

Riparian Forest Buffer Panel Interim Report

November 1995

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Interim Report of the Riparian Forest Buffer Directive Summary

Background

Restoring water quality and living resources are the principal goals of the 1987 Chesapeake Bay Agreement. In 1992, these goals were reaffirmed by recognizing the importance of the Bay's tributary streams and rivers. Since then, commitments have been made to restore the extent and quality of habitat for anadromous fish and other living resources. In 1994, the Executive Council recognized that forests along waterways, known as "riparian forests", are an important resource that help achieve both nutrient reduction and habitat restoration goals. Therefore, the Directive has called on the Chesapeake Bay Program(CBP) to take actions to increase its focus on riparian stewardship in the Chesapeake Bay watershed.

The Panel

The Riparian Forest Buffer Directive, signed by the Executive Council (EC) in 1994, called for the establishment of a "Panel" to develop future goals and policy recommendations for a basinwide effort to protect, maintain and restore riparian forest buffers. A diverse 31-member group has been convened. Its members represent federal, state and local government, scientists, land managers, and citizen, farming, forest industry, developers, and environmental interests. The Panel will

conduct a series of issue forums and stakeholder meetings and report its recommendations to the EC in late 1996.

Focus Areas

Riparian Stewardship.

Healthy streams are critical to restoring the Bay. Riparian buffers and other stream protection measures provide a means to enhance water quality, stream habitat, and wildlife.

Recommendations should increase the overall commitment to the stewardship of streams, rivers, shorelines, and riparian areas. Emphasis on riparian forest buffers.

Forested riparian buffers deliver the greatest range of environmental benefits of any type of stream buffer. Current efforts are limited. Therefore, additional actions are needed to increase the retention and establishment of riparian forests.

Panel Mission

The Panel's mission is: "to recommend to the Chesapeake Bay Executive Council a comprehensive policy and implementation strategy that will enhance overall riparian stewardship and emphasize the retention of riparian forests where they exist and restoration where they are needed."

Principles

Each of the following principles will help shape the Panel's recommendations: Develop measurable goals based on sound science. Recommend flexible implementation strategies that consider the differences in landscape, existing policy, environmental conditions and landowner concerns/objectives. Focus first on existing regulatory and incentive programs, enhancing their ability to accomplish the intent of the Directive and incorporate additional voluntary efforts as needed. Build a policy that increases private and non-profit participation. Recognize the important roles of education, technical assistance, training and continued research. Be responsive to landowner needs and ensure stakeholder involvement.

Functions, Values and the Buffer Concept

Scientific research of the last decade has refined our understanding of specific ecological functions and environmental benefits of riparian forests. Filtering of runoff, removal of nitrogen from surface and groundwater, flood mitigation, providing critical food for fish and wildlife, and the role of trees and woody debris in channel stability and habitat have been studied and quantified. Putting these natural functions to work in preventing pollution from land uses or in restoring fish and wildlife habitat quality is the concept behind the riparian forest buffer. Because of variations in environmental objectives, site condition, and landowner needs, "one size does not fit all". A three-zone buffer is presented as a model for planning buffer management.

State of the Science

The Panel agreed that a foundation of sound scientific study exists to support the promotion of riparian buffers as a management tool in protecting and enhancing water quality. In particular, scientists agree that riparian forests provide the greatest range of environmental benefits of any buffer type. Continuing research, education, and technology transfer is needed to improve the establishment of forest buffers, measure their effectiveness in different landscapes, and develop strategies for targeting their use.

Status of Riparian Forests

Surveys of a few small watersheds or river segments make up the majority of information

regarding riparian forest extent and condition in the Bay states. Only Maryland has completed a statewide inventory of riparian forest buffers. Most existing data on streams and riparian zones has not been evaluated on a regional basis. A GIS analysis effort of the CBP Nutrient Subcommittee's Forestry Work Group will characterize riparian forests in the Bay watershed. Results are expected in the summer of 1996.

