

Info Sheet

Recognizing Riparian Ecological Services

2018

In a dry climate such as found in the SEAWA watershed, comprised of 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 plants zones, each consisting of different dominant species.



Photo: Marilou Montemayor

Fig. 1 In a dry climate, riparian areas stand out as narrow green strips along a stream.

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. Plants include cattails, bulrushes, manna grass, bur reeds, and sandbar willow. Upslope of the saturated zone, shrubs, trees and other forbs grow: chokecherry, Manitoba maple, cottonwoods, red osier dogwood, wild rose, and snowberry.

Riparian areas are the point where the water body **interacts** with the land beside it. This includes floodplains. These interactions of biological, chemical and physical processes between the aquatic ecosystem and the riparian area produce natural benefits which 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.
- 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.
- Seedling recruitment of riparian cottonwood forests relies on floods (Fig. 2). A healthy forest, in turn helps attenuate the effects of flood, and provides seeds for recruitment downstream.



Photo: Marilou Montemayor

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

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, 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 (Fig. 3) 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. 4), 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 are highly productive, supporting an abundance of plants, animals, and micro-organisms (high biodiversity).

Streams and lakes with riparian areas in good condition are resilient to the effects of natural disturbances such as floods and drought, and recover naturally after such events.

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. It is important that riparian areas are maintained in good condition, and degraded ones are restored. provide the ecological (natural) services that benefit the environment and all residents in the watershed.



Photo: Marilou Montemayor

Fig. 4 Trees, shrubs, and other vegetation provide shade and stabilize banks. Seven Persons Creek, Medicine Hat.



Photo: Natasha Rogers

Fig. 3 Northern leopard frogs at Bullshead Creek near Medicine Hat.



Photo: Marilou Montemayor

Fig. 5 An example of a degraded riparian area due to recreation pressure at Seven Persons Creek.

Riparian Areas Assessment & Restoration in the Seven Persons Creek Watershed Project
Recreational Fisheries Conservation Partnerships Program
Watershed Resiliency and Restoration Program



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