

MID-ATLANTIC EXOTIC PLANT MANAGEMENT TEAM

Exotic Vegetation Management Annual Report for Fiscal Year 2009



Host Park:
Shenandoah National Park
Luray, Virginia

James Åkerson and Craig Bentley
Supervisory Ecologist/Liaison and Field Crew Leader
Mid-Atlantic Exotic Plant Management Team
Natural Resources and Science
Northeast Regional Office – NPS
October 2009



Figure 1b. Cutting lanes through kudzu infestation prior to control treatment at New River Gorge NR, August 2009.



Figure 1a. Treating wineberry, lespedeza, Japanese honeysuckle, mile-a-minute, and other invasives at Thomas Stone NHS, June 2009.



Figure 1c. The Team and park staffs cut and treat princess tree, privet, mulberry, thorny elaeagnus, and other invasives at Colonial NHP, April 2009.



Figure 1d. Defenders of Wildlife members and volunteers for a day at Appalachian National Scenic Trail pose before heading up to pull garlic mustard, May 2009. The photograph also highlights their successful removal of autumn olive from the field in 2008-09.

**Exotic Vegetation Management
Mid-Atlantic Exotic Plant Management Team
Annual Report for Fiscal Year 2009**

Start and End Dates: 10/1/2008 – 9/30/2009 (on-going since FY 2003)

Lead Agency Staff: James Åkerson, Supervisory Forest Ecologist and Team Liaison (NPS Northeast Region (NER)).

Field Personnel: Craig Bentley, Field Crew Team Leader (NER); Robert Jennings, Biological Science Technician (NER); Nathan Wender, Biological Science Technician (NER); Travis Williams, SCA Intern, Kyle Titus, SCA Intern, and Eugene Kobayashi, SCA Intern, among others ad hoc.

Funding Source(s): Base funding for operations comes from the NPS Natural Resource Challenge for Exotic Plant Management Teams. Additional project funding came from carry-over on a grant through the National Audubon Society of Virginia with Toyota Together-Green Foundation.

Funding Accounts and Spent/Remaining Amounts for the Year:

<u>Source Accounts</u>	<u>Spent (\$)</u>	<u>Remaining (\$)</u>
1. 2144-6205-NYP	\$297,990. ¹	\$ -0-
2. SNPA account (APPA)	\$593.	\$300
3. BRMD (added)	\$15,743	\$-0-
4. DEWA (Åkerson detail)	\$13,985	\$-0-

Additionally, \$41,500 was expended to perform field treatments via indefinite quantities contract from prior year contract obligations. Sources of contract expenditures came from a combination of NRC, NRPP, and several parks' base funding. Contract I-4840030006 with Invasive Plant Control, Inc., of Nashville, TN, was the vehicle for performing contact field work.

Refer to the appendix for a breakdown of budget expenditures.

Other Sources – In-kind services and contributions to the program were received from partner park units in the form of vehicle fuel, office and storage space, mapping products, geographic positioning of field sites, environmental clearance process, and park staff time in the field. In-kind contributions amounted to an estimated \$119,676 or 29 percent of budget plus in-kind (see the appendix).

¹ The original amount of \$300,000 was decreased due to NPS Northeast Region assessment.

Expanded Executive Summary

Fiscal year 2009 was the seventh year of operations for the Mid-Atlantic Exotic Plant Management Team and its overarching Mid-Atlantic Cooperative of 18 parks. Hosted at Shenandoah National Park, the Mid-Atlantic Team serves national park units in Virginia, Maryland, Pennsylvania, and West Virginia. A Steering Committee made up of representatives from each park unit provides overall management direction. The Team Liaison provides administrative leadership and coordinates activities with individual parks and other agencies. He oversees work by non-NPS work groups and volunteers and serves as Contracting Officer's Technical Representative. The Field Crew Leader provides direction for on-the-ground activity and oversees matters of safety, technical effectiveness, equipment maintenance, data management, and staff training. Fieldwork is accomplished through the broad cooperation of Team crewmembers, park staffs, student interns, volunteers, special interest sponsors, and a private contractor. Program support comes through a combination of federal and nonprofit organizations. Collaborative partnerships broaden the organizational capacity within the Cooperative to manage invasive plants into the future.

The following achievements are notable for Fiscal Year 2009.

- The Mid-Atlantic Cooperative completed field inventories on **5,468** acres at 17 park units and exotic vegetation control treatments on **556 acres²** at **17** parks upon **64** plant species. The top ten species by order of treated acreage include *Microstegium vimineum*, *Lonicera japonica*, *Ailanthus altissima*, *Elaeagnus umbellata*, *Centaurea biebersteinii*, *Rosa multiflora*, *Ligustrum* spp., *Celastrus orbiculatus*, *Lolium arundinaceum*, and *Polygonum perfoliatum*.
- The short-term volunteer program led by the Team at the Appalachian National Scenic Trail increased public participation by involving **463** volunteers with invasive plant control for a total of **1,430** hours. Activities included hands-on plant control treatments and public awareness presentations.
- Treatment prioritization was accomplished and strategic planning was conducted at Valley Forge, New River Gorge, Bluestone, Hampton, and Thomas Stone units. Those units are now in the process of reviewing and approving their drafted strategic plans.
- The Cooperative augmented its functional capacity by utilizing a variety of implementation methods. In addition to the NPS Team, the Cooperative utilized park volunteers, individual Student Conservation Association (SCA) interns, and a for-profit contractor. All performed with excellence.
- The Team worked 463 person-days in the field, accomplishing 491 treatment acres. That represents a greatly improved team work efficiency, from 0.7-acre per field day in 2008 to 1.1-acres per field day in 2009; an improvement of 0.4 acres per field day. The Field Crew Leader and Crewmembers are to be praised for this achievement.

² Includes treatment and retreatment acres for the year.

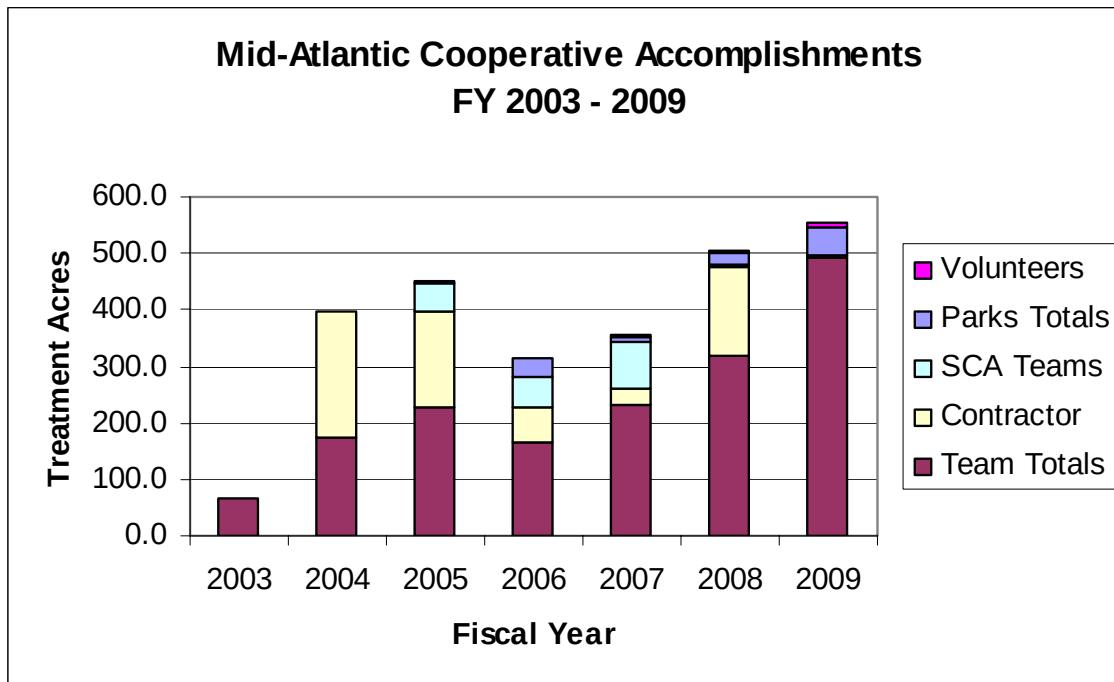


Figure 2. Indicating combined treatment and retreatment accomplishment from all collaborators for the six-year period, FY 2003 – 2009.

