













**2014 SECRETARY OF DEFENSE
ENVIRONMENTAL AWARDS
Natural Resources Conservation, Small Installation**

Vermont Army National Guard, Camp Johnson

INTRODUCTION: Camp Johnson, located in Colchester, Vermont, is a 660-acre training site for the Vermont Army National Guard (VTARNG), providing dismounted training and supporting warrior leader and infantry conversion courses. As an undeveloped site in a more urban area, Camp Johnson is also an important location for the preservation of rare pitch pine habitat. The installation and surrounding area are located on a sandy delta formed approximately 12,000 years ago, which supports sand plain and pitch pine habitat, one of the rarest natural community types present in the state; as development and mining has proceeded in the rest of the county, Camp Johnson represents the largest stretch of pitch pine habitat still present in Vermont.

Pitch pine forest growing in the Champlain Valley of Vermont is at the northern extreme of the species' natural range which extends from central Maine to northern Georgia. Marginal populations, such as those found in the Champlain Valley, are often genetically unique compared to more central populations and, therefore, may be valuable for future adaptation and evolution of the species, especially in times of predicted rapid climate change. Pitch pine in the northern extreme of the species range commonly compete best and are found on acidic, sandy, sterile soils in association with gray birch, red oak and black oak. In the Champlain Valley, particularly in the Burlington area, these same sites are extremely valuable as building sites. As a result, pitch pine habitat and populations are shrinking in response to development pressure. Camp Johnson's tract supports a population of about 200 to 300 mature pitch pine growing primarily in small groups. There is very little regeneration in these stands, probably due to poor establishment conditions for young pitch pine seedlings. Pitch pine in this area usually require periodic fires to remove competition and prepare seed beds for germination and seedling establishment. Over the past 100 years humans have extinguished fires in this area for fear of it spreading to residential and commercial buildings along the fringes of Camp Johnson. In 2013, however, the Natural Resources Conservation (NRC) program at Camp Johnson reintroduced prescribed fire as a management and habitat enhancing tool. In partnership with state agencies and universities, the Natural Resources Conservation (NRC) section of the VTARNG environmental office has actively managed this rare habitat and the many rare and endangered plant and insect species that rely upon it. Camp Johnson has become one of the last places in the nation with this undisturbed natural community, offering an invaluable opportunity for studying and learning to regenerate this ecosystem while also finding ways to match conservation goals with the VTARNG mission.

BACKGROUND: Camp Johnson's NRC section is led by the Environmental Program Manager and Natural Resources Manager, with further support from a Geographic Information System (GIS) specialist, a forester, and a state-provided botanist and ecologist. Other environmental staff, from cultural resources or compliance, also works closely with Camp Johnson's NRC section. The NRC staff coordinates as well with Integrated Training Area Management (ITAM) staff for the post to prioritize and enhance the projects undertaken for training support.

Judging Criteria	
	Program Management
	
	Orientation to Mission
	
	Technical Merit
	
	Transferability
	
	Stakeholder Involvement
	
	Program Impact
	



Camp Johnson NRC Program Staff:

- **MAJ Jacob Roy, Environmental Program Manager:** MAJ Roy holds a B.S. Degree in Civil Engineering from Norwich University and has 18 years of experience in Construction Management, with the last seven years focusing on Environmental and Real Estate Management.
- **Michael J. O’Hara, Natural Resources Manager and Military Lands Administrator:** Mr. O’Hara holds a B.S. Degree in Biology from Idaho State University, and a B.A. Degree in English from Fort Lewis College. Mr. O’Hara has 20 years of experience in the natural resource field and has worked for the U.S. Forest Service; he has 15 years of experience in environmental management with the National Guard.
- **Ryan Ochs, GIS Specialist:** Mr. Ochs holds a degree in Forest Science from Pennsylvania State University and a Post Graduate GIS Certificate from Portland State University. Mr. Ochs has approximately 15 years of experience in the field of GIS mapping and database management with an emphasis in Forest Management. He has been with the VTARNG Environmental staff for 10 years and also works with the VT Guard Installations office and firing range/Integrated Training Area Management staffs.
- **Scott Moreau, Forester:** Mr. Moreau is a natural resource consultant, and President of Greenleaf Consulting Inc. (GCI). Mr. Moreau holds a B.S. Degree in Forest Management and Resource Economics from the University of New Hampshire. Mr. Moreau has 20 years of experience in natural resource management.
- **Brett Engstrom, Botanist and Ecologist:** Mr. Engstrom has a Master’s Degree in Botany from the Field Naturalist Program at the University of Vermont. He has over 19 years of experience in identification of natural communities. Mr. Engstrom is a self-employed consulting ecologist.



