



FACT SHEET

Riparian Forest Buffers in the Chesapeake Bay Watershed



Background

When colonists first arrived on the shores of the Chesapeake Bay, over 95% of the landscape was forested. Captain John Smith wrote in 1608, "the country is overgrown with trees...and affords little grass but that which grows in the marshes". This vast forest was an important regulator of the Bay's environment - a "living filter" which protected the land, filtered pollutants and sediment from rainfall, regulated stream and air temperatures, controlled runoff and provided wildlife habitat.

The last 300 years have brought dramatic changes to the Bay's forests. By the mid-1800's, agricultural clearing, deforestation and the growth of cities resulted in the removal of more than 50% of the watershed's forests. These changes in land use resulted in a fragmented forest landscape that

impacted the Bay, its streams and rivers, as well as its wildlife and fish. While many forests have returned or have been replanted, less than 60% of our original forested areas remain. With 14 million people living in the Bay's watershed, urban growth now results in the permanent loss of almost 100 acres of forests every day.

Linking the landscape to the Bay, close to 100,000 miles of interconnected streams, rivers, wetlands and their riparian areas serve as a "circulatory system" for the Chesapeake Bay. In the Bay region, forests are the natural riparian vegetation. Although comprising only 5-10% of the land in the watershed, riparian areas have an

What is a riparian area?

Riparian refers to the area of land adjacent to a body of water, stream, river, marsh or shoreline. Riparian areas form the transition between the aquatic and the terrestrial environment.

extremely important role in maintaining the health of the Bay. But today, 50% or more of these streamside and shoreline forests are disturbed or degraded and more continue to be lost. Protecting and replanting riparian forests is one of

the goals of the Bay restoration effort.

Functions and Values

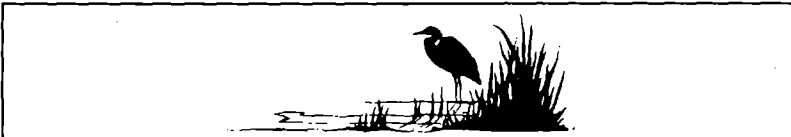
Riparian forests are integral to the health of the Bay and its rivers for many

reasons. Their position in the landscape makes them excellent buffers between upland areas and waters that eventually enter the Bay. Studies have shown dramatic reductions of 30% to 98% in nutrients (nitrogen and phosphorous), sediment, pesticides and other pollutants in surface and ground water after passing through a riparian forest. In addition, trees provide deep root systems which hold soil in place, thereby stabilizing streambanks and reducing erosion.

Cool stream temperatures maintained by riparian vegetation are essential to the health of aquatic species. Shading moderates water temperatures and protects against rapid fluctuations that can harm stream health and reduce fish spawning and survival. Elevated water temperatures also accelerate algae growth and reduce dissolved oxygen, further degrading water quality. In a small stream, temperatures may rise 1.5 degrees in just 100 feet of exposure without trees.

Riparian forests offer a tremendous diversity of habitat. Layers of habitat provided by trees, shrubs, grasses and the transition of habitats from aquatic to upland makes these areas critical in the life stages of over one-half of all native Bay species. Forest corridors provide crucial migratory habitat for neotropical songbirds, some of which are threatened due to loss of habitat. Also, many ecologically important species such as herons, wood ducks, black ducks, as well as amphibians, turtles, foxes and eagles utilize the riparian forest.

Riparian forests also offer many benefits to migratory fish. Forested streams and rivers provide suitable spawning habitat for shad, herring, alewife, perch and striped bass. The decline of these species is partly due to destruction of habitat, which for some, like shad and herring, extends well into small streams. Trees and woody debris provide valuable cover for crabs, small fish and other aquatic organisms along the Bay's shoreline, as well. Degradation of any portion of a stream can have profound effects on living resources downstream. While the overall impact of these riparian forest corridors may be greatest in headwater streams, there is a clear linkage all the way to the Bay.



The Benefits of Riparian Forests

1. Filtering Runoff

Rain that runs off the land can be slowed and filtered in the forest - settling out sediment, nutrients and pesticides before they reach streams. Infiltration rates 10-15 times higher than grass turf and 40 times higher than a plowed field are common.

2. Nutrient Uptake

Fertilizers and other pollutants that originate on the land are taken up by tree roots. Nutrients are stored in leaves, limbs and roots instead of reaching the stream. Through a process called "denitrification", bacteria in the forest floor convert harmful nitrate to nitrogen gas, which is released into the air.

3. Canopy and Shade

The leaf canopy provides shade that keeps the water cool, retains more dissolved oxygen and encourages the growth of diatoms, nutritious algae and aquatic insects. The canopy improves air quality by filtering dust from wind erosion, construction or farm machinery.

4. Leaf Food

Leaves fall into a stream and are trapped on woody debris (fallen trees and limbs) and rocks where they provide food and habitat for small bottom dwelling creatures (such as, insects, amphibians, crustaceans and small fish) which are critical to the aquatic food chain.

5. Stream and Habitat

Streams that travel through woodlands provide more habitat for fish and wildlife. Woody debris serves as cover for fish while stabilizing stream bottoms thereby preserving habitat over time.

The Forest 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 the range of benefits and potential effectiveness, forests are the most effective type of riparian buffer available. These linear strips of forest can 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 buffers accomplish habitat benefits at the same time they improve water quality.

A three-zone buffer concept is proposed to assist technical professionals and landowners with planning and design of riparian forest buffers. It provides a framework in which water quality, habitat, and landowner objectives can all be accomplished.