- The Team Liaison increased public awareness of invasive species issues by:
 - Participating in **three** news media interviews (external)
 - Speaking at **nine** professional or public meetings (external)
 - Creating **22** reports, articles, newsletter entries, and intranet releases (external/internal), and
 - Responding to **18** queries for information outside the Cooperative (external/internal).
- Team members maintained or were in the process of obtaining state certification to apply herbicides³ within the Commonwealth of Virginia, Maryland, Pennsylvania, and West Virginia. SCA interns obtained state certifications for the Commonwealth of Virginia only.
- The Team had no lost time due to incidents. Implementation of the Team's safety program with daily safety discussions⁴ helps set a high organizational standard.

³ Certification is generally required only of the Team Liaison or Crew Leader. It is our organizational goal to have all crewmembers certified, emphasizing our high interest in personnel safety and environmental risk management.

⁴ Daily 6-minute tailgate safety sessions consist of crew-led discussions on various germane topics.

Management Recommendations

The Mid-Atlantic Cooperative is an excellent catalyst for participating parks to identify invasive species threats and mobilize for control activity. However, the Team and participating parks continue to lose ground budgetarily. The Consumer Price Index for expenditures in the Mid-Atlantic region indicates that the Team has suffered an accumulated 20.2-percent decrease in purchasing power since 2003. In similar fashion, parks have tighter budgets and fewer staff. As a result, many parks in the Cooperative now rely on the Team's assistance for their sole source of exotic plant management rather than contributing with their own programs. We recommend that all parks aggressively seek increased base funding to augment invasive plant control. They should also seek project funding to shore up their base funding losses.

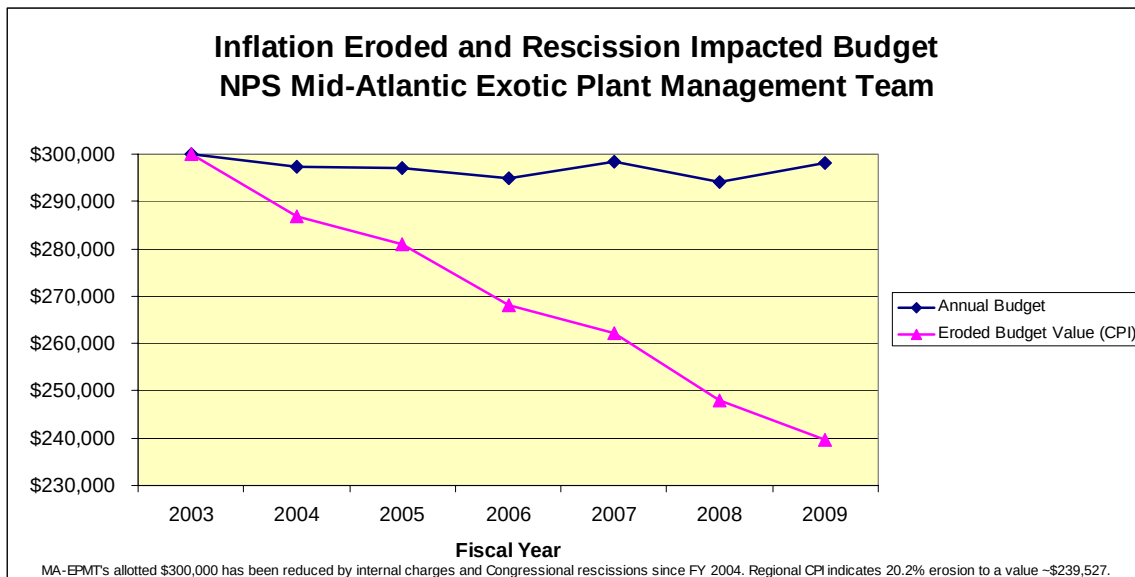


Figure 3. Program funding for the NPS Mid-Atlantic Exotic Plant Management Team has eroded 20.2% since 2003 as indicated by the regionally calculated Consumer Price Index.

There were exceptions to the decline in funding support. Colonial, New River Gorge, and Petersburg successfully competed for project funding to treat invasives. With Team assistance, and utilizing nonprofit grants, the Appalachian Trail augmented their exotic plant management operations by implementing short-term volunteer programs. A modicum of funding was required to furnish volunteers with equipment and supplies. Three parks increased invasive plant control by their own volunteer programs, including Colonial, Shenandoah, and Valley Forge. Other parks should consider pursuing volunteer assistance to increase on-the-ground activity and public awareness of the invasives challenge.

Public outreach is essential to improve the general understanding of invasive species issues, gain public participation in reducing new species introductions, and garner their advocacy for improving long-term effectiveness of the Team. Individual parks should initiate campaigns to improve public understanding and cooperation in invasive plant management.

Introduction/Background

There is a long history of nonnative species introductions beginning with the first European settlers to North America. Accidental introductions came (and continue to come) with immigrants, their dunnage, and unrelated commerce in trade goods. Purposeful introductions came with settlers and later as the result of professional plans for supposed betterment of human health, agriculture, and land reclamation. Negative impacts are readily apparent. Farmers and ranchers in the West became early proponents of “noxious” weed control to fight the economic losses caused by displacement of desired grass crops in grazing and agricultural land by exotic weeds. Ecologists also warned of local native species losses and wholesale ecological change due to invasions of exotic species. Westbrooks (1998) believes that the homogenization of the world’s flora and fauna leads to decreased biological diversity and long-term harm. He states, “Unlike chemical pollutants that degrade over time [rendering them harmless], invasive organisms can become established and reproduce. Once established, they can spread from site to site, and region to region, often without further human assistance.” Elton (1958) believes many native species will decline or disappear altogether due to invasives.

Resisting biological invasions is an essential part of the NPS mission to *conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations* (U.S. Congress 1916). As part of the NPS Natural Resource Challenge funding program, begun in FY 1999, the NPS organized to create a concerted invasive vegetation control effort. Sixteen EPMTs were eventually established throughout the country to work with parks to accomplish survey, control, and monitoring of invasive plants.

In the mid-1990s, parks that are now within the Mid-Atlantic Cooperative began independently increasing their knowledge of local infestations and exotic plant control technologies. Colonial, Gettysburg, Shenandoah, and Valley Forge created small programs to inventory and control invasives. With a successful multi-year NPS-NRPP grant proposal in FY 2000, for the creation of an exotics control team for parks in Virginia, there began an effort to cooperate between eight parks, and collaborate with surrounding landowners to control the worst of known infestations. The system of reconnaissance, species prioritization, and strategic planning they developed helped them to create a viable program. Recognition of their efforts came through the successful FY 2003 competition for national program base funding. It allowed the formation of a larger Cooperative whose traveling team serves 18 national park units in Virginia, Maryland, Pennsylvania, and West Virginia.