Issues, Challenges and Opportunities

Riparian land use issues are complicated. Issues are social, programmatic, and technical. Fear of regulation or economic loss are two primary issues raised by private landowners and developers. Although the threat that landowners perceive from riparian forest buffers has foundation, many barriers are based on misunderstanding or lack of information. Economic tradeoffs are often real, but are also misunderstood or need further examination. Recommendations will focus on incentives and program integration that increases flexibility and reduces economic barriers preventing riparian stewardship. Additional issues relate to the lack of specific riparian forest buffer incentives and the complicated and competitive nature of voluntary incentive programs. Improved communication, coordination, and streamlining is needed. Lastly, technical guidance, training, and field assistance is not available or very limited.

Existing Programs and Gaps

Seventeen preliminary findings were presented to the Panel. For example, few programs specifically target stream/riparian protection and restoration, and fewer still provide strong preferences for natural forest vegetation. Differences between jurisdictions, individual programs, and governmental administration and culture, cause existing efforts to be complicated, uncoordinated, or difficult to administer and track. Voluntary incentive-based approaches are preferred, but the value of existing regulations is recognized. The focus will be on effective use of public and private resources, reduction of bureaucratic hurdles, and an increase in program integration, coordination, and monitoring. New incentive approaches will also be explored.

Future Schedule

The Riparian Forest Buffer Panel will meet every 4-6 weeks during the coming year. Additional workshops, issue forums, and public stakeholder meetings will be held in 1996 to discuss specific aspects of the panel's work and review potential goals, recommendations and approaches.

The Riparian Forest Buffer Panel As requested by the signatories to the Directive, a Panel has been convened to develop a comprehensive riparian forest buffer policy. The charge of the Riparian Buffer Panel is to consider and make recommendations, where appropriate, on a number of policy actions related to riparian forests. One of the Panel's challenges is to propose definitions of forest buffers which balance ecological criteria needed to protect water quality and habitat in streams with the accommodation of appropriate land uses within the riparian zone. The panel is also charged with establishing time-sensitive, quantifiable goals which can serve as a long-term target for maintenance and restoration. Finally, the involvement of all stakeholders is considered essential to the final policy implementation. To ensure broad public input, the Panel has included a diverse membership and will conduct a series of meetings to reach out to a broader constituency. This will strengthen communication and partnerships necessary for success. The Panel will report its final

policy recommendations to the Executive Council for consideration in late 1996.

Panel Focus

Riparian Stewardship.

First, healthy streams are critical to restoring the Bay. Riparian buffers and other stream protection and restoration measures, provide tools for enhancing water quality and fish/wildlife habitat. Therefore, the panel will seek to make recommendations which enhance the overall commitment to the stewardship of streams, rivers, shorelines and riparian areas.

Emphasis on Riparian Forest Buffers.

Forested riparian buffers deliver the greatest range of environmental benefits of any type of stream buffer. Current program efforts are limited. Therefore, additional actions are needed to increase the retention and establishment of riparian forests.

***Shared Assumptions* Natural riparian areas are critical to healthy streams and rivers Focus should be on voluntary incentive-based approaches Education and training are important to success Both Public and private roles are important in implementation Flexibility in approach is essential Shared goals among agencies and interests are needed**

Principles

Each of the following principles will shape the Panel's policy recommendations: Develop measurable goals based on sound science. Recommend flexible implementation strategies that consider the differences in landscape, existing policy, environmental conditions and landowner objectives. Focus first on existing regulatory and incentive programs. Build a policy that increases private and non-profit participation. Recognize the importance of education, technical assistance and continued research. Be responsive to landowner needs and ensure stakeholder involvement.

PANEL MISSION

"to recommend to the Chesapeake Bay Executive Council a comprehensive policy and strategy for implementation that will enhance overall riparian stewardship and emphasize the retention of riparian forests where they exist and restoration where they are needed."

Panel Members

To ensure broad public input, the panel includes scientists, land managers, citizen, farming, forest industry, development, and environmental interests and federal, state and local government.

