

RIPARIAN BUFFER MANAGEMENT

AN INTRODUCTION TO THE RIPARIAN FOREST BUFFER

The word *riparian* refers to anything connected with or immediately adjacent to the banks of a stream or other body of water. Streamside forests are riparian forests. Riparian areas, which encompass the floodplain and a portion of the adjacent upslope area, are complex ecosystems, connecting a stream system and a people-based system such as agriculture, housing, or industry. The ability of these areas to function naturally is crucial to the protection of the water resources of the United States.

A *buffer* is an area managed to reduce the impact of adjacent land use. A *riparian forest buffer*, therefore, encompasses the area from the streambank in the floodplain to, and including, an area of trees, shrubs, and herbaceous vegetation located upslope from the body of water.

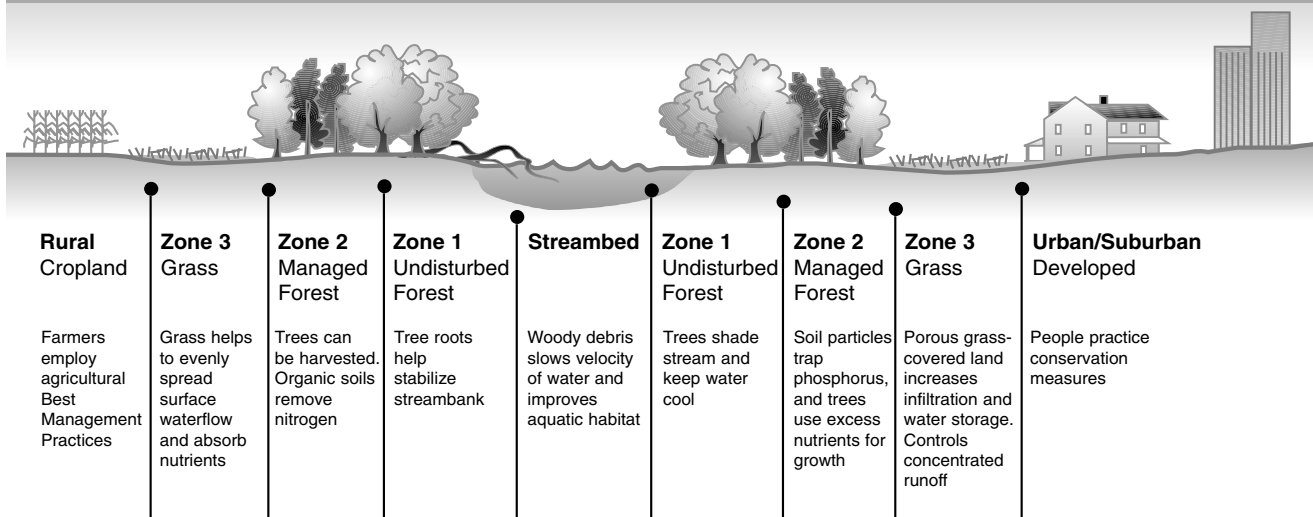
Buffers are established and managed to reduce the impact of adjacent land use. The design of a buffer serves several important functions: it preserves the stream's natural characteristics, protects water quality, and improves habitat for plants and animals on land and in the water.

The riparian buffer traps and filters sediments, nutrients, and chemicals from surface runoff and shallow groundwater. A framework of tree roots stabilizes the streambank. Microbes in organic forest soils convert nitrate into nitrogen gas through *denitrification*.

Shade keeps the water cooler and moderates temperature fluctuation, increasing the water's ability to hold oxygen and support life. The stream flow slows around fallen trees and branches in the stream or riverbed, creating favorable areas for fish. Plant stems

The width of a riparian forest buffer is site specific and dependent on the landowner's objectives.

The three-zone buffer concept provides a framework for the establishment and maintenance of a long-term riparian buffer.



slow water velocity and root systems keep the soil porous, so excess water is absorbed into the ground and flooding potential is reduced. The buffer's capacity to hold large amounts of water allows percolation to deeper water aquifers, replenishing groundwater supplies.

A riparian forest buffer improves the biological diversity of surrounding areas. Birds, mammals, and other animals find the food, cover, water, and nesting sites they need as well as corridors and pathways for movement between areas.

Beginning at water's edge and moving away or upslope, the riparian area can be pictured in segments or zones (see Figure 1). This "**Three-zone Buffer Concept**" provides a framework for thinking about the establishment and maintenance of a long-term riparian forest buffer. The width of the buffer depends on the landowner's objectives, specific site conditions, and the condition of the waterway.

The important structural component in Zone 1 (next to the water's edge) is a mixture of fast- and slow-growing native trees. If the

stream is narrow, at maturity the tree canopy from both sides of the stream will meet or nearly meet.

Zone 2 is designed for uses such as timber harvest (pulpwood or sawtimber), outdoor recreation, wildlife habitat, or alternative forestry products (ginseng, mushrooms, nuts, etc.). Livestock should be excluded from this zone.

Dense grasses and/or *forbs* (broad-leaved herbaceous plants and wildflowers) compose Zone 3. The vegetation must be managed to promote nutrient uptake and sediment filtering.

Used along with other conservation or best management practices, a riparian forest buffer offers a range of environmental benefits to everyone living in the Chesapeake Bay watershed.

REFERENCES

- U.S. Dept. of Agriculture Forest Service. 1996. "Riparian Forest Buffers."
Alliance for the Chesapeake Bay. "Alliance for the Chesapeake Bay White Paper: Riparian Forest Buffers," Jan. 1996.

Other Fact Sheets in the Riparian Buffer Series:

FS 725	Buffer Design, Establishment, and Maintenance
FS 726	Trees for Riparian Forest Buffers
FS 727	Understory Plants for Riparian Forest Buffers
FS 728	Grasses for Riparian Buffers and Wildlife Habitat Improvement
FS 729	Soil Bioengineering or Streambank Restoration for Riparian Forest Buffers
FS 733	Riparian Buffer Systems

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