CHAPTER IV: A COMPREHENSIVE PROGRAM FOR MANAGEMENT OF RESOURCES ON THE APPALACHIAN TRAIL

A. Introduction

The Appalachian National Scenic Trail is like no other place on earth. There are few, if any, national parks or national forests that pass through five major geologic provinces, eight ecological sections, and 20 ecological subsections, or that have a latitudinal differential of thousands of miles, or a range of vegetation that extends from northern hardwood, spruce-fir and alpine krummholz to southern Appalachian oak forest and high-mountain southern balds. Certainly, few parks or forests contain more than 2,100 occurrences of rare plant and animal species and rare or exemplary natural communities, 4,500 acres of open areas and mountain vistas, nine National Natural Landmarks, 19 properties that are listed on the National Register of Historic Places, hundreds of additional sites that are eligible for the National Register, thousands of other cultural resource sites, and five Class I airsheds. The Appalachian Trail, in its traverse of the Appalachian Mountain chain, contains all these resources and much more.

In fact, the Appalachian Trail contains so many outstanding natural, cultural, and scenic features that it sometimes seems impossible to protect and manage them all. Fortunately, the job does not fall to any one agency or organization. The A.T. Cooperative Management System, which is described in Chapter I, includes more than 100 public and private partners. These agencies and organizations carry out many of the tasks that are needed to preserve the Appalachian Trail's remarkable array of natural and cultural resources.

Nevertheless, despite the contributions of these agencies and organizations, a huge job still remains to be done. The responsibility for fulfilling these remaining responsibilities falls to the Appalachian Trail Conservancy and the Appalachian Trail Park Office. Thousands of individual actions need to be undertaken to protect rare plant or animal species from being lost or destroyed. Open areas need to be maintained on a regular basis, or they will be lost to succession. Air quality needs to be monitored, and decisions need to be made to protect hikers and vegetation from adverse effects of poor air quality. Water quality should be monitored, and data should be analyzed and conveyed back to managers in the field. Cultural resources need to be identified along the entire length of the Trail, so that limited funds and volunteer and staff time can be directed to preserve the most significant and most vulnerable. The Trail itself needs to be studied to determine whether it – or at least sections of it – are eligible for the National Register of Historic Places.

Why protect the Trail's natural and cultural resources? Well, it's not just that these resources need to be protected to comply with federal and state laws and policies. These resources represent our nation's natural or cultural heritage, and if they can't be preserved in a protected landscape like the Appalachian Trail, they probably can't be preserved anywhere. Their presence also enhances the experience of the millions of people who visit, hike, and enjoy the Appalachian Trail, and the knowledge and appreciation of people who don't visit the Trail but still value its existence. But there's another reason to monitor, manage and protect the Trail's resources that may be more important than anything else. The Appalachian Trail – by virtue of its geographic expanse, its location on the heights of land across the Appalachian Mountain range, its icon status, and its cornucopia of natural and cultural resources has the unique potential to provide scientists, researchers, visitors, educators, and the general public with a better understanding of the health of the environment throughout the Appalachian Mountains and the Eastern United States.

B. Resource Management Strategies

The intent of this resource management plan is to develop a strategy that provides some over-arching direction to the Appalachian Trail Conservancy and the Appalachian Trail Park Office, so that their managers, staff, and volunteers can make objective decisions and implement appropriate actions to protect, preserve, and interpret significant natural and cultural resources along the Appalachian Trail. The following discussion outlines the Conservation Strategy of the Appalachian Trail Conservancy and the resource management strategy of the Appalachian Trail Park Office.

C. Resource Management Program Priorities

In February 2005, Appalachian Trail Conservancy and Appalachian Trail Park Office staff participated in a series of three priority-setting exercises designed to identify which resource management programs and projects were most important. Trail managers identified 38 programs and projects that could be implemented to respond to the resource management threats, issues, and program needs identified in Chapters I, II, and III. The rationales that were given for establishing priorities varied considerably, but three or four themes dominated reviewers' priorities. In general, people who participated in the priority-setting process felt that priority should be given to:

- programs and projects that respond effectively to direct and immediate threats to Trail resources (*i.e.*, the "triage" approach)
- data management, which is an essential function that supports all resource management programs

- ongoing resource management programs and projects that have been initiated but that are not fully operational
- inventories of resources and threats to those resources, so that decisions about programs could be made based on a broader understanding of the relative importance of various resources and threats to those resources
- programs that leverage new partners and engage new constituents
- programs that engage visitors and volunteers and communicate resource issues and threats to the general public are essential to the protection of Trail values

In the program and project descriptions that follow, salary and benefit costs have been incorporated into the annual and total program and project costs. These costs have been estimated using Federal salary and benefit costs in 2008 dollars (specifically, they have been derived from the Office of Personnel Management Salary Table 2008-DCB).

These estimates reflect the salary costs for carrying out programs and projects using federal employees at the full performance level and maximum step level for the position, plus 30% for benefits. Actual salary and benefit costs may be much lower, particularly if positions are filled within the Appalachian Trail Conservancy instead of the National Park Service. Substantial additional savings also may be realized if volunteers assume greater portions of the roles and responsibilities.

Contract and other direct costs are estimated based on previous contracts for similar projects on the Appalachian Trail or in other National Park units to the greatest extent possible. If this information was not available, estimates are based on the professional judgment of staff.

The Appalachian Trail Park Office has already submitted Operations Formulation System (OFS) statements and Project Management Information System (PMIS) statements for many of the programs and projects listed in this section. Where applicable, the OFS or PMIS statement is noted in the descriptions of these programs and projects.