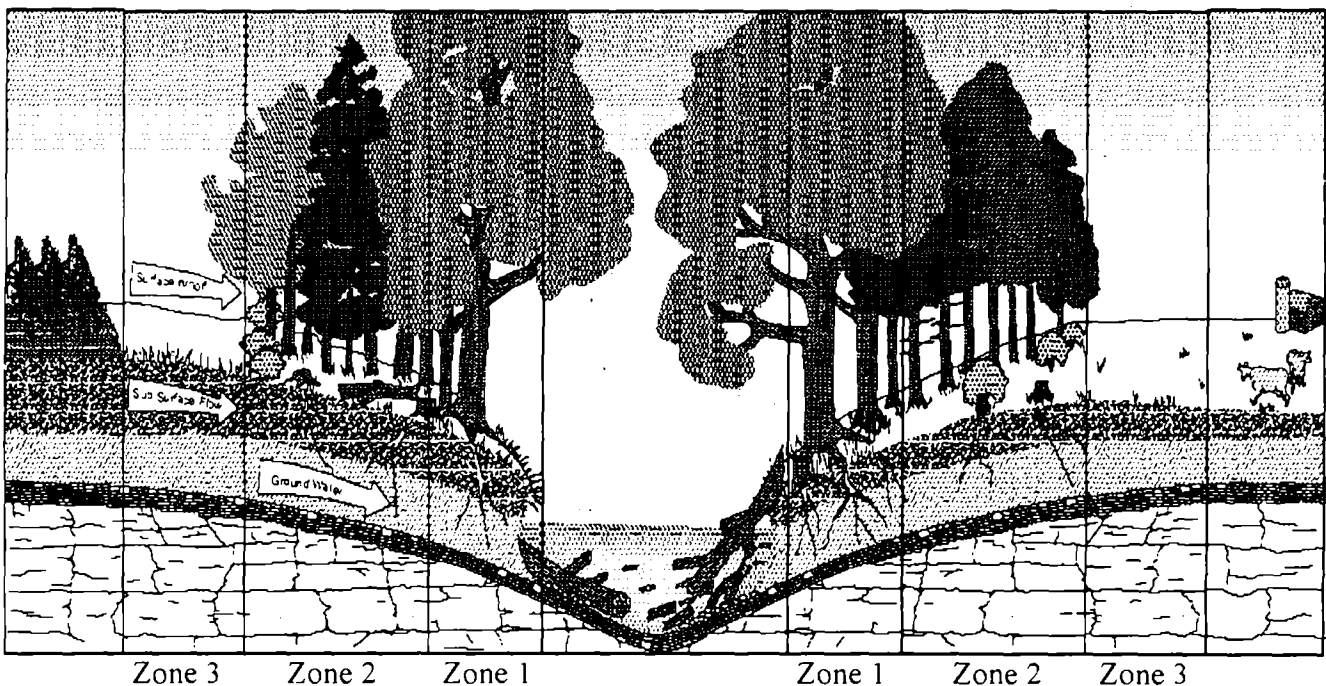
ZONE 1 - A mature forest along the water's edge maintains habitat, food, water temperature and helps stabilize stream banks and remove nutrients.

Definition of a Riparian Forest Buffer:

According to the U.S. Forest Service, a riparian forest buffer is an area of trees and other vegetation which can intercept surface runoff, subsurface flow and deeper ground water flows for the purpose of removing or buffering the effects of nutrients, pesticides or other chemicals from upland land use, which could otherwise enter bodies of water.

ZONE 2 - This zone contains a managed forest. The primary function of Zone 2 is to remove sediment, nutrients and other pollutants from surface and ground water. It also provides habitat and allows for economic benefits to the landowner from the forest resource.

ZONE 3 - Zone 3 contains grass filter strips, level spreaders or other features which can slow runoff, infiltrate water and help filter sediment and its associated chemicals.



Programs Which Can Help

Many state and federal agencies have initiated programs to help protect and restore riparian forest buffers. USDA Programs such as the Conservation Reserve Program, Wetland Reserve Program, Forest Stewardship Program, as well as numerous agricultural conservation practices are designed to provide technical and financial assistance to landowners who want to protect or restore this resource. In developed areas, zoning, land use and stormwater provisions may provide opportunities for greater use of riparian forest buffers. Volunteer assistance with design and planting can be obtained. In some states, easements and tax incentives may be used to protect and restore buffers on private land. A Buffer Incentive Program in Maryland makes a per acre payment to landowners. Call your local forestry, soil conservation, farm service or local planning office for more information about programs that are available in your area.

Chesapeake Bay Program Riparian Buffer Initiatives

The Chesapeake Bay Program has initiated a number of actions to promote better understanding and appreciation for the value of riparian forests and to encourage their protection and restoration. Building a scientific foundation, the Bay Program published a scientific synthesis which defines the water quality function of buffers in the watershed. The Nutrient Subcommittee and its Forestry Work Group have also initiated research and established demonstration projects. In addition, an inventory of the status and condition of riparian buffers throughout the six state watershed is underway. In partnership with each of the states, the Bay Program is developing a handbook for the design and establishment and the initiation of training programs for technical specialists, landowners and managers and local governments. Protecting buffers and stream corridors where they exist and planting in disturbed riparian areas are significant elements of a Baywide strategy to reduce nutrients - the Tributary Strategies.

In October 1994, the Executive Council of the Chesapeake Bay Program signed a Riparian Forest Buffer Directive, which recognized the need for greater riparian forest buffer protection and restoration. With the help of citizens, landowners and other stakeholders, an expert panel of scientists and managers will set future goals and develop a basinwide policy to enhance existing programs which protect, maintain and restore riparian forest buffers. Combined with habitat restoration strategies, this multi-faceted program will help improve riparian management and the health of our streams and rivers and the Chesapeake Bay itself.

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