

“The fact of the matter is these watershed associations aren’t only doing environmental projects, they are enhancing their communities. Agencies are realizing that if they put money into these communities where residents are involved, they are going to get a major return in their investments.” – Jennifer Pauer, WV Department of Environmental Protection, Coordinator for Stream Partners

OPPORTUNITIES FOR SUSTAINABLE ENVIRONMENTAL STEWARDSHIP

While the Mid-Atlantic Highlands is challenged by legacies of poverty, under-employment, and natural resource exploitation, it is rich with assets and opportunities. Open space and natural beauty, energy and renewable forest resources, a relaxed pace, extended family support systems, close contact with the natural world, opportunities for fishing and other recreational activities are just a few of these assets. Such assets can be the foundation of an improved quality of life for all that live in and visit the region.

The historical economic base of the Mid-Atlantic Highlands (agriculture, forest products, mining, and manufacturing) has shrunk. Prosperity will require the creation of new economic bases: new products and resources that can be traded on the global market, for which demand is growing. But first, each community must determine for itself what prosperity means, taking into account both tra-

ditional measures of wealth and less easily measured “quality of life” factors.

Opportunity for the Mid-Atlantic Highlands means taking advantage of resources and skills within the region that cannot be duplicated anywhere else: its people, history and cultural heritage, scientific and governmental institutions, climate, natural scenic beauty, open space, biological diversity, and natural resources. Just as important, it is an opportunity to intertwine economics with sustainable environmental stewardship through innovative partnerships. In fact, this is already happening in local communities throughout the Mid-Atlantic Highlands.

Six examples are provided to show that people working together can, and are, capturing these opportunities to get more value from natural assets through environmental stewardship.

- 1. Coordinate existing stewardship efforts to maximize opportunities for partnerships**

The people and institutions of the Mid-Atlantic Highlands offer unsurpassed opportunities to build partnerships, teach and learn about the region, and develop complementary environmental and socioeconomic goals. Experience has shown us that partnerships among government, research institutions, nonprofit organizations, citizens, and business create more innovative, workable solutions to environmental and socioeconomic problems than those constructed by any one group alone.

There is already a high level of public interest in local watersheds. Within the Mid-Atlantic Highlands

Opportunities exist in the Highlands to create jobs, generate revenue, and promote environmental stewardship through innovative and sustainable use of natural resources.

there are 269 watershed groups, and CVI has worked with almost half (125) of these. Despite limited resources, these groups are doing some amazing things (see sidebar here and next page). Agencies and academic institutions with strengths in environmental science have much to offer these watershed groups. Organizational expertise, like that offered by CVI, already exists to facilitate stakeholder-science partnerships. The current situation however, can be improved. Many more local residents could become involved in improving conditions in their communities.

“From that initial brainstorming session about how to get more citizens involved in our watershed activities, Lower Paint Creek Association has moved to a full-fledged, countywide teaching effort that includes partnerships with other watershed organizations, local schools, and various programs with the WV Division of Environmental Protection. We have also worked with the US Environmental Protection Agency Region III, the West Virginia Department of Natural Resources, and other organizations.”—Marty Prichard, Lower Paint Creek Association

Environmental Stewardship in Action

PAINT CREEK: ORDINARY PEOPLE DOING EXTRAORDINARY THINGS

The Lower Paint Creek Association was formed by four people sitting around a living room, deciding to take on the challenge of cleaning up their community and restoring trout to their watershed. To achieve its goal, the newly-formed watershed group enlisted the help of many other organizations, from the local school board and a coal company to the West Virginia Division of Environmental Protection. Their efforts at improving water quality and habitat paid off, and trout have returned to Paint Creek. The Lower Paint Creek Association continues to grow and gain organizational skills, and continues to develop recreational opportunities in the community. They are now embarking on an ambitious county-wide youth education program, involving students of all ages in a watershed awareness curriculum. Their success shows what can be accomplished when a local watershed group receives encouragement and technical assistance from partners who share the same vision.



Photo: Dave Clark

2. Create a restoration industry to add value to the environment and to boost the economy

A priority of the Highlands Action Program is to restore damaged ecosystems. Doing so will add value to the natural environment, draw more visitors, and add more recreational revenues to the area’s economic base. Recreation is a rapidly growing industry across the US, presenting economic opportunities for the region, which is within a day’s drive for over a third of the US population.