Partners

The Mid-Atlantic Cooperative is made up of national park units in four states. The parks are both stakeholders and partners in resource protection through invasive plant management. A steering committee of park representatives and the Team Liaison set management priorities. Park staff and the Team then cooperate with on-the-ground assessment and control activities.

Table 1. Table of member park units within the Mid-Atlantic Cooperative.

Park Unit	State
Appalachian National Scenic Trail	MD
Appomattox Court House National Historic Park	VA
Bluestone National Scenic River	WV
Booker T. Washington National Monument	VA
Colonial National Historic Park	VA
Eisenhower National Historic Site	PA
Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park	VA
Gauley River National Recreation Area	WV
George Washington Birthplace National Monument	VA
Gettysburg National Military Park	PA
Hampton National Historic Site	MD
Hopewell Furnace National Historic Site	PA
New River Gorge National River	WV
Petersburg National Battlefield	VA
Richmond National Battlefield Park	VA
Shenandoah National Park	VA
Thomas Stone National Historic Site	MD
Valley Forge National Historical Park	PA

Within the scope of managing exotic vegetation and site restoration, and as specifically approved by the Regional Solicitor, in previous years the Mid-Atlantic Cooperative worked with its neighbors to control exotics along park boundary areas. Outreach with neighboring landowners improves the anticipated success and longevity of park treatment projects by creating extended management buffers and engendering active allies in monitoring for subsequent infestations. During FY 2009, collaboration consisted of property access for treatment monitoring of previous work or assessing future treatment needs; there were no field treatments implemented.

Table 2. Table of collaborating neighbors of the Mid-Atlantic Cooperative, FY 2009.

Collaborating Neighbors within the Mid-Atlantic Cooperative			
Neighbor	Adjacent Park	General Location	Targeted Exotic
Colonial Williamsburg Foundation	Colonial National Historic Park	Midway along the Colonial Parkway at the Colonial Williamsburg property	Kudzu, English ivy, tree of heaven
Henry Tobler III	Shenandoah National Park	West side of the Park near US Highway 33	Bamboo
Douglas Workman	Shenandoah National Park	West side of the Park near US Highway 33	Bamboo

Finally, as will be described later, a short-term volunteer program attracted the public to assist park crews and the Mid-Atlantic Team in controlling invasive plants. Volunteers are providing valuable partnering and public advocacy.

Study Area Description

The Mid-Atlantic Cooperative is made up of national park lands within three geographic areas, including the Coastal Plateau, Piedmont, and Ridge & Valley zones. The Coastal and Piedmont zones contain many variants of warm-moist forest types generally described as the Loblolly-Shortleaf Pine forest type (SAF 1980). Hardwoods are very often a large part of the forest

composite. Moister sites may contain yellow-poplar, American beech, white ash, sweetgum, red maple, water oak, and willow oak. Drier sites contain pines, sweetgum, blackgum, southern red oak, post oak, white oak, mockernut hickory, and pignut hickory. The Ridge & Valley zone contains the forest type variants contained within the Oak-Hickory and Oak-Pine forest types (SAF 1980) where the latter types are on drier sites due either to poorer soils or lesser annual precipitation. In either case, hardwoods remain a major factor in the forest composite and development. Moister sites contain sweetgum, Eastern hemlock, Eastern white pine, basswood, birches, American beech, flowering dogwood, and northern red oak, among others. Drier sites contain chestnut oak, white oak, Table Mountain pine, and Virginia pine, among others.

The Cooperative is within one of the most vigorous and biologically diverse ecological zones in North America. As an example, over 1,100 native vascular plant species have been documented within Shenandoah National Park alone. Protecting the natural legacy of participating parks is essential to ensure that future generations of the public enjoy their expanse and native beauty. Invasive exotic vegetation, on the other hand, threatens to destroy native diversity and ecosystem health, replacing thousands of species with a relatively few aggressive invasives. Within the Mid-Atlantic Cooperative, 15-to-25 percent of the vegetative species are nonnative. Generally, the subset of *invasive* plants amounts to 2-to-8% of the nonnatives.

Methods

Recognizing that the scope of invasive plant infestation is too large for complete eradication, the Mid-Atlantic Cooperative strategically targets invasive vegetation that threatens high-value resources within park lands. Decision-making criteria are described below. The Cooperative controlled and monitored exotic infestations in a safe and efficient manner using state-of-the-art approaches while protecting the environment during operations. Increasing the expertise and involvement of participating park staffs was emphasized so there was increased likelihood for programmatic sustainability. The ultimate goal of site restoration was made an integral part of planning, control, monitoring, and follow-up activities. Public education and outreach was a focus during all phases of work. Outreach was conducted through news media, park interpretation, volunteer program, school programs, and professional meetings. Actions that addressed specific goals follow.

Goal 1 – Assess and prioritize invasive exotic vegetation threats, prescribe control methods within a framework of integrated pest management, and compile necessary control protocols. Adaptively update strategic plans at all parks as new information develops. The intent is to conduct extensive operational reconnaissance to locate invasive epicenters, gain acreage estimates of infestation, and note special concerns sufficient for species prioritization, strategic planning, and post-treatment monitoring. Strategic planning and prioritization is a team effort. Each park adaptively amends strategic plans and protocols with the assistance of the Team Liaison. Prioritizing invasive species for treatment is to be accomplished with a four-phase approach as described in the annual work plan (NPS 2007).

Treatment prioritization and strategic planning took place at Valley Forge, New River Gorge, Bluestone, Hampton, and Thomas Stone. We anticipate the finalization of these plans in FY 2010.

Goal 2 – Control targeted exotic populations at all parks.

The Cooperative had a target of 225 treatment/retreatment acres for the year. In FY 2009, the Cooperative exceeded that by 331 acres, totaling 556 acres. This was due to increasing Team efficiencies and the contributions of volunteers, contractor labor, and park project funding.

Table 3. Table of the top ten invasive species treated in FY 2009 at park units within the Mid-Atlantic Cooperative. (Order of appearance indicates relative acreage treated. The first ten species are listed with any others grouped in summary.)

