

Managing Streamside Areas with Buffers

Tips for Small Acreages in Oregon

The Good Life at Water's Edge

Sparkling water and lush plants draw us to fish, swim, and live near streams and lakes. But the choice to live and play near water comes with the responsibility to take care of what attracted us there in the first place. Before anyone knew better, people "tidied up" their properties. They removed native plants and planted pastures, crops, or lawns up to the water's edge. Now we know that a good mix of trees, shrubs, and grasses next to the water bring a wealth of benefits to the landowner and all who live downstream. Near stream areas can provide flood and erosion control, wildlife habitat, and higher property values. Read on to learn how to protect your environmental and real estate investment.

"What we needed, the fish needed."

- Alistair Bleifuss, describing a buffer that protects his streambank and improves fish habitat

Is Your Riparian Area Healthy?

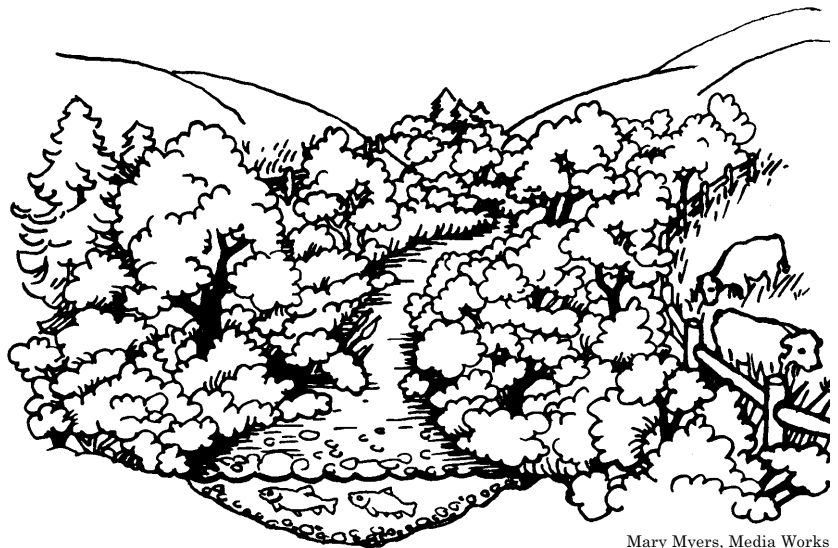
A *riparian area* is the land next to lakes, streams, and wetlands. It has a high water table, occasional flooding, and many valuable benefits (see next page). Signs of an unhealthy riparian area include:

- Raw banks erode and fall into the stream.
- Water is not shaded and heats up in sun.
- Streambanks are wide and shallow from livestock trampling.
- Severe grazing leaves few desirable trees, shrubs or grasses.
- Stream gravel is covered with sediment.
- Noxious weeds invade area and leave no habitat for fish and wildlife.
- Groomed landscape adds runoff with fertilizers, pesticides, and soil to the stream.

- Overhanging trees and shrubs shade water (50 percent or more of bank area).
- Animals are fenced off fragile banks.
- Livestock graze forage and drink clean water in upland pasture.
- Stream gravel is free of sediment (85 percent or more of bottom).
- Native plants and non-invasive exotic plants provide a diverse habitat for wildlife.
- Buffer with trees, shrubs, and grass filters upland runoff.

A *riparian buffer* is an area next to water that cushions the negative impacts that land and water may have on each other. It is often made up of trees, shrubs, and grasses. Examples of a healthy riparian buffer include (levels for good fish habitat are in parenthesis):

- Trees, shrubs, grasses, sedges, and rushes stabilize banks (80 percent or more of bank area).



Mary Myers, Media Works

Benefits of Riparian Buffers

A riparian buffer works for you in a lot of ways you can't immediately see. The following list describe the benefits of a buffer in detail:

Traps eroded soils.

USDA reports that up to 64 percent of the sediment found in streams comes from cropland, pasture, and range. Eroded soils cloud the water, suffocate fish eggs, and scratch the delicate gills

of fish. Sediment fills streams and pushes floodwaters out of banks. A grass buffer can stop up to 70 percent of the soil from entering a stream.

Treats land runoff.

Overland runoff and drainage tile can carry fertilizers and pesticides directly into streams and lakes. Buffers are "last chance stops" where these pollutants are broken down by plants and soil microbes before pollutants can enter streams. Tree and grass buffers remove up to 50 percent of the nitrate and phosphorus in water that might otherwise pollute a stream.

Holds down flood damage.

Trees and shrubs block floating debris from washing onto upland areas. Forest and shrub buffers have stems that slow water and roots that hold soil in place. Grasses, sedges, and rushes reduce soil erosion and increase the amount of water entering soil. Riparian areas with trees generally experience less damage than those planted to grass or crops.