Not only will the environment be improved, but restoration is also likely to establish a new growth industry for the region that will create jobs with global marketing potential (Table 6). Many residents already possess the skills and experience to perform the natural landscape work that is required to restore a stream or forest. They enjoy outdoor

**SHENANDOAH BASIN PROJECT:
STRENGTHENING CITIZEN WATERSHED GROUPS**

Citizens in the Shenandoah Basin in Virginia are protective of their river. Many belong to citizen watershed organizations, which are committed to improving water quality in the Basin. However, these groups are often staffed by volunteers and many times lack the organizational skills, technical expertise, and networking opportunities to be as effective as possible. The Shenandoah Basin Project helps to bridge these gaps. By providing training opportunities, small grants, and other organizational support, the project helps to empower watershed groups so that they can become more effective organizations, and so that they can better address the complex issues that surround water quality improvement. To date, the Project has helped ten citizen watershed organizations.

Table 6. Direct and indirect number of jobs per million dollars of spending for different industrial sectors. Aquatic ecosystem restoration can create as many or more jobs than other industrial sectors.

Industrial Sector	Direct jobs/\$million	Indirect jobs/\$million	Total jobs/\$million
Aquatic Ecosystem Restoration	13.0	17.0	30.0
Road Construction	9.5	14.8	24.3
Utility Maintenance and Construction	6.1	19.7	25.8
Defense Contractors	10.2	10.5	20.7

work and heavy machinery operation. They already have a close connection to the land (see sidebars, this page). According to the Association of General Contractors, for every \$1 million spent on restoring acid mine drainage-impaired streams, 59 jobs are created. Economists have a range of estimates for job creation, from 30 to 59. Restoration projects spawn growth in related industries such as nurseries to provide the native plants required in many restoration projects, and heavy equipment maintenance and repair facilities.

Restored ecosystems enhance tourism and recreational expenditures. The expertise and experience in habitat restoration gained by

photo: Bill Worobec, Dunwoody Fish & Game Club



FROM MINING TO RECLAMATION

After 100 years of mining bauxite in Arkansas, Alcoa closed the mines and started planning for reclamation. To Alcoa's delight, the union miners, who were heavy equipment operators, stepped up and said, "We helped mess this site up and we want to help fix it." Not only are almost 1000 acres being restored to wildlife habitat, but because of the miners' experience, the project is ahead of schedule.

Restoration & Retraining

those in the Mid-Atlantic Highlands can be exported. A global economy presents opportunities to pursue international markets for restoration work.

Community leaders, elected officials, and public agencies all need information, technical assistance, and financial support to fully realize the potential of a restoration industry. All levels of government must make a commitment to restoration, and sources of long-term, stable funding must be developed. Local contractors would be able to compete for agency contracts, with contractor assistance programs and business development support.

RESTORATION WORKSHOPS: HELPING TO TRAIN A NEW GENERATION

In the eastern US, there is a shortage of companies and workers trained in stream restoration techniques. For engineers and contractors who want to get in on this untapped market, Canaan Valley Institute sponsors training in natural stream channel design. Workshops bring together engineers, contractors, and permittees and agency workers to learn about this new technology and how to assess the success of their current and future projects.

3. Obtain more value from natural resources

Partnerships with agencies such as the Small Business Administration are needed to foster businesses that will support the restoration industry (such as native plant nurseries), and to promote entrepreneurship in value-added industries that use agricultural or timber products (see sidebar). In West Virginia, MountainMade.com uses the Internet to market the works of West Virginia artists and craftspeople to a worldwide audience.

Similar endeavors are being developed using telecommunications to manage networks of small-scale but high-value furniture manufacturers. And the West Virginia E-Business program is assisting wood products companies to develop an export component to their business by facilitating relationships with key government agencies, and helping with the development of promotional materials.

High-value nursery and greenhouse products and agriculture-derived products such as beeswax candles are just a few examples - investment must continue to move away from low-priced, globally produced commodities into high-value, regionally specialized products.



Value-added products from forest resources generate more revenue than shipping raw material, especially logs, out of the region. [Photo: Karl Badgley, MountainMade.com]

Transforming Liabilities into Assets

MORRISON COVE SMALL ENTERPRISE AGRICULTURAL BUSINESS INITIATIVE

Agricultural areas with nutrient-related problems due to high concentrations of livestock and manure are also “opportunity zones” for the creation of valuable manure-derived products such as compost, energy pellets, and methane/electricity. In Morrison Cove, Pennsylvania, a locally-based partnership has secured a Rural Business Enterprise grant from the USDA to develop a business plan for a regional composting facility as well as a methane digestion system to supply a nearby town with electrical power.

