

Forest & Riparian Buffer Conservation

Local Case Studies from the Chesapeake Bay Program

Forestry Workgroup of the Nutrient Subcommittee
August 1996

The following case studies descriptions were written by Lynn Stabenfeldt at the Metropolitan Washington Council of Governments.



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Local Case Studies from the Chesapeake Bay Program

Introduction

Dear Stewards of the Chesapeake Bay:

Forests are important to the Bay. Trees and forests help to keep the waters of our streams and Bay clean and provide critical habitat for fish and wildlife. They cool and beautify our cities and communities, add value to our property, and supply essential products for our use. Forests also help to keep our watersheds resilient in the face of increasing pressures to use the land and its resources. Forests are needed more today than ever to restore and sustain the Chesapeake Bay.

I would like to present to you *Forest and Riparian Buffer Conservation - Local Case Studies from the Chesapeake Bay Watershed*. This publication is a collection of case-studies that highlight accomplishments of local governments and citizen organizations to recognize the importance of forests to their communities and to take action to retain and restore those forests. It illustrates, in two separate sections, innovative riparian buffer and forest conservation programs initiated and implemented locally by the stewards of the Bay - its private citizens.

This publication was developed under the direction of the Forestry Workgroup of the Chesapeake Bay Program's Nutrient Subcommittee. The Forestry Workgroup's mission is to coordinate, develop and implement plans and projects that focus on the importance of forest lands to restoring the health and productivity of the Chesapeake Bay watershed. Through this Workgroup, forest management and conservation expertise is brought to the Chesapeake Bay Program's committees and subcommittees. The Workgroup's objectives are to:

- Enhance communication and education regarding forests and forestry within the Bay watershed.
- Identify the need and opportunities for demonstration projects and program development.
- Promote the establishment and management of forests and trees to improve water quality and living resource habitats associated with the Bay and its tributaries.
- Promote forestry research and monitoring needed to evaluate the contribution of forests to the restoration of the Bay.
- Ensure that forest resource information pertinent to the Chesapeake Bay is available to those interested and/or involved in implementing Chesapeake Bay restoration efforts.

This document is intended for use as a resource for local organizations. It offers some excellent examples of what citizens and communities can do to enhance and wisely manage their forest resources. As of 1990, the entire Bay watershed had nearly 24 million acres, or about 59%, of its land in forest. Recent research indicates that as much as 47,000 acres of forest are being lost every year. We hope that this document helps to point out effective, and practical ways to reduce or reverse this trend, and how communities can play an important role in protecting and restoring forests for the Chesapeake Bay.

Sincerely,

Dr. John C. Barber
Chair, Forestry Workgroup

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Acknowledgements

We gratefully acknowledge the many efforts of individuals at state and local governments and interested conservation groups across the watershed who did the work that resulted in the innovations described in this compendium. Our thanks also for their help in compiling the information. The case study descriptions were written by Lynn Stabenfeldt at the Metropolitan Washington Council of Governments in cooperation with the USDA Forest Service, Northeastern Area through the Chesapeake Bay Program Office in Annapolis, MD. Assistance with graphics was ably provided by Alexandra Gagnon.

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City of Gaithersburg Comprehensive Environmental Guidelines

Gaithersburg, Maryland

Background

The City of Gaithersburg is located in the midst of the State of Maryland's technology corridor. Its proximity to the District of Columbia and outlying areas makes this suburban community a desirable place for both businesses and families to locate. As development pressures have increased over the years, the City's natural resources, particularly stream systems, have become increasingly stressed.

In 1994, the City moved to enhance existing development standards to maximize the protection of the City's natural resources. This action stemmed from a residential development proposal which, while meeting all City development standards, would have encroached upon an impaired stream. In response to citizen concerns, City Council directed staff to develop comprehensive environmental guidelines for development; in its directive, the Council expressed a commitment to the protection of natural resources throughout the development process.

At that time, the City had in place numerous, but separate, environmental ordinances including forest conservation, sediment and erosion control, storm water management, and floodplain management. While these ordinances provided some protection for the City's environmental and riparian resources, protection was fragmented.

Project Description

In December 1994, the City of Gaithersburg convened a committee of local professionals to work with City staff in the development of comprehensive environmental guidelines. Local developers, representatives of the Planning Commission and City Council, environmental consultants, regional and county environmental professionals, and City staff attended the bi-weekly committee meetings. Environmental guidelines developed in 1993 by the surrounding jurisdiction, Montgomery County, provided the basis for analysis of the City's existing guidelines. The County guidelines were selected as a model not only because of their comprehensive nature, but to also ease the development process for developers operating in both Montgomery County and the City of Gaithersburg.

Key Words

- ✓ suburban
- ✓ development strategy
- ✓ environmental standards

The City of Gaithersburg modelled its environmental guidelines after Montgomery County's guidelines (the surrounding county) in an effort to ease the development process for developers operating in both jurisdictions.

Over a period of five months, the committee developed a draft guidance document entitled *City of Gaithersburg Environmental Guidelines*. Organized into two main sections, *Natural Resources Inventory (NRI)* and *Guidelines for Development*, the 47-page document is based on the principles of comprehensive watershed management but is more comprehensive in that it also relates to other important environmental concerns including: stream valley protection, limitations on increases in watershed imperviousness, upland and riparian forest resource protection, and wildlife corridor protection.

Natural Resources Inventory:

The NRI, required prior to development, is a complete analysis of existing natural resources and must contain specific information covering the development site and the first 100 feet of adjoining land or the width of the adjacent lot, whichever is less. Information pertaining to streams and drainage courses on or within 200 feet of the property must also be provided along with the off-site drainage areas for all streams entering the property. The *NRI* is submitted in map form along with any required narrative reports.

The careful attention given to existing stream systems during the *NRI* process will help the Planning Commission assess more carefully the potential impacts of proposed developments on these systems. (See Appendix A-1 for sample *NRI*.)

Guidelines for Development:

The *Guidelines for Development* attempt to address the problems and opportunities encountered in watershed development and identify management strategies designed to minimize adverse impacts. Among these management strategies are:

- the judicious application of land uses which allow for limiting impervious surfaces and maintaining wetlands, floodplains, seeps, and bogs in their natural condition;
- the establishment of protected slope areas which address slope gradient, soil erodibility, and proximity to stream channels;
- the use of stream buffers; and
- the provision of healthy forest and tree cover for the purpose of maintaining water quality, preserving wildlife habitat, preventing erosion, mitigating air pollution, controlling temperature, and enhancing community amenities in an urbanizing environment.