JAMES GARNER, CHAIR, Virginia Department of Forestry

DR. LOUIS SAGE. CO-CHAIR, Scientific and Technical Advisory Committee

BILL ADAMS, Pennsylvania Farm Bureau

JERI BERC, USDA Natural Resource Conservation Service

BILL BOSTIAN, The Nature Conservancy

DAVID BRUBAKER, Citizen's Advisory Committee/PennAg Industries

SEAN DAVIS, LDR International

MIKE ECKERT, Maryland Farm Bureau

CARSON LEE FIFER, JR., McGuire, Woods, Battle & Booth

KENT FOX, Pennsylvania Hardwood Lumber Manufacturing Association

VICTOR FUNK, Pennsylvania Bureau of Land & Water Conservation

JAMES GARNER, Virginia Department of Forestry

JAMES GRACE, *Pennsylvania Bureau of Forestry*
MARCIA HANSON, *Local Government Advisory Committee/Fairfax County Supervisors*
IAN HARDIE, *Scientific and Technical Advisory Committee/University of Maryland*
RON HEDLUND, *Virginia Department of Conservation & Recreation*
KATHLEEN LAWRENCE, *VA Chesapeake Bay Local Government Assistance Depy*
PAUL SCHWARTZ, *Susquehanna River Basin Commission*
PETER MILLER, *Westvaco*
ROBERT PENNINGTON, *U.S. Fish & Wildlife Service*
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MICHAEL RAINS, *USDA Forest Service, Northeastern Area State and Private Forestry*
ERIC SCHWAAB, *Maryland Department of Natural Resources Forest Service*
TOM SIMPSON, *Maryland Department of Agriculture/University of Maryland*
WILMER STONEMAN, *Virginia Farm Bureau*
ANN SWANSON, *Chesapeake Bay Commission*
DENICE TAPPERO, *Stone Forest Products*
MIKE THOMAS, *Virginia Office of the Governor*
CAROLYN WATSON, *Maryland Department of Natural Resources*
JAMES WHEELER, *Pennsylvania Association of Township Supervisors*
SYLVIA WHITWORTH, *Environmental Regulation Administration*

Riparian Forest Buffer Panel Technical Team

The process for implementation of the Riparian Forest Buffer Directive approved by the Chesapeake Bay Program's Implementation Committee also provided for the establishment of a technical team. The primary role of this group is to provide the technical information and analysis needed to carry out the mission of the panel and to assist the Alliance for the Chesapeake Bay in facilitating the Panel's Meetings and issue deliberations. Albert Todd serves as Team Leader.

AL TODD, *TEAM LEADER, USDA Forest Service/Chesapeake Bay Program Liaison*
RICHARD COOKSEY, *USDA Forest Service*
SCOTT CRAFTON, *Virginia Chesapeake Bay Local Assistance Department*
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LAUREN WENZEL, *Maryland Department of Natural Resources*

Definitions, Functions and Values Definitions of riparian areas and buffers may vary depending on the perspectives of managers and scientists, the various land use settings in which they are found, as well as by the many activities carried out in the riparian landscape. The word "riparian" is derived from the Latin word for bank or shore and simply refers to land adjacent to a body of water. Most agree that riparian areas do not have fixed, linear boundaries but vary in width, shape and character. In their natural state, most are forested. When we use the term riparian, we are referring to streamsides, river banks and floodplains of perennial and intermittent streams and the shorelines of the Bay.

Riparian area: "Streams, rivers and other bodies of water and the land adjacent to them, which serves as a transitional environment and directly affects or is affected by the presence of that water."

Buffers or filter strips: "An area maintained in permanent vegetation and managed to reduce the impacts of adjacent land uses."

Riparian forest buffer: "A forested area situated between a land use and adjacent body of water which is designed and managed to 1) to help maintain the hydrologic, hydraulic and ecological integrity of stream channels and shorelines, 2) help prevent upland sources of pollution from reaching surface waters by trapping, filtering and converting sediments, nutrients and chemicals and 3) protect fish and other wildlife by supplying food, cover and thermal protection."

