

Appalachian Trail Monitoring Chronology

Table of Contents

1. Important Dates in Appalachian Trail History
2. Who was Benton MacKaye
3. An Appalachian Trail: A Project in Regional Planning (MacKaye)
4. Monitoring the Appalachian Trail Environment: A New Exploration (Foster & Filipovich, 1999)
5. Inventory and Monitoring Program Along the Appalachian Trail (Schwarzkopf 1999)
6. Natural Heritage Program for the AT (Schwarzkopf January 2000)
7. Memo to Beth Johnson Requesting Inclusion of APPA in New I&M Program (January 2000)
8. Letter to Steve Fancy (I&M Lead) Justifying APPA Inclusion in I&M Program (February 2000)
9. Memo from Charles Foster (April 2000)
10. New England Appalachian Trail Monitoring Round Table Statement (Charles Foster May 2000)
11. Monitoring the Appalachian Trail Environment: A Scoping Workshop (SAMAB; May 2000)
12. Monitoring the Appalachian Trail Environment: Suggested Topics for a Draft Concept (T. Gilbert)
13. Letter to NPS Endangered Species Coordinator (June 2000)
14. Letter from Charles Foster (July 2000)
15. A Conceptual Plan for Monitoring and Assessing the Appalachian Trail Environment (SAMAB: Nov 2000)
16. Resource Updates (April 2001)
 - a. A Proposed Environmental-Health Monitoring Program Centered on the Appalachian Trail and Adjacent Lands
 - b. Control of Invasive Exotic Plant and Animal Species Along the Appalachian Trail
 - c. Air Quality Issues and the A.T.
17. Inventory and Monitoring of Biological Resources on Southern Appalachian National Forests (April 2001; Species Lists Are Obsolete and Have Been Omitted)
18. Letter to Beth Johnson (July 2001)
19. APPA Data Mining Progress Report (Tiffney??; November 2001)
20. Summary to Date of Vital Signs Monitoring Planning for the Appalachian Trail by the Appalachian Highlands I&M Network (January 2004)
21. A.T. Resource Management / Environmental Monitoring: Program / Project Summaries (January 2004)
 - a. National Park Service Inventory and Monitoring Program
 - b. Natural Resource Challenge: Acquisition of 12 Datasets
 - c. Appalachian Trail Water Quality Monitoring Program
 - d. Natural Heritage Monitoring Program for the Appalachian Trail (a)
 - e. Natural Heritage Monitoring Program for the Appalachian Trail (b)
 - f. Natural Heritage Management Projects on the Appalachian Trail

- g. Inventory of ALL Vascular Plant Species and Plant Communities in the Connecticut Appalachian Trail Corridor
 - h. Southern Appalachian Man and the Biosphere (SAMAB) Foundation
 - i. Impacts of Land-Cover Change on the National Parks of the Northeast Temperate Network
 - j. Appalachian Trail Wildlife and Habitat Monitoring
 - k. Visibility and Ozone Level Monitoring
 - l. Cultural Resources Survey of the Appalachian Trail in Connecticut
 - m. Invasive / Exotic Species Management
 - n. Appalachian Trail Cultural Resources Management Program
 - o. Survey and Management Plan for the Battle of South Mountain at Fox Gap
 - p. Palmerton Zinc Remediation Project
 - q. Gypsy Moth Suppression
22. Introducing the A.T. MEGA-Transect (Following the 2006 A.T. MEGA-Transect Workshop)
23. Memo from Dave Startzell A.T. MEGA-Transect Initiative: Structure Evaluation and Recommendations (June 2007)
24. Preserving the Appalachian Trail Experience and Environment for the 21st Century and Beyond

Important Dates in Appalachian Trail History

October 1921 — [An Appalachian Trail: A Project in Regional Planning](#) (PDF) by Benton MacKaye appears in the *Journal of the American Institute of Architects*.

April 1922 — Appalachian Trail Committee of Washington formed.

March 3, 1925 — Appalachian Trail Conference established.

January 1927 — Judge Arthur Perkins becomes acting ATC chairman, stimulates additional field work.

June 1931 — Myron H. Avery elected to first of seven consecutive terms as ATC chairman.

August 14, 1937 — Appalachian Trail completed as a continuous footpath.

October 2, 1968 — National Trails System Act becomes law; A.T. becomes a national scenic trail under federal protection.

August 1972 — ATC headquarters moved from Washington, D.C., to Harpers Ferry, W.Va.

March 21, 1978 — "Appalachian Trail Amendments" to National Trails System Act signed into law.

January 26, 1984 — National Park Service delegates to ATC the responsibility for managing A.T. corridor lands.

November 20, 2004 — The Board of Managers of the Appalachian Trail Conference overwhelmingly votes to change the organization's name to Appalachian Trail Conservancy to better reflect its mission of preserving the trail experience for generations to come.

July 4, 2005 — The Appalachian Trail Conference becomes the Appalachian Trail Conservancy, celebrating 80 years of caring for the Appalachian Trail.



History

Who was Benton MacKaye, and what was his connection to the Appalachian Trail?

He first published the idea. MacKaye (1879-1975) grew up in Shirley Center, Massachusetts, reading the work of American naturalists and poets and taking long walks in the mountains of Massachusetts and Vermont. MacKaye (which rhymes with "sky") sometimes claimed that the idea for the A.T. was born one day when he was sitting in a tree atop Stratton Mountain in Vermont. But, after graduating from Harvard, he eventually went to work in the new U.S. Forest Service and began carving out a niche as a profound thinker and an advocate for wilderness. By 1919, his radical ideas had led to him being edged out of the USFS, and he turned his attention to creating a new discipline that later came to be called "regional planning." His initial 1921 "project in regional planning" was a proposal for a network of work camps and communities in the mountains, all linked by a trail that ran from the highest point in New England to the highest point in the South. He called it the Appalachian Trail.



Read MacKaye's article: [An Appalachian Trail: A Project in Regional Planning](#) (PDF).

Why did he propose it?

MacKaye was convinced that the pace of urban and industrial life along the East Coast was harmful to people. He envisioned the A.T. as a path interspersed with planned wilderness communities where people could go to renew themselves. That idea never gained much traction, but the notion of a thousand-mile footpath in the mountains fired the imaginations of hikers and outdoorsmen from Maine to Georgia. Inspired by him, they began building trails and trying to connect them.

What was his connection to ATC?

MacKaye was responsible for convening and organizing the first Appalachian Trail "conference" in Washington, D.C., in 1925. That gathering of hikers, foresters, and public officials embraced the goal of building the Trail. They established an organization, called the Appalachian Trail Conference, appointed MacKaye as its "field organizer," and named Major William Welch, manager of New York's Harriman Park, as its first chairman. The Appalachian Trail Conference became the **Appalachian Trail Conservancy** in 2005.

What happened next?

Some perfunctory scouting of routes took place. A few short sections were marked and connected. New trails were built in New York. Welch designed a logo and Trail markers. Committees met in a few northeastern states and talked about the idea. But, for several years, the idea didn't really go anywhere. MacKaye was much better at inspirational abstract thinking than practical organizing, and it soon

became apparent that someone else was going to have to take the lead for the Trail to actually get built.

Who pushed the project forward?

Two men, retired Judge Arthur Perkins of Connecticut and admiralty lawyer Myron Avery of Washington, D.C. Perkins took the idea and ran with it, essentially appointing himself as the acting chairman of ATC in the late 1920s and recruiting Avery to lead the effort in the area around Washington. Both began vigorously proselytizing the idea of the Trail in 1928 and 1929, championing MacKaye's ideas to recruit volunteers, establishing hiking clubs up and down the coast, and actually going out to hike, clear brush, and mark paths themselves. As Perkins' health failed in the early 1930s, Avery took over, devoting incredible time, energy, and willpower to establishing a network of volunteers, developing clubs, working with the government, building the organization of the ATC, and setting the Trail's northern terminus at Katahdin in his native Maine. Avery remained chairman of ATC until 1952.



What was the relationship between MacKaye and Myron Avery?

They were cordial at first, but, by the mid-1930s, as Avery took charge of the Trail project, they quarreled over fundamental issues and visions of what the Trail should be. Avery was more interested in hiking and in connecting the sections of the Trail, while MacKaye was more interested in the Trail's role in promoting wilderness. MacKaye disassociated himself from ATC in 1935 to found the Wilderness Society and was not closely involved with the Trail again until after Avery's death in 1952.

When was the Trail completed?

In 1937. It fell into disrepair during World War II, when Trail maintainers were unable to work on it, and parts of the route were lost. After the war, a concerted effort was made to restore it, and it was once again declared complete in 1951.

What happened after it was completed?

It's useful to look at the Trail's history in three eras: the era of Trail-building, which lasted until the Trail was completed in 1937; the era of Trail protection, which lasted until 1968, when Congress made the A.T. a national scenic trail; and the era of management and promotion, which has lasted until the present day. The first era was dominated by personalities and focused on getting the thing built and blazed from one end to the other. The second era saw the growth of the clubs taking care of it, the growth of ATC, the construction of shelters, and a continuing battle to keep the route open over the many hundreds of miles of private property that it crossed. The third era saw an explosion of the number of people hiking the A.T. as the government began buying land along the route to guarantee the permanence of the footpath and volunteers shifted their emphasis to the hard work of managing a part of the national park system.

How was the original Trail different from today's A.T.?

At first, the goal was simply to blaze a connected route. Often, this meant that the Trail led along old forest roads and other trails. Trail maintainers mostly just cleared brush and painted blazes. Today's Trail has mostly been moved off the old roads and onto new paths dug and reinforced especially for hikers. Today's route, though engineered much more elaborately, often requires more climbing, because it leads up the sides of many mountains that the old woods roads bypassed.

How do terms like "Trailway," "greenway," "buffer," and "view-shed" fit into this history?

The idea of a "Trailway" was first embraced by ATC in 1937. It meant that there was more to the Appalachian Trail than just the footpath. The "Trailway" referred to an area dedicated to the interests of those on foot, originally a mile on either side. In some cases, that came to mean a "buffer"—a legally protected area around the path that kept the sights and sounds of civilization, logging, and development away from the solitary hiker. In other cases, it meant a great deal more. It evolved into a notion of a "greenway," a broad swath of protected land through which the Trail ran. Crucial to the idea of a greenway was that of the "viewshed," the countryside visible from the Trail's high points. In the years since the A.T. became a national scenic trail, the Conference has worked to influence the development of surrounding areas so that the views from the Trail remain scenic, even when those views are of areas well outside the boundaries of the public Trail lands themselves.

When did Trail protection begin?

The notion of a protected zone was first formalized in an October 15, 1938, agreement between the National Park Service and the U.S. Forest Service for the promotion of an Appalachian Trailway through the relevant national parks and forests, extending one mile on each side of the Trail. Within this zone, no new parallel roads would be built or any other incompatible development allowed. Timber cutting would not be permitted within 200 feet of the Trail. Similar agreements, creating a zone one-quarter-mile in width, were signed with most states through which the Trail passes.

How were Trail lands identified?

Much of the Trail was already in national forests or national parks and state and local parks, but large portions were on private property, with the agreement of the property owners. In 1970, supplemental agreements under the 1968 National Trails Systems Act—among the National Park Service, the U.S. Forest Service, and ATC—established the specific responsibilities of those organizations for initial mapping, selection of rights-of-way, relocations, maintenance, development, acquisition of land, and protection of a permanent Trail. Agreements also were signed between the Park Service and the various states, encouraging them to acquire and protect a right-of-way for the Trail outside federal land.

Why has complete protection taken so long?

Getting federal money appropriated was difficult, and not all property owners were willing to sell, which occasionally raised the specter of the government's threatening to condemn land for the Trail—always a politically unpopular action. Slow progress of federal efforts and lack of initiative by some states led Congress to strengthen the National Trails System Act in an amendment known as the Appalachian Trail Bill, which was signed by President Jimmy Carter on March 21, 1978. The new legislation emphasized the need for protecting the Trail, including acquiring a corridor, and authorized \$90 million for that purpose. More money was appropriated during the Reagan, Bush, and Clinton administrations. Today,

99 percent of the Trail runs across public lands.

What is the relationship between the A.T. and the government, the Conservancy, and the clubs?

In 1984, the Interior Department delegated the responsibility for managing the A.T. corridor lands outside established parks and forests to ATC. ATC and its clubs retain primary responsibility for maintaining the footpath, too. A new, more comprehensive 10-year agreement was signed in 1994.

Learn more about the history of the Trail

[Important dates in Appalachian Trail history.](#)

[Trail Years: A History of the Appalachian Trail Conference](#) (PDF). Includes never-before-published photographs and fresh insights into the lives of Myron H. Avery and Benton MacKaye. A special limited printing is available from the [Ultimate A.T. Store](#).



An Appalachian Trail

A Project in Regional Planning

by Benton MacKaye

Something has been going on these past few strenuous years which, in the din of war and general upheaval, has been somewhat lost from the public mind. It is the slow quiet development of the recreational camp. It is something neither urban nor rural. It escapes the hecticness of the one, and the loneliness of the other. And it escapes also the common curse of both - the high powered tension of the economic scramble. All communities face an "economic" problem, but in different ways. The camp faces it through cooperation and mutual helpfulness, the others through competition and mutual fleecing.

We civilized ones also, whether urban or rural, are potentially helpless as canaries in a cage. The ability to cope with nature directly - unshielded by the weakening wall of civilization - is one of the admitted needs of modern times. It is the goal of the "scouting" movement. Not that we want to return to the plights of our Paleolithic ancestors. We want the strength of progress without its puniness. We want its conveniences without its fopperies. The ability to sleep and cook in the open is a good step forward. But "scouting" should not stop there. This is but a faint step from our canary bird existence. It should strike far deeper than this. We should seek the ability not only to cook food but to raise food with less aid - and less hindrance - from the complexities of commerce. And this is becoming daily of increasing practical importance. Scouting, then, has its vital connection with the problem of living.

A New Approach to the Problem of Living

The problem of living is at bottom an economic one. And this alone is bad enough, even in a period of so-called "normalcy." But living has been considerably complicated of late in various ways - by war, by questions of personal liberty, and by "menaces" of one kind or another. There have been created bitter antagonisms. We are undergoing also the bad combination of high prices and unemployment. This situation is world wide - the result of a world-wide war.

It is no purpose of this little article to indulge in coping with any of these big questions. The nearest we come to such effrontery is to suggest more comfortable seats and more fresh air for those who have to consider them. A great professor once said that "optimism is oxygen." Are we getting all the "oxygen" we might for the big tasks before us?

"Let us wait," we are told, "till we solve this cussed labor problem. Then we'll have the leisure to do great things."

But suppose that while we wait the chance for doing them is passed?

It goes without saying that we should work upon the labor problem. Not just the matter of "capital and labor" but the *real* labor problem - how to reduce the day's drudgery. The toil and chore of life should, as labor saving devices increase, form a diminishing proportion of the

average day and year. Leisure and the higher pursuits will thereby come to form an increasing portion of our lives.

But will leisure mean something "higher"? Here is a question indeed. The coming of leisure in itself will create its own problem. As the problem of labor "solves," that of leisure arises. There seems to be no escape from problems. We have neglected to improve the leisure which should be ours as a result of replacing stone and bronze with iron and steam. Very likely we have been cheated out of the bulk of this leisure. The efficiency of modern industry has been placed at 25 percent of its reasonable possibilities. This may be too low or too high. But the leisure that we do succeed in getting - is this developed to an efficiency much higher?

The customary approach to the problem of living relates to work rather than play. Can we increase the efficiency of our *working* time? Can we solve the problem of labor? If so we can widen the opportunities for leisure. The new approach reverses this mental process. Can we increase the efficiency of our *spare* time? Can we develop opportunities for leisure as an aid in solving the problem of labor?

An Undeveloped Power - Our Spare Time

How much spare time have we, and how much power does it represent?

The great body of working people - the industrial workers, the farmers, and the housewives - have no allotted spare time or "vacations." The business clerk usually gets two weeks' leave, with pay, each year. The U.S. Government clerk gets thirty days. The business man is likely to give himself two weeks or a month. Farmers can get off for a week or more at a time by doubling up on one another's chores. Housewives might do likewise.

As to the industrial worker - in mine or factory - his average "vacation" is all too long. For it is "leave of absence *without* pay." According to recent official figures the average industrial worker in the United States, during normal times, is employed about four fifths of the time - say 42 weeks in the year. The other ten weeks he is employed in seeking employment.

The proportionate time for true leisure of the average adult American appears, then, to be meagre indeed. But a goodly portion have (or take) about two weeks in the year. The industrial worker during the estimated ten weeks between jobs must of course go on eating and living. His savings may enable him to do this without undue worry. He could, if he felt he could spare the time from job hunting, and if suitable facilities were provided, take two weeks of his ten on a real vacation. In one way or another, therefore, the average adult in this country could devote each year a period of about two weeks in doing the things of his own choice.

Here is enormous undeveloped power - the spare time of our population. Suppose just one percent of it were focused upon one particular job, such as increasing the facilities for the outdoor community life. This would be more than a million people, representing over two million weeks a year. It would be equivalent to 40,000 persons steadily on the job.

A Strategic Camping Base - The Appalachian Skyline

Where might this imposing force lay out its strategic camping ground?

Camping grounds, of course, require wild lands. These in America are fortunately still available. They are in every main region of the country. They are the undeveloped or under-developed areas. Except in the Central States the wild lands now remaining are for the most part among the mountain ranges - the Sierras, the Cascades and the Rocky Mountains of the West and the Appalachian Mountains of the East.

Extensive national playgrounds have been reserved in various parts of the country for use by the people for camping and various kindred purposes. Most of these are in the West where Uncle Sam's public lands were located. They are in the Yosemite, the Yellowstone, and many other National Parks - covering about six million acres in all. Splendid work has been accomplished in fitting these Parks for use. The National Forests, covering about 130 million acres - chiefly in the West - are also equipped for public recreation purposes.

A great public service has been started in these Parks and Forests in the field of outdoor life. They have been called "playgrounds of the people." This they are for the Western people - and for those in the East who can afford time and funds for an extended trip in a Pullman car. But camping grounds to be of the most use to the people should be as near as possible to the center of population. And this is in the East.

It fortunately happens that we have throughout the most densely populated portions of the United States a fairly continuous belt of under-developed lands. These are contained in the several ranges which form the Appalachian chain of mountains. Several National Forests have been purchased in this belt. These mountains, in several ways rivaling the western scenery, are within a day's ride from centers containing more than half the population of the United States. The region spans the climate of New England and the cotton belt; it contains the crops and the people of the North and the South.

The skyline along the top of the main divides and ridges of the Appalachians would overlook a mighty part of the nation's activities. The rugged lands of this skyline would form a camping base strategic in the country's work and play.

Let us assume the existence of a giant standing high on the skyline along these mountain ridges, his head just scraping the floating clouds. What would he see from this skyline as he strode along its length from north to south?

Starting out from Mt. Washington, the highest point in the northeast, his horizon takes in one of the original happy hunting grounds of America - the "Northwoods," a country of pointed firs extending from the lakes and rivers of northern Maine to those of the Adirondacks. Stepping across the Green Mountains and the Berkshires to the Catskills, he gets his first view of the crowded east - a chain of smoky bee-hive cities extending from Boston to Washington and containing a third of the population of the Appalachian drained area. Bridging the Delaware Water Gap and the Susquehanna on the picturesque Alleghany folds across Pennsylvania he notes more smoky columns - the big plants between Scranton and Pittsburgh that get out the

basic stuff of modern industry - iron and coal. In relieving contrast he steps across the Potomac near Harpers Ferry and pushes through into the wooded wilderness of the southern Appalachians where he finds preserved much of the primal aspects of the days of Daniel Boone. Here he finds, over on the Monongehela side the black coal of bituminous and the white coal of water power. He proceeds along the great divide of the upper Ohio and sees flowing to waste, sometimes in terrifying floods, waters capable of generating untold hydro-electric energy and of bringing navigation to many a lower stream. He looks over the Natural Bridge and out across the battle fields around Appomattox. He finds himself finally in the midst of the great Carolina hardwood belt. Resting now on the top of Mt. Mitchell, highest point east of the Rockies, he counts up on his big long fingers the opportunities which yet await development along the skyline he has passed.

First he notes the opportunities for recreation. Throughout the Southern Appalachians, throughout the Northwoods, and even through the Alleghanies that wind their way among the smoky industrial towns of Pennsylvania, he recollects vast areas of secluded forests, pastoral lands, and water courses, which, with proper facilities and protection, could be made to serve as the breath of a real life for the toilers in the bee-hive cities along the Atlantic seaboard and elsewhere.

Second, he notes the possibilities for health and recuperation. The oxygen in the mountain air along the Appalachian skyline is a natural resource (and a national resource) that radiates to the heavens its enormous health-giving powers with only a fraction of a percent utilized for human rehabilitation. Here is a resource that could save thousands of lives. The sufferers of tuberculosis, anemia and insanity go through the whole strata of human society. Most of them are helpless, even those economically well off. They occur in the cities and right in the skyline belt. For the farmers, and especially the wives of farmers, are by no means escaping the grinding-down process of our modern life.

Most sanitariums now established are perfectly useless to those afflicted with mental disease - the most terrible, usually, of any disease. Many of these sufferers could be cured. But not merely by "treatment." They need acres not medicine. Thousands of acres of this mountain land should be devoted to them with whole communities planned and equipped for their cure.

Next after the opportunities for recreation and recuperation our giant counts off, as a third big resource, the opportunities in the Appalachian belt for employment on the land. This brings up a need that is becoming urgent - the redistribution of our population, which grows more and more top heavy.

The rural population of the United States, and of the Eastern States adjacent to the Appalachians, has now dipped below the urban. For the whole country has fallen from 60 per cent of the total in 1900 to 49 per cent in 1920: for the Eastern States it has fallen, during this period, from 55 per cent to 45 per cent. Meantime the per capita area of improved farmland has dropped, in the Eastern States, from 3.35 acres to 2.43 acres. This is a shrinkage of nearly 28 percent in 20 years: in the States from Maine to Pennsylvania the shrinkage has been 40 per cent.

There are in the Appalachian belt probably 25 million acres of grazing and agricultural land awaiting development. Here is room for a whole new rural population. Here is an opportunity - if only the way can be found - for that counter migration from city to country that has so long been prayed for. But our giant in pondering on this resource is discerning enough to know that its utilization is going to depend upon some new deal in our agricultural system. This he knows if he has ever stooped down and gazed in the sunken eyes either of the Carolina "cracker" or of the Green Mountain "hayseed."

Forest land as well as agricultural might prove an opportunity for steady employment in the open. But this again depends upon a new deal. Forestry must replace timber devastation and its consequent hap-hazard employment. And this the giant knows if he has looked into the rugged face of the homeless "don't care a damn" lumberjack of the Northwoods.

Such are the outlooks - such the opportunities - seen by a discerning spirit from the Appalachian skyline.

Possibilities in the New Approach

Let's put up now to the wise and trained observer the particular question before us. What are the possibilities in the new approach to the problem of living? Would the development of the outdoor community life - as an offset and relief from the various shackles of commercial civilization - be practicable and worth while? From the experience of observations and thoughts along the sky-line here is a possible answer:

There are several possible gains from such an approach.

First there would be the "oxygen" that makes for a sensible optimism. Two weeks spent in the real open - right now, this year and next - would be a little real living for thousands of people which they would be sure of getting before they died. They would get a little fun as they went along regardless of problems being "solved." This would not damage the problems and it would help the folks.

Next there would be perspective. Life for two weeks on the mountain top would show up many things about life during the other fifty weeks down below. The latter could be viewed as a whole - away from its heat, and sweat, and irritations. There would be a chance to catch a breath, to study the dynamic forces of nature and the possibilities of shifting to them the burdens now carried on the backs of men. The reposeful study of these forces should provide a broad gauged enlightened approach to the problems of industry. Industry would come to be seen in its true perspective - as a means in life and not as an end in itself. The actual partaking of the recreative and non-industrial life - systematically by the people and not spasmodically by a few - should emphasize the distinction between it and the industrial life. It should stimulate the quest for enlarging the one and reducing the other. It should put new zest in the labor movement. Life and study of this kind should emphasize the need of going to the roots of industrial questions and of avoiding superficial thinking and rash action. The problems of the farmer, the coal miner, and the lumberjack could be studied intimately and with minimum partiality. Such an approach should bring the poise that goes with understanding.

Finally these would be new clues to constructive solutions. The organization of the cooperative camping life would tend to draw people out of the cities. Coming as visitors they would be loath to return. They would become desirous of settling down in the country - to *work* in the open as well as *play*. The various camps would require food. Why not raise food, as well as consume it, on the cooperative plan? Food and farm camps should come about as a natural sequence. Timber also is required. Permanent small scale operations should be encouraged in the various Appalachian National Forests. The government now claims this as a part of its forest policy. The camping life would stimulate forestry as well as a better agriculture. Employment in both would tend to become enlarged.

How far these tendencies would go the wisest observer of course can not tell. They would have to be worked out step by step. But the tendencies at least would be established. They would be cutting channels leading to constructive achievement in the problem of living: they would be cutting across those now leading to destructive blindness.

A Project for Development

It looks, then, as if it might be worth while to devote some energy at lest to working out a better utilization of our spare time. The spare time for one per cent of our population would be equivalent, as above reckoned, to the continuous activity of some 40,000 persons. If these people were on the skyline, and kept their eyes open, they would see the things that the giant could see. Indeed this force of 40,000 would be a giant in itself. It could walk the skyline and develop its various opportunities. And this is the job that we propose: a project to develop the opportunities - for recreation, recuperation, and employment - in the region of the Appalachian skyline. The project is one for a series of recreational communities throughout the Appalachian chain of mountains from New England to Georgia, these to be connected by a walking trail. Its purpose is to establish a base for a more extensive and systematic development of outdoors community life. It is a project in housing and community architecture.

No scheme is proposed in this particular article for organizing or financing this project. Organizing is a matter of detail to be carefully worked out. Financing depends on local public interest in the various localities affected.

There are four chief features of the Appalachian project:

1. The Trail -

The beginnings of an Appalachian trail already exist. They have been established for several years -- in various localities along the line. Specially good work in trail building has been accomplished by the Appalachian Mountain Club in the White Mountains of New Hampshire and by the Green Mountain Club in Vermont. The latter association has already built the "Long Trail" for 210 miles thorough the Green Mountains -- four fifths of the distance from the Massachusetts line to the Canadian. Here is a project that will logically be extended. What the Green Mountains are to Vermont the Appalachians are to eastern United States. What is suggested, therefore, is a "long trail" over the full length of the Appalachian skyline, from the

highest peak in the north to the highest peak in the south -- from Mt. Washington to Mt. Mitchell.

The trail should be divided into sections, each consisting preferably of the portion lying in a given State, or subdivision thereof. Each section should be in the immediate charge of a local group of people. Difficulties might arise over the use of private property -- especially that amid agricultural lands on the crossovers between ranges. It might be sometimes necessary to obtain a State franchise for the use of rights of way. These matters could readily be adjusted, provided there is sufficient local public interest in the project as a whole. The various sections should be under some sort of general federated control, but no suggestions regarding this form are made in this article.

Not all of the trail within a section could, of course, be built all at once. It would be a matter of several years. As far as possible the work undertaken for any one season should complete some definite usable link -- as up or across one peak. Once completed it should be immediately opened for local use and not wait on the completion of other portions. Each portion built should, of course, be rigorously maintained and not allowed to revert to disuse. A trail is as serviceable as its poorest link.

The trail could be made, at each stage of its construction, of immediate strategic value in preventing and fighting forest fires. Lookout stations could be located at intervals along the way. A forest fire service could be organized in each section which should tie in with the services with the services of the Federal and State Governments. The trail would immediately become a battle line against fire.

A suggestion for the location of the trail and its main branches is shown on the accompanying map.

2. Shelter Camps --

These are the usual accompaniments of the trails which have been built in the White and Green Mountains. They are the trail's equipment for use. They should be located at convenient distances so as to allow a comfortable day's walk between each. They should be equipped always for sleeping and certain of them for serving meals -- after the function of the Swiss chalets. Strict regulation is required to assure that equipment is used and not abused. As far as possible the blazing and constructing of the trail and building of camps should be done by volunteer workers. For volunteer "work" is really "play." The spirit of cooperation, as usual in such enterprises, should be stimulated throughout. The enterprise should, of course, be conducted without profit. The trail must be well guarded -- against the yegg-man and against the profiteer.

3. Community Groups --

These would grow naturally out of the shelter camps and inns. Each would consist of a little community on or near the trail (perhaps on a neighboring lake) where people could live in private domiciles. Such a community might occupy a substantial area -- perhaps a hundred acres or more. This should be bought and owned as a part of the project. No separate lots should be sold therefrom. Each camp should be a self-owning community and not a real-estate venture. The

use of the separate domiciles, like all other features of the project, should be available without profit.

These community camps should be carefully planned in advance. They should not be allowed to become too populous and thereby defeat the very purpose for which they are created. Greater numbers should be accommodated by *more* communities, not *larger* ones. There is room, without crowding, in the Appalachian region for a very large camping population. The location of these community camps would form a main part of the regional planning and architecture.

These communities would be used for various kinds of non-industrial activity. They might eventually be organized for special purposes -- for recreation, for recuperation and for study. Summer schools or seasonal field courses could be established and scientific travel courses organized and accommodated in the different communities along the trail. The community camp should become something more than a mere "playground": it should stimulate every line of outdoor non-industrial endeavor.

4. Food and Farm Camps

These might not be organized at first. They would come as a later development. The farm camp is the natural supplement of the community camp. Here is the same spirit of cooperation and well ordered action the food and crops consumed in the outdoor living would as far as practically be sown and harvested.

Food and farm camps could be established as special communities in adjoining valleys. Or they might be combined with the community camps with the inclusion of surrounding farm lands. Their development could provide tangible opportunity for working out by actual experiment a fundamental matter in the problem of living. It would provide one definite avenue of experiment in getting "back to the land." It would provide an opportunity for those anxious to settle down in the country: it would open up a possible source for new, and needed, employment. Communities of this type are illustrated by the Hudson Guild Farm in New Jersey.

Fuelwood, logs, and lumber are other basic needs of the camps and communities along the trail. These also might be grown and forested as part of the camp activity, rather than bought in the lumber market. The nucleus of such an enterprise has already been started at Camp Tamiment, Pennsylvania, on a lake not far from the route of the proposed Appalachian trail. The camp has been established by a labor group in New York City. They have erected a sawmill on their tract of 2000 acres and have built the bungalows of their community from their own timber.

Farm camps might ultimately be supplemented by permanent forest camps through the acquisition (or lease) of wood and timber tracts. These of course should be handled under a system of forestry so as to have a continuously growing crop of material. The object sought might be accomplished through long term timber sale contracts with the Federal Government on some of the Appalachian National Forests. Here would be another opportunity for permanent, steady, healthy employment in the open.

Elements of Dramatic Appeal

The results achievable in the camp and scouting life are common knowledge to all who have passed beyond the tenderest age therein. The camp community is a sanctuary and a refuge from the scramble of every-day worldly commercial life. It is in essence a retreat from profit. Cooperation replaces antagonism, trust replaces suspicion, emulation replaces competition. An Appalachian trail, with its camps, communities, and spheres of influence along the skyline, should, with reasonably good management, accomplish these achievements. And they possess within them the elements of a deep dramatic appeal.

Indeed the lure of the scouting life can be made the most formidable enemy of the lure of militarism (a thing with which this country is menaced along with all others). It comes the nearest perhaps, of things thus far projected, to supplying what Professor James once called a "moral equivalent of war." It appeals to the primal instincts of a fighting heroism, of volunteer service and of work in a common cause.

Those instincts are pent up forces in every human and they demand their outlet. This is the avowed object of the boy scout and girl scout movement, but it should not be limited to juveniles.

The building and protection of an Appalachian trail, with its various communities, interests, and possibilities, would form at least one outlet. Here is a job for 40,000 souls. This trail could be made to be, in a very literal sense, a battle line against fire and flood -- and even against disease. Such battles -- against the common enemies of man -- still lack, it is true, "the punch" of man vs. man. There is but one reason -- publicity. Militarism has been made colorful in a world of drab. But the care of the country side, which the scouting life instills, is vital in any real protection of "home and country." Already basic it can be made spectacular. Here is something to be dramatized.

MONITORING THE APPALACHIAN TRAIL ENVIRONMENT: A NEW EXPLORATION

Charles H.W. Foster and Karen E. Filipovich

October 1999

Introduction

Consumed with the challenge of creating and maintaining a 2100 mile, continuous footpath along the crest of the Appalachians, adherents have seemingly forgotten Benton MacKaye's seminal vision of an entire region proximate to the settled eastern third of the nation where urban dwellers can readily find "recreation, health and recuperation, and employment" (MacKaye, 1921). Now that the recreational aspects of the Trail and its corridor are virtually secure, it would seem time to undertake, in MacKayan terms, a "new exploration" - monitoring the Trail environment to ensure the health, integrity, and utility of this extraordinary national scenic trail and the inspiration it can provide for its users. To do so effectively will require unprecedented agreement among the host states and federal agencies in partnership with the constellation of local Trail clubs and the now 4 million estimated annual user-recreationists. If so, the environmental monitoring envisioned will not only serve the Appalachian Trail community, but also provide a valuable pilot for similar long trail initiatives throughout North America and Europe.

The condition of the Trail itself, and the problems encountered by its users, are already the legal responsibility of the National Park Service, the Appalachian Trail Conference, and its member clubs. But no one yet addresses adequately the general environment through which hikers pass - a major ecological resource subject to many

stresses and changes. Most AT users simply traverse the Trail, either unaware of the terrain around them or simply unlikely to report its condition to any save friend or family member. The result for Trail managers is the absence of any early warning of environmental problems, and a Trail constituency largely unaware of the remarkable environmental resource the Trail region represents. A thoughtful, comprehensive, participatory, environmental monitoring program could change all of that.

What is environmental monitoring?

By environmental monitoring, we mean the process of systematically collecting specified categories of data with the intent of regularly assessing changes in and the condition of, in this case, the environment associated with the Appalachian Trail. As others have indicated (e.g., O'Neill et al., 1997), the spatial scale of landscapes is often a good place to begin for two practical reasons. First, landscape level assessments can best reveal the cumulative effects of decisions made by individual landowners and others. And second, political and policy decisions affecting the management of natural resources usually occur at broad scales. One needs to distinguish carefully between the concept of a region - the human-determined construct for acting in unison - and the actual landscape configurations, which can vary widely within a given region (e.g., Forman, 1995). In our case, we propose regional action informed by an improved understanding of the status of the Appalachian Trail's various landscape elements.

How extensive should the monitoring be?

At present, the Appalachian National Scenic Trail encompasses an area extending some 2100 linear miles from Maine to Georgia. It occurs within a protected corridor averaging 125 acres per mile. The core of an environmental monitoring program would thus be the approximately 250,000 Trail acres currently in National Park Service or Forest Service ownership, and the other securely-held public and non-profit holdings adjacent to the Trail. But visualized is a much more ambitious effort. As examples, for the first hierarchical level of monitoring, the region should include the three presently recognized, vegetatively-defined ecoregion provinces (Bailey, 1995) - the Adirondack-New England Mixed Forest, the Eastern Broadleaf Forest, and the Central Appalachian Broadleaf Forest. Second, the ecoregional boundaries should then be modified to include the watersheds of the 25 accounting-level hydrologic units (Seaber, 1987). These represent the headwaters of the principal eastern seaboard drainages. Third, using existing digitized information (e.g., elevation data), NASA's high altitude photography and sensing capabilities, and the existing Geographic Information Systems (GIS) technology, principal viewsheds adjacent to the Trail should be determined and overlain on the ecoregional and watershed maps. This will provide a recreationist's perspective of the Trail environment. The final step will require adjusting these and other landscape features so that whole political jurisdictions are included within the final environmental monitoring region.

What physical elements of the environment should be monitored?

For any high altitude trail system, atmospheric monitoring must top the list. Climate change models should be used to try to predict regional effects. Then, ground level monitoring should be added to examine actual changes in biotic and water resources over time. Adverse air quality can also impact recreational uses of the Trail by creating unhealthy conditions and obscuring important vistas and overlooks. Since the Appalachian Trail is a major headwaters region, changes in water quality will certainly need to be monitored carefully. The condition of vegetation will be important - not only the tunnel of trees through which much of the Trail passes, but the fragile balds and other high elevation sites that are so sensitive to atmospheric conditions. Biotic resources, whose well-being is tied closely to an optimum set of air, water, and vegetation conditions, need to be tracked closely. And maintaining the integrity of entire landscapes and viewsheds will require careful attention to changes in land use in and adjacent to the Trail corridor.

What human elements should be monitored?

User elements would rank the highest here - for example, quality of experience, user satisfaction, access and facility needs, and carrying capacity constraints. Profile information should be gathered regularly on who uses the Trail and for what purposes. Also examined should be the extent to which the Trail can provide an educational opportunity rather than simply a recreational experience. Historic analysis and trend derivation will be especially important here - the human equivalent of an early warning system

for coming changes in use, value, and perception. For example, monitoring the attitude of abutters and host communities may turn out to be as critical as the condition of the Trail's physical resources. What economic elements should be monitored?

Both the costs and the contributions of the Trail to host communities, counties, and states should be measured carefully, especially the valuation, taxation, and public expenditure effects generated by the presence of the Trail and its users. The benefits and adverse implications of active management and use of Trail-region natural resources (e.g., water, wildlife, and timber) are other important aspects. Perhaps the most important economic elements needing to be tracked are Trail-adjacent land use and development, which can have significant protection implications both now and in the future.

Who should be involved in the monitoring?

