

Chapter 2 Pastures

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Although livestock provide humans food, fuel, fertilizer and clothing, improper grazing of domestic livestock has contributed to the degradation of native plant communities (NRC 2002) and water quality in riparian areas.

Problems and Issues

Grazing animals, with unrestricted access to riparian areas, may remove streamside vegetation, compact or disturb soils, breakdown banks, resulting in both channel incision and widening of stream channels (Kauffman and Krueger 1984; Figure 2-1). The excessive sediments may bury critical habitat needed by aquatic animals.

When grazing animals have free access to riparian areas and creek channels their manure is deposited or washed into streams. This results in excessive nutrients, organic matter and pathogenic organisms. The primary sources of microbial contamination of creeks are livestock operations and municipal sewer overflows.

These waterborne microbial pathogens include bacteria, viruses and protozoa that are the sources of many serious diseases that affect livestock as well as humans. These disease include salmonellosis, tuberculosis, colibacillosis, anthrax, tetanus, brucellosis, mastitis and scours (Palmateer, 1992). High nutrients and sediment in the water increase the survivability of bacteria by providing a source of nutrition and reducing the ultraviolet rays from sunlight that may kill bacteria. Many water borne pathogens can be transmitted to humans, livestock and other animals through direct contact with contaminated water.



Figure 2-1. Creek in Spartanburg County where open cattle access has resulted in breakdown of banks, channel widening and shallowing with sediment from bank erosion.

Best Management Practices

There are no “formally” established Best Management Practices (BMPs) for pasture riparian areas but there will likely be some developed in the near future. There is not a lot of research in the humid southeast on this topic at present. This chapter draws on

what research there is and on observations of pasture scientists, as well as producers, over the past several years.

As explained in Chapter 1 many riparian buffer strategies include strips of perennial grasses as part of the buffer area because of the soil protection that the grass roots provide and the filtering effect that the standing grass crop offers to overland water flow following a precipitation event. The buffer grasses also provide nutrient uptake, preventing movement into the stream. The beauty of perennial grass pastures is that the entire pasture can basically function as part of the riparian buffer.

The pressure on a riparian buffer in a pasture system comes from livestock hoof action which can cause erosion, and potential movement of nutrients, purchased fertilizer and/or manure, and pesticides. However, these are relatively easy to manage for stream and riparian area protection and health.

Livestock should not have unlimited access to the stream. Hoof action on the stream bank leads to erosion, sometimes massive erosion during high water. Any deposition of manure and urine into the stream is also a source of fecal coliform, other microbes, and nutrients, particularly nitrogen and phosphorus. Optimally, livestock should be excluded from the riparian area with drinking water supplied in watering troughs located away from the riparian area. However, water crossings and water access areas can be built to give livestock limited access to the stream and these systems perform very well to protect the stream. The local county Natural Resources Conservation Service (NRCS) can provide plans and assistance with the construction of controlled access stream crossings and watering points.

The question is often asked as to why livestock should be excluded from the entire riparian buffer when the problem is mainly hoof action on the stream bank and manure deposition directly into the stream. Part of the answer is based on livestock (particularly cattle) behavior. The riparian buffer is an area of trees most often. Livestock will congregate in the shade to rest and lie down or lounge. When livestock stand back up to go and graze or water, more often than not the first thing they do is defecate. If that is in the riparian area then a large quantity of manure is deposited adjacent to the stream where overland water flow can move it quickly into the stream. Further, nutrients from the manure that leach into the soil may move with soil water into the stream because of the short distance to travel, as opposed to nutrients entering soil water away from the riparian area that have to move through the buffer allowing it to function as the filter it is supposed to.

The second part of the answer goes back to hoof action. If livestock congregate in the shade of the riparian area they will disturb the soil. Grass cover is usually thin at best in shaded areas so it does not take much hoof action to denude the soil. The bare soil, roughed up by hoof action is then easily eroded or washed away during floods, both by flood water within the stream and by overland flow from the adjacent areas flowing to the stream.

Fencing the riparian area out of the pasture is the most straight forward method of protecting the stream and buffer area but it is not the only method that can be used. If the riparian area is fenced then gates should be placed so that livestock can access the stream to water in emergencies (as in well or pump failures supplying water tanks or hard freezes that make other water unavailable). Further, in times of serious drought, the forage available in the riparian area can be utilized as an emergency feed. The short period of time that livestock would be in the riparian area and the very dry conditions would minimize any negative effects on the area.

If feasible it is a good idea to place the fence 10 to 20 feet into the pasture from the tree line in the riparian area. This width can be set or determined by the width of the mowing equipment available. Invasive, non-native brush and weeds will begin to invade the ungrazed areas and being able to mow between the fence and the trees will help control weed invasion of the pasture, and help with fence maintenance (keeping brush out of the fence).

Fencing is a noticeable cost and there is little direct economic return for fencing out the riparian area. However, most livestock operations can greatly improve the efficiency of forage utilization, and therefore the profitability of the operation by implementing a controlled grazing system. There are many names for these systems (i.e., rotational grazing) but they all involve controlling livestock distribution by subdividing pastures into smaller units. The fence protecting the riparian area can easily be incorporated into a pasture management plan to implement a controlled grazing program. More detailed information on controlled grazing can be obtained from the local Extension Agent and the NRCS.

Alternate water sources have to be supplied to livestock in a controlled grazing system just as when the riparian area is excluded from livestock by fencing. The most common water systems involve water troughs, either permanently placed or moveable. All watering locations should be placed as far away from the riparian area as is feasible. Livestock congregate at the water troughs and the area often becomes trampled and wet. The further any eroded soil has to travel to get to the riparian area the more likely it will be filtered out by the pasture vegetation. Also, due to manure and urine deposition, the watering areas tend to accumulate nutrients, again, particularly nitrogen and phosphorus.

The same considerations should be used when placing mineral and salt feeders or mineral and salt blocks. Locate any feed trough for supplemental feed and hay bales away from the riparian area as much as feasible within the overall grazing management system. Another consideration in placement of these items that cause livestock to congregate is that if possible they should not be placed upslope and near the riparian area.

Summary

Allowing livestock unlimited access to creeks degrades water quality by introducing pathogens and increasing nutrients from animal wastes, and increasing sedimentation with the degrading of creek banks. Riparian areas can be damaged by hoof actions which

results in the trampling of vegetation, compaction of soils, and accelerated erosion.

With the ranchers implementing BMPs such as fencing the riparian area, minimizing livestock access to the creek, and pasture management to encourage livestock to use upland areas, water quality, creek banks and riparian areas that are degraded will have a chance to recover.

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