Chesapeake 2000 Stream Corridor Restoration Goals Workshop

Wednesday May 7, 2003
Hanover, Maryland

Sponsored by
The Chesapeake Bay Program's
Chesapeake 2000 Watershed Commitments Task Force
&
The Scientific and Technical Advisory Committee

STAC Publication 04-001

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Executive Summary

This workshop was structured to convey the importance of setting stream corridor restoration goals based on local watershed management planning, to provide case study examples of how this is currently being accomplished and to generate recommendations for how goal setting should be addressed across the Chesapeake Bay watershed. It is hoped that this information will be used by jurisdictions (District of Columbia, Maryland, Pennsylvania, Virginia) as a basis for addressing the following Chesapeake 2000 (C2K) commitment:

> "By 2004, each jurisdiction, working with local governments, community groups and watershed organizations, will develop stream corridor restoration goals based on local watershed management planning."

Emphasis was given to how jurisdictions can begin or continue developing comprehensive goals for stream corridor restoration that will integrate existing programs and planning efforts. The intent of the workshop was not to develop goals, rather to expose participants to alternatives and guidance for a process to develop and set restoration goals within the context of locally developed watershed management plans. Invited participants (representing federal, state and local governments, community groups and watershed organizations) were asked to discuss these ideas and to offer recommendations for next steps needed to meet this commitment.

The morning session opened with presentations from two keynote speakers with expertise in stream corridor restoration and watershed management planning. Keynote addresses were followed by highlights of stream corridor restoration issues and challenges relevant to specific jurisdictions and the entire Bay watershed. During the afternoon session, a selection of case studies served as examples of approaches that have already been applied in localities within the Chesapeake Bay area to set goals within a watershed management planning framework. Attention was then given to the relationships between the 2004 Stream Corridor Restoration Goal commitment and other C2K commitments. At the conclusion of the workshop, jurisdictional breakout sessions provided a forum for discussion of information presented during earlier workshop sessions. Participants were encouraged to consider the relation of this information to ongoing work at the state level for developing and setting integrated stream corridor restoration goals, to offer suggestions for how this commitment should be met and to identify what challenges must be overcome.

The first keynote address focused on defining what is stream corridor restoration. It was emphasized that optimal stream corridor restoration projects should aim to restore not only the ecological structure, but, more importantly, the ecological function of streams. It is essential that stream corridor restoration goals are set at the outset of restoration projects and that goals should be defined as part of a plan for the entire watershed. Understanding the natural variability of a stream system prior to setting meaningful goals is critical.

The essential need to understand watershed conditions to the fullest extent possible in order to develop effective and achievable goals for stream corridors at the local level was reiterated in the second keynote presentation. This presentation addressed watershed management plans as a context for setting stream corridor restoration goals and stressed the need to set appropriate watershed goals at an appropriate scale. The importance of realistic expectations, and the need to use standard assessment techniques to adequately evaluate opportunities for stream corridor restoration was emphasized as well.

Following the opening addresses which provided the foundation for goal setting, experts from Maryland, Virginia, Pennsylvania and the District of Columbia offered an overview of the various stream corridor restoration issues relevant to each jurisdiction. Issues and challenges that are important to consider and address in stream corridor restoration goal setting were highlighted. Topics ranged from finding an appropriate definition of success and how progress is tracked in Maryland, to identifying incentives for local groups to develop watershed management plans and appropriate stream corridor restoration goals that address problems identified in the plans in Virginia. Difficulties with working on federal lands with storm water runoff and other design issues specific to urbanized areas were identified for the District of Columbia. Pennsylvania emphasized its shift in restoration approaches from single purpose projects, such as those addressing public safety concerns, to projects with multiple objectives and an overall goal of environmental improvement.

A number of case studies highlighting various approaches that have been applied at local and county levels to set goals within a watershed management planning framework were then presented. Montgomery County (Maryland) discussed how stream restoration projects were integrated with county stormwater planning while the Western Pennsylvania Conservancy used land acquisition practices and community-led planning to address stream corridors in a predominately forested watershed. The Elizabeth River project (Virginia), in partnership with industry and

government, is focusing all possible conservation and restoration tools to a single tributary of the Elizabeth River to achieve its goals for stream corridor restoration.

Prior to the afternoon jurisdictional breakout sessions, a series of brief overviews pertaining to relevant C2K commitments were presented by various Chesapeake Bay Program workgroups in order to emphasize the need to approach stream corridor restoration goal development, not only within the context of watershed management plans, but also in a manner that supports and builds upon other related C2K commitments. The Community Watershed Task Force outlined accomplishments related to watershed management planning in each jurisdiction and the need to integrate stream corridor restoration at the state level with locally developed and implemented watershed plans. The forestry workgroup described the process for setting new goals for riparian forest buffers along streams and shorelines targeting priority areas for water quality and habitat protection. The urban stormwater workgroup described the significant impacts of flooding, streambank erosion, habitat degradation and nutrients and sediments carried to the bay in stormwater runoff from cities and emphasized the need to effectively manage this runoff. Ideally management options to control both flooding and polluted runoff should be encompassed in local watershed management plans. Criteria for crediting stream restoration projects were also presented as possible guidelines for crediting stream *corridor* restoration projects. The Living Resources Subcommittee wrapped up this session by presenting an overview of options for meeting the C2K goal of restoring and protecting resident and migratory fish through fish passage and dam removal projects. It was suggested that stream corridor restoration goals provide an excellent opportunity to integrate elements of riparian buffer and stream corridor goals with restoring and preserving migratory fish passage. Numerous advantages for combining goals were offered, including targeting areas for multiple restoration benefits, bolstering public support and community involvement, enhancing fund raising potential for project proposals, and eliminating duplicative efforts at the state level by incorporating numerous elements into jurisdiction specific stream corridor goals.

The workshop concluded with three breakout sessions during which recommendations for how to begin or continue developing stream corridor restoration goals in each jurisdiction was discussed. Discussion topics included defining a stream corridor and stream corridor restoration, considering criteria for meeting C2K goals for stream corridor restoration, as well as how restoration will be measured and tracked in each jurisdiction.

Introduction

The 2004 Stream Corridor Restoration Goal is one of ninety-three commitments in the Chesapeake 2000 (C2K) agreement. This agreement is a watershed partnership between the jurisdictions of Maryland, Virginia, the District of Columbia and Pennsylvania, the Chesapeake Bay Commission and the United States Environmental Protection Agency. As a whole, the commitments spelled out in the agreement provide a roadmap for attaining five overarching objectives for improving Bay watershed conditions.

- Living Resource Protection and Restoration
- Vital Habitat Protection and Restoration
- Water Quality Protection and Restoration
- Sound Land Use
- Stewardship and Community Engagement

Streams are an integral part of the Chesapeake Bay's natural infrastructure. Stream networks "interconnect the land, water, living resources and human communities of the Bay watershed (C2K)". As such, improving, restoring and protecting stream ecosystems assumes a pivotal point in moving the Bay and it's watershed resources towards the ideal condition. The C2K commitment that specifically addresses this puts forth the charge:

> "By 2004, each jurisdiction, working with local governments, community groups and watershed organizations, will develop stream corridor restoration goals based on local watershed management planning"

By meeting this commitment, elements critical to each of the five overarching goals of the C2K agreement are addressed. Stream condition is reflected in the quality of its living resources, physical habitat and water chemistry and flow regimes. In turn, stream condition is strongly influenced by land use practices occurring throughout the drainage basin. Setting stream corridor restoration goals, and then moving towards implementation, is best achieved through the cooperative efforts of all levels of government and the citizens and watershed organizations that are most closely tied to the resources.

This workshop was held in response to requests for assistance from the Non-Tidal Habitat Workgroup and the Community Watershed Task Force of the Chesapeake Bay Program Living Resources Subcommittee as a way to begin the deliberations on how this commitment is to be achieved and to frame out some key issues. A Steering Committee was appointed to construct the workshop. Steering Committee members are listed in the appendix. Participants were invited to represent those agencies and organizations identified in the commitment that were charged to work together in the development of stream corridor restoration goals. Keynote speakers were selected to discuss why setting goals are important, how we need to define these goals to improve the ecological functioning of stream corridors and how improvements can be optimized by working within the context of watershed management plans. Jurisdictional experts presented a view on the range of stream corridor restoration issues that should be taken into consideration. Case studies highlighted various approaches and success stories. Representatives from various Chesapeake Bay Program workgroups emphasized how and why this Stream Corridor Restoration Goal commitment should be integrated with other relevant C2K commitments. The participants were then asked to meet together in groups, segregated by jurisdiction, and consider several questions designed to guide discussion around key common elements and recommendations for necessary next steps. During workshop recesses, participants were encouraged to visit exhibits showcasing programs, case studies and professional services. A list of participating organizations and exhibitors are provided in the appendix.

The remainder of these proceedings provides a statement of workshop goals and objectives, summaries of presentations and the results of the breakout workgroups.

