all installation fires and presented the results at the 2007 Sustainable Range Program Conference.
- Dave McNaughton presented the talk “Adapting Protocols For Efficient Fire Monitoring” at the 72nd Annual North American Wildlife and Natural Resources Conference in 2007.
- Nick Hoffman presented the paper, *A Case Study In Maneuvers And Woody Succession*, at the 2007 NMFWA Conference.
- Virginia Tilden was an invited speaker at The Entomological Society of America Eastern Branch Annual Meeting in 2007.

These are just a few of the 16 presentations that the team has given over the last two years.

## ACCOMPLISHMENTS

### Program Management

The installation’s Integrated Natural Resources Management Plan (INRMP) has an up-to-date list of class 0 & 1 projects to be carried out by the installation to meet the natural resources goals and objectives. The team has worked hard at pursuing alternate funding streams and methods to accomplish these projects. Partnering has been the most successful method and has allowed the team to accomplish many projects. Figure 1 contains a list of some of the key partners that have provided funding and services to accomplish INRMP projects at Fort Indiantown Gap.

Figure 1	
Partner	Cooperative Activities
The Pennsylvania State University	Research for prescribed fire effects, forest management and wildlife; four peer-reviewed journal articles
The Nature Conservancy	Training for prescribed burns and assistance with regal fritillary butterfly research; two peer-reviewed journal articles
Pennsylvania Department of Conservation and Natural Resources	Wildland fire training and demonstrations, forest growth studies and interpretive trail maintenance and patrolling
Chesapeake Bay Foundation	Wetland restoration, stream buffers and the construction of an interpretive trail
Pennsylvania Fish and Boat Commission	Fish stocking, law enforcement and patrolling, guidance on state species of concern, Adopt-a-Stream program; INRMP external stakeholder
Pennsylvania Game Commission	Trap and tag bears, consultation on hunting program, antlerless deer tags, harvest data, law enforcement; INRMP external stakeholder
Shippensburg University	Butterfly and dragonfly research resulting in two M.S. theses
Fort Indiantown Gap Conservation Club and Trout Unlimited	Assistance in running cooperative nursery, data collection, wildlife habitat improvement, Adopt-A-Stream program and annual stream clean-up projects

Fort Indiantown Gap does not have any federally listed endangered species but the team works hard, both on and off the installation with stakeholders, to manage species so that if a listing occurs the team will have data to minimize encroachment. This is most evident with the regal fritillary butterfly. The team successfully managed to keep the regal fritillary butterfly off the

federal endangered species list while continuing to effectively train by relocating mechanized training areas around butterfly habitats. The Army considers Fort Indiantown Gap a very important installation in the Army arsenal for training and natural resources. This concept is confirmed by they Army's allocation of over \$1.6 million for INRMP implementation in FY 2006 & FY 2007. The installation's INRMP was reviewed for operation and effect in 2007 with the installation internal stakeholders and the state. Based on input, the INRMP will be revised to reflect new training requirements.

Working with the state, the team has begun to identify areas where the goals of the State Wildlife Action Plan (SWAP) can be incorporated into the installation INRMP and vice-versa. The team understands that natural resources management does not end at the installation fence line and realizes that ecosystem management is the common goal for both the installation and the state.

The team uses the INRMP as its mechanism to meet Environmental Management System (EMS) requirements. Team members keep track of INRMP projects and timelines to make sure implementation is occurring. Projects that cannot be completed due to funding or weather conditions (e.g., prescribed burning) are updated in the INRMP to be completed the following year.

## Mission Enhancement

Having more Soldiers and Airmen in the PA Army National Guard than acres at Fort Indiantown Gap is a team challenge. Over the past two years, the team has met a significant program management milestone by implementing or updating a variety of new management plans and construction projects outlined in the Environmental Impact Statement (EIS) for Enhanced Training and Operations, including 42 projects. Before any projects in the EIS were executed, the team was given a new mission to transform the 56th Brigade into a SBCT. The PA Army National Guard completed a second 1,871-page EIS (including 49 statewide actions and installations in five other states) for the transformation in 2006 and started the 300-page supplemental EA for the construction of a Multi Purpose Training Range. These documents cleared the way for the construction of 41



*The largest documented population of the regal fritillary butterfly is protected at Fort Indiantown Gap.*

new/upgraded ranges and facilities and for the nine new ranges for the 56th Stryker Brigade. Over \$150 million of new construction was executed. All the team activities at Fort Indiantown Gap are designed to enhance the quality of training lands, not only for natural resources, but for Soldiers as well. The team's success proves that training and ecosystem management are not mutually exclusive. The team meets monthly with compliance, NEPA and other PAARNG staff to determine project priority, timing and budgeting. A partnership with Wildlife Services-United States Department of Agriculture reduces Fort Indiantown Gap wildlife hazards at Muir Army Airfield and Bollen Air-to-Ground Range for bird aircraft strike hazard (BASH) and wildlife damage to ranges and infrastructure.