Treated Exotic Species, FY 2009	
Park	Species (Common Names)
APCO	Spotted knapweed, tall fescue, Japanese stiltgrass, English plantain, privets, Japanese honeysuckle, garlic mustard, tree of heaven, multiflora rose, and thistles, plus three others
APPA	Autumn olive, multiflora rose, tree of heaven, garlic mustard, wineberry, Japanese barberry, Japanese honeysuckle, Oriental bittersweet, bush honeysuckle, and Japanese stiltgrass, plus four others
BLUE	Japanese honeysuckle, multiflora rose, privets, autumn olive, and tree of heaven
BOWA	Japanese stiltgrass, periwinkle, mullein, Johnsongrass, Oriental bittersweet, privet, gorse, beefsteak, thistles, and tree of heaven, plus five others
COLO	Phragmites reed, wisteria vine, Japanese honeysuckle, privet, periwinkles, princess tree, English ivy, multiflora rose, thorny elaeagnus, and Chinese holly, plus one other
EISE	Japanese honeysuckle, multiflora rose, bush honeysuckle, tree of heaven, and autumn olive
FRSP	Japanese stiltgrass, tree of heaven, Japanese honeysuckle, Oriental bittersweet, lespedeza, multiflora rose, privet, periwinkles, callery pear, and spotted knapweed, plus nine others
GETT	Japanese honeysuckle, multiflora rose, Japanese stiltgrass, Japanese barberry, bush honeysuckle, Oriental bittersweet, autumn olive, wineberry, privets, and wisteria vine, plus four others
GEWA	Japanese honeysuckle, lespedeza, periwinkles, autumn olive, privets, Japanese stiltgrass, beefsteak, tree of heaven, Oriental bittersweet, and mimosa, plus six others
HAMP	Garlic mustard, Norway maple, tree of heaven, English ivy, wineberry, ground ivy, Japanese stiltgrass, burning bush, Oriental bittersweet, and Japanese honeysuckle, plus four others
HOFU	Japanese stiltgrass, Japanese barberry, Oriental bittersweet, multiflora rose, wineberry, Japanese honeysuckle, mile-a-minute, autumn olive, burning bush, and wisteria vine, plus nine others
NERI	Ground ivy, Japanese honeysuckle, Japanese stiltgrass, kudzu, Oriental bittersweet, Japanese knotweed, multiflora rose, tree of heaven, St. John's wort, and wineberry, plus seventeen others
PETE	Japanese stiltgrass, Japanese honeysuckle, privet, autumn olive, tree of heaven, wisteria vine, kudzu, periwinkle, Japanese barberry, and multiflora rose, plus seven others
RICH	Japanese honeysuckle, tree of heaven, privets, lespedeza, Japanese stiltgrass, Oriental bittersweet, bugleweed, Japanese barberry, paper mulberry, and multiflora rose, plus five others
SHEN	Mile-a-minute, tree of heaven, garlic mustard, wineberry, kudzu, Oriental bittersweet, autumn olive, mullein, multiflora rose, and Japanese honeysuckle, plus three others
THST	Japanese stiltgrass, Japanese honeysuckle, wineberry, lespedeza, mullein, tree of heaven, mile-a-minute, and multiflora rose
VAFO	Autumn olive, zebra grass, wineberry, Japanese barberry, Japanese stiltgrass, mile-a-minute vine, Japanese hops, stinging nettle, ground ivy, and Japanese knotweed, plus thirteen others

Best management practices were followed for treatments and follow-up. Those practices were gathered from field staff, local experience, the counsel of professional experts, and appropriate species-specific documentation in print and on the worldwide web. The Team cooperated with parks in the field whenever possible. That increased on-the-ground outputs and enhanced transfer of knowledge. All procedures were compatible with NPS directives and federal & state laws.

The Team worked at each park in varied amounts, between 1-to-11 percent of their total. A table breaking down the field activity is included in the appendix. Below is a chart of that data.

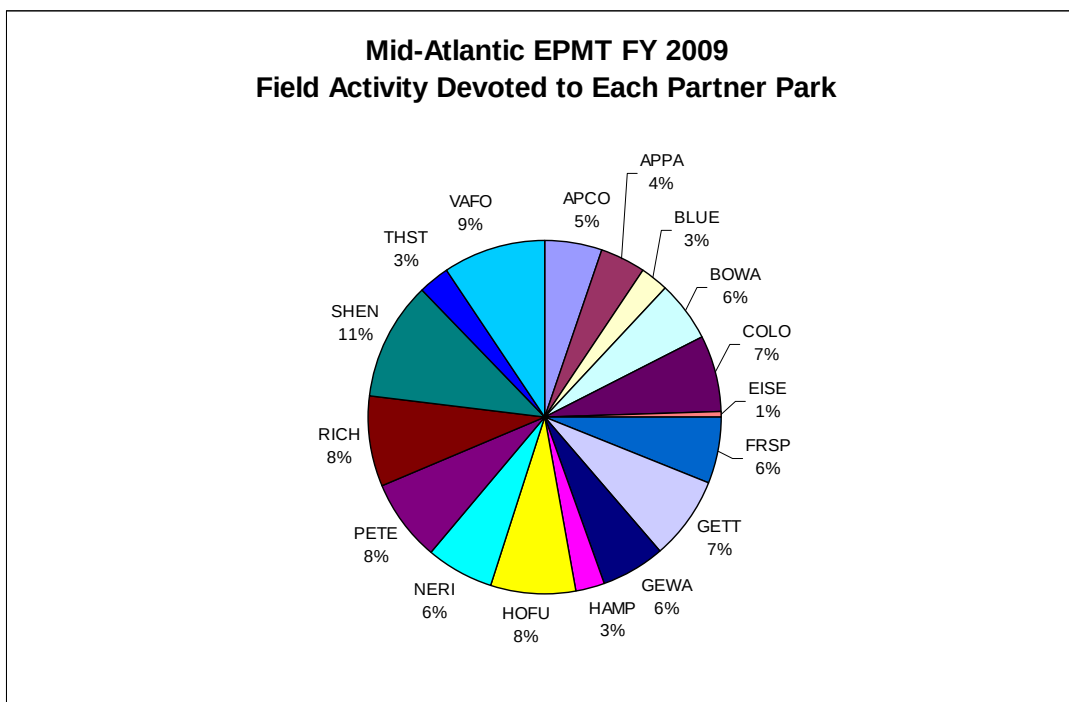


Figure 4. Chart depicting the breakout of field time of the Mid-Atlantic Exotic Plant Management Team devoted to each partner park unit, FY 2009.

Collaboration with park neighbors continues to control common exotic problems. This potentially improves the success of field treatments by increasing the area of influence and management. In FY 2009, only monitoring of pre-existing sites took place on neighboring properties.

The Cooperative conducts treatment site monitoring at least annually to evaluate treatment effectiveness, refine and adjust treatment strategies, and determine exotic species' status and trends.

Risk management and safety are incorporated throughout. Daily tailgate safety sessions and periodical Safety Plan reviews encouraged safe operations and provided a stage to identify and resolve other risk management issues (i.e., hazardous materials management, sustainability, being environmentally "green," etc.). The Field Crew Leader had the prime responsibility for making safety a daily discussion item.

The permanent field team is attaining pesticide applicator certification for each state in the Cooperative. That exceeds state requirements requiring only field leader certification. This indicates the Team's commitment to personnel safety and environmental protection. Individual SCA intern team members studied for Commonwealth of Virginia certification only.

Goal 3 – Assess treated sites for further restoration needs. Implement prescribed fire and other management methods in an integrated fashion where needed and appropriate. Monitor exotics control and restoration actions.

A treatment monitoring protocol (NPS 2003a) was used that is functionally simple and adaptable to fit various shaped and sized units. Results of monitoring provided information regarding invasives' presence, native species regeneration and forest development. The goal of exotic plant management is not solely to control nonnatives. It is to create conditions that allow for healthy functioning native ecosystems. Much of the eastern forest type is well suited to regenerate itself following natural disturbance such as wildfire, windstorm and the like. The removal of invasive vegetation mimics such an occurrence. In general, native plantings are not needed where affected areas are (1) free of subsequent invasive reinfestation, (2) smaller than ¼-acre, (3) not broadly exposed to potentially damaging weather/climatic elements, and (4) not containing soil compaction or environmental poisoning (i.e., mine spoils, and oil, fuel and other chemical spills). Resident or adjacent natives are well able to recolonize such sites without intervention. The need for site restoration subsequent to invasive controls was evaluated on a case-by-case basis to determine appropriate follow-up treatments. FY 2009 saw no need for restoration measures beyond invasive plant treatments.

Goal 4 – Maintain a cohesive and cooperative effort within the Cooperative that trains and benefits from individual park expertise. Develop collaborative ventures with outside agencies and landowners to control exotics and restore ecosystems on a broad scale.

The programmatic intent is to create a program that is bigger than its parts. The following actions in FY 2009 assured that support and momentum were present to promote programmatic success.