Workshop Goals and Objectives

The primary goal of the workshop was to promote science-based approaches to assist the Chesapeake Bay Program partner jurisdictions and their local partners in developing or enhancing existing efforts to develop stream corridor restoration goals based on local watershed management planning. The workshop served as an opportunity to present alternative approaches for setting integrated stream corridor restoration goals and as a forum for discussion on how to identify common elements and determine how jurisdictions will begin or continue working towards setting these goals by 2004.

Keynote Addresses

Stream Corridor Restoration: What does it mean?

Margaret A. Palmer
Professor of Biology and Entomology
PLS BLDG 4112
University of Maryland
College Park, MD 20742

Ecological restoration has enormous potential to enhance ecosystem goods and services and to protect biodiversity. Ecological restoration also provides enormous opportunities for scientists and managers to conduct large-scale experiments and test basic ecological and engineering methods. Indeed, the development of restoration as a science is dependent upon tests of relevant theory and methods being linked to actual restoration projects. Likewise, to maximize the success of restoration projects, restoration (the practice) should be informed and guided by restoration science.

Because rivers are so important economically and ecologically, restoration of these ecosystems is receiving a lot of attention and financial support. Restoration activities are diverse, ranging from channel engineering, to hydrologic experimentation, renewal of riparian vegetation, bank stabilization, and habitat improvement. The goals vary with context and stakeholder interests; however, the optimal projects will aim to restore ecological health to stream corridors. This means intact riparian zones, natural flow regimes, diverse in-stream habitat types including abundant woody debris, clean water inputs, etc. Unfortunately, in many regions of the Chesapeake Bay, massive land use changes and urban pressures have led to poor water quality, high sediment flux, and degraded ecological communities and processes.

It is essential that as we consider how best to restore our watersheds that we focus not only on ecological structure (what is there and how it looks!) but ecological function (how the stream works). If we can restore critical functions (like nutrient uptake by biota, primary production, sediment and hydraulic storage), we can convert highly degraded streams that act merely as conveyance gutters to living, biogeochemically transforming systems. We must establish goals at the outset of projects and these goals should be aimed at restoration of the underlying *processes* that support healthy streams. Species are not independent of processes. In many cases, restoration of particular plant or animal species facilitates overall systems restoration. However, all natural systems vary. Until we understand how much variation (in any given ecological or physical property of a stream or watershed) is "normal" or acceptable to stakeholders, we cannot set goals nor even determine if a particular system is in need of restoration. The concept of "windows of natural variability" is key to any successful restoration program.

If we wish to improve conditions in the Chesapeake Bay, we must focus on the many small watersheds that feed the bay and we must have data on how variable stream "metrics" are in time and space. Only then can we make decisions on what is acceptable and desirable to our citizens. Once we have done this, we should undertake an adaptive experimental restoration program Bay-wide in which we rigorously assess the response of watersheds to our efforts and constantly improve our efforts. Those organizations represented at this Chesapeake Bay workshop are poised to be leaders nationally in efforts to track what is done, why it is done, and how effective it is and thus this workshop is extremely important. We must begin the process of deciding how we will move forward to develop an adaptive restoration program Bay-wide.

At the national level, restoration has suffered from lack of evaluation and lack of synthetic studies of past efforts. I have been leading a new initiative B the National Riverine Restoration Science Synthesis (NRRSS) that began in 2002. It involves a large interdisciplinary team of scientists and engineers working in partnership with the river conservation organization, *American Rivers.* Participants are assembling a data set that spans multiple ecoregions and many types of restoration activities performed by diverse groups with various stakeholders. We are addressing: what kinds of restoration activities, at what scale, and by what means have taken place; how goals were set and success measured; the extent to which scientific criteria were used; the extent to which adaptive management was an explicit component; and the extent to which scientists formed partnerships with restoration practitioners to use restoration projects as opportunities for scientific experimentation. The goal of the project is to facilitate the linkage between the practice of ecological restoration and the science of restoration ecology, as well as establish standards for data gathering and analysis to assess restoration methods and success in a scientifically rigorous manner.

Through work with Maryland's Department of Natural Resources (DNR), we have been able to place Maryland center stage in the NRRSS effort. Among the 45,000 projects nationally that are candidates to this scientific study, Maryland had one of the first, well-organized digital databases (Washington state and California are also very advanced in this arena). In collaboration with DNR and the Maryland Department of the Environment (MDE), my laboratory at the University of Maryland is expanding and updating the Maryland database and putting it into the NRRSS database. This will result in a comprehensive evaluation of Maryland=s past and current restoration projects and allow us to compare our efforts (and results) to other regions in the nation.

Watershed Management Plans: The Context for Setting Stream Corridor Restoration Goals

Thomas R. Schueler
Center for Watershed Protection

An understanding of watershed conditions is essential in developing effective and achievable goals for stream corridor at the local level. Some of the key themes include:

Setting Appropriate Watershed Goals.

Several dozen potential goals can guide stream corridor restoration efforts. These goals can be generally categorized into physical/hydrological, water quality, habitat, biological and community indicators that are measurable.

Goal setting should generally be done at the watershed or basin scale, with local assessment and implementation occurring at the subwatershed scale.

Community goals such as access, recreation, flood safety, aesthetics and greenways should not be neglected in stream corridor restoration; indeed, public involvement in goal setting should be done early and often.

Setting Realistic Expectations: The Impervious Cover Model

Given historical patterns of land development and alteration, it is often impossible to fully achieve the universe of all potential stream corridor goals in a given watershed. Impervious cover has emerged an important tool for setting realistic expectations for what can be achieved in urban and suburban watersheds. Recent research has provided further support for the Impervious Cover Model (ICM), which provides a useful framework for classifying and managing subwatersheds (CWP, 2003).

In subwatersheds with less than 10% IC, other indicators such as percent forest, percent crop or stream-side forest continuity are better tools to set expectations for stream corridor restoration.

Developing Standard Assessment Techniques

The methods and techniques to assess and evaluate opportunities for stream corridor restoration need to be standardized. We have recently devised an eight-step framework to develop comprehensive local watershed restoration plans, as part of a national guidance document on small watershed restoration that will be completed later this year. New methods that involve GPS and digital cameras such as the Unified Stream Assessment (USA) and the Upland Subwatershed and Site Reconnaissance (USSR) will enable watershed managers to rapidly evaluate opportunities for stream corridor restoration.

This data helps watershed managers to determine the degree of stream corridor restoration potential that exists in a subwatershed, and whether it is sufficient to achieve the initial restoration goals that are established at the watershed level.

Defining the Stream Corridor

The actual stream network is poorly mapped in many jurisdictions in the Chesapeake Bay, particularly in the headwaters. Consequently, ground-truthing of the location and condition of the entire stream network should be a component of any good watershed or stream corridor restoration plan. This is particularly true in urban watersheds, where the stream corridor is often interrupted, constrained or eliminated altogether.

Managing Multiple Subwatersheds

Much of the Bay watershed has extensive GIS data that can be quickly manipulated to help communities determine which of their many subwatersheds are most vulnerable to future land development, or have the greatest restoration potential. These watershed analysis techniques have recently been applied to good effect in Goose Creek in Virginia and Bush River in Maryland, where they have identified the most critical subwatersheds to begin planning and implementation efforts. These techniques are described on our website www.cwp.org.

References

CWP, 1998. Rapid Watershed Planning Handbook. Center for Watershed Protection. Ellicott City, MD

CWP. 2003. Impacts of Impervious Cover on Aquatic Systems. Center for Watershed Protection. Ellicott City, MD

Diversity of Issues Baywide

The following overviews of the various types of stream corridor restoration issues relevant to the specific jurisdictions were presented by experts in each Chesapeake Bay region. The intent was to highlight issues and challenges that are viewed as important and or difficult to consider and address in stream restoration goal setting.

Stream Corridor Restoration Issues in Pennsylvania

Michael Conway
Bureau of Waterways and Engineering
Pennsylvania Department of Environmental Protection

No abstract submitted

Stream Corridor Restoration Issues in Maryland

Paul Kazyak
Resource Assessment Service
Maryland Department of Natural Resources

What defines Success? This is a central question to setting and meeting goals to restore stream corridors. Tracking progress and measuring success requires the use of indicators. Maryland tracks stream restoration projects and riparian forest buffer plantings. However, what do these points on a map really tell us? Do these projects encourage the retention of woody debris in streams? Is stream bank stabilization achieved through natural means that enhance stream habitat or are banks hardened through the use of concrete retaining walls? How do we address the effects of impervious cover on stream hydrology? Many urban streams may have stable physical features, but do not support aquatic life because they are dry. With every gain in stream miles restored or riparian forest buffers planted, there are unaccountable losses. Do we evaluate miles of forest planted or miles of forest planted successfully to account for mortality or other detrimental impacts? Where do we focus our efforts? There are opportunities throughout Maryland; on public lands, in urban areas, near highways, on farmland whose owners choose to participate in buffer projects. How do we prioritize these efforts? Do we focus on streams in poor condition, such as those that require TMDLs? Do we invest in streams that rate as fair to good, preventing degradation of good streams and raising fair streams to a higher functional state? The Maryland Biological Stream Survey (MBSS) produces a host of biological indicators that can assist in making these decisions and measuring success. MBSS has identified reference watersheds as benchmarks. Efforts can be directed at increasing the benchmark threshold. Sentinel sites, or sites rated as an A10, should be the focus of protection/anti-degradation efforts. Since the initial identification of sentinel sites, some have already been lost (impaired). Using Indicators of Biological Integrity is one way to set goals and track success in Maryland. The endpoint of our efforts to restore and protect stream corridors should be aimed at securing a biological response.

