Streamside Management for landowners

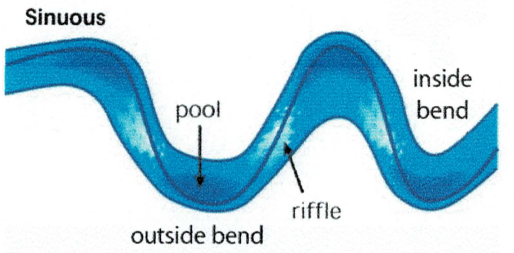
A publication of the Soque River Watershed Association

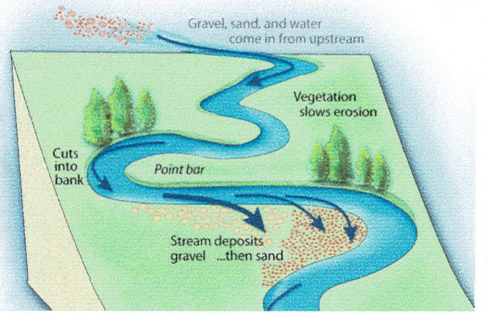
Eroding streambanks like this one can cause headaches for landowers as they watch their land being washed away. Eroding streambanks also cause water pollution. It is estimated that 80% of sediment in Piedmont streams is derived from eroding streambanks. This brief handout is designed to demonstrate a few simple principles of streamside management that should prevent problems like this before they occur, or offer some remedies once a problem has begun.

Three Basic Principles of Streamside Management

- **Give the River Room to Move (but it shouldn't move too dramatically)** - Streams by design change shape over time, meandering through their valleys. This doesn't imply that huge sections of eroding banks are natural, but it does suggest that giving streams room to alter their course slightly over the years is important as its hard to fight the power of water. We'll elaborate on this idea in this brochure.
- **Without Vegetative Cover Soil will Erode** - Vegetation is like armor for the earth. Woody vegetation like trees in particular are able to hold soil in place due to their intricate network of roots. In a natural state most streambanks are armored by trees and tree roots. Re-establishing vegetative cover is one of the most useful measures you can implement in the long-term care of your streams.
- **Stream Buffers are the first link between the water and the land** - The area immediately adjacent to a stream is often called a stream buffer or corridor. These areas do more good for streams than almost any other. Well managed buffers help to control the stability of the banks, regulate the temperature of the water and provide food and habitat for fish and wildlife. Buffers also capture runoff from upland areas helping to reduce erosion, remove pollutants, and stabiillze the soil.

Stream Processes

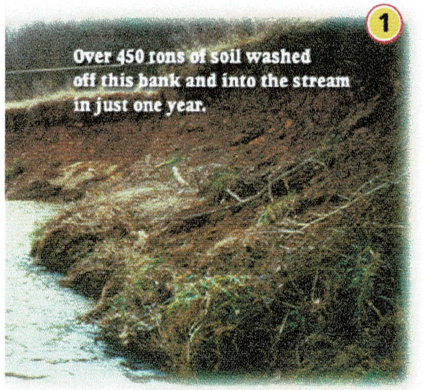




Streams share many common characteristics useful as indicators of stream stability. A **riffle** is an area where the river slope drops rapidly creating a rocky or shallow area where water moves quickly. **Pools** are areas of deeper water, often below a large riffle, or on the **outside bend** of a stream where stronger water velocity scours sediment away. When a formerly deep pool fills with sediment that indicates that more sediment has entered the river than its stream volume and velocity can naturally transport. The **inside bend** or **bar** is typically shallower where water slows down and deposits sediment.

Why and How Streams Meander

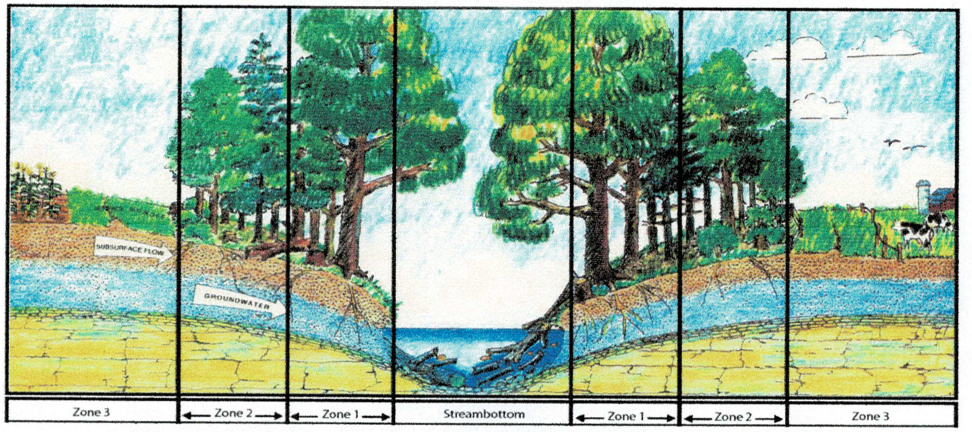
A stream's strongest current constantly shifts from one bank to other. The strong current side occurs on the **outside bends** and slowly erodes the banks on that side. The slow current side occurs on the **inside bends** and as the water slows **deposition** of sediment occurs forming point bars. This is how streams dissipate the immense energy of water flowing down a slope. If a straight line were cut (like when a stream is channelized), the river falls more quickly across a shorter distance increasing its energy. This scours the bottom and cuts the channel downward. In time, the stream will try and return to it's sinuous course. Past channelization is sometimes the cause of current bank erosion problems



Some common causes of Streambank Erosion

Streams often have complex histories that influence their current conditions, but most eroding streambanks are the result of:

1. Absence of mature woody vegetation, or the removal of such vegetation.
2. Un-restricted Cattle Access that trample banks accelerating erosion.
3. Areas that receive excessive stormwater can scour downward creating an incised channel with vertical banks.
4. Areas that have received historical sediment deposition in high amounts (such as from past clear cuts, or cotton farming days) may have banks too high for the river to access its floodplain.