Consistent with the collaborative tradition of the Appalachian Trail effort, environmental monitoring needs to be a cooperative venture. To the extent possible, it should utilize capabilities already in place. As examples, under the leadership of the Forest Service, and with the cooperation of the Southern Appalachian Man & the Biosphere (SAMAB) group, an atmospheric, terrestrial, and aquatic assessment of the southern Appalachian forest (SAA) was completed in 1996. In the central part of the Appalachian Trail region, the Environmental Monitoring and Assessment Program (EMAP) of EPA is currently engaged in a six-state, mid-Atlantic inventory involving inputs from 128 different governmental programs. In New England, there is an opportunity to enlist the cooperation of the Harvard

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Forest's regional long-term ecological research project, its close connections with the University of New Hampshire's New England Regional Climate Change monitoring program, and the capabilities of the entire NSF-supported, national LTER network. Securing inter-institutional cooperation on such a scale would be challenging but not impossible, especially if the provisions of Executive Order 12906 (April 13, 1994), requiring federal agencies to better coordinate their output of geospatial data, are invoked.

How should measurements be taken and analyzed?

Two methods of acquiring data are visualized. The first would be a system of scientifically-designed monitoring stations operated electronically and remotely where possible. Fixed instrumentation would need to be supplemented by periodic sampling carried out by trained personnel and supplemented upon occasion by citizen volunteers. One special virtue of the Appalachian Trail is the access it provides to even remote locations. As a second means of collecting information, the Appalachian Trail community should design a program to deliberately employ the eyes and ears of those using the Trail. Hikers are in a good position to encounter wildlife, detect alterations in the physical environment, and report on changing social conditions. An organized system of hiker-observers would provide an invaluable supplemental data source for the monitoring program. The increasing popularity of the Trail actually improves the chances of systematic monitoring for much of the year. Engaging Trail users directly in monitoring activity should enhance their understanding and appreciation of the environment, add an important human element to the monitoring program, and generate a

strong political base committed to Trail conservation. Designing such a system would be an interesting challenge for a group such as the Appalachian Trail Conference.

The next steps

These and other ideas for the "new exploration" phase of the Appalachian Trail program should be pre-tested before a small group of leadership individuals. If found acceptable in principle, the following next steps are visualized.

1. Determining the boundaries of the target region will require careful thought and attention. One practical way to begin would be to enlist the help of the National Interagency Technical Team of federal resource management agency personnel which is already charged with developing a common framework of ecological regions (USDA, USDI, EPA Memorandum of Understanding, 1996).

2. To design the cooperative framework for monitoring, working conferences of scientists will need to be convened in each of the three principal subregions of the Trail - New England, mid-Atlantic, and southern Appalachians. An additional working conference might be called for the metropolitan New York subregion (portions of Connecticut, New York, and New Jersey) where special problems and institutional capabilities exist. In each instance, the conferees should be asked to consider what data is available, what else needs to be acquired, how it should be obtained, which party should take the lead, and how the results would be analyzed and made available in a timely fashion to managers and users.

3. Implementing a Trail-wide monitoring program would require a final working session. Representatives of cooperating

scientific groups should be brought together with Trail managers, federal and state administrators, political and non-profit organization leaders to devise an interconnected, comprehensive, monitoring program and to reach consensus on how it would operate. A critical element to resolve would be the means by which monitoring results could be transformed into remedial action at executive and legislative levels.

4. How to support such an environmental monitoring initiative will need to be considered carefully. By all accounts, monitoring the environment of a region encompassing the Appalachian Trail could cost as much as \$1 million annually. However, by utilizing existing data-gathering, facilities, and programs, the new dollars required are expected to be a third of that amount. It is hoped that the philanthropic community will be willing to step forward and support the first five years of such a program. Thereafter, the costs of monitoring should be incorporated routinely in agency and organization budgets.

5. To begin the process, an estimated \$200,000 in start-up funds will be needed. For example, the sum of \$45,000 a year for two years will be required to oversee the development of a Trail-wide environmental monitoring initiative. Additional sums of \$25,000 each will be needed for the three subregional working conferences. \$35,000 should be available for a final conference to confirm and endorse a region-wide, environmental monitoring program. But given the tradition of the Trail movement and the nature of the participants, any such contributions are likely to be matched at least two to one by in-kind, volunteer resources and agency allocations.

Conclusion

The idea of a coordinated, comprehensive, environmental monitoring program covering fourteen states, four national parks, eight national forests, and a host of state, local, and private jurisdictions defies the imagination. Yet, at least twice in history the impossible has been achieved. In October of 1921, for example, Benton MacKaye's vision was viewed as improbable. But by November of 1937, volunteers had cut out and marked the last section and could open a fully-connected Appalachian Trail. Returning from World War II, outdoor enthusiasts found the Trail to be disconnected in places, severely impacted by intrusions, and in serious disrepair. The effort began again. This time, federal help was sought through the 1968 National Trail Systems Act. Thirty years and more than \$180 million later, the majority of the Trail and its immediate corridor have been placed in permanent public ownership. As the country turns the corner into the next millennium, a new challenge faces the Appalachian Trail community - monitoring the condition of this extraordinary environment. In our judgement, it is a time once again to be bold.

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"erosion"-related preferences of mountain bikers. This is not to say that allowing erosion is correct management, or even desired from an environmental standpoint.

A more logical solution to this paradox is to locate and design mountain bike trails in areas that are resistant to trail erosion but which still provide the trail factors preferred by the majority of bikers. If, within a resource area, there are several soil types and textures, a resource manager might direct trail location to areas with textures that are more sandy and soil types that are shallow. This type of design would reduce erosion and pollution of the environment because of a more durable soil texture, and a shallow soil would create less potential for a large amount of soil loss than on a thicker soil. Shallow soils would also provide experience-enhancing obstacles, such as rocks, after a relatively small amount of soil erosion, compared with a large amount of soil having to erode on a deeper soil for unconsolidated rock material (saprolite) to be exposed.

The mountain biker is a relatively recent addition to the recreation spectrum and future research needs to allocate as much study to this user group as it does to other recreational use types. It is still unclear how some recreation resource environments should ideally be managed for mountain bike use. A balanced information base will aid resource managers and allow them to make more informed decisions in our wildland areas concerning appropriate carrying capacities and levels of acceptable change.

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Inventory and Monitoring Program Along the Appalachian Trail

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Objectives

The Appalachian Trail (AT) provides an example of an inventory and monitoring program along a lengthy, linear land corridor through multiple jurisdictions utilizing minimal staff. In 1988 the AT became the first national trail to establish an inventory and monitoring program, and it may still be the only trail to have such a program. The primary purpose of conducting AT natural heritage inventories in the 14 states through which the trail passes is to identify and record occurrences of rare, threatened, and endangered plant and animal species and exemplary natural communities found along the trail corridor. After completing each inventory, a monitoring program can be established. The AT inventory and monitoring program is also designed to guide future land management decisions and to educate the trail community about the ecological significance of trail lands (Figure 1).

History of the AT

At approximately 2,150 miles, the AT is the longest unit within the National Park System. The trail passes through 14 states, 6 National Park Service (NPS) areas, 7 national forests, and many state parks and forests. In total, it passes through more than 75 jurisdictions. As originally envisioned by forester Benton MacKaye in 1921, the AT connects the scenic high ridges of the Eastern Seaboard in one continuous public footpath from Springer Mountain, Georgia, to Mount Katahdin, Maine. Work on the AT commenced in 1922 and was completed in 1937.

In 1968 the AT became one of the original trails included under the National Trails System Act. Unlike most of the other 19 national scenic and historic trails, considerable land has been purchased to protect the AT corridor. Since 1978 the NPS has purchased approximately 105,000 acres to protect the AT. This land is in addition to the 165,000 acres of the AT corridor that were present in 1978, most of it in existing national and state parks and forests. The trail corridor is generally 1,000 feet in width, though in some locations it extends over one mile in width. Currently, about 99% of the trail corridor is public land, and the remaining 1% is to be purchased by 2000.

Ecological Significance

Although the AT was created to provide recreational and scenic opportunities for hikers, the trail is becoming known as an important habitat for significant and rare natural resources. The AT corridor protects many rare, threatened, and endangered plant and animal species and natural communities found only in the higher elevations of the eastern United States. Many of these species are endemic to the Appalachian Mountains. With over 1,600 rare plant and animal occurrences identified to date, it is possible that the AT corridor contains among the most occurrences of threatened, endangered, and rare species within any unit of the National Park System.

The southern and central Appalachians are among the most biologically diverse areas within the United States. On maps produced by the World Wildlife Fund (1997), the Appalachian-Blue Ridge ecoregion, which includes the southern and central Appalachians, is in the second highest category (out of 10) in the number of vascular plant and animal (mostly vertebrate) species found within the continental United States. With regard to species endemism, the Appalachian-Blue Ridge ecoregion is also in the second highest category (out of 11) in number of species.

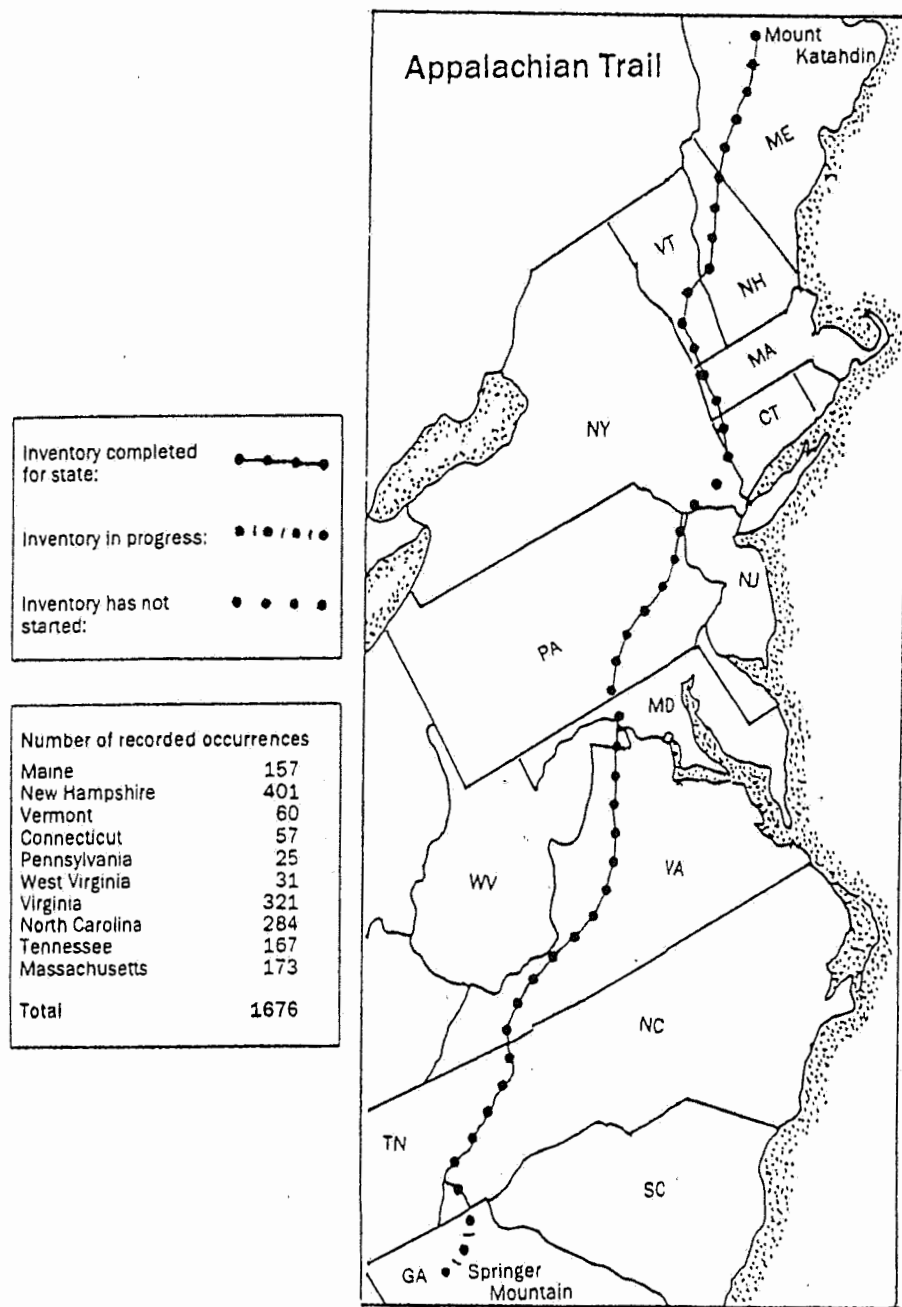


Figure 1. Current status of Appalachian Trail natural heritage inventories

Partnerships and Cooperative Agreements

Management of the AT is accomplished via a system of agreements between the Appalachian Trail Conference (ATC), its trail clubs, NPS, the U.S. Forest Service (USFS), and state land management agencies. The ATC is a private, non-profit organization to which the NPS has delegated the responsibility of maintaining and managing the AT corridor. The NPS retains ultimate responsibility for the administration and protection of the trail, including environmental compliance, threatened and endangered species, law enforcement, and the authority to acquire lands through which the trail passes.

The inventory and monitoring program for the AT was established in 1988 by Paul Brewster, a USFS resource specialist assigned to the NPS's Appalachian Trail Park Office (ATPO), and was further developed by Don Owen of the NPS. The program is administered jointly by the ATPO and the ATC. The ATPO has a staff of seven, including one natural resource specialist who manages the inventory and monitoring program. The ATC has regional offices along the trail, three of which have a staff person assigned to use a small portion of their time to help coordinate natural heritage inventories and monitoring in their regions. Other partners in the AT inventory and monitoring program are the federal or state land-owners through which the trail passes, the local AT clubs, and the state natural heritage programs, which often conduct the actual inventories. A cooperative agreement or a contract defines each party's role.

Conducting the Inventories

At the time the inventory and monitoring program for the AT was being established, it was felt that inventorying rare, threatened, and endangered species was the most immediate need. Due to the trail's length, it was also thought that the most manageable way to proceed would be to conduct the inventory state-by-state. In addition to breaking the inventory into more manageable segments, each state has its own natural heritage program that is a repository for information on all recorded species in the state, including distribution, habitat, present status, and land ownership. Though each state has its own natural heritage program, there is consistency among the states, since they all use a standardized system of field survey methods and data storage that were developed by The Nature Conservancy in the 1970s.

In most of the AT states, the state natural heritage office has agreed to conduct the state AT inventories utilizing their own staff, with funding provided by AT partners. Some natural heritage offices have supplemented their own staff by hiring contract botanists and zoologists to complete specific parts of an inventory. In a few states where the state natural heritage office was unable to conduct an AT inventory, the ATC has contracted directly with independent scientists.

Due to time and fiscal limitations, not all groups of plants and animals have been included in the state AT inventories. In each state, all rare vascular plants have been inventoried, and in a few, some groups of rare non-vascular plants were identified. The recommendations of the state natural heritage offices have been important in deciding which animal groups to inventory. The animal groups most frequently inventoried have been birds, reptiles, and amphibians.

inventory. All endangered and threatened species; USFS PETS (proposed, endangered, threatened, and sensitive) species; and watch list species are included in the AT inventories.

Preparing a landscape analysis and work plan is the first step in conducting an AT natural heritage inventory. The landscape analysis identifies which locations are most likely to contain extant populations of previously recorded or new occurrences of rare, threatened, and endangered species and exemplary natural communities. In addition to doing an element search of the natural heritage database, information is gathered from historical records, such as surveyor notes and fire records; scientific literature; aerial photographs; satellite imagery; herbarium and museum specimen collec-

tions; consultations with experts on the flora and fauna of the region; and interviews with people familiar with the area. The work plan is developed from the landscape analysis, and it usually consists of a map-based summary of high- and low-probability sites slated for field survey, a list of the existing and potential species of concern to be surveyed for, and a brief summary of the procedures to be followed in the field.

In the field survey phase of each state AT natural heritage inventory, the research team attempts to verify existing records of element occurrences on the ground, while searching for previously unrecorded occurrences. Populations of rare species are described and habitat characteristics are noted. The boundary of each rare species occurrence is mapped, as is the boundary of each natural heritage site. (A site includes all rare species occurrences at a single location.) The large majority of the trail length is surveyed at least once in the field season, and in many cases on several occasions, to increase the probability of locating ephemeral species. The state AT natural heritage inventories have taken 1-3 field seasons to complete, depending primarily on the length of the AT in each state.

While conducting the field surveys, researchers note any natural or unnatural disturbances or threats that may endanger the survival of rare species populations. Among the most common threats recorded during the AT natural heritage inventories are: competition from invasive exotic plants, competition from other native plants, trampling by hikers and trail maintenance crews, and defoliation of canopy tree species by gypsy moth and hemlock woolly adelgid infestations.

Also while in the field, researchers begin assessing the options for managing the threats that have been identified. Common recommendations for dealing with threats to rare species have included: monitoring for presence and health, conducting additional survey work, control of exotic species, acquiring additional lands or interest in lands, relocating the trail, consultation with the state natural heritage program and the ATPO prior to any relocation of the trail, educating trail maintenance crews to exercise caution around occurrences, and using signs to educate trail users. Some of these recommendations require actions by land managing agencies, but many, such as monitoring and careful trail maintenance, can be performed by local trail clubs. A few recommended actions, particularly relocations of the trail, take place during the time of the inventory fieldwork, in order to immediately eliminate continued impacts to a rare species occurrence.

Written documentation of the AT natural heritage inventories in each state has included an interim draft, a final draft, and a final report delivered to the ATPO, the ATC, and to other federal and state land-owners along the trail in that state. The state AT inventory reports have varied from about 100 pages to 600 pages. After discussing methodology, the final inventory report contains individual site reports, which consist of: 1) a table of exemplary natural communities and element occurrences, with their global and state rarity and legal status (Figure 2); 2) site descriptions, including rare species, common species, and habitat; 3) threats to the rare species and communities; 4) recommended management actions; and 5) a series of topographic maps which identify the natural heritage site boundary and the boundaries of the individual rare element occurrences and exemplary natural communities.

Results

The first statewide AT natural heritage inventory to be completed was that of Pennsylvania in 1990. Other states—about one per year—followed, and at the present time, inventories have been completed for 10 of the 14 AT states. One inventory (Georgia) will be completed in 1999, and the remaining three (New York, New Jersey, and Maryland) should be completed in 2000 (Table 1).

Inventory results have shown that trail lands provide much critical habitat for sensitive species. Thus far, 429 natural heritage sites, containing 1,676 occurrences of rare, threatened, or endangered plant or animal species or exemplary natural communities, have been identified. The total number of natural heritage sites has varied

PINK MOUNTAIN

SIZE: ca. 1,586

BIODIVERSITY RANK: B4

NATURAL HERITAGE RESOURCE SUMMARY TABLE

SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Plants:						
CINNA LATIFOLIA	SLENDER WOOD REEDGRASS	G5	S2	--	--	D
DIPHYLLEIA CYMOSA (1)	UMBRELLA-LEAF	G4	S2S3	--	--	D
DIPHYLLEIA CYMOSA (2)	UMBRELLA-LEAF	G4	S2S3	--	--	C
DIPHYLLEIA CYMOSA (3)	UMBRELLA-LEAF	G4	S2S3	--	--	C
HYPERICUM MITCHELLIANUM	BLUE RIDGE ST. JOHN'S-WORT	G3	S1S2	--	--	D
ILEX COLLINA	LONG-STALKED HOLLY	G3	S2	3C	LE	E
PRENANTHES ROANENSIS	MOUNTAIN RATTLE-SNAKE ROOT	G3	S2	3C	--	C
Animal:						
GLAUCOMYS SABRINUS FUSCUS	VIRGINIA NORTHERN FLYING SQUIRREL	G5T2	S1	LE	LE	D
Community:						
SUBMESOTROPHIC FOREST						B

Figure 2. An example of a resource summary table for rare plants and animals and exemplary natural communities found within a natural heritage site report. "G1" and "S1" species are rarest (five occurrences or fewer globally or statewide), "G3" and "S3" species are moderately rare, and "G5" and "S5" species are very common. "LE" refers to a listed endangered species.

from 8 in West Virginia to 74 in Virginia, and the total number of occurrences has varied from 25 in Pennsylvania to 401 in New Hampshire. Virginia and North Carolina also have a large number of rare species occurrences, partly due to greater habitat diversity across a wider range in elevation found in these states. One plant, the federally endangered small whorled pogonia, is found at several locations along the AT, including the only population of the orchid in Connecticut. Among the rarest animals found along the trail are several species of Shenandoah salamanders.

Funding

Support for the AT inventories has come from the NPS operating budget, the NPS challenge cost-share program, the USFS, the National Forest Foundation, the National Fish and Wildlife Foundation, state resource agencies, and private foundations and corporations. The total cost for the inventories conducted to date is \$247,250 on an acreage of 254,158 acres, or an average of only about \$1.00 per acre surveyed. Inventory cost has varied from \$4,000 for West Virginia to \$59,750 for Virginia, reflecting the amount of acreage surveyed and the year in which the inventory was conducted.

State	Acreage	Miles	# of sites	# of occurrences	Cost	Status of inventory
PA	30,000	229.8	15	25	\$13,500	Completed 1990
NH	23,000	157.7	59	401	\$9,900	Completed 1991
VT	22,500	145.5	33	60	\$8,400	Completed 1991
CT	6,000	46.7	27	57	\$4,500	Completed 1992
NC	27,500	234.0	66	284	\$27,000	Completed 1993
VA	60,000	543.2	74	321	\$59,750	Completed 1994
TN	10,800	73.2	58	167	\$17,000	Completed 1996
WV	2,100	29.4	8	31	\$4,000	Completed 1997
ME	40,300	274.6	46	157	\$44,100	Completed 1998
MA	12,500	89.0	43	173	\$19,500	Completed 1999
GA	7,166	75.6	In progress	In progress	\$19,600	Begun June 1998
NY	12,292	90.9	—	—	\$25,000	Begun May 1999
NJ	—	73.0	—	—	—	Begun May 1999
MD	—	40.0	—	—	—	Planned for 2000

Table 1. Summary of Appalachian Trail natural heritage inventory and monitoring program, by state

Site Monitoring

Once a statewide AT inventory is completed, a monitoring program for the trail in that state can begin. The primary goals of the natural heritage site monitoring program are to discern the size and health of the rare species and to identify any threats to them. Because of AT staff limitations, and because of the success of utilizing volunteers in other roles along the AT, a decision was made to accomplish the monitoring program through volunteers. Most natural heritage volunteers are selected from local trail clubs based on their interest in observing plants and animals, though some are also environmental professionals. Of the total 429 sites identified in 10 of the AT states, only about 100 of the highest priority sites have been identified for monitoring, based primarily on the rarity of the species and the threat to its presence. Approximately 100 volunteer natural heritage monitors have been trained and are active along the AT.

Workshops

At least one workshop is held in each state to train volunteers in identifying the species to be monitored and in procedures for monitoring. The ATPO and the ATC regional offices organize each workshop. The primary instructor is usually from the

state's natural heritage office or is the contracting biologist for the AT inventory. Also invited are natural resource managers from national parks and forests and state land agencies in the region. Over the course of the six-hour workshop, volunteers are introduced to the concepts of biodiversity and rare species protection, briefed on the AT natural heritage inventory program, shown identifying characteristics of the species or communities to be monitored (through slides and herbarium specimens), and instructed on how to complete monitoring forms. During the afternoon portion of the workshop, volunteers practice species identification and monitoring under the guidance of professionals.

A monitoring packet supplied to each volunteer consists of general information on the AT inventory and monitoring program, a specific site report from the inventory, drawings or photos of the species and community occurrences, topographic maps showing the location of the occurrence(s), and blank monitoring report forms. Volunteers are encouraged to take photos of their site and species. The monitoring reports are critical to determining if a natural heritage site needs more active management to preserve its rare elements.

A Look Ahead

Once the 14 state AT inventories are completed, the ATPO will devote more time to prioritizing and implementing additional management recommendations from the inventories, particularly on its own lands.

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United States Department of the Interior

NATIONAL PARK SERVICE
Appalachian National Scenic Trail
Harpers Ferry Center
Harpers Ferry, West Virginia 25425



IN REPLY REFER TO:

January 12, 2000

MEMORANDUM

TO: ATC Field Staff

FROM: Kent Schwarzkopf, ATPO

SUBJECT: Natural Heritage Program for the AT

Over the last several months, ATPO and ATC have been working to obtain useful summary data from TREAD and the natural heritage inventories in order to prioritize management actions to protect the rarest plant and animal species and exemplary natural communities found within the AT corridor.

We are enclosing several important products from the results of this analysis. These products summarize natural heritage data from at least 9 states: Maine, New Hampshire, Vermont, Connecticut, Pennsylvania, West Virginia, Virginia, Tennessee, and North Carolina. Some of the products include preliminary data for Massachusetts.

One 8-page table lists "Globally Rare Species within the Appalachian Trail Corridor," with fields for site number, species scientific name, common name, and global and state ranks. Another 45-page table with the same title has additional fields for site name, landowner, federal and state species status, and management recommendations. For this table, we are including the data for sites within your region. This table allows us to quickly see who owns the land containing the rare species and what management recommendations have been identified to protect the rare species. The table for Pennsylvania lacks management recommendations, since those recommendations were not input into TREAD.

The "globally rare species" include G1 species (critically imperiled, usually 5 or fewer locations worldwide), G2 species (imperiled, 6-20 locations worldwide) and G3 species (vulnerable, 21-100 locations worldwide). These globally rare species are species that are truly rare (especially the G1 and G2 species) and not just species that are rare within a state, by virtue of their being at the end of their range.

The globally rare species tables show us that globally rare species are found at 160 of 390 natural heritage sites. Only 17 of the 160 natural heritage sites with globally rare species are found on land purchased for the NPS Appalachian Trail Park Office. The majority of the globally rare species are on U. S. Forest Service land. Of the globally rare species, there are 8 G1 species and 29 G2 species within the AT corridor.

Of the total number of 1503 occurrences of rare species and plant communities found thus far at natural heritage sites within the AT corridor, there are 318 occurrences of globally rare species. (Massachusetts is not included in these totals.) Of these 318 occurrences, 13 are G1 occurrences, 72 are G2 occurrences, and 233 are G3 occurrences. The remaining occurrences are state rare (S1-S3) or are rare and exemplary plant communities. North Carolina and its border with Tennessee contain the most globally rare species, followed by Virginia and New Hampshire.

Additional tables document those species that have a federal or state status of endangered or threatened. (These lists could not be produced from TREAD, but were obtained by going through each of the inventories.) There are 9 federally endangered species and 20 federally endangered occurrences that have been identified within the AT corridor. Federally endangered species are found in 6 states: NC, TN, NH,

ME, CT, and VA. It should not be assumed that just because a species does not have a federally endangered status, that it is not nationally or globally rare. For example, *Iliamna remota* (Kankakee globe mallow), with only 8 known localities in the world, does not have status as a federally endangered or threatened species.

There are 88 state endangered species and 175 state endangered occurrences, and 98 state threatened species and 336 state threatened occurrences that have been identified within the AT corridor. The greatest number of state endangered and threatened species occurs in New Hampshire, followed by Tennessee and North Carolina. Whether a species has a status as endangered or threatened appears to have less to do with its rarity than it does to the strength of a state's natural heritage office or the will of its legislature to declare a species endangered or threatened. I am in the process of obtaining new state endangered and threatened species lists, since it is possible that the status has changed on some of the species.

Hansen Ball coaxed TREAD to print a master listing (128 pages) of all Rare Plant and Animal Species and Exemplary Natural Communities located within the Appalachian Trail corridor in the 9 states that have completed natural heritage inventories. This printout is a good summary of the several thousand pages of inventories that we now have. On this printout, each natural heritage site has a field for recommended actions, preceded and followed by fields for the site number, site name, landowner, scientific name, common name, global rank, state rank, federal status, and state status. We are enclosing only those pages containing natural heritage occurrences in your region.

A natural heritage volunteer, Joanne Firman, developed a master list of all Natural Heritage Sites Being Monitored or Recommended for Monitoring. This table is for 10 states, including Massachusetts, and has fields for site number and name, the name of the species being monitored and its global and state rank, the name of any rare or exemplary plant community, and the landowner(s) of the natural heritage site.

There are 140 natural heritage sites being monitored or recommended for monitoring and 444 occurrences of species being monitored or recommended for monitoring. Approximately one-third of all natural heritage sites within the AT corridor are being monitored. The sites that have not been recommended for monitoring generally contain resources that are either less rare and/or less threatened. As far as could be determined, only those species recommended for monitoring within a natural heritage site are included in this table. We expect to reexamine some of the sites and species recommended for monitoring, particularly those in the earliest monitoring programs, and we will solicit your assistance and that of the state natural heritage offices to do this.

For those natural heritage sites that were monitored in 1999, Bob Proudman and I would like your region's natural heritage coordinator to prepare a 1 or 2 page summary of 1999 monitoring results in each state. (I will prepare the 1999 results for Virginia.) Please prepare these summaries by February 15 and mail them to each of us. Monitoring summaries will also be requested from Fiona Hawley and Paul Palmer for Massachusetts and Connecticut, respectively.

I would appreciate it if your region's natural heritage coordinator would review all of the enclosed natural heritage tables and lists and submit any errors or modifications to me for updating.

It is our intention to use these tables to help prioritize implementation of management actions to protect these rare species and plant communities, particularly those that are globally rare. There are a wide variety of management actions recommended in the natural heritage inventories for protection of natural heritage resources identified within the AT corridor.

Two of the most common management recommendations to protect rare natural heritage resources are site monitoring and informing trail maintainers and crews of the localities where rare plants exist immediately adjacent to the trail. I believe we should identify this year those sites in each state where rare species lie on or immediately adjacent to the trail, and then notify trail maintainers of these locations and how to identify the species so that they are protected during trail maintenance work. Last year, one of our natural heritage monitors in Virginia noted that her husband, a trail maintainer, was cutting down the rare plants that she

had been asked to monitor. Your assistance and recommendations for how best to inform trail maintainers and crews is requested.

Other management recommendations from the natural heritage inventories may be more difficult or expensive to implement and can occur only with the support of and direction from the landowning agency. Among these recommendations are control of exotic plants and pests, land acquisition, relocation of a section of Trail, better control of hiker traffic to eliminate trampling, and even prescribed burns. An example of one management recommendation implemented in 1999 was the state of Connecticut's thinning of the forest canopy in order to improve the habitat for the state's only known occurrence of *Isotria medeoloides* (small whorled pogonia), which is located within the AT corridor. This year, we hope to implement at least 1 exotic species control project on ATPO land.

If management actions are not taken to protect them, some rare plant and animal occurrences are in danger of being lost to a variety of threats. Only recently, we became aware that the globally imperiled G1 species, *Iliamna remota* (Kankakee globe mallow), is no longer present within the AT corridor. This is the plant featured in newspapers and ATC publications as the rarest plant along the AT. This species occurrence, which was located on CSX land along the James River, has been monitored annually by the Virginia Natural Heritage Division, but the species has not been present in the AT corridor during the last two field seasons. (Monitoring recommendations for this site included public land acquisition and vegetation management, which CSX would not permit.) A natural heritage site in northern Virginia, Moore Run, appears to have succumbed to the proliferation of garlic mustard, barberry and multiflora rose. An example of a rare animal that appears to have been lost from the AT corridor is the Appalachian Bewick's wren in southern Virginia. Other rare plants and animals may have been temporarily or permanently lost, since natural heritage monitors have been unable to locate them.

Please review the enclosed material carefully. The completion of the natural heritage inventories in all but the Mid-Atlantic Region allows us an opportunity to shift our efforts from identification to monitoring and protection of these rare species and rare and exemplary plant communities, which is of course our ultimate goal. We hope that you will agree that more attention should be given to implementing natural heritage monitoring and other management recommendations to protect natural heritage resources. We look forward to working with you in this effort.

Please bring this material with you for discussion at the ATC retreat in January.

Author: Kent Schwarzkopf at NP-WASO
Date: 1/27/00 12:21 PM
Normal

AT

TO: Beth Johnson at NP--NAR Subject: Re: Inventory and Monitoinrg-----

----- Message Contents

Hi Beth,

Thanks for sending me the email messages between you and Gary Williams regarding the AT and its not being designated as a natural resource park. I have spoken with Pam Underhill, Park Manager for the AT, and we intend to prepare a letter, probably to Gary Williams, requesting that we be considered a natural resource park.

I am mailing you the summary report I showed you last week of the Rare Plant and Animal Species and Exemplary Natural Communities within the Appalachian Trail Corridor and also some other information which describes or summarizes the AT's natural resources and its inventory and monitoring program. I will also be sending this material to Steven Fancy and Gary Williams in Ft. Collins.

In addition to speaking with Steven Fancy during the conference last week, I spoke with Abby Miller and gave her a copy of the AT Rare Species summary report I'm sending you. She seemed to indicate that she would be supportive of the AT being a natural resource park, and indicated that it would need to somehow fit into the 32 I & M clusters.

The inventories that the AT has thus far accomplished in 11 of 14 trail states have concentrated on rare vascular plant species and, depending on the state, on rare and exemplary plant communities and some rare vertebrate species. We would need to do many additional inventories to document 90% of the vascular plants and vertebrate species found within the AT Corridor. Our rare species inventories have documented rare species anywhere within the AT corridor, no matter who the landowner (NPS, USFS, state, etc.). The AT corridor is approximately 270,000 acres, of which 105,000 acres was purchased by the NPS specifically for the AT. Future inventories might need to be limited to NPS land, if there are funding restrictions.

If you have any feedback for us on the materials I'm sending you, please let me know. Also, if you have any suggestions for putting forth our interest in becoming a natural resource park, please advise.

Also, I would be interesting in seeing the lynx update you mentioned.

Kent

Reply Separator

Subject: Inventory and Monitoinrg
Author: Beth Johnson at NP--NAR
Date: 1/21/00 8:58 PM

Kent,

I hope you were able to talk with Steve Fancy. I got a note from Gary



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Appalachian National Scenic Trail
Harpers Ferry Center
Harpers Ferry, West Virginia 25425



February 2, 2000

Steven Fancy
Inventory and Monitoring Program
National Park Service
Natural Resource Information Division
1201 Oak Ridge Drive, Suite 350
Fort Collins, CO 80525-5589

Dear Steven:

I am enclosing for you the summary table of Rare Plant and Animal Species and Exemplary Natural Communities within the Appalachian Trail Corridor, which I showed you at the recent George Wright Society Conference in Valley Forge, PA. This table includes the 390 natural heritage sites that have been identified within the Appalachian Trail (AT) corridor in the 9 states for which rare species inventories have been input into the AT database, TREAD. (The 9 states are Maine, New Hampshire, Vermont, Connecticut, Pennsylvania, West Virginia, Virginia, Tennessee, and North Carolina.) This printout is a good summary of the several thousand pages of inventories that we now have. We hope to conclude the remainder of the 14-state Appalachian Trail rare species inventories in 2000. Thus far, 1676 occurrences of rare species and exemplary plant communities have been found at 429 sites along the AT.

I am also enclosing an 8-page table listing species, communities, and occurrences that are globally rare (G1, G2, or G3) along the AT. There are 318 occurrences of globally rare species. These globally rare species occur at 160 natural heritage sites that have been identified within the AT corridor. This is a good indication of the significance of the biological resources contained within the AT corridor.

There are 9 federally endangered species and 20 federally endangered occurrences identified within the AT corridor. There are 88 state endangered species and 175 state endangered occurrences, and 98 state threatened species and 336 state threatened occurrences that have been identified within the AT corridor. I can provide you lists of threatened and endangered species by state, if desired.

Approximately 140 AT natural heritage sites are being monitored by AT volunteers or have been recommended for monitoring.

It should be kept in mind that the AT corridor consists of about 270,00 acres of public land including 14 national forests, 6 NPS areas, and many state parks and forests. The rare species data is for the whole corridor, no matter whom the landowner. Approximately 105,000 acres have been purchased by the NPS for the AT outside of the 6 existing NPS areas. Federal land acquisition for the Appalachian Trail is scheduled to conclude within the next year.

The natural heritage inventories that have been conducted for the AT identify only rare vascular plants and some animal groups. Some state AT inventories have identified rare lower plants, and most state AT inventories have identified rare and exemplary plant communities. Not all rare animal groups have been inventoried; rare birds are the most frequent group inventoried. Even with the several thousand pages of rare species inventories we now have, we would have to do many more inventories to achieve the Servicewide goal of documenting 90% of the vascular plants and vertebrates that are present within the AT corridor.

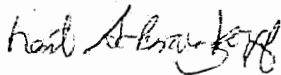
I am enclosing a summary table for the AT Inventory and Monitoring Program, with information broken out by state.

I have previously sent you a copy of the article I wrote for the Proceedings of the 1999 George Wright Society meeting.

I hope that your review of this material will illustrate that the Appalachian Trail has significant natural resources and should be a part of the NPS Inventory and Monitoring program. Please share this material with Gary Williams as well.

Thank you for your review of this material.

Sincerely,



Kent Schwarzkopf
Natural Resource Specialist

Cc: Abby Miller
✓ Beth Johnson

Charles H.W. Foster
484 Charles River Street
Needham, Mass, 02492
(781-444-6266)

April 28, 2000

Memorandum: Vernon (Tom) Gilbert
From: Charles H.W. Foster

In advance of your May 4-5 SAMAB meeting, you have asked for my views on how funds might be raised for the Appalachian Trail monitoring project described in our Foster/Filipovitch paper (October 1999). Let me respond based on the rough estimates contained in that paper. It is assumed that the actual amounts may change once additional details are developed. Given the need to get the monitoring program better defined, I am going to concentrate on the \$200,000 in front-end funds called for in our paper. This includes \$110,000 to cover the costs of convening four working conferences, three at the subregional level and one held regionally to conform the three individual plans, and \$90,000 to cover the costs of a program coordinator over a two year period.

As for raising the required funds, my previous experience as a national foundation officer leads me to recommend strongly an intermediate step before the inevitable preparation of grant proposals begins. We should identify up front an interested foundation program officer and, when the preliminary subregional planning has advanced sufficiently, ask that individual to host a meeting for other program officers at which advocates could present their aspirations for a Trail-wide environmental monitoring initiative. By convening a number of representatives of philanthropy in one place at one time, any requests we submit will gain the benefit of the officers' collective input, thereby making the ultimate proposal(s) that much more convincing. It will also lead to informal consultation among foundation program officers on how to finance our endeavor. We will then be advised on what to submit, to whom, and when. But going into the foundation "consultation", we should have in mind a number of potential cooperating fiduciaries, one in each subregion and one for the Trail region as a whole. Quite often, foundations will express preferences for certain grant recipients.

