

Agroforestry Riparian Buffer Strips

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Riparian buffer strips are zones of native trees, shrubs, and grasses designed to protect the temperature and clarity of moving water and to prevent agricultural chemicals and soil from eroding directly into stream water. The Kentucky Water Quality Act of 1994 encouraged farmers to protect their streams from soil erosion and compaction from livestock. Best management practices (BMPs) for people who are harvesting timber require streamside management zones (SMZs).

A classic riparian buffer strip is fairly wide (the USDA/Forest Service recommends a total of 66 feet) with three distinct bands or zones (see figure page 2). Zone 1 is directly next to the water and consists of native riverbank tree species such as sycamore (*Platanus americana*), river birch (*Betula lenta*), native poplars (*Populus* species, not tulip-poplar), red maple (*Acer rubrum*), or willows (*Salix* spp.) and tree species that are able to become established and grow rapidly. Zone 1 should be left as undisturbed as possible, although if the landowner selects tree species that can be coppiced (ones that readily resprout when cut), there is potential for *some* utilization of the tree species at a later time.

Zone 2 is farther away from the water and consists of native shrub species. Depending on whether the landowner would like some type of non-timber forest product to sell or would like flowering species that would be aesthetically pleasing, a mixture of shrubs could be planted, including, for example, dogwoods (*Cornus* spp.) and corkscrew willow (*Salix matsudana* 'Tortuosa').

Zone 3 is the most interior of the three zones and consists of native grasses and forbs. This too, once established, could be mowed for a crop or as forage for livestock but should be left undisturbed until it is fully established.

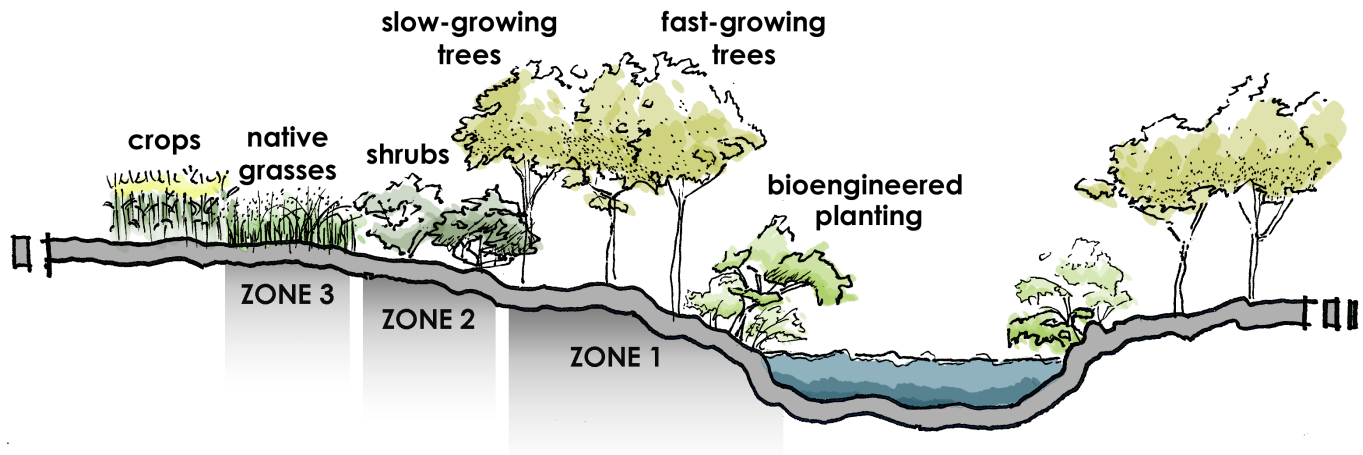
The most obvious benefit of riparian buffer strips is protection of water quality. However, they also control surface runoff and soil erosion, stabilize eroding stream banks, and, depending on species selected,



supply food and cover for wildlife. In addition, they improve aquatic habitats for fish and other aquatic species and potentially can generate income from harvested timber and non-timber forest products. Another important role of riparian buffer strips is to mitigate damage or protect agricultural fields from flooding.

When selecting species for the different zones, choose tree species for the streamside zone that are water loving and flood resistant. It is not necessary to select shrub species for Zone 2 that are flood resistant because these species will be located farther from the water than the tree zone. As with all agroforestry systems, when one is mixing tree, shrub, and herbaceous species, it is important to be sure the species chosen are compatible with one another and that whatever fertilizers and/or biocides needed will be tolerated by all species involved. Since the purpose of the riparian buffer strip is to protect the stream and filter unwanted materials, the spacing of both trees and shrubs should be relatively tight—6 to 8 feet apart for tree species and 3 to 4 feet apart for shrub species. The herbaceous layer of grasses and forbs should be seeded densely.

Consider, especially if the stream banks are both steep and susceptible to erosion, whether special bioengineering of the banks is necessary, involving such things as geotextiles, rip-rap, gabions, or fascines



A classic riparian buffer with three distinct bands or zones.

(bundled fresh-cut branches tied together and placed parallel to the stream to form “logs” that can be buried and may sprout new growth to resist stream flow). If agricultural fields near the stream have been tilled, do not plant tree species near the tiles—grasses only!

Once established, riparian buffer strips should begin to take on the appearance of a natural forest. Loss of income from land taken out of agricultural production to establish such buffer strips should eventually be offset by products that can be harvested from the strips themselves. Also, agricultural crops will not suffer from flooding as they might have prior to the establishment of the riparian buffer strip, and loss of income for agricultural crops will be less than they might have been before the establishment of the buffer strip.

If a landowner has only forest land and is considering a timber harvest at some time in the near future, the forested area closest to the streams could be managed along the same lines as a riparian buffer strip and have shrubs and/or grasses interplanted among existing trees to protect the streams during the harvesting operation.

Agroforestry in Kentucky

Alley Cropping (FOR-111)

Riparian Buffer Strips (FOR-112)

Silvopasture (FOR-113)

Windbreaks (FOR-114)

Forest Farming (FOR-115)

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