



What all waterfront landowners should know

Riparian buffers (streamside plants) link the land and the water together. Whether your waterfront slice is on a large stream or a small, intermittent tributary, the water is affected by what happens on your home turf. In fact, we are all riverfront landowners because we live in the Chesapeake Bay watershed — even that storm drain at the bottom of your driveway or street eventually leads to a waterway.

The bad news is that a residential neighborhood can be a major source of pollution. Water flowing over roads, lawns, and yards picks up sediments, lawn fertilizers, pesticides, herbicides, heavy metals, and other pollutants that people don't want in their waterways. Americans have long loved the park with its neatly trimmed grass. But disturbing the riverfront to expand a lawn, create a view, or build a boat landing invites these troubles:

- ▶ **erosion:** cutting riverbank vegetation destabilizes the shoreline and can lead to loss of land. The area between the water's edge and the top of the bank must stand up to scouring currents, fluctuating water levels, moving ice, flooding, surface runoff from higher ground, and, on a large river, boat wakes and wind-driven waves.
- ▶ **flooding:** land development increases runoff from impervious surfaces such as roofs, roads, sidewalks, and parking lots. Rainwater can run off lawns twice as fast as from forests. More water reaches the stream faster than it would naturally, causing it to flood during heavy rains and run low or even dry out during dry spells.
- ▶ **water damage:** building structures within the riparian area places them in harm's way.
- ▶ **unsightly algae blooms:** just as fertilizers make your lawn green, they make your river green by feeding algae and aquatic weeds.
- ▶ **damage to fisheries:** clearing trees exposes waters to more sunlight, raising water temperatures and stressing fish and their food supplies.
- ▶ **loss of habitat:** the river's edge is prime real estate for birds and other wildlife. Backyard bird feeders are no substitute for good plant cover and natural food.
- ▶ **loss of privacy:** Our central Pennsylvania streams have been discovered by anglers, kayakers, and swimmers. Shoreline vegetation screens homes from public view.



BUFFER BENEFITS

The good news is that plants protect your property by slowing runoff and allowing it to soak into the ground, recharging wells and reducing flooding. Roots help hold the soil and control erosion. Trees cast their shade over the water to keep it cool for fish and frogs, and provide perching places for birds. Buffer plants can provide seasonal blooms and autumn color to beautify your yard while attracting butterflies and birds.

The backyard buffer: boundary between the natural and man-made worlds for your watershed

Permanent vegetation along your stream bank provides a “living filter” for both surface and subsurface water running off the land, while providing your home landscape with privacy and the pleasure of watchable wildlife. The flood and erosion “insurance” provided by a riparian buffer is all the more important now that weather patterns are taking a turn. Whether global climate warming is natural or human-induced, Pennsylvania is seeing a definite shift toward heavy storms that deliver several inches of rain in a single day. Sturdy plantings on your stream bank are the best protection you can provide for your own property and your neighbors. No stream is too small to benefit from a buffer. In fact, the smaller the stream, the more your buffer will help. It is those many little streams that make up our creeks and rivers.

ANATOMY OF A RIPARIAN BUFFER

Use the description below as a general guide which can be altered to fit the available space between the water and your home. Every bit of buffer counts. Even a 50' buffer is better than no buffer at all.

A THREE ZONE BUFFER SYSTEM — the most effective backyard buffer has three zones:

- ▶ **Streamside:** from the water to the top of the bank. Protects the bank and offers habitat. The best buffer has mature forest but large shrubs may be a better choice where trees have collapsed a bank. Let it grow and let it go for the best protection.
- ▶ **Middle zone:** from the top of the bank inland. Protects stream water quality and offers habitat. It varies in width depending on size of stream and the slope and use of nearby land. The best buffer has trees, shrubs, and perennial ground plants. It can allow some clearing for recreational use.
- ▶ **Outer zone:** the yard, garden, or woods between your home and the rest of the buffer. Traps sediment; play areas, gardens, compost piles, and other common residential activities are suitable here.

BEGINNING YOUR BUFFER

First Steps

Spend some time outside during a heavy rainstorm, watching your property to see where the water goes. Your buffer does the best job of filtering runoff when the water spreads out and does not flow straight to the stream in a channel. Re-grade, or use stones or landscape timbers to divert runoff into flatter areas where it can soak in. If your land receives storm water runoff from a road, an engineer's advice is useful.

If you have an unstable bank, deal with this first. Remember that a buffer will provide good insurance for your riverbank. Your county Conservation District office has an inventory of erosion sites on many local streams.



A Buffer is a right-of-way for a stream

Choose building sites wisely: protect your property and the stream by not building in the Yellow Breeches' flood plain. Streamside land is a high risk area for development even above flood elevation, since a channel may not stay where you wish it would. Don't be fooled into thinking that you can dramatically change a natural shore land to fit your desires. *Be certain to get any required permits before starting any work on a riverbank or in a wetland.*

The first goal is to avoid planting a lawn to the water's edge. This is the worst and most common mistake homeowners make in setting up housekeeping next to water. Lawns have no habitat value (except for mice and moles). They put your property at risk for erosion, and deliver lawn chemicals directly to the stream, to say nothing of ruining the fishing. You don't have to return your entire yard to a natural forest to protect a stream, however. A lawn nearer your house can work as part of your riparian buffer, by soaking up runoff and catching sediment from driveways and bare ground.