Stream Corridor Restoration Issues in Virginia

Lee Hill
Virginia Department of Conservation and Recreation

Commitment:
In the C2K document, local governments and groups are being asked to develop watershed management plans to address the needs in the watershed. However, the localities and groups did not sign the C2K Agreement. Since they did not sign, one question is being asked "What incentives are they (local governments, groups, etc.) going to be given to develop the plan?"

The term "incentives" is important. Incentives can be many things. Some ideas are:

- Funding ($): to hire staff to develop the plans; to hire consultants to develop the plans; to cover costs associated with the meetings to develop plans; to pay for plan implementation; to monitor success or failure.
- Technical Assistance (provide staff): to provide training and educational opportunities for local governments developing watershed management plans; to publicize and attend meetings; to identify problems and the measures needed to address the problems; to write the plan; to print and distribute the plan; to oversee implementation of the measures needed to address identified problems; to monitor success or failure.
- Others: creative ways to assist localities in developing and implementing the plans.

If no funds, technical assistance or creative ways to assist localities and groups are provided, what can be expected? What does this say about commitment? A statement that is heard too often - "WE DO NOT HAVE TIME (funds, resources, etc.)".

Land Ownership:
To accomplish watershed management and stream corridor restoration goals, we need the support of the Land owners. Plans should be developed that address both restoration needs and what the landowner may desire for the property. Without landowner acceptance, can we really accomplish anything through a voluntary effort? Yes, we can. However, it may require more work and perseverance to the cause.

Land Use (Urban/Rural):
This is a topic that polarizes many issues and groups. Try to remember that stream restoration or stream corridor protection each can be defined in one way. However, goals, opportunities and practices to accomplish each issue may and will vary with land use B urban versus rural. We must remember - the end results of restoration should be improved water quality and wildlife habitat.

Problems/Needs/Opportunities:
The problems we are trying to address through restoration are varied and are mainly aimed at three areas - physical, chemical, and biological. If restoration does not address all three at one time, is it really mitigation? The answer – yes. Problem solving can be a slow process and any step in the right direction is needed. While we should strive to address all three areas, this may not be feasible in all situations. Thus, by addressing one issue, improvements may result that directly influence (hopefully improve) the remaining issues.

Implementation and Monitoring:
These two issues directly relate to the first item - commitment. Once the plans have been developed, implementation is the next step and relies on commitment for its success. Once the plans are implemented, monitoring is needed to track the success or failure of the plan in meeting the identified goals. In both instances, funds and technical services are needed.

Results:
Does restoration address the problems identified in the watershed management plan? Hopefully, the answer is yes. If the problems are not addressed, have we failed? The answer is - NO. In this instance, we have to remain positive and modify our approaches to better address the problems. An example of refining a commitment – the C2K Agreement.

Stream Corridor Restoration Issues in the District of Columbia

Dr. Hamid Karimi
DC Department of Health,
Watershed Protection Division

Stream corridor restoration in an urban setting presents a number of challenges not often encountered in less developed areas. Dr. Hamid Karimi's talk focused on some of the unique aspects of planning and implementing stream restoration projects in urbanized areas such as Washington, DC. Topics discussed include addressing stormwater runoff, working on federal lands or with multiple landowners, forming effective partnerships, and specific design considerations in urbanized watersheds. The presentation includes examples from three stream restoration projects in DC- Oxon Run, Watts Branch, and Pope Branch.

Case Studies

A series of case studies that showcase alternative approaches that have been applied by localities in the Chesapeake Bay area to set goals within a watershed management planning framework were presented. These presentations highlight the various ways that local or county led stream restoration goals have been developed, implemented and integrated with regulatory and non regulatory requirements and other local priorities.

Urban Stream Restoration and Water Quality Protection

Cameron Wiegand and Meosotis Curtis
Montgomery County Department of Environmental Protection

Altered hydrology and related stream channel adjustments are the most significant stream protection problem in Montgomery County and many other urban jurisdictions. Loss of stream habitat, related sedimentation damages, and reduced stream base flows that accompany watershed development dominate other stream quality problems. Literature sources suggest that stream channel erosion caused by inadequately controlled runoff is the source of up to 75% of sediment loads generated in urban watersheds. Local government priorities focus on neighborhood stream protection to improve habitat conditions and appearance of local neighborhood streams. Local implementation of these projects results in downstream benefits to Bay ecosystem and water quality.

Remediation opportunities in urbanized streams face many constraints including: high levels of impervious areas, difficulties of finding sites to add new stormwater controls, the extent of stream headwaters that have been piped, and the presence of many infrastructure constraints that cannot be easily removed or relocated (parallel roads, stream crossings, and water and sewer lines). Stream restoration projects have a general goal of "raising the bar" by improving degraded habitat to increase the diversity of supported biological communities, while reducing downstream sediment and pollutant loading impacts. Examples of typical restoration approaches, projects built in Montgomery County, and typical unit costs for construction are provided along with an overall description of the size and funding of the County's capital program for stream restoration. Guidance from the Urban Stormwater Workgroup on criteria to be used for including Bay program recognition of stream restoration as an urban BMP is discussed. Key questions are presented for STAC committee consideration regarding the integration, tracking, and funding of stream restoration as a key component of Bay management strategies.

Paradise Creek Restoration Plan

Joe Reiger
Elizabeth River Project

The Elizabeth River Project presented a plan for the restoration of Paradise Creek, as a model for how to restore the Elizabeth River and the Chesapeake Bay B one creek at a time.

Since its incorporation in 1993, the non-profit Elizabeth River Project and its partner agencies have completed hundreds of environmental improvement projects. But the projects have been scattered across the 200-square mile urban watershed of the Elizabeth River, where a diverse array of restoration and conservation methods have achieved award-winning wetland restorations, stormwater innovations, public education initiatives and pollution prevention, as well as advances with industrial partners and the initiation of a demonstration effort by the US Army Corps of Engineers to clean the toxic river bottom.

The Paradise Creek Restoration Plan signifies the 10-year anniversary of the Elizabeth River Project's community partnership by seeking for the first time to concentrate its entire "tool box" of restoration and conservation options on one small tributary of the Elizabeth River. The goal is to achieve maximum results in the relatively short period of five years, then move on to achieve a 10-mile corridor of similar projects encompassing most of the Southern Branch, plus sections in four river cities, by 2020. The plan will initially concentrate on Paradise Creek, a 2.9 square mile tributary in southeastern Portsmouth, VA, because it presents a microcosm of the challenges and the promise of the rest of the Elizabeth River.

While old Navy landfills on the shores of Paradise Creek exemplify past abuses, actually making National Priorities (Superfund) listing for the urgency of the contamination, the Navy, its industrial, municipal and residential neighbors are now zealous partners in the creek restoration plan. Meanwhile, it has been discovered that the creek itself is surprisingly resilient. Despite its intense industrial and residential history, the kind of wildlife that is expect to be found on more remote, rural areas of the Chesapeake Bay are routinely seen on Paradise Creek's open spaces. The Elizabeth River Project has nearly completed a wetland restoration and reforestation along the shore of former site of Peck Iron & Metal where wild foxes are often seen amongst concrete rubble and rusting auto parts in partnership with the private landowner. Toward our goal for returning scarred "brownfields" to viable use, the owner has found a buyer to remediate and redevelop the rest of the site. A public park is planned, in partnership with the City of Portsmouth, at the former Grimes Boatyard on Victory Boulevard, where wild asparagus more than 5 feet tall was discovered growing in the midst of old pilings on the shore.

Restoring an urban river is a long and daunting task. Through this planning process, a Paradise Creek has been discovered that lives up to its name: holding forth the high hopes for the Elizabeth River's future.

The Elizabeth River Project envisions a "Return to Paradise (Creek)" that:

- ***Celebrates and promotes awareness of the creek's diverse partnerships***, its rich history and its abundant natural resources, all of which are a source of community pride;
- ***Demonstrates such powerful results in restoration and conservation*** that the creek enjoys national recognition as *the model* for watershed management that safeguards ecological and human health;
- ***Maximizes quality of life for humans***, who experience Paradise Creek and its shores as a safe, marketable haven providing economic, recreational and educational benefits while also preserving the beauty, peace and natural vitality that are among a creek's greatest gifts.