Project Impact

What began as a concern for inadequate protection of riparian buffer systems during the development process, resulted in the creation of comprehensive environmental guidelines for development in the City of Gaithersburg. Not only

will stream corridors be protected, but so will other important natural resources including wildlife habitat. The guidelines, adopted as *Environmental Standards* in October 1995, set minimum standards for developers with the hope that even higher standards will be met.

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County-wide Riparian Forest Buffer Regulation

Baltimore County, Maryland

Background

Baltimore City's three drinking water reservoirs, which are located primarily in Baltimore County, provide water to approximately 1.6 million people in the region each day. More than 2,000 miles of streams flow through County land, some captured by the drinking water reservoirs, the rest flowing on to tidal creeks and ultimately the Chesapeake Bay (see Appendix A- 2 for map of Baltimore County watersheds and streams). In Baltimore County, protection of this valued resource is a high priority.

The County has developed a multi-faceted strategy for water resource management which includes the following:

- watershed management and planning,
- water quality monitoring,
- citizen education,
- volunteer stream restoration activities, and
- legislation.

Many of these activities are supported by a \$24 million, six-year capital program for stream restoration, stormwater retrofits, wetland creation, forest establishment, waterway cleanups, dredging, and shore erosion control.

Project Description

The retention and restoration of forest buffers are key elements of Baltimore County's effort to protect water quality, as articulated in their *Regulations for the Protection of Water Quality, Streams, Wetlands and Floodplains* (adopted in 1989 and codified in 1991):

The purpose of the Forest Buffer is to protect Baltimore County's streams, wetlands and floodplains; to protect the water quality of Baltimore County's watercourses, reservoirs, lakes and the Chesapeake Bay; to protect Baltimore County's riparian and aquatic ecosystems; and to provide environmentally sound use of Baltimore County's land resources.

** See Appendix A-3 to A-15 for copy of ordinance*

Key Words

- ✓ urbanizing
- ✓ stream restoration
- ✓ regulation

Baltimore County's riparian forest buffer regulations establish a clear link between water quality protection and riparian forest buffers.

The concepts contained in the regulation were developed over several years by the Baltimore Water Quality Steering Committee through a process of negotiation and consensus building. The Steering Committee included representatives from the engineering, home building and environmental communities, as well as representatives of County agencies.

The regulation intends that riparian areas be left undisturbed to encourage regeneration or continued growth of existing vegetation. Establishment of forested buffers next to all perennial and intermittent streams is required for new development. Post-construction, forested buffers are protected through delineation on record plats.

A feature of the regulation is the flexibility applied to calculation of buffer widths; widths are determined using stream classification and slope, as summarized in the table below.

Percent Slope	Width of Forest Buffer (ft)	
	Class I Stream	Class III,IV Stream
18	80	100
19	90	100
20	100	100
21	110	110
22	120	120
23	130	130
24	140	140
25	150	150

The legislation requires that all new development establish riparian forest buffers and that management activities for existing buffers, including restrictions on disturbance of existing vegetation and soil, be strictly followed.

Maryland Water Use Classes and Standards :

Class I - primary contact recreation

Class II - protection and propagation shellfish harvesting waters

Class III - protection & propagation of natural trout waters and their associated food organisms

Class IV - recreational trout waters

(There are no Class II streams in Baltimore County)

The regulations provide not only for the establishment of riparian forest buffers, but also for their management. Management requirements for established forest buffers restrict activities that would impair the ecological health of the system, including:

- disturbance of existing vegetation,
- disturbance of soil,
- pesticide use, and
- motorized vehicle use.

Also, planting of the forest buffer may be required in areas where channel erosion, stream pollution or habitat degradation exists.

Project Impact

The County regulation has proven to be a model initiative for the preservation of riparian forests and the protection of water quality. Because the regulation applies to all Baltimore County streams, protection of the ecological health of the County's stream systems is better insured. The County is currently tracking the effectiveness of the riparian forest buffer regulation using a resources database for land development projects which is reviewed by the Department of Environmental Protection and Resource Management.

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Donegal Creek Restoration Project

Lancaster County, Pennsylvania

Background

The Lancaster County Conservation District and the Donegal Fish and Conservation Association have formed a cooperative "Partnership" for the purpose of restoring Donegal Creek, a limestone trout stream located in the northwest corner of Lancaster County. Once a favorite stream of local fishermen, intensive agricultural practices on surrounding lands have severely degraded this aquatic habitat. Streambank erosion and excessive nutrient levels have impaired the stream system and, for more than 30 years, trout have not returned to Donegal Creek to spawn. A primary objective of the restoration effort is to re-establish Donegal Creek as a healthy, thriving trout stream.

Success of the Donegal Creek Restoration Project depends in large part on the cooperation of local landowners. Properties owned by 23 individuals line the 6.67 mile stream segment that has been targeted for restoration. On many of these properties, cattle operations are common. Unrestricted cattle access to the stream has contributed significantly to its degraded condition. The Partnership is also concerned with the lack of native vegetation, a sediment-laden substrate, and a wide, shallow channel due to various forms of accelerated erosion and resulting sedimentation.

A Partnership Memorandum of Understanding (1994) clearly defined partner roles, responsibilities, and procedures for coordinating project implementation. According to this agreement, the Conservation District will oversee permitting, design work, and administrative funding in support of the project; the Conservation Association will provide the necessary labor for project implementation. The Alliance for the Chesapeake Bay has helped with recruitment of volunteers for planting projects.

Project Description

The Partnership has identified a stream restoration approach that will reduce the impacts of agricultural practices on the stream system and encourage re-establishment of the trout population. This approach comprises two phases: education of landowners and implementation of stream restoration projects.

Education of Landowners:

Conservation District staff initiated the project with a landowner educational

Key Words

- ✓ agricultural use
- ✓ fish habitat restoration
- ✓ cooperative partnership

Unrestricted cattle access to the stream has contributed significantly to its degraded condition.

program. The program consisted of 1) a survey designed to assess landowner knowledge of the stress that agricultural runoff places on stream systems, and 2) workshops designed to educate the landowners about the adverse impacts of agricultural runoff on the local stream, the stress that unregulated cattle access places on the system, and the subsequent impacts on the trout population.

Conservation District staff made personal visits to the landowners, and worked with them to assess the property immediately adjacent to Donegal Creek and to identify enhancement projects that could provide long- term benefits for both Donegal Creek and their individual agricultural practices. The educational efforts have paid off; at present, 19 of the 23 landowners have agreed to participate in the Donegal Creek Restoration Project.