- The Team worked closely with park management staffs in all phases as appropriate (i.e., park priority setting & review, species identification, site survey and documentation, treatment implementation, monitoring & evaluation, site restoration planning, and annual work planning and program evaluation).
- Created and measured real on-the-ground accomplishments.
- Focused on effective transfer of knowledge and procedures to park staffs.
- Created optimal infrastructure and functionality, within funding constraints, needed to efficiently assess and control invasive exotics.
- Reached out to the public at park units regarding the story of invasive vegetation issues and control accomplishments with inexpensive media tools, media contacts, and public contact in the field.

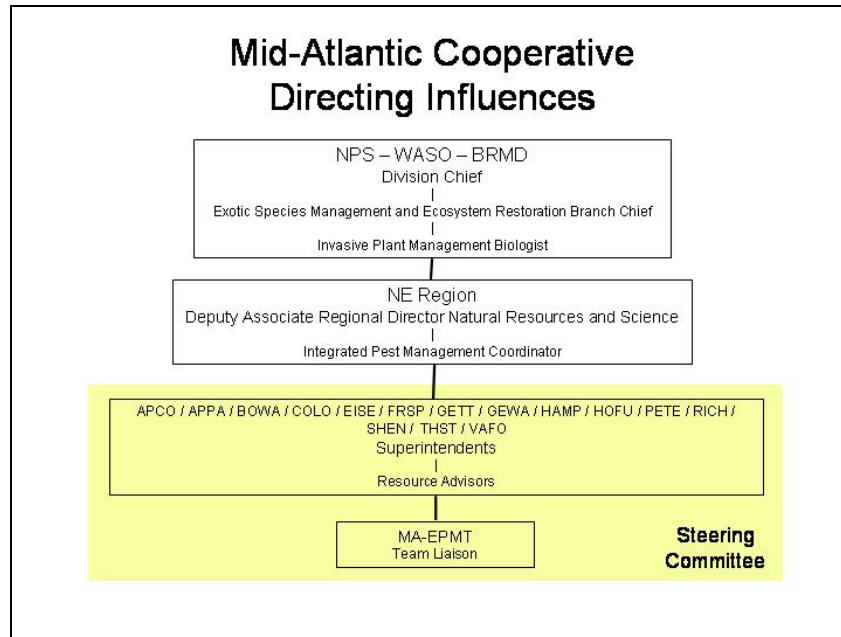


Figure 5. Chart illustrating the directing influences for operations of the Mid-Atlantic Exotic Plant Management Team and Cooperative.

Results

This was the seventh year of ONPS base-funded operations (FY 2003-2009) continuing from an earlier three-year NPS NRPP project effort (FY 2000-2002) which focused on park units in Virginia. A summary of achievements for the year follows.

Notable Achievements

(1) The Cooperative increased its annual treatment acreage, reaching 556 acres. This was the third year in a row of production increase. The Team contributed 88-percent of the total. The amount of declared species-acres of control increased modestly as well.

Table 4. Table of treatment contributions by partners within the Mid-Atlantic Cooperative, FY 2003 - 2009.

Mid-Atlantic Cooperative: Treatment Acres by Partners								
Partners	2003	2004	2005	2006	2007	2008	2009	Totals
--- Treated + Retreated Acres ---								
Mid-Atlantic EPMT	67.0	175.4	225.9	165.8	232.8	317.2	491.4	1,675.5
Partner Parks	0.0	0.0	1.3	32.3	6.9	19.6	49.6	109.7
SCA Teams	0.0	0.0	50.2	56.1	84.0	4.3	0.0	194.6
Contractors	0.0	220.5	171.6	60.2	26.5	160.4	5.8	645.0
Volunteers	0.0	0.0	0.0	1.2	6.5	4.5	8.8	21.0
Totals	67.0	395.9	449.0	315.6	356.7	506.0	555.6	2645.8

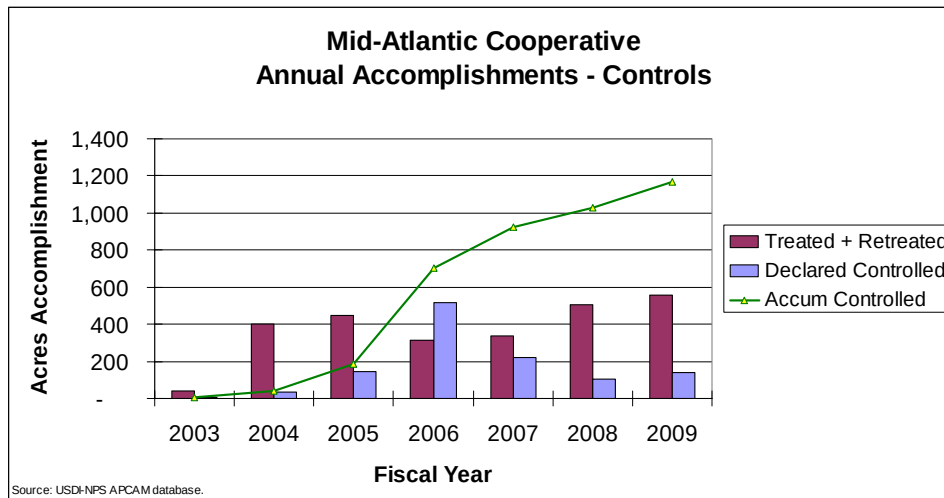


Figure 6. Chart of annual treatment accomplishment and acres of control, 2003 - 2009.

(2) The Team worked 463 person-days in the field, accomplishing 491 treatment acres (of the Cooperative's 556 acres total). That represents a Team efficiency improvement of 0.4 acres per field day, a notable achievement.

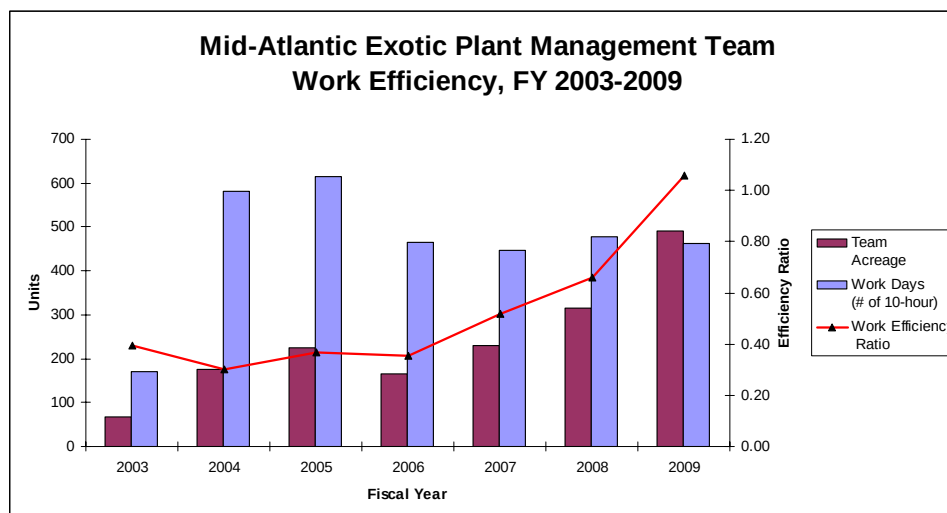


Figure 7. Chart depicting Team field work efficiency, 2003 – 2009.

(3) The Mid-Atlantic EPMT organized and directed the short-term volunteer program for the Appalachian National Scenic Trail (Northern Virginia section). The intent of the program is to expand exotic plant control accomplishment and develop public advocacy. Funding was obtained for the Appalachian Trail program through a grant with the Toyota Together-Green Foundation in cooperation with the National Audubon Society of Virginia. Funds were used to purchase field equipment and supplies. The Appalachian Trail database had an initial count of 361 records, which grew through the year to 395 records. Included are individuals, schools, universities, churches, clubs, and professional organizations. The Appalachian Trail program had 21 events where 463 volunteers contributed 1,430 volunteer hours. Their labor added 25.1 gross infested acres to the treated total.