Table IV.A, Potential Resource Management Programs and Projects on the Appalachian Trail, 2009 - 2019 depicts estimated costs and staff requirements for each program or project. These 32 programs and projects are divided into five major program areas: **cultural resource management**, **natural resource management**, **environmental monitoring**, **GIS development**, and **Trail protection**, and are listed in order of priority. Priorities were established for management programs and projects within each of the program areas, based on policies that guide the National Park Service Appalachian Trail Park Office and the Appalachian Trail Conservancy, and input received from program specialists, members of the scoping teams, Appalachian Trail Conservancy Board and committee members, agency partners, Trail club members, and the general public.

[Note: Please keep in mind as you review this section that this plan is not a strategic plan, a land use allocation plan, or an implementation plan. It is a programmatic plan that is designed to analyze resource conditions, threats, program capabilities, needs, and priorities for management of resources along the Appalachian Trail.]

Table IV.A, Potential Resource Management Programs and Projects on the Appalachian Trail 2009 - 2019

Program or Project Name	Estimated First Year Cost	Estimated Annual Cost	Estimated Total Cost (Over Ten Years for OFS Requests)	Priority	Potential Start Date
Cultural Resource Programs and Projects					
Development of a Cultural Resource Management Program for the A.T. (OFS)	$126,000.0	$126,000.0	$1,260,000.0	**VH**	**2010**
National Register Nominations for the A.T. and Significant Cultural Resources (PMIS)	$60,000.0	$60,000.0	$240,000.0	**H**	**2009**
List of Classified Structures for A.T. Park Office Lands (PMIS)	$60,000.0	$60,000.0	$180,000.0	**M**	**2013**
Survey and Rehabilitation of CCC-Constructed Shelters on the A.T. (PMIS)	$36,000.0	$36,000.0	$144,000.0	**L**	**>2019**
Natural Resource Programs and Projects					
Appalachian Trail Mega-Transect Program (OFS)	$238,000.0	$238,000.0	$2,380,000.0	**VH**	**2009**
Monitor and Manage Rare, Threatened, and Endangered Species on Appalachian Trail Lands (OFS)	$206,400.0	$206,400.0	$2,006,400.0	**M**	**2011**
Inventory Appalachian Trail Lands for Exotic Plants and Insect Pests (PMIS)	$28,800.0	$28,800.0	$28,000.0	**M**	**2011**
Control Exotic Plants on A.T. Lands (PMIS)	$120,000.0	$120,000.0	$1,200,000.0	**H**	**2010**
Trail Protection					
Boundary Maintenance Program for the A.T. (OFS)	$160,000.0	$160,000.0	$1,600,000.0	**H**	**2009**
Geographic Information System (GIS) and Information Management					
Appalachian Trail Data Management Program (OFS)	$150,000.0	$150,000.0	$1,500,000.0	**VH**	**2010**
A.T. Corridor Mapping Project (PMIS)	$37,500.0	$37,500.0	$150,000.0	**H**	**2010**
Total, all potential resource management programs and projects, 2009 to 2019					

** although these programs benefit the Trail, funding for these programs is allocated to other National Park Service offices

Chapter IV.B

Program and Project Statements for Cultural Resources

The following statements describe programs and projects that could be implemented or enhanced to manage cultural resources on the Appalachian National Scenic Trail. See *Table IV.A.1, Potential Resource Management Programs and Projects on the Appalachian Trail 2008 – 2015*, for a comparative summary of all programs and projects.

1. Development of a Cultural Resource Management Program for the Appalachian Trail: Protect and Interpret Cultural Resources Through Partnerships

OFS Number: currently a component of 11549A

Estimated Cost: $126,000 annually

Cost Break-out: $102,000 for a cultural resource specialist; $12,000 for administrative costs; and $12,000 for GIS support.

Full-time staff required (cost included in estimated cost above): 1.0 full time employee (cultural resource specialist)

Program Description: This funding would permit the Appalachian Trail Park Office and the Appalachian Trail Conservancy to develop a cultural resource program for the Appalachian National Scenic Trail. The funding would be used to work with local communities, historical societies, educational institutions, and Trail partner organizations to protect and interpret the vast wealth of historic resources that exist along the Appalachian Trail. The requested full-time employee (FTE) may be shared with another park unit or used to fund services provided by non-profit management partners. The incumbent would serve as a program coordinator for all cultural resource programs on the Trail. Duties would include serving Section 106 coordinator; coordinating work on cultural landscape inventories, a list of classified structures, and cultural resource overview and assessments; assisting in resource protection activities; and managing programs and projects to protect, restore, and interpret significant cultural features and sites on the Appalachian Trail.

Justification: Currently, the Trail does not have any staff that are dedicated to cultural resource management. Cultural resource programs and projects are handled by the environmental protection specialist as an ancillary duty. Identified needs are extraordinary. In 2004, a study of archaeological resources along the 55 miles of the Appalachian Trail in Connecticut alone identified 382 archaeological resource sites and features, dozens of which are likely to be

eligible for the National Register of Historic Places. Cultural resource management needs include the need to:

- identify, locate, manage, and protect cultural resource sites, cultural landscapes, and historic structures along the Appalachian Trail in 14 states;
- educate management partners, the public, and communities along the Trail about the value of cultural resources and the rich history of the Appalachian Trail itself, and foster a sense of pride and protective ownership for these resources;
- enrich the experiences of hikers, visitors, tourists, and members of the communities along the Trail; implement projects to stabilize and protect the most vulnerable cultural resources; and
- and conduct Section 106 clearances in a timely manner.