The Value of a Wooded Stream Buffer

Wooded Stream Buffers have more benefits to streams and rivers than almost any other practice. Nearly all streams in our area would naturally have wooded buffers that help hold streams in place through a dense network of tree and plant roots, keep streams shaded which reduces algae growth and reduces stream temperatures critical for aquatic species like trout, and provide food and habitat by dropping leaves and limbs.

Wooded stream buffers have signficant **benefits to land owners** as well. Since wooded buffers experience less bank erosion than bare streambanks, the **risks of losing property due to erosion are reduced**. Stream buffers also serve as **groundwater recharge areas**. If your home is on a well, groundwater recharge is vital to insure future water supplies. Buffers also **reduce the damage caused by floods**. As waters rise, stream forests slow the water down, and allow the land to act as a sponge. Streamside forests **capture and treat upland runoff** such as nutrients. For those who manage their forests to generate income the capture and treatment of nutrients through uptake into harvestable trees helps **enhance forest value**. Property with forested streams also appraise at a higher value due to their aesthetic appeal and natural capital.

Managing a Wooded Stream Buffer

There are many different ways to manage wooded stream buffers, but the following are some general guidelines that have proven successful. This approach encourages a landowner to think about critical zones along a stream, and the unique characteristics of a property.

ZONE 1 / UNDISTURBED FOREST / 15 - 25 feet

This is the most important zone as it provides stability to the banks, allowing several layers of trees to grow so that if one falls in, another mature tree is behind it and able to stabilize the soil and streambank. It is recommended this area be no less than 15 feet from the waters edge, 25 feet being preferable. This is so if the stream moves slightly over the years (as you should expect it to), the entire area is stable enoug that such shifts will be restricted by mature trees.

ZONE 2 - MANAGED FOREST - 50 feet

The managed forest allows both landowner and nature to benefit. Periodic tree harvesting is encouraged from this zone as it removes accumulated nutrients that buildup in the soil as a product of capturing upland runoff. This area also provides seed stock for forest replinishment, habitat to animals, while filtering water, and replenishing groundwater through infiltration.

ZONE 3 - OPTIONAL FILTER STRIP / 10-20 feet

This optional zone helps in slowing surface runoff, reducing its erosive power, and trapping nutrients where they can be most useful. This zone can be a vehicle path between fences and forest, a haying zone, or controlled grazing area (with use of temporary fence to restrict access to the forest). Everything beyond this zone would be cropland, pasture, timber harvest or a home site or other use.

STREAMBOTTOM

Don't forget streambottoms. The removal of woody debris is discouraged unless it is causing signficant erosion. Study after study show that woody debris actually stabilize streams and enhance its ecology.

How to Improve Streamside Management

I don't have a Wooded Stream Buffer. What can I do?

If you own a small property you can likely replant in the Zone 1 area with a little help. The Soque River Watershed Asociation holds an annual community TREE SALE every January that makes bareroot trees available at just $2 each, and larger container trees for just $6-$8. If you own a larger **FARM** property, depending on your location we may be able to help you plant up to 1,500 feet of stream using volunteers and funds raised from the community. In addition to trees there are many shrubs and grasses that provide stability at the toe of the slope (where the bank meets the water). We can make recommendations of plants and nurseries for these materials, and we hope to be propogating some ourselves in the years ahead at our community garden and greenhouses.

Should I use rip-rap on my banks?

Keep in mind, your goal is to restore the natural function and beauty of the stream. For this reason, riprap, and other armoring devices are not often recommended. Riprap may solve the erosion problem but usually at the expense of the stream's natural beauty, wildlife, and establishment of natural vegetation. There are occassions (if a structure is jeopordized) where rip-rap provides the only solution, but armoring banks is considered the least natural and desirable way to restore streambanks, if other solutions are available.

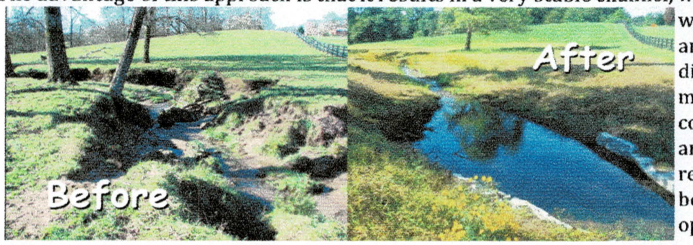
My streambanks are steep and vertical, what should I do?

Even though planting trees is recommended on almost any property, it cannot fix every problem. If your streams are experiencing **MASS WASTING** in which large pieces of land are falling into the river several times a year you may need some **BANK RESTORATION** in order to make it possible for the river to reach it's floodplain and for trees to grow and not be undercut. We hope to develop another publication just on STREAMBANK RESTORATION, but for now here's a few suggestions.

Natural Channel RESTORATION

Mankind has been altering rivers and streams for centuries, but in just the last 20 years we've discovered that mimicing nature provides the best long-term stability. This approach to stream restoration is called Natural Channel Design and invovles designing and reforming streams to have dimensions, patterns and profiles that we'd see in nature. This requires a deeper understanding of stream dynamics and data on stream slope, sinuosity, depth, watershed area and stream flow. In other words, before moving dirt around with large equipment, we have to know what the river wants to be.

The advantage of this approach is that it results in a very stable channel, with optimum benefits to water quality, stream life, and property values. The disadvantage is that it takes more resources and often costs more. If only small areas are eroding a "spot restoration" approach can be taken. To determine your options invite us out to take a



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