Charles Van Sickle
U.S. Forest Service – Retired
19 Nottingham Drive
Candler, NC 28715
Email: cvans@prodigy.net

As for the major monitoring funds, the bulk will have to derive from existing public sources. Simple reprogramming of existing programs may accomplish some of our objectives, but new fund sources are not beyond the realm of possibility. We will need a coordinating group with high level agency representation to uncover such prospects. Among those that I would recommend exploring promptly are Section 204 of the National Parks Omnibus Management Act of 1998, and a remarkable new EPA authorization termed EMPACT, which some feel could produce \$2 million in support from this one source alone.

Finally, I regret that neither Karen Filipovich nor I can attend your May 4-5 meeting to deliver these thoughts in person. However, we will be working on the program's behalf by convening the first meeting of scientists on a New England monitoring program the day before your session. As promised, I will FAX a brief report on our deliberations to provide New England input for your session.

In sum, I remain enthusiastic about this new venture for the AT and immensely grateful to SAMAB for taking the first step in this latest, important journey.

Hann

Charles H.W. Foster
484 Charles River St.
Needham, Mass. 02492
(781-444-6266)

FAX COVER SHEET

Date: May 3, 2000

To: Vernon (Tom) Gilbert

Address: North Carolina Arboretum
Asheville, NC

Telephone:

Subject: May 3 New England Meeting

Message: Here is a brief summary of what transpired at
Harvard today. You are welcome to share the
contents or even the memo with the other
attendees at the SAMAB working session.

Tom

Charles H.W. Foster
484 Charles River St.
Needham, Mass. 02492
(781-444-6266)

New England Appalachian Trail Monitoring Roundtable
Harvard Kennedy School - May 3, 2000

A preliminary discussion of Appalachian Trail environmental monitoring took place today under the auspices of the Kennedy School's Environment and Natural Resources Program. Those in attendance included:

David Foster, director of the Harvard Forest and its Long Term Ecological Research Project;

Mary Foley, manager for natural resources and science, Boston support office, National Park Service;

Gregory Hellyer, environmental ecologist, USEPA (Region 1);

Paul Somers, state botanist (MA), Natural Heritage and Endangered Species Program;

Kevin Peterson, New England coordinator, Appalachian Trail Conference;

Charles H.W. Foster, research associate, Harvard Belfer Center for Science and International Affairs.

Mary Foley delighted the group by announcing a recent lead assignment on inventory and monitoring, Trail-wide, to the Boston support office of the NPS.

Participants began by noting the availability of maps of the Appalachian Trail and its corridor forwarded by Pamela Underhill, an ecoregional map overlain by hydrologic designations prepared by Robert Bailey of the Forest Service, the somewhat different ecoregional map prepared by James Omernik of EPA's Corvallis laboratory, and other materials provided by the participants. After sharing general information on existing data sources and prospective monitoring participants, the following questions were addressed:

Definition of the region to be monitored. It was agreed that the core of the region should be the Trail and its immediate corridor, but expanded to include adjacent areas in public or nonprofit ownership, possibly the geographic, watershed, and ecological attributes identified by Bailey and Omernik, plus aspects of significant viewsheds. Other areas would be added as necessary to make the

region relevant in a social and political as well as ecological sense. It was felt that the Massachusetts portions of the Trail might serve as a pilot for regional definition by piggybacking on the current biomapping project being carried out by the state Natural Heritage Program at the personal request of Environmental Secretary Robert Durand. Paul Somers agreed to explore that possibility.

Available data bases. The Natural Heritage, LTER, wildlands, and watershed data bases would be obvious prospects - also many of the existing atmospheric and environmental quality data bases being collected on a regular basis under EPA and associated institutional auspices. Forest Service participation, and data from the Hubbard Brook (NH) Experimental Forest and the Green and White Mountain national forests, should also be sought. David Foster offered to make available a list of his LTER data sources and cooperators.

Potential cooperative network. The group was particularly impressed by the ten year experience of the Agency of Natural Resources' Vermont Environmental Monitoring Cooperative, with its 60 participants. The Cooperative could serve as a possible model for New England as a whole. Another approach suggested as worth emulating was the Northern Forest Alliance, a coalition of nonprofit organizations funded by foundations and committed to the future well-being of wildlands throughout northern New England.

Resource elements. It was agreed that the objective should be to measure environmental change within the entire region - what the NPS's Mary Foley referred to, in a medical analogy, as the "vital signs of the environment" - not simply design a monitoring program site-specific to the Trail and its immediate corridor. The broader purpose should be to devise an environmental early-warning system for much of the settled eastern seaboard, an objective that would fit well with the expansion of EMPACT next year, Gregory Hellyer advised, which will no longer be limited to activities in metropolitan areas.

Role for Trail users. The group agreed that the use of recreationists and volunteers for supplemental monitoring activities, under proper standards and supervision, could be very beneficial, both to expand the knowledge base and to educate Trail users to the environment they encounter. The ATC's Kevin Peterson felt that monitoring participation could well attract additional volunteers to the Trail program, particularly those who would not

otherwise be candidates for Trail maintenance. A new designation as VIMs (Volunteers In Monitoring) could give the activity a measure of stature and prominence.

Institutional Aspects. The monitoring project will need a measure of institutional structure, but not to the point of discouraging grassroots participation and collaboration, which should be the essence of the program. An important component would be an extensive public outreach capacity connected to those who can follow up promptly any needs revealed by the monitoring. New England's environmental monitoring, while specific to its own region, should also be interconnected with other monitoring efforts at subregional and national levels.

The Next Steps. With respect to future actions, it was agreed that every effort should be made this summer to inventory data sources and to identify prospective data sources and cooperators. Harvard will try to take on that responsibility. The goal will be to have a preliminary inventory available, and a set of potential participants, in time for a special session of EPA's planned Region 1 environmental monitoring conference to be held in September. If agreement is reached there, an appropriate lead organization steps forward, and funds are available, a full-scale New England planning project will be initiated.

In addition, it was felt that the concept of Trail region-related monitoring should be included as an agenda item at the October meeting of ATC's Regional Management Committee, where delegates from member clubs assemble annually to discuss programs and activities. Volunteer groups should be apprised of a possible monitoring project, and asked for their input early on.

A meeting with the heads of the New England states' Natural Heritage Programs will be sought.

Finally, the group was very interested in pursuing funds nationally under EPA's EMPACT program, the submission for which would occur in the spring of 2001 after the New England and other subregional programs had been better defined. Formation of a cooperating monitoring network as described above would materially enhance the prospects for such funding.

ISSUES	INFO NEEDS	EXISTING RESOURCE/PROGRAMS
Trail/facility design/const.	Maintenance needs/conditions/resource problems/nat./cultural resource impacts	Trail assessments, TREND, diversity inventories
Recreational use impacts, conflicting uses group use, commercial use, high-use	Resource impacts, visitor impacts	Corridor monitoring, boundary maintenance, campsite-impact analysis, visitor survey(s)
Visitor patterns/preferences/trends	Lots of stuff	Visitor survey, ridgerunner observations
Natural/cultural/resource management	Species occurrences/species health, trends	Inventories/monitoring programs, satellite imagery/GIS
External/treats impact, analysis/mitigation	Visual/auditory, resource impacts	Viewshed analysis, natural/cultural inventories
Land use patterns/trends/controls	Demographics, forest cover, development impacts	Land trust community outreach, NASA/landset, GIS

Other:

Air/water quality
Disease/infections
Indicator species



Monitoring the Appalachian Trail Environment: A Scoping Workshop

North Carolina Arboretum
Asheville, North Carolina
May 3 & 4, 2000

1. Purpose

The workshop was conducted to examine a concept proposed by Charles H.W. Foster and Karen Filipovich of Harvard University's John F. Kennedy School of Government entitled *Monitoring the Appalachian Trail Environment: A New Exploration*. The authors envision a comprehensive, participatory program to benchmark the condition of the environments associated with the Appalachian Trail (AT) and monitor the changes in them.

The intent of this workshop was to begin to explore the potential for utilizing the Appalachian National Scenic Trail and associated lands as a focus for monitoring a variety of environmental health indicators and as a "classroom" for environmental education. The intent was also to suggest how such a program might be organized, to identify participating organization needs and issues that might benefit from such a program, and to get a better sense of the kinds of research and monitoring that are already underway along or near the AT corridor.

The workshop was sponsored by the Southern Appalachian Man and the Biosphere (SAMAB) Program, the Appalachian Trail Conference (ATC), and the National Park Service (NPS) Appalachian Trail Park Office.

A list of participants is included in Attachment 1.

2. Existing Research and Monitoring Activities Related to the AT Environment

It was recognized that a large number of research and monitoring activities are already underway and that there was need for greater sharing of information about and from such programs.

Examples of existing activities that were discussed included:

- ATC programs such as monitoring visitor use, and lands associated with the AT that have the potential to be changed in ways that might detract from the Trail experience.
- NPS – such as the state-by-state natural heritage inventories that concentrate on identification of plant and animal species and rare plant communities.
- Aquatic and watershed monitoring along the Upper Little Tennessee River.
- Great Smoky Mountains Air Quality Monitoring.
- Forest Service – Forest Health Monitoring and Forest Inventory and Analysis.
- Fish & Wildlife Service Breeding Bird Monitoring.

These examples provided a beginning for discussions regarding the need for a more coordinated monitoring effort. They also provided some basis for identifying and clarifying some of the issues regarding initiating a comprehensive effort.

3. Issues

Key issues that were discussed included the following:

- Suitability of the AT for a comprehensive monitoring program. Are lands associated with the AT more suitable than others for a comprehensive program? Can the AT serve as an organizing principle or focus for such a program?

It was agreed that the AT corridor could have great value as an ecological transect and as a means to link and strengthen existing programs. It was also agreed that the AT has unique value as an organizing principle because of its significance, its constituency, and its wide recognition.

- Concern was expressed that the AT's volunteer-based Cooperative Management System was already overburdened (More than 4,200 volunteers contributed more than 180,000 hours in work on the Trail in 1999.) and that any new initiative should be designed so that it would not place additional burdens on the existing volunteer force.

It was felt that a new monitoring initiative could be started primarily by recruiting new volunteers who were interested in the monitoring activity. Several university professors and students have expressed interest in the proposed activities. For example, Dr. John Bishop who teaches a course on Appalachian Mountain Ecology at Richmond University, VA expressed interest in participating in an AT monitoring project. His course is designed to acquaint students with ecological communities in the Appalachian Mountains, and to help them develop skills in conducting field studies. It was also noted that the Air Quality Monitoring Program scheduled for this summer in the Great Smoky Mountains National Park had more volunteers than were needed.

- Concern was expressed that “the wheel should not be reinvented” in starting any new monitoring activity.

It was generally agreed that the proposed monitoring initiative should be built upon existing efforts and developed as part of a process carried out by participating organizations in which they assess their own needs and identify what they want the new program to accomplish.

It was also recommended that an AT monitoring initiative should be developed using approved protocols, standards and guidelines such as those developed by the Forest Health Monitoring Program of the Forest Service, and the Forest Inventory and Analysis (FIA) programs. The Forest Service's Southern Research Station's Program Managers for Forest Inventory and monitoring offered to share the field manuals and quality assurance control procedures that the Forest Service uses throughout the United States. It was also recommended that a new AT monitoring initiative should be carried out within the context of current national objectives and standards. (Objectives and standards such as those recommended by the National Research Council's 1999 Report, "Ecological Indicators for the Nation," and in the report of the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests – the "Montreal Process." This approach would help advance the development of internationally agreed criteria and indicators for conservation and sustainable management of ecosystems.

- Participants indicated that AT management problems sometimes occur, not always because of a lack of data or access to data, but because of the overwhelming amount of data regarding some issues. Therefore, the AT management needs help in organizing, analyzing, interpreting, and communicating the data that already exist.

The Southern Appalachian Regional Information System (SARIS) was presented as the major vehicle for dissemination of the Southern Appalachian Assessment data, and as a knowledge base about regional data sources, data sets and their uses. It was suggested that SARIS might eventually be linked with other programs focusing on Appalachian environmental data to form an Appalachian regional information system.

While the primary activity of the project would be environmental monitoring, a key outcome is likely to be a public better educated about the value of protecting the environment of the AT. Educational opportunities range from scouts who see first-hand the relationship between automobile use and land use, to graduate students who learn and apply field research methods, to retirees who monitor plant numbers and types in designated plots. Learning through involvement is more effective than other styles of learning.

- In regard to funding potential, ATC strongly urges a plan of work be developed before approaching funders. Strategies Dr. Foster recommended (via memorandum to our workshop participants, Attachment 2) were to

1. Discuss the sub-regional planning of the AT monitoring project, concentrating on secure funds to cover the costs of several working conferences at the sub-regional level, and one held regionally to conform the individual plans, and funds to cover the costs of a program coordinator over a two year period.
 2. To identify an interested national foundation program officer and, when the sub-regional planning has advanced sufficiently, to ask that individual to host a meeting for other program officers at which advocates could present their aspirations for a Trail-wide environmental monitoring initiative. This Dr. Foster believes could lend to consultation among program officers on how to finance the endeavor.
- A brief summary of the New England AT Monitoring Roundtable held at the Harvard Kennedy School, May 3, was also shared with our workshop participants on the Morning of May 4. (Attachment 3).

4. Conclusions and Next Steps

- A program can be designed that will contribute to management purposes of the Appalachian National Scenic Trail, especially by strengthening the scientific approach to the conservation of the nationally significant scenic and natural qualities of the areas through which the Trail passes. A monitoring program can be designed that will strengthen existing programs and contribute to participating organizations management objectives, through a synergistic effort combining volunteer activities, government programs, university professors and students, and interested conservation organizations. Development of such an approach is compatible with the volunteer-based cooperative management system of the AT. The ATC should not have to divert existing volunteer efforts to the monitoring initiative, but could play a coordinating role.
- The Appalachian Trail Park Office of the National Park Service indicated willingness to assume an overall coordination role if funds are secured for a program coordinator.
- A new draft conceptual document reflecting discussions to date and the collaborative nature of the enterprise should be drafted. Volunteers from SAMAB will initiate the preparations of this draft, so that it can be reviewed and prepared in time to be presented at the ATC Board of Managers meeting in October 2000.
- Each participating organization will continue to identify its management needs, assess existing research and monitoring activities and contribute ideas about how the new monitoring initiative should be designed. (ATC leadership drafted an overview of its management needs and information resources to begin identifying monitoring and assessment needs. This is included as Attachment 4.) It was emphasized that a monitoring program must have focused objectives and that "doable" pilot projects would be a way to learn to work together.
- At the conclusion of the workshop, a field trip was conducted by the Blue Ridge Parkway, Resource Planning and Professional Service Division. The trip demonstrated the value of viewshed monitoring with community involvement, especially for keeping track of parcels of land adjacent to or near the trail.

ATTACHMENT 1

APPALACHIAN TRAIL WORKSHOP ATTENDEES MAY 2000

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Charles H.W. Foster
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(781-444-6266)

FAX COVER SHEET

Date: May 3, 2000

To: Vernon (Tom) Gilbert

Address: North Carolina Arboretum
Asheville, NC

Telephone:

Subject: May 3 New England Meeting

Message: Here is a brief summary of what transpired at
Harvard today. You are welcome to share the
contents or even the memo with the other
attendees at the SAMAB working session.

Tom

Charles H.W. Foster
484 Charles River Street
Needham, Mass, 02492
(781-444-6266)

April 28, 2000

Memorandum: Vernon (Tom) Gilbert
From: Charles H.W. Foster

In advance of your May 4-5 SAMAB meeting, you have asked for my views on how funds might be raised for the Appalachian Trail monitoring project described in our Foster/Filipovitch paper (October 1999). Let me respond based on the rough estimates contained in that paper. It is assumed that the actual amounts may change once additional details are developed. Given the need to get the monitoring program better defined, I am going to concentrate on the \$200,000 in front-end funds called for in our paper. This includes \$110,000 to cover the costs of convening four working conferences, three at the subregional level and one held regionally to conform the three individual plans, and \$90,000 to cover the costs of a program coordinator over a two year period.

As for raising the required funds, my previous experience as a national foundation officer leads me to recommend strongly an intermediate step before the inevitable preparation of grant proposals begins. We should identify up front an interested foundation program officer and, when the preliminary subregional planning has advanced sufficiently, ask that individual to host a meeting for other program officers at which advocates could present their aspirations for a Trail-wide environmental monitoring initiative. By convening a number of representatives of philanthropy in one place at one time, any requests we submit will gain the benefit of the officers' collective input, thereby making the ultimate proposal(s) that much more convincing. It will also lead to informal consultation among foundation program officers on how to finance our endeavor. We will then be advised on what to submit, to whom, and when. But going into the foundation "consultation", we should have in mind a number of potential cooperating fiduciaries, one in each subregion and one for the Trail region as a whole. Quite often, foundations will express preferences for certain grant recipients.

As for the major monitoring funds, the bulk will have to derive from existing public sources. Simple reprogramming of existing programs may accomplish some of our objectives, but new fund sources are not beyond the realm of possibility. We will need a coordinating group with high level agency representation to uncover such prospects. Among those that I would recommend exploring promptly are Section 204 of the National Parks Omnibus Management Act of 1998, and a remarkable new EPA authorization termed EMPACT, which some feel could produce \$2 million in support from this one source alone.

Finally, I regret that neither Karen Filipovich nor I can attend your May 4-5 meeting to deliver these thoughts in person. However, we will be working on the program's behalf by convening the first meeting of scientists on a New England monitoring program the day before your session. As promised, I will FAX a brief report on our deliberations to provide New England input for your session.

In sum, I remain enthusiastic about this new venture for the AT and immensely grateful to SAMAB for taking the first step in this latest, important journey.

A handwritten signature in black ink, appearing to be "Hann", with a short horizontal line underneath.



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Appalachian National Scenic Trail
Harpers Ferry Center
Harpers Ferry, West Virginia 25425

June 13, 2000

Loyal Mehrhoff
Endangered Species Coordinator
National Park Service
1201 Oak Ridge Drive, Suite 200
Fort Collins, CO 80525

Dear Loyal:

I apologize for the delay in sending to you the material you requested about the Appalachian Trail(AT). I've been busy getting the AT's rare species monitoring programs underway for the season. I am enclosing our brochure/map on the AT, as well as a land acquisition progress report for the Trail. We have had one of the largest land acquisition programs in the NPS, and today there is only a small percentage of the AT corridor that has not been acquired for the public. As indicated on the progress report, 106,189 acres have been acquired by the NPS specifically for the Appalachian Trail; this acreage excludes the AT corridor that lies within other NPS units. The total acreage protected within the AT corridor is approximately 270,000 acres. Major portions of the AT corridor pass through land held by the U. S. Forest Service and various state parks and forests. Since the land acquisition progress report is broken down by state, you can see that the largest acreage purchased for the AT is in Maine.

I have checked through the natural heritage inventories for the AT in Maine, New Hampshire, and Vermont, and none of the inventories identified the lynx as present. The purpose of these studies was to identify, through field work, rare, threatened, or endangered plants and animals within the AT corridor. (The AT corridor includes all NPS land acquired specifically for the AT, plus a 1000-foot corridor centering on the AT through all other public land.) These inventories gave a greater concentration to identifying rare plants, but some rare animals, especially birds, were identified in the inventories. My background is in natural resource management, planning, and botany, so any work specific to lynx would need to involve other individuals.

As indicated to you by phone, the NPS AT office does not report to any NPS region, though we pass through three NPS regions (Southeast, Northeast, and National Capital). Our office reports to Maureen Finnerty, Associate Director, Park Operations and Education in Washington. Pamela Underhill, AT Park Manager, and I may need to brief Maureen prior to her signature, so please keep us informed.

Since 1989 the AT (both the NPS and the Appalachian Trail Conference, a private non-profit organization) have contracted for natural heritage inventories of the AT corridor in each of the 14 states through which the AT passes. Thus far, 461 natural heritage sites with 1890 rare species occurrences have been identified in 11 states. The 3 remaining inventories are underway this year (New York, New Jersey, and Maryland). About one-half of the state AT inventories were undertaken by the state natural heritage offices and one-half by contracting biologists.

Volunteer monitoring programs for rare species at about 140 sites have been established in 10 of the AT states. Most of the rare species sites are doing well, but some are suffering from trampling, exotic species, gypsy moths, and trail maintenance. We know of one site that apparently succumbed to exotic species, and others have been damaged by AT trail maintenance activities. I am making an effort this year to identify each rare species occurrence that is immediately beside the Trail, and thus subject to Trail maintenance damage, and to provide information about that species and its location to the trail maintainer or their supervisor for that Trail section. There appear to be several hundred occurrences immediately beside the Trail, and I'm still reviewing the natural heritage inventories to identify them.

Other than rare species monitoring, we have not had sufficient staff or time to implement many of the several thousand recommended management actions contained within the AT natural heritage inventories. The NPS AT office has a staff of only 7, including 1 U.S. Forest Service employee; I am the only natural resource employee. In contrast, Shenandoah National Park has 42 FTE in resource management, with a land base smaller than the AT corridor. Though the Appalachian Trail Conference assists us in the management of the AT, they do not have any natural resource staff.

In the next few months, I hope to undertake some priority setting for protecting the 1890 rare species and community occurrences that have been identified along the Trail. I will be seeking the assistance of others, including yourself, in identifying priorities. Should separate priorities be established for NPS and other public land? Should the highest priority be given to federally listed threatened and endangered species, followed by globally rare species, state listed threatened and endangered species, and state rare occurrences? From what I have seen, the national GPRA goals only address federal and state listed species, though it seems to me that protection of globally rare species should have a higher protection priority than state listed species. There are some G1 and G2 species along the Trail that are not federally listed.

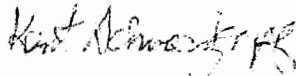
I am enclosing some descriptive information regarding the AT's rare species inventory and monitoring program: 1) an article from the George Wright Society's most recent conference, 2) a January 12, 2000 memo, summarizing the results of the natural heritage inventories thus far completed, 3) a list of federal threatened and endangered species (as you noted, several of these species have their status changed), 4) a list of 318 globally rare (G1, G2, or G3) species occurrences identified within the AT corridor, 5) a summary table of 390 of the 461 natural heritage sites (management recommendations are

incomplete in this summary), and 6) a 1-page summary table for the AT's Inventory and Monitoring Program, broken out by state. Much of this material has been previously sent to Steve Fancy and to Beth Johnson. I can provide you more data, by state, if you wish.

In April of this year, Pamela Underhill, Park Manager for the Appalachian Trail, and I met with Abby Miller regarding adding the Appalachian Trail to the list of park units with significant natural resources, in order that we can compete for inventory and monitoring funds related to the Natural Resource Initiative. It remains to be decided how we will fit into the group of natural resource networks, since we appear to pass through 5 of them. Rare animal inventories for the AT are incomplete and have varied greatly from state to state. Inventories and monitoring beyond rare plants and animals and exemplary natural communities have not yet occurred.

I hope this information about the AT and its rare, threatened, and endangered species inventory and monitoring program is useful to you. Let me know if you have additional questions or information needs. I would be interested in hearing if you have any guidance for prioritizing rare species management actions within the AT corridor.

Sincerely,

A handwritten signature in dark ink, appearing to read "Kent Schwarzkopf".

Kent Schwarzkopf
Natural Resource Specialist

cc: Beth Johnson, NPS

JUL -27-00 5:25PM;

345356270;

ENT BY: ATPO;

DR. CHARLES H. W. FOSTER

King of the FATF

JOHN F. KENNEDY SCHOOL

OF GOVERNMENT

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July 3, 2000

Mr. Kevin A. Peterson, Regional Administrator
Appalachian Trail Conference
18 On the Common, Unit 7
Lyme, NH 03768

Dear Kevin:

Tom Gilbert stopped by from SAMAB last week, leaving behind the copies of the minutes of the Asheville and our meetings. Tom, Karen Filipovich, and I thereupon had a good conversation about future activities. Here is where matters stand with us at present.

Karen is prepared to spend a good part of August and September helping define the New England portion of the monitoring protocol and identifying who might attend a cooperators' meeting in September. We would suggest that either you in New Hampshire or the Environmental Monitoring Cooperative in Vermont host that session. This would give you results in hand to try out on your October New England ATC participants and thence on to the full ATC board in November. The EPA session in Boston appears to be mostly a technology conference.

I have also put to Secretary of Environmental Affairs Robert A. Durand the prospect of Massachusetts serving as the pilot Trail state in New England for environmental monitoring purposes. Although there has been no official response, his assistant secretary for biodiversity and ecosystem protection is keen on the idea.

Finally, we all agreed that it might be time to activate a central *Fund for the Appalachian Trail Environment* (FATF) to provide seed money for planning and convening. I am prepared to do some hustling for such a Fund if Pamela Underhill, Mary Foley, and David Startzell think this is a good idea. I am open to where the Fund might be located, how it should be administered, and what it should be used for, but I am obviously hopeful that monitoring will be its top priority.

All best wishes,

Charles H.W. Foster

ccs: Filipovich, Gilbert
Foley, Underhill, Startzell

read John Tom
MAY 19 2000

Monitoring the Appalachian Trail Environment

Suggested topics for a draft concept document- T. Gilbert

Date: June 15, 2000

1. Introduction

- **purpose and rationale**

Benton MacKaye, father of the Appalachian Trail concept, envisioned the entire Appalachian Trail region as a resource where people could find... "recreation, health and recuperation, and employment". (ref.) This seminal vision was in 1921. Now, 79 years later, the Appalachian National Scenic Trail is recognized as a remarkable achievement, and the Trail is known throughout the world. It extends for 2,160 miles from Maine to Georgia and is protected along more than 97 percent of its course by federal or state ownership of the land itself or by rights-of-way. The Trail is now a unit of the National Park System, managed under an innovative Cooperative Management System with the Appalachian Trail Conference (ATC) and its 31 member trail clubs. Volunteers affiliated with the ATC) have planned, constructed, and maintained the Trail, as well as a system of more than 250 shelters and associated facilities.

Now that land acquisition along the Trail and its corridor are virtually complete and the Cooperative Management System is well established, it is an appropriate time to consider the environmental condition of the areas through which the Trail passes and the sources of many of the environmental problems which affect the Trail and its enjoyment. The idea for a comprehensive monitoring program of the Appalachian Trail, a "new exploration" of the Appalachian Trail has been proposed¹. This program would focus on monitoring and assessing the health of the areas through which the Trail passes to gain better understanding of the human/natural relationships which enhance or degrade these environments, and promote actions to protect them. Such a program would assist the Appalachian National Scenic Trail authorities to carry out their cooperative mission to... "*preserve and provide for the enjoyment of the varied scenic, historic, natural and cultural qualities of the areas between the states of Maine and Georgia through which the Trail passes*". The program would assist the Cooperative Management System in carrying out its purpose to "*provide for maximum outdoor recreational potential of the extended Trail and for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the areas through which the Trail passes.*" (ref.)

¹ Charles H.W. Foster and Karen E. Filipovich first proposed this "new exploration" in a paper titled Monitoring the Appalachian Trail Environment: A New Exploration. Both are faculty at the Harvard University Kennedy School of Government. It is with Dr. Foster's encouragement and at the suggestion of participants in a May 2000 workshop about this concept that SAMAB takes the lead in advancing and refining the concept, the purpose of this paper.

Initiation of a comprehensive regional monitoring program is important because the recreational potential of the Trail and the nationally significant scenic and natural qualities through which the Trail passes are seriously threatened by a variety of environmental problems. Air quality is a matter of particular concern, for air pollutants have significantly decreased visibility along the Trail. They have adverse effects on the environment and human health. In addition to causing direct damage to forests, these pollutants increase susceptibility to insect infestations and disease. The Great Smoky Mountains National Park, a key barometer of the southern Appalachian region, has experienced a rapid increase in unhealthy ozone levels in the last decade. Water quality has also worsened in many areas, and there is an invasion of exotic plants and insects that negatively impact the AT environment. Approximately 40% of Forest Health Monitoring plots in the southern Appalachians contained exotic plant species (ref.)

There could be many social, scientific, recreational, and economic benefits for taking a more collaborative and comprehensive approach to determine what is at risk in the Appalachian regional environment and to generate actions with the support and cooperation of people who live in and around the region to protect the environment. Such a program would benefit all people who live in, or who visit the Appalachian region. The Appalachian Trail, and its Cooperative Management System, can provide the sense of cohesion and common purpose to achieve this broad mission. This paper suggests how such a program can be designed.

2. Definitions (ecosystems, ecosystem management, monitoring, assessment etc.)

3. Development of a Collaborative Program (coordinated planning and development by key AT authorities and collaborators, perhaps through a series of workshops)

- **determination of scope and participation** (regional and sub-regional components organized around the AT corridor and protected lands)
- **assessment of existing activities and determination of management needs by participants** (process underway but needs systematic approach)
- **determination of organizational structure, protocols and standards** (re: protocols and standards- U.S. Forest Service has offered to collaborate, helping to provide consistent data collection methods and standards, enabling participants to evaluate status, trends, conditions at multiple scales and comparisons among geographic areas. See letter from R. Guldin.)
- **development of an Appalachian regional information system** (see SAMAB proposal- discuss how a regional system might be organized to serve purposes of this program and all participants)
- **development of training and educational components** (refer to interest by colleges and universities and benefits to the program + to them through common purpose and useful information systems. An additional volunteer resource)
- **development of funding strategies and priorities**
- **initiation of pilot projects in sub-regions (two year projects)**
- **development of regional program**

4. Some requirements for successful collaboration (agreement by participants about purpose and goals, strong appreciation of the importance of collaboration, agreement about leadership, organization and roles, incentives for participants, etc.)

5. Conclusion

6. Next steps

A Conceptual Plan for Monitoring and Assessing the Appalachian Trail Environment

November 8, 2000

We present here a conceptual plan for monitoring and assessing the status of the Appalachian environment, with a focus on areas traversed by the Appalachian Trail (AT). With the Trail and surrounding environment threatened by potentially serious conditions ranging from air pollution to telecommunication towers and invasive pests to trail access, the managers of the trail and areas it traverses, including local jurisdictions, need the information, the access to information, and the educated public this program offers. Specifically, the program aims to make existing information about trends in the area's environmental health widely available and usable, and it will expand existing monitoring activities and fill in the gaps to produce additional, critical information about the health status of the Appalachian Trail environment. The program will be carried out through the cooperation of many partners—universities and resource management agencies and groups, including the Appalachian Trail Conference and the National Park Service. The program will build this partnership using the model of the AT's Cooperative Management System, and will be carried out with a corps of volunteers recruited from and led by experts from university campuses and other groups. The outreach to these groups and the educational benefit that will accrue through their involvement in the monitoring can have a lasting effect on the conservation of the AT and its surrounding environment as a public resource.

1. Program Goals

This document describes a conceptual plan for monitoring and assessment of the Appalachian environment with a focus on areas traversed by the Appalachian Trail (AT). The concept[†] is in support of the mission of the Appalachian Trail authorities “to preserve and provide for the enjoyment of the varied scenic, historic, natural and cultural qualities of the areas between the states of Maine and Georgia through which the Trail passes.”¹

The AT, an internationally significant achievement, is seriously threatened by deteriorating environmental quality

The Appalachian Trail

In 1921, Benton MacKaye, architect of the Appalachian Trail concept, envisioned the entire chain of Appalachian Mountains as a resource where people could find recreation, health and recuperation, and employment. In some respects, a significant part of his vision has been achieved, as the Appalachian National Scenic Trail is now a reality enjoyed by people from around the world. It is estimated that over 3 million people use the Trail annually. The Trail now extends for 2,167 miles from Maine to Georgia and is protected along more than 97 percent of its course by federal or state ownership of the land itself or by rights-of-way. It is managed as a unit of the National Park System under an innovative Cooperative Management System in which the Appalachian Trail Conference (ATC) and its 31 member trail clubs and volunteers have planned, constructed, and maintained the Trail and a system of more than 250 shelters and associated facilities.

Send comments and suggestions to
vgilbert@mindspring.com
and rsturner@utk.edu

[†] The concept, as initially proposed by Charles H.W. Foster and Karen Filipovich of Harvard University's John F. Kennedy School of Government, was entitled *Monitoring the Appalachian Trail Environment: A New Exploration*. Since the concept was first proposed in 1999 several meetings have explored the feasibility and utility of the concept, and it is with the permission and encouragement of Dr. Foster and Ms. Filipovich that this paper is prepared to update and advance the proposed program.

of the areas through which the Trail passes. Concern is not just for the Trail corridor itself, but also for the surrounding region and the integrity of the "Appalachian experience" sought by trail users, residents, and other visitors to the region.

Air quality is a matter of particular concern. The title of a recent *Appalachian Trailway News* article describes the situation: "Hikers come to the Appalachians for clean air and inspiring views. But air quality is worse than ever, and increasingly they find that the vistas have vanished in the haze."² When the vistas are not obscured by haze, they are increasingly being encroached upon by development, such as homes, highways, and communication towers.

Pollutants are causing direct damage to some plant and animal species, and increase the susceptibility of the forest to insect infestations and disease. In addition to causing damage to certain plant and animal species, ozone poses a health hazard to humans, particularly children, elderly people, and those with respiratory problems. Over the last several years, the Great Smoky Mountains National Park, a key barometer of the southern Appalachian region, has experienced a rapid increase in the occurrence of ozone levels harmful to human health. Water quality has also worsened in many areas, and a variety of exotic plants and insects have invaded and negatively impacted the Appalachian environment. Approximately 40% of Forest Health Monitoring plots in the southern Appalachians contain exotic plants.³

Such environmental problems interact to form a spreading matrix of trouble that cannot be dealt with by traditional means. There is urgent need to develop a comprehensive, regional understanding of the nature and extent of the problems, from which an ecosystems approach can be used to address the problems. A more informed and participatory public will also be necessary if the goal of restoring environmental quality is to be achieved. Accordingly, while the primary activity of this program would be environmental monitoring, an equally important component would be active public involvement and environmental education.

The Cooperative Management System provides a good model for developing a collaborative monitoring initiative. The System has demonstrated the means and techniques to help bring together people and organizations interested in monitoring. The capability to carry out a monitoring program could be developed through partnerships with scientific and educational institutions and regional programs such as the Southern Appalachian Man and the Biosphere (SAMAB)

The Appalachian Trail Cooperative Management System

Under the authority of the National Trails Systems Act (1968) and its amendments, the Secretary of the Interior (represented by the National Park Service) has the responsibility for administration of the Trail in consultation with the Secretary of Agriculture (represented by the Forest Service). In 1984 a NPS agreement was signed with the Appalachian Trail Conference, which delegated management authority to the Conference and in turn to the 31 trail clubs. (In 1999, 4,200 volunteers worked 180,000 hours on the Trail.) The Cooperative Management System for the AT, which has evolved to include more than 100 partners, extends the partnership concept and preserves the tradition of flexibility. It is the mission of the Appalachian Trail Park Office to foster the Cooperative Management System in order to accomplish its goals.

Definitions

Monitoring: The periodic and systematic measurement of change of an indicator.

Assessment: The evaluation of trends in time and geographic distribution of an indicator, as well as an evaluation of relationships (including potential cause and effect relationships) among indicators.

Indicator: A measure (measurement) of conditions or processes that communicates information about the status of something of interest, and, when recorded over time, can yield valuable information about changes or trends.

Ecosystem: An interconnected community of living things, including humans, and the physical environment within which they interact. The ecosystem approach is a method for sustaining ecosystems and their functions and values based upon common goals and collaboratively developed means to achieve desired future conditions.

Program. The idea would be to design a synergistic effort combining volunteer activities, university studies, and programs of organizations and institutions with outstanding credentials in science and technology. Such a program would strengthen the capability of the Cooperative Management System to “provide for maximum outdoor recreational potential of the extended Trail and for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the areas through which the Trail passes.”¹ Achievement of this goal would benefit all people who live in, or visit, the Appalachian region.

2. Plan

a. Identification and evaluation of existing monitoring efforts

Many research and environmental monitoring programs are already conducted by public and private authorities throughout the Appalachian region. There is an opportunity to link these efforts, and in doing so to create a more synergistic and effective force to deal with the growing environmental problems. The Southern Appalachian Assessment—a collaborative effort among federal agencies, state agencies, universities, special interest groups, and private citizens—concluded in 1996 that the present state of environmental monitoring was inadequate in many areas, and that a larger systematic, comprehensive program was needed.⁴

In 1999 the Research and Monitoring Committee of the SAMAB Interagency Cooperative took steps to promote more interaction among researchers in the agencies and in the academic community by developing a list of the research and monitoring activities that are occurring in the region.

In a similar manner, the Appalachian Trail monitoring project would identify research/monitoring programs that might wish to participate in or collaborate with the proposed environmental monitoring activity. For example, academic institutions with an interest in the proposed program might contribute to the National Park Service natural heritage inventorying. This program, which was started in 1988, conducts natural heritage inventories to identify, record, and monitor rare, threatened, and endangered plant and animal species and exemplary natural communities found along the Trail corridor. This program is designed to guide future land management decisions and to educate the Trail communities about the ecological significance of Trail lands.⁵

What should be monitored?

The resources that make up the natural environment of the Appalachian Mountains are at the core of the Appalachian Trail experience. Accordingly, the status of these resources, as well as human activities that affect them, should be monitored.

The resources to be monitored include, generally, air quality, water quality, vegetation, and biotic resources. Examples of human activities that affect the Trail environment include development that affects viewsheds and access.

The determination of what, specifically, is to be monitored will be based on management needs and what the subregions that will carry out this program define as important. The determination will also be influenced by existing efforts and the resources and capabilities of the participants, as the program seeks to capitalize on these factors.

b. Collaborative development of an Appalachian Regional Information System

An initial organizing activity would be the development of an Appalachian Region Information System (ARIS). This system would focus on the AT corridor and adjacent lands from Maine to Georgia. As a distributed information system, ARIS would make use of existing information sources to the extent possible by coordinating data-collection, archiving, and presentation activities. Users with web browsers would be able to use ARIS to generate and view maps, charts, and reports about historic and present natural resource use, environmental conditions, and development impacts throughout the Appalachian range. ARIS would support data integration to answer specific questions of the AT management authorities and the Cooperative Management System, including the broad spectrum of scientists, planners, educators and students, decision-makers at all levels, stakeholders, hikers, and other resource users. ARIS would display real-time monitoring data and information about current and forecast weather, air quality, and trail conditions.

c. Organizational structure, procedures and standards

A flexible organizational structure for a collaborative regional monitoring program is needed since most of the participants already have established organizational structures, procedures, and standards. It is desirable that a project coordinator should be employed by the Appalachian Trail Park Office to help guide the development of the project by working closely with leaders of the sub-regional sections.