The Partnership continues to work with the remaining landowners to gain their support for the project. In that effort, a "Demonstration Fence" used to limit cattle access to Donegal Creek has been built along a highly visible and well travelled segment of the Creek's mainstem. The Partnership hopes that the "Demonstration Fence" will convince concerned landowners that these fences are structurally sound.

Stream Restoration Projects:

The Partnership has identified a number of stream restoration projects that will help restore Donegal Creek to a healthy trout stream which are:

- stream bank fencing and cattle crossings,
- fish enhancement structures,
- streambank stabilization, and
- riparian buffer strips.

Success of the overall effort is largely dependant upon limiting cattle access to the stream. Comparison of a wooded segment to a pastured segment where cattle are allowed free stream access, clearly demonstrated that the cattle contributed considerably to stream degradation. Along the wooded segment near the headwaters of the west branch, the stream width at water level measured 12 feet and had an average depth of 11 inches. Stream width and depth changed dramatically 100 feet downstream of the wooded site where pasture land dominated. At this point, stream width increased to 24 feet, with a corresponding decrease in average depth to four inches.

Stream Bank Fencing and Cattle Crossings. A priority for the Partnership is limiting cattle access to Donegal Creek; stream bank fencing and cattle crossings will be used in this effort. The project partners are targeting 15 cattle pastures for stream bank fencing - two of those sites have already been fenced with donated materials. In the future, the Soil and Water Conservation District's tree seedling sale and moneys from a 319 grant will be used to install fencing. Fencing maintenance will be supplied free of charge by the Partnership. Minimally, the fences will be placed a distance of 10 feet from the stream.

The Partnership estimates that more than 25,000 seedlings will be needed to establish a contiguous riparian forest buffer along Donegal Creek.

Stone ford cattle crossings will also be designed and installed by the Partnership. It is anticipated that one crossing will be installed per 1,000 feet of fenced stream corridor. Once stream bank fencing is in place, the practicality of and need for other restoration projects is considered.

Fish Enhancement Structures. A number of in-stream structures have been identified to help trout negotiate Donegal Creek as they swim upstream during spawning season. In-stream habitat projects that restore channel dimensions and flow patterns, such as rock frame and log frame deflectors, porcupine deflectors, Jack Dams, slat fish houses, and half-log houses will be used in this effort. Replacement of large boulders will also take place.

Streambank Stabilization. Stabilization of eroded streambanks is needed along most of Donegal Creek. Techniques identified for this purpose include bio-engineering, rip-rap, mud sill installation, porcupine, rock frame and log deflectors.

Riparian Buffer Strips. Riparian reforestation will occur at all sites along Donegal Creek where it is deemed appropriate and necessary. To date, riparian buffer plantings have taken place at three sites; more than 3,000 trees were planted in Spring 1994 in this effort. The Partnership estimates that more than 25,000 seedlings will be needed to establish a contiguous riparian forest buffer along Donegal Creek.

Project Impact

The Donegal Creek Restoration Project has united local government, a non-profit group, local citizens, and private landowners in an effort to restore a degraded trout stream. Re-establishing a contiguous riparian forest buffer is an important component of the Partnership's restoration work. With hard work and perseverance, the efforts of the community partnership will be rewarded as this riparian forest system is restored, resulting ultimately in the return of trout in large numbers to Donegal Creek.

Project Partners

Project partners include the Pennsylvania Fish and Boat Commission, Chesapeake Bay Foundation, Alliance for the Chesapeake Bay, PACD and Pennsylvania Department of Environmental Resources - Bureau of Forestry, USDA Forest Service - Northeastern Area.

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Geographic Information System: Riparian Restoration Analysis Initiative

Annandale, Virginia

Background

The Northern Virginia Planning District Commission (NVPDC) is a public agency engaged in a wide variety of regional planning, coordination, and technical assistance activities in support of 13 local governments within the Virginia portion of the Washington, D.C., metropolitan area. NVPDC's program areas include demographics and economic analysis, legislative services, and planning and environmental services. The planning and environmental services program supports member government implementation of Chesapeake Bay protection measures.

Rapid urbanization has placed stress on riparian systems throughout NVPDC's planning area. Many member jurisdictions have responded by developing local ordinances and programs that enhance riparian areas. These include Loudon County's Scenic Creek Valley Buffer Ordinance and Fairfax County's riparian restoration project in the Difficult Run watershed. While these efforts are important and have contributed to the overall health of riparian systems in the region, NVPDC recognized the need for a coordinated regional effort that would promote re-establishment of priority riparian buffer segments in Northern Virginia.

Project Description

NVPDC initiated the *Riparian Restoration Analysis Initiative* in 1993. The *Initiative* uses aerial photography to identify impaired buffer systems and then analyzes them for restoration potential. All riparian segments within NVPDC's planning boundaries are being considered for restoration potential including the tidal portions of the Potomac River. The two-phase study was designed to support Chesapeake Bay program initiatives.

Phase I:

Review of 1993 aerial photographs provided baseline data for Phase I analyses. Stream segments were defined as "buffer impaired" when review of these photographs indicated limited, or complete absence of, woody vegetative cover apparent within a 100-foot buffer around stream segments. The 100-foot buffer is based on the State of Virginia's *Chesapeake Bay Preservation Area Designation and Management Regulations* which require the establishment of a buffer not less than 100 feet in width adjacent to Resource Protection Areas

Key Words

- ✓ regional approach
- ✓ GIS technologies
- ✓ restoration analysis

The Northern Virginia Planning District Commission is using GIS to develop a regional riparian buffer restoration strategy.

(tidal wetlands, nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams, and tidal shores). In some cases, stream segments were examined beyond locally designated RPAs.

This information was then used to create the *Buffer Impaired Stream Segments in the Northern Virginia Coastal Zone* map (see Appendix A-16 for example of map). Using a base map created from the U.S. Geological Survey 1:100,000 scale topographical map series, the "buffer impaired" areas were identified for NVPDC's planning area. The map is intended to provide a primarily subjective guide for identification of potential target sites for reforestation and other revegetation activities.

Phase II:

Phase II efforts include digitization of the buffer impaired stream segments map for use with NVPDC's GIS system. Following digitization, buffer impaired stream segments will be overlaid with land use data already on NVPDC's GIS. Those areas with the greatest potential for buffer restoration will be identified and mapped. This information will then be distributed to Northern Virginia localities and local organizations involved in riparian restoration efforts. Phase II is underway with an anticipated project completion date of June 1996.