## Land Use Management

Proper and sustainable land rehabilitation and maintenance is a very important component for the team. The Integrated Training Area Management (ITAM) Program is an integral component supporting both management of training lands and environmental quality. Training schedules are adjusted to times and locations which will minimize the impact to vegetation, soils and waterways.

In FY 2006, the team completed restoration of five acres of wetlands to functioning status and constructed a wetland interpretative trail: seven miles of stream buffer in the cantonment area and 25 acres of warm season grasses in a training corridor. The project addressed soil erosion and stream siltation issues. This was accomplished with a \$35,000 Environmental Protection Agency grant and over \$50,000 of partner assistance for habitat restoration.

The team has implemented a water resource management plan to guide the protection of water resources at Fort Indiantown Gap. Water monitoring is conducted by the United States Geological Survey (USGS). The data from the USGS indicates that on-post sampling sites have better biotic assemblages, higher stream quality, higher habitat assessment scores and minimal sediment loads than some sampling sites taken from nearby waters. USGS results are mirrored by Range and Training Land Assessment (RTLA) land condition assessments that have shown low amounts of erosion activity and sediment transport in open training lands. The data clearly demonstrates that training, through implementation of erosion control methodology by the team, is not negatively impacting the Chesapeake Bay watershed.

A key ITAM project is the annual application of dust palliative on 25 miles of gravel combat trails. The product decreases safety hazards and vehicle maintenance while keeping costly gravel on the trail surface and reducing dust, thereby keeping it out of waterways and air. This reduces the impact on soldiers and wildlife. Best management practices developed by the Pennsylvania Dirt and Gravel Roads Program have been adopted by the team to upgrade over 25 miles of trails annually. The team collects native seed on-site to promote native plant utilization and partnered with Ernst Conservation Seeds to collect native seed and propagate commercially. This rare seed source was used in Fort Indiantown Gap construction projects and is utilized by the United States Fish and Wildlife Service, National Park Service, Natural Lands Trust and Pennsylvania Energy Company restoration projects. It was also incorporated into the Fort Indiantown Gap Design Guide, which provides the specifications for all construction and maintenance projects, and is published by the Engineering Office. The use of native seeds/grasses is also beneficial to migratory grassland birds and supports the military mission by providing excellent cover for training activities on Fort Indiantown Gap.

## Forest Management

The primary mission for the forestry program at Fort Indiantown Gap is to provide a sustainable forested

environment that meets the requirements of the current military mission scenario and looks ahead to manage anywhere from five to 50 years out. When Fort Indiantown Gap was designated to be the home of the 56th SBCT, nine new training ranges were required and proper forest management was needed. Contracting with local timber companies, over 1,000 acres were cleared/thinned, generating approximately \$800,000 in support of the largest construction effort since 1941. Revenues generated from the forestry program are returned to the installation where they supplement the natural resources program and help fund INRMP projects; including gypsy moth control, forest regeneration, timber stand improvements and urban forestry/landscaping.

Using state-of-the-art forest management inventory computer programs on GPS-enabled tablet field computers designed by the Penn State University School of Forestry and adapted to fit Fort Indiantown Gap, forest inventories are tracked in detail, reducing paperwork and decreasing the amount of time to prepare timber sales. The Forestry Office partnered with the U.S. Forest Service to conduct forest growth and yield studies. The team provides back-cross tress and chestnuts to the American Chestnut Foundation for development of blight-resistant American chestnut trees.

The team, in cooperation with installation range operations and the fire department, conducts prescribed burns in-house and provides training for other state agencies interested in implementing burn programs. The team annually burns approximately 1,500 acres to manage fuel loads, forests and regal fritillary butterfly habitat, as well as to reduce training restrictions on pyrotechnic and ordnance use. The installation has the largest prescribed fire program on a single landholding in Pennsylvania.

## Fish and Wildlife

The team is devoted to conserving and managing wildlife on Fort Indiantown Gap. Soldiers share their training areas with 97 species of concern and 18 state listed plant communities of concern. Fort Indiantown Gap has the best quality and greatest quantity of warm season grass in Pennsylvania. All habitat for regal fritillary butterfly is found on former or current ranges. The regal fritillary butterfly is

found in only two locations in the East; Radford Army Ammunition Plant, Va. and the largest documented population in the world at Fort Indiantown Gap. As a Pennsylvania state listed species and an Army Category 2 species at risk, Fort Indiantown Gap, using installation stakeholders and external partnerships, has been proactive and very successful in the protection of the butterfly, increasing the estimated population to around 1,000 and preventing designation as a federally endangered species. Regal fritillary butterfly areas are currently off-limits to mechanized training. To facilitate training, the team developed training scenarios around the 219 acres of regal fritillary butterfly habitat and notionally designated butterfly habitat as “mine fields” as part of training exercises, which allows mechanized training to continue and butterfly habitat to thrive.