Volunteers contributed to the control of *Alliaria petiolata*, *Elaeagnus umbellata*, *Rosa multiflora*, *Rubus phoenicolasius*, *Berberis thunbergii*, *Microstegium vimineum*, *Polygonum caespitosum*, *Verbascum thapsus*, and *Celastrus orbiculatus*.

The short-term volunteer program had two kinds of field events – special events open to the public and events by appointment with specific groups. The event by appointment gathers the most volunteers and treatment accomplishment by far. In total, 18 group events and 1,222 volunteers devoted 705 hours during the period of Mid-Atlantic EPMT direction. The three special events, on the other hand, though providing fewer people and field hours for the staff time invested, provided a venue for reaching the public, and helped the overall program by increasing public understanding of the issues involved. News media publicity was used with special events to promote the message and intent of the program. The special events produced 36 volunteers who devoted 208 hours of fieldwork during the period.

(4) The Mid-Atlantic Cooperative completed field inventories on **5,468** acres at **17** parks. There were **64** exotic species treated during the year. The treatment/retreatment goal of 225 acres was achieved and surpassed at **556** treated and retreated acres.

Table 5. Table of Mid-Atlantic Exotic Plant Management Team accomplishments for Fiscal Year 2009 – summarizing management activity.

Mid-Atlantic EPMT Fiscal Year 2009 Accomplishments		
Work Category	Parks	Acres
Inventoried	17 of 18	5,468
Treated	17 of 18	539
Monitored	9 of 18	76
Retreated	6 of 18	17
Controlled species	6 of 18	138
GPRA goal: 225 acres	Achieved: 556 acres	

(5) The Team completed invasive threats and treatment priority analyses for NERI, BLUE, HAMP, and THST. Strategic planning also took place for those units plus VAFO during the year. The intent in FY 2010 is to finalize planning for all five parks.

(6) Newer permanent team members worked toward state certification to apply herbicides within the Commonwealth of Virginia, Maryland, Pennsylvania, and West Virginia. Student interns obtained state certification for the Commonwealth of Virginia. The Team Liaison conducted pesticide user safety training on two occasions, in July and September, for incoming Student Conservation intern staff. The appendix lists all pesticide certifications.

(7) The Team had no lost time due to injuries by implementing a well-executed and documented safety program with daily safety discussions (NPS 2008b).

(8) The Cooperative augmented its functional capacity by utilizing individual SCA interns, park volunteers, sponsoring nonprofits and for-profit organizations, and a private sector contract – all with excellent success.

(9) The Team Liaison participated on the Commonwealth of Virginia Invasive Species Advisory Committee.

(10) The Team submitted a draft management plan to partner parks titled *The Mid-Atlantic Invasive Plant Management Cooperative of National Parks Management Plan, 2010 – 2014* for their review and approval.

(11) The Team submitted a draft Simplified FY 2010 Work Plan for review to the Mid-Atlantic Cooperative Steering Committee in September 2009 (NPS 2009a).

(12) The Team Liaison increased public awareness of invasive species issues by the following. (Refer to the appendix for detail.)

- Participating in **three** news media interviews (external)
- Speaking at **nine** professional or public meetings (external)
- Creating **22** reports, articles, newsletter entries, and intranet releases (external/internal), and
- Responding to **18** queries for information outside the Cooperative (external/internal).

Discussion

The Mid-Atlantic Cooperative is within an unglaciated, biologically diverse and highly productive region spanning the coastal plains of Chesapeake Bay, Piedmont, and Ridge & Valley zone of the Blue Ridge Mountains. Few areas have greater biological diversity. Protecting the natural and cultural legacy of the region is essential to assure that future generations enjoy its expanse and beauty. The Mid-Atlantic Team is an excellent organizational foundation for preserving and protecting natural and cultural resources. Most parks lost ground financially and increasingly relied solely on the Team for their exotics control program instead of being able to conduct their own on-the-ground activities. This will decrease future annual progress in treating high priority invasive species. It will also tend to decrease corporate knowledge of the program due to lack of on-the-ground participation.

Parks are making progress toward achieving a maintenance level of exotic plant management needs. That status is achieved and noted when monitoring and treatment needs are less than one percent on an annual basis. Organizationally, increasing short-term volunteer participation in exotic plant management and improving public awareness of the issues will help slow down the programmatic losses due to budgetary short-falls.

The nationally funded Mid-Atlantic Exotic Plant Management Team is a continuation of efforts begun in FY 2000 when, through NPS Natural Resource Protection Program project funding, a smaller Virginia Invasive Vegetation Management Team and its cooperative of eight parks was begun. The momentum and expertise garnered during the 2000-2002 period became an essential part in helping the Mid-Atlantic Cooperative thrive in its first years of expanded operations.

In spite of budget problems, on-the-ground participation of park staffs and volunteers has increased for the most part since the Cooperative's beginning. Transfer of knowledge continues for all involved, helping expand the corporate knowledge of program intent and activity. Invasive exotic plants are being controlled in a strategic fashion that provides for long-lasting protection that will leave parks' resources unimpaired for future generations.

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Appendices

Outreach: Reports, Presentations, and Outreach of FY 2009

Reports, Publications, and Articles

- George Wright Society. 2009. "It Takes Many Hands to Control Invasive Plants Along the Appalachian Trail" IN *Rethinking Protected Areas in a Changing World: Proceedings of the 2009 George Wright Society Biennial Conference on Parks, Protected Areas, and Cultural Sites; March 2-6, 2009, Portland, OR* (in draft). Samantha Weber, ed. George Wright Society, Hancock, MI.
- NPS. 2009. *Mid-Atlantic Exotic Plant Management Team Work Plan - FY 2010* (in draft), September 2009. NPS-Biological Resources Management Division, Mid-Atlantic Exotic Plant Management Team, Luray, VA. 5 pp.
- NPS. 2009. *Mid-Atlantic Invasive Plant Management Cooperative of National Parks; Management Plan 2010 – 2014*. NPS-Biological Resources Management Division, Mid-Atlantic Exotic Plant Management Team, Luray, VA. 51 pp.
- NPS. 2009. *Safety Plan for Field Operations: 2009-2014*. NPS-Biological Resources Management Division, Mid-Atlantic Exotic Plant Management Team, Luray, VA. 42 pp.
- NPS. 2009. *Bringing the Public into Public Lands Management: Short-Term Volunteers and Other Collaborators Aid Two National Parks In The Northeast Region*. January 2009. NPS Northeast Region, Mid-Atlantic Exotic Plant Management Team, Luray, VA. 28 pp. Available on-line:
http://nrpcsharepoint/brmd/Invasive_Plant_Mgt/MAEPMT/Shared%20Documents/Public%20Relations%20and%20Outreach/Bringing%20the%20Public%20into%20Public%20Lands%20Management_booklet.pdf
- NPS. 2009. "Volunteers Enhance the Work at Shenandoah and the Appalachian Trail" IN *Science and Management: Winter 2008-2009*. February 2009. USDI, NPS, Northeast Region, Natural Resources and Science, Philadelphia, PA. p. 6-7. Available on-line:
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- Shenandoah NP. 2009. "Regional Assistance: Fighting Invasive Species Requires Collaboration" IN *Resource Management 2009*. USDI National Park Service, Shenandoah National Park, Luray, VA. P. 10-12. Available on-line:
http://www.nps.gov/shen/parkmgmt/upload/SHEN_NCR_News_2009_04_sm.pdf

Presentations

1. Åkerson spoke at the Natural Areas Association conference, 10/15/08, in Nashville, TN, with the speech title, "Volunteer Programs are an Essential Aid in Controlling Invasives" (~65 people).