Project Impact

NVPDC's *Riparian Restoration Analysis Initiative* will help localities and local organizations identify riparian restoration and reforestation sites that will enhance Chesapeake Bay restoration efforts both locally and on a regional scale.

Project Partners

Funding to support the *Riparian Restoration Analysis Initiative* was provided by the Virginia Department of Environmental Quality's (DEQ) Coastal Resources Management Program. NVPDC receives annual support for its Coastal Management Program from a DEQ technical assistance grant. *The Riparian Restoration Analysis Initiative* is part of NVPDC's ongoing technical assistance activities and was included in NVPDC's 1993 and 1995 grant applications.

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Hampshire County Riparian Task Force

Hampshire County, West Virginia

Background

Clean, free-flowing streams are an integral part of Hampshire County's heritage. They provide recreational opportunities for locals and visitors and are the primary drinking water source for many residents. Development pressures and expanding agricultural practices increasingly threaten this resource. Water from Hampshire County and the surrounding seven counties drains into the North and South Branches of the Potomac River, a major tributary of the Chesapeake Bay. By 1990, human activities had resulted in an estimated 35 percent loss of the County's streamside vegetation.

In 1992, the Hampshire County Riparian Task Force was convened. Comprised of landowners and twelve local organizations, the Task Force has subsequently dedicated itself to educating the general public about the important role that forested riparian buffers play in maintaining water quality. An important part of the Task Force message is that individual actions and personal choices can have lasting effects, both good and bad, on the region's water resources. Committed to reaching as large an audience as possible, the Task Force developed an educational strategy that targets both children and adults.

Committee membership includes representatives from the Division of Natural Resources (fisheries), Division of Forestry, Natural Resources Conservation Service (formerly the Soil Conservation Service), Extension Homemakers, Pine Cabin Run Ecological Lab, County Planning Commission, Consolidated Farm Services Agency (formerly the Agricultural Stabilization Conservation Service), West Virginia University Extension Service, US Forest Service, Westvaco, Potomac Valley Soil and Water Conservation District, and the Potomac Headwaters Resource, Conservation and Development Council. The committee rapidly began to take on a regional focus as several members are assigned to the eight-county area.

Project Description

The Hampshire County Riparian Task Force developed educational materials and demonstration sites to promote the importance of protecting water quality in the Potomac River Basin. To date, the Task Force has:

- developed a recycled paper placemat with illustrations of healthy and degraded riparian habitats;
- developed a brochure that explains how agricultural, forest, and

Key Words

- ✓ rural
- ✓ education & outreach
- ✓ demonstration

The Task Force has dedicated itself to educating the general public about the important role that forested riparian buffers play in maintaining water quality.

development activities contribute to degraded water quality; and

- established four riparian buffer demonstration sites that demonstrate how streams benefit from healthy riparian buffers.

Riparian Forest Buffer Placemat:

The riparian forest buffer placemat has proved an invaluable educational tool for school students throughout the eight-county region. By contrasting a healthy riparian habitat with a degraded one, the placemat demonstrates the inherent value of a wooded riparian buffer: clean water, abundant wildlife, lush vegetation, and fish. In contrast, the stream segment adjacent to an agricultural operation with no riparian buffer is characterized by dirty water, eroded stream banks, and dead fish. The placemat has been distributed to 4th graders attending public schools throughout the region, by local restaurants and at Earth Day events (see Appendix A-17 for example of placemat).

This educational tool has challenged children to think about their relationship to the environment and has helped them understand the important role that forested riparian buffers play in protecting water quality. An added benefit is that the children may share this information with their parents, in turn teaching them of the importance of forested riparian buffers.

Development and distribution of a placemat that depicts both a healthy riparian habitat and a degraded one has proven an important educational tool for 4th graders.

Riparian Brochure:

The Task Force also developed a four-panel brochure highlighting forestry, agricultural, and land development best management practices (BMPs) that minimize degradation of riparian buffers. Photographs contrasting BMPs with no management practices for each of the three land uses visually enhance this educational tool (see Appendix A-18 to A-19 for copy of brochure).

Riparian Buffer Demonstration Sites:

To supplement the printed educational materials, the Task Force has established four riparian buffer demonstration sites. All sites are fenced and planted with native seedlings. One demonstration site is simply a fenced wooded area in pristine condition, providing a visual demonstration of how a healthy riparian zone functions.

Project Impact

The Hampshire County Riparian Task Force has reached beyond County borders and brought agencies together in a collective effort to highlight the critical link between healthy riparian buffers and good water quality. In that effort, the Task Force distributed 35,000 color and 10,000 black and white copies of the original placemat in three counties. Another 1,400 copies were laminated with plastic for permanent use.

Other significant projects including the brochure and demonstration sites are in

place as a result of the successful placemat effort. The brochure was distributed to more than 35,000 landowners in eight counties. Four demonstration sites were also established. Through projects and activities, the Task Force's educational program has reached an estimated 80,000 citizens of the region. The important role of riparian forest buffers in protecting water quality was emphasized throughout the effort. The Task Force hopes that the work done in Hampshire County will be the start of a statewide effort to educate the public about the value of riparian habitats.

Project Partners

Support for Task Force activities include funding from West Virginia Education Grants, West Virginia Extended Service Grants, U.S. Forest Service, and Potomac Headwaters RC&D.

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Headwaters of the Shenandoah River: Riparian Easement Program

Augusta County, Virginia

Key Words

- ✓ farmland protection
- ✓ conservation easement
- ✓ resource management

Background

The American Farmland Trust noted in a recent report entitled "Farming on the Edge", the urgent farmland preservation needs in the Shenandoah Valley and other agricultural powerhouses of the nation. The valley was identified as an area where extremely productive farmland coincides with population growth far above national rates. With this in mind, protection of riparian zones in the Shenandoah River Valley is essential to minimizing water quality impacts from agricultural and other land uses.

In response to these concerns, the Headwaters Soil and Water Conservation District (Headwaters SWCD) developed a voluntary easement program that targets agricultural riparian zones in the Shenandoah Valley. (An easement is a legal agreement in which the landowner retains ownership and full control of the property, yet conveys specified rights to the holder of the easement.) It is the first riparian easement program in the State of Virginia. Through this program, the Headwaters SWCD is working with local citizens to repair, maintain, and protect forested riparian buffers to benefit present and future generations.

Project Description

The Headwaters SWCD Riparian Easement Program began in 1993. Landowners participating in the Riparian Easement Program agree to place easements on their properties which limit their rights to alter the riparian zone. They also agree to work with Headwaters SWCD, the easement holder, to develop a management plan that ensures protection of the riparian zone. Typically, this is done by establishing and maintaining vegetation and limiting livestock access to the stream. Each easement is tailored to the property and the desires of the individual landowner.