Key Goals of the Paradise Creek Restoration Team:

- ***Develop a plan to clean up creek sediments*** determined to pose a serious risk to humans or the eco-system and begin implementation by 2008.
- ***Achieve a habitat corridor of restored and conserved open land***, including wetlands, forests and meadows, for 100 feet inland on the north shore of the creek and on the southern shore as practical, with areas set aside as parks or nature preserves as practical.
- ***Implement innovative solutions to stormwater pollution*** to address those sub-watersheds with highest impact on the eco-system, and provide maximum practical storm water treatment for new developments.
- ***Restore Navy landfills*** on Paradise Creek to productive use, helping achieve the relevant goals in this plan for water quality, sediment quality, living resources, and quality of life.
- ***Return at least three Superfund and/or brownfield upland sites to productive use*** through elimination of the risks to human and ecological health, resulting in increased marketability of individual properties and the creek area as a whole, and preventing re-contamination of restored sediments.
- ***Implement a comprehensive public relations and outreach plan*** to educate the citizens about creek restoration and history.

Sideling Hill Creek

Presented by Greg Socha
Western Pennsylvania Conservancy

The Sideling Hill Creek watershed is located primarily in south-central PA, with a small portion in Maryland. Land use in the watershed is 73% forested, 24% agriculture and 3% developed. Western Pennsylvania Conservancy's (WPC's) selection of this watershed for directed conservation and protection efforts was based on a GIS-based analysis using data from the Pennsylvania stream classification, the Western Pennsylvania Conservancy Natural Heritage Inventory, existing water quality data, level of threat information, known agriculture and forestry activities,

and forest tract connectedness. The Conservancy's strategic conservation approach is to protect the entire Sideling Hill Creek watershed through traditional land acquisition, community planning, and a community conservation "commitment".

The Western Pennsylvania Conservancy's goal for direct land acquisition is to secure funding for acquiring land tracts and/or conservation easements in the Sideling Hill Creek watershed. Land acquisition is accomplished by seeking and actively planning for opportunities to acquire land along the stream.

The Western Pennsylvania Conservancy's goal for community planning is to secure funding to build planning tools and provide technical assistance to community leadership. Objectives for community planning are to: increase access to locally relevant environmental/demographic/landuse data, to produce community/natural resource plans, and to create community/natural resource planning tools. Community planning projects include involvement in a joint-township Comprehensive Plan, developing GIS tools and training for forestland stakeholders, creating an analysis of agriculture and forestry sectors, and developing a River Conservation Plan for Sideling Hill and Fifteenmile Creeks and the neighboring town.

The Western Pennsylvania Conservancy's goal for community involvement in watershed conservation is to build a lasting community commitment to protecting the Sideling Hill Creek watershed through sustainable forestry, sustainable agriculture, and sustainable "rural living". Objectives are to: establish and promote forestry and agricultural Best Management Practices (BMP's), educate the public about important natural resources, coordinate community beautification events, and inspire involvement and interest in resource and community conservation. Projects encouraging conservation commitment in the community include a conservation beef co-op, a video highlighting positive activities in the watershed, hosting neighborhood watershed clean-ups and planning sustainable forestry, riparian restoration and cover crop projects.

Because sustainability is the guiding principal, the Western Pennsylvania Conservancy recognizes that a timetable is difficult to adopt. Therefore, three phases are recognized: planning, implementation, and maintenance.

The funding strategy is diverse (state, federal, and private funding), as is citizen involvement in order to avoid reaching a "saturation point" of those willing to be involved. Focusing on the local area is key because even though the people in the watershed care about other places (i.e. Chesapeake Bay), their response has been highest when their "backyard" is the focus.

The 2004 Stream Corridor Restoration Goal commitment is not a "stand-alone" commitment. It is dependent on the development of watershed management plans and should incorporate other C2K commitments and jurisdictional goals that address stream corridor restoration, both in physical features, water quality and quantity, and in relation to living resources. Several Chesapeake Bay Program workgroups were invited to present updates on commitments addressing watershed management planning, riparian buffers and fish passage. These presentations are not inclusive of all issues that should be considered when developing stream corridor restoration goals. Examples of other relevant efforts that should be considered include wetland restoration, water quality impairments (303(d) list), agricultural best management practices and conservation and stewardship initiatives.

Chesapeake 2000 Watershed Commitments Task Force (CWiC)
C2K Commitments Overview

By 2010, work with local governments, community groups and watershed organizations to develop and implement locally supported watershed management plans in two-thirds of the Bay watershed covered by this Agreement. These plans would address the protection, conservation, and restoration of stream corridors, riparian forest buffers, and wetlands for the purposes of improving habitat and water quality, with collateral benefits for optimizing stream flow and water supply.

Accomplishments:

- Established the necessary components of a watershed management plan that fulfills the C2K commitments
- Developed Jurisdictional watershed management strategies, based on these criteria, to guide programs and processes for encouraging watershed management planning at a community or local government level
- Surveyed known community watershed groups and local governments to measure existing watershed management planning efforts
- Identified and created tools to help local governments and community watershed organizations create watershed management plans
- Developed Bay wide outreach messages to generate public interest and convey the importance and effectiveness of locally based watershed management planning.

Next Steps:

- Create a system for tracking progress towards meeting the Chesapeake 2000 watershed commitment
- Encourage the development of local watershed management plans as a means of implementing the Tributary strategies
- Facilitate the development of a process within the Bay watershed for local agencies to develop plans that meet multiple federal program goals (TMDL implementation planning, MS4 permit planning and source water assessments) within a consolidated watershed planning process
- Facilitate a "Watershed Dialogue" as a training process to assist local governments and watershed associations in working through the development and implementation of watershed management plans
- Integrate efforts of other subcommittees and workgroups into tools, training, marketing, outreach, and incentives that promote watershed management planning
- Determine how watershed management plans and tools are currently marketed to community watershed groups and local governments and develop new methods for marketing these plans and tools

By 2001, each jurisdiction will develop guidelines to ensure the aquatic health of stream corridors. Guidelines should consider optimal surface and groundwater flows.

Accomplishments:

- A matrix was created of current regulations for each jurisdiction related to protecting aquatic health of streams and stream corridors
- Bay-wide Aquatic Health Guidelines and recommended actions to ensure the health of stream corridors were produced. These guidelines are a part of the Community Watershed Assessment Handbook and are intended to provide a measure of success for CWO's and local governments to determine how they are doing through watershed management planning efforts

By 2002, each jurisdiction will work with local governments and communities that have watershed management plans to select pilot projects that promote stream corridor protection and restoration.

In progress:

- Projects funded through the Small Watershed Grants program have been reviewed in order to identify and select pilot projects that promote stream corridor protection in communities with watershed management plans. Task Force members are presently working with the National Fish and Wildlife Foundation to develop an evaluation study that will include the chosen pilot projects and assess the efficiency and/or effectiveness of restoration projects that are based on a watershed plan

By 2003, include in the "State of the Bay" report, and make available to the public, local governments and others, information concerning the aquatic health of stream corridors based on adopted regional guidelines.

Future Work:

- Work with Jurisdictions to determine what information and in what format the health of stream corridors should be reported in the State of the Bay

By 2004, each jurisdiction, working with local governments, community groups and watershed organizations, will develop stream corridor restoration goals based on local watershed management planning.

Future Work:

- Work with State representatives to establish state specific stream corridor restoration goals based on watershed management planning

Forestry Workgroup

Setting New Goals for Riparian Forest Buffers

Update[1]

In 1996, the Chesapeake Bay Executive Council adopted a series of goals and policy recommendations aimed at enhancing the conservation and restoration of riparian forest buffers in the Bay watershed. Since then, over 2200 miles of riparian forest buffer have been planted –exceeding the goal set for accomplishment in 2010. Chesapeake 2000 calls us to "By 2003, establish a new goal to expand buffer mileage." This broadside updates the progress made toward establishing that goal.

Process for Goal Setting

Currently, a proposal to the Executive Council is expected to include:

1. A revised numeric restoration goal - include a range of mileage options, while holding constant the deadline of 2010.
2. Additional supportive goals.
3. Context and Policy Recommendations – includes findings from the policy review, stakeholder sessions, and economic analysis. Recommendations are made regarding programs, targeting, capacity to deliver, and renewed emphasis on conservation of existing, and maintenance and protection of restored buffers.

Setting a New Mileage Goal for Restoration

To derive a new mileage goal by 2010, several factors were evaluated, including reaching the environmental outcomes of the Chesapeake Bay Program. In essence, the analysis to date has been guided by 1) sustaining or expanding the current rate of restoration, 2) targeting the highest priority areas for water quality and habitat, and 3) achieving the necessary contribution to obtain water quality standards. The range of mileage goals and accompanying policy recommendations will also be considered in light of their economic cost and feasibility.

Current Rate of Restoration

This option is based on the successful riparian forest buffer restoration effort accomplished since 1996, largely supported by the development of CREP programs in each State. Through an analysis of the status and trend of progress thus far potential targets for accomplishment for 2010 can be proposed. Each one makes assumptions about continuing the current level of effort until 2010. Each one represents an expansion of the 2010 goal and thus includes accomplishments to date.

- 5 Year Average – 4600 miles
- Current Rate - 10,000 miles

Choosing among these potential levels of current accomplishment should consider changes in available resources, ability to maintain or increase technical assistance to landowners, ability to increase, alter, or develop new incentive programs beyond CREP, maintain nursery capacity, generate new sources of funding such as private funds, mitigation funds, nutrient trading, or capitalize on ancillary benefits (such as carbon or air quality credits).