2. Åkerson submitted abstract and poster on volunteerism in invasive plant management for the Natural Areas Association conference, 10/14-17/08, in Nashville, TN. The abstract can be found at <http://www.naturalarea.org/conferenceAbstracts.aspx?p=418>
3. Åkerson spoke to Warren County High School students, 11/21/08, on the topic of invasive plant impacts to the Appalachian National Scenic Trail (~45 students).
4. Åkerson and Ted Pryor manned an exhibit at the Rappahannock County Wildlife Habitat Open House, 2/7/09 (Outreach: ~300 people).
5. Åkerson spoke at the Rappahannock County Wildlife Habitat Open House, 2/7/09, with the speech title, "Invasives are Eating Your Lunch" (Outreach: ~50 people).
6. Åkerson spoke at the Virginia Association of Forest Health Professionals Conference, 2/2/09, with the speech title, "Invasives are a Slow Wildfire And More Destructive!" (Outreach: ~80 people).
7. Åkerson spoke (with Wayne Millington, NE IPM Coordinator; Nancy Fraley, Liaison SE-EPMT; and Betsy Lyman, Liaison NE-EPMT) at the NPS *Eastern Revegetation Conference* (GRSM), 3/17-19/09, with the speech title, "Project Management: Anecdotes and Advice" (Outreach: ~35 people).
8. Åkerson spoke to the Virginia Governor's School, Mt. Jackson, VA, 4/7/09, on invasive species issues (Outreach: 49 students and faculty).
9. Åkerson prepared a slideshow titled, "Mission: Preserve & Protect Appalachian Trail Resources: Invasive Plant Management," that was presented by C. Casey Reese, APPA GIS Specialist, at the Appalachian Trail Conservancy Biennial Conference, July 2009, Castleton State College, VT (Outreach: ~80 people).
10. Åkerson spoke to the Ivy Creek Forum, Charlottesville, VA, 9/29/09, on the topic of forest insects, pathogens, and invasive vegetation with the title, "Invasive Species Impacts on Forest Health: Pangaea's Not All It's Cracked Up to Be!" (Outreach: 52 adults).

Media and Other Public Outreach

1. Åkerson was interviewed (along with Rolf Gubler, SHEN Wildlife Biologist) by reporter/program host Jeff Ishee for WSVA-radio and WVPT-TV *Virginia Farmer with Jeff Ishee*, 5/6/09, on the topic of invasive species impacts to Virginia resources (Outreach: potentially 1,000,000 with Northern Virginia/Maryland cable outlets).
2. Åkerson was interviewed by Leslie Fiddler, freelance reporter 5/12/09, for an article on invasive plant problems in the Front Royal, VA, area; it ran in the *Warren County Report* (Outreach: potentially ~75,000).
3. Released the pamphlet, "Bringing the Public into Public Lands Management: Short-Term Volunteers and Other Collaborators Aid Two National Parks in the Northeast Region" as an Acrobat pdf-file for electronic distribution, January 2009 (Outreach: ~500 internal/external).
4. Åkerson submitted monthly accomplishment updates into the Northeast Region *Highlights Newsletter* (Outreach: @200 people; internal).

Safety Management

1. The *Mid-Atlantic Exotic Plant Management Team Safety Plan* updated for 2009, 10/31/08.
2. The field team conducted almost daily 6-minute tailgate safety sessions to emphasize safety during the workday (126 occasions during the year).
3. Volunteer leaders conducted safety briefings for safe operations during volunteer events (21 occasions during the year).

4. Conducted herbicide inventories (12/11/08, 4/7/09, 7/8/09, and 9/30/09) and made sure required MSDS sheets were available for all products.
5. Appropriately disposed of triple-rinsed herbicide containers to the Rockingham County landfill for special recycling, 1/8/09
6. Provided pesticide use reports to all park units for CY 2008 Team activity, 1/12/09
7. Pesticide certifications:
 - a. Åkerson: VA-Forest and R/W; WV-Forest; MD-Forest and R/W; and PA-Forest
 - b. Bentley: VA-Forest and R/W
 - c. Jennings: WV-R/W; and PA-R/W
 - d. Wender: VA-Forest; WV-Forest; MD-Forest; and PA-Forest
 - e. Titus, SCA intern: VA-Registered Technician
 - f. Kobayashi, SCA intern: VA-Registered Technician

Training

Administration

1. Charge card training completed: Bentley, 2/15/09 (1 hour @ person)
2. Privacy Act training completed: Åkerson, 4/28/09; Bentley, 4/30/09; Jennings, 5/18/09, and Wender, 5/5/09 (1 hour @ person)
3. Records Management training completed: Åkerson, 4/28/09; Bentley, 4/30/09; Jennings, 5/18/09; and Wender, 5/5/09 (1.0 hours @ person)
4. Discrimination in the Workplace and Whistleblowing training completed: Åkerson, 3/13/09; Bentley, 4/6/09; Jennings, 5/17/09; and Wender, 3/2/09 (1.0 hours)
5. DOI Information Technology Safety training completed: Åkerson, 3/13/09; Bentley, 2/18/09; Jennings, 5/17/09; and Wender, 3/26/09 (1.0 hour @ person)
6. NPS GOVTRIP web-based travel documentation training on-line: Bentley, 3/15/09 (1.5 hours @ person)
7. ACMIS on-line training and certification for COTR administration: Åkerson, 4/13/09 (4 hours)
8. Quicktime NPS timekeeping software on-line training: Åkerson, 1/15/09

Safety / Risk Management

1. VA pesticide core training completed: Titus, 7/09 (20 hours); Kobayashi, 9/09 (20 hours)
2. VA pesticide recertification training completed: Åkerson, 2/09
3. NPS Fire Safety Refresher completed: Bentley, Jennings, and Wender, Spring 2009 (8 hours)
4. Spill kits for pesticide applicator recertification on-line: Åkerson, 5/1/09 (1.5 credit hours)
5. Flammable and Combustible Liquids: Bentley, 9/18/2009
6. Hand and Portable Powered Tools: Bentley, 9/19/2009
7. Introduction to Industrial Hygiene: Bentley, 9/19/2009

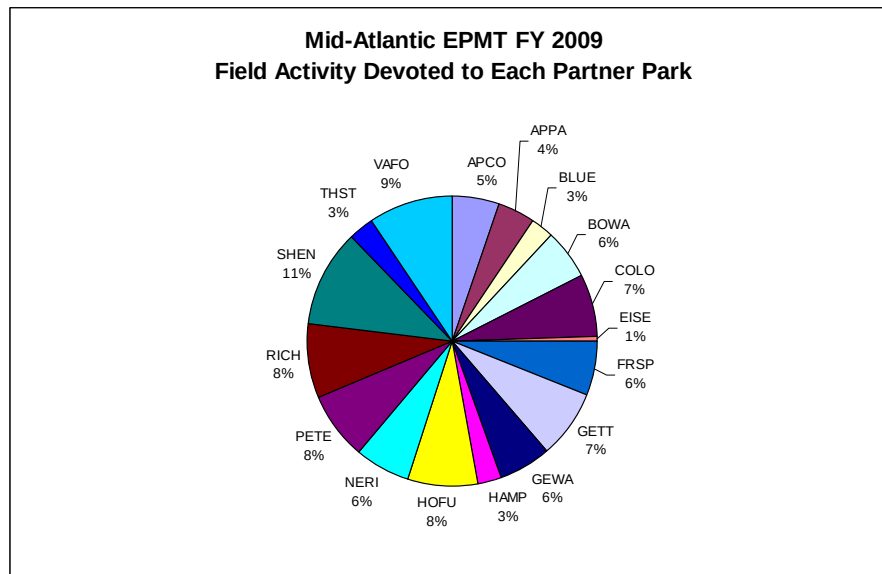
Biology

1. Attended VA Association of Forest Health Professional conference, Charlottesville, VA: Åkerson, 2/2/09 (8 hours)
2. Attended NPS Eastern Revegetation Conference, GRSM, 3/17-19/09: Åkerson (30 hours)
3. Attended NPS Fundamentals V training (STMA), 3/23-27/09: Jennings (40 hours)