Increases stream flows in summer.

Forest buffer soils take in water up to 15 times faster than pasture or cropland soils. This "buffer sponge" has tremendous water storage capacity and slowly releases water to add to summer flows.

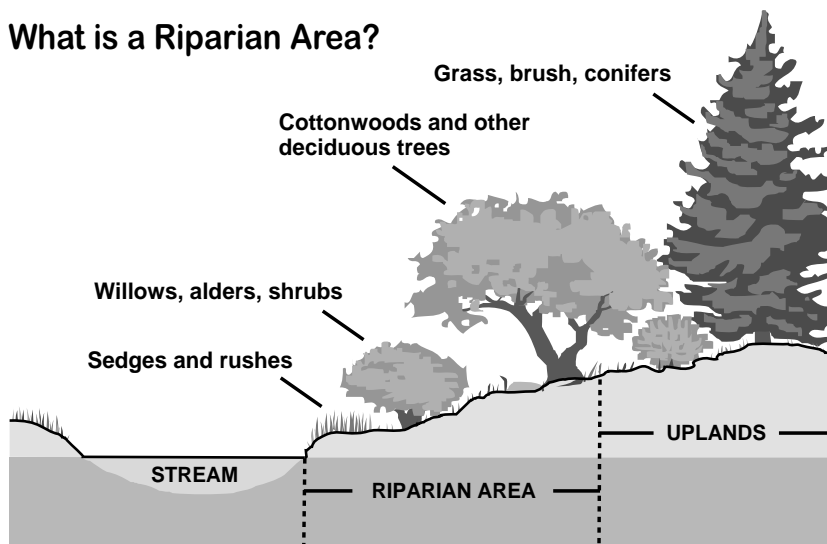
Provides food for the biggest fish.

Overhanging trees and shrubs drop leaves, twigs, and insects into the water and become food sources for aquatic insects. The aquatic insects are eaten by small fish, which are eaten by bigger fish, and so on up the food chain. Trees fall into the stream and provide log shelters for fish. Small, well-shaded streams can supply up to 75 percent of the food base for an entire river system from the headwaters to an ocean estuary.

Creates habitat for wildlife.

Small animals come down to drink, eat, shelter, and hide in the green curves next to water. Larger animals travel the cool corridors that connect one habitat area to another. In eastern and western Oregon, 74 percent and 94 percent of the land animals depend on riparian zones, respectively.

What is a Riparian Area?



Montana Dept. of Natural Resources and Conservation

Relative Advantages of Different Riparian Plant Types

Benefit	Grass	Shrub	Tree
Stabilizes bank erosion	Low	High	High
Traps sediment	High	Low	Low
Filters nutrients, pesticides, and bacteria			
Attached to sediment	High	Low	Low
Dissolved in water	Medium	Low	Medium
Provides in-stream habitat	Low	Medium	High
Provides wildlife habitat			
Grassland wildlife	High	Medium	Low
Forest wildlife	Low	Medium	High
Economic products	Medium	Low	Medium
Attractive landscape	Low	Medium	High
Flood protection	Low	Medium	High

Adapted from *How to Design a Riparian Buffer for Agricultural Land* (AFN-4), USDA National Agroforestry Center.

How to Design a Riparian Buffer

One example of a buffer design that provides many benefits follows. It combines 50 feet of trees, shrubs, and grasses planted next to the stream. This design requires 6 acres of land per stream mile (or 12 acres per stream mile, if installed on both sides of the stream).

1) Streamside zone - 20 feet / 2 to 3 tree or shrub rows

(measured from the top of streambank). Trees protect the streambank, slow floodwaters, and take up nutrients. A mature riparian forest is best left undisturbed. If a fast-growing tree buffer is needed, plant trees such as cottonwood, alder, and willow. These trees and shrubs will form quick roots for bank stability. Add conifers that will provide durable wood for fish shelters. If you are concerned about trees tearing out banks as they fall, plant shrubs in the streamside zone and trees in the middle zone. Include sedges and rushes in wet areas to increase the plant diversity. Limit activities to recreation and flood damage control. Fence livestock out.

2) Middle zone - 10 feet / 1 to 2 tree or shrub rows.

Trees and shrubs slow floodwaters, take up nutrients, and provide wildlife habitat. Here, buffer width can be increased to include the 100-year-floodplain, steep slopes, or adjacent wetlands. Limited activities are possible to produce forest products or increase recreation.

3) Near-field grass zone - 20 feet / grass strip.

Grasses are the best at trapping eroded soils in runoff. This zone can include the most activities. On farmed ground, this area may be pasture or hay with proper management. Near homes, this area may be lawn or garden with careful management of fertilizers and pesticides. New structures or septic systems should be excluded from this area.

Buffer widths will depend on landowner objectives, site conditions, and local rules. Here are some examples where:

Buffer width is adjusted down.