2. National Register Nominations for the A.T. and Significant Cultural Resources

PMIS Number: new

Estimated Cost: $240,000

Cost Break-out: $60,000 per year for four years, from FY 2009 to FY2013

Full-time staff required: 0.0 employees (program would be administered by the Environmental Protection Specialist or a Cultural Resource Specialist)

Project Description: The Appalachian Trail Park Office and the Appalachian Trail Conservancy would hire a contractor to evaluate the Appalachian National Scenic Trail and up to a dozen other likely candidate sites for their potential eligibility for the National Register of Historic Places. The contractor also would be asked to proceed with nominating those sites that qualified for the Register. In addition to the Appalachian Trail itself, the contractor would be required to analyze existing inventory data and select up to twelve other sites for evaluation, based on likely significance, condition, land ownership, geography, and other criteria and constraints. The contractor would then follow the prescribed National Register evaluation and nomination process and submit each nomination, as appropriate, to the state historic preservation offices and the Advisory Council on Historic Preservation.

Justification: According to cultural resource specialists, the Appalachian National Scenic Trail without question is eligible for the National Register of Historic Places. However, at this time the only section of the Trail that has been determined to be eligible is a short section of the Appalachian Trail in New Jersey. National Register status would ensure that the cultural value of the Appalachian Trail is recognized, and that the Trail receives some degree of protection from activities that would adversely affect that cultural significance.

3. List of Classified Structures for Appalachian Trail Park Office Lands

OFS Number: currently a component of 11549A

Estimated Cost: $180,000

Cost Break-out: $60,000 annually for contracts, for three years (2009, 2010, and 2011)

Full-time staff required: 0.0 full-time staff (program would be administered by the environmental protection specialist or a cultural resource specialist, working in cooperation with ATC regional staff)

Project Description: This funding would permit the Appalachian Trail Park Office and the Appalachian Trail Conservancy to inventory all historic structures along the Trail, including Trail shelters and incidentally acquired structures. Virtually all of these structures are 19th and 20th century structures. At least 20 of the 95 Appalachian Trail shelters originally constructed by the CCC are still in existence. Further, more than a dozen other shelters constructed by Trail clubs and other organizations (such as the Works Progress Administration) are believed to be historically significant. In addition, at least three incidentally-acquired structures (the Prosper Mountain Ski Tow Cabin in Woodstock, Vermont, the Mid-Atlantic Regional Office in Boiling Springs, Pennsylvania, and the Kegley Farmhouse in southwest Virginia) are being retained by the National Park Service because of their historical significance. Funds would be used to contract an historical architect or architectural historian to:

a) conduct an inventory for all structures (including Trail shelters) on ATPO-administered lands in accordance with established List of Classified Structures procedures;
b) determine the condition, cost, management, treatment, and historical information for all extant structures that qualify for the List of Classified Structures; and
c) develop management recommendations for protection and stabilization of all structures with historic significance on ATPO-administered lands; and
d) enter data into the List of Classified Structures Database

4. Survey and Rehabilitation of CCC-Constructed Shelters and Other Facilities along the Appalachian Trail

PMIS Number: new

Estimated Cost: $144,000

Cost Breakout: $36,000 per year for four years (from FY 2009 to FY 2012, following the completion of the List of Classified Structures)

Full-time staff required: 0.0 employees (project would be administered by the environmental protection specialist or a cultural resource specialist)

Project Description: The Appalachian Trail Park Office and the Appalachian Trail Conservancy would use these funds to hire a contractor to evaluate and document the condition of all CCC-constructed facilities along the Appalachian National Scenic Trail. The contractor would be required to develop detailed rehabilitation plans and materials lists. Follow-up rehabilitation work would be carried out by the responsible Appalachian Trail-maintaining club, with assistance as necessary from the Appalachian Trail Conservancy's Trail Crew Program.

Justification: At least 20 of the 95 Appalachian Trail shelters originally constructed by the CCC are still in existence. Many are believed to be in sub-standard condition, and some are slated for removal or replacement. This program would ensure that CCC-built structures are retained and rehabilitated if possible, or that appropriate HABS/HAER documentation procedures are followed if structures are slated for removal or replacement.

Chapter IV.C

Program and Project Statements for Natural Resources

The following statements describe programs and projects that could be implemented or enhanced to manage natural resources on the Appalachian National Scenic Trail. See *Table IV.A.1, Potential Resource Management Programs and Projects on the Appalachian Trail 2009 – 2019*, for a comparative summary of all programs and projects.

5. The Appalachian Trail Mega-Transect

OFS Number: 26207A

Estimated Cost: $238,000 annually

Cost Breakout: $178,000 annually for contract services; $35,000 annually for report preparation, public outreach, volunteer coordination; $25,000 for GIS and data management support.

Full-time staff required: 0

Program Description:
Scientists with the NPS, the USGS, Smithsonian, educational institutions, and non-profit conservation organizations held a symposium in 2006 to propose the Appalachian Trail (A.T.) as an indicator of the environmental health of the Eastern U.S. With significant planning in 2007, the Appalachian National Scenic Trail (APPA) and its partners (including the Appalachian Trail Conservancy and the NPS Inventory and Monitoring Program) are now prepared to establish the Appalachian Trail Environmental MEGA-Transect program to monitor, understand and respond to changes in the environment; engage partners, communities and visitors in shared stewardship of the Trail and its wealth of natural resources; increase the number of volunteers involved with the Trail; and tell the story of the health of the A.T. and surrounding lands to visitors, neighbors, and the American public. Funding would allow APPA and Appalachian Trail Conservancy (ATC) to hire an overall coordinator for the Appalachian Trail Environmental MEGA-Transect, implement programs to monitor air, water, and biological resources along the Trail, and provide for data management and GIS support.