4. Obtain full value from the restored natural environment by fostering amenity-based development

Amenity-based development occurs when a region's natural and cultural assets (its amenities) attract and retain people and businesses. Individuals no longer value just salary, but also value quality of life components such as climate, recreational opportunities, low crime, lack of crowding, clean air and water, good schools, and cultural resources. Amenity-based development respects and safeguards the natural and cultural assets on which it is based, even as more people move to the area (see sidebar).

A priority of the Highlands Action Program is to protect special places. The preservation of the character, diversity, and function of the ecosystems and special places within the Mid-Atlantic Highlands is in and of itself an opportunity that may be offered only once. Failure to act as good stewards of these resources may result in irreversible impacts to the area and the irretrievable loss of the region's natural legacy.

Special area protection and restoration have economic return implications as well. The Mid-Atlantic Highlands already contains many public lands that are attractive to urban visitors, but 75% of the rich forested lands remain in the private sector. Government incentives such as the wetlands Conservation and Reserve Program of the US Department of Agriculture should be used to reward private landowners for allowing environmental stewardship of their lands to take priority over short-term private gain. Federal mine reclamation funds should be used to reforest systems and reignite recreational uses of these areas.

An enhanced natural environment means enhanced opportunities for tourism of all kinds: ecotourism, outdoor recreation,

KIDS ARE FISHING AGAIN ON GEORGES CREEK!

In western Maryland, Georges Creek Watershed Association catalyzed the installation of an innovative treatment system for acid mine drainage. Since the treatment system was installed on a tributary of Georges Creek, a reproducing brook trout population has been reestablished. Now the stream is a youth-oriented catch-and-release fishing area. Because of this success, Georges Creek Watershed Association was inspired to continue improving fish habitat and water quality in their watershed. The successes of Georges Creek Watershed Association have created a groundswell of local interest in improving economic and environmental conditions throughout the watershed.



Photo: Diana Kinder

hunting and fishing, and heritage tourism. Coordination on a regional level could strengthen the power of promotional products and packages and improve wages and benefit levels for tourism workers. Historic landscapes, scenic vistas, rivers and streams, mountain trails - much of the “natural infrastructure” is already in place in the Mid-Atlantic Highlands, and demand for these products is growing (Table 7). In addition, land trusts, conservation easements, and comprehensive planning will continue to protect even more special places (see sidebar.)

Using Science to Protect Special Places

CACAPON AND LOST RIVERS LAND TRUST

A major four-lane highway is being built near the Cacapon and Lost Rivers watersheds and will connect this formerly remote rural location to the Washington, DC area. Sales of farms and forested land to developers are already intensifying in the area, and open space is being subdivided at a rapid rate.

Due to the lack of a comprehensive land use plan in this region, the founders of the Cacapon and Lost Rivers Land Trust (CLRLT) in West Virginia sought private sector tools, such as conservation and agricultural easements, for landowners to voluntarily and permanently prevent unwanted subdivision and development on their property, while retaining ownership and the right to sell or transfer the property to heirs.

Table 7. Increasing demand for outdoor recreation in the United States

Activity	Millions of Participants	Millions of Participants	Percent Change
	1994-1995	2000-2001	1994-2001
Kayaking	2.6	7.3	182.6
Photographing Wildlife	26.8	53.1	97.8
Viewing Wildlife	61.1	95.3	55.9
Backpacking	14.8	22.8	53.8
Day Hiking	46.7	70.6	51.3
Bicycling	56.1	84.6	50.8
Canoeing	13.8	20.6	49.8

Public Complaints Inspire an Innovative Solution

5. Develop opportunities to manage the environment using innovative technology

The Highlands Action Program will promote work to achieve sustainable environmental stewardship. Local environmental problems, including flooding and small sewage discharges into streams, offer challenges to develop new technologies - such as better methods of flood control and flood management. Individualized onsite wastewater treatment systems and “cluster” systems could be designed to provide more efficient and effective treatment, to be managed by qualified third parties, and to provide affordable sewerage options for rural residents (see sidebar).

Partnerships with state and federal water management agencies must be formed to correct the misperception that innovative local solutions to problems are too expensive or technologically infeasible. Partnerships with research firms and institutions should provide incentives for technology development.