In 1993, the first conservation easement was placed on 4.18 acres abutting the Middle River. Through the easement, the Headwaters SWCD gains assurance that the landowner's streambank will be maintained according to a management plan drawn up and agreed to by both parties. The primary objective of the management plan is to maintain streambank vegetation. To achieve this objective, the management plan specifies that cattle must either be given controlled access to the creek or an alternative water source. The management

While many easements can take up to a year to establish, the Headwaters SWCD has streamlined the process - enrollment in the Headwaters Riparian Easement Program takes just 30 days.

plan further specifies that the landowner maintain fencing and implement sound practices of soil, water, timber, and wildlife resource management.

Additionally, no construction activities are allowed in the riparian zone, except for a picnic shelter.

A clear description of the easement zone is an important part of the Riparian Easement Program. The description gives exact acreage for federal and local tax deductions due the landowner. Additionally, the description helps the easement holder and landowner understand where the zone is and, subsequently, to what areas the management plan applies (see Appendix A-20 to A-27 for sample conservation easement).

While many easements can take up to a year to establish, the Headwaters SWCD has streamlined the process - enrollment in the Headwaters Riparian Easement Program takes just 30 days. This has resulted in increased levels of interest from landowners who are unwilling to devote a year's time (the amount of time that it typically takes to establish an easement) towards easement establishment.

Project Impact

The Headwaters SWCD Riparian Easement Program has been in place for two years, with very positive results. Since 1993, five easements have been established in three counties of the Shenandoah region. The establishment and protection of vegetated riparian zones contribute significantly to the overall effort. Over time, benefits will be increased further if easements are placed on consecutive parcels, resulting in the establishment of riparian buffer corridors.

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Herring Run Watershed Association

Baltimore, Maryland

Background

The Herring Run Watershed Association (HRWA), a grassroots, volunteer-based environmental group was formed in January 1993 after a stream survey of the Herring Run and its major tributaries was conducted by citizen volunteers. These volunteers found that much work was needed to restore this urban stream. Notable problems identified in the survey included sewage overflow points, fish migration barriers, and poor riparian conditions.

A primary goal of the Herring Run Watershed Association is to improve water quality in the Herring Run and Chesapeake Bay. It is the Association's hope to restore the herring fishery before the turn of the Century. The 25-mile stream system runs through both Baltimore City and County. Its watershed is 45 square miles and contains 120 communities, 80 schools, and 65 churches.

The large human population in the Herring Run watershed has placed significant stress on this ecosystem and has influenced the direction that the Association's restoration efforts have taken. Initially, the Association functioned primarily as a group of volunteers that worked together on stream cleanups and tree plantings. Over time, however, Association members realized that a strong education and outreach program would more effectively promote their goal of improved water quality in the Herring Run because such a program would reach a large audience, resulting in increased community involvement in the HRWA's stream restoration projects.

The HRWA has successfully implemented a number of stream restoration and public education/outreach projects in this effort. These include community stream teams, stream and watershed surveys, water quality monitoring, stream cleanups, and a quarterly newspaper highlighting what schools are doing to help the Herring Run. A successful walkathon and festival to build community support was held in 1995 - more than 1,500 people attended.

For the past year, the Herring Run Watershed Association has been working with the Department of Natural Resources' TREE- MENDOUS MARYLAND and the Chesapeake Bay Foundation on a major educational and reforestation effort in the Herring Run watershed.

Project Description

In 1995, the Herring Run Watershed Association initiated a tree nursery

Key Words

- ✓ citizen volunteers
- ✓ education & outreach
- ✓ stream teams
- ✓ tree nursery program

In 1995, HRWA initiated a tree nursery program that will provide free trees to watershed community groups for local tree plantings.

program. The nursery program, run in cooperation with TREE- MENDOUS Maryland, the National Tree Trust, the Baltimore Municipal Golf Corporation (BMGC) and the Baltimore City Department of Recreation and Parks, will provide free trees to watershed community groups committed to restoration of the Herring Run watershed.

A key aspect of the nursery program is the unique relationship between HRWA and the BMGC: golf corporation staff care for the trees and the HRWA provides administrative support for the program. The tree nursery program is structured as follows:

- 1) Seedlings from the National Tree Trust program are provided to the BMGC by TREE- MENDOUS Maryland.
- 2) The BMGC maintenance crew pots, weeds, and waters the seedlings with assistance from HRWA volunteers.
- 3) HRWA promotes the availability of free trees for Herring Run watershed plantings, all of which occur on public lands.
- 4) HRWA maintains an inventory and manages the distribution of trees.
- 5) HRWA advises communities about the suitability of trees for specific areas.

In 1996, HRWA's tree nursery program will provide more than 600 trees to neighborhood groups.

HRWA has also established a tree planting program which provides the education and tools needed for successful tree plantings. Mulch and special watering systems are provided to support these volunteer planting projects.

Project Impact

As designed, the year-old tree nursery program will provide numerous benefits both to the Herring Run watershed and the community that lives there. Through this program and other reforestation efforts, 25 acres of riparian forest buffer will be re- established; this year alone, more than 600 trees will be distributed to neighborhood groups committed to restoring the health of the watershed. Citizen groups receiving trees will be informed of the values of trees, planting and maintenance techniques, and watershed management.

The HRWA nursery and tree planting programs are designed to promote citizen-based restoration of the Herring Run. These programs encourage watershed residents to become actively involved in restoring the resource by providing them with the knowledge and tools necessary to become environmental stewards.

Project Partners

The Herring Run Watershed Association's efforts have been supported by the following organizations: Chesapeake Bay Program; Chesapeake Bay

Foundation; National Tree Trust; Maryland Department of Natural Resources (TREE- MENDOUS Maryland); Maryland Save Our Streams; Baltimore Municipal Golf Corporation; Baltimore City Department of Recreation and Parks; and the U.S. Forest Service.

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Resource Protection Overlay Zone

Charles County, Maryland

Background

The Charles County Comprehensive Plan Citizen's Advisory Committee, consisting of 65 members representing both residential and business interests, identified protection of stream valleys and natural resources as an issue to be addressed in the 1990 County Comprehensive Plan. To achieve this goal, several objectives were established, including the "adoption and enforcement of development performance standards to protect sensitive areas and environmental features and the establishment of a stream valley protection and acquisition program." The goal of stream valley protection and protection of associated sensitive areas was achieved with the implementation of a *Resource Protection Overlay Zone (RPZ)*, included in the revised County Zoning Ordinance that was enacted in 1992.

