seawa
South East Alberta Watershed Alliance

YOUR CONNECTION TO THE WATERSHED

Info Sheet **Recognizing Riparian Ecological Services** **2018**

In a dry climate such as found in the SEAWA watershed, that includes the South Saskatchewan River Sub-Basin (within Alberta) and the Pakowki Lake watershed, **riparian areas** are easily distinguished (Fig. 1). Narrow green bands along streams and around lakes stand out, especially during late summer or drought years, amidst a mostly amber and brown landscape.

Riparian areas are characterized by a **gradient** in soil moisture. Soils are saturated at the water's edge, and gradually become drier moving upslope or farther away. This soil moisture gradient results in corresponding plant zones, each consisting of different dominant species.

Fig. 1 In a dry climate, riparian areas stand out as narrow green strips along Peigan Creek, July 2017.

Shoreline wetlands may develop at some locations along the water's edge. These are colonized by plants that grow in soils that are waterlogged for most of the year. Native plants include cattails, bulrushes, manna grass, bur reeds, and sandbar willow.

Upslope of the saturated zone, native shrubs, trees and other forbs grow: chokecherry, wolf willow, thorny buffaloberry, red osier dogwood, western snowberry wild rose, Manitoba maple, cottonwoods and many more. Invasive plants and noxious weeds are also present: leafy spurge, Canada thistle, Russian olive, Japanese brome, and others.

Riparian areas are the point where the water body **interacts** with the land beside it**.** Riparian areas include floodplains.

Interactions of biological, chemical and physical processes between the aquatic ecosystem and the riparian area produce natural benefits that are called **ecological services.**

Flood and drought attenuation

Riparian areas act as storage zones for water. This sustains stream baseflow during periods when the precipitation is limited, such as in late summer.

Riparian vegetation increases channel wall roughness, which decreases stream flow rate, and the associated erosive power of water.

Riparian vegetation cover stream banks and lake shores from the impacts of water action, while the roots of riparian vegetation bind soil together protecting it from erosion.

Fig. 2 Cottonwood recruitment along the South Saskatchewan River, Medicine Hat, July 2017.

Seedling recruitment of riparian cottonwood forests is dependent on floods (Fig. 2). A healthy forest, in turn helps attenuate the effects of flood, and provides seeds for recruitment downstream.

Nutrient Cycling and Water Quality

Bank erosion can increase turbidity (cloudiness), contaminant concentrations, and cause siltation that can smother fish habitat. By limiting bank erosion, riparian areas help improve water quality of streams and lakes.

Riparian areas utilize excess nutrients from the waterbody, and from the adjacent upland runoff.

Under saturated soil conditions, nitrogen compounds are reduced and released as nitrogen gas. Depending on soil moisture condition, phosphorus may be held within the riparian areas, or released into the waterbody.

Habitat and food web maintenance

Riparian vegetation provides habitat and food for animals that live on land. Riparian plants provide food to aquatic organisms; while wastes from wildlife provide nutrients to plants growing in the riparian areas.

Amphibians like the leopard frog and tiger salamander live in water, as well as on land. They rely on riparian areas for shade, and for supporting invertebrates that they feed on.

Overhanging vegetation shades the water from the sun (Fig. 3), protecting fish by regulating stream temperature. Banks stabilized by the roots of riparian vegetation provide shelter for juvenile fish.

Beavers are important for stimulating tree and shrub growth in riparian areas. By slowing water ways, or flooding basins they create **variability in habitat**, and increase biodiversity.

Riparian areas in good condition (Fig. 4) are highly productive, supporting an abundance of plants, animals, and micro- organisms (biodiversity).

Riparian areas in good condition are resilient to the effects of natural disturbances such as floods and drought and recover naturally after such events.

Fig. 3 A riparian area in good condition, Seven Persons Creek, Medicine Hat, July 2017.

Human activities (Fig. 5) in riparian areas, or in adjacent uplands can adversely impact these natural processes and compromise their ability to provide valuable ecological services.

Functioning riparian areas are an essential component of a healthy aquatic ecosystem. They provide ecological (natural) services that benefit people, fish and wildlife, and the overall environment.

Fig. 3 Trees, shrubs and other vegetation provide shade and stabilize banks. Seven Persons Creek, Medicine Hat, July 2017.

Fig. 5 An example of a degraded riparian area due to recreation pressure at the Seven Persons Creek, Medicine Hat, July 2017. Restoration measures were completed in September 2019.

Riparian Areas Assessment & Restoration in the Seven Persons Creek Watershed Project
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