3 The Buffer Zone

- Your Problem Solver

When we moved from the city to the water's edge, our plan was to live slower lives and enjoy the things that nature, and our new community, had to offer. Somehow, things worked out a little differently! Our time and resources were stretched to the limit with running a resort, keeping our consulting business going, and trying to find time to spend with the children. We welcomed anything that could save us time or prevent future problems – such as the concept of the buffer zone.

If there is one single message that every one of us who lives beside water, or has water running through our property, can benefit from, it is the value of the "buffer zone", and the importance of protecting it. The buffer zone is an excellent investment for maintaining the quality of your water and protecting your land, possibly even from disappearing!

Your buffer zone is an area of natural vegetation, including fallen trees, branches and washed up logs, and natural rocks or pebbles, that runs along the length of your shoreline, streamside, or bluff edge. It includes the areas upland of the high water mark (your **riparian** buffer) as well as the area below the high water mark or normal high tide mark, right down into the water (your **aquatic** buffer). In marine areas it can even extend below the low tide mark into eelgrass beds.

Ideally, a buffer zone contains vegetation that would normally grow in your area, based on climatic zone and physical location. These might include trees, shrubs, wildflowers, grasses and other plants in the riparian area, and native aquatic plants (e.g. cattails and rushes for freshwater, and saltgrass and eelgrass in coastal settings).

What's in a Name?

The riparian buffer zone has many other names – buffer strip, leave strip, filter strip, riparian zone, and vegetation retention zone. Some call it the ribbon of life, because of its crucial role for many living things.

Over the years, many of us have cleared our buffers for views, created wide access swaths to the shore, and "tidied" up the shoreline. Lawns and ornamental gardens near the water's edge, artificial beaches, retaining walls and other "hard" installations along many shorelines have gradually eliminated the ability of buffers to function effectively.

When a shoreline is cleared and native vegetation removed along with driftwood logs, root wads, rocks and boulders, the buffer area has the potential to become an "erosion zone". Alterations to shorelines and streambanks can also result in silted up spawning beds, pollution from runoff and increased flooding. By helping buffers return to a more natural state, we can often reduce these problems.

As "pollution-prevention, water quality control, and erosion-protection devices", riparian and aquatic buffers help keep our property and water safe. In fact, you could look at them as a free shoreline insurance program...we invite you to take advantage of this opportunity!

CAUTION

Without a buffer zone you might find that your shoreline becomes an erosion zone. You then risk:

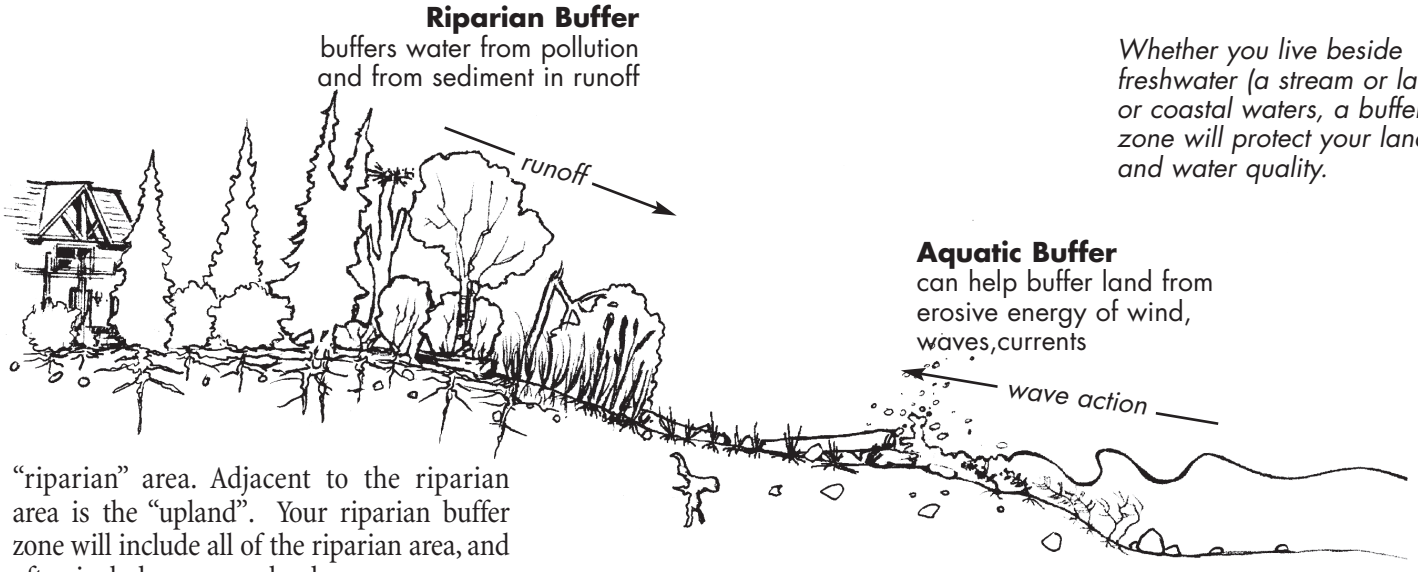
- **Physical loss of your property.**
- **Civil litigation from neighbours if their property is damaged.**
- **Possible criminal charges if fish habitat is harmed or destroyed.**