Project Description

The overlay zone for major stream valleys/corridors is superimposed on the County zoning maps. Its location corresponds with the location of all stream valleys/corridors in the County and incorporates adjacent sensitive areas including floodplains, non-tidal wetlands, steep slopes, and habitat areas associated with stream valleys. Performance standards for protection of these sensitive areas are defined in the County Zoning Ordinance. All new development activities are required to comply with *RPZ* guidelines.

The primary goal of the *RPZ* is to protect water quality. Towards this goal, the removal of vegetation is prohibited and disturbances to streambeds are to be minimized in the *RPZ*. Within the *RPZ*, compliance with a combination of performance standards and established buffer widths based on stream order is required. First and second order streams are required to provide a 50-foot-minimum buffer width while third and fourth order streams are protected by a 100-foot-minimum buffer. The minimum buffer is extended outward to include all adjacent 100-year floodplains, adjacent non-tidal wetlands or wetlands within 25 feet, and steep slopes greater than 15 percent adjacent to the buffer. In the case of adjustment for steep slopes, the buffer is expanded to the top of the slope or is doubled, whichever is less (see Appendix A-28 for sample *RPZ* delineation). Several uses are permitted in the buffer, provided that certain conditions have been met and that the *RPZ* is not compromised. Agricultural uses are permitted contingent upon an approved soil conservation and water quality plan. Timber harvesting is also permitted provided the harvesting is

Key Words

- ✓ suburban/rural
- ✓ resource mapping
- ✓ county zoning ordinance
- ✓ environmental standards
- ✓ flexible guidelines

Since Charles County adopted the RPZ, public officials, the development community, and citizens have become increasingly aware of the important role that riparian buffers play in enhancing stream systems.

conducted in conformance with forest conservation practices outlined in the Annotated Code of Maryland. Utility transmission lines, recreational access, and non-motorized trails are permitted in the buffer subject to compliance with the following performance criteria:

- Project location in the *RPZ* is essential for access or continuity and no reasonable alternatives exist.
- Crossings of the *RPZ* are as close to 90 degrees as reasonably possible.
- The project complies with the requirements of the U.S. Army Corps of Engineers, Maryland Department of Natural Resources, and the Charles County Floodplain Management Ordinance.
- The project is designed to minimize disturbances associated with clearing and grading practices.
- Approved sedimentation and erosion control, best management practices, and re-vegetation plans are implemented for the project.
- The habitats of Federal or State listed threatened and endangered species or other critical habitats are fully protected.

During the first two years of *RPZ* requirement implementation, the County found it necessary to provide a more comprehensive definition of a stream and to establish policy regarding the location of lot boundaries outside the *RPZ* area. The definition of a stream now contains criteria for surface flow and water originating from a groundwater source during a portion of the year. In cluster subdivisions with lots ranging from 15,000 to 30,000 square feet, an amendment was proposed requiring that development be located outside the *RPZ* (lots greater than 40,000 square feet in size are excluded from this requirement). This measure was taken to protect the integrity of the buffer and to guard against the possible loss of function if the buffer was encroached upon by development.

Project Impact

Implementation of the *RPZ* requirements has resulted in greater protection of stream valleys and associated sensitive areas through better subdivision design and management of public facility location. For example, the siting of stormwater management facilities outside the *RPZ* results in improved water quality while maintaining streambed integrity. Protection of forested buffers is an important aspect of the County's stream valley and water quality protection efforts. The County's Forest Conservation Ordinance identifies forested *RPZ* areas as a high priority for retention and protection through conservation easements. Since the program's inception, public officials, the development community, and citizens have become increasingly aware of the important role that forested buffers play in enhancing stream systems. *RPZ* designation on final plats has also assisted in notification of a stream's resource value to current and future property owners. Contact:

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Riparian Greenway System

City of Newport News, Virginia

Background

Pressures from urbanization have prompted communities throughout the Chesapeake Bay watershed to acknowledge the importance of greenway systems in their communities. Today, many local governments include greenway, stream corridor, and open space language in their discussion of long range goals. Without strong programmatic or regulatory backing, however, goals of greenway preservation are seldom achieved.

The City of Newport News, Virginia established programmatic backing for its greenway system in November 1993. At that time, the Newport News City Council adopted the City's new Comprehensive Plan, the *Framework for the Future*. A unique aspect of the plan is that it features a future vision of the City's riparian greenway system on the Comprehensive Plan Map.

Project Description

By placing the City's riparian greenway system on the Comprehensive Plan Map, the City has committed to the establishment of this greenway over time. Elements identified on the Framework's Comprehensive Plan Map (e.g. the greenway system) must be addressed in master plans for development proposals that require zoning changes or conditional use permits. Development proposals are expected to accommodate the Comprehensive Plan Map elements in the overall design. Historically, this approach has been used to protect rights-of-way for future roads, parks, schools and other necessary public facilities. Under the City's new program, this same approach is applied to riparian greenways.

Previously acquired greenway property and easements provide the basis for the City Greenway Plan. A number of stream segments are already protected and additional sections will be added to the system as developments are proposed or expanded. The system is 10 percent complete at present and is anticipated to grow approximately 10 percent per year during the coming decade.

Expansion of the greenway network will occur primarily through easements, both donated and purchased, which will be administered by the Urban Conservancy Program within the Department of Planning and Development. The Department of Parks and Recreation will develop and manage public access facilities. Physical improvements for public access to the riparian greenway system have been and will continue to be funded by a variety of sources including the general fund, bonds, and grants from state and federal

Key Words

- ✓ urban
- ✓ greenway preservation
- ✓ Comprehensive Plan

In 1993, the City of Newport News committed to the establishment of a riparian greenway system by depicting this system on its Comprehensive Plan Map.

agencies.

The City Greenway Plan currently includes two established greenway systems: Slater's Creek Greenway and Stony Run Creek Greenway. The Slater's Creek Greenway, established by purchase, is now being developed for public access as part of the City's Waterfront Parks Master Plan. This greenway includes more than 7,000 linear feet of the stream and its banks. Plans for access facilities along the Stony Run Creek Greenway, in the northern portion of Newport News, are currently being designed by the Department of Planning and Development.

Project Impact

The City anticipates several benefits from its riparian greenway system, including the following:

- neighborhood beautification,
- an improved recreational system with linear connections developed between parks, and
- increased opportunities for nature study.

