Riparian Areas & Land Effects

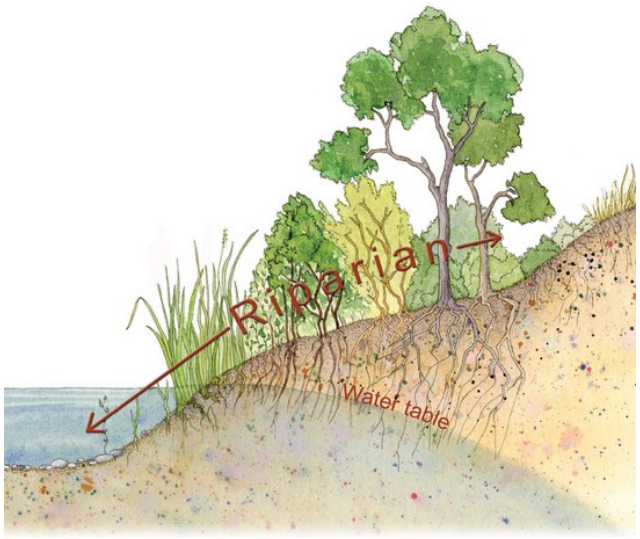
What are riparian areas and what do they do?

Riparian areas are the transition zones between land and water environments. The presence of water and water-loving plants set riparian areas apart from the drier upland areas. The exact boundary can sometimes be difficult to determine, as all riparian areas look different depending on their location. Vegetation is present that responds to, requires and survives in abundant water, lots of water present, seasonally or regular and soils have been modified by abundant water, stream, or lake processes.

While they cover only a small percentage of the landscape, riparian areas play an important role in the overall health of the watershed. A healthy riparian area is able to successfully perform certain ecological functions including:

- Trap sediment– The aboveground vegetation and the belowground root system of healthy riparian area plants act as filters to prevent sediment and pollutants entering the waterways.
- Filter and buffer water– Healthy vegetation in riparian areas use nutrients contained in runoff for growth which prevents the nutrients from building up in water. This vegetation also provides shade which in turn helps regulate stream temperature.
- Reduce erosion and stabilizing stream banks– Deep –rooted, healthy vegetation increases bank stability and protects shorelines from damaging erosion caused by water as it moves downstream.
- Recharging aquifers—a well-vegetated riparian area can help reduce the speed at which water flows during time of increased run-off. The slower stream flow allows increased absorption of water into the soil, replenishing groundwater reserves and decreasing flood risk downstream.
- Store water and energy—Riparian areas have the ability to hold excess water, acting as a natural sponge. By performing this role, riparian areas reduce the impact of flood and droughts.
- Maintaining biodiversity– An abundance of water, shelter and food can be found in healthy riparian areas and can attract all types of wildlife and sustain a diverse population of plant and animal species.
- Creating primary productivity— enhanced soil developments and forage production are benefits of healthy riparian areas.

In Saskatchewan, many riparian areas have been dramatically altered by agriculture and human development. These alterations have a negative impact on the health of the riparian area. When riparian areas are not healthy they will not be productive and cannot function properly resulting in environmental and economic concerns.



Effects of Agriculture on Riparian Areas

Agriculture can either have a positive or negative effects on riparian areas, depending on the producer's management of the riparian zone. These areas often suffer from over-use; however, when properly managed, they can be as much as 4 times more productive than their surrounding areas.

Examples of agricultural activity that can have a negative effect on riparian zones include:

- Overgrazing can cause bare ground and decreased plant vigour in favourable vegetation, creating an opportunity for weeds to invade.
- Trampling exposes stream banks to erosion and creates instability in the soils of the riparian area.
- Livestock manure introduces bacteria, pathogens, and nitrates which can enter and contaminate the water body associated with the riparian area.
- Cultivation too close to the stream bank, or without leaving a buffer strip around the riparian area will eliminate riparian vegetation resulting in erosion and other issues. Erosion of soil affects fish habitat, reduces water depth and lowers storage capacity of groundwater reserves. Soil salinity may also increase when riparian vegetation is removed due to ground seepage and evaporation can deposit large amounts of salts on the soil surface.
- Excessive removal or alteration of vegetation in riparian increases stream velocity, which in turn results in more soil erosion. When a flood occurs the water is stored temporarily in wetlands, lakes and floodplains.
- Timing has an impact. In spring and early summer soils are most susceptible to trampling damage because they are moist and soft. Woody vegetation such as shrubs and tree seedling are sensitive to browse damage.

Trampled riparian area with no rest and no vegetation.

How can we protect riparian areas?

There are many ways that agriculture producers can help protect and care for riparian areas on their land.

- To prevent overgrazing producers should make a grazing plan to provide a rest period for the vegetation to recover.
- Balance livestock demand with available forage supply to avoid overgrazing.
- Distribute livestock evenly throughout the area. This can be accomplished with the use of mineral and salt blocks, temporary fencing, or remote watering systems.
- Producers can put fencing around the riparian area or keep the animals away from the area until shrubs and vegetation are established in the late summer to prevent trampling.
- Avoid grazing during sensitive seasons, such as the spring when the ground is soft.
- Leave a decent sized buffer strip this will allow plant species to grow as well as provide habitat for bird and other animal species.
- Provide a rest period for the riparian area.
- Producers and Public can also do a riparian assessment to see how healthy their riparian area is.

Rest

No Rest

- More information can be found on cows and fish website– under caring for the Green Zone: Riparian Areas and Grazing Management. All photos and charts were sourced from Cows and Fish website.

Although riparian areas provide similar functions for flowing (streams/rivers) and non-flowing (lakes/wetlands) systems, there are some differences:

Stream and Rivers	Lakes and Wetlands
trap sediment	trap and store sediments; prevent re-suspension of sediments
build and maintain banks	build and maintain shorelines and banks
reduce flood damage	reduce damage from high water levels and wave action
store water, especially flood water	store water, especially flood and spring runoff water; act as a surface reservoir
extend perennial flows or levels by recharging underground aquifers	extend seasonal or long-term levels by recharging underground aquifers
dissipate flow and ice energy	dissipate wave and ice energy
high primary production, including forage and shelter values	high primary production, including forage and shelter values
maintain or improve water quality	maintain or improve water quality
filter and buffer water, both from over-land flow (runoff) and water from within the channel	filter and buffer water, both from over-land flow (runoff) and water from within the basin
maintain biodiversity[1]	maintain biodiversity[1]
	trap nutrients and sediments to balance nutrient cycling, in-filling and primary production

[1]biodiversity: The variety of life in all its forms, levels and combinations. Includes ecosystem diversity, species diversity, and genetic diversity (IUCN, UNEP and WWF, 1991).