The Three-Zone Riparian Buffer Concept

The concept behind a riparian buffer is to put the natural benefits and functions of riparian areas to work in nonpoint pollution control. When considering a full range of benefits and potential effectiveness, forests are the most beneficial type of riparian buffer available. These linear strips serve as the last line of defense from the activities we undertake in managing the land, such as agriculture, grazing and urban development. Unlike most best management practices, the high value of forests to wildlife and fish, helps riparian forest buffers accomplish multiple habitat benefits at the same time they improve water quality. Riparian buffers will vary in character, effectiveness and size based on environmental setting, proposed management, level of protection desired and landowner objectives. A three-zone riparian buffer concept is proposed to assist technical professionals and landowners with planning and design. The width of each zone is determined by site conditions and landowner objectives.

- ***Zone 1 - Primarily functions as an extension of the stream or water body and is the area in which critical habitat and stream integrity objectives are achieved. Shade, detritus and large woody debris are provided by mature forest vegetation. Trees help reduce flood effects, stabilize streambanks and remove some nutrients.***
- ***Zone 2 - Preferred vegetation in this zone consists of a managed forest. The primary function of Zone 2 is to remove sediment, nutrients and other pollutants from surface and groundwater. It provides enhanced habitat, allows for economic benefits to the landowner from the forest resource and helps reinforce Zone 1.***
- ***Zone 3 - Should be provided if needed to slow runoff, infiltrate water and help filter sediment and its associated chemicals. Zone 3 may contain grass filter strips, level spreaders or other features. Zone 3 helps protect the buffer from damage.***

State of the Science Our knowledge of the values and functions of riparian forests has been rapidly growing over the last 15-20 years. Scientists agree on the body of knowledge indicating the critical habitat functions provided by riparian forests. Substantial research is continuing to advance technical knowledge about the water quality functions of riparian forests gained over the last decade. However, it is only very recently that detailed scientific research on the water quality and ecological functions of forests have been put to use in management. Under natural conditions, riparian forests provide a dynamic yet stable buffering system along most shorelines, rivers, and streams in the Bay watershed. The scientific foundation of the Riparian Forest Buffer System is based on studies of naturally-occurring riparian forests and experimental-scale grass filter strips. Although few studies have documented the specific changes in water quality during the establishment period of a restored riparian forest, even newly planted forest buffers are expected to sustain water quality functions over the long term in a manner similar to the natural system.

The Consensus Report

A report just released by the Chesapeake Bay Program, serves as a research synthesis and scientific consensus. "Water Quality Functions of Riparian Forest Buffer Systems in the Chesapeake Bay Watershed", by Lowrance, et.al., contains a review of riparian forest and vegetated filter strip literature and helps determine the applicability of riparian forest buffer systems as a water quality enhancement practice. The report acknowledges that scientific questions remain and that there is some uncertainty in predicting generalized nutrient reductions over time due to variations in loading rates, management, site conditions, and hydrology on individual field sites. However, the Report firmly supports the use of forest buffers as a pollution prevention tool, describes and quantifies the ecological and water quality functions of riparian forests, and discusses the level of effectiveness predicted. The table on the next page is a sample of information provided in the scientific report on potential effectiveness of buffer systems.

Water Quality Functions*

- Maintains the ecological integrity and stability of the stream environment
- Removes sediment and sediment-borne nutrients and other chemicals
- Removes nitrogen from surface and groundwater
- Controls dissolved phosphorus

*Listed from most common to least common function in all riparian forests

Priority Considerations

Based on current scientific knowledge, establishing and managing buffer for multiple water quality and habitat objectives may be subject to a variety considerations useful in targeting efforts in the field.

- **Habitat-** Riparian forests are essential habitat for fish and upland species of wildlife. Targeting for habitat enhancement will be different than for water quality.
- **Geographic Setting -** Differing hydrology and soils will affect the level of pollutant removal of riparian forest buffers. In general terms, environmental settings where a higher percentage of the water budget moves to streams as subsurface flow and not deep groundwater or surface runoff, will provide ideal conditions for nutrient reduction processes. This is especially true for dissolved nitrogen, a particularly difficult pollutant to retain on the land. Shallow aquicludes,

highly dissected landscapes and the presence of well-developed floodplains all indicate high potential for dissolved nutrient removal. In optimum areas, removal may be as high as 98% declining to 0 in hydrologic systems with deep groundwater percolation or extreme runoff efficiency. Surface runoff treatment is affected more by slope and degree of soil permeability. In the Chesapeake Bay watershed, water quality benefits of riparian forest establishment and retention may be highest in the Coastal Plain. Piedmont and specific areas of the Valley and Ridge hydrologic provinces.