Finding your Buffer Zone

Your buffer zone includes vegetation along the water's edge adapted for the environment there – plants that like the extra moisture close to freshwater, and those that can tolerate the marine environment near ocean waters. The area above the high water mark which is influenced by the presence of water – for example, seeping through the soil – is the "riparian" area. Adjacent to the riparian area is the "upland". Your riparian buffer zone will include all of the riparian area, and often includes some upland area.

Vegetation and soils will help you identify your riparian buffer. Some riparian buffers may lack trees and shrubs, even in a natural state, due to characteristics such as soils which may be too wet. And, some aquatic buffers may naturally lack emergent aquatic vegetation like rushes and submergent plants growing in the water. Rocks, fallen trees, washed up logs and root wads also act as part of your buffer.

A marine riparian area includes the backshore area (upland of the high high water mark, but still influenced by salt water). A buffer in marine settings almost always extends upland of the backshore area. The aquatic buffer in marine shorelines includes the intertidal foreshore area, and the subtidal nearshore area where important plants like eelgrass grow.



Did you know . . .

Buffer zones provide rich and important habitat for fish and other wildlife. Scientists say that natural habitat ABOVE the high water mark is very important to the survival of salmon and other species of fish.

Whether you live beside freshwater (a stream or lake) or coastal waters, a buffer zone will protect your land and water quality.

The Benefits of Buffers

Did you know . . .

A recent study by the BC government confirms that average sea levels rose between 4 and 12 cm (2 to 5 in) along the BC coast during the last century. Protecting your coastal property with buffers of vegetation will be even more important in the face of rising sea levels!

"A few of us on our lake have brought in sand for beaches. If I had realized that it would silt over the gravel area where trout used to spawn, I wouldn't have done it – and I'm sure my neighbours wouldn't have either."

Harvey, Interior lake

Benefit	*How buffers help*
Protection of water quality	• Buffers help purify water by filtering toxic substances and some pollutants (fertilizers, pesticides, bacteria, heavy metals and septic leachate) out of runoff from roads, fields, yards and septic fields, before these substances reach water bodies. • Vegetation helps keep water clear by trapping soil particles in runoff. • On a property with extensive native vegetation, you can avoid the use of fertilizers and pesticides and further help protect water quality; these substances are not required to grow native plants. • If properly established and maintained, a full riparian buffer can remove at least: - 50 percent of chemical fertilizers and pesticides. - 60 percent of some bacteria. - 75 percent of sediment.
Protection from erosion	• The roots of riparian and aquatic buffer vegetation act like "rebar" in concrete, to reinforce soil and sand and help hold them together. • Buffers help prevent land loss by protecting your bank or shoreline from slumping or being washed away. • The leaves of plants reduce the energy of waves and currents, break the force of falling rain, and slow water as it runs downhill. Since shoreline properties are commonly on the receiving end of drainage, the more vegetation cover, the more your property will benefit.
Protection of property value	• By protecting water quality and preventing erosion along the shoreline, a buffer zone helps maintain the value of your property. • Buffers help protect buildings and trees on your property from damage due to wind and water – even salt spray if you're a coastal dweller.
Protection from flooding	• Vegetation, logs and rocks in streams or along the shoreline slow down flood waters, reducing damage to your property. • Riparian vegetation acts like a sponge, helping to increase the soil's ability to absorb water, and to lessen the impacts of flooding.
Quality of life	• Trees and other vegetation provide cooling and shade in summer, protection from wind in winter, and clean and freshen the air. • Vegetation along the shoreline can provide privacy from other dwellings and from noisy activities on the water. • Natural landscaping can help put you in touch with the seasonal cycles of plants and wildlife, and the beauty of nature.
Protection of water supply	• Riparian vegetation helps the ground absorb more water in fall, winter and spring, and during storms. The ground can then slowly release water into streams in the summer, to help maintain flows during dry periods.
Protection of fish and wildlife	• Vegetation provides food, nesting cover, and shelter for fish and other wildlife, including species-at-risk. • Vegetation alongside and overhanging waterways provides shade to help keep water cool for fish. • Vegetation along shorelines provides connecting corridors, enabling wildlife to move safely from one area to another.