After endorsement of the concept by the Trail authorities, the next step would be to invite interested parties from the community of federal agencies, state and local governments, academic institutions, and the private sector to join in planning and development of the project. Most of the planning would be done in the three or four sub-regional sections of the AT environment.

The AT monitoring initiative should be developed using approved protocols, standards and guidelines such as those developed by the Forest Health Monitoring, and the Forest Inventory and Analysis programs of the U.S. Forest Service. These programs collaborate with a large number of State agencies and non-governmental organizations in inventory and monitoring activities. The Forest Service has offered to collaborate in providing consistent data collection methods and standards—including their field manuals and quality assurance control procedures.

Steps in the Development of an Appalachian Regional Information System

An Appalachian Regional Information System (ARIS) would make existing information widely available and easily usable. To develop an Appalachian Regional Information System the following activities must occur.

- *Identify existing information systems with significant Appalachian data holdings*
 - *Identify organizations currently collecting or planning to collect relevant data*
 - *Identify major GIS activities that cover the Appalachians and particularly the Trail corridor*
 - *Determine organizations interested in the proposed collaborative effort*
 - *Hold focus group meetings of potential partners and users to prioritize data themes for ARIS integration and to identify the important data gaps*
 - *Develop cooperative agreements*
 - *Determine implementation phases*
-

A program of monitoring and assessment of the AT environment would benefit from and contribute to national objectives of developing indicators for the conservation of ecosystems, and in research to improve the effectiveness of indicators. Participation of the AT project in these national initiatives could also help advance the development of internationally agreed criteria and indicators for conservation and sustainable management of ecosystems.

The establishment of a broad, resource-monitoring program for the AT is in keeping with recent national attention given to inventory and monitoring in the NPS. The 1998 National Parks Omnibus Management Act gives the most explicit direction to date regarding inventory and monitoring in NPS areas: "The Secretary shall undertake a program of inventory and monitoring of National Park System resources to establish baseline information and to provide information on the long-term trends in the condition of National Park System resources. The monitoring program shall be developed in cooperation with other Federal monitoring and information collection efforts to ensure a cost-effective approach."

In August 1999 NPS Director Robert Stanton announced a five-year action plan called the Natural Resource Challenge." Among the specific thrusts of the Natural Resource Challenge are: 1) expand efforts to monitor and understand air quality in parks, 2) monitor and protect park waters, watersheds and aquatic life, 3) monitor changes in the condition of park natural resources, 4) collaborate to acquire, apply, and disseminate scientific knowledge in pursuit of natural resource goals, 5) facilitate broad scientific inquiry for the betterment of both parks and society, and 6) expand and improve opportunities for the public to enjoy and learn about park natural resources and their preservation. Unlike earlier efforts to increase the attention given to inventory and monitoring in the NPS, the Natural Resource Challenge will provide funding to all NPS units with significant natural resources. In 2000 the AT was designated as one of approximately 265 NPS units to possess significant natural resources, enabling it to be incorporated in the NPS Natural Resource Challenge.

3. Implementation strategies

a. Sub-regional components

The project will require coordination region-wide, but planning for specific monitoring activities and collection of

AT Monitoring Program Helps to Meet National Objectives

*The AT Monitoring Program aims to contribute to national objectives, including the Trail's objective of preserving the scenic, historic, and cultural qualities of the Trail area and public agencies' objectives to work more closely with the public. Using widely accepted and approved protocols, standards, and guidelines allows the monitoring to help to meet ecological monitoring objectives embodied in the National Research Council's 1999 Report, "Ecological Indicators for the Nation" and the Inter-agency Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (known as the Montreal Process).^{6,7} It is also consistent with the prototype laid out in the H.J. Heinz III Center report, *Designing a Report on the State of the Nation's Ecosystems*,⁸ which provides a framework of indicators to describe the extent of U.S. ecosystems, the human uses of those systems, and their basic condition. This report draws data from public and private sources to describe croplands and forests, and coasts and oceans, and in 2001 will also include arid lands, rangelands, cities and suburbs.*

existing monitoring data will occur at the sub-regional level. The principal sub-regions of the Trail are New England, the mid-Atlantic, and the southern Appalachians. Careful thought and attention will be required in determining the boundaries of the target region.[†] To monitor and assess environmental health as described above, ecosystems need to be characterized and monitored at very large scales. The boundaries for particular ecosystem monitoring efforts would be determined by the participants in each sub-region based upon what they decide they want to accomplish, or the problems they want to solve.

b. Funding

Funding to plan and implement the project is expected to be derived through a number of sources. The ATPO has agreed to provide funding from its Challenge Cost Share Program to employ a person to facilitate the planning and coordination of the monitoring project. The work of the coordinator will include development of funding strategies. These strategies are expected to be diverse and may include the following:

1) Concentrate on securing funds to cover the costs of several working conferences at the sub-regional level, and one held regionally to coordinate the individual plans.

2) Identify an interested national foundation program to host a meeting of other foundation program officers at which the plans for the monitoring initiative can be presented. Through this approach some overall strategy for funding from foundation sources might be developed.

3) Pursue funds rationally from federal agency sources, such as EPA's Empact program, and the NPS Natural Resource Challenge Program.

4) Use in-kind and volunteer labor wherever possible and available.

c. Progress

Steps taken to advance this concept already are underway and are discussed in an appendix to this paper.

References

¹ National Park Service, *Strategic Plan for the Appalachian National Scenic Trail Long-term Goals for Fiscal Years 2001-2005*. Appalachian Trail Park Office, Harpers Ferry, West Virginia, April 2000.

² Glenn Scherer, "Vanished in the Haze," *Appalachian Trailway News*, March-April 2000.

³ Southern Appalachian Man and the Biosphere Program (SAMAB), *Forest Health Monitoring Program*, TVA Forest Sustainability Initiative (in Cooperation with the National Forest Health Monitoring Program and SAMAB), Knoxville, Tennessee, 1996

⁴ Southern Appalachian Man and the Biosphere (SAMAB) Cooperative, *Southern Appalachian Assessment*, SAMAB, Knoxville, Tennessee.

⁵ Kent Schwarzkopf, "Inventory and Monitoring Program along the Appalachian Trail," In *Parks and Public Lands, The 1999 George Wright Society Biennial Conference*, George Wright Society, Hancock, Michigan, 1999.

⁶ National Research Council, 2000. *Ecological Indicators for the Nation*, the National Academy Press, Washington, D.C.

⁷ Canadian Forest Service, 1995. *Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests- The Montreal Process*. Quebec, Canada

⁸ H.J. Heinz III Center for Science, Economics and the Environment, *Designing a Report on the State of the Nation's Ecosystems: Selected Measurements for Croplands, Forests, and Coasts & Oceans*. The Heinz Center, Washington, D.C., 1999.

[†] For example, it may be desirable to have an additional working conference for the metropolitan New York sub-region (portions of Connecticut, New York and New Jersey) where special problems and institutional capabilities exist.

Appendix
Progress in Program Development and Implementation
Conceptual Plan for the Monitoring of the Appalachian Trail Environment:
November 2000

Two meetings and several informal discussions have been held to explore the potential for a comprehensive program to monitor the Appalachian Trail environment.[†] These meetings and discussions have provided a means for interested participants, including representatives of the National Park Service, the U.S. Forest Service, the U. S. Fish and Wildlife Service, the Environmental Protection Agency, the Appalachian Trail Conference, and other interested groups and individuals to explore the potential for utilizing the Appalachian Trail and associated lands as a focus for monitoring a variety of environmental health indicators and as a “classroom” for environmental education.

Participants in these meetings agreed that the Trail could have great value as a “barometer” in monitoring the Appalachian regional environment, and as an ecological transect, and that the Trail has unique value because of its significance and wide recognition.

Meeting participants agreed that ascertaining what monitoring is already occurring and determining how existing programs can better meet management needs are the first steps in deciding what elements of the AT environment should be monitored. They pointed out that a large amount of environmental data on some issues already exists, but that there is need for greater collaboration in organizing, interpreting, and using this data as a basis for deciding natural resource policies and management approaches.

It was felt that the supplemental monitoring that the proposed program would involve could be carried out, under proper standards and supervision, by new volunteers interested in the Appalachian environment, and by doing so would prevent the imposition of an additional burden on existing AT volunteers. The volunteers’ activities would both expand the knowledge base and educate Trail users about the environment they encounter.^{††} Based upon interest expressed to date by university professors and students, it is likely that representatives of many of these institutions would be willing to participate in an organized program. In a cursory survey, SAMAB staff has identified more than 400 universities and colleges within 100 miles of the Trail, many of which have Appalachian studies and/or environmental science programs.

It was pointed out that most government agencies have mandates to increase citizen involvement, and that many research sites/programs are encouraged to broaden their efforts to regional contexts, so participation in the proposed monitoring program would help accomplish these goals.

The timing of the proposed project was considered appropriate because the ATC is currently involved in strategic planning, and the Appalachian Trail Park Office had just revised its Strategic Plan in April 2000. This plan describes Long-term Goals for Fiscal Years 2001-2005,

[†] Two meetings were held in early May 2000. One in Asheville, North Carolina was co-hosted by SAMAB, the ATC, and the Appalachian Trail Park Office (NPS). The second at Harvard’s Kennedy School of Government was hosted by Dr. Foster. A summary of both meetings is available on the SAMAB web site at <http://www.samab.org/projects/atwrksum.pdf>.

^{††} It was suggested that a new designation, “Volunteers in Monitoring” (VIMs) might give the activity a measure of stature and prominence.

one of which is to acquire GIS and other natural resource data, and to perform analyses to assist in the identification of vital signs for natural resources in the AT corridor.

A cooperators meeting in October 2000 began work to define the New England portion of the monitoring protocol. A planning meeting for the Southern Appalachian sub-region held in September 2000 explored prototype activities that could be built into pilot monitoring project. A summary of the Southern Appalachian meeting is available at <<http://samab.org/Projects/at-project.html>>.

A.T. ENVIRONMENTAL MONITORING PROGRAM

Issue: A proposed environmental-health monitoring program centered on the Appalachian Trail and adjacent lands.

Background: About two years ago, the former chairman of the Appalachian National Scenic Trail Advisory Council (ANSTAC), Hank Foster, proposed in a letter to Dave Field and Pam Underhill that ATC and NPS join experts in the scientific community in using the land base that has been acquired via the federal A.T. land-acquisition program as a focus for an environmental-health monitoring program of some kind. In the spring of 2000, ATC and NPS were again approached by Foster and a colleague of his, Tom Gilbert, who is affiliated with the Southern Appalachian Man and the Biosphere (SAMAB) program, about the environmental-monitoring concept. SAMAB, which is involved in monitoring a variety of environmental-health indicators in the southern Appalachian biosphere—one of several global biosphere areas recognized by the United Nations—had gained some notoriety some years ago for assembling data in a publication called the *Southern Appalachian Assessment*. SAMAB draws on resources from a number of federal and state agencies (including USFS and NPS), as well as a variety of universities.

Later in the spring, Gilbert and SAMAB Executive Director Robb Turner visited Harpers Ferry and met with Startzell, Dave Field, Brian Fitzgerald, and members of the ATC staff. They described further the various programs and activities sponsored by SAMAB and expressed their strong interest in engaging ATC and possibly the cadre of volunteers involved in the A.T. project in some kind of environmental-monitoring and education program. Startzell, Field, and Fitzgerald, while expressing some interest in the proposal, asked the SAMAB representatives to respond to several questions, including: What data or indices related to environmental health are they interested in monitoring? Why did they believe the A.T. corridor and related lands are an appropriate focus for such monitoring? And, what role do they envision A.T. volunteers (and ATC staff) playing in an environmental-monitoring program?

In May, ATC and NPS representatives were invited to participate in a one-and-one-half-day workshop to further explore the concept of an A.T. environmental-monitoring program. This meeting was held in Asheville, North Carolina, at the North Carolina Arboretum in conjunction with the spring meeting of the SAMAB leadership group. Several members of the ATC staff and southern Board members participated in that meeting. Some months following the meeting, SAMAB developed a draft concept paper outlining its vision of an A.T.-centered environmental-monitoring program. That concept paper was provided to the Board at the November meeting.

Later in the summer, Foster and a colleague from Harvard University, Karen Filipovich, organized a similar meeting to consider environmental-monitoring efforts in the New England region. Kevin Peterson attended that meeting, representing ATC.

In early September, SAMAB sponsored a follow-up meeting in Asheville. By that time, the SAMAB Foundation already had endorsed the A.T. monitoring concept and had authorized its staff to devote some attention to pursuing the idea. Underhill participated in that meeting, but no one from ATC was available to participate. As an outgrowth of that meeting, Underhill made a tentative commitment to allocate \$30,000 from 2001 NPS cost-share funds to support the monitoring program in two ways: (1) hiring a part-time coordinator (Tom Gilbert) and (2) supporting the development of a computer database capable of serving as a repository of environmental data and a means of sharing that data among interested users.

At its October 1 meeting, the Executive Committee was informed of those developments and asked to indicate its interest in the project. In general, the group acknowledged that the concept required further refinement. However, in general, the group was supportive, particularly if the initial refinement of the program concept would not require significant amounts of staff or volunteer time or expenditures of funds.

Following the Executive Committee meeting, another meeting related to the environmental-monitoring concept was held in late October in Lyme, New Hampshire. At that meeting, both ATC and NPS were represented. In addition, a number of other groups participated, including the Appalachian Mountain Club, The Nature Conservancy, and various other groups that have active research programs related to mountain environments in that region. The group appeared in general to feel that, while the A.T. might not be an appropriate engine for driving environmental-health research, certainly the A.T. traverses many areas where research related to such issues as air quality, acid-rain deposition, alpine tundra, and other sensitive habitat is being collected. The group also acknowledged that the "icon status" of the A.T. in terms of public recognition could provide an opportunity to make more people aware of trends affecting eastern mountain environments.

The environmental-monitoring concept was discussed briefly at the November Board of Managers meeting.

Recent Actions: Following the November meeting, discussions continued between Underhill and SAMAB's Gilbert and others. In late February, a "brainstorming session" was hosted by Underhill at her home near Shepherdstown to further explore the concept. Several representatives of SAMAB, former ATPO Manager Dave Richie, ATPO and ATC staff members, and others participated in that meeting. Later, in mid-March, Gilbert again returned to Harpers Ferry for a meeting with ATPO and ATC staff members to discuss the environmental-monitoring concept, a draft work plan for the next year or two, and the concept of forming an advisory committee. Brian Fitzgerald participated in those discussions via speaker-phone. One outgrowth of those discussions was a recognition that the monitoring initiative could assist ATPO in developing a resource-management plan for the A.T., which it has been considering for some time. In that regard, Underhill indicated that she would be asking resource specialist Don Owen to play a more active role in the initiative as ATPO liaison. Kent Swartzkopf also may play a role in some aspects.

Based on the tentative work plan, it now appears that the first year or so of the project is likely to be devoted to identifying existing data and gaps in that data, defining the types of data and monitoring that may be appropriate, and identifying prospective partners from both the public and private sectors. The idea of forming an advisory committee also will be explored further. Indications are that ATC will be asked to appoint one or two representatives to the advisory committee.

A brief presentation and discussion of the concept also occurred at the Southern Regional Management Committee meeting in late March.

Board Action Required: Discussion as desired. The revised 2001 operating budget does not include any specific allowance for the development of an environmental-monitoring program. However, it is likely that, as the concept undergoes further refinement, staff members and some volunteers or Board members may participate in more discussions, meetings, review and comment on concept papers, and the like. It also is possible ATC may be requested to assist in fund-raising to support certain aspects of program.

INVASIVE EXOTIC SPECIES

Issue: Control of invasive exotic (nonnative) plant and animal species along the Appalachian Trail.

Background: Invasive exotic species have been around the Appalachian Mountains longer than the Appalachian Trail. Beginning in the 1920s and 1930s, the chestnut blight and Dutch elm disease destroyed as much as 20 percent of the forest canopy along the chain. Later arrivals, such as the gypsy moth and balsam woolly adelgid, continue the assault.

Probably the most widespread identification of invasive exotic species along the Appalachian Trail began in 1989, with the undertaking of the Appalachian Trail natural-heritage inventories. Those state-by-state reports identified invasive exotic plant and animal species because they frequently represented a threat to populations of rare plants and animals found along the Trail. For example, in the Pennsylvania and North Carolina/Tennessee studies, insect pests such as the gypsy moth and balsam woolly adelgid were identified as threats. Purple loosestrife, phragmites, garlic mustard, European barberry, and Japanese honeysuckle were identified as threats in the Connecticut study. The most extensive identification of exotic species along the A.T. occurred in the Virginia survey, where exotic species were documented as a threat to 51 of the 74 identified sites. Invasive exotics noted in that study included garlic mustard, Japanese knotweed, Chinese lespedeza, purple loosestrife, Johnson grass, multiflora rose (promoted heavily to farmers earlier in the century by USDA), balsam woolly adelgid, hemlock woolly adelgid, and gypsy moth.

Discussion: Much remains to be learned about the presence and extent of invasive exotic species along the A.T. However, it is becoming increasingly evident within the scientific community that invasive exotic species represent one of the most significant threats to biodiversity worldwide, second only to habitat loss. This threat is recognized by the federal government, which has formed an interagency task force to address the problem. The Trail environment is no exception. From Georgia to Maine, invasive exotic species are threatening to displace native species—and, in some cases, rare species—from their habitats.

Eradication of most invasive exotic species is next to impossible. Most are firmly established as part of the ecosystem, some are favorites of many people, and even draconian solutions would not eliminate them. Even control is difficult in many cases, especially in an area as lengthy and exposed as the Appalachian Trail. What can the Appalachian Trail Conference, its member clubs, and its agency partners do when faced with such a task?

ATC could undertake several actions short of a massive investment of time, energy, and funds. Actions to control invasive exotic species have the greatest chance of success in relatively small, targeted areas. ATC could establish criteria for when and where it would devote funds and volunteer and staff time for control of invasive exotic species. In addition, ATC could develop policy guidelines and join forces with other groups interested in protecting native species and limiting the impact of invasive exotic species on the environment of the Appalachian Trail.

Recent Actions: The Trail and Land Management Committee discussed the draft policy at its March meeting. The committee recommends that the draft be published in *The Register*, shared with club presidents, and discussed at the fall regional management committee meetings.

Board Action: Discussion of the proposed draft policy (next page).

Draft Policy on Invasive Exotic Species

The Appalachian Trail Conference and its member clubs recognize the potentially adverse impacts of invasive exotic plant and animal species upon the ecosystems through which the Trail passes. Proliferation of these species may significantly alter the natural communities along the Trail and threaten biodiversity.

ATC's program to control or eliminate invasive exotic species will consist of the following elements:

- Education – ATC will incorporate information on invasive exotic species and the threats they present into its public-information efforts. As part of this effort, the Conference will seek to raise the collective awareness of its members, volunteers, and staff regarding the potential harm caused by invasive exotic species and methods that can be employed to control them effectively.
- Monitoring – The occurrence and spread of invasive exotic species will be monitored as resources permit. Priority will be given to those areas where threatened and endangered species are at risk and in natural communities that are most vulnerable to invasion.
- Control – Invasive exotic species will be controlled to the extent feasible, with priority given to those areas (1) where invasive exotic species have the potential to do the greatest harm and (2) where actions to control invasive exotic species will do the greatest good and have the highest likelihood of success. The Conference will work with its agency partners and member clubs to identify areas where rare plant or animal species or natural communities are threatened by invasive exotic species and assist in developing and implementing plans to control or eradicate invasive exotic species from those areas. Control methods that have adverse impacts on non target species will be avoided. Such methods will only be used where there is a clear, long-term benefit to the natural community or its component species.

AIR QUALITY ISSUES AND THE A.T.

Issue: ATC's participation in legislative activities related to air quality.

Background: In mid-summer 2000, Board member Glenn Scherer contacted Dave Startzell regarding his interest in air-quality issues and his desire to see ATC become more engaged in that issue. He asked Startzell about an appropriate mechanism for bringing the issue to the attention of the Board. Startzell suggested that a good place to start would be developing some sort of issue or concept paper for consideration by the Executive Committee, which also now serves as the *de facto* external-affairs committee. Noting that ATC traditionally has maintained a relatively narrow focus in its activism, Startzell also suggested that it might be worthwhile to discuss the issue at the fall regional management committee meetings in the mid-Atlantic and New England regions. Finally, Startzell suggested that Scherer discuss this approach with Dave Field.

Scherer did follow up with Field and also developed an issue paper for Board and regional management-committee consideration. That issue paper was shared with the Executive Committee at its meeting on October 1. In general, the Executive Committee found Scherer's presentation compelling and offered conceptual endorsement of his proposal that ATC join other conservation organizations, including a new hikers-for-clean-air coalition, in supporting appropriate legislation. However, the group felt that it was inappropriate at this time for ATC to endorse any specific piece of legislation until the staff had an opportunity to review the legislation. It also was noted that, since the congressional session was nearly at its end, it was not likely that any air-quality legislation would receive serious consideration before 2001.

Abbreviated issue papers related to the air-quality issue also were included in the briefing materials for the mid-Atlantic and New England regional meetings. Scherer provided a presentation at the mid-Atlantic meeting, and limited discussion time was provided at the New England meeting as well. At the conclusion of Scherer's presentation, Startzell asked for a show of hands among the participants in the mid-Atlantic meeting indicating how many believed it was appropriate for ATC (and Trail-maintaining clubs) to support legislation related to air quality. Virtually everyone in the room expressed support for such participation. Most of the participants in the New England regional meeting appeared to have a similar reaction.

In November, the full Board was apprised of the issue and provided with a copy of Scherer's issue paper. Caution, wariness of new time commitments, and a careful reading of legislation was advised, while many agreed the topics deserve attention as they relate to the Trail experience.

Recent Actions: Since November, a Hikers for Clean Air "listserve" has been created (by Walt Daniels) on the Internet. That group includes representatives of the Adirondack Mountain Club, AMC, NY-NJ Trail Conference, and the American Hiking Society. At this point, it is not clear if ATC is considered a formal member of that group. However, Startzell is on the listserve and does receive periodic updates and exchanges among its members.

In November, the staff had indicated that it would undertake a review of legislation related to air quality that had been considered in the previous session of Congress, as well as any new legislation introduced this year. However, the staff has not yet had an opportunity to conduct such a review and, to the best of its knowledge, no significant legislation related to air quality presently is receiving serious consideration in the Congress, although that certainly could change in the coming months.

Board Action Required: Discussion as desired.

Inventory and Monitoring of Biological Resources On Southern Appalachian National Forests Briefing Paper -- April 2001

Inventory and monitoring of biological resources on national forests has gained emphasis in recent years due to the Forest Service's shift to ecosystem management and numerous legal challenges involving biological diversity issues. Current biological inventory and monitoring programs are primarily directed at two groups of species: 1) management indicator species (MIS), and 2) species with viability concerns, i.e., those species federally listed as threatened or endangered (or proposed for such listing), and species designated by the Forest Service as "sensitive." Species in this second group are often referred to as PETS species (Proposed, Endangered, Threatened, and Sensitive).

Monitoring MIS Population Trends

Selection of management indicator species for each national forest is required by 1982 regulations (36 CFR 219) promulgated to implement the National Forest Management Act of 1976 (NFMA). During forest planning, MIS "shall be selected because their population changes are believed to indicate the effects of management activities" (36 CFR 219.19(a)(1)). They may be selected from species listed by state or federal governments as threatened or endangered; species with special habitat needs that may be affected by management; species commonly hunted, fished, or trapped; non-game species of special interest; or species that may serve as ecological indicators because "their population changes are believed to indicate the effects of management on other species" (36 CFR 219.19 (a)(1)). MIS are planning tools used to set objectives for habitat, focus environmental effects analysis, and monitor effects of forest plan implementation. Monitoring requirements are explicit: "Population trends of the management indicator species will be monitored and relationships to habitat changes determined" (36 CFR 219.19(a)(6)).

All southern Appalachian national forests have selected MIS under this regulation, although numbers and types of MIS vary (see Attachment 1). Current litigation alleges the Forest Service is not in compliance with the monitoring requirement of 36 CFR 219.19(a)(6). Staffs on all forests are currently compiling data on each of their MIS to demonstrate compliance.

PETS Species Inventories for Project Analysis

Under the Endangered Species Act, the Forest Service is required to ensure its actions do not jeopardize continued existence of a listed species, and to contribute to recovery objectives. In addition, under 1982 NFMA regulations (36 CF 219.19) and USDA Departmental Regulations (9500-004), the Forest Service is required to maintain viable populations of almost all species on national forest lands. To meet these regulations, the Forest Service requires a Biological Evaluation to accompany all Forest Service decisions. The Biological Evaluation analyzes and discloses effects of the decision on PETS species. It is used in consultation with the US Fish and Wildlife Service over listed species where necessary, and is used to ensure that decisions will not cause the loss of viability of any sensitive species.

The Forest Service typically conducts inventories of PETS species or their habitats within project areas in support of Biological Evaluations. All southern Appalachian national forest plans once contained a standard for Biological Evaluations that required: "when adequate population inventory information [for PETS species] is unavailable, it must be collected when

the site has a high potential for occupancy by a threatened, endangered, proposed, or sensitive species.” Following an adverse court ruling related to use of this standard on the Chattahoochee National Forest, two southern Appalachian units (Chattahoochee-Oconee National Forests and National Forests in Alabama) have amended their plans to clarify when PETS species inventories are necessary (see Attachment 2 for full texts of the original and amended standards). Current litigation challenges Forest Service compliance with the original PETS species inventory standard across the region. What constitutes “adequate inventory information” is at issue.

A current list of Forest Service sensitive species for southern Appalachian national forests is attached (Attachment 3).

Monitoring and Inventory in Support of Viability Evaluation

As described previously, the Forest Service is required by both NFMA and USDA departmental regulations to provide for viable populations of existing species on national forest land. Although Biological Evaluations directly address effects of decisions on population viability of sensitive species, the scale at which this analysis is usually done (the project-level) is too small to easily analyze population-level effects. A larger-scale assessment of population status, trends, and threats, supported by inventory and monitoring, is needed.

Questions

Given these legal requirements, the Forest Service is engaged in a variety of activities to answer the following questions:

- What existing sources of data and information are available for assessing trends of current MIS in the southern Appalachians? Who has a mutual interest in monitoring and assessing trends of any current MIS? What are opportunities for collaboration in this effort?
- Which MIS are truly useful as indicators of the effects of national forest management? Which are not?
- Which PETS species need to be inventoried in project areas before implementing typical national forest management activities to ensure their protection? On the other hand, for which species and activities do we understand enough to adequately predict effects and provide protection without conducting project-area inventories?
- For those PETS species needing regular inventories, what are appropriate inventory methods? Should inventory protocols be standardized?
- Who has mutual interest in designing protocols for and/or conducting PETS species inventories? What are opportunities for collaboration in this effort?
- What existing sources of data and information are available for assessing status, trend, and viability of PETS species, or other species at risk, in the southern Appalachians? Who has a mutual interest in making this assessment? What are opportunities for collaboration in this effort?

Forest Service Briefing Paper-Attachment 2:

PROPOSED ACTION

Description of the Proposed Action

The proposal is to amend the Forest Land and Resource Management Plan (Forest Plan) for the Chattahoochee and Oconee National Forests (NFs) to clarify the management direction for conducting biological evaluations (BEs) on proposed projects. A BE discloses the effects of a proposal on proposed, endangered, threatened, and sensitive (PETS) species. Table 1 lists the wording in the amended Forest Plan and the wording of the proposed amendment (slight change from scoping letter).

TABLE 1

Wording of Amended Forest Plan and Proposed Amendment

Existing Direction from Forest Plan Amendments 6 and 8	Proposed Direction to Clarify Requirements for BEs, Which Are Needed to Implement Projects on the National Forest
A biological evaluation of how a project may affect any species federally listed as threatened, endangered, or proposed, or identified by the Forest Service as sensitive, is done as part of the site specific environmental analysis.	A biological evaluation of whether, and to what extent, a management action could affect any species federally listed as threatened, endangered, or proposed, under the Endangered Species Act (ESA), or designated by the Forest Service as sensitive, is prepared as part of environmental analysis for project-level decision making. The procedures for biological evaluations are found in Forest Service Manual 2670, <i>Threatened, Endangered, and Sensitive Plants and Animals</i> .
This evaluation considers all available inventories of threatened, endangered, proposed, and sensitive species populations and their habitat for the proposed treatment area. When adequate population inventory information is unavailable, it must be collected when the site has high potential for occupancy by a threatened, endangered, proposed, or sensitive species. Appendix D identifies potential adverse effects from vegetation management by species. When adverse effects are projected, mitigation measure specified in appendix D and this chapter are used to prevent them.	During the biological evaluation process to identify possible effects, existing available information will be used to determine the PETS species known or expected to occur in the vicinity of the proposed project, or likely to be affected by the action. The information considered may include data on species/habitat relationships, species range distribution, and population occurrences developed from past field surveys or observations. Existing available information considered may also include the amount, condition, and distribution of suitable habitat.

Existing Direction from Forest Plan Amendments 6 and 8	Proposed Direction to Clarify Requirements for BEs, Which Are Needed to Implement Projects on the National Forest
	For some PETS species expected to occur in the vicinity of the project, or likely to be affected by the project, additional field surveys conducted in suitable habitat that is potentially affected by the proposed project are desirable to document the presence or absence of these species. These field surveys would be most appropriate if past field surveys are not available for such areas and if they would provide more definitive information to improve the determination of effects to PETS species.
	However, there are some PETS species and situations where information to determine potential effects to PETS species may not require population surveys. For these situations, the PETS species in question would be assumed to occur in the area, and effects to it would be considered in the effects analysis. These situations occur when: 1. There is a low likelihood of detecting a species; the field survey probably would not provide definitive information for excluding a species from further consideration. 2. Established Forest Plan direction or mitigation, which effectively protects PETS species expected to occur in suitable habitat in the project vicinity, is already in place and is part of the proposed action. 3. Habitat requirements of a PETS species are well known, and (a) there is sufficient evidence that the proposed actions would have only short- or long-term beneficial effects or no effects (no adverse effects) to PETS species, or (b) that any expected adverse effects of the proposed actions would not likely cause a trend to Federal listing or a loss in viability.

Purpose and Need

The recent decision by the United States Court of Appeals for the Eleventh Circuit in *Sierra Club v. Martin* illuminated the need to clarify the management direction for conducting BEs on proposed projects. The Eleventh Circuit essentially interpreted the current provision (see Table 1) as requiring the Forest Service to have population inventory information on all PETS species occurring, or with a high potential to occur, within the vicinity of the project. In hindsight and with the benefit of the Eleventh Circuit's analysis, we now realize that the Court's interpretation is consistent with the clear language of the current provision. Nonetheless, the Court's interpretation is contrary to the Forest Service's own interpretation. Since the provision does not clearly state the Forest Service's intent or support its view of the proper scientific methodology to be followed, it is readily apparent that the current management direction needs to be clarified, or more clearly stated.

As aptly demonstrated by the result in the *Martin* decision, it is critical that the language we use to articulate our intent and methodology be clear and unambiguous. Because the current language setting forth the management direction for conducting biological evaluations on proposed projects does not do this, the provision needs to be amended so that it clearly states the Forest Service's intent and methodology.



United States Department of the Interior

NATIONAL PARK SERVICE

Appalachian National Scenic Trail
Harpers Ferry Center
Harpers Ferry, West Virginia 25425

IN REPLY REFER TO:

July 31, 2001

Beth Johnson
NPS Northeast Region I & M Coordinator
University of Rhode Island
16 Coastal Institute
1 Greenhouse Road
Kingston, RI 02881

Dear Beth,

I wanted to send you a hard copy of several items that should have been sent to you by email or were handed out at the Appalachian Trail Resource Management Plan scoping session in May. I'd also like to provide some comments about the items.

First is the table of Invasive Exotic Species Present at Rare, Threatened and Endangered Species Sites in the Appalachian Trail Corridor. This list was prepared a few months ago, and is the first compilation of the known locations of exotic species along the AT. The list indicates that exotic species are present at 72 of the 516 natural heritage sites along the trail. Since some of the AT natural heritage inventories are more than a decade old, exotic species could now be present at a substantially higher number of sites than this table indicates. The table does give us a starting point for where to begin exotic control efforts.

I'm also enclosing our listing of Rare and Exemplary Natural Communities and Features Along the Appalachian Trail. This list is organized by state and natural heritage site, but it does not yet contain the last 4 states that we inventoried. Nevertheless, I was surprised at the large number of rare or exemplary natural communities found within the A.T. corridor. Quite a few of the states have some globally rare plant communities, some of which are on NPS Appalachian Trail Park Office land. For example, we have acquired considerable subalpine and alpine acreage in Maine, which I believe represents the only alpine acreage within the national park system in the eastern U.S. I hope you will take a look at this list so that we can discuss to what extent we should be monitoring or managing these areas and how they relate in significance to the rare, threatened and endangered species that have been the primary focus of our monitoring and management efforts thus far. To what extent do you believe that these natural communities should be discussed in our Resource Management Plan and be a focus of our resource management efforts? I will also ask Janet Wise, if I ever succeed in reaching her.

The table on Presence or Absence of Rare, Threatened or Endangered Plants and Vertebrate Surveys for the Appalachian Trail Corridor was prepared earlier this month for a presentation I gave at the A.T. Federal Land Managers Meeting. This table indicates that 5 of the 14 A.T. states have had mammal inventories, 10 have had bird inventories, 7 have had reptile/amphibian inventories, and 2 have inventoried fish. You should not assume that a complete inventory was done just because a state is listed as having a particular vertebrate inventory. For example, at the I & M meeting this spring at Richmond National Battlefield, Chris Ludwig of VA Natural Heritage thought that perhaps only 50% of the A.T. corridor in VA was inventoried for vertebrates. In another state, I believe salamanders were the only reptile/amphibian group to be inventoried. Even with vascular plants, some of the earlier inventories, such as Pennsylvania (1990), the inventory was focused on reconfirming previously identified r, t, and e occurrences, instead of surveying the whole corridor. I look forward to discussing with you which of the remaining inventories should be the highest priority for us to complete.

As you talk with other researchers, would you query them as to which vertebrate groups might be the highest priority to inventory within the A.T. corridor and what the cost might be? As I have time, I will

talk with the state natural heritage offices to ask them the same questions. In order to estimate cost, I am enclosing a couple of tables that give the acreages of A.T. land in each state. The Appalachian National Scenic Trail Protection Progress Report table gives the NPS Appalachian Trail Park Office acreage in each state—about 108,000 acres trailwide at present. The A.T. Inventory and Monitoring table gives the total A.T. corridor acreage within each state that has been inventoried—about 269,000 acres—no matter who the landowner is. Our total inventory cost thus far has been \$272,000, or about \$1 an acre. It would be great if we could continue to get these good rates. Depending on the cost and other factors, we may need to limit future A.T. inventories to A.T. Park Office land. We could also ask the Appalachian Trail Conference to continue seeking private funds for inventories.

For your information, I am enclosing a U.S. Forest Service briefing paper on Inventory and Monitoring of Biological Resources on Southern Appalachian National Forests that was handed out at the Resource Management Plan scoping session.

Also, FYI, at the biennial A.T. Federal Land Managers meeting held a few weeks ago, I used some of the power point images from your Inventory and Monitoring talk, to brief the managers on the NPS Natural Resource Challenge and the NPS I and M Program, my first talk on that subject. Thanks for providing the images. Attendees at that group included Forest Supervisors and others from each of the national forests through which the A.T. passes, superintendents and managers from the 6 NPS areas through which the A.T. passes, plus a few state park managers. Dick Ring from WASO was also there. At the meeting, I also gave talks on the A.T. Inventory and Monitoring program and on our Resource Management Plan efforts. We didn't get much feedback on whether the Forest Service thought their A.T. corridor land should be included in the A.T. Resource Management Plan that we prepare. The group had lots of questions, but most of them dealt with the A.T. inventories themselves.

I appreciate your looking this material over and giving me any feedback that you might have. Thanks.

Sincerely,



Kent Schwarzkopf
Natural Resource Specialist

Scott Tibbney?

Appalachian Trail Update – November 27, 2001

Data Mining Effort

The datamining effort for the Appalachian National Scenic Trail began with a search on the web of any relevant information. Due to the nature of the trail (spanning 14 states and narrow area) this proved to be difficult to narrow down organizations or information that is specific just to the trail area. However, through general searches of researchers and organizations contacts are being made and proving helpful.

On March 27, 2002 we had a meeting with Casey Reese from the Appalachian National Scenic Trail. In that meeting we discussed the datamining needs of the Appalachian National Scenic Trail and the use of this data in NPSpecies as well as the possibility of incorporating the TREAD database into NPSpecies. It was determined that the main focus of the datamining should concentrate on the vertebrates (mainly endangered, rare and threatened species), as the Appalachian National Scenic Trail currently feel they have a suitable survey of the vascular plants. The TREAD database (created by the Appalachian Scenic Trail) is based on information about a particular site, rather than species information. Meaning that the information describes the site structure and monitoring rather than the species found within those sites. Although some species are identified, for NPSpecies this information is not useful since there is not status information or references for those species.

Since the Appalachian Trail passes through 14 states, the datamining effort has been to concentrate on one state at a time starting with Maine and working south to Georgia. Using a list of colleges found within 100 miles of the trail (compiled by Jane Johns, SAMAB), I have begun to contact all researchers found within those universities that (based on their websites) seem to be potential candidates for having done research along the trail. All these researchers were contacted via email (see attached contact sheet). This was not very time consuming and overall I feel that I got a good response and leads for other contacts. I am currently in the process of contacting the few that did not return replies or said that they had information to share.

