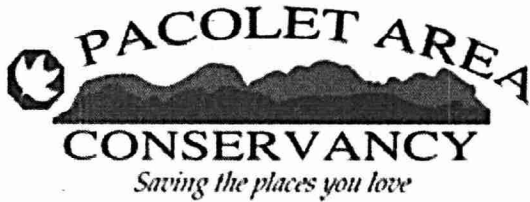


Riparian Buffers and their importance

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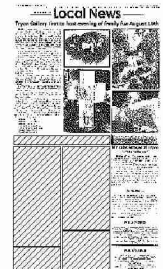


=By Pam Torlina

With the recent abundance of rain in the area and especially with the erosion that follows, it seems a perfect time to discuss the importance of riparian buffers. First, what is a riparian buffer? A riparian buffer is the vegetated land adjacent to a stream or water body. This vegetation benefits water quality and habitat by helping to regulate temperature, add organic matter (leaves and twigs), assist in pollution reduction, and by providing wildlife habitat.

Lack of riparian buffers along streams and water bodies result in excess stream bank erosion. Some stream bank erosion is a natural part of the down cutting process of waterways; however, this process is accelerated by altering the stream system in some way, such as straightening or widening, removing streamside vegetation, and clearing for agriculture, forestry, and/or development. Altering the natural system can result in erosion rate hundreds of times greater than those seen in naturally stable streams.

Without proper riparian buffers, stream bank erosion and sedimentation of waterways is all too common. Sediment and other nonpoint source pollutants come from many sources and make their way into our waterways through surface runoff. When land disturbing activities occur, soil particles (sediment), nitrogen, phosphorus, pesticides, and fecal coliform bacteria are transported by surface water and are often deposited into streams, lakes, and wetlands. These pollutants can affect an aquatic ecosystem in a number of ways. Excess nutrients (nitrogen and phosphorus) can cause algal blooms, fecal coliform bacteria can be an indicator of waste-borne disease, and pesticides can kill or sicken fish and aquatic invertebrates. The loss of these valuable vegetative zones results in reduced water quality, reduced wildlife and fish populations, causes serious property damage (bank erosion), and loss of valuable agricultural lands. It also results in increased water temperatures and decreased dissolved oxygen in the water, decreasing aquatic life. The loss of shade by clearing along waterways exposes soils to drying by wind and sunlight and reduces the water storage ability of the riparian area. If there is not a buffer for runoff water to spread over, it can cut channels into the land, allowing the sediment and



sediment-attached pollutants to flow directly into a stream or waterway. Sediment in our waterways is the largest single nonpoint source pollutant and one of the primary factors in the deterioration of surface water quality in the United States.

Riparian buffers are the most stable and effective ways to protect our streams and waterways. In North Carolina, natural riparian buffers are forested. They include a combination of native trees, shrubs, grasses, and herbs that form a plant community adjacent to a stream or water body.

How do riparian buffers work? Buffer vegetation slows and filters runoff water above ground, causing sediment to settle out and be deposited in the buffer, not in our waterways. The vegetative buffer allows water to percolate through the soil into the groundwater table, instead of running over the surface of the land, picking up sediment in the process. In many locations, groundwater moves toward streams, and it often carries nitrate-nitrogen and sometimes pesticides. Nitrate, a pollutant that moves in groundwater can be diluted in a riparian buffer. Plants use it, but more importantly, it is changed to nitrogen gas through denitrification, and nitrogen gas poses no harm to the environment. Riparian buffers that contain a diverse mixture of plants work the best, since different plants have different rooting structures. Some plants utilize the top several inches of soil, while others, such as taproots penetrate deeper into the soil. These roots not only remove nutrients but they stabilize stream banks. What are the benefits of having, preserving, and/or restoring riparian buffers? Buffers perform many environmentally, economically, and socially significant functions. They maintain and improve water quality by protecting water resources from nonpoint pollutants from both urban and agricultural activities.

Buffers slow floodwaters, thereby helping to maintain stable stream banks and protect downstream property. Slowing floodwaters allows the riparian zone to function as a site of sediment deposition, trapping sediments that build stream banks and would otherwise degrade streams and rivers. By slowing down floodwaters and rainwater runoff, riparian vegetation allows water to soak into the ground and recharge groundwater. Buffers shade streams and regulate fluctuations in water temperatures which help maintain fish habitat, especially for cold-water fish such as trout. Buffers can increase the amount and variety of wildlife and songbirds because they provide a wider range of habitat and food and they are an important travel way for wildlife.

What is the best kind of riparian buffer?

The debate continues and there are many schools of thought on the topic. It can get fairly complex, taking into consideration site characteristics, such as hydrology, topography, geology, land use, and value. However, the basic rule of thumb is, the wider the buffer, the better for water quality and wildlife, but even a narrow buffer is better than no buffer. An ideal mountain land buffer consists of a continuous forest along the stream or water body. However, for non-forested land, you could use a two-part buffer: a primary buffer consisting of a forested strip next to the stream or water source, and

a secondary working buffer between the non-forested land use area and the forested buffer.

This secondary buffer can consist of grasses, shrubs, or additional forest, and would be available for nonintrusive uses such as haying, logging, or taking cuttings for horticultural production. It is important to remember that sediment, fecal coliform bacteria, and nutrient levels all significantly increase when livestock are kept near a stream. The stream bank and buffer benefit greatly from removing or reducing livestock access in the stream bank buffer.

The Pacolet Area Conservancy (PAC) has worked with the state of North Carolina and area landowners to protect countless miles of streams, creeks, and rivers in the area, preserving a natural riparian buffer. PAC has also helped to protect thousands of acres of land within the watershed, aiding in the quality of water in our area. Our beautiful waterways are an asset of the community worth protecting and preserving for future generations.

For more information or to discuss how you can permanently protect a riparian buffer on your property or land within the watershed, contact PAC at 828-859-5060 or e-mail, landprotection@pacolet.org.