The Camp Johnson Integrated Natural Resources Management Plan (INRMP) is currently undergoing its five-year update and will be submitted for public review in the coming months. Consultation with the public, and other state and federal agencies including the U.S. Fish and Wildlife Service and the Vermont State Department of Natural Resources, help ensure the best plan possible is developed. The INRMP incorporates wetlands management, threatened and endangered species management, invasive species control and management, forestry and vegetation management plans, as well as habitat improvement and research programs.



SUMMARY OF ACCOMPLISHMENTS: As mentioned above, reintroduction of prescribed fire as a management technique for pitch pine habitat represents a major milestone for the installation NRC program; no prescribed burn had been conducted since 1998. The prescribed fire program, moreover, was completed in-house with cost-saving assistance from St. Michael’s

2012-13 Quick Facts

- **Acres managed with prescribed fire: 7**
- **Acres treated for invasive species: 142**
- **Acres logged prior to prescribed fire: 15**
- **Pitch pine seedlings planted: 60**
- **Cost savings from partnerships: \$40,000+**

College, a prime NRC program partner. Last summer, the NRC section also implemented the installation’s first invasive species crew to address honeysuckle encroachment in the pitch pine habitat. As the forest is recovered with invasive species removal and fire, the NRC program replants with seedlings raised in the University of Vermont’s nursery. Developing these management techniques and



strategies in-house has created significant cost savings for the installation, allowing for more effective management. Expansion of partnerships with area organizations and universities has

allowed Camp Johnson to leverage resources and share expertise in order to accomplish projects on a larger scale and with greater long term impact while still directly supporting the installation training operations. Improving forest conditions has direct benefits for the VTARNG mission, as cleared understory and invasive species eradication provide for ideal training conditions. The NRC program also works diligently with trainers to balance training and environmental needs. For instance, when the grasshopper sparrow, a state threatened species, was recently found on a grassland helicopter training area, the NRC staff found usage mitigations during nesting and breeding seasons and assisted with the siting and development of a new landing zone that will alleviate pressures on the habitat.



Program Management and Coordination: As detailed above, the core NRC staff for Camp Johnson is fully capable of enhancing the unique habitat and resource needs of the post. Coordination with the ITAM staff ensures complete alignment between training and environmental goals. In addition, as it is co-located with the Facilities Maintenance Office, the NRC section is easily able to communicate and cooperate on any issues or concerns with training site plans as they arise. The Facilities Management Office and Environmental managers take part in regular Adjutant General briefings to keep command, trainers, and other range staff abreast of NRC activities, plans, or issues. The needs of these internal stakeholders are also incorporated into long-term planning and implementation of the INRMP.

Compliance, Partnerships and Cost Savings: To ensure full NRC compliance, the NRC section coordinates closely with the Vermont Agency of Natural Resources (ANR). The ANR assisted with developing the pitch pine nursery seed stock mentioned above; Green Mountain Power Company also partnered on this effort, donating use of a bucket truck for gathering seeds. Two ANR staff assisted in the collection free of charge. The state Wildlife Department also provides Camp Johnson with a botanist for the NRC staff as part of the Non-game Natural Heritage Program.



St. Michael’s College is another key partner for the installation, allowing the NRC section to achieve management goals at a minimal cost. The College obtained grant funding to assist in pitch pine research on post over the past two years, which allows the researchers to provide money to pay ANR staff and consultants involved in pitch pine management. Students conducting field work on the habitat essentially provide Camp Johnson with cutting-edge data and analysis at no cost to the VTARNG. As the habitat is of interest to the state as well, Vermont conservation departments provide their own budgets and grant resources to assist Camp Johnson in management; the VTARNG does not have to fund this support. The cost savings from these partnerships are significant:

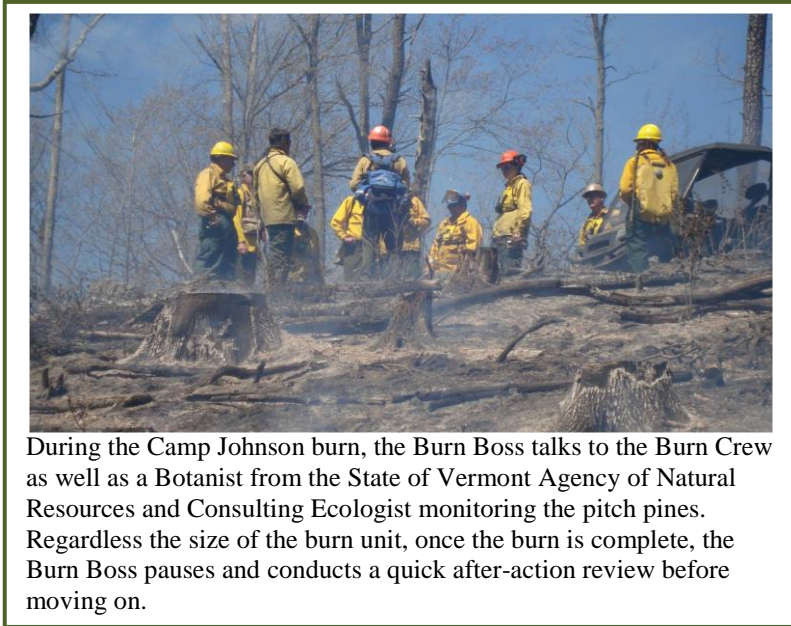
Savings	Activity
\$10,000-\$15,000 annually	St. Michael’s College conducts the pre and post burn surveys as well as comparisons to the prior burns completed in 1995 and 1998. These surveys have been accomplished over the last five years at no cost to the VTARNG.
\$10,000	St. Michael’s College grant funding for the hiring of an ecologist to study the Sand Plain over a two year period. In addition, this grant covered the cost of taking 100 seeds to a nursery and growing trees to plant after the burn.
\$600	Green Mountain Power Company donation of bucket truck and two operations to collect seeds from tree tops. This savings reflects the avoided equipment cost; the savings associated with on-site seed collection as opposed to purchase is even greater.



Less tangible cost savings are reflected in resources and time provided by NRC section partners. After the prescribed fire, for instance, 48 trees were planted by volunteers from St Michael’s College, the State of Vermont Fish and Wildlife and internal staff of the VTARNG. The University of Vermont at South Burlington 4H outreach program also photographed, measured, and captured GPS datapoints for the seedlings from the burn site as part of a Natural Resource Camp. This exercise saved the NRC staff many hours of work in documenting and cataloging the trees.

In addition, funding for invasive species control has come from the forestry reserve fund for the past two years; Camp Johnson NRC staff applied for and won grants of \$15,000 annually in 2012 and 2013 for invasive species management in the pitch pine forest.

Forest Management and Prescribed Fire: Forest management has been the primary focus of the installation NRC program over the past two years, combining invasive species management, prescribed fire, wildlife protection, and habitat enhancement. The installation boasts approximately 175 acres of pitch pine forest, which supports 15 Vermont rare plants as well as many insect species associated only with this community type. Forest Management activities focus on this pine-oak-heath sandplain forest at Camp Johnson, and the open plain habitats conducive to large openings. The creation of large-scale early successional habitats as a part of the Camp will maintain or increase the level of biodiversity. Species identified as Vermont Species of Greatest Conservation Need will benefit from the creation, enhancement, promotion, and retention of early successional habitat. Techniques can include progressive clearcutting, brush hogging, burning, or other operations that increase habitat available to early successional species. Reintroduction of prescribed fire has been a cornerstone of the installation’s NRC approach over the past two years.



During the Camp Johnson burn, the Burn Boss talks to the Burn Crew as well as a Botanist from the State of Vermont Agency of Natural Resources and Consulting Ecologist monitoring the pitch pines. Regardless the size of the burn unit, once the burn is complete, the Burn Boss pauses and conducts a quick after-action review before moving on.