Results to Date

Maine

- Maine Outdoor Heritage Fund
 - Award grants for: Fisheries and wildlife, and habitat conservation projects; Acquisition and management of public lands, parks, wildlife conservation areas and public access, and outdoor recreation sites and facilities; Endangered and threatened species conservation projects; Natural resources law enforcement.
 - They sent me listings of all the grants that have been awarded and to whom they were awarded.
 - I am currently trying to get the reports for all the grants used by the Maine Department of Inland Fisheries and Wildlife (Henry Hilton 207-287-5252)

- Maine Department of Inland Fisheries and Wildlife
 - Sent GAP analysis on CD's, don't know how much help this will be
 - Richard Dressler: (GIS person) (207) 941-4467
 - Has sent a GIS coverage that is supposed to show where all the Endangered, Threatened and Rare species are along the trail and a mile on either side (vertebrates). I have not explored this coverage yet.
 - Need to dig deeper in this organization
 - Walter Jackubas: Mammal Unit Leader (walter.jakubas@state.me.us)
 - His name was given to me by Chris Hoving
 - Henry Hilton 207-287-5252, henry.hilton@state.me.us, contacted 10-22-02 about reports from Maine Outdoor Heritage Fund
- Bigelow Preserve
 - Tom Charles -- Bigelow Preserve -- (207) 778-8231
 - Sent me the Unit preserve plan, contains species lists and contact information
 - Also sent these potential contacts:
 - ballen@LEHMANN.MOBO.ORG -- High altitude bryophytes
 - Don Hudson -- Chewonki Foundation of Wiscasset, investigated subalpine forests at Bigelow
 - Molly Docherty (207) 287-8045 -- Maine Natural Areas Program
- Grafton Notch State Park
 - Steve Curtis -- (207) 624-6076
 - Was not much help, said they have no money for inventory & monitoring and therefore no information
- Baxter State Park
 - Jean Hoekwater -- (207) 723-5140
 - She tried to be very helpful, but is swamped and won't be able to help until August/Sept
 - Said that there was a big moss and lichen study going on
 - She can compile a list of researchers

- Maine Audubon
 - Said to contact Molly Docherty and Richard Dressler (already done) (received 9/20/02)
 - Have replied and requested information on any and all bird species occurring within 1 mile of the trail (9/20/02), they are looking into the possibility

- Christopher Hoving, email: pcrucifer@yahoo.com, phone: 518-624-3314, have received the following information:
 - Lynx and caribou information around trail (historical and recent)
 - Hoving, C. L. and W. B. Krohn. In Press. Excerpts from Early Writings on Selected Species of Maine Wildlife, 1614 - 1930, including wolf (*Canis spp.*), Canada lynx (*Lynx canadensis*), mountain lion (*Felis concolor*), wolverine (*Gulo gulo*), and woodland caribou (*Rangifer tarandus*). University of Maine Press, Orono, Maine, USA.
 - Hoving, C. L. 2001. Historical Occurrence and Habitat Ecology of Canada Lynx (*Lynx canadensis*) in Eastern North America. Thesis. University of Maine, Orono, Maine, USA
 - GIS coverage of 5 lynx locations
 - Sent CD containing his full thesis

- Peter Vaux, Director of Maine Aquatic Biodiversity Project
 The Nature Conservancy
 c/o ME Dept. Inland Fisheries and Wildlife
 650 State Street
 Bangor, ME 04401
 Phone: 207-941-4459; FAX: 207-941-4443
 Email: peter.vaux@state.me.us
 - Compiling information on all past and present monitoring programs on fish, aquatic veg., herps, inverts, etc. In all lakes, streams, ponds, rivers, etc. in Maine.
 - Casey should be sending GIS coverage of trail to him so that he can overlay his data and send us all pertinent information
 - Doesn't have GIS for all the studies yet
 - Will eventually have a public website available: www.mainebiodiversity.org
 - He received the shape files from Casey mid Oct (according to Casey)
 - Sent a follow-up email on 10-22-02

- Bruce Allen, Missouri Botanical Gardens, Bruce.Allen@mobot.org, 314-511-9510
 - Contacted 9/27/02
 - Did work on Bryophytes in Bigelow, Grafton Notch
 - Sending info by early Nov
 - Gave me two other contacts for work done on Katadhin:
 - Norton Miller, NY State Museum, Albany, NY, Nmiller2@mail.nysed.gov; emailed 10-22-02
 - Allison Dibble, Maine, Adibble@panax.com; emailed 10-22-02
- Don Hudson, President, The Chewonki Foundation, 485 Chewonki Neck Road, Wiscasset, Maine 04578-4822, 207-882-7323 (work), 207-882-4074 (FAX), dhudson@chewonki.org, www.chewonki.org
 - Contacted 9/25/02
 - Sent two reports:
 - Old Growth Forest, Subalpine Forest, and Alpine Areas in the Bigelow Preserve, Mahoosuc Mtns., and the Baldpates. 1986.
 - Old Growth Forest, Subalpine Forest, and Alpine Areas in Baxter State Park. 1985.
- BioDiversity Research Institute (BRI), <http://www.briloon.org/>, Phone: 207-781-3324, Fax: 207-781-2804
 - Emailed Lucas Savoy (Research Biologist/Database Manager and Waterfowl Specialist), 10/22/02; lucas.savoy@briloon.org
 - Sent songbird data (via email) from Bigelow. Forwarded email to Casey, hard copy in files.
- References we currently have:
 - Bigelow Preserve Management Plan, Bureau of Parks and Lands. 1989.
 - Maine Natural Areas Program. A Natural Heritage Inventory of the Appalachian Trail in Maine. 1998.
 - Janet McMahon. An Ecological Reserves System Inventory: Potential Ecological Reserves on Maine's Existing Public and Private Conservation Lands. 1998. Prepared for the Maine Forest Biodiversity Project.
 - May, Diane Ebert. 1978. Alpine Tundra Vegetation on Maine Mountains and its Relevance to the Critical Areas Program. Planning Report No. 36
 - Burke, Ingrid. 1982. The Mahoosuc Mountains, Oxford County, Maine. A Natural Areas Inventory and Management Statement.
 - Preliminary Vascular Flora of Baxter State park. 1988.
 - Maine Natural Heritage Program. Natural Landscapes of Maine: A Classification of Ecosystems and Natural Communities
 - Old Growth Forest, Subalpine Forest, and Alpine Areas in the Bigelow Preserve, Mahoosuc Mtns., and the Baldpates. 1986.
 - Old Growth Forest, Subalpine Forest, and Alpine Areas in Baxter State Park. 1985

New Jersey

In early June I took a trip to visit several state parks in New Jersey that the trail passes through. The park managers were very helpful and willing to work with me. Listed here are the contacts:

- High Point State Park
 - Kate Monahan (she is the naturalist)
(973) 875-1471
 - John Keator (973) 875-4800
 - Sent me contact information for dragonfly study that occurred in the park:
Dr. Thomas Adelman
- Wawayanda State Park (Includes Abram S. Hewitt State Forest)
 - Bill Foley (973) 853-4462 (He was at Stokes State Forest for years)
 - Bill contacted the New Jersey Division of Fish and Game, endangered species group and they were supposed to be sending a detailed list of the endangered species that occur within a 1-mile buffer of the trail. I have not received any information yet and need to contact Bill for an update.
- Stokes State Forest
 - Paul Stern (973) 948-3820
 - I have not contacted Paul Stern yet, but plan to do that next week. I relied mostly on Bill Foley as he was there for several years and just this summer moved to Wawayanda.
 - There was supposedly a small mammal (specifically shrew) study conducted at Stokes through the School of Conservation (Contact: Randy Turner)

Pennsylvania

- Dr. Robert M. Ross, USGS, Northern Appalachian Research Laboratory, R.R. #4
Box 63, Wellsboro, PA 16901 570-724-3322 x239
 - Contacted by Lori Redell: lori_redell@usgs.gov (570-724-3322 x237)
 - Lists of Birds found along Appalachian Trail near DEWA. June 2000.
 - Forwarded to Casey Reese, hard copy in file.

- References we currently have:
 - Grace, James R. 1980. Vegetation Assessment of High Point State Park, Sussex County, New Jersey.
 - Fitzgerald, Randall W. Sampling Northwestern New Jersey for *Sorex palustris*, *Microtus chrotorrhinus*, and *Desmognathus ochrophaeus*.
 - U.S. Department of the Interior. 1989. The Ecology of Atlantic White Cedar Wetlands: A Community Profile. Biological Report 85 (7.21)
 - Kuser, John, E. T.R. Meagher, D.L. Sheely, and A. White. 1997. Allozyme Frequencies in New Jersey and North Carolina Populations of Atlantic White-Cedar *Chamaecyparis thyoides* (Cupressaceae).
 - Niering, William A. 1953. The Past and Present Vegetation of High Point State Park, New Jersey.
 - Rozenwald, Melissa N.G. 1995. Preliminary Hydrogeologic Study of Cedar Swamp Bog, High Point State Park, NJ.
 - Bird check-off list. Common Birds of High Point State Park.
 - Mammals of High Point State Park. Don't know how accurate or complete this is.

General Contacts (need to contact)

- Robin Jung -- USGS Patuxent Wildlife Research Center
 - County based distribution maps of reptiles and Amphibians (Nationwide)
 - Already have several Cooperative agreements with the Park Service and have worked with NPSpecies before
- Nature Conservancy

Hours Spent on Project

I estimate that, to date, I have spent approximately 280 hours on this park.

Future Projection

- I feel that it is worth the effort to research the universities and colleges within 100 miles of the trail and contact all potential researchers at those institutions
- I think it is best to proceed with a state by state datamining and collection effort
- This could easily be a 2-3 year project

References received for Appalachian Trail

<u>MAINE</u>		
<u>Reference</u>	<u>Source</u>	<u>Contact Information</u>
Hoving, C. L. and W. B. Krohn. In Press. Excerpts from Early Writings on Selected Species of Maine Wildlife, 1614 - 1930, including wolf (<i>Canis spp.</i>), Canada lynx (<i>Lynx canadensis</i>), mountain lion (<i>Felis concolor</i>), wolverine (<i>Gulo gulo</i>), and woodland caribou (<i>Rangifer tarandus</i>). University of Maine Press, Orono, Maine, USA.	Christopher Hoving	Email: pcrucifer@yahoo.com Phone: 518-624-3314
Hoving, C. L. 2001. Historical Occurrence and Habitat Ecology of Canada Lynx (<i>Lynx canadensis</i>) in Eastern North America. Thesis. University of Maine, Orono, Maine, USA	Christopher Hoving	Email: pcrucifer@yahoo.com Phone: 518-624-3314
GIS coverage of 5 lynx in Maine	Christopher Hoving	Email: pcrucifer@yahoo.com Phone: 518-624-3314
Bigelow Preserve Management Plan, Bureau of Parks and Lands. August 1989.	Tom Charles Bigelow Preserve manager	Email: Tom.T.Charles@state.me.us Phone: 207-778-8231
May, Diane Ebert. 1978. Alpine Tundra Vegetation on Maine Mountains and its Relevance to the Critical Areas Program. Planning Report No. 36	Susan Daniels – Appalachian Trail Conference	
Burke, Ingrid. 1982. The Mahoosuc Mountains, Oxford County, Maine. A Natural Areas Inventory and Management Statement.	Susan Daniels – Appalachian Trail Conference	
Preliminary Vascular Flora of Baxter State park. 1988.	Susan Daniels – Appalachian Trail Conference	
Maine Natural Heritage Program. Natural Landscapes of Maine: A Classification of Ecosystems and Natural Communities	Susan Daniels – Appalachian Trail Conference	
McMahon, Janet. An Ecological Reserves System Inventory: Potential Ecological Reserves on Maine's Existing Public and Private Conservation Lands. 1998. Prepared for the Maine Forest Biodiversity Project.	Susan J. Caldwell – The Nature Conservancy Maine Chapt.	Email: scaldwell@tnc.org Phone: 207-729-5181
Old Growth Forest, Subalpine Forest, and Alpine Areas in the Bigelow Preserve, Mahoosuc Mtns., and the Baldpates. 1986.	Don Hudson President Chewonki Foundation	485 Chewonki Neck Road, Wiscasset, Maine 04578-4822, 207-882-7323 (work), 207-882-4074 (FAX), dhudson@chewonki.org, www.chewonki.org
Old Growth Forest, Subalpine Forest, and Alpine Areas in Baxter State Park. 1985	Don Hudson President Chewonki Foundation	485 Chewonki Neck Road, Wiscasset, Maine 04578-4822, 207-882-7323 (work), 207-882-4074 (FAX), dhudson@chewonki.org, www.chewonki.org
Lists of Birds found along Appalachian Trail near DEWA. June 2000.	Dr. Robert Ross/ Lori Redell sent the information	USGS 570-724-3322 x239 rossr@usgs.gov; United States Geological Survey Norhtern Appalachian Research Laboratory R.R. #4 Box 63 Wellsboro, PA 16901 570-724-3322 x237 lori_redell@usgs.gov

<u>Reference</u>	<u>Source</u>	<u>Contact Information</u>
BioDiversity Research Institute (BRI), http://www.briloon.org/ ,	Lucas Savoy	Research Biologist/Database Manager and Waterfowl Specialist lucas.savoy@briloon.org Phone: 207-781-3324, Fax: 207-781-2804

SUMMARY TO DATE OF VITAL SIGNS MONITORING PLANNING
FOR THE APPALACHIAN TRAIL
BY THE APPALACHIAN HIGHLANDS I&M NETWORK
NATIONAL PARK SERVICE
(January 21, 2004)

Upon advice from the Southeast Regional I&M Coordinator, the Appalachian Highlands I&M Network incorporated within our network the southernmost 836 miles (39%) of the Appalachian Trail, from Shenandoah National Park in Virginia to the Trail's terminus in Georgia, for planning purposes. I&M-funded inventories of the Trail have revealed a substantial number of significant natural resources, including over 2,000 occurrences of globally rare species and exemplary vegetative communities, half of which are found within the states of Virginia, North Carolina, Tennessee and Georgia.

Even though the AT does not yet have monitoring funding from the NPS I&M program, we included the Trail in the Phase I and II planning process for our network, so that the preparatory work to identify potential Vital Signs for monitoring would be in place if and when the Trail receives monitoring money. Kent Schwarzkopf, Resource Management Specialist for the Trail, provided substantial information on the Trail's natural resources, and participated in our scoping meetings to prioritize potential Vital Signs. We have not engaged in any additional data mining beyond what Kent had already accomplished. Our focus for the Trail was primarily on exemplary communities and the significant resources within those, at the ecosystem level.

Following is a brief synopsis of our Vital Signs planning process, to date, which included the Trail:

- Major ecosystems were identified for each network park and further refined into significant components.
- Detailed matrices and descriptions for each ecosystem type were developed, defining driver and stressor effects on principal ecosystem attributes.
- Detailed ecosystem conceptual models were developed, made up of stressors, drivers, biotic and abiotic attributes. These were used in Vital Signs workshops to identify key monitoring attributes (Vital Signs) and linkages for each model. Twenty-five ecosystem conceptual models were developed, based upon sixteen different community types.
- We worked with network parks' staffs to identify highest priority monitoring questions related to management issues. Park responses were used to guide discussions in monitoring workshops, and as the central focus for developing network Vital Signs priorities.
- Criteria were developed to evaluate conceptual models and potential Vital Signs. The four main categories were management significance, ecological significance, threats to ecosystem integrity, and monitoring efficacy and feasibility.
- From this process, potential Vital Signs were selected and ranked in priority order within parks and across the network (see accompanying table).

We have not gone beyond this stage for the Trail, to focus on site-specific details for monitoring, as we are now doing with the other parks in our network.

For the other network parks, we are now involved in Phase III of our planning process for monitoring, which involves a much more detailed, site-specific focus, and development of detailed protocols for long-term monitoring of Vital Signs. Since the AT does not have monitoring funding allocated, we are not including them in this phase of our monitoring program. If and when funding does become available for the AT in the future, we have the basic work completed for our portion of the Trail, with the significant resources identified, most important monitoring-related management questions identified, and potential Vital Signs prioritized.

Ongoing AT monitoring in our network area which is not funded by I&M:

- The Southern Appalachian Man and the Biosphere Foundation (SAMAB) recently received a \$100,000 cost-share grant from the National Forest Foundation for volunteer "Monitoring and Assessment of the Appalachian Trail Environment" to "...develop a scientifically-based, regional approach for stewardship of natural and cultural resources in the Appalachian region, focusing on lands and gateway communities near the Appalachian National Scenic Trail and the national forests and park areas through which the Appalachian Trail passes." Specific components are described below:

-Exotic invasive plants – As part of the above SAMAB project, a monitoring project has been initiated for invasive exotic plants within the Appalachian Highlands Network area. This monitoring is focused on four main project areas on and around AT lands with the larger objective of protecting significant natural heritage sites on the Trail and National Forest lands. Currently, the volunteers are only recording the presence or absence of 12 "Primary Plants of Concern" that have been identified by forest service and park service botanists, exotic pest plant councils, etc. Only established corridors (roads, trails, riparian corridors, and utility rights-of-way) are being monitored; no plot surveys are involved.

-Water quality – also as part of the above SAMAB Foundation Project, a volunteer-based water quality monitoring program has been initiated in the Southern Appalachians. Volunteers are collecting biological, limited chemistry and limited bacteriological data in and around gateway communities. Biological health is being measured in the form of benthic macroinvertebrate tallies. Water chemistry parameters being measured include total suspended solids, turbidity, nitrates, ammonia, orthophosphate, pH, alkalinity, and conductivity.

-Forest Health – protocols are being developed with the US Forest Service for a volunteer-based forest health monitoring project on and around the Trail. This work is funded by the Appalachian Trail Park Office, the National Forest Foundation, and the Tennessee Valley Authority. This project is in the early developmental stages. Further details will be forthcoming.

- Rare Species – Most of the Trail's natural resource monitoring is currently carried out by ATC club volunteers, and the bulk of what has been done to date has focused on rare plant species.

Program/Project Title:

NATIONAL PARK SERVICE INVENTORY AND MONITORING PROGRAM

Program description : The intent of the NPS monitoring program is to track a subset of park resources and processes (“vital signs”), or significant indicators of ecological condition. Monitoring is a central component of natural resource stewardship in the National Park Service, and in conjunction with natural resource inventories and research, provides the information needed for effective, science-based managerial decision-making and resource protection. A 3-phase planning and design process has been established for the monitoring program. *Phase 1* involves defining goals and objectives; beginning the process of identifying, evaluating and synthesizing existing data; developing draft conceptual models; and completing other background work that must be done before the initial selection of vital signs. Each network is required to document these tasks in a *Phase 1* report, which is then peer reviewed and approved at the regional level before the network proceeds to the next phase. *Phase 2* of the planning and design effort involves prioritizing and selecting the vital signs that will be included in the network's initial integrated monitoring program. *Phase 3* entails the detailed design work needed to implement monitoring, such as developing specific monitoring objectives for each vital sign, developing sampling protocols and a statistical sampling design, developing a plan for data management and analysis, and determining the type and content of various products of the monitoring effort such as reports and websites.

Primary program responsibilities:

Program Coordination: Greg Shriver and Fred Dieffenbach, Northeast Temperate Network, 54 Elm Street, Woodstock, Vermont, 05091.

Current status of program: The Northeast Temperate Network completed their *Phase 1* report in September 2003. The *Phase 1* report was reviewed and approved by the National I&M program. The Network will be hosting a Vital Signs Selection workshop in Spring 2004 and drafting the *Phase 2* report for submission in September 2004. The final monitoring plan (*Phase 3*) for the Northeast Temperate Network is due in December 2005.

Desired future condition of program: This program will provide the justification, design, implementation, and reporting for Vital Signs monitoring on the Network parks.

Program Title:
Natural Resource Challenge
Acquisition of 12 Data Sets

Program Description:

The Mission of the National Park Service (NPS) is “to conserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment of this and future generations”. To uphold this goal, the NPS created the Natural Resource Challenge in 2000 to encourage National Parks to focus on the preservation of the nation’s natural heritage through science, natural resource inventories and expanded resource monitoring and management. Through the Natural Resource Challenge, the 265 parks of the NPS were placed into seven regions and, subsequently, organized into thirty-two Inventory and Monitoring Networks, based on geographic and ecological similarities.

One goal of the Natural Resource Challenge is to develop 12 data sets or inventories for each of the 265 parks. These data sets seek to determine the nature and status of the park’s natural resources, so that parks can inventory, monitor and understand the dynamic nature and condition of the resource as well as provide key points for comparisons with other environments. Ultimately, the goal of developing these 12 pieces of information is to integrate inventory and monitoring information into planning and decision-making.

Primary program responsibilities:

12 Data Sets	Responsibility for compilation	Status
Natural Resource Bibliography	NPS I&M Networks	on going
Base Cartographic Data	NPS APPA	complete
Geology Map	NPS Geologic Resources Division	future
Soils Map	NPS Geologic Resources Division	future
Weather Data	NPS APPA and I&M Networks	on going
Climate Divisions	NPS APPA and I&M Networks	on going
Air Quality	NPS Air Resources Division	on going
Locations of Air Quality Monitoring Stations	NPS Air Resources Division	complete
Water body location and classification	NPS APPA and Water Resources Division	on going
Water Quality Data	NPS APPA and Water Resources Division	future
Vegetation Map	NPS Vegetation Mapping Program	future
Species List	NPS I&M Networks	on going
Species Distribution and status of vertebrates and vascular plants of high priority to each park	NPS I&M Networks	on going

Current Status of the program: Currently, aside from base cartographic data, each data set is developing or planned for the future as resources become available within the Inventory and Monitoring networks.

Desired future condition of the program: All 12 Data sets are complete and resource management staff effectively uses the information in trail wide decision-making and in developing a better understanding of broad ecological conditions on the Appalachian Trail.

Program/Project Title:

Appalachian Trail Water Quality Monitoring Program
with the Environmental Alliance for Senior Involvement

Program description (two or three short paragraphs): In 2003, the National Park Service Appalachian Trail Park Office (ATPO) was selected as one of five park units that would receive technical assistance and support through a new NPS Natural Resource Laureate Program. Through the program, a “laureate” (an individual or organization with specific expertise in natural resources) from the Environmental Alliance for Senior Involvement (EASI) was assigned to assist the ATPO in developing a water quality monitoring program for the A.T.

EASI is in the process of assisting ATPO and ATC in developing a program that will:

- (5) provide volunteers with portable, inexpensive water-quality monitoring kits (which consist of chemical-sensitive paper strips, a color chart, instructions for use, and a monitoring form)
- (6) provide training for volunteers
- (7) create an on-line database for reporting monitoring results, and
- (8) ensure prompt follow-up to volunteers

Primary program responsibilities:

Overall program coordination:	Tom Benjamin, Casey Reese
Design and production of monitoring kits:	Tom Benjamin
On-line database development:	Tom Benjamin, Casey Reese
Volunteer recruitment and development:	Matt Stevens, Earl Talley, Tom Benjamin
Volunteer training:	Earl Talley
Volunteer coordination/feedback:	Matt Stevens, Earl Talley
Other involved parties	Don Owen, Michele Miller, Jerry Seabolt (GATC)

Current status of program: Currently, the program is in the initial stages of development. The monitoring kits, database, and training programs are under development, and volunteer recruitment has begun. Deployment of a pilot program (for 20 – 50 volunteers) is scheduled for May 2004.

Desired future condition of program: Ultimately, the goal of the program is to have a self-sustaining volunteer-based monitoring program that provides consistent, reliable water-quality information for approximately 50 to 200 key sites along the Appalachian Trail. Volunteers would receive prompt feedback about their work. Data would be integrated into management decisions; shared with ATC members and volunteers through articles in Trail publications; and used to report to Congress and others to support protection of water resources along the Trail.

Attachments: Request for Water Quality Monitoring Assistance (Reese, 2003)

Request for Water Quality Monitoring Assistance

Developing a water quality monitoring program for the Appalachian National Scenic Trail will be a complex, challenging task. The Trail's geographic expanse is the first challenge: it is a 2,170-mile long footpath that is located on six hundred and eight (608) USGS 1:24,000 quadrangle maps. Secondly, the Trail is an administrative challenge, in that it traverses through fourteen (14) states, six (6) National Park Units, eight (8) National Forests, sixty seven (67) state agency lands, eighty six (86) counties, one hundred and fifty (150) local townships. The Trail's physical location presents a third challenge: the Trail corridor is located along the highest ridgelines of the Appalachian Mountains, and it runs along the top rim of many of the watersheds through which it passes.

With a limited resource staff of three, the park is currently focusing on maintaining its current resource management programs and completing its resource management plan. Planning and development of the park's scope, objectives and sampling methodologies for water quality are currently on the horizon. Professional assistance is needed, however, to help park staff identify immediate water-quality program needs and develop appropriate strategies, methodologies, and protocols for water quality testing. In addition, assistance is needed to coordinate with Park Service Inventory and Monitoring initiatives and ensure that monitoring protocols are developed that can be carried out by volunteer citizen scientists. This information would be instrumental in defining the water quality program in the park's resource management plan and thereby guiding the park to initiate specific projects.

One of the primary concerns of park staff with respect to water quality is its potential effects on the health of hikers, who depend upon streams and springs for their drinking water. In addition, staff also are interested in the ecological health of the springs, streams, and ponds that support biota and serve as key indicators to the overall health of the localized ecosystems along the Trail.

Several potential projects could be implemented relatively easily. Researchers could identify the optimal locations for monitoring lotic and lentic systems by using available in-house Geographic Information Systems data (such as locations of existing USGS gauge stations, streams, springs, other water sources, over-night camping sites, shelters, and sanitation facilities). A researcher also could develop a strategy of how to integrate existing water quality data with more regional park-wide water monitoring initiatives through coordination with existing programs in citizen-based water quality monitoring, such as the Southern Appalachian Man and the Biosphere project (SAMAB).

Researchers also could assist resource management staff by assembling data available from other sources. For a resource as long as the Appalachian Trail, there are often programs and data collection efforts happening that the park does not know about. Developing an information network or bibliography of colleges and universities or local county watershed groups that are collecting water quality information close to the trail would provide a resource that would focus the park's attention to existing data and would potentially draw attention to the trail's unique resource within local communities.

The A.T. Project office would be able to provide detailed information related to known trail features such as stream crossings, either GIS data layers or maps. Housing for researchers would not be available although desk space would be available at the park office for research and computer usage.

Program Title:

Natural Heritage Monitoring Program for the Appalachian Trail

Program Description: The purpose of the AT natural heritage monitoring program is to track the status of the rarest or most threatened plants, animals, and natural communities located along the AT. Each of the natural heritage inventories for the 14 Appalachian Trail states recommended that many of the rare, threatened, and endangered species and sites identified within the AT corridor should be monitored on a regular basis. After the completion of each natural heritage inventory, volunteer monitors were sought from the AT clubs and trained during one-day monitoring workshops to conduct some basic monitoring of the rarest or most threatened species within their club's section of the AT. The same monitoring form is utilized in all states, though the monitoring form has been modified a couple of times. Monitoring workshops for natural heritage resources in PA, NH, VT, CT, and NC were held during the early 1990's, and workshops for each of the remaining states (except for Maine) were held from 1998 and 2002.

Since 1990, approximately 150 volunteer natural heritage monitors have been trained to monitor rare, threatened, and endangered plants, animals, and communities at approximately 30% of the 515 natural heritage sites identified within the AT corridor. More than 95% of the occurrences placed in the monitoring program are of rare plants, with only a few rare animal species (birds) or plant communities placed into the program. The monitoring of rare birds has met with less success than the monitoring of rare plants. Almost all volunteer natural heritage monitors have been from trail clubs, though in recent years, monitors from outside the clubs have been sought. A monitoring coordinator was found to coordinate the volunteer monitors within each state. Primary responsibilities of the monitoring coordinators include seeing that the assigned volunteers monitor their sites and submit their reports and seeking replacement monitors for sites that need new monitors.

Primary Program Responsibilities:

Overall Program Coordination: Kent Schwarzkopf, Natural Resource Specialist (ATPO)

State Monitoring Coordinators: ATC staff, New York-New Jersey Trail Conference staff, Appalachian Mountain Club staff, and volunteer coordinators from several trail clubs. For specific coordinators, see the attachment.

Volunteer Training: Kent Schwarzkopf, Casey Reese, and the state natural heritage biologists and independent biologists who prepared the natural heritage inventories.

Database Input: In the past, a few volunteers have been responsible for entering the natural heritage data.

Current Status of Program: In 2003, 53 of 118 natural heritage sites currently in the monitoring program were monitored. Thus, 45% of the designated monitoring sites are being monitored. Monitoring success is usually good after a workshop, but declines over the years as people move or lose interest.

Desired Future Conditions of Program:

Ideally, all of the sites recommended for monitoring should be monitored by volunteers or staff. Monitoring reports should be promptly turned in and reviewed by the state monitoring coordinator and the overall program coordinator, and any needed actions, responses, or consultations made. The monitoring reports should be copied and distributed to appropriate agency partners.

Attachments:

- 1) Inventories and Monitoring of Natural Heritage Resources along the Appalachian Trail, By State, and
- 2) Natural Heritage Monitoring Reports for 2003 (attachments to be handed out at meeting)

Program Title:

Natural Heritage Inventory Program for the Appalachian Trail

Program Description: From 1989 to 2001, a natural heritage inventory was completed for each of the 14 states through which the Appalachian Trail passes. These inventories documented rare, threatened, and endangered species and rare or exemplary natural communities within the AT corridor (defined as all ATPO land and other public land within 500 feet of the AT). All 14 of the AT natural heritage inventories documented vascular plants within the AT corridor, and all of them documented some rare or exemplary natural communities. However, documentation of rare, threatened, or endangered vertebrates within the AT corridor has varied from state to state. In a few states, non-vascular plants and selected invertebrates were inventoried. The natural heritage inventories described and mapped each species, and listed threats and management recommendations to protect them.

The 14 AT natural heritage inventories documented approximately 2100 occurrences of rare, threatened, or endangered (RTE) species and rare or exemplary natural communities within the AT corridor, regardless of landowner. The number of RTE occurrences within the AT corridor is believed to be the greatest of any of the 370+ NPS units. Approximately 88% of the RTE species occurrences identified in the inventories are plants and 12% are animals. Approximately 330 of the occurrences are of globally rare species (that is, species identified as G1, G2, or G3 by The Nature Conservancy). The greatest number of globally rare species are found along the AT from Virginia southward. Approximately 360 of the 2100 occurrences are on ATPO land. Only 15 occurrences of RTE species documented in the AT corridor are federally listed, and all of these are on non-ATPO land. All RTE occurrences along the AT have been prioritized, based on their global and state rank and their federal and state status.

Primary Program Responsibilities:

Overall Coordinator and Contract Administrator of Natural Heritage Inventories:

Kent Schwarzkopf, ATPO Natural Resource Specialist

Preparer of Inventories: State Natural Heritage Offices & Independent Biologists

Review of Inventories: ATC and ATPO

Funding of Inventories: ATC and ATPO

Current Status of Program: Inventories of RTE vascular plants have been completed for all 14 of the AT states. Inventories for RTE vertebrates are incomplete and vary from state to state. For example, some states such as Massachusetts and Virginia inventoried RTE species in each of the 4 vertebrate groups (mammals, birds, herps, and fish), while other states such as New Jersey and Maryland did not inventory any RTE vertebrate groups. See the attachment for which vertebrate groups have been inventoried in which states.

Desired future condition of program: Inventories should be utilized by ATC, ATPO, and other management partners (agencies and trail clubs) to prevent harm to RTE species during project or maintenance related work. Management recommendations for the rarest and most threatened species should be evaluated, discussed with management partners, and potentially implemented, with recommendations for less rare and threatened species implemented as time permits.

Attachments: 1) Inventories and Monitoring of Natural Heritage Resources along the Appalachian Trail, By State and 2) Status of Inventories of RTE Vertebrates, By State. (attachments to be handed out at meeting)

Program Title:
Natural Heritage Management Projects on the Appalachian Trail

Program Description: From 1989 to 2001, the natural heritage inventories that were prepared for the Appalachian Trail Corridor in 14 states documented the presence of approximately 2100 occurrences of rare, threatened and endangered species and rare or exemplary natural communities. The inventories indicated that a large proportion of these rare species were threatened by one or more human-related or natural threats. Even while some inventories were being prepared, some threats to rare species were addressed through management projects. As an example, in Massachusetts, trail-related impacts were having an impact on the state endangered *Agrimonia parviflora*. To protect the agrimony, a short relocation of the Appalachian Trail was constructed to bypass the population of these plants.

Other than monitoring, the management recommendation most frequently made in the natural heritage inventories was to inform trail maintainers of the presence and location of threatened and endangered species so that they would not inadvertently harm them during their maintenance work. To fulfill this recommendation, in 2001, approximately 200 rare plant identification sheets were prepared for threatened or endangered plants that had been documented immediately beside the tread of the AT. Each rare plant identification sheet included an illustration and color photo of the plant, along with a non-technical description of the plant, the best time to identify the species, and a topographic map showing the location of the plant along the AT. The rare plant identification sheets were distributed through AT club leaders to those maintainers on whose trail sections these plants were found, along with an instruction sheet explaining the project and how to avoid harming the rare species.

The natural heritage inventories contain hundreds of recommended actions to protect threatened and endangered species, such as controlling exotic species, vegetative manipulation to remove competing species, relocating the trail, controlling erosion, and use of signage to educate users. In 2002 ATC and Dickenson University joined efforts to fence off several populations of the globally rare *Euphorbia purpurea* in Pennsylvania from browsing by deer or other animals.

Primary Program Responsibilities: Both ATC and ATPO staff have led individual projects. The Rare Plant Identification Sheet project has been coordinated by Kent Schwarzkopf of ATPO, with contributions from ATC staff and club leaders.

Current Status of Program: In order to protect the highest priority species first, all of the threatened and endangered species documented in the natural heritage inventories were prioritized in 2002 and 2003. Recently, the top 100 highest priority threatened and endangered species on ATPO land were evaluated for their threat level and specific threats, which will allow us to direct management actions to the most threatened occurrences first. The Rare Plant Identification Sheet project is meeting with mixed success, partly due to turnover in trail maintenance volunteers and to lack of interest in the project by some maintainers.

Desired Future Condition of Program: The completion of prioritizing all rare, threatened, and endangered species within the AT corridor will allow us to implement management actions on the most critical species first. The prioritization effort can help guide us in resource protection discussions with other managers of AT corridor land. The Rare Plant Identification Sheets should be widely utilized by AT maintainers to avoid harming threatened and endangered species immediately beside the trail.

Project Title:

**Inventory of All Vascular Plant Species and Plant Communities in the Connecticut
Appalachian Trail Corridor**

Program Description: A contract to inventory all vascular plant species (not just threatened and endangered species) and all plant communities within the 50-mile long AT corridor in Connecticut was begun in 2003. This is a pilot project for the AT, which will go toward meeting 2 of the 12 data sets: 1) a list of all vascular plants currently present in the park, and 2) vegetation mapping of the park. The identification of plant communities is a precursor to vegetation mapping. The contract was awarded to botanist Ted Elliman, who was the primary preparer of the AT natural heritage inventories for Massachusetts, New York, and New Jersey. The project involves documenting all native and non-native plant species within the full length of the Connecticut AT Corridor, as well as noting their general locations.

The plant community portion of the project involves sampling all plant communities observed in the field along the length of Connecticut's AT corridor. The plant community types described will follow the Draft Vegetation Classification for Connecticut (Metzler, 2003). The contractor will use the plant community plot forms developed by NatureServe for NPS lands, with sample plots varying from 20m by 20m for forest communities, 10m by 10m for shrub communities, to 1-3m by 1-3m for grassland communities. The contractor will record all plant species occurring in the plots and information about plant community structure, topography slope, hydrology, soils, and geologic features. GPS points will be taken and each plot will be photographed.

The contract with Ted Elliman will also identify, document, and map all rare plant species and communities observed within Connecticut's AT corridor that were not discussed in the 1992 Connecticut Natural Heritage Inventory for the AT, and it will recheck, document and map rare species and communities that were noted in the 1992 inventory. As part of this contract, Elliman is also monitoring and managing rare, threatened and endangered (RTE) species at about 20 sites from Maine to Pennsylvania.

Primary Program Responsibilities:

Contract Administrator: Kent Schwarzkopf, Natural Resource Specialist (ATPO)

Primary Reviewers of Work and Reports: Kent Schwarzkopf (ATPO) and Alice Schori (ATC New England Regional Office). Review by others is also sought.

Current Status of Program: Final Project Reports are expected in January, 2004. Ted Elliman has provided us a preliminary draft list of more than 800 vascular plant species observed within the AT corridor in Connecticut. We have not yet received a report on the plant communities observed in Connecticut's AT corridor. We recently received a final or draft final report on the monitoring and management of RTE plant species from Maine to Pennsylvania.

Desired Future Condition of Program: Receipt of all reports and other work products related to the contract. The review of this pilot project should help us to decide whether to expand documentation of all vascular plants and plant communities in other AT corridor states.

Program/Project Title:

Southern Appalachian Man and the Biosphere Foundation
Southern Appalachian Volunteer Environmental Monitoring Program

Program description (two or three short paragraphs):

SAMAB is monitoring water quality, invasive exotic plants, and forest health in ten communities of the southern Appalachians, stretching from north Georgia to southwest Virginia. The ultimate purpose behind SAMAB's volunteer environmental monitoring program is to facilitate a transition to sustainability by gateway communities adjacent to the Appalachian Trail, national forests, and other federal lands in the southern Appalachians. The program is operated under the fundamental belief that these communities can either be tremendous assets upon which federal land managers can draw to assist in the pursuit of natural resource management objectives or they can be the greatest threats to the viability of these natural and recreational resources. SAMAB feels that it can achieve its aim through attainment of three key goals. They are:

- A. Increase the capacity of citizen scientists in gateway communities to understand firsthand their unique local environment so they can make better decisions with their own properties and neighborhoods and can participate effectively in the decisionmaking processes of their local governments and the federal land management agencies whose borders they share.
- B. Facilitate information sharing between citizen monitors, their communities, the federal land management agencies, and other citizen monitoring programs.
- C. Increase the capacity of citizen monitors and their associations to sustain themselves over time.