The system will also contribute to the ecological health of the James River and Chesapeake Bay.

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Scenic Creek Valley Buffer Ordinance

Loudon County, Virginia

Background

In 1989, Loudon County officials began work on a new comprehensive plan aimed at managing growth in the east while preserving the more rural, mountainous, and agricultural western half of the County. This strategy developed from concerns with the rapid rate at which Washington suburbs were spreading into the County. The 520-square-mile County is home to, among other things, the Dulles International Airport. According to 1990 census data, its estimated population is 102,100, a figure which grew by 50 percent in the 1980s and continues to grow 5 percent per year.

The new Comprehensive Plan (adopted in 1991) recognized the need for provisions in the zoning ordinance that protect both the scenic nature and water quality of County streams and led to a proposed zoning ordinance revision. The proposed ordinance included protection for "scenic creek valley overlay districts". Those, in effect, would be special zoning districts that would affect land 300 feet from the banks of all streams that drain more than 640 acres, or one square mile.

The push for a zoning ordinance revision came to a halt shortly after the 1992 election; the election changed the makeup of the County Board of Supervisors and resulted in a dramatic shakeup of the Planning Commission. In 1993, eight of the Commission's nine members were replaced. It appeared that the new Commissioners would scrap the buffer provision altogether because they felt the 300-foot buffer identified in the overlay district was excessive. In response to this threat, concerned citizens provided educational programs to County officials and citizens to promote and gain support for the "scenic creek valley buffer" ordinance. The ordinance was adopted in 1994.

Project Description

The intent of Loudon County's Scenic Creek Valley Buffer Ordinance (see Appendix A-29 to A-30 for sample ordinance) is to:

- promote water quality and the preservation of significant environmental resource areas, wildlife habitat and corridors, and native vegetation areas;
- protect and enhance water and groundwater recharge processes by protecting the natural capacity of vegetative areas along rivers and creeks to filter and purify storm water runoff;
- protect aquatic environments from the warming effects of solar radiation

Key Words

- ✓ citizen action
- ✓ zoning ordinance
- ✓ stream buffer protection

County citizens were instrumental in gaining support for the "Scenic Creek Valley Buffer Ordinance". The end result of their efforts, which included provision of riparian buffer educational programs to the public and County officials, was adoption of the ordinance by County officials in 1994.

by preserving riparian tree canopy cover;

- promote tourism and high quality corporate investment by maintaining, to the extent reasonably possible, existing high water quality;
- maintain the scenic beauty of the streams of Loudon County; and
- implement the Comprehensive Plan.

The Scenic Creek Valley Buffer prohibits construction activities in areas adjacent to scenic rivers and major stream areas draining greater than 640 acres, or one square mile (see Appendix A-31 for map). Measured from the stream bank, the ordinance requires stream buffers as follows:

- 250 feet along the Potomac River;
- 200 feet along the County's two state- designated scenic rivers, Goose Creek and Catoctin Creek; and
- 150 feet along other County streams.

A feature of the ordinance is the flexibility it affords to the calculation of buffer widths; reductions of up to 100 feet are permitted provided stormwater best management practices are used or if streamside forests are either preserved or planted. The ordinance, which applies to all new subdivisions, allows developers to transfer development densities from areas within the buffer to other parts of the same development tract.

Project Impact

Loudon County's "scenic creek valley buffer" ordinance is an example of citizen-government cooperation and action. Citizens and local government were able to agree upon a plan to protect many of the County's waterways before they were surrounded by development. Contact:

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Small Habitat Improvement Program in Urban Areas

Washington, D.C.

Background

The Small Habitat Improvement Program (SHIP) was established in 1990 by the Anacostia Watershed Restoration Committee (AWRC) as a pilot program to package small-scale environmental restoration projects for citizens and volunteers. The SHIP provides opportunities for Anacostia watershed residents in the District of Columbia, Prince George's and Montgomery counties to actively participate in local stream restoration efforts. Public education, outreach, and restoration projects implemented at the local level are key components of this program. The re-establishment of streams as a community resource, particularly in neighborhoods where streams have become severely degraded, is an important objective of the program.

In 1994, the Metropolitan Washington Council of Governments (MWCOG) joined the U.S. Environmental Protection Agency, the Corporation for National Service, and a local service corps to implement SHIP projects in the District of Columbia portion of the watershed. MWCOG designed and coordinated the project which was implemented at the neighborhood level by AmeriCorps members. AmeriCorps is a federal initiative that aims to engage all citizens, but particularly young people, in meeting unmet needs in communities across the United States. Other project partners included federal and local government agencies, citizens groups, schools, and non-profit organizations as follows:

- District of Columbia's - Environmental Regulation Administration, Planning Agency, Department of Public Works, Department of Recreation and Parks, and Fisheries Program;
- American Rivers;
- Garden Resources of Washington;
- Earth Conservation Corps;
- US Department of Agriculture's Soil Conservation Service; and
- Cook, Backus, and Birney Elementary schools.

Working in a cooperative effort, the SHIP was implemented in one of the more economically depressed and environmentally degraded subwatersheds - Watts Branch (see Appendix A-32 for map). SHIP projects implemented included reforestation projects, wetland plantings, stormdrain stenciling, and stream cleanups. A key component of the program was a stream valley park restoration project that included a series of tree plantings, resulting in the establishment of nearly two linear miles of riparian buffer.

Key Words

- ✓ citizen volunteers
- ✓ adopt-a-neighborhood
- ✓ urban stream restoration

The re-establishment of streams as a community resource is an important objective of the Small Habitat Improvement Program.

Project Description

The program began with an intensive environmental education program in which AmeriCorps members (Corps members) learned about the important link between healthy streams and riparian buffer systems. The educational program emphasized the important role that healthy trees and riparian buffers play in an urban environment. Through the educational sessions, Corps members developed the knowledge and skills needed to accomplish restoration projects and outreach activities in the community.

Outreach activities and restoration efforts were closely linked throughout the program. Corps members conducted tree plantings at local schools and interacted with the Watts Branch community through project *Adopt-a-Neighborhood* which was designed to enhance implementation of stream restoration work at the neighborhood level. The following steps comprise project *Adopt-a- Neighborhood*:

- identify geographical boundaries of a neighborhood,
- assess neighborhood for project potential (reforestation, stormdrain stenciling, stream cleanup, education and outreach, etc.),
- develop action plan, and
- implement action plan.