The last prescribed burn on Camp Johnson was conducted in 1998. As the installation is located in an urban area, reintroducing this management technique required coordination and outreach with the local community. NRC staff met with the town of Colchester, presented the burn plan, and obtained permits. The Colchester and St. Michael’s College fire departments were partners for the burn, though Camp Johnson’s in-house burn crew and fire staff were the leads for the effort. A special exemption of Camp Johnson from a statewide fire ban was acquired by the NRC staff following a successful demonstration of their fire

management expertise for the local fire chiefs and wardens. In preparation for the 2013 burn, the NRC staff conducted a logging operation in early FY12 to add more debris fuel; the tops of logged trees were left in the ground to dry out. Due to the heavy concentration of hardwoods in the restoration area, the understory and duff only had light fuels. By adding debris from the logging operation and cutting brush in the area, the fuel load increased to one- to ten-hour fuels.

This was needed to concentrate the heat in a small area to create the hot burn effect without risking a large scale fire that could have harmed other habitat or training resources.

In total, seven acres were burned in 2013 with assistance from St. Michael's College and ANR; the College conducted pre- and post-fire analysis of effects on plant and insect species. Provided weather conditions are right, two more forest units are slated for fire management in FY14 according to the priority guidance of the installation forest management plan.



Green Mountain Power Company donated a bucket truck to assist in the collection of pitch pine seeds for the pitch pine nursery.

Forest Habitat Enhancement and Management: The 15 rare plant species in the area of the sand plain/pitch pine forest require disturbed ground conditions to regenerate. Logging and controlled burns that expose the mineral soil to these plants create the ideal situation for their survival. By conducting logging, controlled burns and invasive species treatments, the installation NRC section is able to eliminate competition of areas between the native rare species and invasive plants. The eradication of invasive species is bolstered by replanting projects on the post. In 2012, pitch pine seeds were collected from the existing forest stand with the assistance of ANR staff and Green Mountain Power equipment. These seeds were then raised in the Nature Conservancy's Champlain Valley Native Plant Restoration Nursery with the intent to further expand this nursery stock to keep pace with the new burn schedule. Over the past two years, 120 seedlings have already been established in the nursery, half of which were planted following the prescribed burn. The remaining 60 seedlings will be planted in 2014. About half the pitch pine habitat area is being managed with a fire and replanting approach, with the other half serving as a control site for comparison to validate the NRC section's management techniques.



Invasive Species Control: Invasive honeysuckle is a significant problem for the pitch pine forest on Camp Johnson. The summer of 2012 was the first year the installation was able to employ an invasive species crew to manually remove honeysuckle trees and treat stumps with herbicide. Of the 122 acres being monitored for invasive species, 102 acres were treated in 2012, with an additional 40 treated in FY13. Other invasive species, like purple loosestrife, which are present throughout Camp Johnson are also treated. In 2013, Camp Johnson hosted a representative from the Department of Forestry and Connecticut Agricultural Experiment Station to perform a demonstration for area agencies and conservation organizations on control of invasive species using a propane torch to reduce herbicide use.



Camp Johnson has taken an aggressive approach to eliminating invasive plant species. Burning, shown here, is one method tried against invasive plants as well as manual cutting and applying herbicide and covering areas with plastic.



Wildlife Management: Camp Johnson supports healthy populations of deer, coyotes, foxes, and beavers, with occasional presence of moose or bears. Some beaver control is necessary to avoid flooding in low-lying stream areas. Insect and rare plant species associated with the pitch pine forest are managed and supported via forest management techniques of invasive species eradication, prescribed fire, and replanting.



Mission Orientation, Support, and Mitigation: Maintaining optimal environmental conditions on the training lands is essential for the success of the military mission at Camp Johnson. The NRC management measures have been deployed based on the current conditions of the resources, and the military mission and activities as they are anticipated. For the military mission, the NRC program, as described in the INRMP, will ensure that the environmental conditions of the training lands continue to provide the blend of open and forested areas that are necessary for realistic military training. From an environmental perspective, implementation of this plan will maintain, protect, and enhance the ecological integrity of the training lands and the biological communities (particularly sensitive, rare, threatened and endangered species) inhabiting them. In addition, the installation NRC program protects ecosystems and their components from unacceptable damage or degradation, and identifies and restores already degraded habitats. Adherence to the INRMP ensures users of the Camp Johnson range will have an increased awareness of the potential for impacts to occur as a result of their activities, a heightened awareness that will in turn minimize the possibility for undesirable impacts, thereby decreasing the effort and costs that must be expended for mitigation.