What Makes an Effective Buffer?

Native plants... and lots of them!

Ideally, the buffer area is thickly covered with native vegetation. The higher the percentage of the ground that is covered, the better your buffer can work. A landscape made up of native plants is low-maintenance. Once established, they can survive without extra watering, and without application of pesticides and fertilizers. Native plants are adapted to deal with local bugs and diseases and can get all the nutrients they need from existing soil. *See Chapter 7 and Appendix 2 for more information on native plants.* A ground covering of turf grass does not provide enough of the functions of a buffer to help it be effective.

The wider the better!

Scientists are showing us that buffer zones need to be much wider than previously thought, in order for them to carry out all the functions that nature intends for them. These days, the general rule for an effective riparian buffer is to provide a minimum width of 30 m (100 ft), measured back from the high water line or normal high tide mark. You may also need to increase the size of your buffer if you live on a ravine or sloped shoreline or if the shore or bank is made of rock. *See sidebar.*

In addition to the riparian buffer, some shorelines also have an aquatic buffer, particularly lakes and ocean properties. In an ocean setting, the aquatic buffer may extend to the low tide line and beyond to include any eelgrass or kelp beds near the shoreline. In some areas, riparian buffer zones as wide as 50-100 m (165-300 ft) may be established, to help protect very sensitive streams or eelgrass beds. In exceptionally fragile areas, 150 m (500 ft) may be required. The buffer will be translated into a "setback" for development; vegetation within it would be "managed" under strict guidelines.

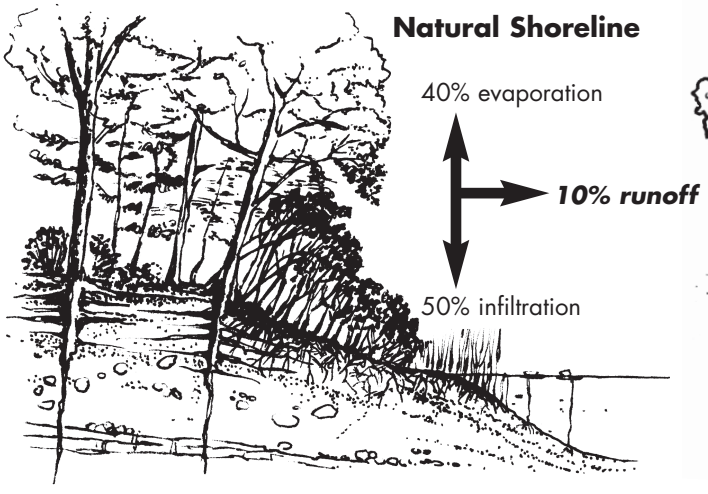
Wide buffers are best at filtering out pollutants before they reach the water, protecting soil from eroding, mitigating the effects of flooding, and providing habitat for fish and other wildlife.

If you have a lot which has already been cleared, if your lot is too small to establish the buffer we recommend, or if your house or cottage is closer than 30 m (100 ft) to the water's edge – you may feel that the task of creating a buffer is irrelevant, or impossible for you. Do not despair! Whatever you set aside for a natural buffer area along the shoreline will benefit your property. Start slowly, and the rewards may inspire you to expand the area.

