

The success of riparian forest buffers is dependent on landowners taking time to learn how to care for them.

The Western Pennsylvania Conservancy, Alcoa Foundation and American Forests Global ReLeaf thank you for taking steps to protect and restore our environment.



Improving Water Quality through Riparian Buffer Restoration

Tips for helping stream bank plantings succeed



Western Pennsylvania Conservancy



Western Pennsylvania Conservancy
Watershed Conservation Program
1067 Philadelphia Street, Suite 101
Indiana, PA 15701
Phone: 724.471.7202
WaterLandLife.org

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Key Seasonal Tasks for Riparian Buffer Success

Winter: After frost heaving has ended, check tree shelters and fix fallen or broken shelters, re-install or replace loose or damaged stakes, remove nets from the shelters of trees that will surpass nets this season and eliminate wasp nests.



Spring: Mats will protect trees from competing vegetation that uses the trees' water, nutrients, and light. Optionally, apply herbicide to actively eliminate competing plants in six-foot strips or six-foot diameter circles around tree shelters.

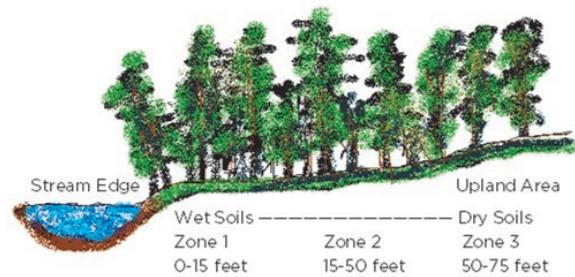


Fall: Repair any damage to tree shelters resulting from flooding, and if needed, replant trees after determining the cause of tree death. Mowing or herbicide application may be considered to protect trees from voles during the winter months; however, these steps will slow natural tree regeneration and are not necessary if voles are not a problem.



Summer: Mats will continue to protect trees from competing vegetation. It is acceptable, but not necessary, to remove additional vegetation by mowing within the buffer during the first few years. Noxious and invasive plants may also be targeted using an effective removal method based on the problem species, such as herbicide application or hand pulling.

Common Forested Riparian Buffer Trees & Shrubs



A variety of trees and shrubs create successful riparian buffers. The ability of each species to thrive is dependent on their moisture requirements and tolerances. Species planted closest to the stream (Zone 1) are able to tolerate very wet soils, while others prefer drier soils and are planted farthest from the stream (Zone 3). Plants tolerant of both conditions are planted between the two extremes (Zone 2).

Trees

- Silver Maple (1)
- Swamp White Oak (1)
- Sycamore (1)
- Black Willow (1)
- Red Maple (2)
- Pin Oak (2)
- Red Bud (2)
- Black Gum (2)
- Shagbark Hickory (2)
- White Pine (3)
- Sassafras (3)



Shrubs

- Red Chokeberry (1)
- Winterberry Holly (1)
- Northern Arrowwood Viburnum (1)
- Elderberry (1)
- Silky Dogwood (1)
- Shadblow Serviceberry (2)
- Maple-leaved Viburnum (2)
- Nannyberry Viburnum (3)

Weeds such as Canada thistle, multiflora rose and Johnson Grass can be noxious and invasive. These plants compete with growing trees for light, nutrients and water. The best way to control weeds depends by species, but the most common methods are mowing or herbicide application.



Deer damage trees by both browsing vegetation and rubbing the bark off of trunks. Protecting trees with tubes is crucial for the first few years of the buffer's life.

Voles are small rodents that gnaw on roots and stems of trees until they reach 4 to 5 inches in diameter. They can tunnel beneath tree shelters or may enter easily into leaning shelters, resulting in stunted growth and even tree death within a newly planted forested riparian buffer.



Challenges to Stream Bank Plantings



Flooding can overturn or tilt tubes, providing a pathway for rodents and possibly killing trees. Planted buffers should be assessed within a week of flooding so that disarranged tubes can be reset and damage is minimized.

Birds may become trapped inside tree tubes and then die and rot, resulting in tree mortality. To prevent bird entrapment, mesh nets should remain at the tops of tree tubes until tree growth will surpass the top of the tube.



Wasps build nests inside tubes, preventing tree emergence and potentially causing trees to rot. Nests may also attract bears which will damage the tube in pursuit of eating the nest. Wasp nests should be removed before wasps become active in order to keep trees healthy and reduce the risk of being stung.

Benefits of Forested Riparian Buffers

The establishment of forested buffers enhances both stream and terrestrial habitats in many ways. Trees and shrubs provide shelter and food for a variety of wildlife. When leaves fall into the stream, they provide food for macroinvertebrates which will then feed fish. Furthermore, large woody debris provides structured habitat for fish and other organisms living in the stream.



Trees increase the infiltration capacity of soils. As a result of enhanced infiltration, more water is absorbed into the ground and flooding is diminished. This results in reduced runoff; decreasing pollution from nitrogen, phosphorous, and pesticides into the streams.

Water quality is also improved by the ability of forested riparian buffers to hold stream banks in place and shade water. Stream bank stabilization results in minimized erosion and shading generates water temperatures that are cooler in the summer and warmer in the winter.

Overall, forested buffers create a more stable stream bank and enhanced water quality for many aquatic species.