



Protecting Your Shorelands for Better Farming and Ranching, and Healthier Fish Habitat

SHORELANDS - THE VITAL ZONE

Shorelands are the vital transition zones between land and water. They protect crop land from erosion, safeguard water quality, ensure reliable stream flows, and provide some of the most productive fish and wildlife habitat on the prairies.

Shorelands, sometimes called riparian zones, line lakes and streams and surround potholes and marshes. They can be wide and lushly vegetated or narrow, bare, and eroded. A key feature of shorelands is the underlying saturated soil that supports water loving plants and trees.

If the shoreland has been damaged, it cannot hold enough water to feed the roots of vegetation. It can turn into an eroded zone that cannot protect either the land or the water.

The next time you look at the creek at the end of your field, try checking the state of your shoreland. Is it covered with lush vegetation overlooking clear water, or bare of cover and eroding?

What if you discover small gullies where snowmelt flows off fields into ponds and streams, or banks slumping and falling into the stream, or an absence of willow, dogwood, and other shrubs that anchor the soil? These are signs that your shoreland may need work so that it can perform its role as a buffer zone between the land and the water, protecting them both.

HEALTHY SHORELANDS - WHY WE NEED THEM

Shorelands slow runoff, giving the water time to sink into the soil and replenish aquifers that supply wells and dugouts.

deer by water



They keep water levels up in potholes and sloughs, and maintain stream flows late in the season. By helping ensure a supply of good water, shorelands can play a critical role in

the health and productivity of your cattle, particularly during hot, dry periods when an animal can drink up to 100 litres of water a day.

Healthy shorelands save money. By filtering water and keeping sediment from clogging waterways, they cut water treatment costs and can reduce waterway maintenance which may cost upwards of \$5000 a kilometre.

Although shorelands represent only a small fraction of the prairie landscape, they are home to much of our prairie wildlife. Songbirds, waterfowl, mink, and muskrat thrive in them, and fish, frogs, and turtles depend on them to protect and support their habitat.

Saving land at the water's edge

Working that extra 10 metres of land at the water's edge can cost you more than you gain in crop or forage production. Heavy farm equipment weakens the bank and destroys deep-rooted shrubs and trees. As the soil slumps into the water, you lose valuable crop and pasture land. Runoff is now free to carry fertilizers and herbicides into the water, along with your topsoil.



The same drawbacks apply to working around wetlands, which are just as important for protecting your water supplies. Wetlands are often recharge areas that maintain local ground levels in wells and dugouts. They also store water and release it slowly, reducing flows and erosion.

With careful management and an adequate buffer zone, natural wetland activity can continue virtually unaffected beside cropped fields.

Planting buffer strips

Buffer strips are zones of trees, shrubs, and hardy perennial grasses that stabilize shorelands with their root systems and protect the ground during heavy rains. Vegetated banks can withstand up to three times the flows that a bare bank can handle without eroding.

A buffer strip between your field and the water can boost crop production by holding moisture and preventing wind and water erosion. Planting trees can provide economic returns from timber and wood supply.

Here are some guidelines for planting buffer strips. Note that you may have to reshape banks before replanting:

- plant native grasses, trees and shrubs along banks and field edges
- try a clover/alfalfa or grass/legume mix to establish perennial forage
- use dogwood and willow to protect banks and resist ice damage
- select deep rooted species that can withstand periodic flooding and ice scour, and also shade the water. Green ash, Manitoba maple, trembling aspen or cottonwood are good riparian

species to plant

- use a mulch of hay or straw held down with a brush mat to protect new plantings

A buffer zone at least 15 metres wide is best for protecting waterbodies and providing landowner benefits. Wider buffer zones may be required for steep banks, long slopes, and erodible soils. Once vegetation starts to grow, it can form part of a rest/rotation pasture to supplement or improve forage for better livestock production.

Controlling bank erosion

Some stream banks are too steep and eroded to replant without first reshaping the bank to provide suitable seed and root bed. Measures include:

- reshaping banks to 4:1 side slopes by cutting back the bank away from the water
- protecting banks with rip-rap or field stone where water velocities are high
- covering the toe of reshaped bank with clean rock to prevent undermining
- installing a protective bank facing of logs or willows

Erosion control measures should be designed for individual sites to be effective. Structures in stream channels are sometimes needed to control stream gradient and protect streambanks. Seek professional assistance from your provincial departments of Natural Resources, Agriculture, or Environment, or try the federal government's Prairie Farm Rehabilitation Administration. You may need an environmental permit for construction.