Targeting High Priority Areas – Environmental Mapping Analysis

The 1996 Riparian Buffer Panel Report stated that the restored miles of forest buffer would be targeted where they will be of greatest value to water quality and living resources. Although highly desirable, it is very difficult for targeting exercises to match actual delivery of buffer restoration on-the-ground as most programs are offered on a willing landowner basis. The approach however does provide three clear benefits. First, it provides a check on the numbers generated using other analysis methods. Second, it can influence a more customized implementation of existing restoration plans or incentive programs. Lastly, criteria like those described below, can be used in targeting at the local level where it is most effective and more commonly practiced.

To evaluate how buffers might be targeted, watersheds (11-digit HUC) that were the highest priority to receive riparian forest buffers were determined by compiling available data on 1) water quality, 2) aquatic habitat, and 3) terrestrial habitat. In each case, the unbuffered miles in the highest priority watersheds would be the goal. Based on this environmental analysis, the number of stream and shoreline miles that are not currently forested in

1 Prepared by the Forestry Workgroup of the Nutrient Subcommittee for the Chesapeake Bay Program, April 2003.

high priority watersheds would be calculated. This represents the number of miles that would help restore the identified benefits in the highest priority watersheds, and thus guides the goal-setting process.

Maximum Contribution to Wildlife Habitat and Water Quality

Riparian forest buffers are used as a Best Management Practice in the Chesapeake Bay watershed. An analysis of the number of riparian forest buffers needed to attain watershed integrity for wildlife habitat and water quality is predicted to be about 30,000 miles.

New Proposed Goals

In 1996, the Executive Committee of the Chesapeake Bay Program adopted the following three goals as part of the Riparian Buffer Panel Report:

- To the extent feasible, assure that all streams and shorelines will be protected by a forested or other riparian buffer.
- Conserve existing forests along all streams and shorelines.
- Increase the use of all riparian buffers and restore riparian forests on 2,010 miles of stream and shoreline in the watershed by 2010, targeting efforts where they will be of greatest value to water quality and living resources.

We recommend that the first two of these goals continue to be used for the Chesapeake Bay Program.

The following new goals are proposed to build upon the 1996 Goals and Policy Recommendations:

1. **Restore New Buffers by 2010**
   Restore XXXX miles of riparian forest buffers along streams and shorelines in the Chesapeake Bay watershed by 2010 (alternatives of 10,000 to 30,000 miles are currently being evaluated).
2. **Maintain Existing Buffers**
   Maintain newly established buffers to assure a well-stocked stand of trees (planted or naturally regenerated) after 3 years
3. **Permanently Protect Newly Established Buffers**
   By 2010, permanently protect twenty-five percent of all riparian forest buffers established since 1997, through conservation easements or other mechanisms.
4. **Integrate Riparian Forest Buffers into Conservation Programs**
   Enhance conservation by incorporating the protection, establishment, or management of riparian forest buffers into state and local conservation easement acquisition, zoning and development requirements, income or property tax credits, and other related programs.
5. **Long term Goal for RFB Conservation**
   Over time, achieve and maintain a minimum of seventy-five percent of the Chesapeake Bay streamside and shoreline miles in riparian forest buffers (approximately 150,000 miles of buffer).

Analysis of a separate goal for buffering functions using trees in urban watersheds is also taking place. Recommendations such as these will be taken to the Executive Council meeting of 2003 for a decision. For more information and to comment on the goals, go to www.chesapeakebay.net/bufferprocess.html.

Urban Stormwater Workgroup

Stream Restoration in Urban Areas
Crediting Jurisdictions for Pollutant Load Reductions Associated with this Best Management Practice

The Chesapeake Bay Program will credit jurisdictions for reducing pollutant loads to the Bay and its tidal rivers, resulting from stream restoration in urban areas (including suburban areas). This document provides guidance to the jurisdictions regarding the stream restoration actions in urban areas that will be credited in the watershed model.

Stream Restoration in Urban Areas

Land cover changes in the contributing watersheds disrupt the existing natural balance between the water flow regime and sediment flux, destabilize stream channels, and increase the loadings of pollutants to downstream areas. The objectives, opportunities, and measures for stream restoration may differ in urban and rural areas. The objectives for stream restoration in urban areas include, but are not limited to, reducing stream channel erosion, promoting physical channel stability, reducing the transport of pollutants downstream, and working towards a stable habitat with a self-sustaining, diverse aquatic community. Stream restoration activities should result in a stable stream channel that experiences no net aggradation or degradation over time.

In addition to these in-stream restoration activities, addressing upland sources of stream impacts (for example, reducing watershed runoff and associated pollutant loads, or encouraging groundwater recharge) is critical to ensuring the success of stream restoration projects in urban areas. Projects should be planned in the context of a comprehensive watershed assessment or inventory, where upland sources of the problem are considered in the project design. Smaller stream restoration projects on isolated stretches of a stream can be counted as long as upland sources of impacts are considered in some way. To ensure the success of a stream restoration project in an urban area, the project must have adequate watershed controls of upstream sources of urban runoff or be designed to accommodate the current and future urban runoff volume and velocity from upstream sources.

Just like with other best management practices in the Chesapeake Bay watershed, it is important to track and monitor the effectiveness of stream restoration projects in urban areas. All projects should either have a monitoring component or regular inspection and maintenance program to ensure ongoing stability of the urban stream.

What Types of Projects are Credited as Stream Restoration in Urban Areas?

Pollutant load reductions associated with stream restoration projects in urban areas can be credited in the Chesapeake Bay Watershed model if they meet the following criteria:

1. Projects must meet multiple objectives of stream restoration in urban areas.
2. Project must be set within the context of a watershed assessment that considers the effect of upland sources to the viability of the stream restoration project.
3. Project must have a monitoring component and/or regular inspections to demonstrate ongoing stability of the urban stream.

The Chesapeake Bay watershed jurisdictions will annually report the number of urban stream miles restored in each Chesapeake Bay Watershed Model county segment to the Chesapeake Bay Program Office.

Pollutant Load Reductions Associated with Stream Restoration in Urban Areas

In addition to localized benefits, stream restoration in urban areas can result in reductions of pollutant loads entering the Bay and its tidal rivers. There is only one known study that quantifies the pollutant load reductions associated with stream restoration in an urban area. Although data are lacking, the Chesapeake Bay Program decided it was important to account for load reductions resulting from stream restoration. The Chesapeake Bay Program will refine these efficiencies as additional data become available. Reductions in pollutant loads entering the Bay and its tidal rivers from stream restoration in urban areas will be calculated based on the following pollutant removal efficiencies (Baltimore County, Maryland, Spring Branch Stream Study, 2002):

- TN = 0.02 lb/linear foot/year
- TP = 0.0035 lb/linear foot/year
- TSS = 2.55 lb/linear foot/year

Living Resources Subcommittee

Summary of Fish Passage as a Component of Stream Corridor Restoration

Background

- In the Chesapeake Bay watershed, there are over 2,500 blockages leaving several hundred miles of habitat inaccessible to resident and migratory fish.
- The Chesapeake Bay Program's goal is to restore and protect sustainable populations of resident and migratory fish in the Chesapeake Bay watershed.

Goal Components

- Fulfillment of the 2003 goal to open 1,357 miles of habitat to resident and migratory fish.
- Setting a new goal to include the following:
  - -No new blockages
  - -Maintenance of existing fish passage structures
  - -Targeting high priority tributaries
  - -Utilization of complementary Best Management Practices (BMP)
  - -Dam removal will be preferred over fishway construction
  - -Monitoring for fish in newly opened areas
  - - Stocking programs
- Analysis of conflicting and supporting policies.

New Goal Options

(to include goal components listed above)

1) During 2004-2013, Chesapeake Bay jurisdictions will complete 75 fish passage and dam removal projects which will open over 1,300 miles of tributary habitat to migratory and resident fishes.

2) During 2005-2014, Chesapeake Bay jurisdictions will complete 100 fish passage and dam removal projects to open tributary habitat to migratory and resident fishes.

3) *******During 2005-2014, Chesapeake Bay jurisdictions will complete 100 fish passage and dam removal projects of which no less then 50 will be fully integrated within locally supported watershed management plans, which will open 500 miles of tributary habitat to resident and migratory fishes.*

*****Option recommended by the Living Resources Subcommittee.

Integration into Comprehensive Stream Corridor Restoration Goals

- Chesapeake Bay Program initiatives to set Fish Passage and Riparian Buffer goals are opportunities to integrate a number of elements of stream corridor restoration.

Living Resources Subcommittee

INTEGRATING ELEMENTS OF STREAM CORRIDOR RESTORATION
5/7/03

Opportunity: In pursuing a number of CBP commitments related to restoration and protection of habitats for sustainable fisheries, CBP partners have an opportunity to maximize environmental benefits by combining efforts on a variety of otherwise independent initiatives.