If a stable streambank is your only concern, a narrow strip of trees and shrubs is better than no buffer at all. Engineered structures may need to be added to protect the bank. If the stream meanders, width may vary to straighten out field borders. For creeks that dry up in the summer, buffer trees and shrubs won't be needed to shade water. However, a grass buffer that filters overland flow may be useful.

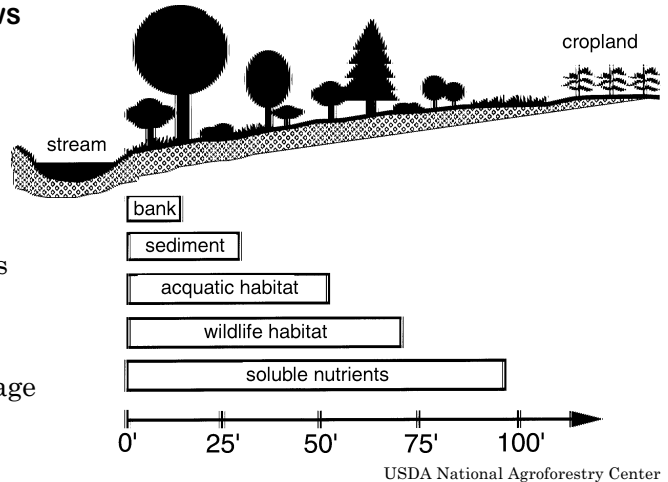
Buffer width is adjusted up.

If the slope above the stream is steep, a wider buffer is needed to adequately treat runoff. For maximum flood protection, a buffer extending the width of the 100-year floodplain may be desirable. If you are installing a buffer with cost-share, most programs require greater widths. The USDA Natural Resources Conservation Service recommends widths from 35 to 300 feet, based on site conditions and landowner goals.

Do Small Streams Matter?

You bet. Even streams that dry up in the summer, because the next hard rain will flush pollutants in the creek bed down the river. Small streams are sensitive and react quickly to changes in riparian areas. When added together, these feeder streams can deliver cool, clean water or a polluted punch to larger rivers. All the benefits of riparian buffers on large rivers apply to small streams, only more so.

Estimated buffer widths for desired benefits.



Montana Stream Management Guide

Installing and Keeping a Buffer in Top Shape



Replanting may be needed to improve a degraded riparian area. To decide what to plant, look at what's already growing at your site:

- Keep existing native plants.
- Plant more of the same. These plants are most likely adapted to conditions from your area.
- Add different native plants that are adapted to your conditions and increase diversity.
- Remove invasive plants such as yellow starthistle, English ivy, deadly nightshade, field morning glory, scotch broom, cheatgrass, and purple loosestrife.
- Maintain the buffers. Harvest grass buffers for livestock feed to remove nutrients trapped by

the buffer. Level eroded soils that have been trapped by the buffer. This will provide an even water flow for good filtration. Control grass that overtops tree and shrub seedlings for at least 3 years. Protect woody seedlings from mice, rabbits, nutria, or beaver.

- Grow native plants from seed or cuttings (willows and dogwood) or buy plants from nurseries. Do not take *rooted* native plants from the wild. This practice destroys wild plant communities and survival is very low. One exception to this is rescuing plants from construction sites with landowner permission. For information specific to the Willamette Valley, see the *Guide for Using Willamette Valley Native Plants Along Your Stream*, South Santiam Watershed Council publication, (541) 967-5927.

Meeting Buffer Costs, Making Buffers Pay

Some landowners worry about the cost of installing buffers and losing productive land. It's a reasonable concern. To defray costs, some landowners produce saleable products from their buffers. These products include hay, saw timber, chip material for pulp, nuts, berries, and hunting rights. Others have found that greenbelts and wildlife areas increase the property sale values by 10 to 20 percent. Landowners have also used cost-share programs and reduced property taxes when installing buffers. For more information, see the listed agencies under For Help.



- The local soil and water conservation district (SWCD) and USDA Natural Resources Conservation Service (NRCS) provide on-site technical advice to create, enhance, and protect riparian areas through several cost-share programs. Contact your local SWCD and NRCS office for more information.
- The U.S. Fish and Wildlife Service's Partners For Wildlife Private Lands and Jobs in the Woods Programs fund projects that create, enhance, or restore riparian areas and wetlands.
- The Oregon Department of Fish and Wildlife administers the Riparian Lands Tax Exemption program that provides tax incentives to preserve riparian areas.
- Commercial nurseries, the Oregon Department of Forestry, and your local soil and water conservation district may sell native trees, shrubs, and grasses.
- The local Extension Service office or the Oregon Department of Agriculture Noxious Weed Program at (503) 986-4621 may provide recommendations on removing weeds

