



Riparian Buffer Strips is the third in a five-part series of Agroforestry articles. Agroforestry includes the following other practices: alley cropping, silvopasture, windbreaks, and forest farming. See Kentucky Woodlands Magazine Vol. 1 Issue 2 for more information.

Non-Timber Forest Products

Agroforestry Part Three: Riparian Buffer Strips

By Deborah B. Hill

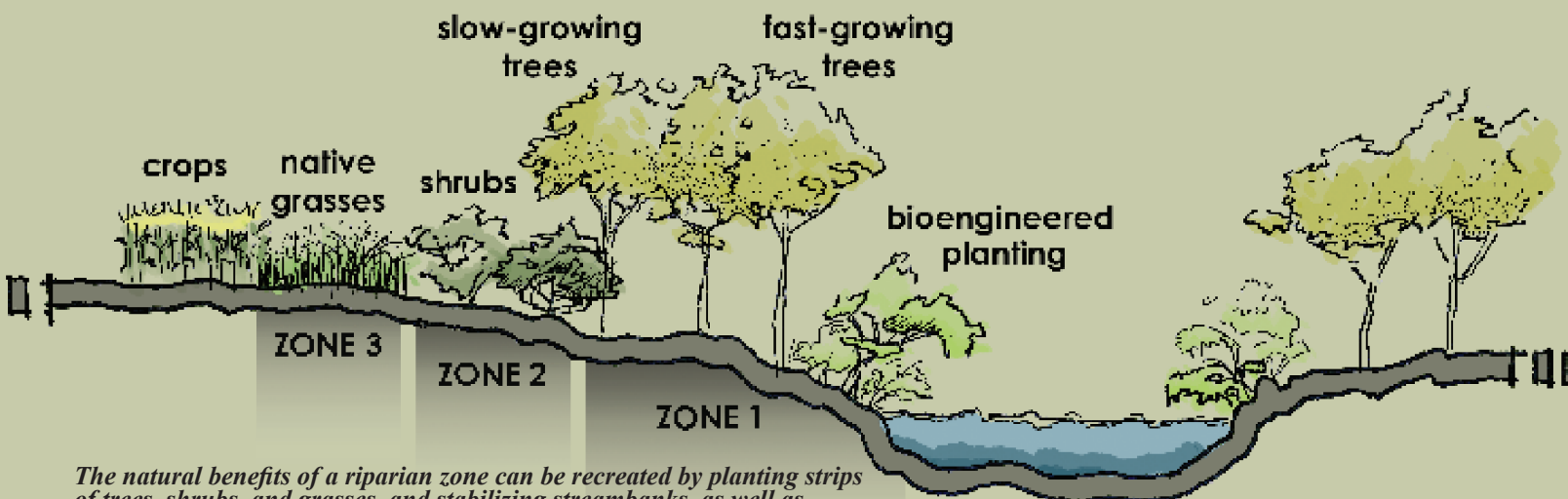
The third of the five agroforestry systems that would be practical to implement in Kentucky is riparian buffer strips. The Kentucky Water Quality Act of 1994 encouraged farmers to protect their streams from soil erosion and compaction from livestock. Best management practices (BMPs) for landowners who are harvesting timber require streamside management zones (SMZs). Both of these are similar to riparian buffer strips except that in the buffer zones designed in agroforestry, the landowner implements a specific series of zones of native trees, shrubs, and grasses a) to protect the temperature and clarity of moving water and b) to prevent agricultural chemicals and soil from eroding directly into stream water.

A classic riparian buffer strip is fairly wide (the USDA/Forest Service recommends a total of 66 feet) with three distinct bands or zones. 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, which is something else), 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 un-

disturbed 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.), corkscrew willow (*Salix matsudana* 'Tortuosa'), etc.

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



The natural benefits of a riparian zone can be recreated by planting strips of trees, shrubs, and grasses, and stabilizing streambanks, as well as constructing small wetlands to capture tile flow from nearby fields.

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.

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 ones chosen are compatible with one another and that whatever fertilizers and/or pesticides 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.

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

tural crops will not suffer from flooding as they might have prior to the establishment of the riparian buffer strip.

If a landowner has only forest land and is considering a timber harvest at some time in the near future, the 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.

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