Elements of Stream Corridor Restoration:

- Restoring and Maintaining Passage for Migratory and Resident Fish
- Stream Bank Stabilization
- Riparian Forest Buffer Restoration and Protection
- Wetland Protection and Restoration
- Urban Stormwater Management
- Establishing and Enforcing Total Maximum Daily Loads
- Watershed Management

Why Integrate?

- Achieve synergistic effects of fish habitat restoration and protection
- Maximize environmental benefits from investments
- Enhance fundraising appeal of project proposals (e.g., for grants)
- Provide for communication of a comprehensive vision of restored stream corridors (avoid disjunct and confusing initiatives)
- Widen basis for community engagement

Linkage to Fish Passage Goal

- Targeting - e.g., restore and protect buffers where fish have access; and remove blockages to provide fish access to areas where buffers support good habitats
- Goals for fish passage, buffers, and other stream corridor related initiatives could be combined into one CBP stream corridor goals document for Executive Council adoption.

Suggested Implications for Stream Corridor Restoration Goals

- States should commit to incorporate multiple elements listed above, and especially fish passage and riparian forest buffer goals, into jurisdiction-specific stream corridor goals.

Jurisdictional Breakout Session

The following points summarize the scope of discussion among jurisdictional stakeholders addressing the development of C2K 2004 Stream Corridor Restoration Goals. The STAC Steering Committee developed a series of questions for each jurisdiction to address that were considered important topic areas relevant to setting stream corridor restoration goals. Attendee comments related to the core questions are presented by jurisdiction. In addition, recommendations for next steps and identification of other issue areas follow the question discussion.

The five (5) core discussion questions addressed by each jurisdiction are:

1. Definition for stream corridor?
2. What is stream corridor restoration?
3. What are the minimum criteria for stream corridor restoration that will meet C2K goals?
4. How will stream corridor restoration be measured and should/can state-wide numeric goals be set?
   a. Quantitative vs. qualitative goals
   b. Focus on stream miles or individual parts (quality, quantity, in-stream, riparian zone) or whatever fits best for the groups developing goals.
5. Tracking- what are we capable of reporting on and how do we do it?
   a. Issues of double-counting to address
   b. Some projects can be tracked by permit; other approaches may have to be tracked in a different manner.

General Comments:

District of Columbia

Many of the participants noted the unique situation of urban areas like DC in addressing C2K goals. In particular, the need for creating criteria specific to urban areas and giving credit for management practices that may be outside of the corridor, but have a positive impact, such as addressing storm water runoff was discussed.

Maryland

Core questions and initial comments were circulated to Maryland stakeholders following the workshop. Additional responses to the questions were added to comments generated during the breakout session.

Virginia

Twenty-seven (27) individuals attended the afternoon breakout session. Participants discussed Question 1 (Definition for Stream Corridor). However, time did not allow the four (4) remaining questions to be considered by the attendees during the breakout session. The questions were e-mailed to those in attendance for review and comments. As of July 1, no comments have been received.

Pennsylvania

Pennsylvania did not hold a jurisdictional breakout session on the day of the workshop due to travel constraints, but did submit responses to the core questions following the workshop.

Breakout Questions:

1. Definition for Stream Corridor?

District of Columbia

- Any *open* stream corridor, regardless if it is channelized, naturally meandering, etc., as long as it is not piped.
- Should streams that are partially piped be included in this definition?
- What are the limits of the stream corridor and are other structures considered part of it? In urban areas like DC paved areas, such as streets, parking lots can be found very close to stream edge.

Maryland

- Should address chemical, biological, and/or physical impairments. Success should not consider a single reference standard, such as for most "pristine" systems, but consider conditions of best streams under various land uses, physiographic regions, etc.

Pennsylvania

- In Pennsylvania, the stream corridor is presumed to be the floodway as regulated under our Chapter 105 Rules & Regulation. The floodplain is defined as the lands adjoining a river or stream that have been or may be expected to be inundated by flood waters in a 100-year frequency flood.

Virginia

- A broad definition of stream corridor based on the STAC Steering Committee Meeting Notes was provided to the group. The definition was:

  > "A stream and its adjacent land that has a direct effect on water quality, physical habitat and biological integrity".

- A lively discussion was held on the contents of the definition. General comments from the group about the proposed definition were:
  - Covers the entire watershed. However, direct does not mean entire watershed.
  - Replace adjacent with immediately adjacent
  - Replace adjacent with floodplain to define limits of restoration B active floodplain; 100 year floodplain
  - Replace adjacent with contiguous
  - Replace water quality, physical habitat and biological integrity with ecological integrity
  - Replace adjacent with 100 foot buffer
  - Does stream order change definition?

2. What is Stream Corridor Restoration?

District of Columbia

- A stream would be considered restored when it is a stable system that it is neither aggrading nor degrading.
- Returning a degraded system to a prior time, or into a range of natural variability
- Question of rehabilitation vs. restoration.
  - Issues common to rural areas are not common/shared with urban areas, making distinction between restoration vs. rehabilitation and/or creation difficult (ex. of piped streams)

Maryland

- See responses to question #3: issues discussed simultaneously
- Can be physical, chemical, biological improvements

Pennsylvania

- Stream Corridor Restoration is actually stream restoration and is a regulated activity through a Water Obstruction & Encroachment Permit. The purpose of the permitting is to assure that activities and structures are regulated in order to protect the health, safety, welfare and property of the people and the environment. Restoration can range from bank stabilization, removal of gravel bars to restore hydraulic capacities, dam removal to restore fish passage to channel restoration work to a preexisting condition. The use of the Water Obstruction & Encroachment permit has been expanded for FGM (Fluvial Geomorphology) projects on a watershed basis. As funding becomes available, various segment of work can be completed without going through the permit process for each individual project in the watershed.

Virginia

- Not discussed

3. What are the minimum criteria for stream corridor restoration that will meet C2K goals?

District of Columbia

- Criteria that address structural/functional, biological and chemical aspects. Should include riparian vegetation, water chemistry, wildlife habitat

- Criteria should be established that addresses "human habitat" and the integration of stream into the community and the involvement of the public (volunteer support).
- Sustainability needs to be part of the criteria for restoration and could involve:
  - Ensuring a plan is established that address the need for integration of management of things that affect the stream. (i.e. involving DDPT, WASA, DCPR)
  - The creation of a monitoring plan and post-implementation activities
  - Plans for public outreach/ monitoring of stewardship
- Consider a functional assessment, such as those used in wetland restoration projects. It is area specific and addresses the range of functionality you can expect in urban/ suburban/rural areas and would allow for non-traditional improvements, i.e. parks, infrastructure repair.
- Buffer widths established (believe that current standard is 50 feet on either side).
- Thresholds for these criteria should be established (chemical thresholds, biological index thresholds): Relates to question #4.
- Need to look at watershed influence (such as land use and subsequent runoff) before establishing criteria.
  - DC might need different criteria (and specific measurements) than rural or suburban areas.
  - We need to bring DC's unique circumstances to the attention of the Chesapeake Bay Program.

Maryland

- Lessons learned from the urban storm water group should be recognized. The storm water group could not agree on a single definition. Rather, they developed guidelines for what counts as stream restoration. Is it possible that these guidelines could be broadened to account for stream *corridor* restoration? These guidelines should be distributed for discussion and agreement reached early on in the process of setting stream restoration goals.
- Why are we doing Stream Restoration?
  - Recognize that drivers for restoration projects are typically not living resources related. For example, many restoration projects address infrastructure issues and may not yield the desirable living resource and water quality benefits. It should be recognized, though, that infrastructure driven restoration often results in improved physical stability, reduced erosion and improvements to water quality. This area of concern relates back to the question of "What count as stream restoration?"
- Would a project count if it is not part of a watershed management plan?
  - Entities without resources may not be able to do a watershed management plan and might be excluded from participating in this commitment. This concern highlights the need for assistance in locating resources and partners.
  - Would projects (outside of a watershed management plan) be eligible if there is reason to believe that the project would accomplish its restoration purpose?
- Operationally define what is meant by "based on Watershed Management Plans"
  - Does this require that restoration goals must be defined using existing watershed management plans or can the process of project evaluation and design, if done within a watershed based framework, serve to meet the criteria of the goal setting process? Watershed planning, in concert with project planning, would be particularly amenable to small watershed planning and project implementation. In addition, the statement ("based on") should be interpreted as broadly as possible.
- Protection priorities/areas of sensitivity, in addition to restoration priorities, should also be considered during this process.
- Consider setting assessment goals
- Gaps in critical pieces of information needed (based on integrated data step above) to develop stream goals should be identified and pursued. For example, how many fish passage blockages are there by county?
- A clear understanding of how this goal overlaps with other related C2K goals or State goals would be helpful.

Pennsylvania

- To date no minimum criteria has been established. In order to meet the C2K goal, improvements to habitat and water quality will be addressed when conducting a stream restoration project. Other items that may be considered are the tributary strategies for nutrient reduction and implementation of TMDL's.