Large-scale issues such as mountaintop mining and timber operations represent a challenge to the goals of economic prosperity and environmental protection. Advances in science and technology should help locate and manage these activities to prevent un-

TWIN LAKES

Heavily used, the outdated pit toilets at Twin Lakes County Park in southwest Pennsylvania were a problem. The public had serious odor complaints and health concerns. To make matters worse, the park was investing a lot of time, labor, and money just trying to keep up with the maintenance of this inefficient system.

So in 1999, the Penns Corner Resource Conservation and Development Council convened an Alternative Wastewater Management Committee to work with local elected officials on this and other rural wastewater issues. Canaan Valley Institute provided information about alternative sewage systems and sought technical advice from the National Small Flows Clearinghouse and the Freshwater Institute. A new peat-based biofilter technology was chosen as a demonstration project. Initial test results indicate that effluent levels are meeting state standards, and an official year-long monitoring of the system began in April 2002.

acceptable impacts, to minimize disturbances, and mitigate unavoidable damage while achieving fair economic returns.

6. Create opportunities for science, teaching, and learning

The Mid-Atlantic Highlands is a data-rich and diverse environment that could be attractive to research institutions. It is an irreplaceable natural laboratory for scientific study-not only to establish baseline values for relatively pristine natural environments, but also to develop and test better tools and management techniques for

stewardship and restoration of degraded areas to a healthier condition (see sidebar, page 39). This information and these tools and management techniques can be taught to those outside the Mid-Atlantic Highlands.

Not only is the region a natural laboratory for scientific study, but it's also a natural classroom for teaching children and young people about environmental stewardship in their watersheds. The Randolph County Outdoor Education Program provides over 300 fifth-graders in West Virginia each year with a three-day residency grounded in the county's rich natural

environment and its cultural heritage. The program is designed to increase children's awareness and appreciation, with input from local teachers, administrators, and community partners. Similar programs are in place throughout the region, but these can be strengthened – younger generations are the future partners in the Mid-Atlantic Highlands.

Environment-economy-community working together

Using Flood Models to Educate Homeowners

SMITHFIELD, WEST VIRGINIA

Residents of Smithfield, WV needed help to deal with repeated flooding events. A triad of public agencies, private companies, and nonprofit organizations has developed a flood model for the town (Figure 18). An airborne technology known as LiDAR was the first used in the state. The model includes easy-to-understand computer graphic movies of flooding events. Residents will be able to watch and see when a house is likely to be flooded, and how deep the water will be. Residents can more carefully evaluate the pros and cons of FEMA buy-out offers, identify constricting structures along their streams, and create a safer, more secure future for the community.

is the model for sustainable development and environmental management. However, for this approach to work, it must be built on the collaborative and cooperative efforts of all the stakeholders. Partnerships among government agencies, nonprofit orga-

nizations, the private sector, and the local community create sustainable environmental stewardship.

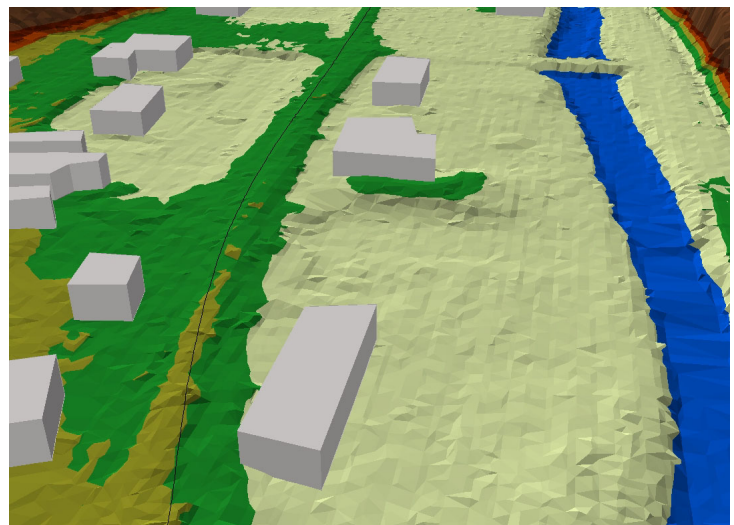


Figure 18. Two scenes generated by a computer model show Smithfield, WV residents which areas are likely to flood (blue areas) during periods of high flows. A low flow is shown above and a high flow below.