SAMAB continues to achieve Goal A through our development of credible monitoring protocols and monitoring plans, recruitment and training of volunteer monitors, coordination of monitoring events, storage and manipulation of data, and production of relevant data outputs such as maps, charts, and graphs. SAMAB has developed and implemented an invasive exotic plant monitoring protocol and strategy through consultation with federal land management staff, state and regional exotic pest plant councils, and other natural resource professionals. SAMAB has borrowed and employed throughout the region a biological water quality monitoring protocol from the State of Virginia and Tennessee Valley Authority accepted Izaak Walton League modified rocky bottom sampling method, which was developed with assistance from Virginia Tech. In one project area, SAMAB continues to use a widely accepted Index of Biotic Integrity fish monitoring protocol to measure water quality and stream health. SAMAB has also partnered with the State of NC Volunteer Water Information Network certified lab at the University of North Carolina to perform lab analyses of water chemistry samples in several project areas. In one and a half years, approximately 150 volunteers have invested over 1,500 hours on monitoring environmental indicators (counting SAMAB's partnership with an existing monitoring program administered Little TN Watershed Association, that number jumps to 429 volunteers and 2,961 hours). Of these 150 volunteers, 54 have invested over 10 hours on monitoring and directly related activities while six have invested over 40 hours. Volunteer collected data, maps, charts, and photographs are stored and accessible by anyone at SAMAB.org and SAIN.NBII.gov. The monitoring program coordinator also regularly creates and distributes map and data updates to the volunteer monitors.

SAMAB and its volunteer monitors want their data to be useful. From the program's inception, SAMAB has stressed this to its many cooperative partners, especially the NPS Appalachian Trail

Park Office and USDA Forest Service. Invasive plant monitoring events have been planned and performed at sites where Forest Service botanists and land managers and ATC regional representatives have specifically requested action. SAMAB has created and distributed to ATPO and the National Forest Foundation a report on monitoring efforts and data collections from 2002 and 2003. Nantahala National Forest utilized volunteer data to locate and eradicate a multi-flora rose colony in the Standing Indian campground. Pisgah National Forest land managers have expressed their desire to use the Hot Springs volunteers invasive plant data to help located and eradicate 2 and 3 year old tree of heaven and princess tree occurrences that are recolonizing a burned area which coincidentally is also a significant natural area. Mount Rogers National Recreation Area land managers are hopeful that volunteer collected data in 2004 will help them control coltsfoot and canada thistle invasions of their significant bald areas. On the local level, volunteer collected data in the Smokies project area helped galvanize political support in Pittman Center, TN for the drafting and adoption of an invasive exotic plant control ordinance.

Goal C – creating self-sustaining local monitoring efforts has proven very difficult to attain, but SAMAB continues working in this regard. One success is the USEPA award of \$800,000 to our partner the Upper Tennessee River Roundtable of which a small percentage will help support continued volunteer monitoring for a number of years. SAMAB provided maps, data, and political networking in support of that grant. On a year-to-year basis, SAMABs partnership with the National Forest Foundation, ATPO, Tennessee Valley Authority, University of Tennessee, and various local funders has resulted in over \$450,000 raised in cash and in-kind services over a two year period.

Primary program responsibilities:

Program Design – SAMAB Design Team: Dr. Robb Turner, Susan Schexnayder, Dr. Jack Ranney, Dr. Bill McLarney, Tom Gilbert, Andy Brown

Program Coordinator – Andy Brown (on contract)

Program Coordinator Staff Support – Equinox Environmental staff (Andy's firm)

Invasive Plant Monitoring Team Leader – Dr. Jack Ranney of University of Tennessee

Water Quality Monitoring Team Leader – Dr. Bill McLarney from LTWA

Data Storage and Manipulation – Southern Appalachian Information Network; National Biological Information Infrastructure (SAIN.NBII); and SAMAB

Program Administration – SAMAB: Larry Bell, Sherry Estep, Robb Turner, Susan Schexnayder

Current status of program:

The program is active. See statements above under program description. SAMAB is still in the forest health monitoring protocol development stage with the Forest Service, but plans to recruit and train volunteers in the spring and summer of 2004.

Desired future condition of program:

- 1) Local governments recognition of this program as an asset to their communities and subsequent funding support.
- 2) Enhanced communication and constructive dialogue between volunteers, federal land managers, and local level decisionmakers with purpose being for gateway communities to recognize economic and quality of life assets of national forests and Appalachian Trail

- 3) Dedicated long term funding source (5 years +) to support a) monitoring, not just baseline data collection; b) local level action; c) federal land management action; d) evaluation efforts
- 4) Usefulness of data in local level planning and federal lands planning and natural resource management

Attachments:

- 1) Project Area Map

Program/Project Title:

IMPACTS OF LAND-COVER CHANGE ON THE NATIONAL PARKS OF THE
NORTHEAST TEMPERATE NETWORK

Program description : The purpose of this project is to provide a landscape context for the 11 parks (including 10 segments of the AT from Maine-Maryland) in the National Park Service's Northeast Temperate Network. Superintendents and resource managers have identified changes in land use surrounding Network Parks as a primary threat to park ecosystems. This project will quantify changes in land-cover types associated with the increase in human development around Network parks over the past 30 years. This information will aid resource managers and the National Park Service's Inventory and Monitoring program to identify and prioritize ecosystem stressors caused by human encroachment adjacent to parks. Providing this landscape context for park ecosystems, and quantifying the extent of land cover changes adjacent to parks is a critical step in the development and implementation of a long-term monitoring program. Activities will include an assessment of land-cover types using Landsat imagery from 3 time periods between 1973 and the present. Land cover types within and surrounding parks will be quantified for the three time periods, and changes in these land cover types over time will be calculated. The precise dates for each park will be based on image quality, availability, and cost.

Primary program responsibilities:

Principal Investigators: Y.Q. Wang, Ph.D. and Gregory Bonyng, M.S. Department of Natural Resources Science, University of Rhode Island, Kingston, Rhode Island 02881-0804

Program Coordination: Greg Shriver, Northeast Temperate Network, 54 Elm Street, Woodstock, Vermont, 05091.

Current status of program: This project will maintain a timeline that consists of four phases (Table 3). Phase I, concluding August 31, 2004, consists of a series preliminary reports submitted to each park and the NETN coordinator. The Phase I preliminary reports will document the current status of each park's land-cover classification. Pertinent data will be included with the report. Phase II, ending January 31, 2005, consists of the final land-cover classification results, in addition to the preliminary land-cover change results. The land-cover change analysis and associated tabular data will be completed during Phase III. This project will conclude on July 15, 2005 with the end of Phase IV.

Desired future condition of program: This project will provide the foundation for monitoring landscape change over time throughout the Northeast Temperate Network Parks, including segments of the AT.

Program/Project Title:
Appalachian Trail Wildlife & Habitat Monitoring Program
with Keeping Track, Inc.

Program description (two or three short paragraphs): The Keeping Track protocol helps participants use wildlife to assess habitat quality and overall forest health. As one of the three ATEMI pilot projects, ATC has sought out existing Keeping Track volunteer groups to establish wildlife and habitat monitoring transects on the A.T. corridor in Vermont. Volunteers monitor transects seasonally based on the Keeping Track protocol and record observations which are entered in a database provided by Keeping Track. The group's database is maintained locally and a copy is sent to Keeping Track for inclusion in a regional database. Information is used in local and regional planning and conservation efforts.

Primary program responsibilities:

Overall program coordination:	Matt Stevens, ATC; Shelley Wood, coordinator for Barnard, VT KT group Lars Botzjorns, KTI
Data management:	Shelley Wood, Matt Stevens, Casey Reese (NPS)
Volunteer recruitment and development:	Matt Stevens, Shelley Wood
Volunteer training:	Keeping Track, Inc.; Matt Stevens
Volunteer coordination/feedback:	Matt Stevens, Shelley Wood, future coordinator
Other involved parties	

Current status of program: Currently, the program is in the initial stages of development. ATC reached an agreement with a Keeping Track group in Barnard, Vermont whereby existing volunteers would establish new transects to include the A.T. corridor in Barnard and adjoining towns in the winter of '03-'04. Monitoring could start as soon as spring '04, but finalizing transects could delay data gathering until autumn '04. A grant proposal was submitted in November '03 to fund a training session for A.T.-specific volunteers. If successful, funding will not be available until early June '04.

Desired future condition of program: Ideally, there will be volunteers gathering data at sites in all states starting in New England. Each group will be self-sufficient with any additional support from ATC and Keeping Track, Inc. Data will be available to A.T. managers to be integrated into management decisions; shared with ATC members and volunteers through articles in Trail publications; and used to report to Congress and others to support further land conservation along the Trail. It will also be used in prioritizing further land protection for ATC's land trust activities.

Attachments: none

Program/Project Title:
Viz Vols – Visibility and Ozone level monitoring

Program description (two or three short paragraphs): (as of 1/22/04) In 2003, the Appalachian Mountain Club launched the volunteer-based visibility monitoring program. Volunteers use a commercially-available ozone (O₃) detector card (credit card-sized) to take momentary ground-level ozone readings at various sites. Participants also fill out a data sheet and take a photograph of the visibility. Information including the photograph is sent to AMC in Pinkham Notch, NH. ATC will adopt the program and expand it to as many areas on the A.T. in New England as possible.

The VizVols program will:

- (1) provide volunteers with basic, inexpensive ozone monitoring cards and associated data sheets
- (2) provide training for volunteers where necessary
- (3) create an on-line database for reporting monitoring results, and
- (4) ensure prompt follow-up to volunteers

Primary program responsibilities:

Overall program coordination:	Georgia Murray, AMC; Matt Stevens for ATC
Design and production of monitoring kits:	Georgia Murray, AMC
On-line database development:	Georgia Murray
Volunteer recruitment and development:	Matt Stevens, ATC
Volunteer training:	Georgia Murray, Matt Stevens, AMC Chapter VizVol coordinators
Volunteer coordination/feedback:	Georgia Murray, Matt Stevens
Other involved parties:	Ken Kimball, AMC; AMC Chapters

Current status of program: AMC has gathered data from the '03 season and is in the process of analyzing it and evaluating the ozone cards used for monitoring and the photographic information. ATC will recruit volunteers to monitor on the A.T. and assist in implementation of improvements for the '04 season. All data will be sent to AMC at Pinkham Notch in NH.

Desired future condition of program: This program will continue to serve as an educational tool and advocacy platform for volunteers and will provide good visibility and ground-level ozone concentrations information to the conservation community. All of the data gathered will be synthesized and reported upon by AMC staff with help as needed. Information gleaned from the collected data will be useful in helping advocate for clean air in the eastern United States. Volunteers who participate in the program will have direct access to synthesized data and all participants will recognize one another at least once per year, preferably soon after any reports are prepared. Data would be integrated into management decisions; shared with ATC members and volunteers through articles in Trail publications; and used to report to Congress and others regarding visibility and air quality along the A.T.

Attachments: VizVol data sheets (below).

Program/Project Title:
Cultural Resources Survey of the
Appalachian Trail in Connecticut

Program description (two or three short paragraphs): Connecticut is the second among the Trail states for which a cultural and historical resource inventory has been prepared. The inventory has been produced through contract with the Office of State Archaeology at the University of Connecticut and a private sub-contractor. ATPO, ATC, and several dedicated and knowledgeable volunteers assisted the contractor throughout the process and volunteers were indispensable as guides for much of the field survey work. The final inventory report includes management recommendations for more than 400 cultural resource sites identified in the survey, along with maps and ASMIS data sheets for each record.

The first state cultural resource overview and assessment was completed in 2001. Dr. Dean Snow of the Penn State anthropology department completed the initial literature search, which identified 55 cultural resource sites along the Trail in Pennsylvania. Volunteer Tom Scully and intern Erin Cathers followed up on Dr. Snow's work, adding 23 additional sites and photo-documenting, locating, and mapping all 78 cultural resource sites in Pennsylvania.

Primary program responsibilities:

Contract management:	Don Owen, Matt Stevens
Field visits and survey:	Keegans Associates, AMC CT chapter trails committee
Analysis and report preparation:	Keegan's Associates
Draft review:	Don Owen, Matt Stevens, Norm Sills, Doug Christie, Sue Spring
Other involved parties:	Nick Bellantoni, JT Horn

Current status of project: A draft final report for Connecticut (received January '04) is under review by ATC and ATPO. Comments and any necessary revisions are imminent and the final product should be delivered by February ('04).

Desired future condition of program: The statewide cultural resource inventories, like those in the natural heritage program, will be used to provide baseline information on cultural resources, identify priorities for management, and establish a volunteer-based monitoring to ensure that cultural resources are not lost or damaged. The program will also include interpretive and educational aspects aimed at providing a larger cultural context to the land over which the A.T. traverses. Information will be available to A.T. managers to be integrated into management decisions; shared with ATC members and volunteers as appropriate through articles in Trail publications; and used to report to Congress and others to support cultural and historic preservation of resources along the Trail.

Attachments: A copy of the report will be available at the meeting.

Program Title:
Invasive/Exotic Species Management Program

Program Description: In 2001, the ATC Board of Managers adopted a three-pronged policy on invasive exotic species: education, monitoring, and control. Priority for controlling exotic species would be given to threatened and endangered species occurrences that were threatened by exotics and to locations that would have the highest likelihood for success. Quite a few workshops have been held during the past several years to educate ATC members about the exotic species problem and what can be done about it. For several years, monitoring of exotic species has been a part of the natural heritage site monitoring program. More widespread monitoring by volunteers of exotic species along the southern portion of the AT began in 2002 through a cooperative effort of the Southern Appalachian Man and the Biosphere (SAMAB).

Our knowledge of where exotic species are located within the AT corridor is incomplete, but growing. Some of the state natural heritage inventories prepared for the AT documented the presence of many exotic species, especially some of the more recent inventories. Within the past several years, botanical contractor Ted Elliman has documented more precisely the extent of the exotic species problem within the AT corridor in Massachusetts, New York, New Jersey, and Connecticut. In 2002 an Appalachian State University student documented the presence of exotics along 400 miles of the AT in North Carolina and Tennessee, finding that most occurrences were located at road crossings of the AT.

In 2002 mapping and chemical control of exotic species in the AT corridor began through the efforts of the NPS National Capital Region Exotic Plant Management Team (EPMT) at three endangered species sites in northern Virginia and southern Pennsylvania.

Primary Program Responsibilities:

Overall Coordination: Kent Schwarzkopf (ATPO). Additional coordination provided by Michele Miller (ATC Mid Atlantic Region)

Management of NPS Exotic Plant Management Teams: Lisa Jameson (National Capital Region), Betsy Lyman (Northeast Region), and James Akerson (Mid-Atlantic Network).

Current Status of Program: In 2003, three additional NPS EPMT's started up: one for the Northeast Region stationed at Delaware Water Gap NRA, one for the Mid Atlantic area headquartered at Shenandoah NP, and one for the southern Appalachians, headquartered at the Blue Ridge Parkway. Contact has been made with two of these EPMT's. Based on information provided by botanist Ted Elliman, 4 high priority locations for exotic species control in the AT corridor were recently provided to the Northeast Region EPMT liaison.

Desired Future Conditions of Program: There is much room for greater involvement of volunteers in helping to physically control exotic species along the AT, if the interest can be developed. It may be possible for AT volunteers to assist the EPMT's in controlling exotic species. With training, AT hikers and volunteers can provide early warnings to land managers of new occurrences of exotic species. The new EPMT's should be able to control some of the highest priority exotic species occurrences along the AT.

Program/Project Title:
Appalachian Trail Cultural Resource Management Program

Program description (two or three short paragraphs): Cultural resources are a key element of the experience that the Appalachian Trail provides. *The A.T. Comprehensive Plan* states:

“The Appalachian Trail is a way, continuous from Katahdin in Maine to Springer Mountain in Georgia, for travel on foot through the wild, scenic, wooded, pastoral, and *culturally significant* lands of the Appalachian Mountains.”

The Trail passes through places like Harpers Ferry National Historical Park and Pine Grove Furnace State Park, which have well-established cultural resource protection and interpretation programs. But for most of the Trail, management programs for cultural resources are few and far between, particularly on recently acquired National Park Service lands.

In 1999, ATC and ATPO embarked upon a pilot project to conduct an inventory of cultural resources, similar to the natural diversity inventories. ATC and ATPO entered into a cooperative agreement with Penn State, which conducted a two-year intensive literature search that identified 55 historic and prehistoric sites along the Trail in Pennsylvania. An ATC volunteer conducted follow-up field work to verify the data. He also identified and catalogued 23 additional sites. A similar project in Connecticut, which identified more than 400 cultural resource sites along the Trail in Connecticut, was completed in December 2003.

In 2002, an NPS archaeologist completed a detailed Historic Context for the Appalachian Trail as part of the Appalachian Trail resource management planning effort.

Two other cultural resource management initiatives were completed in 2003: (1) the cultural resource survey and management plan for the Battle of South Mountain at Fox Gap and (2) the cultural resource training program for A.T. volunteers and staff.

Primary program responsibilities:

Overall program coordination:	Don Owen
Co-responsibility for specific projects:	ATC regional or associate regional representative
Technical advice and support:	NPS Northeast Regional Office (Lloyd Chapman)
Volunteer participation in specific projects:	key club volunteers (Charlie Graf, Tom Scully, etc.)
Other involved parties	state archaeologist, state historic preservation officer, state or federal staff archaeologists,

Current status of program: Currently, the cultural resource program is in the initial stages of development. The Historic Context is complete. Two statewide cultural resource inventories are complete; two are on hold waiting for funding and program coordination.

Desired future condition of program: Ultimately, the goals of the program are to have (a) a comprehensive overview and catalogue of cultural resources along the Trail and their condition; (b) funding to ensure that significant cultural resources are not damaged or lost; (c) monitors in place to keep an eye on sensitive or vulnerable sites; and (d) a program in place to interpret culturally significant resources for the benefit of the public.

Program/Project Title:
Survey and Management Plan for the
Battle of South Mountain at Fox Gap, Maryland

Program description (two or three short paragraphs): In 2001, ATC, ATPO, the Potomac Appalachian Trail Club (PATC), the Maryland Department of Natural Resources, and the Central Maryland Heritage League (CMHL) secured funding for and hired a contractor to conduct a survey and development a management plan for a historically significant Civil War battlefield along the Appalachian Trail in central Maryland. The contractor, Indiana University of Pennsylvania, completed *A Management Plan for Historic and Archaeological Resources for the Fox Gap Section of South Mountain Battlefield* in 2003.

In addition, the Maryland Department of Natural Resources formed a committee in 2003 to develop broad management principles for the entire area of the Battle of South Mountain (which encompasses other sections of the Appalachian Trail at Turners Gap and Crampton Gap as well as Fox Gap). ATC, NPS, PATC, and CMHL representatives are on the committee.

Primary program responsibilities:

Overall program coordination:	Don Owen, Karen Lutz, Charlie Graf (PATC), Al Preston (Maryland DNR)
Other involved parties	Neal Welch (Maryland DNR), Dean Considine (CMHL), Lloyd Chapman (NPS NERO), Steve Stottelmyer (CMHL), Joe Baker (IUP)

Current status of program: The initial cultural resource survey and draft management plan are complete. The committee has been formed and meets regularly. Several management projects (including construction of a parking lot and side trail) should be constructed in 2004. Decisions regarding additional site-specific research, additional land protection, landscape restoration, prevention of vandalism and looting, interpretive signage, public access, trails, parking, and monumentation need to be made.

Desired future condition of program: Ultimately, the goal of the management partners is to manage the site of the Battle of South Mountain at Fox Gap so that significant cultural resources are protected from adverse impacts (such as erosion and vandalism) and interpreted for the general public in a manner that is harmonious with the surrounding environs and the management of the Appalachian Trail.

Note: Executive Summary, *A Management Plan for Historic and Archaeological Resources for the Fox Gap Section of South Mountain Battlefield* (2003) will be distributed at the meeting

Program/Project Title:
Palmerton Zinc Remediation Project

Program description (two or three short paragraphs): Between 1898 and 1978, the New Jersey Zinc Company operated two zinc smelters in the town of Palmerton, Pennsylvania. By the time the smelters closed, they had emitted thousands of tons of airborne lead, zinc, and cadmium into the atmosphere. Large quantities of these contaminants became concentrated in the upper soil layers on more than 2,000 acres of Blue Mountain, killing virtually all vegetation. This in turn led to massive erosion of soils, which in turn had severe adverse effects on the Lehigh River, Aquishicola Creek, and other surface and subsurface water bodies. Once densely forested, Blue Mountain became a biological wasteland of contaminated soils and barren rock.

In the early 1980s, the National Park Service purchased approximately 800 acres of land to protect approximately ten miles of the Appalachian Trail along the ridgeline of Blue Mountain between Lehigh Furnace Gap and Little Gap immediately southeast of Palmerton. In 1985, the Environmental Protection Agency (EPA) identified Palmerton as one of the nation's first Superfund sites under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). In 1987, EPA laid out objectives for remediation of the site in a Record of Decision (ROD) and identified Horsehead Industries, Inc., as the owner and "primary responsible party" under CERCLA. Between 1990 and 1996, Horsehead Industries (under EPA's direction) began remedial actions on approximately 775 acres of private lands at the site, using a mixture or treated human sludge, fly ash, and seed in an attempt to re-establish vegetation and deter further erosion. In 2000, a company called Viacom (as successor in interest to Horsehead) began remedial work on the remaining lands at the site. That work is ongoing.

Implications for the Appalachian National Scenic Trail range from extended closures of the Trail during and subsequent to the remediation process, to effectiveness of the treatment in stabilizing soils and re-establishing vegetation, to introduction of non-native species, to dealing with the long-term effects of residual contaminants in the soils, water, vegetation, and wildlife. The National Park Service and the Pennsylvania Department of Transportation spent more than \$2,000,000 in the early 1990s to remove a large, overhanging rock and install a fence to prevent rockslides onto Pennsylvania Route 248, a four-lane highway that passes through the site.

Primary program responsibilities:

CERCLA response/remedial action:	Greg Nottingham
NRDA casework:	Dave Anderson
Legal assistance, CERCLA response:	Shawn Mulligan
Legal assistance, NRDA activities:	Mark Barash
Coordination with ATPO Park Manager:	Don Owen
Coordination with ATC and PTC:	Michele Miller, Paul Schubert (PTC)
Other involved parties	Mark Roberts (FWS), Charlie Root (EPA), Bill Freeman (Weston Solutions), NRDA Trustee Council (FWS and other state and federal agencies)

Current status of program: In 2003, after three years' work, NPS representatives secured approximately \$700,000 in funding as part of a Consent Decree signed by EPA, the Department of Justice, and Viacom, to cover past and anticipated future costs associated with remediation of the site. Also in 2003, affected federal and state agencies formed a Natural Resource Damage Assessment Trustee Council to develop a case and pursue damages for natural resources at the site.

NPS and other federal agency representatives continue to encourage EPA to press Viacom to implement remedial action that will accomplish the objectives of the Record of Decision. A remedial test plot plan has been implemented by Viacom's contractor on adjacent private lands. A test plot plan for NPS lands has been developed by NPS and Weston Solutions, but it has not yet been implemented. Full scale remedial work is expected to begin in 2005.

Desired future condition of program: Ultimately, the goals of the program are to: (1) remediate the site so that a healthy, functioning eastern hardwood forest environment can be re-established on all NPS lands located within the Palmerton Zinc Superfund Site as soon as possible; (2) be compensated under NRDA for damages to natural resources at the site; and (3) ensure that Trail club maintainers can manage and maintain the Trail through the site without risk of exposure to hazardous materials.

Attachments: none

Program/Project Title:

Gypsy Moth Suppression, West Nile Disease, Rabies Control, Fire Management, Agricultural Use, Open Areas Management, and Other Natural Resource Issues

Program description (two or three short paragraphs): ATPO and ATC deal with a number of other resource management issues that surface with surprising frequency. Gypsy moth suppression programs along the Trail through the mid-Atlantic states have been active since the late 1980s. These programs have been carried out primarily on lands administered by state and other federal agencies, but in many instances ATPO lands have been treated as well. No programs for treatment of West Nile disease vectors have been proposed yet for ATPO lands, although some monitoring has been proposed.

Agricultural uses are normally dealt with through special use permits issued by ATPO and administered by ATC regional office staff. Open areas projects are coordinated by regional ATC staff.

The USDA APHIS Wildlife Service is currently writing an environmental assessment for a national rabies vaccination program that is being implemented to prevent the spread of rabies in wildlife populations in the Appalachian Mountains. The program involves distribution of vaccine pellets by fixed wing aircraft. Since ATPO lands are ideally situated for the program, it is likely that ATPO lands will be prominently featured.

ATPO also is in the process of preparing a fire management plan and conducting an environmental assessment for forest fire management on all ATPO lands. The plan and environmental assessment will outline necessary coordination among local, state, and federal emergency response personnel and evaluate the environmental impacts associated with suppression of all wildfires on ATPO lands under a series of cooperative agreements.

Primary program responsibilities:

Gypsy moth suppression programs:	Don Owen
Rabies vaccination program:	Don Owen
Fire Management Plan:	Bob Gray
Agricultural Use:	Michele Miller, Bob Gray
Open areas management:	ATC regional representatives
Other involved parties :	Casey Reese, Kent Schwarzkopf, ATC regional and assistant regional representatives

Current status of program: Programs are in various stages of development as noted above.

Desired future condition of program: Ideally, one individual in ATC or ATPO would administer these programs as an ancillary duty and coordinate with others as necessary for the entire length of the Appalachian Trail. Program administration would require little staff commitment, as most program logistics and oversight would be conducted by other parties.

Attachments: none

Introducing the A.T. MEGA-Transect

PURPOSE OF THIS REPORT

For more than 25 years, the Appalachian Trail Conservancy (ATC) and Appalachian Trail Park Office (ATPO), who coordinate the scores of government agencies and private non-profit organizations that manage and maintain the Trail, have focused their efforts on securing a permanently protected corridor for the Appalachian Trail. Having nearly completed this goal, we have turned our energies toward assessing, understanding, and managing the wealth of natural resources present on the Appalachian Trail's land base, and telling the story of the Trail's environment to the American public. In support of this vision, in November 2006 ATC and ATPO hosted a three-day symposium that brought together a group of sixty-five scientists, natural resource managers, educators, and policy experts to explore the use of the Appalachian Trail as an environmental monitoring mega-transect.

This report is a product of the long process that culminated with the 2006 Symposium, and marks the official creation of the A.T. MEGA-Transect program. The report lays out the current status of the Appalachian Trail's natural resources as well as the knowledge gaps that currently exist, and highlights some of the potential monitoring projects to be launched as part of the A.T. MEGA-Transect.

BACKGROUND

The Appalachian Trail traverses the high elevation ridges of the eastern United States, extending 2,175 miles across 14 states, from Springer Mountain in Northern Georgia to Mount Katahdin in central Maine. The Trail's corridor encompasses 250,000 acres and intersects with 8 national forests, 7 units of the National Park System, more than 70 State Park, Forest, and Game Management units, and 287 local jurisdictions. Its gradients in elevation, latitude, and moisture sustain one of the richest assemblages of temperate zone species in the world. In fact, recent biological surveys distinguish the Appalachian Trail as one of the most biologically diverse units of the National Park System.

While the Trail's recreational value is well understood, its role as a flyway, biological corridor, source of water resources, and home to more than 2,000 occurrences of rare, threatened, or endangered species is a relatively recent consideration for the Trail's managers and traditional constituency.

Threats to the environment of the Appalachian Trail—from urbanization, recreational impacts, acid precipitation, exotic species, and climate change—represent threats to the health and well-being of every citizen, making the Trail and its protected corridor an ideal barometer for environmental condition that directly affect more than 120 million Americans.

Perhaps most important of all, the Appalachian Trail provides an outstanding opportunity to engage the American public in understanding environmental change. By engaging people in monitoring activities that adhere to monitoring protocols anchored in the principles of science, and “telling the story” of the health of the environment along the

Appalachian Trail, scientists and land managers can use the Trail to illustrate how changes in the environment may impact all of us.

Genesis of a big idea

The concept of using the Appalachian Trail corridor as an environmental mega-transect has surfaced several times in recent years. In 1999, Dr. Charles “Hank” Foster, Harvard Environmental and Natural Resources Program Research Fellow, along with colleagues wrote “Monitoring the Appalachian Trail Environment: A New Exploration” to outline how the A.T. could evolve from a simple footpath to a valuable source of environmental information. This was, by all accounts, the first time the idea had been put into print.

In 2000, the ATC and the Appalachian Trail Park Office (ATPO) hosted two meetings in New Hampshire to discuss Dr. Foster’s concept and begin mapping a strategy to put his idea into practice. Then, in November of the same year, Southern Man and the Biosphere (SAMAB) built on the momentum from the New Hampshire meetings expanded on Dr. Foster’s paper by publishing a plan entitled, “A Conceptual Plan for Monitoring and Assessing the Appalachian Trail Environment.”

In May of 2003, ATC and ATPO launched the Appalachian Trail Environmental Monitoring Initiative by hiring a coordinator for a three-year pilot project to experiment with these concepts. Just a few weeks later Dr. Foster convened a small, intense, one-day session at the New York Academy of Sciences, to further solidify the concept. Also in 2003, ATC and ATPO began working with the Park Services’ recently established Northeast Temperate Network (NETN), to coordinate ongoing and future inventory and monitoring activities.

Based on strong sentiment and some early successes, ATC’s strategic plan released in 2004 identified environmental monitoring as a key goal for the protection of the Trail. Later in 2004, Trail managers met with NPS Inventory and Monitoring program (I&M) coordinators from five AT related I&M networks to develop a list of indicators or “vital signs” to help assess ecological health on the A.T. The meeting produced the November 2005 *Appalachian Trail Vital Signs Report* and helped launch the 2006 At Ecological Monitoring symposium.

The term “mega-transect” was coined by ecologist and National Geographic Explorer in Residence Michael Fay to describe his monumental fifteen-month journey through more than a thousand miles of unbroken African forest (1999-2000). While Fay’s primary goal was to observe and record his observations, his accomplishments have proven to be inspirational. Borrowing directly from Dr. Fay’s long walk, we have adopted the term “mega-transect” to describe this project that is centered on 2,175 miles of Appalachian Trail. Ironically, the term MEGA, is also shorthand used by A.T. hikers to indicate their effort to hike the Trail from its northern terminus in Maine to its southern terminus in Georgia.

A.T. MEGA-Transect essentials

Mission

The Appalachian Trail Mega-Transect exists to monitor ecological resources, to document changes in the environment, to improve resource management, to build public awareness and

appreciation for nature and conservation, and to “tell the story” of the health of the Appalachian Trail and surrounding lands.

Goals

- **Monitor** – Collect and synthesize existing and new data on key indicators of environmental health from agencies, organizations, researchers, and citizen scientists
- **Understand** – Transform data into knowledge, and help understand ecological status and trends through analysis, synthesis, and modeling
- **Inform and Engage** – Educate, and involve decision makers, stakeholders and the public about the ecological health of the A.T.

Scope

The Appalachian Trail is both a social phenomenon and a representative cross-section of the Appalachian Mountains. To fully harness the power of the A.T. Mega- Transect concept, we seek to combine scientific investigation with broader educational and participatory opportunities.

Seeds of the A.T. MEGA-Transect

While the symposium served as a large-scale launch of the A.T. MEGA-Transect project, there exist numerous independent research projects that have used the Trail corridor over the years along with programs administered by Trail managers or partner groups. A few examples include:

The rare, threatened, and endangered plant monitoring program on the A.T. began with inventories in each of the fourteen Trail states. The program, directed by NPS, is designed to monitor the health and status of known occurrences of rare, threatened, and endangered plants and has enjoyed success and participation by dedicated volunteers for many years.

The Appalachian Trail Environmental Monitoring Initiative (ATEMI) began in 2003 as a pilot program to engage citizen scientists in gathering environmental information from the A.T. corridor for use by both A.T. managers and the broader public. The ATEMI has included water quality monitoring, ground-level ozone and visibility monitoring, area-sensitive carnivore (wildlife) habitat monitoring, and migratory songbird monitoring. The protocols employed for these programs are generally affordable, manageable, and intended for volunteer implementation.

The A.T. wildlife survey began in the spring of 2007 in cooperation with the Smithsonian Institute. Using infrared sensing digital cameras set up and collected by volunteers, the study will record large mammal occurrences at pre-determined points along the Trail.

Over the past two years ATC, ATPO, and SAMAB have been developing and evaluating an A.T.-specific protocol for monitoring forest health, which is based on the USDA Forest Service’s Forest Inventory and Analysis and Forest Health Monitoring programs.

Southern Appalachian Volunteer Environmental Monitoring program (SAVEM) volunteers monitor water quality and invasive plant populations at sites throughout the southern Appalachians. From the start, the program has consisted of a cooperative partnership among

SAMAB, ATC, and ATPO. Data from the program are used to improve management and public awareness.

National Park Service Inventory and Monitoring Program. In 1998, the National Park Service initiated the Inventory and Monitoring program that partitions 270 NPS units with significant natural resources into 32 separate ecological monitoring networks. The A.T. passes through 5 of the 32 networks: Appalachian Highlands, Mid-Atlantic, National Capital, Eastern Rivers and Mountains, and the Northeast Temperate with the NETN serving as the lead network for I&M program directed ecological monitoring.

June 11, 2007

MEMORANDUM

TO: Dave Startzell, Executive Director, ATC

FROM: Destry Jarvis, ORAPS, LLC

Subject: *AT Mega-Transect Initiative* - Structure Evaluation and Recommendations

As the first part of my assignment from ATC, my task was to assess the organizational structure of the AT mega-transect initiative (AT-MT), and make recommendations regarding possible improvements.

In order to carry out this task, I conducted 16 interviews, and read all of the pre-and post-conference materials, as well as participating in several conference calls with Steering Committee members. Most interviews were via telephone, though several were conducted in person. Persons interviewed included

1. Dave Startzell
2. Caroline Dufour
3. Laura Belleville
4. Pam Underhill
5. Don Owen
6. Fred Dieffenbach
7. Brian Mitchell
8. Steve Fancy
9. Marcia McNiff
10. David Merriwether
11. Hank Foster
12. Nick Salafsky
13. John Peine
14. Gary Machlis
15. Jean McKendry
16. Matt Stevens

Time and again in conversations and teleconferences, AT-MT participants keep coming back to the question of "what are we trying to accomplish?" Responses to this question continue to revolve around the "*big tent versus small tent*" paradigm. That is, is the M-T initiative primarily about public engagement through education and participation with the AT, or is it primarily about carrying out research in the search for new data that can support management and policy decisions that affect the future trail environment? At this writing, this question has not been fully resolved in all of the minds of all of the current participants. Settling this question is a fundamental step that must occur, soon, if success is to follow. That said, lack of dedicated leadership is the key missing ingredient.

Based on all that I have seen and heard, and on my own 35 years of experience with non-profit management, public service, and private business, simply stated, my recommendations are:

1. **Simplify the structure and separate functions more cleanly in order to distinguish between the functions best suited for public versus private sectors.**
2. **Designate a single (ATC) person as coordinator, and assure full and open communications across sectors.**
3. **Use the existing ATC Natural Heritage Site Monitoring program (about 120 individuals) as the starting point model for citizen science engagement – it already exists; it has active and knowledgeable citizen participants; it has a place in the club infrastructure.**
4. **With some exceptions, do not expect the ATC Clubs to take on the growth needed for the Mega-Transect project with existing members, but support them in a recruitment drive to use the new initiative as a means to recruit/expand the clubs, by attracting folks who might not be as interested in trail maintenance.**
5. **Secure funding, both private and public. ATC should develop a comprehensive “Case Statement” that serves as the overarching fundraising tool for the AT-MT. ATPO should make the AT-MT initiative the centerpiece of the ATPO Centennial Challenge strategy for their August 25 report. Mutual support from each sector is critical to success.**
6. **Engage the CESUs to support the AT-MT research agenda.**

Background

Credit for the idea of using the Appalachian Trail corridor as the venue for a large-scale scientific transect goes to Dr. Hank Foster at Harvard University. Dean Foster’s concept, first articulated in 2000, is to use the existence of the AT and its well-organized constituency to monitor the condition of the larger environment surrounding the Trail; use the ATC community as the eyes and ears – as an early warning detection system – that will alert the public and engage the scientists more directly as changes to the Trail environment are detected or suspected by those who use it and know it best. Dean Foster has clearly and succinctly described the sort of “big tent” approach that incorporates both scientific research, resource-management oriented science, and citizen science, as a direct means of serving public outreach and education, in order to influence the future condition of the trail corridor and its surrounding region. These elements should be embraced by all of the participating agencies and organizations as the AT Mega-Transect Project moves forward.

The November 2006 symposium was an excellent beginning to the AT Mega-Transect (AT-MT) project, with broad participation, serious engagement, and universal enthusiasm for the initiative. Dr. Michael Fay’s convincing analogy to his prior work in Africa, and Dave Startzell’s powerful call to action served as appropriate bookends to the Initiative’s launch.

Since that time, *the Initiative has stalled*, primarily due to lack of new funding and dedicated staffing, but also due to an overly complex structure.

Analysis and Recommendations

1. Simplify the structure and separate functions more cleanly in order to distinguish between the functions best suited for public versus private sectors.

At present, there are three public agencies (NPS, USGS, and USFS) and one private, non-governmental organization (ATC) that are chiefly engaged in the AT-MT. In the initial organizational structure, each of the participating entities is engaged in discussion of every aspect of the project, down to the individual technical working groups (i.e. Birds or Visitor Use), and the fundraising and communications elements. This integrated approach to the structure of the AT-MT does not result in a productive, efficient planning process, and does not allow each entity to focus on what it is that they do best. While keeping every one informed is important, that task could be largely accomplished through the intranet site, and teleconferences strictly reserved for decisions that require joint approval. Below is a bubble chart that represents a somewhat improved structure for the AT-MT, especially to acknowledge the separation that is needed between the inherently governmental and/or scientific research functions, and those that should be carried out by the private sector, principally citizen science, fundraising, and public education.