The Fort Indiantown Gap Team and the National Park Service are reintroducing the regal fritillary butterfly into the Gettysburg National Military Park. Funding from the DoD Legacy Program, in partnership with the Nature Conservancy, resulted in a grant to create satellite populations within the park and reduce potential encroachment issues on the installation and training mission. In support of this effort, the Academy of Natural Resources conducted genetic work and trial captive rearing.

The team has partnered with the 2nd Pennsylvania Breeding Bird Atlas Program, logging in over 76 species in 10 survey blocks including new and rare observations for the region and 21 species of concern. The team monitors over 150 nesting boxes with use by over 12 species including owls, ducks, kestrels, songbirds and bats. In 2007, Fort Indiantown Gap Boy Scout Troop 431 Eagle Scout constructed 50 new bird boxes to be used in support of the installation migratory bird program.

The installation partnered with the Pennsylvania Game Commission Deer Management Assistance Program to distribute additional antlerless deer tags to hunters in order to reduce the deer population from an unsustainable level of 39.3 deer per square mile to 17.4 in 2006.

The Wildlife Data Collector (tablet computer with GPS capabilities and relationship database) intertwines

scientific study and opportunistic observations of both biota and their habitat. The data collector replaces paper forms with digital tables, saving the team hundreds of hours of office work. This system, with powerful new decision-making Global Information System (GIS)-enabled software (NetWeaver), combines expert knowledge, integrated systems, dependency networks and feedback loops in a manner similar to the Military Decision Making Process (FM 101-5).



*Using GPS to record butterfly milkweed, a key nectar plant.*

The installation has an active hunting and fishing program, thanks to the work of the team and its partners. The monetary contributions of over 2,400 recreational hunters, trappers and anglers, who pay to use installation grounds, supplements the management of natural resources and identified INRMP projects. To meet the needs of veterans and the community, the team maintains five handicap-accessible hunting platforms. A cooperative nursery produces over 7,000 trout annually for stocking.

## **Invasive Species Control and Pest Management**

Invasive species occurrence (e.g., ailanthus and mile-a-minute plant) and rate of spread are tracked with a new GIS-enabled automated system, simplifying eradication. Judicious herbicide use and manual labor are employed as necessary to control invasive plants. The installation has an up to date pest management plan and an invasive species component of the INRMP that is used to assist installation personnel.



The pest management plan and invasive species component are reviewed annually and updates are made as needed. All application of herbicides and pesticides are done by certified applicators. Invasive species do not currently prevent or alter training due to implementation of the INRMP component. Without adherence to the invasive species component, invasives like ailanthus and mile-a-minute plant would directly impact training and butterfly habitat.

## Community Education and Outreach

The team takes advantage, whenever possible, to present their findings, accomplishments and responsibilities to other military organizations. This includes the National Guard Bureau, ITAM and NMFWA conferences, as well as national and regional natural resources conservation conferences. At NMFWA 2007, wildlife staff chaired a session on the ecology of military training and the paradox of biodiversity on military installations. The wildlife staff also provided session presentations on monitoring prescribed fire, using native plants and beneficial impacts of mechanized maneuver training.

its effects on the natural resources of the region. In FY 2007, recreational users volunteered over 1,300 hours feeding and stocking trout, pruning apple trees, seeding legume enhanced training areas and assisting with the Outdoor Recreation Orientation Briefs. This volunteer help assisted the team in the completion of natural resources projects and vital land enhancements, while saving the installation money.

The Training Site Commander, working with the installation team, opens up training areas for butterfly enthusiasts, averaging about 125 people per year, to visit and view the rare regal fritillary butterfly. This positive program enhances relations with the community and helps develop further partnerships, which can bring additional dollars to the base for butterfly/ecosystem improvements. The 25th Anniversary Conference for the Pennsylvania Natural Heritage Program was held on the installation in 2007. The team was able to promote the diversity and stewardship of its training lands and ranges to a distinguished cross section of professionals and educators.



*Fort Indiantown Gap Youth Group.*

The installation is host to the Second Mountain Hawkwatch, an organization that has been monitoring annual raptor migration for 25 continuous years through counts on Second Mountain, an Audubon Important Bird Area. The team conducts multiple educational tours with local schools and scout troops on topics including environmental and outdoor education. Community leaders, local chambers of commerce, outside conferences and adult organizations are often invited to tour the installation to learn more about what training is occurring and

## Conclusion

PAARNG Natural Resources Conservation Team's leadership in natural resources management has enhanced the quality of life for the installation and the community. Components of the program effectively integrate installation chain-of-command with the interests of resource management agencies, private conservation groups, regulatory agencies and the local community to conserve resources while providing an optimal atmosphere for military training and readiness. Partnerships are integral to the installation for accomplishing INRMP projects at a cost savings and the team works hard at identifying new external opportunities while keeping current partners satisfied with the excellent work performed and accomplishments made. The team and installation actively promote recreation within the fence line and work with the community to better understand the military mission of Fort Indiantown Gap and how the military has successfully integrated training with natural resources conservation. Biodiversity, quality water, a diverse ecosystem and healthy natural resources thrive at Fort Indiantown Gap.