- *Stream Size - Small streams (order 1-3) constitute the greatest number of stream miles and may be the highest priority areas to reduce nutrients. Small streams also experience higher nutrient loads in relation to their flow volume. Buffers here are expected to be highly effective for water quality.*
- *Contiguous Buffers - Achieving continuity of forest buffers on the landscape could be given higher priority than potentially larger fragmented buffers and may be considered as a specific goal.*
- *Width - Buffer width is most affected by slope of adjacent lands, degrees of water quality or habitat benefit desired, soils and hydrologic setting and landowner constraints. Flexible buffer widths based on these criteria are most desired, with minimums provided to ensure adequate control of the stream environment.*
- *Degree of Degradation - the severity of degradation is directly related to the benefits expected from riparian forest buffers. Streams in areas without forests, such as pastures, may benefit the most while highly urbanized streams affected by altered hydrology may provide high wildlife and aesthetic benefits but may not be able to provide high levels of pollution control.*
- *Loading rates - Where nutrient loading is highest, pollutant removal efficiency may also be highest.*

Research Gaps and Information Needs

There are many aspects of forest buffer retention and establishment which will require additional study. Some have their resolution in monitoring management choices, not in scientific study. Specific questions include: What are the specific environmental variables that control water quality effectiveness of buffers and how are they quantified? How quickly do newly planted trees begin to function as a forest? What species provide the greatest return to water quality? What is the most efficient planting and maintenance method in agricultural areas? How do buffers function in highly developed areas? How should buffers be integrated with stormwater planning?

Status and Trends of Riparian Forests For all that has been learned about the function of riparian forest buffers for water quality and habitat in the Chesapeake Bay region, surprisingly little is known about the extent and location of forested buffers across the Bay landscape. Conducting inventories of riparian land use is relatively new. Most data sources that do exist characterize only small watersheds. Only Maryland has conducted a state-wide inventory. Existing data is available for only one point in time, consequently it is impossible to analyze trends. A new generation of geographic information will assist in making better management decisions and help guide targeting efforts. Geographic

Information Systems (GIS) technology has the potential to help assess where rivers and streams are protected by forest cover, as well as the mix of land uses forming their watersheds.

History of Forest Lands

Looking at changes in general amounts of forest land over time may help gain a perspective on riparian forests. When the first colonists arrived on the shores of the Chesapeake, they found a vast forest covering nearly the entire watershed. Along the Chesapeake and the rivers that fed it, these settlers found a seemingly infinite variety of trees, astonishing in their "bulk and antiquity." As William Strachey, Secretary of the Jamestown colony observed, "the land we see around us is overgrown with trees and woods, being a plain wilderness, as God first ordained it." The natural riparian system was characterized by a nearly continuous mixed hardwood forest with a high diversity of understory shrubs and herbaceous vegetation.

Changes

Forests, in general, have significantly changed in each state in the Bay basin. Over 300 years of growth and land use change has resulted in the clearing of many forests for cultivation, livestock grazing, urban development, improved drainage, or flood control. Many riparian zones have been permanently destroyed or altered. Several resource inventories were consulted to determine the status of forests in the Bay watershed and to indicate trends over the past two decades. The following information illustrates forest data for those portions of the states within the Bay watershed.

STATUS

- *Pennsylvania has over 9 million acres and is 63% forested.*
- *Virginia has 8.2 million acres and is 59% forested.*
- *Maryland has 2.5 million acres and is 43% forested.*
- *Washington DC has 5 thousand acres and is 12.5% forested.*

TRENDS

- *MD - Loss - Inventories show a 2% forest loss between the mid-1970s and 1990.*
- *PA - Static - Inventories indicate a balance of loss and gains for the state.*
- *VA - Loss - Inventories clearly show a decline in forest land of between 2-7% loss.*