Indeed, as important as conservation of unique natural communities is, the priority for the VTARNG is finding ways to support NRC goals in service of the training mission. For Camp Johnson, where the majority of training happens on foot, with no live fire training, there has been little need to mitigate training activities because of NRC concerns. In general, the NRC staff has focused on briefing instructors and unit leaders on environmental awareness. The low level of disturbance from training has also allowed NRC staff to find ways to enhance training opportunities that also enhance habitat. Management of pitch pine forest areas, for instance, with the removal of honeysuckle and fire rotation, has made those areas more maneuverable and accessible to VTARNG soldiers in two key ways. First, the management techniques open the understory for dismounted maneuver training and land navigation in both day and night conditions. Having a relatively open training area provides a safer environment for both the sand plain forest and the Soldiers; honeysuckle is hard and has sharp branches that can cut or puncture, and the root system creates a significant trip hazard. Additionally the honeysuckle prevents the Soldiers from seeing the Pitch Pine trees, resulting in the trees to be trampled or otherwise damaged. Secondly, removing the honeysuckle prevents Soldiers from transporting the honeysuckle seeds to other training areas or installations, thereby preventing the honeysuckle from spreading to other areas on post. Preventing the honeysuckle from spreading is the best control for this invasive species.

When NRC goals and training activities seem to conflict, NRC staff find ways to mitigate for training to continue. The presence of grasshopper sparrow, a state threatened species, on 50 acres of grassland used by helicopter units is one example. NRC staff limited use of the site during nesting season and increased the minimum hover height during breeding season. The current construction of a new landing zone, however, will alleviate the pressures on the landing zone/sparrow habitat. NRC staff also consults with ANR on the sparrow, conducting breeding season surveys, instituting mowing restrictions, and limiting site access.

Transferability: The Camp Johnson NRC program routinely seeks opportunities to share expertise and information. Partnerships with ANR and St. Michael’s College have contributed to the expansion of awareness and improvement of management techniques for the rare pitch pine habitat. For this year’s prescribed burn, the installation hosted environmental staff from the New Hampshire Army National Guard to observe the VTARNG’s process. ANR and College support of the installation’s management plan has also meant that the VTARNG reaps the benefits of research and innovations beyond the post’s perimeters.

Internally, NRC activities are fully integrated into the VTARNG’s eMS, and the NRC section maintains a comprehensive section on the state’s GKO site, with all NRC documents and plans accessible. These materials are also hosted in the eMS document library and the Vermont State document repository with full electronic backup to ensure that any new staff can easily be brought up to speed on past, current, and planned NRC projects.



Education, Access, and Outreach: As discussed above, partnerships have been essential to the VTARNG’s success at Camp Johnson. The ANR and St. Michael’s College have been primary supporters of NRC projects, providing staff, funding, expertise, materials, and research capabilities. For the College, however, Camp Johnson offers an unparalleled live laboratory. The students who conduct research and fieldwork on the post enjoy the opportunity to access a habitat that virtually no other college can offer, a tremendous advantage for students seeking to become NRC and forestry professionals. The students’ research projects are also presented each year to VTARNG staff and College faculty; using that data, the NRC section can effectively adjust management techniques. The students’ work has real-world application beyond the classroom.



St. Michael’s College students conducting field work. The partnership between the College and Camp Johnson has greatly benefitted student and faculty research. Each year the students present their findings to the Biology Faculty and the VTARNG Environmental Section.

Camp Johnson does not offer hunting programs because of safety issues; the installation is surrounded by houses and businesses, and the volume of training would likely cause access conflicts. Mountain bikers are another safety concern, as they cross the installation perimeter and can potentially hurt themselves or delicate natural resources. NRC staff has worked with mountain biking organizations to educate their members about potential dangers and put up signage to discourage bikers from entering the post. The NRC program, however, does encourage other kinds of public access. The University of Vermont 4H Extension Operation Military Kids Club visits Camp Johnson to hold camps and events. Camp Johnson hosted the Boy Scout Jamboree last year as well. A VTARNG military history museum on post attracts public visitors. Due to media coverage of the prescribed fire this year—the event was filmed by four local television stations and an article about the program was published in the *Burlington Free Press*—public awareness of the NRC program at Camp Johnson has been improved. To capitalize on this, the NRC staff is coordinating with VTARNG leadership now to draft a community involvement plan.