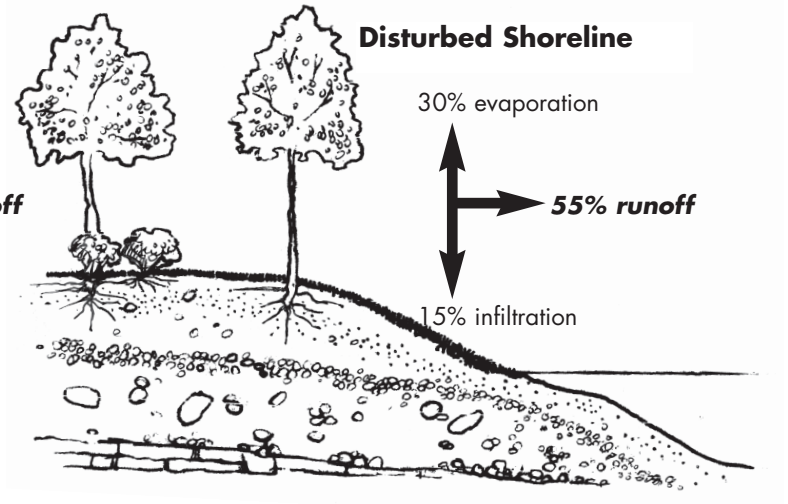
tip ***Make the buffer wider than 30 m (100 ft):***
- on slopes: add at least 0.6 m for every 1 percent of slope. *See Pg 71 for calculating slope.*
- if rock outcrops are included, or wetlands are adjacent: add the width of the outcrop/ wetland.
- for coastal waters: add the width of any backshore area.

Did you know . . .

Leaving a buffer strip does not mean that you will be inundated with insects, mice, skunks or other wildlife. If wildlife can find what they need on your shoreline, they will probably stay there – unless you invite them with tasty dinners of garbage, or warm inviting beds for the winter. See Chapter 11.



Native vegetation protects water quality from polluted runoff, and helps soil absorb water.



Hard surfaces and reduced vegetation increase runoff and and erosion potential, and decrease absorption by the soil.

"By letting a wide buffer strip grow along the water's edge we've cut down on our yard maintenance. Each year we see tiny new shrubs popping through the ground, and have fewer worries about the water being damaged by septic leachate and runoff."

Sarah and Clive

Did you know . . .

Wetlands like coastal, estuarine, and inland marshes provide breeding, nesting and wintering habitat for thousands of migratory birds, as well as habitat for many other species of wildlife.

tip ***If your property is located on an estuary or salt marsh, consider inviting a biologist to help identify the vegetation and wildlife. You may be the guardian of several unique species!***

Variety...the spice of life

An effective buffer mimics the complexity of nature. Vegetation of different heights, types, and ages grows all mixed together. In a healthy natural shoreline, new saplings crowd up next to their parent tree, rotting wood from fallen trees provides nutrients for new grasses and shrubs, and cover for young fish. Tall plants provide shade and protection for smaller ones and, as they die, make room for new ones to grow. All this framework, both above and below ground, acts like a skeleton, holding the structure of your shoreline together.

An effective buffer generally has a mix of different types of plants, ranging from low-growing grasses, flowers, ferns and other plants to shrubs and trees of various heights. Plants with deep, binding root masses help hold the shoreline together. There may be some standing dead trees, signifying that the buffer is renewing itself. Note that some soils (such as very wet or sandy soils) may not support the full variety of vegetation described here, but the buffer can still be healthy and functioning.

In the aquatic buffer, shoreline plants such as grasses, reeds and cattails, other emergent plants such as water lilies and submergent plants such as eelgrass, kelp and pondweed (what we often call water weeds) bind the soil, break the force of waves, and function as a collective kidney, filtering pollutants and purifying the water. Remember though, that they, like us, can only cope with a certain level of toxins; overdosed, they can die!

Don't bare your soil!

Any bare ground we create – by paving a boat access, importing sand for a beach, or using a path until there is no vegetation left – decreases the effectiveness of our buffer. And when we harden our shoreline with retaining walls or solid docks, we can severely interfere with the buffer's ability to work. *See Chapters 7 and 8.*

Beware alien invaders

Invasive plants ("alien invaders"), discussed in Chapter 7, have the potential to interfere with the functions that a buffer performs. A healthy functioning buffer is free of them.