Virginia

- Not discussed

4. How will stream corridor restoration be measured and should/can state-wide numeric goals be set?

District of Columbia

- Measure not only inputs (what you're doing) but also outputs (effects). Example: D.O., inverts, etc.
- Need tangible results for the money spent, such as:
  - Amount of erosion reduced
  - # of acres of habitat created
- Thresholds (as mentioned above). However, these would be different for urban stream vs. rural/suburban
- Quantitatively, stream corridor restoration in urban areas may have less impact; it costs more, but it's where most people live and therefore could have a greater impact on quality of life.
- Some difficulty in what to include/not to include in goals: i.e.--trash- social issue vs. environmental issue? Goes back to management needs and responsibility questions. Also, what about tracking outreach and educational aspects of stream corridor restoration projects?
- Are there other ways to get credit for restoration beyond just stream corridor, don't just look at stream, but the watershed action plan for the area.
- Maybe need two goals -- an in-stream goal and a water management.
  - Can you do stream restoration w/o effectively dealing with the storm water issues?
  - Streams can be designed to handle larger flows, however, the ideal scenario would be to deal with the storm water first.
- Storm water management should be done concurrently with in-stream management and should be part of the restoration goals.
  - Perhaps we could focus on this more in urban areas, because they have the potential to achieve more in this area and it is another unique issue for urban areas.
  - Are there LID techniques that will give us credit in terms of the C2K agreement?

Maryland

- If goals are to be quantitative, they can be enumerated in a variety of ways. One suggestion to address this follows:
  - Express as Number of *Projects* vs. Number of *Miles*
    - "*Miles"* based goal derived from a Watershed Management Plan requires high degree of fine scale analysis.
    - "*Projects"* more easily quantified and are inclusive of efforts related to corridors that don=t conform to the strict linear dimensions of streams.
    - A *Combination* approach could also be considered
- Develop appropriate goals for functional status of streams. Example: Using IBI=s as a functional metric, intersect Land Use/Impervious Cover maps with streams rated as Agood@. Set goals accordingly using the Center for Watershed Protection=s Impervious Cover Model (ICM).
- Use ICM thresholds to develop goals
  IC < 10 %: Protect sensitive streams and watershed
  IC = 10-25%: Improve the biological and landscape functions of the impacted watershed
  IC = 25-40%: Restore the structure of non-supporting streams (ie. Address concrete trapezoids)
  IC > 60%: Manage downstream impacts
  Using ICM provides guidance within the context of a Watershed Management Plan
- However, ICM should not be the only sort of guidance. Other factors, such as 305(b), 303(d), report results, and assessments from local governments for NPDES watershed plans, should also be considered.
- Overall watershed restoration goals should be developed by stakeholder consensus. Community buy-in upfront is essential. Following goal development, subwatershed prioritization should occur, followed by field assessment and validation at the subwatershed and reach scale. This should be the basis of project identification, if the projects are deemed to be consistent with overall watershed restoration goals.
- Consider (in response to point above) that restoration goals and projects may be set with less information than in a full scale watershed plan, depending on type of restoration. In many instances, watershed planning may not be completed for years yet.

Pennsylvania

- Although no goals have been yet established, it will probably include both quantitative and qualitative goals based on improving water quality. Numeric goals can be established based on miles of impaired steams and the designated impairment.
- Focus on stream miles or individual parts (quality, quantity, in-stream, riparian zone) or whatever fits best for the groups developing goals.

Virginia
- Not discussed

5. Tracking: What are we capable of reporting on and how do we do it?

District of Columbia
- Tracking in an urban setting is a research priority. Need to identify other research deficits to determine gaps in monitoring/tracking.
- Should we tie TMDLs to restoration? We have to be able to prove this and need definitions for urban areas.

Maryland
- Depending on how goals are defined and tracked may result in more narrow quantification of goals. For example, tracking restoration success as measures for nutrient and sediment reduction may result in "missing" or not counting other restoration efforts that benefit stream biota.
- State permit database and required project monitoring reports should be used to evaluate and track restoration. As mentioned above, tracking solely on "permitted" projects may result in some restoration efforts being missed/not counted.

Pennsylvania
- In order to avoid double-counting, it would be best to keep separate goals as a part of the stream corridor restoration goal. Wetland impacts are tracked through the permitting process and have a separate goal. Riparian forest buffers are also another goal, both of which are part of stream corridor restoration.
- Other approaches exist for tracking, beyond permits, that are non-regulatory. These approaches, such as BMP's, should be addressed through the watershed management planning process.

Virginia
- Not discussed

Other Issues:

Beyond the questions to be answered, jurisdictions also offered other concerns and necessary next steps to be completed towards developing a framework and collecting fundamental information in order to set stream corridor restoration goals.

District of Columbia
- Political boundaries are not equal to watershed boundaries: This is definitely a DC problem.
    - The importance of non-profits in dealing with intra-jurisdictional issues; they can be essential in building community interest in stream restoration/LID, etc.
    - Opportunities for statesmanship. Mayor talking to PG County representative. Building upper level partnerships/agreements.
    - Can Watts Branch be used as a template for this intra-jurisdictional cooperation?

Maryland
- Where are we and where do we want to be?
  In order to set goals, some idea of current status of stream health, status of watershed management planning and desired final condition/outcomes need to be envisioned. This suggests both adequate monitoring of the current status of streams in addition to the expected outcomes of stream corridor restoration. The points below provide more detail on these points.
- Report on status of Watershed Management Planning in the Maryland
  Review responses to the Watershed Management Planning survey conducted in summer 2002 by the Maryland Department of Natural Resources, in coordination with other State agencies. Planning efforts and information at the local level can be used to assist in goal development. Need to first determine what "counts" as a watershed management plan.
- What do we know about our streams?
  Gather and integrating all local and state stream related assessments. This would include the state level Maryland Biological Stream Survey data and indicators/data developed for the Maryland's Unified Watershed

Assessment. Other sources of local and state level information should be identified, such as 305(b), 303(d), NPDES plan results and flood studies.

- Monitoring

  The Maryland workgroup discussions emphasized the need to develop a comprehensive stream restoration monitoring process immediately. Restoration projects should be monitored both before and after the restoration event to evaluate water quality, physical stability and habitat benefits. Monitoring will assist in identifying what aspects of stream restoration are important and if restoration is successful in meeting performance objectives. A point highlighted is the need to recognize that stream restoration is done for multiple reasons and may address functions that could be at cross purposes to other functions. For example, restoration to improve stability may not, in itself, improve habitat (which may or may not matter depending on restoration goal). Specific point that arose during this discussion is presented below:

  - Adequate pre- and post-restoration project monitoring should be conducted
  - Specifically identify the structural and functional attributes which should be monitored
  - Identify standard protocols
  - Prioritize the desirable functions
  - Need to monitor in order to justify what we are doing
  - Should evaluate monitoring data required through permits as part of this assessment
  - A possible venue to develop and coordinate a standardized statewide monitoring protocol was suggested through a partnership between the Maryland Water Monitoring Council and the Stream Restoration Professionals Association. The Maryland Water Monitoring Council has been working on this issue over the past year.

Recommendations

The following points summarize key recommendations developed by the jurisdictional break out sessions that should be considered during the next phase of work to develop stream corridor restoration goals by 2004.

- Criteria, goals, objectives, and performance metrics should reflect unique circumstances of watershed land use influences (urban, rural, suburban, % impervious cover)

- Continue discussion on definitions and criteria for stream corridor and stream corridor restoration
  - Incorporate criteria of local and state programs (NPDES, 303(d) list, etc.)
  - Evaluate applicability of Urban Stormwater Workgroup guidelines for stream restoration
  - Address biological, physical, water quality and water quantity components of stream health – either in whole, or in part

- Consider how to address management practices that occur outside of the stream corridor but impact stream condition (i.e., stormwater management, wetland restoration, agricultural best management practices, land use planning, conservation, etc.)

- Goal Development
  - Integrate with other ongoing programs and regulations at Bay, state and local levels – C2K goals, Tributary Strategies, 303(d) list, NPDES, Agricultural BMPs, and other drivers for stream restoration.
  - Provide guidance to local entities regarding how to integrate stream corridor restoration goals with other programs (see above).
  - Eliminate duplicity and ensure higher-scale efforts don't supercede efforts at smaller-scales.
  - Allow flexibility in terms of qualitative vs quantitive goals, units (miles, projects), components (entire corridor and stream or individual parts).

- Define relationship to Watershed Management Planning
  - Consider scale, existing plans, plans in development, non-existent plans, political boundaries, progress updates, degree of stakeholder involvement.

- Assessment, Monitoring and Tracking
  - Standard performance measures of restoration projects in relation to expected outcomes
  - Integrate all existing state and local assessment and monitoring efforts
  - Utilize existing tracking systems (permits, buffers, watershed management planning, etc), but be aware of double-counting and restoration activities that may be missed

- Protection of high quality stream resources

- Social issues – education, outreach, aesthetics, political leadership

- Define strategies to improve and sustain key roles that locals must play in proactive stream restoration and in receiving targeted funding for these projects that recognize and are tied to local watershed management planning and priority setting efforts.

