

BENEFITS OF RIPARIAN BUFFERS



Riparian buffers are integral to the health of streams for many reasons, including the following:

- **Filtering Runoff:** Rain that runs off the land can be slowed and infiltrated in the buffer, which helps settle out sediment, nutrients and pesticides before they reach streams. Infiltration rates of wooded buffer areas can be 10 to 15 times higher than those of grass turf areas and 40 times higher than those of a plowed field. Studies have shown 30 to 98 percent reductions of nutrients (nitrogen and phosphorus), sediment, pesticides and other pollutants in surface and groundwater after passing through an adequately implemented riparian buffer. In addition, trees provide deep root systems that hold soil in place, thereby stabilizing streambanks and reducing erosion.
- **Nutrient Uptake:** Tree roots absorb fertilizers and other pollutants that originate on the land. Nutrients are stored in leaves, limbs and roots instead of reaching the stream. Through a process called 'denitrification,' bacteria on the ground of a riparian buffer can convert harmful nitrates to nitrogen gas, which is then harmlessly released into the air.
- **Canopy and Shade:** 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. Tree canopies also protect against elevated water temperatures that accelerate

algae growth and reduce dissolved oxygen, further degrading water quality. In a small stream, temperatures may rise 2 degrees along a 100 foot section of stream without trees. The leaf canopy also improves air quality by filtering dust from wind erosion, construction and farm machinery.

- **Leaf Food:** Leaves from the riparian buffer fall into streams and are trapped on woody debris (fallen trees and limbs) and rocks where they provide food and habitat for small bottom-dwelling creatures (i.e., crustaceans, amphibians, insects and small fish), which are critical to the aquatic food chain.
- **Habitat:** Riparian buffers offer a tremendous diversity of habitat. The layers of habitat provided by trees, shrubs and grasses and the transition of habitats from aquatic to upland areas make these areas critical in the life stages of more than one-half of all native species. Streams that travel through woodlands provide more habitat for migratory fish by providing suitable spawning habitat. Trees and woody debris provide valuable cover for small fish and other aquatic organisms. Degradation of any portion of a stream can have profound effects on living resources downstream. The overall impact of riparian buffers is greatest in headwaters and smaller order streams.

The following illustrates the various functions of the different types of vegetation:

Benefit	Vegetation Type		
	Grass	Shrub	Tree
Stabilize bank erosion	Low/ Medium	Medium/ High	High
Filter sediment	High	Low/ Medium	High
Filter nutrients, pesticides, microbes			
• sediment-bound	High	Low/ Medium	High
• soluble	Medium	Low	Medium
Aquatic habitat	Low	Medium	High
Wildlife habitat			
• range/pasture	High	Medium	Low
• forest wildlife	Low	Medium	High
Economic products	Medium	Low/ Medium	High
Visual diversity	Low	Medium	High
Flood protection	Low	Medium	High