



W I L H E L M F A R M F A C T S H E E T

Riparian Protection on Wilhelm Farm

Wilhelm Farm owns a short stretch of Mountain Brook that divides the front 30.6 acres from the back 15 acres. We are contemplating purchase of a small parcel from an adjacent owner to give our property more protection and a longer riparian zone.

The riparian zone is in reasonable shape. However, the embankments show some wear and tear from mismanagement of upstream landscape, mainly through careless development of residential properties that did not use Best Management Practices, and older hardwood trees that are in declining health.

The NRCS Riparian Buffer job sheet states the purposes:

Riparian forest buffers of sufficient width intercept sediment, nutrients, pesticides, and other materials in surface runoff and reduce nutrients and other pollutants in shallow subsurface water flow. Woody vegetation in buffers provides food and cover for wildlife, helps lower water temperatures by shading the stream or waterbody, and slows out-of-bank flood flows. In addition, the vegetation closest to the stream or waterbody provides litter fall and large wood important to fish and other aquatic organisms as a nutrient source and structural components to increase channel roughness and habitat complexity. Also, the woody roots increase the resistance of streambanks and shorelines to erosion caused by high water flows or waves. Some tree and shrub species in a riparian forest buffer can be managed for timber, wood fiber, and horticultural products. (from NRCS Job Sheet – Riparian Forest Buffer 391)

Agroforestry can provide riparian forest buffers that are natural or re-established streamside forests made up of tree, shrub, and grass plantings. We will establish vegetation throughout our riparian zone that stabilizes the stream bank and provides an ecological environment suitable for forest farming.

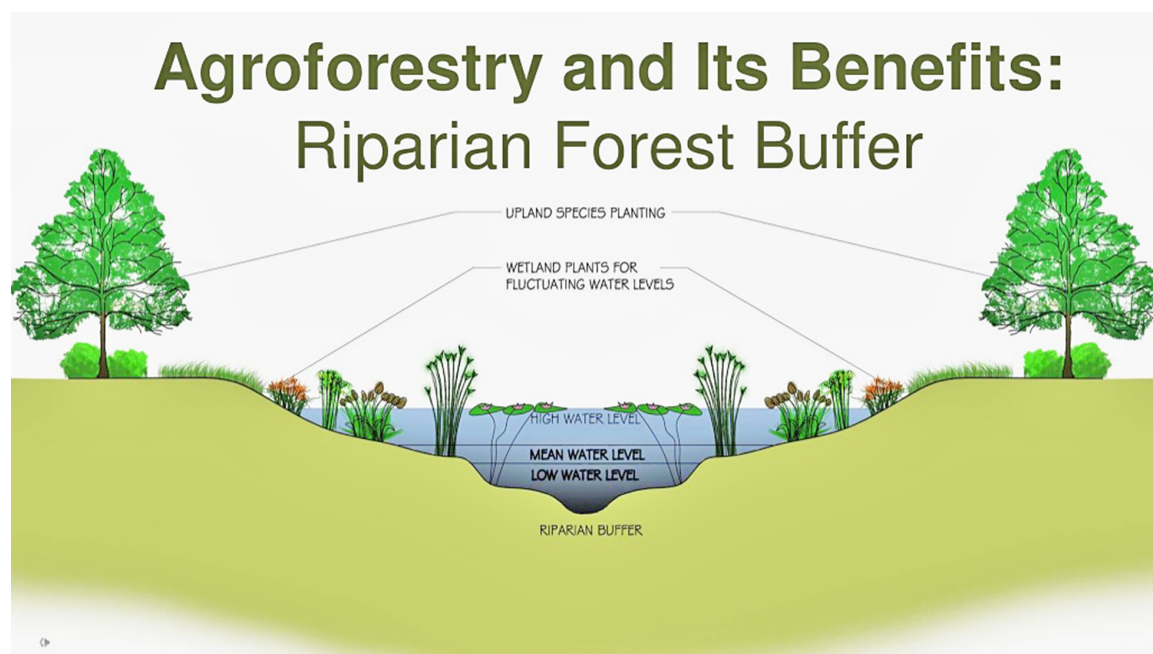
Heather Gall, a Penn State University researcher who is developing a flexible strategy to ramp up installation of riparian buffers project, comments:

While buffers provide significant ecosystem benefits, they can be expensive to install, and because they can entail removing cropland from profitable intensive farming, they can have high costs for farmers, she explained. Effective buffers are not short-term landscape changes — the most effective are long-term ecosystem investments and correspondingly long-term restrictions on farmers' land-use choices.