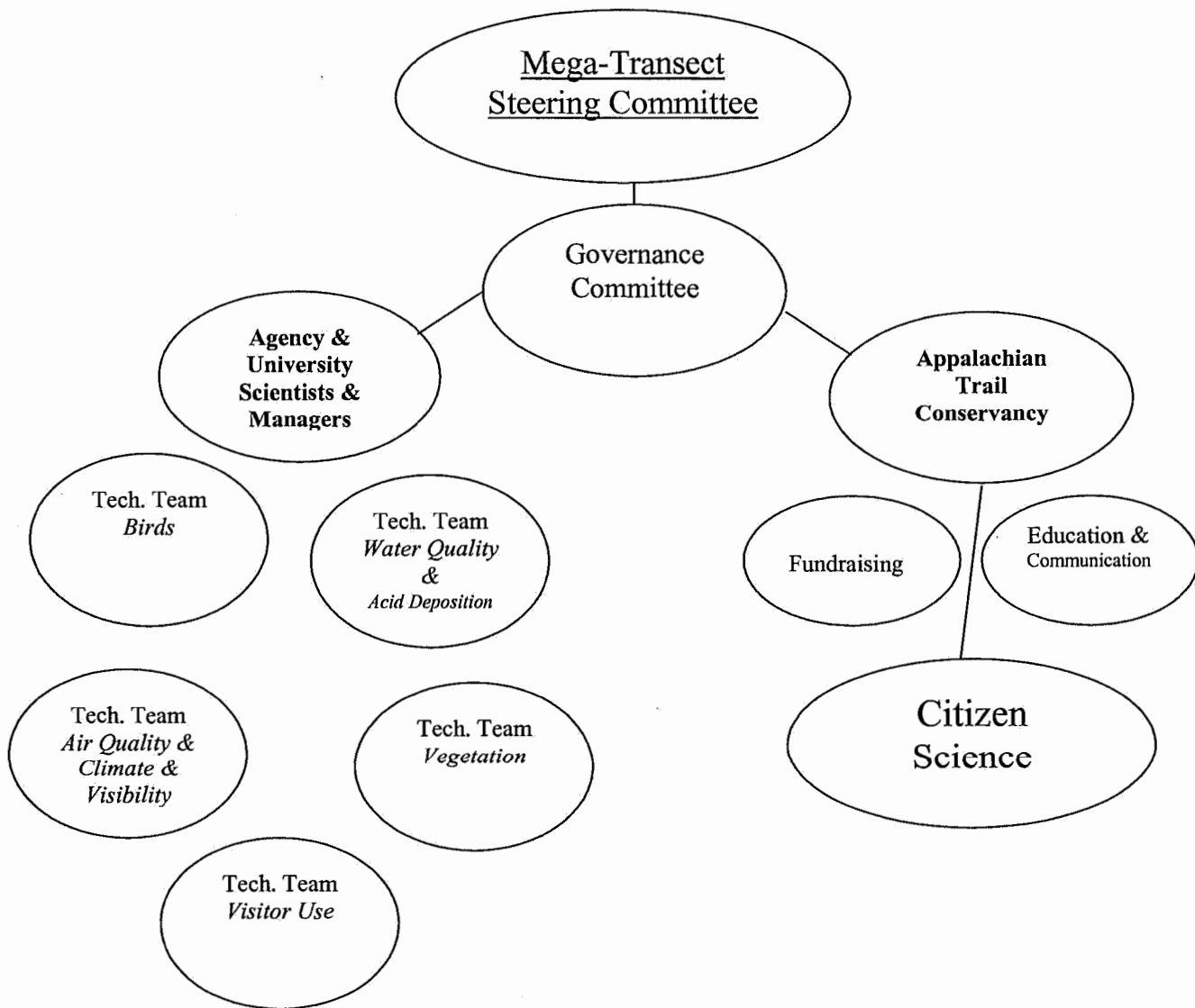
While the partnership that ATC enjoys with the NPS/ATPO is critical (and nearly unique) to the potential success of the AT-MT, this close relationship cannot obscure the fundamental differences in purpose and capability that necessarily exists between government and non-governmental organizations.

As an NGO, ATC must (and does) aggressively seek contributions of private funds to support its programs, and must occasionally approach the US Congress to articulate needs for the AT that the NPS cannot express for itself as a part of each Administration that ordinarily expects to assure that its agencies adhere to its budget requests and policies. These are not activities in which federal employees may actively participate, and would get into trouble for doing so.

Therefore, ATC must focus on fundraising and public education as a first priority for getting the AT-MT off the ground and sufficiently visible that citizens will wish to both contribute financially and participate in the citizen science aspects of the initiative.

At the same time the agencies must focus on designing the research and the protocols that enable it. In doing so, the agencies must keep in mind that some, but not all, of the monitoring and inventories that are fundamental to the AT-MT can and will be supported, or even carried out, by citizens recruited by ATC for the purpose. Consequently, the design of inventory and monitoring protocols should distinguish among those elements that must be carried out by research-grade scientists, and those aspects that can be usefully completed by citizens.

Some of the citizen science can and should be provided in direct support of the field work of the agency/university scientists, and some of it can be designed to be carried out entirely by citizens, for use in public education and civic engagement.



2. Designate a single (ATC) person as coordinator, and assure full and open communications across sectors

Up to the present, there has been no single person in charge of the AT-MT, and as a consequence time and opportunity has been lost. Ideally, there should be a single agency official and a single ATC employee designated as co-leads, who can devote full-time to the initiative. At a minimum, ATC must find the financial resources to hire a full-time senior employee who can lead and coordinate the overall AT-MT program. A full-time leader from the NGO side of the initiative makes more sense, because that individual can function with a less-constrained agenda, and a persona that can become the public face of the initiative.

In private fundraising, in public policy discussions before the Congress, through the media, and in the citizen grassroots, a well-spoken individual with an outgoing and inclusive personality can often carry an initiative to success, when a loose coalition cannot. A truism of philanthropy is that donors most often support individuals that they know and trust.

The AT-MT must have a public face if it is to be successful. It is also true that management succession is one of the hardest things for either NGOs or public agencies to achieve smoothly. Consequently, if the AT-MT is to be a long-term venture, key second tier individuals should also be positioned to be knowledgeable and engaged in each sector.

Open communications, especially between the ATC and the agency sectors, is essential to success. At the same time, there are some elements that each sector must do alone, and then communicate the results. Up to this point, there has been a bit too much overlapping process and engagement between sectors in matters that should properly be left to one sector alone, and communicated after results are in. The effect of this current approach has slowed the process and contributed to the stall. For example, the research protocols are the purview of the agencies, and private fundraising is the specialty of the ATC. Similarly, there has been too much angst expressed about citizens doing “science” and not enough focus on getting the actual protocols done in a timely manner.

3. Use the existing ATC Natural Heritage Site Monitoring program (about 120 individuals) as the starting point model for citizen science engagement – it already exists; it has active and knowledgeable citizen participants; it has a place in the club infrastructure.

Beginning in 1989 and continuing to the present, the ATC and over 100 individuals from the member clubs have actively engaged in conducting inventories and monitoring of selected natural areas along the 14 states that make up the AT corridor. While a key element of this program has focused on rare, threatened, and/or endangered species and exemplary natural communities, it has also served as an early model that demonstrates

both the capability and the level of interest from the ATC community for a science-based work product that complements the ATC clubs' long-standing trail maintenance focus.

It is likely that many of the individuals who have participated in the Natural Heritage Program could also engage with the broader inventories and monitoring that is envisioned by the AT-MT initiative. Certainly, these individuals have gained knowledge and experience with field work that supports solid scientific research, as well as public education about the condition of the natural environment of the AT.

A comprehensive scan of these individuals should be undertaken by ATC in order to ascertain both opportunities for expanding their engagement, and to capture *lessons learned* that could be useful to the more expansive scope of citizen engagement with the AT-MT.

While this program has had some successes, with 515 natural heritage sites identified along the AT, and 135 of these sites currently included in the monitoring program, only 62 of them were actually being monitored in the latest program evaluation (2004). Clearly a stronger organizational model is needed, with a more reliable funding stream.

4. With some exceptions, do not expect the ATC Clubs to take on the growth needed for the Mega-Transect project with existing members, but support them in a recruitment drive to use the new initiative as a means to recruit/expand the clubs, by attracting folks who might not be as interested in trail maintenance

To date, ATC has not thoroughly vetted the AT-MT with its members clubs, in large part because there has been little of substance to report to them, none of the likely protocols are in place, no new funds have been raised, and it is not yet clear exactly what ATC will ask the clubs to do for the AT-MT.

Nevertheless, for the AT-MT to achieve is optimal level of engagement on the ground, the clubs must participate. At the same time, the members of the constituent clubs are generally fully engaged with volunteer work on the AT, principally focused on trail maintenance, and occasional major relocations, AT corridor protection projects, and public education. While the leadership and membership of some clubs have expressed interest in the AT-MT, it is more likely that the majority of existing club members will want to continue to focus their volunteer time on their traditional areas of excellence in trail maintenance.

Consequently, ATC must find ways to build incentives for AT-MT participation into the evolving program and citizen science process so that the clubs will want to engage with it. Ideally, both ATC and the clubs will see the AT-MT as an opportunity to recruit the next generation of volunteers for the AT.

In some important ways, the success of the AT-MT is critical to the successful implementation of the ATC Strategic Plan. This Plan, and the re-focusing of the ATC

that has resulted, contemplates carrying out Benton MacKaye's original vision for the AT – not only a continuous footpath through the Appalachian Mountains, but also the best means of sustaining comprehensive conservation management of the entire mountain region.

A central component of the ATC fundraising plan for the AT-MT will need to be financial support for the clubs to mount a new recruitment campaign, one that is focused on bringing in new members who will be committed to engagement with the AT-MT project, and who will apply their volunteers hours to participating in the various projects that comprise the citizen science aspects of the initiative.

5. Secure funding, both private and public. ATC should develop a comprehensive “Case Statement” that serves as the overarching fundraising tool for the AT-MT. ATPO should make the AT-MT initiative the centerpiece of the ATPO Centennial Challenge strategy for their August 25 report. Mutual support from each sector is critical to success.

In the world of private philanthropy, the term “case statement” is often utilized to signify a major paradigm shift for an NGO - a comprehensive thrust in a major new direction, or taking an existing program to a whole new level of sophistication and complexity. Just such a “case statement” should form the basis for ATC fundraising for the AT-MT. It should be bold, ambitious, and large. More importantly, it should be positioned to serve the ATC as the basis for the organization's fundamental shift that is at the core of its Strategic Plan. While the framework of this new Strategic Plan has been approved by the ATC Board of Directors and its new name and structure implemented, the big goals that it sets out for the organization are far from being realized at present.

The AT-MT Case Statement will have a sufficiently broad scope to cover all aspects of program funding needed for ATC to assure that the AT-MT will be successful over time. It will encompass all aspects of the leadership staffing, field management, citizen science, public education, community engagement, and communications elements of the AT-MT. It will seek to secure multi-year funding for all elements of the initiative.

Simultaneously, the ATPO should make the AT-MT the centerpiece of its required Centennial strategy, as that office's submission for the Secretary's August 25 Report. This proposal should focus on agency leadership, field staffing, protocol development, research funding, and outreach to university-based scientists through the CESU network.

As it has done in the past, ATC should utilize its connections, communications skills, and track record of success to convey the significance of the AT-MT to higher levels of the NPS and DOI, and to the Congress and the new media. Similarly, ATPO should lend its credibility-enhancing support to the ATC Case Statement fundraising efforts through appropriately worded letters of support and by other legitimate means.

The possibility of some combination of public and private funding that can be devoted to the AT-MT through the Centennial Challenge should not be ruled out at this stage, though success is still possible by each sector working more independently to achieve their respective funding.

6. Engage the CESUs to support the AT-MT research agenda

It has only been since 1998 that the NPS has had a clear mandate in law for its management of the parks to be based on sound science. In the same public law, Congress authorized NPS to establish a network of universities, to be called the Cooperative Ecosystem Studies Units (CESU), that would be organized around the major physiographic provinces of the USA and that would conduct and facilitate science that supports sound management of the parks.

To date, the CESU network has not been recruited to be an active participant in the AT-MT, but it should be. Often, universities in the CESU network have been able to raise new funding for NPS projects through their own lobbying and advocacy efforts. We need them to do so for the AT-MT.

While university based research programs are no more capable than agency research-grade science, these institutions can often enhance visibility, credibility, and scope of needed research efforts, and can often bring long-term stability and continuity to programs that are essentially intended to be permanently fixed to the landscape.

Both public and private fundraising efforts should include budgets for CESU engagement with the AT-MT. Relevant CESU universities and appropriate staff should be identified, and these universities brought into the planning phase of the AT-MT. Aside from any added depth or breadth that the CESU can bring to the research agenda, these institutions can also add credibility to the fundraising. For example, some foundations or individuals will much more readily donate to a university science project than they will to a federal agency.

In order to make effective use of the CESUs, one university in each of the relevant physiographic groups should be selected as the lead university, with others in each group able to participate as they can. Thus, a lead university in the Northern Forest Group, the Chesapeake Watershed Group, and the Southern Appalachian Mountains Group, should be chosen to lead the CESU involvement for their respective region.

For the Northern Forest Group, the lead university is most likely to be either the University of Vermont, SUNY College of Environmental Science and Forestry, or University of West Virginia; for the Chesapeake Watershed Group, the likely choices are University of Maryland, Frostburg State, College of William and Mary, or George Mason University; and for the Southern Appalachian Mountains Group, the University of Tennessee is already involved (through John Peine), but other possibilities include Western Carolina University and the Oak Ridge National Laboratory.

Appalachian Trail Conservancy

CASE STATEMENT

Preserving the
Appalachian Trail
Experience & Environment
For the 21st Century and Beyond



www.appalachiantrail.org

**APPALACHIAN TRAIL
CONSERVANCY**

Join the Journey™

PHOTO BY LINDA NORMAN

Case Statement

For a five-year, \$8.5 million citizen science, public education and restoration initiative for the Appalachian Trail Conservancy, which will go far toward assuring that the A.T. will endure as a premier hiking trail and remain a conservation icon for centuries to come, accessible to all, in a pristine setting.

The Appalachian Trail may well be the best example of successful civic engagement and stewardship of any unit of the national park system, involving tens of thousands of American citizens in a grassroots protection effort dating back more than 82 years and continuing to this day. The A.T. can thus serve as a new paradigm for future park management and stewardship applicable to other NPS units.

Dave Startzell,
ATC Executive Director

The 270,000 acres of public land in the A.T. corridor comprise 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 slender 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. Last but not least, the Trail has a culture of cooperation and partnership, and is known to millions as one of the last great places in America.

Pamela Underhill,
National Park Service
Appalachian Trail Manager



PHOTO BY LAURIE POTTEIGER

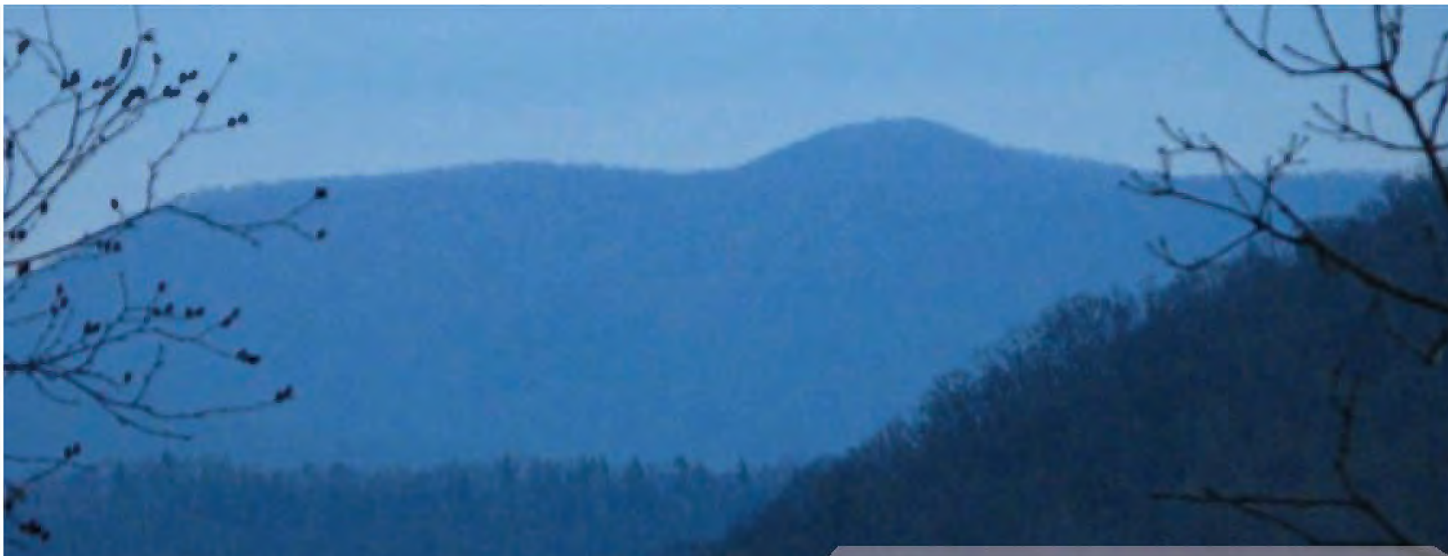


PHOTO BY PHILLIP JORDAN

Executive Summary

At the turn of this new century, it was clear to the Appalachian Trail Conference that dramatic change was needed. The national icon that is the Appalachian National Scenic Trail (A.T.) is under a multi-pronged, insidious assault from diminished air and water quality, reduced forest health, habitat fragmentation, and incompatible land use encroachment, while the devoted core volunteer constituency of the A.T. is aging, and the youngest generation is suffering from “nature deficit disorder.”

Dramatic steps were called for, and taken. The Appalachian Trail Conservancy (ATC) was born anew as the result of a major and extensive strategic planning process. The name change was more than symbolic, but reflects a consensus for an expanded mission that is driven by hard science, advanced by education, and implemented by a new generation of volunteers and partners.

A comprehensive organizational renewal strategy, called “Linking the Landscape” was initially adopted by ATC with five

key elements that together encompass its newly expanded and invigorated mission—Conservation, Communities, Citizens, Classrooms, and Causes.

Paralleling and complementing this overarching strategic vision ATC, key governmental agencies, and private science-based organizations and universities have most recently developed the concept of carrying out a unique inventorying and monitoring transect along the entire length of the 2,175-mile A.T. Only by the active engagement of volunteer citizen scientists convened, trained, organized, and activated by ATC, and a cadre of new and existing partners in lands and resources management and in the education arena, will this effort be feasible.

This Appalachian Trail MEGA-Transect¹ can provide a mechanism that could profoundly alter the average American’s understanding of the A.T. and its surrounding resources, the forces affecting them, and their engagement with them. As an ongoing process involving scientists and citizens both from the 14 states through which the A.T. passes and beyond, this massive science-based project will not only provide extensive and timely data for decision-makers, and an educational platform for teachers and students, but offers the ATC the framework for both protecting the A.T. and building the next generation of trail volunteers, through active citizen engagement.

¹A.T. MEGA-Transect is the official title of the multi-part project. A mega-transect indicates a very large scale scientific inventory and monitoring study along a linear corridor. ME (Maine)—GA (Georgia) also happens to be the acronym for the states where the A.T. begins and ends its route.

The Components of the A.T. MEGA-Transect Initiative

1. From Trail Building to Ecosystem Restoration—Launching the MEGA-Transect Initiative
2. Citizen Science—Inventorying and Monitoring For & By the People
3. Field Research & Protocols Through CESUs, NPS I&M, USGS, and USFS Field Stations
4. A.T. Scholarship—Graduate Student Field Work
5. Understanding the Results—The 5th Year Symposium
6. A Trail to Every Classroom—School-based Education to Get Kids in the Woods
7. Trail Towns—Engaging Gateway Towns that Sustain the A.T. Environment & Viewshed
8. Engaging and Expanding the A.T. Constituency

As this Case Statement presents, the ATC, along with its key partners, proposes to take a leadership role in implementing the A.T. MEGA-Transect initiative as the critical element in carrying out its strategic vision for the new century.

Success will require new public and private funding totaling some \$8.5 million over the next five years. This success will be sustained into the future by the resultant organizational growth in membership, partnerships and constituencies for the A.T. that will carry this through another century of national significance for all Americans.

The Need

Climate change, habitat fragmentation, loss of species diversity, regional haze and loss of clear-sky visibility, acid rain and water pollution, and the inexorable creep of urban and suburban subdivisions into the Appalachian Mountains all along the east coast of the U.S. pose serious threats to the integrity and enjoyment of the Appalachian National Scenic Trail and, indeed, to the entire complex of ecosystems that make up America's oldest extant mountain range. More than the proverbial "canary in the coal mine," the health and environmental condition of the A.T. foreshadows the health and living environment for nearly half

of the American people who reside within a few hours' drive of some portion of the Trail.

The 2,175-mile Appalachian National Scenic Trail, a continuous footpath along the crest of the eastern mountain ridges from Maine to Georgia was envisioned, built and is maintained today primarily by private citizen volunteers. Since 1925, these citizens have been organized into clubs of trail-maintaining volunteers arrayed along segments of the A.T., and unified under the banner of the Appalachian Trail Conservancy.

The idea for this continuous footpath originally came from Benton MacKaye, a regional forester and planner, in an October 1921 article in the *Journal of the American Institute of Architects*. However, MacKaye's vision was for much more than a footpath through the mountains, but a complex regional approach to conserving and appropriately utilizing the natural resources of the eastern mountains to revitalize the American people and the lands on which they live and recreate; he termed it "a project in regional planning."

As is often the case with visionaries, the product of their vision is sometimes overtaken by the pragmatists. Such has been the case with the A.T. for most of the past 86 years—a continu-

The 2,175-mile Appalachian National Scenic Trail was envisioned, built and is maintained today primarily by private citizen volunteers.



PHOTO COURTESY GREEN MOUNTAIN CLUB

ous footpath was built by 1937 and is regularly maintained by thousands of volunteers today, but the surrounding natural environment has not been adequately protected, and the quality of the trail experience, not to mention the underlying natural ecosystems, is seriously threatened, and few people understand either the threat or what they can do about it.

Although the Appalachian National Scenic Trail received federal recognition in 1968 and is now administered as a unit of the national park system, the A.T. is, and has been for more than 80 years, first and foremost a creation of an engaged and committed citizenry. To this day, the A.T. is sustained by the sweat equity of its citizen constituency through the ATC and its 30 affiliated clubs, with more than 5,000 volunteers contributing about 190,000 hours of labor annually. Recognition of the need to take positive steps to preserve the A.T. region in order to

‘This project has the potential to support every facet of our mission as it has evolved over the course of 82 years.’

David N. Startzell,
ATC Executive Director

preserve the Trail environment and thus the Trail experience, calls upon ATC to reconstitute itself and to build a new constituency that will carry it through the 21st century and beyond. In 2005 ATC adopted a new strategic vision for this purpose.

Significant steps to protect the A.T. have been accomplished over the years, but clearly, not enough has been done to assure

the perpetuation of the high-quality mountain environment that is being enjoyed by millions of Americans every year. In 1968, Congress enacted the National Trails System Act, and designated the A.T. as the first “national scenic trail” in that system. In 1978, Congress authorized, and began to appropriate funds for the purchase of lands, chiefly by the National Park Service (NPS) and the USDA Forest Service (USFS), needed to acquire a protective corridor or greenway averaging 1,000 feet in width for the entire length of the A.T. By 2007, that 1,000-foot publicly owned A.T. corridor is 99 percent complete.

However, it is also clear in 2007 that neither the quality of the A.T. experience nor the Appalachian Mountains environment are assured of permanent protection—in fact, the trend appears to be in the wrong direction. A 1,000-foot wide corridor may be sufficient for a footpath, but not for the natural environment and the wide diversity of native species that find their habitats in the Appalachians.





With serious threats to the integrity of the A.T. clearly in mind, the ATC has embarked on an expanded mission, one that if successful is intended to achieve the complete vision of Mac-Kaye's "regional plan" for the A.T.

This Case Statement and its eight components are intended to encompass a comprehensive way for the ATC to carry out this new strategic vision and fully protect the A.T. corridor, the A.T. experience, and the quality of the environment of the Appalachian Mountain region that is critical to the quality of life for nearly half of America's citizens who reside in the regions bordering the Trail.

The Vision

The keys to the future of the A.T. and its environment are 1) management based on sound science and systematic data collection and analysis, 2) education through classrooms and through service learning and 3) civic engagement in both A.T. gateway communities and major East Coast cities. Both to

Anyone familiar with the A.T. or its surrounding environment can attest to the fact that the quality of that environment is being diminished by a variety of forces.

honor its roots and because it is the best way to manage and protect the A.T. for present and future generations, ATC will continue to function largely through volunteers, supported by strategic public-private partnerships with federal and state agencies, universities, and a variety of nonprofit organizations.

Since 1978, nearly \$200 million from the federal Land & Water Conservation Fund, from several states, and from private donations has been spent to secure a permanently protected corridor of land for the A.T. That part of the job is nearly complete. In a unique partnership, the ATC, the NPS, and several other state and federal agencies share in the day-to-day management of the 270,000-acre A.T. corridor, with volunteer club

members carrying out the bulk of routine trail maintenance, major trail relocations, and visitor use and resource management responsibilities. The NPS and local jurisdictions retain responsibility for regulations and law enforcement, while planning and public education programs are carried out jointly.

In order to protect that substantial public investment and the iconic quality of the A.T., much more is needed for the future—more research, more education, more cooperation, more support. For ATC to fulfill its strategic goals, the organization must keep pace with the enhanced levels of sophistication and capacity that are needed to support preservation of the A.T. environment and sustain the A.T. region in the face of ever more complex challenges.

Whether one is a casual day-hiker, a weekend backpacker, or a "thru-hiker" (as end-to-end A.T. hikers are known), anyone familiar with the A.T. or its surrounding environment can attest to the fact that the quality of that environment is being diminished by a variety of forces. The questions are: by how much, in what ways, what does it mean, and what should be done? The A.T. MEGA-Transect and related initiatives that stem from or are integrated with it are intended to provide the answers.

In November 2005, the NPS, the ATC, and a group of university cooperators produced the *Appalachian Trail Vital Signs Technical Report*, which sets out the general framework for a comprehensive A.T. environmental-monitoring program that should cover 14 states, six national parks, eight national forests, and more than 200 local jurisdictions. It would provide scientists, land managers, and local decision makers with data on air quality, water quality, land development, native bird populations, forest vegetation, invasive species, and visitor usage. While this document provides a comprehensive outline for what is needed, the implementation of the program remains unfilled in 2007.

In the fall of 2006, ATC, NPS, the U.S. Forest Service, and the U.S. Geological Survey, along with various university and private cooperators convened a three-day symposium “*Exploring the Appalachian Trail Mega-Transect*.” The conclusion of the conference was a clear, unequivocal endorsement of the concept of using the Appalachian Trail as a scientific mega-transect:

The Appalachian Trail corridor traverses the highest areas in the eastern United States, stretching from Maine to Georgia. This proximity to nearly half the U.S. population makes the corridor an ideal place from which to gather information regarding current conditions and changes to air and water quality, wildlife habitat, and forest health that occur over time, and to share this new knowledge with the millions who reside nearby.

For instance, the high mountains of the Northeast are often the first place to feel the negative effects of air pollution. Information gained through environmental monitoring in the A.T. corridor can serve a much larger public interest and even influence local, regional, and national public policy as it relates to environmental quality and human health.

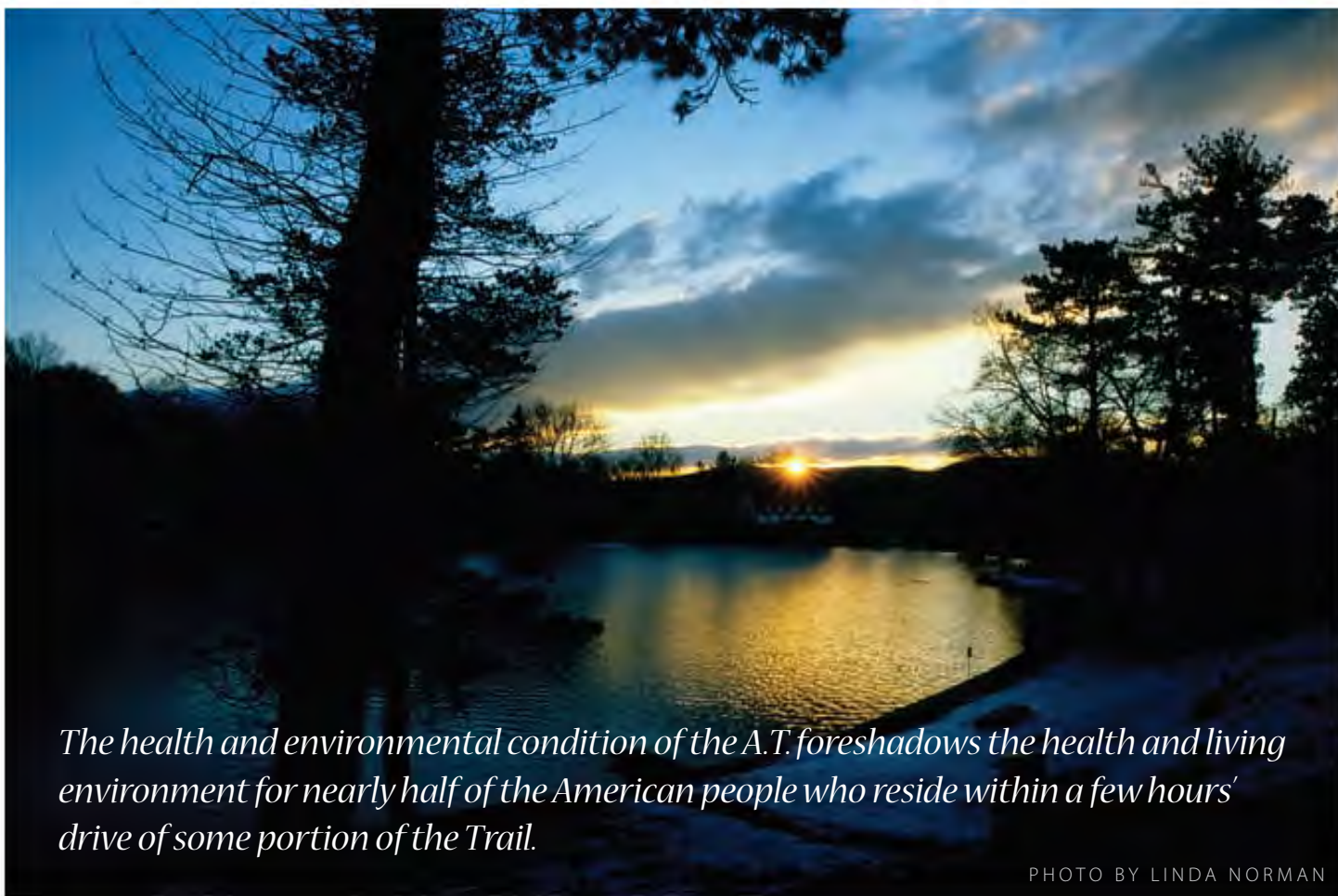
Based in large part upon this recommendation, the ATC and its major federal partners have decided to enlarge several ongoing land-management programs into a long-term collaborative project to comprehensively monitor changes in the mountain and valley environments which the famed, 2,175-mile footpath

traverses.

The purpose of this A.T. MEGA-Transect initiative, an ATC partnership with other nonprofit organizations and scientific agencies, is fourfold:

- Understand the changes in air and water quality and the health of the plants and animals within the 270,000 acres of public lands associated with the trail, and what these changes may indicate for the large populations residing in the regions through which the A.T. passes.
- More effectively protect the corridor’s natural resources.
- Foster public appreciation for nature generally and conservation of the A.T. and the region specifically.
- Better tell the story of the status of the health of the mountain lands surrounding the Trail to visitors, trail neighbors in 14 heavily populated eastern states, and the general public.

“This project has the potential to support every facet of our mission as it has evolved over the course of 82 years,” said David N. Startzell, executive director of the ATC. “That includes our traditional work as the trail-builder and maintainer, our three decades of work through a remarkable public/private partnership that has conserved hundreds of thousands of acres, and our rich heritage of volunteer-based stewardship.



The health and environmental condition of the A.T. foreshadows the health and living environment for nearly half of the American people who reside within a few hours’ drive of some portion of the Trail.

PHOTO BY LINDA NORMAN



PHOTO BY RANDY DIMMETT

This Appalachian Trail MEGA-Transect can provide a mechanism that could profoundly alter the average American's understanding of the A.T. and its surrounding resources.

“And, it is a potent means to pull together many things we and our affiliated clubs have only recently initiated in reaching out to school children and neighboring communities.

“Protection of the Trail and the hiking experience for which it exists has always been our principal mission,” Startzell continued. “A quarter-century of citizen-based land-management experience has taught us, however, that ‘protection’ today means more holistic monitoring of everything going on in those woods and everything having an impact.

“Four generations of hikers have gone to the Appalachian Trail for a particular experience. That experience is largely defined by the place in which it happens. Recent satellite images show us that some things are definitely happening to that land, especially the forests. The surrounding ‘urbanization’ and habitat fragmentation is obvious, but we need to know more about the impacts and causes of those and other changes on wildlife and air and water quality if we are going to properly protect the resources behind that hiking experience. And, we need this kind of expanded partnership to do it, because neither we and the clubs nor our traditional agency partners can do it alone,” he concluded.

The Initiative

The concept behind the A.T. MEGA-Transect is adapted from a 1997 “mega-transect” of central Africa undertaken by National Geographic Society explorer-in-residence Michael Fay—a walk of more than 2,000 miles to document the health of plants and animals in blocks of pristine forest, and foster new protection for a chain of 13 national parks. Fay, keynote speaker at the aforementioned A.T. symposium, explained: “Transecting is what 19th century explorers did: systematic collection of data

on landscapes and species.” Climate change underway today “is perhaps the greatest challenge in our history,” Fay said, and the north-south path of the A.T., “an icon in this country, is an excellent setting for collecting relevant, scientifically valid data on where we’re going as a country.

“Such a project should look at perhaps 50 variables—and everything goes in your notebook—so that, over time, the relationships among variables, including the cultures of those who live nearby, can be seen,” he added. “Observations by walkers could be more valuable than some researchers’ myopia. The Appalachian Mountains have been exploited for its resources for centuries—we’ve destroyed that ecosystem several times. In the 21st century, it’s a great focal point for educating people to ecosystems’ resiliency.”

In order to carry out this ambitious set of goals, the Conservancy must adjust its programs, and increase its capacity to carry out the multitude of needed projects. Over time, as research is conducted and results are conveyed to the public, the incredible value of this initiative will be better understood, and the ATC can expect to expand its membership and partnership base in order to sustain the work. However, over the next five years, ATC will need a significant infusion of funding, a modestly expanded staff, and a significant expansion of its traditional volunteer base to launch this large initiative effectively.

Therefore, each of the eight critical components proposed in the following sections needs start-up funding that can be provided by foundation or corporate grants, federal and state partners, and contributions from individual donors. Based on the growth in membership and general public support that is projected to result from the five-year start-up phase of these new initiatives, ATC will be able to sustain the new programs over time.



5-YEAR BUDGET

1 From Trail Building to Ecosystem Restoration— Launching the MEGA-Transect Initiative

ATC and its partners agree that the proposed A.T. MEGA-Transect initiative holds great promise as a means to monitor, understand, and respond to changes in the environment, to engage new partners, communities and visitors in shared stewardship of the Trail and the wealth of associated natural resources, to increase the number of volunteers involved in the Trail, and to tell the story of the health of the A.T. and surrounding lands to visitors, neighbors, and the American public. However, a full scale launch of the A.T. MEGA-Transect project following the November 2006 symposium has been slow to materialize, despite the enthusiastic support of all of the participants. Lacking a single staff leader, the numerous coordination functions have fallen to a Steering Committee of senior partner representatives, and further to a Coordinating Committee of working-level participants from each of the major partner organizations, none of whom can devote their full attention to the MEGA-Transect initiative.

It is clear that modest targeted additions to the staff will be needed to lead the A.T. MEGA-Transect, both at ATC headquarters, and in the offices of its four administrative regions.

A new senior member of the staff, one with an advanced degree in a relevant field of science, is needed to serve as the national team leader and initiative coordinator. This person will need to be a good communicator, and will have solid experience with both the conduct of traditional field research and public-private partnerships that foster citizen science.

Based on its 82 years of experience in public-private partnerships and volunteer engagement, the level and detail of coordination and inter-agency cooperation that is needed will best come from the ATC, rather than from a federal agency, or even from an individual university.

Throughout its history, the ATC has been a lean organization, relying far more on volunteers than paid staff for the conduct of its essential work to sustain the Appalachian Trail. This should not, and will not change as a result of the A.T. MEGA-Transect initiative.

However, without a full-time senior manager/coordinator on the staff of the ATC, the A.T. MEGA-Transect cannot achieve its goals in a timely manner. This leader would provide critical coordination among the various working groups, cooperating universities, and other partner organizations and would help develop and monitor citizen-science projects and programs designed to collect information about a wide range of environmental health “vital signs.” The coordinator also would play a leadership role in preparing reports, publications, and other materials highlighting the key resources of the A.T. including air and water quality, climate, vegetation, rare, threatened and endangered species, birds, and landscape dynamics in order to tell the story of the health of the environment of the Appalachian Mountains to policy and decision makers, land managers, visitors, and the general public.

Additional resources will be required for the development of monitoring protocols, for data management and GIS support, and for communications needs.

Program management Staffing and travel (Program Manager)	\$475,000
Protocol development support	\$112,500
Data infrastructure (database, GIS development support)	\$112,500
Communications support	\$125,000
Total	\$825,000

Turn page for
A.T. map showing
its proximity to
major population
centers along the
East Coast.