Supporting Information:

The world-renowned Appalachian National Scenic Trail is uniquely positioned to serve as a beacon for engaging thousands of citizens and students in natural resource stewardship of the Appalachian Trail and understanding the environmental threats that face our national parks and forests. The 2,175-mile Trail is protected by an unbroken thread of 250,000 acres of public land, spread out on a long traverse along the crest of the Appalachian Mountains through 14 states, 6 other national park units, 8 national forests, 1 national wildlife refuge, and multiple state lands from Maine to Georgia (ME-GA). These 250,000 acres hold one of the greatest assemblages of temperate zone species in the world, with more than 2,000 occurrences of rare plant and animal species. This thread of public land also traverses the headwaters of many of the major rivers and streams in the eastern United States; crosses the summits of most of the highest mountains in the eastern United States; and stands downwind of many of the major air-polluting sources and upwind of many of the most densely populated areas in the eastern United States. Its resources are threatened by the same activities that threaten many of our national parks: air pollution, water pollution, invasive species, off-road vehicles, adjacent land development, and climate change. The Trail has a culture of cooperation and partnership, and is known to millions as one of the last great places in America. The Appalachian Trail's history is a dramatic story of successful civic engagement and stewardship, involving tens of thousands of American citizens in a grassroots protection effort dating back more than 85 years and continuing to this day.

National Geographic Explorer in Residence J. Michael Fay coined the term "mega-transect" in 1999 as he surveyed resources of the Congo river basin of Africa during a 2,000 mile trek. The three-day symposium for 70 scientists, land managers, and policy makers to explore the potential for the Appalachian Trail to serve as an "environmental mega-transect", held in November 2006, was a huge success. Fay expressed his support for the project, as did most of the organizations represented at the Symposium. The Symposium and the concept of an "Appalachian Trail Environmental MEGA-Transect" received nation- and world-wide attention. In addition, the participants created an entire framework for inter-agency collaboration and citizen and volunteer involvement in the project (For more information on the Symposium, please see: http://www.appalachiantrail.org/site/c.jkLXJ8MQKtH/b.2264999/k.9C7C/AT_MegaTransect.htm). For all of the above reasons, we believe that the Appalachian Trail Environmental MEGA-Transect Program exemplifies the five overarching goals guiding the Centennial Challenge including: Lead America in preserving and restoring treasured resources; Demonstrate environmental leadership to the nation; Offer superior recreational experiences where visitors explore and enjoy nature and the great outdoors; Foster exceptional learning opportunities connecting people to parks, especially children and seniors; and Achieve

management and partnership excellence to match the magnificence of the treasures entrusted to us.

Further, this program supports the specific performance goals of the Centennial Challenge by improving the natural resources as measured by vital signs inventories, increasing the volunteer hours, and attracting more visitors, volunteers, and supporters. This Program also already has the firm commitment of our primary partner, the Appalachian Trail Conservancy, who is willing and able to contribute to the success of the Centennial Challenge. Finally, the Centennial Challenge seeks imaginative, innovative, and collaborative programs that benefit multiple parks and contribute to national initiative all things that the AT Environmental MEGA-Transect program will accomplish.

The Appalachian Trail Environmental MEGA-Transect will encourage citizen science involvement in understanding environmental change, managing natural resources, fostering an appreciation for conservation, and tell the story of the health of the Appalachian Trail and surrounding lands to visitors, neighbors, and the American public. The A.T. Environmental MEGA-Transect will coordinate a diverse collection of programs along the length of the 2,175-mile Appalachian Trail from ME to GA, analyze their results, and convey significant findings to the public. Federal and state agencies, local environmental organizations and citizens groups, research universities, and schools and youth groups will all contribute valuable information about the Appalachian Trail environment through this project.

Protocols for specific A.T. Environmental MEGA-Transect monitoring programs will be developed with a special emphasis on using citizen science and volunteers. Within the first year, a water quality monitoring program will be designed, reviewed, approved, and implemented. The program, which will involve approximately 800 volunteers, will be modeled upon the methodology used in World Water Monitoring Day. In addition, a new natural heritage site monitoring program involving approximately 100 trained volunteers will be implemented to assess the health of rare plant species occurrences at more than 100 sites along the Appalachian Trail. Thirdly, an expanded wildlife monitoring program involving approximately 120 volunteers will be implemented, using protocols developed in cooperation with the Smithsonian Institute. Finally, an air quality monitoring program also will be designed and approved, which is likely to involve another 100 to 200 volunteers. All four monitoring initiatives will be fully functional at the completion of the pilot program. Coordination with the National Park Service's Inventory and Monitoring Program will ensure that monitoring protocols and results are scientifically valid and measurable.

In addition to highlighting the importance of the environment of the Trail to the Appalachian Trail community's 1,000,000+ supporters, 100,000+ members, and 5,000-plus active volunteers, the Appalachian Trail Environmental MEGA-

Transect will reach and involve new groups and individuals in stewardship of the Appalachian Trail and promote volunteerism by building a strong sense of stewardship of the Trail and its bountiful natural resources. The Appalachian Trail Conservancy, the National Park Service, and other partners will use the A.T. Environmental MEGA-Transect to emphasize the messages of conservation and stewardship in publications, newsletters, and electronic media.

