LIFE ON THE EDGE - RIPARIAN ZONE ESTABLISHMENT

What is a Riparian Zone?

In an agricultural environment, a riparian zone is an area of permanently vegetated land located at the edge of a field along a watercourse such as a stream, river or pond. Riparian areas function as transition zones between terrestrial and aquatic environments and have extensive ecological benefits. These areas help to buffer the effects of agricultural production and provide valuable protection to watercourses. Maintaining riparian zones is a best management practice used by farms to limit negative impacts of soil erosion, nutrient loss and pesticide applications on water quality. Riparian zones are diverse and can look quite different depending on their location. Riparian zone vegetation usually contains a combination of moisture tolerant plants such as trees, shrubs, grasses, sedges and ferns. Riparian zones may not have a defined edge and can sometimes extend into or over a watercourse and contain woody debris that provides shelter and habitat for fish.

What are the Environmental Benefits?

Healthy riparian zones perform many important ecological functions that protect water quality. Plant roots hold soil in place along banks and prevent erosion during normal or extreme flow events. Vegetation, like grasses, help slow the speed of water runoff from fields giving it more time to infiltrate into the soil. Sediment in the water is trapped, preventing it from reaching the watercourse and reducing siltation. Nutrients contained in soil and runoff water can be captured and stored in the riparian area, preventing nutrient loading in the watercourse. Some plants, such as willow, are effective at capturing and taking up excess nitrogen. Trees can also function as windbreaks to help hold snow on fields over winter, reduce wind damage to crops and soil wind erosion. Riparian zones are also effective at sequestering carbon.

Riparian zones provide habitat for many species such as insects, birds, fish, mammals and amphibians, thereby enhancing the biodiversity of the landscape. Riparian zones may also provide important habitats to threatened or endangered species. The zones provide a connecting corridor to help wildlife move between habitats. Shade provided by large trees along a watercourse regulates the water temperature, which is important for good fish habitat. Eroded banks can cause a stream to become wider and shallower resulting in increased water temperatures. Flood risks can be reduced as riparian zones can act as a sponge to absorb excess water as plant roots help to improve the porosity of the soil and increase water holding capacity.

Why Fence Livestock out of Riparian Zones?

Allowing livestock to directly access watercourses has been a traditional method for providing water but can have many severe impacts on riparian zone health. Livestock can erode the streambank, compact the soil and reduce its ability to hold water. Sensitive vegetation is grazed and trampled, reducing the ability of the riparian zone to act as a filter and sponge (Figure 1). The biodiversity of the zone is also reduced, and fish habitat is degraded when livestock disturb streambeds and create siltation. Manure and urine can contaminate the watercourse and lead to the growth of algae and bacteria. It is also important to note that under the federal Fisheries Act or provincial Environment Act, there could be potential penalties for destruction of fish habitat or deposition of 'deleterious' substances like manure and sediment. Livestock that stand in a degraded, stagnant or muddy water source may be more prone to leg, foot and udder infections. Livestock will prefer to drink from a clean, cool water source, and improvements in performance and weight gain may also be seen.

Figure 1: An un-fenced watercourse in a pasture showing eroded streambanks and lack of vegetation caused by cattle. Image source: Thomas Harrington.

How to Establish a Riparian Zone?

Riparian zones should be composed of at least 5 meters of mixed vegetation, with an additional 3 meters grassed buffer strip if the adjacent field will have exposed soil, such as in row-crop production (Figure 2). Wider is always better, and a larger buffer will provide additional benefits and more habitat for wildlife. Riparian zones can be established by discontinuing cropping to the edge of a watercourse or fencing livestock out of the area and allowing natural vegetation to re-establish. If the area is severely degraded, planting appropriate trees (such as willows) and shrubs can help stabilize the bank and allow natural vegetation to establish. See the "**Beneficial Management Practices for Riparian Zones in Atlantic Canada**" publication for more information on establishing riparian zones. Where livestock are present, they should be fenced from watercourses.

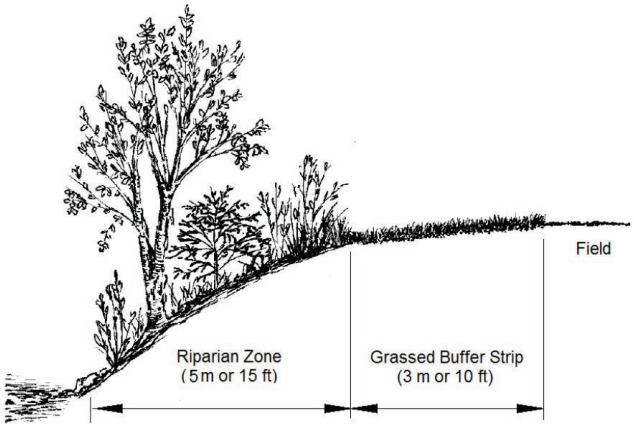

*Figure 2: Minimum recommended widths for riparian zones in cropping systems with exposed soils. Image source: Environmental Farm Plan '**Minimum Separation Distances for Agricultural Activities**' fact sheet.*

The fence should allow for natural vegetation to establish along the watercourse, and an alternate watering source should be provided. In cases where this is impossible, livestock should still be fenced such that they do not have free access to the entire length of the watercourse but are provided access to a specific limited area. See the facts sheets "**Livestock Watering Systems for Pastures**" and "**Providing Water with Limited Access Ramps**" for information on alternate watering methods.

For more information on the Nova Scotia Agri-Environmental Program and to view additional resources, please visit the website at: **www.nsaep.ca**