This organizational structure allowed AmeriCorps members to make a thorough and demonstrable difference in a sub-section of the Watts Branch subwatershed before moving to another neighborhood. Within the framework of this project, Corps members made significant contributions to the watershed community at the neighborhood level by providing education and outreach to area residents, stenciling stormdrains, and planting trees along denuded sections of the stream. The larger subwatershed community also benefitted from a series of tree plantings which resulted in the re-establishment of forested buffers along Watts Branch.

Project Impact

During the nine-month project, AmeriCorps members conducted education, outreach, and restoration activities throughout the Watts Branch subwatershed. This coordinated application of the SHIP boasted many results that will have a long-lasting positive impact on the watershed community and the stream.

School students learned about the importance of trees and also planted trees on school property where they can watch them mature. Watershed residents received environmental education materials, more than 1,000 stormdrains were stenciled with the message "Don't Dump - Anacostia River Drainage", and trash was removed both from neighborhood streets and the stream system. At the subwatershed level, significant progress was made: a series of tree plantings resulted in re-establishment of nearly two linear miles of riparian buffer.

Approximately 1,500 trees, all native species, were planted during the nine-month project.

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Urban Riparian Restoration in the Difficult Run Watershed

Fairfax County, Virginia

Background

The Difficult Run watershed is the largest watershed in Fairfax County, Virginia, totaling 56,566 acres. Land use within the watershed is changing rapidly from forested areas to urban uses, contributing to adverse water quality conditions and other environmental degradation. Ten major tributaries drain the diverse land uses which make up its watershed (see Appendix A-33 for map). Difficult Run is a direct tributary of the Potomac River and the Chesapeake Bay.

The stream valley areas of the Difficult Run watershed have been reserved as Ecological Quality Corridors by the Fairfax County Planning Commission with management by the Fairfax County Park Authority. Intensive development within the watershed has resulted in reduced riparian buffer widths; in some cases, these buffers have been eliminated entirely. To address concerns about degraded and disappearing riparian forested buffers and the associated impacts to streams, the Virginia Department of Forestry established the Difficult Run Urban Riparian Restoration Project in 1993.

Project Description

The Difficult Run Urban Riparian Restoration Project was initiated to assist communities in restoring urban streams. The watershed-wide reforestation effort is a partnership between State and local government, and Fairfax County citizens. Project implementation, which is taking place in three phases, includes: identification of priority riparian restoration sites within the watershed, reforestation of identified areas, and a watershed-wide education and outreach program.

Protocol for Evaluation of Priority Riparian Buffer Reforestation Sites:

In 1994, an interagency work group developed a protocol for the evaluation of riparian buffers; the protocol provided the basis for evaluation of priority riparian reforestation sites. Members of the work group included representatives of the Virginia Department of Forestry, the Metropolitan Washington Council of Governments, Fairfax County Park Authority, and the Prince William County Soil and Conservation District. The established protocol comprises the following two steps for selection of priority planting sites: (1) Perform vegetation inventory to determine the extent to which the riparian area and adjacent floodplain has undergone a loss of vegetation. (2) Select and prioritize restoration sites to achieve

Key Words

- ✓ urban
- ✓ watershed restoration
- ✓ citizen involvement

Beginning in 1996, the Difficult Run Urban Riparian Restoration Project will expand its focus on the mainstem to also include the tributaries.

the maximum environmental benefit using a vegetation inventory, local land use and tax maps, soil maps and descriptions, topographical maps, and aquatic resources needs of local stream conditions.

The Virginia Department of Forestry began the Difficult Run Riparian Restoration Project by identifying priority restoration sites along the mainstem. Criterion considered during the evaluation process are summarized below:

Criterion for Site Selection	Definition
Cover Type	Characteristic vegetation living in study area
Density	Quantity of plants per unit area
Continuity	Same cover type without interruption
Contiguous	Adjoining land or cover types
Landownership	Property rights by purchase or dedication
Adjacent Land Use	Land use directly surrounding study area
Recreational Use	Used for leisure activities
Buffer	Sufficient vegetation to protect and provide easy transition between different land uses
Stream Order	Importance of stream based on size and number of tributaries
Stream Hydrology	Properties of stream flow
Stream Morphology	Characteristics of stream based on stream banks/bed
Slope	Land contours or elevation variances
Erodability	Tendency of soil to be displaced by wind or water
Sensitive Resources	A resource easily destroyed or damaged
Fisheries	Aquatic environment capable of supporting fish species

A value of 1, 2, or 3 was assigned to each criterion referenced in the preceding table, a value of "1" representing a poor score and a "3" representing a good score. Following the evaluation of each site, the sum of points was divided by the number of criterion that were applied to the site, insuring a constant scoring system throughout the evaluation process. If a criterion could not be attributed to the site, no points were scored for that characteristic. The scores from each sheet were totaled and sites were prioritized according to their need for restoration. Sites with the lowest total overall score were the highest priority sites for riparian buffer restoration.

The protocol was used to evaluate seven sites along the Difficult Run mainstem for reforestation needs; five of the seven sites were found to be in need of

restoration. The sites were planted in Spring 1994 under the supervision of Fairfax ReLeaf, Fairfax County Park Authority, and the Virginia Department of Forestry. In 1996, the Virginia Department of Forestry will begin expanding the project to the Difficult Run tributaries.

Riparian Reforestation:

The Difficult Run riparian reforestation program has been ongoing since 1993. Priority enhancement areas were first identified and impaired floodplain areas were then targeted for planting efforts. Approximately 8,000 tree seedlings have been planted since the program's inception. In 1995, a 150-foot buffer was established near a residential subdivision development; more than 1,500 native seedlings planted in this effort. Tree plantings were executed by volunteers generated by Fairfax ReLeaf, a local non-profit organization.

Watershed-wide Education and Outreach Program:

Program coordinators are currently developing the watershed-wide education and outreach program, the objective of which is to mobilize citizens to further efforts to improve water quality through the establishment of healthy riparian buffers. The maintenance and enhancement of restored areas will be a primary goal.

Project Impact

The expected outcome of the Difficult Run Urban Riparian Project includes:

- improved water quality,
- increased wildlife habitat,
- improved flood control, and
- lower levels of nonpoint source nutrients,
- improved aesthetic value for buffer zones, and
- decreased stream bank erosion.

These anticipated benefits are directly related to re-establishment of forested riparian buffers along the Difficult Run's mainstem and its tributaries.

Project Partners

Funds for the 1994 and 1995 plantings were provided by the USDA Forest Service - Northeastern Area. The EPA's Chesapeake Bay Program has agreed to support future planting efforts. And, Fairfax ReLeaf has provided and will continue to provide volunteers for future planting efforts.

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