6. Monitor and Manage Rare, Threatened, and Endangered Species on Appalachian Trail Lands

OFS Number: 13270A (modified)

Estimated Cost: $206,400

Cost Breakout: $187,800 for salary and benefits and $18,600 for GIS and data management support

Full-time staff required: 2.0 full time employees (one biologist, one coordinator)

Program Description: Funding would allow for monitoring of some rare, threatened and endangered species by NPS or cooperator resource biologists and would allow for greatly increased implementation of many of the more than 2,000 management actions identified in the A.T. natural heritage inventories. Completed natural heritage inventories for the Appalachian Trail corridor in 14 states have identified more than 1,700 occurrences of more than 300 rare, threatened, and endangered (RTE) plant and animal species within the A.T. corridor. Approximately 90% of these occurrences are of RTE plants. The RTE species occurrences have been prioritized so that monitoring and implementation of management actions can begin on the rarest and most threatened occurrences first. Funding would also allow for implementation of many of the recommendations of the recently completed natural heritage program review. More time could be given to supporting the natural heritage site monitoring program of A.T. volunteers. Additional staff would be able to prepare and administer contracts to inventory RTE and other vertebrate species in A.T. states that have not yet been inventoried. Recommended additional staff would be one botanist and one zoologist or one biologist and one monitoring program coordinator, who could concentrate on expanding the natural heritage monitoring program and then implementation of management actions. These positions would also allow increased time for coordination with natural resource professionals and land management staff in other federal and state agencies that manage A.T. land.

Justification: The more than 1,700 occurrences of RTE plant and animal species are believed to be the highest number of state and federal RTE species of any NPS unit nationwide. More than 300 of these occurrences are of globally rare species. Among the globally rare species are the Peaks of Otter salamander, Weller's salamander, Virginia northern flying squirrel, spruce-fir moss spider, Blue Ridge amphipod, spreading avens, Gray's lily, Roan Mountain bluet, glade spurge, variable sedge, Fraser fir, and rock gnome lichen. Some of these RTE occurrences within the A.T. corridor are known from less than five locations worldwide, and many other RTE occurrences are known from less than 20 locations worldwide. Approximately 15 of the occurrences are of federally endangered and threatened species, six of which are plants and nine of which are animals. There are more than 2,000 management actions that have been recommended to protect these 1700 RTE species occurrences. More than 300 of the RTE plant and animal occurrences are on NPS A.T. land, and the remaining 1,400 occurrences are on the A.T. corridor land of other federal and state agencies. Some of these RTE species occurrences will likely become extirpated if management actions are not taken to protect them. A few occurrences of RTE species within the A.T. corridor are already believed to have become locally extirpated. The addition of a zoologist or wildlife biologist to the A.T. resource management staff will allow for the study, monitoring and management of RTE vertebrates and invertebrates, filling a need that is currently being unmet.

7. Exotic Species and Integrated Pest Management Program

OFS Number: new program

Estimated Cost: $114,000 annually

Cost Breakout: $102,000 annually for a biologist; $12,000 annually for GIS and data management support.

Full-time staff required: 1 full time employee (biologist)

Program Description: A specialist in exotic species and integrated pest management (IPM) is needed to manage the growing exotic species program for the Appalachian National Scenic Trail in all 14 states through which the A.T. passes. Primary duties of this position would be to:

1) coordinate with four existing NPS Exotic Plant Control Teams (EPMTs) to have them control exotic plants in a few locations on ATPO land each year;

2) direct inventories of exotic species and insect pests along the A.T. corridor in all 14 A.T. states;
3) prioritize sites for exotic species treatment;
4) seek funding to establish an EPMT specifically for the Appalachian Trail;
5) seek assistance from and coordinate with other organizations such as The Nature Conservancy, the New England Wild Flower Society, and the Southern Appalachian Man and the Biosphere (SAMAB) to control exotic species along the A.T. and to develop a regional perspective on the control of exotics;
6) coordinate with ATC and the Trail clubs to seek and train volunteers to assist in the removal of exotic plants within the A.T. corridor;
7) coordinate with state agencies and other jurisdictions to control gypsy moth and other insect pests;
8) examine the potential to utilize biological means to control the hemlock woolly adelgid and other insect pests;
9) prepare all environmental compliance related to exotic species and integrated pest management actions on Appalachian Trail Park Office lands;
10) manage other IPM issues such as West Nile Virus, rabies, and rodent control; and
11) develop an Integrated Pest Management program for the Appalachian Trail.

Justification: Exotic plants and insect pests are a major threat to RTE species and other biological resources along the Appalachian National Scenic Trail. Though we do not yet have a complete picture of the severity of the threat Trailwide, natural heritage inventories of the Appalachian Trail completed over the past 15 years have documented the presence of both exotic plants and insect pests in many of the states through the Trail passes. In Massachusetts, New Jersey, and New York, exotic plants cover an estimated 1,500 acres within Appalachian Trail natural heritage sites. More than 55 exotic plant species have been documented at more than 40 natural heritage sites along the A.T. corridor, though most of the corridor has not yet been surveyed for exotic plants or insect pests. In a 2002 survey in North Carolina and Tennessee, exotic plants were found at 66 locations along a 400-mile segment of the Trail. The gypsy moth has had a severe impact on biological resources along the A.T. in Virginia. The balsam woolly adelgid has severely impacted the Fraser fir in Virginia, Tennessee, and North Carolina, and the hemlock woolly adelgid has severely impacted A.T. lands in New Jersey and probably in other states as well. Current A.T. natural resource staff have only been able to devote 0.1 FTE to the inventory, monitoring, and management of exotic plants and insect pests along the Appalachian Trail. This amount of time has allowed only for limited exotic plants coordination with the SAMAB program and with four NPS Exotic Plant Management Teams, which have assessed and/or controlled exotic species at four sites Trailwide during the past two years. A full-time biologist dedicated to the inventory, monitoring, and management of exotic plants and insect pests would result in greatly expanded

protection of RTE species and other significant natural resources at a much greater number of sites on A.T. lands. This biologist would also allow for the development of a comprehensive Integrated Pest Management program for the Appalachian Trail.