Steering Committee Members

Christine Conn, Chair
Power Plant Research Program, Maryland Department of Natural Resources
Jen Kozlowski
Chesapeake Research Consortium
US EPA Chesapeake Bay Program
Melissa Bugg
Chesapeake Research Consortium
US EPA Chesapeake Bay Program Scientific and Technical Advisory Committee
Lee Hill
Virginia Department of Conservation and Recreation
Laura Dunleavy
District of Columbia Department of Health
Sid Freyermuth
Pennsylvania Department of Environmental Protection
Sean McKewen
Maryland Department of the Environment
Ted Graham
Metropolitan Washington Council of Governments
US EPA Chesapeake Bay Program Scientific and Technical Advisory Committee
Sally Claggett
US EPA Chesapeake Bay Program
Mary Beth Adams
US Forest Service
Jim Graycie
Brightwater Consulting, Inc.

Agenda

Chesapeake 2000 Stream Corridor Restoration Goals Workshop
Wednesday May 7, 2003
8:30am-4:30pm
Ramada Inn BWI, Hanover, Maryland

8:30-9:30 Registration and Exhibits
Participants can enjoy a continental breakfast and tour exhibition hall.

9:30-9:45 Introduction
Christine Conn, Maryland Dept. of Natural Resources

9:45-10:15 Stream Corridor Restoration – What Does it Mean?
Margaret Palmer, University of Maryland

10:15-10:45 Watershed Management Plans – A Context for Setting Goals
Tom Schueler, Center for Watershed Protection

10:45-11:15 Break/Exhibits

11:15-12:00 Diversity of Issues Baywide
Experts from Pennsylvania, Maryland, Virginia and the District of Columbia will present stream corridor restoration issues relevant to each specific jurisdiction.

12:00-1:00 Lunch and Touring Exhibits

1:00-2:20 Case Studies
Four case studies for innovative or traditional approaches towards setting goals within a watershed management planning framework will be presented.

2:20-2:50 Chesapeake Bay Program / _Chesapeake 2000_ Commitments Overview
-_Chesapeake 2000_ Watershed Commitments Task Force
-Forestry Workgroup
-Urban Stormwater Workgroup
-Fish Passage Workgroup

3:00-4:00 Breakouts by Jurisdiction
Moderated discussions on how to begin or continue developing stream corridor restoration goals in each jurisdiction that integrate existing programs and planning efforts.

4:10-4:25 Closing Remarks / Next Steps
Lee Hill, Virginia Dept of Conservation and Recreation

4:30 Workshop Adjourns
Refreshments and last chance to visit exhibits.

List of Participants

Mary Beth	Adams	U.S. Forest Service
Ava	Anders	MD Department of Natural Resources
Shelia	Besse	D.C. Department of Health
Wade	Biddix	Natural Resources Conservation Service
Alexi	Boado	D.C. Department of Health
Keith	Bowers	Biohabitats
Madeline	Broadstone	Chesapeake Research Consortium
Ken	Brown	Center for Watershed Protection
Melissa	Bugg	Chesapeake Research Consortium
Ken	Burkett	Biohabitats
Deborah	Cappuccitti	MD Department of the Environment
Mow-Soung	Cheng	PG County Dept. of Environmental Resources
Sally	Claggett	U.S. Forest Service
Denise	Clearwater	MD Department of the Environment
Steve	Coleman	Washington Parks and People
Christine	Conn	MD Department of Natural Resources
Michael	Conway	PA Department of Environmental Protection
Martha	Corrozi	Chesapeake Research Consortium
Christel	Cothran	Jones Falls Watershed Association
Darin	Crew	Herring Run Watershed Association
Meo	Curtis	Mont. County Dept. of Environmental Protection
Kehinde	Dawodu	D.C. Department of Health
Frank	Dawson	MD Department of Natural Resources
Clarence	Dickens	D.C. Department of Health
Patty	Dietz	Prince William County
Tom	Devilbiss	Carroll County Soil Conservation District
Laura	Dunleavy	D.C. Department of Health
Charles	Edwards	D.C. Department of Health
Stephanie	Flack	The Nature Conservancy
Julia	Flanagan	Prince William County
Sidney	Freyermuth	PA Department of Environmental Protection
Mike	Fritz	U.S. Environmental Protection Agency
Laura	Goldblatt	Chesapeake Research Consortium
Norm	Goulet	Northern Virginia Planning District Commission
Jim	Gracie	Brightwater Consulting
Ted	Graham	Met. Washington Council of Governments
Frank	Graziano	Wetland Studies and Solutions, Inc.
Al	Gregg	VA Dept. of Conservation and Recreation
Mark	Gutshall	Landstudies
Oscar	Guzman	Prince William County

Carrie	Hagin	James River Association
Craig	Hartsock	Allegany County Soil Conservation District
Brooke	Hassett	University of Maryland
Chuck	Hegberg	KCI Technologies
Rich	Hersey	Herring Run Watershed Association
Lee	Hill	VA Department of Conservation and Recreation
Pete	Hill	D.C. Department of Health
David	Honick	Worcester Cnty. Dept. of Comp. Planning
Porter	Ingrum	MD National Cap. Park & Planning Comm.
Julie	Jenkins	VA Dept. of Conservation and Recreation
Jim	Kahl	MD Department of Natural Resources
Paul	Kahl	Allegeny County Department of Public Works
Hamid	Karimi	D.C. Department of Health
Paul	Kazyak	MD Department of Natural Resources
Tamara	Keeler	VA Dept. of Conservation and Recreation
Alicia	Ketchem	Natural Resources Conservation Service
Nick	Konchuba	U.S. Army Corps of Engineers
Jen	Kozlowski	Chesapeake Research Consortium
Matt	Kropp	Harford County Planning and Zoning
Jack	Leighty	Patuxent River Commission
Larry	Lubbers	MD Department of Natural Resources
Danielle	Lucid	MD Department of Natural Resources
Anne	Lynn	Natural Resource Conservation Service
Janis	Markusic	AA County Office of Planning and Zoning
Tony	Marquez	Prince William County
Stephanie	Martin	Virginia Association of SWCDs
Tamara	McCandless	U.S. Fish and Wildlife Service
Steve	McKinley-Ward	Anacostia Watershed Society
Jeremy	Mondock	MD State Highway Administration
Shannon	Moore	Frederick County Division of Public Works
Rob	Northrop	MD Department of Natural Resources
Libby	Norris	Chesapeake Bay Foundation
Tee	O'Connor	Nanticoke Watershed Alliance
John	Odenkirk	VA Dept. of Game and Inland Fisheries
Judy	Okay	VA Department of Forestry
Abiodun	Oladokun	D.C. Department of Health
Don	Outen	Balt. County Env. Protection & Resource Mgnt.
Janice	Outen	MD Department of the Environment
Margaret	Palmer	University of Maryland
Quirico	Perando	Prince William County
Mary	Pittek	U.S. Army Corps of Engineers
Catherine	Rappe	MD Department of Natural Resources

Joe	Rieger	Elizabeth River Project
Asad	Rouhi	Northern Virginia SWCD
Brian	Rustia	Met. Washington Council of Governments
Tom	Scheuler	Center for Watershed Protection
Bryan	Sepp	The Potomac Conservancy
Randy	Sewell	Vanasse Hangen Brustlin, Inc.
Steve	Sharar	Howard County Department of Public Works
Robert	Shreeve	MD State Highway Administration
Stacey	Sloan-Blersch	U.S. Army Corps of Engineers
Greg	Socha	Western PA Conservancy
Bill	Stack	Baltimore City Public Works
Rich	Starr	U.S. Fish and Wildlife Service
Dan	Sweet	KCI Technologies
Roger	Thomas	Natural Resource Conservation Service
John	Trypus	D.C. Water and Sewer Authority
Mike	Vanlandingham	VA Dept. of Conservation and Recreation
Sue	Veith	St. Mary's County Planning and Zoning
Cathy	Viverette	Virginia Commonwealth University
Eric	Walberg	Hampton Roads Planning District Commission
Beth	Walls	Virginia Commonwealth University
Chuck	Weinkam	Coastal Resources, Inc.
Hoyt	Wheeland	VA Dept. of Conservation and Recreation
Cameron	Wiegand	Montgomery County
Karen	Wiggen	Charles County Planning Division
Willie	Woode	Northern Virginia SWCD
Jim	Woodworth	Natural Resources Defense Council
Michael	Woolson	James City County
Ken	Yetman	MD Department of Natural Resources

List of Exhibitors

Maryland

Maryland Biological Stream Survey, DNR
Watershed Management and Analysis Division, DNR
Watershed Restoration Division, DNR
Center For Watershed Protection
Chesapeake Bay Program

Virginia

Elizabeth River Project
NRCS
KCI Technologies
Vanasse Hangen Brustlin, Inc.
Virginia Department of Forestry (stream restoration)
Virginia Department of Forestry (riparian buffers)
Northern Virginia Soil and Water Conservation District

District of Columbia

DC Watershed Protection Division / NRCS
USACE
Anacostia Watershed Society
NRDC
USFWS