Riparian Inventories

Forest inventories in their traditional form do not tell us the extent of riparian forest. The linear nature of riparian zones requires a broad-scale spatial approach such as analyzing aerial photographs or using satellite imagery in GIS. Only Maryland has conducted a state-wide assessment of riparian forests. Small watershed studies, like one conducted for the Conodoguinet Creek, Pennsylvania begin to characterize riparian areas. However, the status of riparian forest buffers in the whole watershed is largely unknown. Maryland's forest inventory indicates that when a 100 foot wide forest buffer is looked at on both sides of the stream, streams in Maryland were found to lack 50-60% of their forest buffers. Pennsylvania's Conodoguinet Creek, in Cumberland county is 67% buffered by forest at 100 feet on at least one side, but only 7% in forest buffer when both sides of the streams are considered. . We do not yet know the status of riparian forest buffers for watersheds in the state of Virginia, Pennsylvania, or the Bay watershed as a whole.

Forestry Workgroup Efforts

The Forestry Workgroup of the Nutrient Subcommittee is presently developing an inventory of riparian forests for each state and for the entire Bay watershed. This information will be useful in setting future goals and aid in targeting implementation projects and assistance programs aimed at conserving and restoring forest buffers for streamside habitat and water quality improvement. The project will compile a GIS land use layer of riparian forest and conduct a statistical analysis of forest adjacent to streams and rivers for the Chesapeake Bay watershed. Preliminary data and analysis will be available this winter and all final data layers, analytical reports and maps are expected in June 1996.

Issues The public has expressed support for clean water and stream protection and restoration efforts on private and public lands. While some innovative steps have been taken, a number of obstacles have prevented progress in meeting these challenges. To effectively improve riparian stewardship and conserve and restore riparian forests, action by the Panel will need to meet these challenges.

Issues related to land use adjacent to waterways are complicated ones. Streams and their riparian areas cut across ownerships, interest groups, and scientific disciplines. They are an important part of our larger landscape but can also form our property lines and backyards. Workshops with landowners, environmental groups and government professionals, have helped to identify issues that may present barriers to implementation of a riparian forest buffer policy. These issues fall into four main categories:

- 1. Perceived threat to landowners/developers Discussion of riparian buffers can generate fear and resistance from landowners, farming interests, developers, and industry. These fears may represent a broad-based resistance to government programs, resistance to change or fear that a voluntary agreement to establish a buffer may lead to permanent regulation of land. Some landowners believe that designation of a buffer may lead to unrestricted public use, habitation by endangered species, or loss of use or property value.*
- 2. Economic loss As with other BMP's, landowners and developers may experience a loss of income associated with installation or retention of a forest buffer. For farmers, the amount of land removed from production may be small but the level of impact may vary. For a land developer, it may mean realignment of a subdivision plan, including roads and utilities, or may change the density of development. Tax laws may not recognize buffers favorably, thereby failing to encourage their retention. Economic benefits and tradeoffs of forest buffer retention and establishment are not well understood or documented. Farmers, developers or local governments, may also lack the time, ability, funds, or desire to plant and maintain forest buffers.*
- 3. Capability of existing programs Very few incentive programs are targeted to riparian forest buffer establishment or retention. Buffers, stream fencing, and other stream protection measures are often not eligible for cost-share programs. Programs are scattered throughout government, are complex, present bureaucratic hurdles, and may have significant regional differences. Competition between agencies/programs creates a lack of coordination and common goals. Some administrative or regulatory policies create disincentives to riparian forest buffers. Successful programs are sometimes poorly funded. Private and non-profit groups are underutilized as partners in riparian buffer efforts.*

4. *Scientific/technical information needs Although the scientific foundation of riparian forest buffer function is substantial, experience and technical guidance for establishment and maintenance is limited. Information transfer and technical training is needed for landowners and field professionals. Monitoring of demonstration sites is limited. There is currently no inventory or database on riparian buffer status or condition.*

Challenges and Opportunities Throughout the watershed, people are working to conserve and restore riparian areas through a wide variety of approaches. Actions which build on successes, reduce landowner and business fears, and generally enhance a stewardship ethic focussed on riparian forests are needed. The ultimate goal is to enhance water quality and habitat in our rivers and streams and along the shorelines of the Bay. Achieving forested buffers is desired, however, it is recognized that some landowners will limit their riparian stewardship to basic stream protection, filter strip measures, or forest buffers of minimal width. Therefore, meeting the challenge of retaining and restoring riparian forest buffers will require approaches that:

1. *Build commitment among riparian landowners A more aggressive stream and riparian stewardship program/policy requires a strong commitment by all levels of government, clear and coordinated goals and objectives, and adoption of a sound riparian stewardship ethic among landowners. Such an ethic should focus on retaining and restoring the integrity and ecological health of streams and rivers through promotion of naturally functioning riparian systems, such as forests. Riparian landowners are essential partners in this effort.*
2. *Increase technical knowledge of riparian forest buffers More than a decade of research and demonstration projects has shown the value and functions of riparian areas in water quality and habitat enhancement. The recently released EPA Chesapeake Bay Program report entitled, "Water Quality Functions of Riparian Forest Buffer Systems in the Chesapeake Bay Watershed", provides a firm foundation for understanding buffer function. A watershed-scale inventory of riparian buffers is underway. Future steps must be taken to refine this knowledge and provide technical guidance for establishment and management of RFBs to allow landowners and resource managers successfully establish/conservate riparian forests and other buffers.*
3. *Increase knowledge of landowners and technical staff Additional training and technical knowledge in forest buffer establishment and stream protection and restoration is needed for those who provide landowner assistance. Cross-training is needed among state, federal and local government personnel. For example, foresters do not regularly interact in the agricultural or urban arena and farm service personnel do not often promote riparian forest buffers. Effective technology transfer is needed for those who make resource management decisions.*
4. *Coordinate and enhance existing programs and policies While some existing programs incorporate riparian corridors as part of nonpoint source reduction or land conservation programs, very few focus specifically on riparian forests. Many agencies or commissions have specific but limited responsibilities for activities with the riparian area. As such, management or restoration of this resource can be complicated and confusing. Improving coordination, communication and streamlining existing efforts is needed.*

5. *Provide adequate incentives* The vast majority of riparian areas are on private lands. Greater attention must be placed on the essential role of private landowners as partners in managing, conserving and restoring riparian resources, especially for reducing nonpoint source loads to the Bay and its tributaries. A variety of voluntary incentives will need to be offered which provide flexibility in application. Innovative ideas for tax and cost-share approaches will be explored.

Analysis of Existing Programs Panel staff is conducting an examination of a wide variety of existing "programmatic tools" which could be utilized to increase emphasis on riparian forest buffers (RFB's). Included are federal, state, and local government programs as well as private-sector initiatives. These analyses focus on those programs that promote forests in the riparian zone as well as those that promote more general stream protection measures where the focus on riparian forests could be enhanced. The goal is to suggest ways to modify, streamline or enhance existing approaches in order to target riparian forest buffers more actively within existing authorities and financial resources. *Analysis Recommendations* to modify existing programs must be based on an assessment of how well a program or type of program contributes to the intent of the Directive. By looking at program accomplishment data where available, analyzing case studies, and talking to program managers, additional policy steps can be identified. The analysis posed a number of broad qualitative questions:

- *Do the programs have a riparian forest emphasis?*
- *Are regulatory programs being adequately enforced?*
- *Are incentives in non-regulatory programs adequate to encourage landowner participation?*
- *What are the barriers to riparian forest stewardship?*
- *Are programs adequately funded?*
- *How permanent are actions taken by incentive programs?*

Findings

Because of differences between jurisdictions and individual programs, approaches, and data collection methodology, a full spectrum of comparative data useful in making comparisons was not available. The following is a synopsis of the interim findings from this analysis:

- 1) *Very few programs provide a specific riparian forest buffer focus; it is more common that protecting, establishing, or maintaining RFB's is an ancillary benefit to some other programmatic goal.*
- 2) *Federal and state incentive funds for RFB's are unstable or on the decline adversely affecting such programs as SIP, FIP, 319 grants, and CZMA § 6217.*
- 3) *New partnerships or new sources of funds must be sought to expand potential funding and enlist other forms of in-kind support.*
- 4) *Many programs are unnecessarily bureaucratic, complicated to understand and participate in, and cumbersome to administer due to burdensome paperwork.*
- 5) *A general lack of awareness of the various existing RFB programs that exist is a serious impediment increasing the level of participation.*