8. Inventory the Appalachian Trail Corridor for the Presence and Extent of Exotic Plants and Insect Pests

PMIS Number: new project

Estimated Cost: $4,800 (interns) to $28,800 (NPS seasonal employees)

Cost Breakout: An estimated 70% of the cost would be personnel costs, which may be interns, Student Conservation Association employees, or seasonal Appalachian Trail Conservancy or National Park Service employees. An estimated 30% of the cost would be for transportation and lodging. There might be a relatively small training and equipment cost.

exotic species at approximately 10-15 high priority rare, threatened, and endangered (RTE) species sites and other priority locations along the Appalachian National Scenic Trail. Project will be accomplished in partnership with the Student Conservation Association (SCA) and the Appalachian Trail Conservancy (ATC), a private, non-profit organization. An SCA team, trained by a NPS Exotic Plant Management Team (EPMT) or a botanical contractor, will operate for a three-month season, with the team leader employed for a six-month season. ATC, a primary management partner for the NPS Appalachian Trail Park Office, will provide administrative oversight of the project and support SCA in the field. At this funding level, it is anticipated that approximately 200 acres of invasive exotic species can be controlled. For this project, control of exotic species would occur solely or primarily on NPS-owned Appalachian Trail land in Virginia, West Virginia, Maryland, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, and Maine. The control of exotic species would be by chemical or physical removal, though biological control might also be utilized. Where appropriate, Appalachian Trail volunteers will be utilized to assist in the physical removal of exotic plants.

Justification: In 2005, an inventory of invasive exotic plant species documented 472 occurrences of exotic species at 250 locations along the Appalachian Trail (A. T.) between Georgia and Maine. In that survey, a total of 1,366 acres of invasive exotic species (or 9% of the area surveyed) were documented within 30 feet of the A.T. Other botanical inventories of the Appalachian Trail in Massachusetts,

New York, and New Jersey have documented approximately 1,500 acres of invasive exotic plants at rare, threatened, and endangered (RTE) species sites in the 1,000-foot wide Appalachian Trail Corridor. Many of the species documented are of highly invasive plants. Exotic species have been documented at more than 40 Appalachian Trail RTE species sites. The A.T. Resource Management Plan (RMP), completed in 2008, identifies that control of exotic species threatening RTE sites is a high priority management action.

Evidence suggests that it is probable that some RTE species will be locally extirpated in the near future due to competition from invasive exotic species. For example, at a natural heritage site along the Appalachian Trail (A.T.) in Virginia, a rare trillium (Trillium cernuum) has almost been lost from a RTE species site, probably due to the abundance of exotics at the site. At another RTE species site in Pennsylvania, the globally rare Carex polymorpha (variable sedge) is being negatively impacted by the prolific and widespread exotic plant Microstegium vimineum (Japanese stilt grass).

Funding this project would allow a stepped-up treatment of invasive exotic plants before a RTE species is lost or before an exotic plant(s) becomes too prolific to control. In the past several years, three NPS Exotic Plant Management Teams have been able to treat exotics at 6 RTE species sites on the Appalachian Trail in VA, PA, and MA. In 2008, an SCA team was successfully utilized on A. T. lands during one month to control exotic species at 5 RTE species sites in Massachusetts. This proven model can be used again to continue the partnership with SCA, nationally known for its high-quality volunteer youth conservation programs. SCA Crew members will learn to live and work as a team, gain leadership skills, and enhance their self-esteem through participation in this project. Additionally, the youth will gain a lifetime appreciation for the A.T., and the NPS. Alternatively, project funds could be utilized to hire a private invasive exotic plant control company to accomplish exotic plant control on NPS Appalachian Trail lands.

Funding will be TARGETED to specific exotic control projects based on a combination of prioritized rare, threatened, and endangered species sites, exotic species impacts, and cost effective logistics for the SCA Team. It is estimated that 10-15 RTE sites on approximately 200 acres can be treated during the project.

Funding need is TEMPORARY in nature for a defined three-month SCA TEAM, with a team leader for a six-month period.

Funding can be obligated in a TIMELY fashion through the existing Service-wide Cooperative Agreement with SCA and the NPS Appalachian Trail Park Office Cooperative Agreement with the ATC.

Funding for this specific SCA Team project has no TAIL. However, there is no doubt that the most effective treatments will require continued monitoring and

possible retreatment. Volunteers may be able to provide this post-treatment in-kind service.

9. Control Exotic Plants on the Appalachian Trail

PMIS Number: **147937**

Estimated Cost: $108,000 a year

Cost Breakout: The estimated cost for an outfitted Student Conservation Association (SCA) team is $96,000-$108,000, though this estimate is not specific to the Appalachian Trail. This estimate would include a vehicle, equipment, travel and lodging costs. Included in this is the personnel cost for staffing a SCA team to control exotic species, estimated at $67,200. This would provide funds for a team leader for six months and four field personnel for three months.

Project Description: This funding would allow for control of exotic species at priority natural heritage sites and other priority locations along the Appalachian Trail where exotic plants threaten rare, threatened, and endangered (RTE) species. RTE species sites and species have been prioritized Trailwide. Exotic plants have been identified at more than 40 Appalachian Trail natural heritage sites, though some survey work is more than a decade old and exotic species may now threaten many more sites. The presence and extent of exotic species at natural heritage sites in Massachusetts, New Jersey, and New York has been estimated at 1,500 acres. There are probably several thousand additional acres of exotic species at RTE species sites in other A.T. states. It has been estimated that the maximum acreage of exotic species that can be controlled by an Exotic Plant Control team is about 500 acres a year. For this project, control of exotic species would occur solely or primarily on NPS Appalachian Trail land in Virginia, West Virginia, Maryland, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, and Maine. The control of exotic species would be by chemical or physical removal, though biological control might also be utilized. Appalachian Trail volunteers might be utilized to assist in the physical removal of exotic plants.