APPALACHIAN TRAIL

0 100 miles



The Appalachian Trail corridor traverses the highest areas in the eastern United States, stretching from Maine to Georgia. This proximity to nearly half the U.S. population makes the corridor an ideal place from which to gather information regarding current conditions and changes to air and water quality, wildlife habitat, and forest health that occur over time, and to share this new knowledge with the millions who reside nearby.

MAP: MATT ROBINSON, ATC GIS SPECIALIST



2 Citizen Science— Inventorying and Monitoring For & By the People

Without a doubt, the single most important precedent that will be set by the A.T. MEGA-Transect initiative is the extent of citizen engagement in field science. While there are very good models for active citizen participation in field research, nothing of this scale has been undertaken in the past anywhere in the United States.

Adequate coverage along the 2,175 miles of the A.T. will require hundreds of transect sites, and still more citizen volunteers. Assuming adequate funding, there are three keys to the success of a citizen science program: 1) research protocols that can be adapted to the capabilities and limitations of citizen participation; 2) citizen training that is adequate to the tasks they are assigned; and 3) information materials that are accessible and easily understood.

Many scientists have come to realize that several types of research can be carried out by citizen volunteers. Some research would be virtually impossible to accomplish without the large number of volunteers that can be provided through support organizations such as the ATC; in particular, research projects that are long-term or permanent, and research projects that cover very large geographical areas.

The potential of broad scale citizen science involvement already has been demonstrated through some recent pilot projects along the A.T. For example, in the spring and summer of 2007, a cooperative project involving the Smithsonian Institution and ATC used motion-sensitive digital cameras for monitoring mammals and attracted more than 200 volunteers from ATC clubs and other organizations. Beginning in the fall of 2007, ATC also launched a trail-wide, citizen-based water-quality monitoring program in cooperation with the Water Environment Federation and the International Water Association. It is anticipated that the program will attract as many as 800 volunteer participants in just the first year of this long-term program.

Successful citizen science protocols have also been designed for research involving water quality, deterioration of visibility (visual range), bird counts, tracking expansion of invasive plants or loss of native species, and long-term forest-health monitoring, all of which are directly relevant to the A.T.

Working both with ATC member clubs and other community-based groups along the A.T., the ATC will develop a strong cadre of research-oriented volunteers. ATC will rely heavily upon cooperating university and federal scientists for protocol development and as field research team leaders. Thus ATC will focus its own efforts upon matching volunteers who reside near transect sites to participate with appropriate projects, providing training and equipment, and sharing data-collection results.

Since these functions are best performed at the local or regional level, additional staff capacity will be necessary in each of ATC's regional offices (Lyme, New Hampshire; Boiling Springs, Pennsylvania; Blacksburg, Virginia; and Asheville, North Carolina). These resource management coordinators also will liaison with local trail clubs, cooperating federal and state agencies, universities, and other partner organizations. In addition, these staff will implement management recommendations arising from monitoring activities. For example, as more is learned about invasive species and effects—especially on rare, threatened, and endangered species indigenous to the trail corridor—these staff will help develop control or eradication projects.

5-YEAR BUDGET

Staffing (regional resource management coordinators)	\$1,300,000
Materials & Equipment	\$350,000
Training Series	\$200,000
Public Relations	\$75,000
Total	\$1,925,000

Turn page for
excerpt, "From
the Mouths of
Rivers," ATC's
volunteer
water quality
monitoring
effort.





From the Mouths of Rivers

Measuring Water Quality on the A.T.

BY CAROLINE DUFOUR

This fall, participants of World Water Monitoring Day will have an attractive new option: choosing and monitoring a site on the Appalachian Trail.

PHOTO BY RYAN COSENS

"We've been gathering data on water quality along the Trail for several years with the help of our volunteers," said Matt Stevens, ATC environmental monitoring coordinator, "but this partnership will allow us to get to a whole new level."

Coordinated by the Water Environment Federation and the International Water Association, World Water Monitoring Day is actually a full month, from September 18 through October 18. Participants gather specific water quality data and can purchase a kit from the Web site or use their own equipment. After completing their monitoring, they can once again log onto the Web site and submit their data.

"Part of the power of World Water Monitoring Day is that it takes people's contributions and fits them into a greater meaningful whole" said Laura Belleville, ATC regional director for central and southern Virginia. Although the information collected is fairly basic, the sheer amount of data collected will contribute to a larger picture that can help decision-makers and scientists focus further attention on water quality.

"The same reasoning applies to the A.T.," said Stevens. "Partnering with World Water Monitoring Day should allow us to get more people out on the Trail gathering data, and even if it's not the most rigorous [scientific study], it will still give us a better picture of the situation." Participants will be able to sign up as A.T. volunteers, which will allow the World Water Monitoring Day analysts to separate the A.T.-focused data and send it

to ATC at the close of the event.

Partnering with World Water Monitoring Day and bolstering ATC's water monitoring efforts are part of the new A.T. MEGA-Transect program, which establishes the Appalachian Trail as an "environmental laboratory" to monitor the health of the Appalachian Mountain region, and brings volunteers into closer touch with changes in their environment.

The A.T. runs over, through and next to many lakes, ponds, streams, wetlands and springs, and because it runs mostly along mountains and ridge crests, it often follows watershed divides. From Maine to Georgia, the A.T. passes through 64 major watersheds and most of the nearly 1,800 streams and lakes are at the headwaters of those watersheds.

"Because the A.T. runs along ridgelines, protecting land to secure the Trail has had the side effect of protecting headwaters as well," said Don Owen, environmental protection specialist with the Appalachian Trail Park Office. The many water bodies along the Trail not only provide drinking water and scenic views for hikers, but also provide important habitat for wildlife and plants. Farther downstream, these same resources contribute to public water supplies, sustain fisheries' resources, and enable hydropower generation.

In addition to partnering with World Water Monitoring Day, ATC has reached out to the Girl Scouts of America. "The Girl Scouts are already involved with World Water Monitoring Day, and they have been looking for additional meaningful outdoor projects, so it's a natural fit," said ATC's Belleville.

Excerpt from *A.T. Journeys, The Magazine of the Appalachian Trail Conservancy*, September/October 2007



3 Field Research & Protocols Through CESUs, NPS I&M, USGS, and USFS Field Stations

The A.T. MEGA-Transect initiative is unique in three ways. First, its scale is larger than any scientific transect ever undertaken in the United States. Second, the scale of citizen volunteer participation that is contemplated in the A.T. MEGA-Transect is unprecedented for a major scientific endeavor. Third, from the outset, it is integrated with classroom education and community engagement.

In order for research that is to be conducted to have validity and reliability, detailed inventorying, monitoring, and other research protocols must be developed by the scientists who are involved, and coordinated with the citizen organizations, principally the ATC, who will be directly engaged in supporting these research projects. Such direct interaction will better assure workable and meaningful protocols.

Career field staff of each of the three federal partners, National Park Service (NPS), U.S. Geological Survey (USGS), and U.S. Forest Service (USFS), are all active and eager participants in the A.T. MEGA-Transect, but lack sufficient numbers of dedicated staff and field-office locations to be able to provide the breadth and depth of field research that is needed.

In 1998, Congress authorized establishment of a university-based network of “cooperative ecosystem study units” (CESU)², which have yet to be effectively integrated into the A.T. MEGA-Transect. Creating incentives for CESU universities in each of the three A.T. physiographic provinces to be directly involved in the project is critical to success. Once a lead university from each of the three eco-regions—Northern Forest, Chesapeake Basin, and Southern Appalachian Mountains—has been selected and is added to the team, each of them will become a contributor both to the research and to the general public support for the project. The goal will be for each of these universities to be a net contributor to the project, both in people and funding.

As an incentive for the most effective participation, ATC will conduct a brief competition among the universities in each of the three relevant CESU regions, with the selected lead university to receive a grant of \$25,000 per year for each of the five years of this initial phase of the project. A key selection factor will be the level of commitment (faculty and graduate student) offered.

5-YEAR BUDGET

Grants	
	3 grants @ \$25,000 annually
Total	\$375,000

Turn page for excerpt from “Wildlife on the A.T.” our partnership with the Smithsonian Institution.



²Section 203 (a) of Public Law 105-391 states – “The Secretary is authorized and directed to enter into cooperative agreements with colleges and universities...in partnership with other federal and State agencies to establish cooperative study units to conduct multi-disciplinary research and develop integrated information products on the resources of the national park system, or the larger regions of which parks are a part.”



4/25/07 9:35 AM

Wildlife along the A.T. —the tales the cameras tell

BY CAROLINE DUFOUR

For over a month, dozens of motion-sensitive infrared cameras have been posted on the Trail corridor to capture images of wildlife and provide better information on the animals that call the A.T. lands their home.

The cameras have so far caught coyotes, raccoons, deer mice, one bear, one bobcat, and many white-tailed deer, as well as an unexpectedly high number of *Homo sapiens*.



5-YEAR BUDGET

4 A.T. Scholarship – Graduate Student Field Work

The amount of data needed, species to be inventoried, research projects to be coordinated and reported, and the number of field transect sites to be monitored for the A.T. MEGA-Transect is expected to dwarf that of a typical research program. One of the keys will be to have numerous university and agency researchers directly engaged in specific project and transect sites, but even they run the risk of becoming overwhelmed by the volume and extent of the work involved. Consequently, ATC and its agency partners will need to make ample use of graduate students to carry out much of the field and data processing work that will be required for the A.T. MEGA-Transect.

In order to assure sufficient interest by top graduate students, ATC proposes to offer a significant scholarship grant of \$10,000 each for qualified Masters degree-level graduate students through a competitive process. Five scholarships in each of four ATC regions will be offered annually (20 each year) for five years.

The A.T. MEGA-Transect interagency Steering Committee will annually review the most pressing research topics and determine those that will be made the subject of the scholarship program competitive grant process each year. A proposal review and selection committee comprised of one person each from ATC, NPS, USFS, USGS, and an invited participant from the American Association for the Advancement of Science (AAAS), will make the annual selections. ATC will present the scholarship awards prior to the start of the next year's field season.

Modeled after the NPS Canon Scholars Program (a PhD scholarship program), this scholarship program lends itself to support by a single major foundation or corporate underwriter that ATC will solicit. Administrative overhead costs will be kept to a minimum, with the ATC MEGA-Transect national coordinator providing overall leadership, and selection panel participants being only reimbursed for travel expenses if needed.

Scholarship recipients will be assigned to a project team that is compatible with their research topic, and one that will assure direct relevance to the overall goals of the MEGA-Transect. Each recipient will be required to provide ATC with a copy of any published or unpublished thesis or other paper which results from their A.T.-related work, while retaining their intellectual property rights. In turn, ATC will report on the activities and research results of each scholarship recipient in its publications and/or on its web site.

Another model for field research would team a graduate student with a group of citizen volunteers, under the supervision of an agency scientist or university professor, with up to 20 such teams per year working actively during the field season.

Scholarships	
5 @ \$10,000 per region, annually (indexed)	\$1,060,000
Administration	\$40,000
Total	\$1,100,000

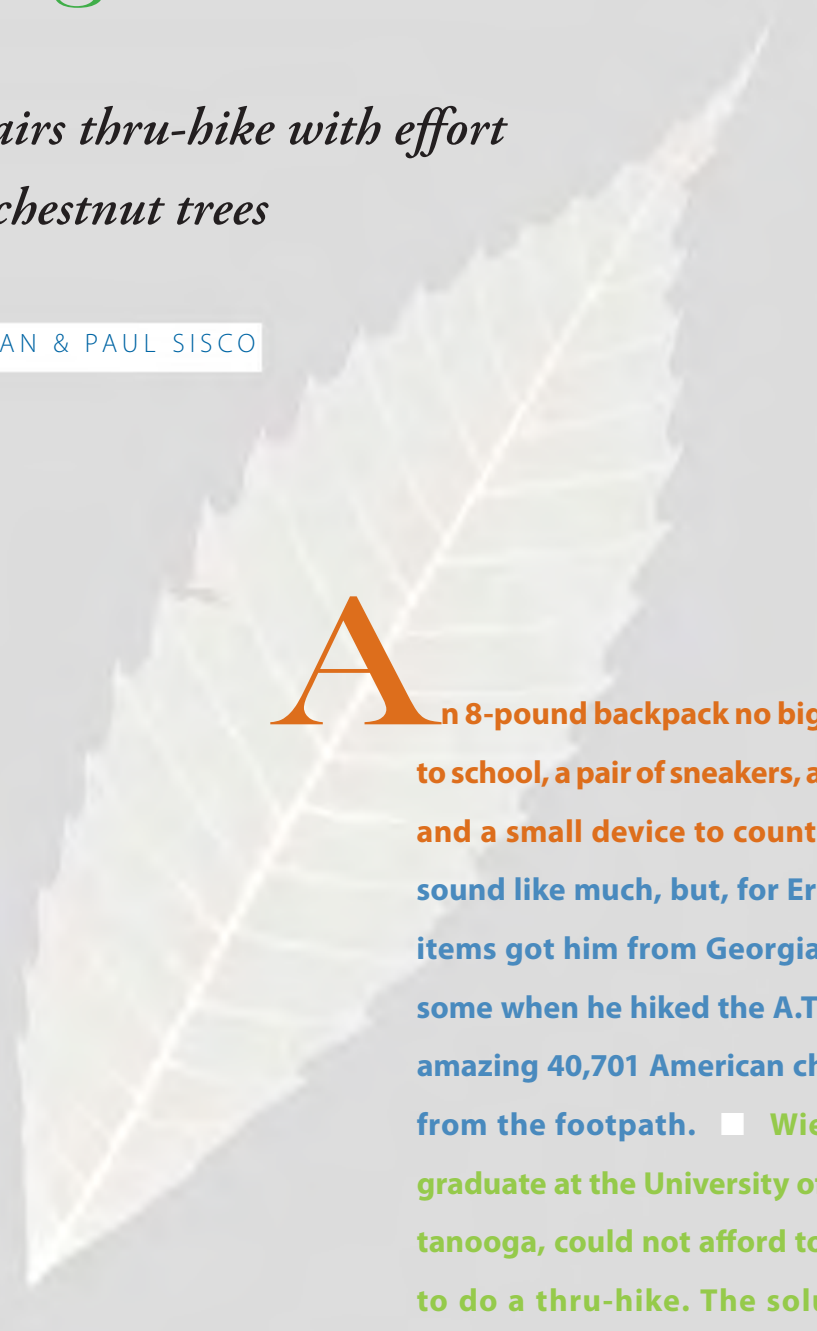
Turn page
for "Hiking
for Credit," a
look at one
way college
students might
contribute to
A.T. MEGA-
Transect
research.



Hiking for Credit

*Eric Wiese pairs thru-hike with effort
to catalogue chestnut trees*

BY MEGHAN JORDAN & PAUL SISCO



An 8-pound backpack no bigger than a kid takes to school, a pair of sneakers, a set of walking poles and a small device to count trees. That doesn't sound like much, but, for Eric Wiese, those four items got him from Georgia to Maine and then some when he hiked the A.T. — and recorded an amazing 40,701 American chestnut trees visible from the footpath. ■ Wiese, then an undergraduate at the University of Tennessee at Chattanooga, could not afford to drop out of school to do a thru-hike. The solution — get course credit for it! ■ Four months later, Wiese finished the Trail at Katahdin. "I really wanted to hike the Appalachian Trail, but I couldn't take a whole semester off," says Wiese. "So, I worked with Dr. Hill Craddock, an assistant professor for biological and environmental sciences, to plan out a project to gather important data while hiking."

American Chestnut
Castanea dentata



5-YEAR BUDGET

5 Understanding the Results (The 5th Year Symposium)

At the end of the five-year A.T. MEGA-Transect introductory cycle, there will be much to report, data to share, and progress to celebrate. There will also remain much to be done.

ATC proposes to reconvene a national symposium, following up the 2006 conference “Exploring the Appalachian Trail Mega-Transect,” that will bring together for three days the leading scientists in the field of inventorying and monitoring to evaluate progress on the A.T. MEGA-Transect, and offer suggestions for work that still will need to be carried out.

With adequate funding, staffing, organization, and leadership in the next five-years, substantial progress can be made, but the A.T. MEGA-Transect will still need guidance, support, and the generation of new ideas.

Also participating will be representatives from the new cadre of citizen scientist volunteers who have been recruited and trained for the A.T. MEGA-Transect, representatives from the education community, and representatives from trail-side communities.

With adequate funding, staffing, organization, and leadership in the next five years, substantial progress can be made, but the A.T. MEGA-Transect will still need guidance, support, and the generation of new ideas.

The Symposium will serve to evaluate the extent and composition of the research, inventorying and monitoring that has been accomplished to date. It will also serve to inform and excite the general public through a simultaneous web-cast, media participation, field trips, and video clips of successful field work.

To the maximum extent possible, conference presentations will blend together the work of the citizen scientists, agency managers and research staff, and university

scientists to present a full picture of the accomplishments, challenges, and remaining tasks. Every effort will also be made to secure participation of key senior officials of the Administration and the Congress, as well as partner teams from trail towns comprised of local officials and citizen trail-related organizations.

Working together in this way, all of the various constituencies of the A.T. community can come together to assess accomplishment and determine next steps and the resources needed to accomplish them.

Event planning	\$25,000
Staffing (report generation)	\$25,000
Printing & Distribution	\$15,000
Facilities	\$100,000
Communications support	\$50,000
Total	\$215,000

Turn page for a brief list of Environmental Facts Along the Appalachian Trail corridor.



Environmental Facts Along the Appalachian Trail

SOURCE: APPALACHIAN TRAIL VITAL SIGNS, A TECHNICAL REPORT PUBLISHED BY THE NATIONAL PARK SERVICE INVENTORY AND MONITORING PROGRAM, WOODSTOCK, VERMONT

Appalachian Trail lands: 270,000 acres (est.)

Appalachian Trail footpath: 527.2 acres

Shelters and overnight-use sites: 162 acres

Increase in urbanization, 1973–2002, adjacent to the A.T. at:

St. Anthony's Wilderness, Pennsylvania 194.8%

Hanover, New Hampshire 137.6%

Wallkill Valley, New Jersey 415.9%

Tyringham Valley and Sheffield, Massachusetts 86.2%

Cumberland Valley, Pennsylvania 211.1%

The number of rare, threatened, and endangered species occurrences within the Appalachian Trail corridor is believed to be the greatest of any unit of the national park system. Inventories in all 14 states, heavily weighted toward vascular plants documented about 2,050 occurrences and rare or exemplary natural communities at 515 sites. Approximately 330 occurrences were of globally rare species.

Between 1994 and 2003, ozone concentrations at sites within a mile of the A.T. worsened at a rate of 2.6 percent per year for Great Smoky Mountains National Park; 0.5 percent per year for Mt. Washington, New Hampshire.

One third of all the bird species identified as "threatened or declining" on the Partners in Flight Watch List can be found on or near the A.T. corridor.

Average 1999–2003 nitrogen concentrations in precipitation were elevated along the A.T. from Virginia through New York, while sulfur concentrations were up in all states except Maine.

Within the 1,100-acre Appalachian Trail corridor on Roan Mountain in northeastern Tennessee are found 12 globally rare plants, four globally rare animals, and more than 80 regionally rare species.

Excerpt from *A.T. Journeys*, *The Magazine of the Appalachian Trail Conservancy*, January/February 2007

ATC's "MEGA-Transect" symposium featured experts from organizations including the National Park Service, National Geographic Maps, NASA, the USDA Forest Service, and the Cornell Laboratory of Ornithology.





5-YEAR BUDGET

6 A Trail to Every Classroom— School-based Education to Get Kids in the Woods

ATC recognizes the need to cultivate the next generation of citizen volunteers by addressing concerns surrounding “nature deficit disorder” among our youth, as well as childhood obesity and other health-related issues. With those needs in mind, ATC and the National Park Service Appalachian Trail Park Office launched a new program in 2006 called Trail to Every Classroom (TTEC)—a multi-disciplinary professional development program for K-12 teachers that uses the A.T. as an educational resource through placed-based and service-learning education. Now in its second year, the program has trained 75 teachers and community partners from 10 states and, through curriculum and service projects developed as an outgrowth of the teacher training, approximately 1,200 students have been engaged so far.

The program consists of a week-long Summer Institute in which educators and community partners receive training in a range of subjects as well as an introduction to the Appalachian Trail. In exchange for graduate-study credit, educators are required to develop curriculum or service projects for implementation in their respective schools. The institute is supplemented by regional workshops both before and after the program.

While TTEC already has enjoyed significant success, over the next several years ATC and NPS propose a number of enhancements to strengthen and expand the program. For example, increased travel stipends will attract more educators—especially those from smaller, under-funded school districts. Building upon successes to date, some curriculum and service-learning projects will be packaged as models for other educators. A second Summer Institute with a particular focus on science and geography may be developed so curriculum development and service-learning projects can be better integrated into the MEGA-Transect initiative, adding a strong youth component to the growing network of citizen scientists.

ATC also proposes to develop a web-based component where both educators and students alike can share experiences, success stories, and sample curriculum and projects. ATC also hopes to provide incentives to encourage progressive learning among students spanning several years, to promote student-to-student mentoring programs, and to encourage students to pursue professional careers in resource management and environmental sciences. Ultimately, the goal is to engage as many as 10,000 students over the next five years.

To support and expand the TTEC program, ATC will require financial resources to create an Education Coordinator position responsible for curricula development, regional workshops, and the Summer Institute(s). In addition, the coordinator will assist in educator recruitment, program evaluation, and facilitation of information sharing. Another key element of TTEC is that local ATC club or other community-based volunteers will be recruited as instructors or field guides, with ongoing roles as knowledgeable resources who can be called upon for classroom, field or other support. Those volunteers will be recruited and supported by an education and outreach coordinator position in each of ATC’s four field offices.

As has been proven with other environmental education programs, both students and teachers who benefit from TTEC will become constituents for and advocates of the A.T. as a direct result of the knowledge and experiences gained through the program.

Staffing (education coordinator and regional support)	\$1,000,000
Workshops (two local workshops and summer institute per year)	\$425,000
Consultants (program evaluation)	\$60,000
Communications (recruiting, publications, course materials)	\$125,000
Web infrastructure development and maintenance	\$150,000
Stipends	\$105,000
Total	\$1,865,000

Turn page to see how “Trail to Every Classroom” is already inspiring students.





Jackie Rossy and her students at a science fair at New York's Museum of Natural History with their winning project which documented their A.T. experience.

PHOTO COURTESY JACKIE ROSSY

T H E P R O G R A M

Trail to Every Classroom Continues to Inspire

A Trail to Every Classroom (TTEC) is a professional development program for teachers focusing on student engagement through Appalachian Trail resources. After a successful pilot in 2006, the 2007 program offers local workshops in target locations. With strong support from several Trail clubs, TTEC's focus is on Maine, the four state region surrounding the Harpers Ferry area (Pennsylvania, West Virginia, Maryland, Virginia), and North Carolina. The spring workshop served as an introduction to the A.T., hike leadership, and Leave No Trace. The summer institute's focus has been on place-based education, service-learning, curriculum development, and student assessment. The fall workshop will instruct participants about partnerships, grant writing, curriculum implementation, and program sustainability. Currently, 35 enthusiastic participants are working on their curriculum development.

A follow up evaluation from last year's participants shows the continued impact of the program on teaching practices. Students have adopted bulletin boards, assisted with Trail assessments and participated in Trail maintenance projects. In the first two years more than 1,200 students were engaged in A.T. activities as a result of TTEC.





7 Trail Towns—Engaging the Gateway Towns that Sustain the A.T. Environment & Viewshed

In 1921 Benton MacKaye proposed, in the *Journal of the American Institute of Architects*, the creation of an “Appalachian Trail,” an effort that he saw as “a project in regional planning.” He foresaw the Trail as a “levee” against pressing East Coast urbanization, a place where millions of Americans could seek physical and spiritual renewal from congested cities and suburbs within a day’s drive. He saw a continuous greenway connecting public lands and tracts of open space.

More recently, land managers have begun to assess and understand the wealth of natural and cultural resources present on the 270,000-acre land base surrounding the Trail. In fact, biological surveys distinguish the Appalachian Trail as one of the most biodiverse units of our National Park System. The magnitude of threats to these resources has led ATC to the identification of at least 32 priority landscapes urgently requiring further protection along the Trail. Most of these areas are characterized by their remote or rural character, yet are on the verge of being “discovered” either for second home development, retirement homes, or from a booming economy associated with, somewhat ironically, outstanding outdoor recreation opportunities. In most of these areas there is usually little or no permanent provision for conservation, and often little to no effective land-use planning. Without effective conservation strategies, the view from the Trail could soon resemble the view from most of our interstates: a scrim of foliage masking subdivisions and sprawl.

Next Steps: Building on MacKaye’s legacy

As development moves closer to the A.T. environment, ATC recognizes it is imperative that conservation strategies be integrated more fully into community development plans and future visions for a region. The ability to engage diverse stakeholders is critical for successful landscape-scale conservation. This can be ac-

In the next five years ATC will build capacity toward generating catalytic programs and projects that engage Trail communities.

complished through landscape-level strategic conservation planning (i.e. green infrastructure planning). Long-term protection can also be accomplished by reinvigorating attention among gateway communities to the significance of the A.T. for environmental and human health, as well as by providing a source of inspiration to reengage youth in the outdoors.

In the next five years ATC will build capacity toward generating catalytic programs and projects that engage Trail communities. Many of the programs we have highlighted (volunteer development, Trail to

Every Classroom, citizen science) help raise awareness of the significant recreational and biological assets of the A.T. corridor. Here, we propose to build community capacity to influence local and regional strategic conservation planning initiatives aimed at protecting the A.T. experience and surrounding resources.

Essential to achieving progress in this area is dedicating senior staff time to building and sustaining local networks, and implementing high leverage strategies. One such strategy is the creation of an A.T. Gateway Community training series in partnership with The Conservation Fund. After assessing and developing local

continued on following page

5-YEAR BUDGET

Staffing (25 percent Director of Conservation plus 50 percent FTE regional support)	\$860,000
Training series	\$100,000
Trail Town designation (two communities per region per year)	\$640,000
Total	\$1,600,000

Turn page
for an excerpt
from “Boiling
Springs,
Pennsylvania,”
one of the
pilot towns for
ATC’s Gateway
program.



Trail Town: Boiling Springs, Pennsylvania



There is no evidence that A.T. visionary Benton MacKaye had Boiling Springs in mind when he conceived of the Trail as a place to seek refuge from an increasingly urbanized society, yet the tranquil setting of the historic village provides just that. The keen eye reveals a nexus of significant natural resources that served to influence and shape the landscape, including architecture, industry and the economy through the past two centuries.

An ironstone dike extrudes through the softer limestone and at one time provided a source of ore from which iron was forged. The deep, sweet, rich limestone soil contributes to the agricultural character unique to this A.T. section.

The limestone, spring-fed lake is home to an extraordinary cold-water fishery

where trout, muskrats, and numerous waterfowl species are readily observed. The lake is fed by dozens of springs that

*Thousands of slaves
were sheltered in a secret
room in the ironmaster's
mansion as they worked
north to freedom on the
Underground Railroad.*

produce 22 million gallons of water constantly bubbling to the surface, also the source of the town's name. During the dog days of summer, hikers flock to water's edge to soak their weary feet in temperatures that hover at roughly 53 degrees year-round.

Entering the village from the south, the remains of the iron forge, which produced cannons used in the Revolutionary War, can be seen.

Boiling Springs is home to ATC's mid-Atlantic Regional office, found at the northern end of the Children's Lake, just across from the post office and bank.

In 2006, the town was the site of one of two pilot "Gateway Community" forums that brought together local leaders, merchants, Trail enthusiasts, and ATC representatives. Through workshops and discussions, program goals and criteria were established that could, in time, be rolled out across dozens of communities along the entire length of the Appalachian Trail.

Excerpt from *A.T. Journeys, The Magazine of the Appalachian Trail Conservancy*, Jan/Feb 2007.

Trail Towns, continued from previous page

community leadership capacity in the 32 priority A.T. conservation areas, ATC will invite community representatives to attend two such series; "Balancing Nature and Commerce in Communities that Neighbor Public Lands" and "Strategic Conservation Planning Using the Green Infrastructure Approach." Our intent is to train and to enable local capacity to plan for sustainable communities. The outcomes of such a strategy are improved knowledge for effective planning and peer to peer learning among communities along the Trail. We fully expect that initiating a training series will lead to the development of new local

initiatives, such as a "Trail Town" designation program, whereby dedicated communities are welcomed into a marketing and appreciation strategy that promotes resource-compatible economic growth. Our early assessments may reveal A.T. communities already working toward sustainable growth.

ATC already has traction in several communities along the Trail, including areas of the Mahoosucs in Maine, the New River Valley in Virginia and in the smaller communities of Boiling Springs, Pennsylvania and Hot Springs, North Carolina.



5-YEAR BUDGET

8 Engaging and Expanding the A.T. Constituency

The past and continuing success that ATC has sustained for more than 50 years has depended heavily on the thousands of volunteers who have participated through 30 local Trail clubs. These clubs take responsibility for all aspects of A.T. maintenance and related management on their sections of the A.T. As has been noted by many close observers of the Trail community, this dedicated group is by and large an aging constituency. The A.T. MEGA-Transect initiative presents ATC and its clubs with a

challenge as well as an opportunity to recruit the next generation of A.T. devotees, as citizen scientists, community educators and volunteers.

The MEGA-Transect initiative provides us with the opportunity to not only build capacity at the club level for expanded programming, but to engage new partners, such as youth groups, schools and environmental organizations.

The key challenge lies in the club structure. The clubs—as with membership based organizations nationwide—are losing members as interest is increasing in episodic, youth, family, and corporate volunteer opportunities. Though club leaders have expressed interest in engaging youth and families and other non-traditional volunteer groups—as well as concern about aging membership base—club leaders may not be as aware of current trends in volunteerism, nor the differing expectations of volunteers in these groups. Before we can expect them to solicit, recruit, train, and support volunteers for this massive project, ATC needs to implement volunteer management practices at the club level that will expand their current use of volunteers.

ATC has created a program in response to these challenges: the ATC Volunteer Clearinghouse. Based on the Points of Light volunteer center model, this Trail-wide program provides ATC staff, club leaders and other management partners with tools and training to strengthen existing volunteer programs and match new types of volunteers (families, youth, people of color, corporate groups) with new volunteer opportunities more attuned to their schedules, and interests. Once planning for new programming has been completed, new Internet tools and other recruitment strategies will connect prospective volunteers with volunteer opportunities on the A.T.

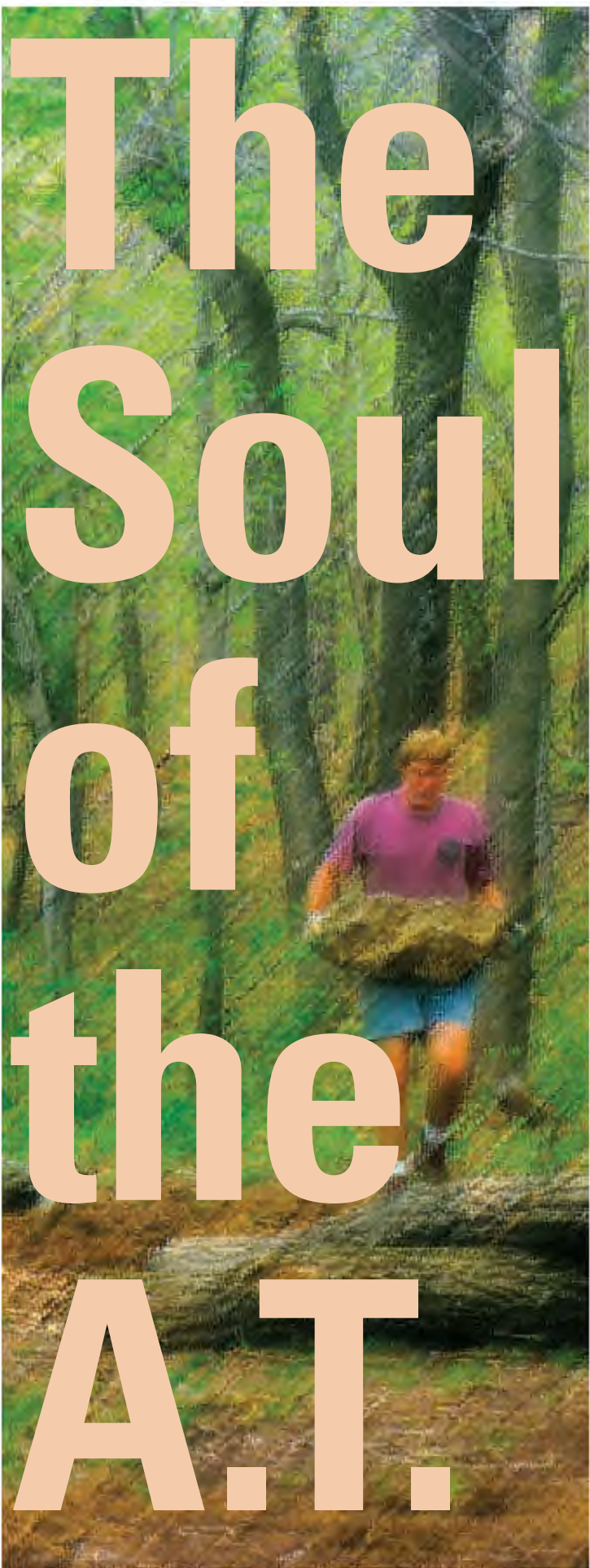
ATC's effort will entail development of a web-based volunteer opportunity matching database, along with the creation and distribution of volunteer-administration training materials, and a grants program for building capacity at the club level.

The MEGA-Transect initiative provides us with the opportunity to not only build capacity at the club level for expanded programming, but to engage new partners, such as youth groups, schools and environmental organizations. By partnering with these groups and providing programming support to the clubs, ATC will recruit and train a new cadre of A.T. volunteers who will serve as citizen scientists engaged in a variety of inventory, monitoring, photo-documentation, data collection or other MEGA-Transect related projects.

Staffing (volunteer resources coordinator)	\$360,000
Volunteer matching system	\$50,000
Communications and training materials	\$75,000
Club capacity grants	\$125,000
Total	\$610,000

Turn page to learn about the incredible contributions volunteers make to the Trail project every day.





Volunteers not only provide the muscle behind the physical Trail—building, repairing, and maintaining the treadway, controlling vegetation, constructing shelters and privies and bridges—they provide many other skills the Trail can't do without. They monitor corridor lands, work with Trail neighbors to prevent or mitigate encroachments, reach out to schools and groups in their communities, monitor threatened and endangered species, manage exotic plants, attend local planning and zoning meetings, edit guide books, work on club newsletters and Web sites, answer hiker inquiries, write letters to newspapers and government officials, organize and participate in conferences, and serve as officers and committee chairs of their local Trail clubs.

In addition to the thousands of volunteers working under the auspices of the 30 A.T.-maintaining clubs, others join ATC-sponsored trail crews, or volunteer at ATC offices to answer phones and correspondence, assist with mailings, fill book and map orders, or serve on ATC's Board and committees.

We try to capture all of the time spent on all of those projects by all of those people into a single annual report submitted to our federal agency partners. From our first report in 1983, when 1,605 workers reported working 20,058 hours, to last year, when 5,265 volunteers reported 190,017 hours, we have broadened our reporting to include not only field work, but everything volunteers do to manage the Trail, including the time spent in meetings involving Trail management and traveling to and from their volunteer "jobs." Information is collected separately for Volunteers in Forests, those working on National Forest lands, and for Volunteers in Parks, who work on National Park and NPS-ATPO corridor lands. Those numbers are then combined into Trailwide totals.

We do our best to count volunteers only once each year—no matter how many separate work trips or meetings they participate in. This complicates record-keeping, but gives an accurate picture of people's dedication to the work of the Appalachian Trail. The average number of hours worked annually has increased from 12 in the first report to 44 in the peak year 2000, varying between 35 and 40 since then.

Based on the most recent average value for volunteer time of \$18.77/hour (as computed by Independent Sector, a nonpartisan coalition of charities and foundations), volunteers contributed more than \$3.5 million worth of their time to the Trail last year.

Excerpt from A.T. Journeys, The Magazine of the Appalachian Trail Conservancy, May/June 2006.

A.T. MEGA-Transect Initiative: Budget Summary

5-YEAR BUDGET

1. From Trail Building to Ecosystem Restoration—Launching the MEGA-Transect Initiative

Staffing and travel (program manager)	\$475,000	Total: \$825,000
Protocol development and support	\$112,500	
Data infrastructure	\$112,500	
Communications support	\$125,000	

2. Citizen Science—Inventorying and Monitoring For & By the People

Staffing and travel	\$1,300,000	Total: \$1,925,000
Materials and equipment	\$350,000	
Training series	\$200,000	
Public relations	\$75,000	

3. Field Research & Protocols Through CESUs, NPS I&M, USGS, and USFS Field Stations

Grants (3 @ \$25,000 annually)	\$375,000	Total: \$375,000
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4. A.T. Scholarship—Graduate Student Field Work

Scholarships (5@ \$10,000/region, annually indexed)	\$1,060,000	Total: \$1,100,000
Program administration	\$40,000	

5. Understanding the Results—The 5th Year Symposium

Event planning	\$25,000	Total: \$215,000
Five-year report	\$25,000	
Printing and distribution	\$15,000	
Facilities	\$100,000	
Communications support	\$50,000	

6. A Trail to Every Classroom—School-based Education to Get Kids in the Woods

Staffing and travel	\$1,000,000	Total: \$1,865,000
Workshops	\$425,000	
Consultants	\$60,000	
Communications	\$125,000	
Web infrastructure	\$150,000	
Stipends	\$105,000	

7. Trail Towns—Engaging Gateway Towns that Sustain the A.T. Environment & Viewshed

Staffing and travel	\$860,000	Total: \$1,600,000
Training series	\$100,000	
Trail town designation	\$640,000	

8. Engaging and Expanding the A.T. Constituency

Staffing and travel	\$360,000	Total: \$610,000
Volunteer matching database	\$50,000	
Communications and training materials	\$75,000	
Club capacity grants	\$125,000	

Total Budget, all components: \$8,515,000