

# Riparian Forest Buffer Fact Sheet

Riparian buffers are naturally vegetated areas adjacent to waterways, including streams, ponds, estuaries and wetlands. This natural vegetation protects the land adjoining a waterway by preserving the floodplain, keeping native soils intact, and maintaining the streamside land and streambanks. The vegetative community provides habitat for many species of plants and animals, many of them dependent on riparian habitat features for survival and many of them threatened or endangered species. The buffer area provides a living cushion between upland land use and water, protecting water quality, the hydrologic regime of the waterway and stream structure. The naturally vegetated buffer filters out pollutants, captures sediment, regulates streamwater temperature, and processes many contaminants through vegetative uptake. In this way, buffers efficiently provide water quality benefits and environmental enhancement for waterways and wetlands and should be kept intact or restored wherever possible.

- **Buffers protect floodplains and reduce flooding**

The floodplain is the area adjacent to a waterway where floodwaters periodically flow in storms. When the floodplain is naturally vegetated it can function as the sponge nature intends -- allowing water to be taken up by buffer vegetation and to be infiltrated through the soil to groundwater and absorbing storm flows, holding and gently releasing floodwater over time, which helps to regulate the flow of the stream and reduces downstream flooding during a storm<sup>1</sup>. The floodplain's access to water, nutrients, and the dynamic forces of nature allow it to support productive and beautiful landscapes and combine to make the riparian area some of our most fertile soils<sup>2</sup>.

- **Buffers protect streambanks and waterway morphology (stream structure)**

Streams are formed over time by the forces of nature. A stream's physical structure shifts naturally over time but often is forced to change by human intrusion such as uncontrolled stormwater runoff, dams and other structures, floodplain disturbance and hydrologic alterations. A vegetated buffer along a waterway protects and supports the banks and other critical parts of a stream's make-up, allowing it to resist erosive forces and remain stable. Riparian buffers are the glue that holds together nature's design. The vegetation's roots hold the riparian lands in place, maintaining the hydraulic roughness of the bank, slowing flow velocities in the stream near the bank.<sup>3</sup> Also, the absorption ability of a vegetated buffer, especially when it contains a mix of woody shrubs and trees, slows down the water in high stream flows and soaks up water, reducing in-stream channel velocity and volume during storm events<sup>4</sup>, and thereby reducing the damage to the stream of poorly

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<sup>1</sup>J. Toby Tourbier, "Open Space Through Stormwater Management, Helping to Structure Growth on the Urban Fringe".

<sup>2</sup>David Welsch, Forest Resources Management, USDA Forest Service, "Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources", NA-PR-07-91

<sup>3</sup>Water, Science, and Technology Board, Board of Environmental Studies and Technology, "Riparian Areas: Functions and Strategies for Management", 2002, citing Swanson, et al.

<sup>4</sup>J. Toby Tourbier, "Open Space Through Stormwater Management, Helping to Structure Growth on the Urban Fringe"

controlled stormwater flows. Root systems of woody shrubs and trees do a better job of anchoring soils -- a job turf grass cannot do effectively.<sup>5</sup>

## Conservation Benefits

**Improved stream health & water quality:** We've long known forests are tops at keeping pollutants from reaching streams. New research shows that streamside forests also multiply a stream's ability to remove pollutants that do reach the stream. While this is a major insight with big implications, it shouldn't be a surprise. The stream organisms that clean the water work best when given the types of food, light levels, temperatures, and overall conditions that they've been accustomed to in streams running through "Penn's Woods" for thousands of years.

**Reduced bank erosion, less flooding:** Bank erosion is a normal process, but removal of woody vegetation accelerates erosion since grasses don't offer much strength. In time, trees will reduce erosion rates. Forest soils are great sponges, absorbing lots of water that can become helpful groundwater instead of damaging flood water.

**Stewardship of soil, water and wildlife:** Streamside forests are the key to keeping soil where it belongs and keeping water clean. Buffers absorb much of the excess nutrients and other adverse chemicals in runoff water. Wildlife benefits of buffers are enormous, with a long list of game and nongame animals benefiting from these key streamside corridors that produce a smorgasbord of berries, seeds and insects. Songbirds show a quick and substantial response. Fisheries rebound dramatically – in one study of a fenced buffer, the fishery increased by 400% in just a few years.

Stabilized crossings made from hog slats limit livestock use of stream while providing access to pastures on both sides. Unmanaged access to creeks exposes livestock to numerous risks for injury and disease.

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<sup>5</sup> DNREC and Brandywine Conservancy, Conservation Design for Stormwater Management: A Design Approach to Reduce Stormwater Impacts from Land Development and Achieve Multiple Objectives Related to Land Use, September, 1997