Justification: For the past three years, there has been very limited treatment of exotic species on Appalachian Trail lands. The NPS National Capital Region Exotic Plant Management Team (EPMT) has treated exotic species at one natural heritage site in Virginia and one in Pennsylvania. There has also been some physical removal of exotic species by a contract botanist at a handful of natural heritage sites in New Jersey and New York. The existing EPMTs may be able to treat only one or two sites along the A.T. a year.

It is possible that some RTE species will be locally extirpated in the near future due to competition from exotic species. For example, at a natural heritage site along the A.T. in Virginia, a rare trillium (*Trillium cernuum*) has almost been lost from a natural heritage site, probably due to the abundance of exotics at the site. At another natural heritage site in Pennsylvania, the globally rare *Carex polymorpha* (variable sedge) is being reduced while the exotic plant *Microstegium vimineum* (Japanese stilt grass) is increasing in abundance. Funding this project would allow a stepped-up treatment of exotic plants before a RTE species is lost or before an exotic plant(s) becomes too prolific to control.

Chapter IV.D

Program and Project Statements for Trail Protection

The following statements describe programs and projects that could be implemented or enhanced to protect the Appalachian National Scenic Trail. See *Table IV.A.1, Potential Resource Management Programs and Projects on the Appalachian Trail 2009 – 2015*, for a comparative summary of all programs and projects.

10. Establish Comprehensive Boundary Management Program

OFS Number: 28076A

Estimated Cost: $160,000 annually

Cost Breakout: $120,000 for a boundary maintenance; $20,000 volunteer support; $10,000 Land Survey Support; $10,000 GIS and Data Management Support.

Full-time staff required: 0.0 FTE

Description: Funding is requested to establish a sustainable boundary management program for Appalachian NST to ensure the long term protection of the $149M investment in the NPS owned A.T. corridor lands. In addition, $9M has been expended in surveying, marking, and mapping 111,000 acres of NPS lands with 1,373 miles of boundary line in 11 states. Despite an ongoing volunteer effort to maintain the integrity of the lines, currently 80% of the boundary surveys are now more than 10 years old and the original boundary line markings risk being lost to time, vegetative growth, and encroachments from neighboring landowners. A well-marked boundary is critically important to the Appalachian Trail because of its very narrow land base and the increasing development pressures experienced in the densely populated eastern region.

This funding would go to directly to supporting the efforts of our partner organization, the Appalachian Trail Conservancy, to recruit, train, and retain volunteers to monitor and maintain the boundary and corridor lands, provide for funding to survey disputed or lost boundary lines, address illegal boundary encroachments, and develop a sustainable GIS-based system for managing a complex lands database.

Justification: The 2,175 mile-long Appalachian National Scenic trail is the nation's longest-skinniest National Park. As a result of the linear nature of this park, the A.T. has more miles of surveyed boundary that Yellowstone National Park. With a corridor of protected lands averaging only 1,000 feet wide, the A.T. is particularly vulnerable to illegal encroachments from neighboring land owners. Encroachments include timber harvest, dumping, construction of buildings, driveways, pools, patios on NPS lands, deer stands, ATV access, and resource theft. A clearly defined boundary line is the first line of defense against these types of encroachments. With more rare, threatened, and endangered species than any other National Park Service unit, it is imperative that encroachments are minimized to prevent the destruction of these critical resources.

Since 1978 the NPS has embarked on, what has widely been acknowledged, as one of the most complex land acquisition programs in the history of the NPS. To date, more than $149 million has been invested in acquiring a publicly owned and protected corridor for the footpath of the A.T. Further, more than $9 million has been expended to survey these newly acquired lands, set NPS boundary monuments, clear and paint the boundary, and map the location of the land parcels and boundary survey information. It cannot be understated how important it is to maintain these boundary lines in order to protect that significant investment in land and surveys. The cost to resurvey neglected boundary line lost to encroachments or lack of maintenance is extremely high.

Despite ongoing efforts to provide adequate maintenance, it is apparent that at the current rate of clearing and re-painting approximately 80 miles of boundary per year utilizing limited project funding, significant portions of the boundary are at risk of being lost.

A small but dedicated cadre of volunteers provide some support in the maintenance of the boundary line, however as the boundary becomes less apparent and overgrown, it is becoming increasingly difficult for volunteers to provide adequate maintenance. In fact, less than 5% of the more than 200,000 volunteers hours contributed annually to A.T. are devoted to the boundary. Additional resources are necessary to bring the boundary up to a condition that will allow the volunteers to maintain the boundary in a sustainable manner.

In addition to simply maintaining the boundary, much of the effort also involves reaching out to the thousands of neighbors that share the NPS boundary.

Successful outreach can enhance neighbor relations and head-off potential issue before they arise. If an encroachment is found, it is necessary to follow-up with the land owner, either informally or through law enforcement efforts, to address any issue. NPS has an obligation to protect its interest in the lands it owns and the boundary maintenance program is a way to proactively provide both a visual boundary and a way to interact with neighbors.