Programmatic Time Breakdown: Activities and Parks

Appendix Table 1. Table of combined fieldwork and shared administrative tasks conducted for member park units within the Mid-Atlantic Cooperative, FY 2009.

Mid-Atlantic Cooperative Breakdown of Work Time, FY 2009						
Park Unit	MA-EPMT Work at Parks & Shared Admin		Contractor Work at Parks ⁵	Volunteer Work at Parks	Total of All MA-Cooperative Work at Parks	
	(Days)	(%)	(Days)	(Days)	(Days)	(%)
APCO	24	5%			24	4%
APPA	19.5	4%		143	162	26%
BLUE	12	3%			12	2%
BOWA	26	6%			26	4%
COLO	32	7%			32	5%
EISE	3	1%			3	0%
FRSP	28	6%			28	4%
GETT	34	7%			34	5%
GEWA	28	6%			28	4%
HAMP	12.5	3%			13	2%
HOFU	36	8%			36	6%
NERI	28	6%			28	4%
PETE	35	8%			35	6%
RICH	39	8%	18.1		57	9%
SHEN	50.5	11%		0.9	51	8%
THST	12	3%			12	2%
VAFO	44	9%			44	7%
	463	100%	18	144	625	100%



Appendix Figure 1. Chart of field activity devoted to partner parks, FY 2009.

⁵ Partially supported by park funding in the case of PETE, RICH, and SHEN.



Appendix Figure 2a. Group photograph of the Mid-Atlantic EPMT FY-2009, early season. Left-to-right are James Åkerson, Robert Jennings, Travis Williams (SCA intern), and Nathan Wender.



Appendix Figure 2b. Group photograph of the Mid-Atlantic EPMT FY-2009, later in the season. Left-to-right is Kyle Titus (SCA intern), Craig Bentley, Nathan Wender, Robert Jennings, and James Åkerson.



Appendix Figure 3. Owners and employees of Invasive Plant Control, Inc. The contractor completed five years with the Mid-Atlantic Cooperative.



Appendix Figure 4. Volunteer Leaders, Ted Pryor and Wendy Ebersberger, are among five that lead volunteer events for the Appalachian National Scenic Trail.

Appendix Table 2. Table of in-kind support from participating parks within the Mid-Atlantic Cooperative, FY 2009.

Mid-Atlantic Cooperative In-kind Contributions

Location/Item	Value (\$)	
All parks (except APPA/FRSP/GARI/HOFU):		
Fuel (20 gallons/week * 32 weeks * \$3.50/gal)	\$	2,240
Minor non-budget tools & repairs	\$	500
SHEN (as host):		
Office space (12'x15' + 10'x12' = 300 sqft) @\$4-6/ft/mo	\$	14,400 3240
Office supplies	\$	500
Equipment storage & shop (25'x50' = 1,250 sqft) @\$2/ft/mo	\$	30,000
Fuel (20 gallons/week * 45 weeks * \$3.50/gal)	\$	3,150
Utilities (phone + electric + water/sewer/garbage)	\$	3,600
Network & IT support	\$	5,000 \$ 56,650
Park specific:	Subtotals	Staff Equipment GPS/GIS Photography Johnboat Storage Loader Housing Other
APCO: 1 field staff, field equipment, GPS/GIS services	\$ 3,466	\$ 1,466.35 250 750 1000 \$ -
APPA: 1 field staff, NEPA clearance	\$ 3,188	\$ 2,688.00 \$ - 500
BOWA: 0 field staff, field equipment	\$ 250	\$ - 250 \$ -
COLO: 1 field staff, storage	\$ 5,222	\$ 3,221.86 2000 \$ -
FRSP: 1 field staff, field GPS, GIS, field equipment, storage	\$ 4,888	\$ 2,688.00 200 1500 500 \$ -
GETT/EISE: 6 field staff, GIS, radios, field equipment	\$ 9,748	\$ 8,798.13 200 750 \$ -
GEWA/THST: 0 field staff, housing 2 seasons, field GPS, field equipment, canoe/Johnboat (phragmites work), storage	\$ 3,370	\$ - 200 750 100 1000 \$ 1,320.00
HAMP: 2 field staff, field equipment, Bobcat loader	\$ 3,633	\$ 2,932.71 200 500 \$ -
HOFU: 0 field staff (VIPs), housing 4 seasons, storage & office space	\$ 1,820	\$ - 500 \$ 1,320.00
NERI: 2 field staff, housing 3 seasons	\$ 4,913	\$ 2,932.71 \$ 1,980.00
PETE: 0 field staff, housing 2 seasons, field GPS, GIS, field equipment	\$ 5,356	\$ - 200 1500 2000 \$ 1,656.00
RICH: 1 field staff, field GPS, field equipment	\$ 3,416	\$ 1,466.35 200 750 1000 \$ -
SHEN: 3 field staff, field GPS, GIS, field equipment, NEPA clearance	\$ 6,799	\$ 4,399.06 200 1500 200 \$ - 500
VAFO: 1 field staff, GIS, storage, NEPA clearance, loader	\$ 4,216	\$ 1,466.35 1500 250 500 \$ - 500
		\$ 32,059.53 \$ 1,900 \$ 9,000 \$ 200 \$ 100 \$ 8,250 \$ 1,000 \$ 6,276 \$ 1,500
Total In-kind	\$ 119,676	\$ 119,676
2009		
In-kind percent of total budget (\$300,000 + in-kind)	29%	
2009		
In-kind percent of funded budget (\$300,000)	40%	

Appendix Table 3. Table of funding expenditures of the Mid-Atlantic Exotic Plant Management Team, FY 2009.⁶

FY 2009 Funding Expenditures of the Mid-Atlantic EPMT					
	→ Source	NR Challenge Base Funding	NR Challenge Base Funding	DEWA account for Åkerson work detail	Toyota Together-Green Project Grant (APPA)
Expense Type	→ Account	2144-6205-NYP	2146-2301-NYP	4320-RZZ	Funds held by the Shenandoah National Park Association for APPA vol. prog.
Personnel		\$225,509	\$ -0-	\$ 10,988	\$ -0-
Supplies & Materials		17,280	15,743	2,997	293
Training		94			
Travel		28,334			
Equipment		3,997			
Vehicles		1,000			
Rent/Utilities		2,454			
Services		13,183			
Other		6,139			
Totals		\$ 297,990*	\$ 15,743	\$ 13,985	\$ 293
Funds held into FY-2010		-0-	-0-	-0-	\$ 300

* The allotted \$300,000 MA-EPMT base budget was reduced 0.67 of 1% by NER administrative assessment.

⁶ These figures include all activities relative to exotic plant management.