Fortunately, the USDA Natural Resource Conservation Service and Forest Service, state cooperative extension systems, and land-grant university research provide a rich array of resources to help guide our efforts (see references).

Current problems

The forest vegetation along Mountain Brook as it traverses Wilhelm Farm is old and, in some cases, dying and other cases falling as the stream banks slowly erodes. Upstream neighbors have developed close to the brook, setting the stage for erosion problems. In one recent case, a development a mile or so upstream did not use *Best Management Practices* (BMPs) while cutting driveways and foundations. Our section of Mountain Brook had a lot of sediment and was discolored for most of last spring. The developer responded to actions by the Town with several remediation efforts. By last fall the sediment load had dropped to normal and hopefully we will not see future problems.



This diagram¹ illustrates our planned direction as we manipulate the vegetation along Mountain Brook. We will drop trees that are immediately along the bank and pull them back from the streamside zone (and maybe use them for mushroom production). We will plant perennial grasses in place of trees, and we will investigate the use of wetland plants in our setting (which is shallow and shady). Forest farming will be part of the landscape away from the brook but well within the wet moisture regime it creates

¹ Source for diagram: <https://www.slideshare.net/GLADIADORVASCO/agroforestry-and-its-benefits-riparian-forest-buffer>

We are considering three near-term approaches to minimizing future problems. First. We will fell older trees away from the brook and break the logs in shorter chunks that would be suitable for mushroom production. In any case, they will decompose rapidly in the damp alluvial stream-side corridor.

Second, we will plant alder, willow and perennial grasses along the stream bank to prevent erosion. Third, Ann will use the rich, shaded alluvial soils for her experiential learning about forest farming. Ramps, fiddlehead ferns and selective propagation of mushrooms will be considered. Mushroom production might be a good use of the felled trees and would be a more valuable use than the value of low-grade black birch logs.

Salmon Brook as an Illustration



Over the years, the east branch of Salmon Brook, which is across the highway from Wilhelm Farm, has periodically changed course in years of heavy precipitation and flooding. The most dramatic recent event was the 1955 flood. It dramatically altered the course of Salmon Brook and deposited a layer of gravel on what was prime top soil in the hayfield immediately east of our farm. The above aerial photos demonstrate the changes in the course of Salmon Brook in 1934 and then in 1965.

References

Bentrup, Gary 2008. Conservation buffers: design guidelines for buffers, corridors, and greenways. Gen. Tech. Rep. SRS-109. Asheville, NC: Department of Agriculture, Forest Service, Southern Research Station.

Connecticut River Joint Commission. 2005. Introduction to riparian buffers. From: Riparian Buffers for the Connecticut River Valley, no.1. <http://www.crjc.org/riparianbuffers.htm>

Dosskey, Mike; Schultz, Dick; and Isenhardt, Tom. 1997. Riparian Buffers for Agricultural Land. Agroforestry Note No. 3

Gregory, S. V., S. J. Swanson, W. A. McKee and K. W. Cummings. 1991. An ecosystem perspective of riparian zones. BioScience 41: 540-551

Hawes, Ellen, and Smith, Markelle. April 2005. Report for the Eightmile River Wild and Scenic Study Committee. Yale school of Forestry and Environmental Studies. 15 p.

Lakel, W. A., M. A. Aust and C. A. Dolloff. 2006. Seeing the trees along streamside. Journal Soil and Water Conservation 61(1): 22-29.

North Country and Southern New Hampshire Resource Conservation and Development Councils. 1999. "A Guide to Developing and Re-developing Shoreland Property in New Hampshire." 3rd Edition. NC & SNH RC&D, 719 North Main Street, Laconia, NH. 40 pp.

NRCS Job Sheet – Riparian Forest Buffer 391. Illinois Job Sheet - 391 February 2003. 4 p.

Researchers receive USDA grant to study new riparian buffer strategy. Penn State News, July 20, 2017

Schultz, R. C. 2006. How to design, build and maintain buffer strips. The Forestry Source 11(5): 24-25.

Verry, E. S., J. W. Hornbeck, C. A. Dolloff, Eds. 2000. Riparian Management in Forests of the Eastern United States. Lewis Publishers, Boca Raton, FL, 402 pp.

This NRCS and Forest Service webinar gives an overall perspective on agroforestry systems, including their soil, water and riparian advantages:

<https://www.bing.com/videos/search?q=usda+nrcs+forest+service+videos+on+riparian+buffers&&view=detail&mid=685B133910448849BE34685B133910448849BE34&rvsmid=BDF4BD273B6FF138D826BDF4BD273B6FF138D826&FORM=VDQVAP>