Shorelands for healthy fish habitat

Fish are an excellent indicator of water quality and the condition of a watershed. The same healthy shoreland that supplies plenty of clean water also supports diverse fish populations.

Water temperatures are kept low by the cooling shade of the shoreline trees. Cooler water holds more oxygen for fish to breathe, and reduces the effects of pollution which are magnified by warmer water.

Stable banks reduce erosion and the release of sediment that can cover spawning habitat and suffocate fish eggs. Wide buffer zones reduce the volume of sediment entering water. Also, trees and shrubs in shoreland buffers contribute many insects to the water for fish to eat.

Shoreline vegetation filters sediment and run-off that carry fertilizers and pesticides into surface waters. The filtering action keeps nutrients in fertilizer and livestock waste from reaching the water where they cause algal blooms that rob the water of oxygen when they decompose, suffocating fish.

Many prairie streams flow intermittently, providing no fish habitat during the summer because of the rapid runoff and poor water storage on cleared water sheds. A 10-metre buffer strip along a stream course can help keep the water flowing, even during drier times of the year.



Slow release of water may also moderate flood peaks and erosion that can damage fish habitat and limit the potential for many sport species.

The presence of a variety of fish in our streams--especially game species like walleye, northern pike, and trout--signifies care of the land. Conservation of shorelands throughout the watershed is needed to support these species.

Some streams that are now in trouble can be restored with a few protective measures, encouraging

fish to return.

Keeping your livestock healthy and productive

Managing your shorelands can pay off in a range of benefits for your livestock, from cleaner water to better forages.

Protecting shorelands near pastures and feedlots



Allowing livestock unrestricted access to watering sites in streams may be causing a range of problems. Hooves trampling a soft, moist, streambank make footing dangerous and increase erosion, releasing sediment to the water. The animals can get bogged down in the mud and have difficulty reaching the water. Mud-caked udders make it difficult for calves to nurse to nurse, and increase the incidence of mastitis in milking cows.

Livestock drinking water is contaminated by the animal's own waste when free access to streams is allowed. Leptospirosis and bovine virus disease can easily be transferred under these conditions.

The more their water is polluted with silt, manure, algae, and other unpalatable substances, the less water livestock tend to drink and the less milk and beef they produce.

Restricting Access



Use fencing to keep your livestock away from shorelands where they can damage banks and lower water quality. As a general rule, set your fences at least 10 metres from the high water mark or top of the bank, to reduce the likelihood of contaminated runoff reaching surface water.

There are four basic types of fences: page wire, barbed wire, high tensile smooth, and electric. The choice depends on your animals, how long you want the fencing to last, and cost. For feedlots and barnyards electric fencing is relatively inexpensive and easy to install. Consult your Ag Rep for more information.

Setting Up Watering Facilities

If you keep your livestock out of the water and off your shorelands, they will need alternate

watering facilities. There are several options, including solar powered pumps, self-priming nose pumps, and gravity water systems.

Pumps, troughs, and heaters may not always seem practical, but they are the most effective way to protect shorelands and water quality. Erosion-resistant ramps that limit access to streams, although not as effective as in-pasture watering, still reduce erosion.

Protecting shorelands on the range

Open range grazing tends to destroy shorelands. Livestock are attracted to the shelter, water, and better forage they offer. When cattle trample banks, vegetation that stabilizes the soil cannot grow. Erosion increases, and streams get wider and shallower. Shorelands hold less water because there is little vegetation to slow runoff, leading to water shortages in summer.

On open range and pasturelands, you may need to install fencing to keep cattle away from streams and rivers. By fencing the corridor, you can divide your pasture into two parcels-- ideal for rotational grazing. This strategy also improves forage and growth while protecting shorelands.

Place supplemental feeding stations, watering sites, and salt licks in upland pastures to improve grazing distribution and cut the time livestock spend on shorelands. Set up complementary pastures in uplands for grazing in early spring. They allow shoreland and native range time to recover from the effects of winter.

Managing manure for cleaner water

Manure is a valuable resource--in the right place. More than just a natural fertilizer, it adds moisture and organic matter to cropland. But when it reaches wetlands, lakes, and streams, it fouls the livestock water, spreads disease organisms, and causes algal blooms that give the water a bad taste. The challenge is to use manure to improve crops and forages, and avoid spreading it where runoff can flush it into surface water and threaten the health of your herd and your neighbour's.

To keep your water clean, make sure that waste sits above the high-water mark, and that runoff from it cannot reach the water.