- 6) State regulatory programs are implemented locally with varying degrees of consistency.*
- 7) There are many agencies and conservation organizations involved with riparian forest buffer retention and/or restoration, but with varying degrees of support. A consensus or shared goal for riparian forests would help reduce competition and stimulate joint actions among these organizations.*
- 8) Cost-share rates and caps, grants and/or tax breaks are not sufficient to encourage riparian landowners to initiate RFB activities. Any restructuring of economic incentives must ensure that local governments, likely to implement RFB programs, will not suffer an unreasonable loss to local tax base.*
- 9) Various incentives programs have requirements such as entry fees, minimum acreage or time commitments which can discourage participation in RFB programs.*
- 10) RFB programs provide varying levels of protection ranging from the duration of the regulated activity to 25 plus years for easements.*
- 11) Existing efforts do not effectively utilize the capabilities of non-profit and private groups.*
- 12) RFB programs on the federal and state level consist of delivery of technical and financial assistance (including easement programs) and various types of income and property tax breaks.*
- 13) Most RFB programs on the local (county and municipal) level consist of comprehensive planning and zoning and the institution of development and conservation ordinances.*
- 14) Accomplishment report data are unavailable or inconsistent between and within the states.*
- 15) Not all programs have a specific buffer component or otherwise have the ability to differentiate between administrative overhead and implementation relative to RFB's establishment, protection and maintenance.*
- 16) Programs which mandate mitigation for the loss of forest land or the designation of set aside acreage often have requirements which do not recognize the establishment of RFB's as a legitimate way of complying with the mandate.*
- 17) Some RFB programs need to be more flexible allowing landowners to perform needed maintenance, conduct pest control measures and judiciously harvest timber to recover some economic return from the land on a periodic basis.*

Clearly, there are many issues to consider in determining how to most effectively use public and private resources to restore streams and rivers and promote riparian forest maintenance and restoration. During the coming months, the Panel will continue to perform a thorough examination of existing programs to determine how to take best advantage of their capabilities to enhance riparian forest stewardship throughout the Chesapeake Bay region.

Framework for a Riparian Strategy In developing potential strategies for a riparian forest buffer policy, the Panel recognizes that the content and organization of its recommendations to the Executive

Council will need to be dynamic. The strategy will be continually refined throughout the process of information gathering and stakeholder deliberations. Emphasis on definitions, jurisdictional differences in buffer-related programs, availability of data on existing buffers and innovative ideas from the public will all affect the detail, thoroughness and efficacy of the Panel's final recommendations.

To organize the policy process, the Panel has decided to focus on broad program goals and, within that framework, by land use type, retention and restoration and type of implementation program. The Panel will format its final report to follow the Directive commitments to a goal, definitions, recommendations on program, partnership and communications. The Panel will seek to avoid highly prescriptive actions leaving as much flexibility as possible in implementation. The report will, however, establish quantifiable outcomes that should result from the policy. A Panel workgroup is investigating the applicability of various types of quantifiable targets as well as reasonable and practical time frames for implementation. With this framework in mind, two tracks will be followed; riparian maintenance/retention and riparian area restoration. Here, "Goals" are defined as broad core messages to guide discussion.

Proposed Goals for Policy Development

- ***Improve public understanding of and commitment to stream and riparian stewardship.***
- ***Coordinate, streamline and enhance existing federal, state and local riparian forest buffer policies/programs.***
- ***Increase knowledge of landowners and technical assistance personnel in forest buffer planting and management.***
- ***Provide adequate incentives to gain landowner acceptance of riparian forest buffer retention and restoration.***
- ***Increase the role of private and non-profit organizations.***
- ***Encourage government to set the example for riparian forest buffer retention and restoration through management of public lands.***
- ***Increase scientific and technical knowledge of riparian buffer effectiveness and benefits (economic and ecologic).***
- ***Ensure that progress in retention and restoration of forest buffers is monitored and accomplishments measured.***

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Last Modified 30 July 1996