Specifically, this funding will allow the NPS to provide support to our primary partner, the Appalachian Trail Conservancy (ATC) through our existing and long-standing Cooperative Agreement. ATC will be able to enhance its field level staff to provide the additional resources necessary to; increase the number of miles of boundary maintained each year; recruit, train, and retain additional volunteers; follow-up and address illegal encroachments; enhance neighbor outreach; and produce survey and land ownership maps utilizing a GIS-based platform. In addition, the funds will be used to enhance the existing GIS and database systems to accommodate the complexity of managing lands, survey, and maintenance tracking data. Further, the funding will also go to support contracted surveys of disputed boundary lost due to encroachments or neglect.

The funding of the sum of the above components would contribute to the successful implementation of a sustainable comprehensive boundary management program on the Appalachian National Scenic Trail.

Chapter IV.E

Program and Project Statements for GIS and Information Management

The following statements describe GIS and information management programs and projects that could be implemented or enhanced to manage of natural, cultural, and scenic resources on the Appalachian National Scenic Trail. See *Table IV.A.1, Potential Resource Management Programs and Projects on the Appalachian Trail 2005 – 2015*, for a comparative summary of all programs and projects.

11. Appalachian Trail Data Management Program

OFS Number: not developed

Estimated Cost: $150,000 annually

Cost Breakout: $115,000 for a data manager and clerical support, and $35,000 in IT support, equipment, and software licensing

Full-time staff required: 1.0 FTE for a data manager and 1.0 FTE for clerical support

Description: This program would integrate and manage critical resource management data for the Appalachian Trail. Multiple databases have been developed over the last ten years to manage Trail-related information. These databases, which include Land Ownership, Trail Assessment, Corridor Monitoring, Natural Diversity, Structures, Open Area Management, Cultural Resource, Environmental Monitoring, Membership and contact information, are in a current state of dormancy, where information is currently not being maintained through appropriate data management practices. The resulting data are inadequate to properly manage to trail. This program also would establish appropriate data management practices, which include:

- The use of rational directory structures and file naming conventions to ensure that data files can be found when needed;
- Ensuring system and data integrity and security measures to protect the data against accidental or intentional damage or destruction, or unauthorized access or use;
- The use of standardized updating procedures to ensure data integrity and to enforce built-in quality assurance and quality control practices;
- Maintaining a working data model that develops links and associations between databases to reduce the number of data systems in place;
- Expanding and customizing the functionality of the database to maximize efficiency in data entry and reporting;
- Coordinating the flow of information so that information is collected ina timely manner and is in proper format; and
- Developing up-to-date reports and summaries for trail managers

Implementing these practices into a functional program would necessitate hiring one full-time database manager/programmer and one data entry clerical position that could potentially be filled by A.T. volunteers or qualified interns.

Justification: The geographic extent and geo-political complexity of the Appalachian National Scenic Trail present significant challenges for managers who need to make well-informed management decisions. These decisions are highly dependent upon obtaining and utilizing the most current and up-to-date information, much of which is held in-house in various data systems and databases. Up-to-date data systems and databases that accurately reflect the

current status of the trail's resources are an essential component in stewarding such a dynamic resource. Building the capacity to update, manage and analyze trail-related information is an essential component in developing a functional resource management program.

12. Appalachian Trail Corridor Mapping Project (PMIS)

OFS Number: not developed

Estimated Cost: $37,500 annually for four years

Cost Breakout: $37,500 for contract services

Full-time staff required: 0.0 FTE

Description: Over the last 25 years, the National Park Service (NPS) has spent over $149 million and protected 111,269 acres to ensure that the Appalachian National Scenic Trail (A.T.) has an adequate protective buffer along its entire length of over 2,100 miles. NPS has paid an additional $9 million to contract professional surveyors to monument, mark, and map over 1,373 miles of exterior corridor boundaries in 11 states from VA to ME. In partnership with NPS, the Appalachian Trail Conservancy's (ATC) Boundary Program helps to ensure the long term protection of this investment by coordinating and conducting the monitoring and maintenance required to preserve this vulnerable corridor of land.

Under contract with the NPS Appalachian Trail Land Acquisition Field Office (ATLAFO) in Martinsburg, WV, twenty-two separate firms surveyed the exterior corridor boundary along the A.T. At present, more than half of these surveys are at least 15 years old. Well over 60 percent date back to the pre-AutoCAD era and only exist as mylar originals, which are stored at ATLAFO. ATC Boundary field staff and trail club volunteers use 36" x 24" paper copies of these mylars to monitor and maintain the boundary.

Justification: At present, neither NPS nor ATC have a common database to effectively record and organize the monitoring and maintenance work performed annually along the A.T. corridor boundaries. Incorporating the boundary line and monument locations into a GIS, along with their existing conditions, maintenance data, and known encroachments, will enable ATC to more effectively fulfill their role as "guarantor" to NPS, ensuring that the corridor lands are being properly managed.

Using this information will also enable ATC Boundary staff to plan more effectively. It will allow them to determine what areas are most threatened by probable encroachment, what areas are most in need of maintenance and boundary line reclamation, and where annual staff time and resources should be allocated to ensure the longevity of the surveyed boundary lines and the corridor lands they protect.

This GIS information will also increase our ability to prevent encroachments by providing a format that can be shared with adjacent landowners. Many timber companies have the capacity to use GIS data to locate their property boundaries. Being able to share the exact location of the A.T. corridor with adjacent timber companies will improve our relationships with them and decrease the possibility of timbering on NPS corridor lands. The age and deteriorating condition of many boundaries in areas such as Maine and New Hampshire increase the probability that adjacent landowners would be unable to recognize where their land stops and the A.T. corridor begins. Providing neighboring landowners with this GIS information is an important part of the Boundary Program's plan to prevent serious encroachments.