Fresh and Saltwater Wetlands

Wetlands are an important element of your property that need buffering and protection, just as much as a freshwater lake or ocean inlet. A healthy wetland, like a healthy shoreline, safeguards your water supply through filtration and by replenishing groundwater, and plays a vital role in the survival of many species of amphibians, reptiles, water birds, mammals and specialized plants.

All wetlands have three things in common – water, water-saturated soils and water-tolerant plants. Wetlands combine features of both land and water.

- **Freshwater wetlands tend to develop in places where water collects and remains at or near the surface, and they can range from small depressions that hold water only after spring runoff, to forested swamps with saturated peat soils. They can be found beside streams and lakes, as well as low lying areas. If you have them along your shoreline, they will be part of your aquatic buffer.**
- **Estuaries are areas where freshwater from a creek or river meets and mixes with the saltwater of the ocean.**
- **Salt marshes can be found between the muddy tidal flats that are exposed at low tide and higher dry land.**

Nurturing your Buffer

Restoring a buffer

If your buffer zone has been altered by years of human occupation, it is possible to restore some of its natural functions. You can start small by leaving it alone and letting nature take over; if you maintain a lawn to the water's edge, stop mowing the area along the shore. Over time, your turf grass will grow longer, and native plants from surrounding areas will gradually move in. You can speed things up by removing turf and planting nursery stock. If your shoreline is eroding, of course, you'll need to take more direct action using a careful, planned approach. Chapters 7 and 8 provide planting tips and suggestions for softening a hardened shoreline and for dealing with erosion. Look for the Shoreline Restoration icon in these chapters.

Because you are working to create something that nature would have created in the first place, your work will be easier. You'll find new plants springing up, and if you leave them alone, chances are they'll thrive and spread over time. Gradually, a mix of plants of different ages will develop, and your property will reap the benefits of the buffer.

CAUTION: ***A reminder – you'll need to watch out for "alien invaders".*** *See Chapter 7 and Appendix 2.*

When you start the process of restoring a buffer area, make sure that you consider your own needs for access, recreation, and views, as well as what the buffer requires to function effectively. In this way you'll have a design you can live with.

Building on your land

In Chapter 4 we give tips for construction, and for protecting your buffer when clearing a building site. Leave the edge of the buffer uneven with a mix of plant heights and types, and clusters of vegetation. This kind of variety helps provide lots of fallen leaves, needles and twigs to slow water runoff and encourage absorption. It also provides useful habitat for birds and small mammals looking for food and shelter.

Accessing the water

In Chapter 9 we suggest ideas for minimizing buffer damage when you create access to the water's edge, by creating the smallest possible "puncture" in your buffer. Try to keep as much of your shoreline untouched as possible, and focus your access pathway and other activities in one general area. On steep shorelines, any access may cause instability, and you may need to look at alternate ways of reaching the water, such as using a nearby public dock.

Where have I heard that before....?

As you read this book, you may notice that maintaining or restoring a buffer zone is a common theme repeated throughout. This is because the benefits of the buffer relate to many areas of waterfront living: shoreline landscaping, erosion control, water quality, construction, septic systems, hobby farming, recreation, wildlife, natural beauty.... the list goes on. Protect your water, your investment in your property, and your health. Nurture your buffer and save yourself time, headaches, and money.

tip ***Metre by metre... yard by yard. Show your buffer to your neighbours. Re-establishing buffer zones is something we can each contribute to, a metre at a time and one yard at a time!***

CAUTION

Shorelines, especially those beside fast currents and banks, bluffs, cliffs and rocky areas, can be dangerous places. Take all necessary precautions whenever you are planting or doing any other work in hazardous areas.

Resources

The Shore Primer: A Cottager's Guide to a Healthy Waterfront. Fisheries and Oceans Canada. www.dfo-mpo.gc.ca/publications/Shore%20Primer_e.pdf

Lakescaping for Wildlife and Water Quality. 2000. Henderson, Carrol L. et al. Department of Natural Resources: St. Paul, Minnesota.

See Appendix 1 for complete Resources.

Treat your shoreline like the delicate treasure that it is...not just another frontage to be cleared and readied for construction.