Store liquid manure in earthen pits, and solid and semi-solid manure in wooden or concrete walled structures. When spreading manure on pasture or cropland, keep at least 30 metres from rivers, lakes, and wetlands--60 metres if you are spreading on medium to fine textured soils or slopes over 6%. Apply manure only on dry, level, unfrozen ground. Make sure you till-in manure on land susceptible to flooding or rapid runoff.

Reduce the amount of runoff moving through barnyards and feedlots by making an earthen mound up-slope from the site to divert flows around the yard. Direct water from rain gutters on barns and farm buildings away from animal pens and feedlots. At the low end of the yard, filter runoff through a wide grassed strip at least 10 metres from the water's edge.

Coping with beaver dams

Beavers are prolific builders that are generally in harmony with the environment. But fewer natural predators on the prairies since settlement days, and less trapping, have led to over population and in some locations, too many dams.

Large beaver populations spread into flat land where their dams flood large areas, block roads and

culverts, cover spawning habitat, and prevent fish from moving upstream.

If you try to remove a beaver dam by blasting or other means, you may kill fish or other animals by draining upstream ponds that in some areas provide the only over-wintering habitat in a stream.

Your efforts to control beavers and their dams should form part of an overall management plan involving other landowners in the watershed. Consult your local natural resources officer for advice and obtain any necessary permits before you go ahead.

Shoreland code of practice for landowners

Here are the keys to protecting your shorelands, for better farming and ranching, and healthy fish habitat.

- Leave a buffer zone at least 10 metres between your fields and nearby waterbodies to prevent bank slumping and land loss.
- Plant shoreland buffer strips of trees and shrubs to stabilize banks and reduce erosion.
- Fence streams on rangeland and install erosion resistant stream crossings to create lush, healthy shorelands.
- Store and treat manure well away from surface water to protect water quality and fish habitat.
- Place stone at the base of steep eroding banks and construct a gentle slope to allow revegetation.
- Set up livestock water facilities in pastures and feedlots for clean water and healthy herds.

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Working towards healthier human and wildlife habitat along the shorelines of Canada

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before

1. Cleared, manicured lot - lacks shade and privacy; loss of native plants leads to more erosion, runoff...and work for you!

[Top](#)

2. Runoff - flows over solid surfaces accelerating erosion; pollutants and excess silt degrade habitat for aquatic life.

[Top](#)

3. Chemical fertilizers and pesticides - degrade water quality, are hazardous to your health, can be deadly for fish and other wildlife.

[Top](#)

4. Lawn to the water's edge - lacks deep roots required to stabilize bank.

[Top](#)

5. Hardened shoreline - can deflect erosion downstream, eliminates "natural filtering" of pollutants and sediment, degrades habitat.

[Top](#)

6. Artificial beach - requires

after

1. Prune trees rather than removing them; plant low maintenance native trees and shrubs to reduce erosion and absorb runoff.

[Top](#)

2. Replace solid surfaces with porous materials where possible; redirect runoff into settling areas, away from the water's edge.

[Top](#)

3. "Mow it high and let it lie" - leave grass 8 cm (3") high to retain moisture, mulch clippings for fertilizer.

[Top](#)

4. Start a buffer - leave some grass uncut along the water's edge; restore with deep rooting native plants.

[Top](#)

5. "Soften" your shoreline - improve erosion protection with native trees, shrubs, grasses and aquatic plants.

[Top](#)

6. Create a "dry land" beach

ongoing sand replacement, reduces water quality, degrades aquatic habitat.

[Top](#)

7. Old 2-stroke engine - dumps 25-40% of fuel, un-combusted into water and air.

[Top](#)

8. Solid crib dock - destroys aquatic habitat, alters currents, can deflect erosion downstream.

[Top](#)

9. Malfunctioning septic system - allows phosphorous and bacteria to leach into adjacent waterways.

[Top](#)

10. Harmful household chemicals and cleaners - damage septic system and degrade water quality.

[Top](#)

above the high water mark; let imported sand erode away naturally and native plants grow back.

[Top](#)

7. Use a well maintained electric motor, or a 4 or 2-stroke engine that meets or exceeds EPA 2006 guidelines.

[Top](#)

8. Remove solid dock - try a pipe, cantilever or floating dock, avoid treated wood; use public access where possible.

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9. Replace and properly maintain your septic system - consult an expert.

[Top](#)

10. Use environment - friendly products, or alternatives like baking soda and vinegar.

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