If You Have a Lawn to the Water's Edge

You can begin a buffer by starting a wildflower meadow on the water side of your lawn. Create islands of non-mowed areas around the edges of the lawn. Seed these with wildflowers, and mow around them if you want a tidier look. Eventually allow these wildflower islands to expand until they create a continuous garden by the water. Keeping grass at a height of 2½-3" encourages deeper rooting to withstand heat and drought. You can create an appealing waterfront garden landscape while eliminating time-consuming lawn care and watering. The no-mow option is the least expensive and the easiest; the lawn will gradually become a meadow, shrubs will move in, and then trees. If you want to keep part of your yard as a wildflower meadow, mow once every two to three years, except along the immediate stream bank. You can also encourage your meadow to fill in with trees and shrubs, by letting the birds plant them for you. Don't mow, and plant one or two berry-bearing shrubs or trees. This attracts the birds to perch in your yard and distribute seeds through their droppings. Of course, you can speed the process up by planting more nursery-grown plants. (Be sure they are native – check the list attached.)

If Natural Vegetation Remains

Consider retaining the natural beauty of a wooded shoreline. You might like the way a natural buffer looks — a carefree collection of native plants. If that's what you have, your best option is to let nature alone. If large trees block your view, consider careful pruning rather than removal. You can always cut a tree later, but it takes decades to replace a mature tree, and its root system is better at removing pollutants. Keep heavy equipment at least 25' from trees you wish to save, and avoid changing the grade around their roots.

Access to the Water

Frame your view of the river or stream with plants that add to your property value, or by careful pruning. If foot access to the stream is important, lay out a curved path and plant around it. Grade the path if necessary to keep it from becoming a tiny stream channel during rainstorms. Slopes over 15% require constructing steps or stairs. Try to keep children and pets on this path to discourage them from trampling the rest of the riverbank. Choose fence locations with equal care—fences built on flood plains near the water have a bad habit of catching ice floes and debris.



Select Native Plants

Native plants are far better for buffers than exotic ones. Many trees, shrubs, and herbaceous perennials used in conventional landscape plantings are non-native species from Europe or Asia. A number have escaped from cultivation to become pests. Their novelty can also attract nuisance wildlife. Aggressive exotics can overwhelm native plants and turn your yard into a virtual desert where wildlife is concerned. You don't have to settle for a dull buffer, however. Many native plants are particularly attractive, with showy flowers, berries, branching habits, and autumn color. The buffer is also a good place to grow the family's Christmas trees.

Visit some nearby natural areas to see what grows there. You're better off copying Mother Nature: these plants have proven their ability to survive there with no care. They're resistant to most diseases and insects, are adapted to the local climate, and they're what wildlife expect to find. The *Native Plant listing* identifies native plants with ornamental value and those that attract birds, butterflies, or other desirable wildlife.

Since the backyard buffer forms the boundary between the natural and man-made worlds, the most successful streamside planting design aims for a less manicured look than one might expect on the street side of the home landscape. Group plants in odd-numbered clusters and repeat plants across the waterfront for a naturalistic effect. Do not try to transplant wildflowers from the wild — it often fails and can be illegal without the landowner's permission. Purchase nursery-grown wildflowers from a responsible supplier.

THE BETTER BUFFER

The best safeguard for water quality, both in the river and in your well, is woodland. A variety of trees and shrubs will do the best job of filtering runoff and providing habitat diversity for wildlife. The bigger the buffer, the better. Trout streams, those used for water sports, and sources of drinking water need the most protection. You need a wider buffer if you have a lawn, landscaped area or garden where fertilizers and pesticides are used, or if there are parking lots, roads, or hillsides sending runoff through your yard into the stream.

Add buffers between your house and the street to filter runoff before it enters a storm drain or ditch on its way to a river. Another good place for buffers is along a parking area or driveway, where they can be disguised as perennial flower beds, shrub borders, or fern gardens. Trees planted on the south or west side of your stream will do the best job of shading and cooling its waters for fish. Trees cannot entirely shade rivers wider than 75', but they can still help hold the soil, filter runoff, and provide habitat.

CARING FOR YOUR BUFFER

The best care is the least care when it comes to a stream buffer. Resist the urge to tidy up. A natural forest floor, with its "litter" of fallen leaves and twigs, helps the buffer break down pollutants and soak up water. Raking or removing them defeats its purpose. Fish appreciate natural woody debris which falls into their stream because it provides hiding places and creates resting pools. Remove only debris that could form dams and cause inundation. If a large tree threatens to fall from a steep bank, cut the tree if you're concerned that it will pull the riverbank with it, but leave the root system in place.



You can mulch with pine needles or bark chips on high visibility areas if you wish, and leave the rest alone or shield the forest floor with ferns or other herbaceous plants. Fresh wood chips should compost six to twelve months before use. Cedar and redwood bark mulch are not recommended for stream buffers because their chemistry interferes with the removal of excess nutrients and other pollutants. If you must fertilize near the water, use only lime or wood ash.

Mowing and removing clippings from a lawn on the land edge of the buffer helps recycle nutrients it has captured and promote vigorous sod growth. Watch your buffer for signs of erosion or channeled runoff. Keep pet droppings from washing into the stream. Remember that Nature will probably rearrange your efforts to some degree, and that as the buffer grows, natural succession will replace shorter-lived plants with more shade tolerant, long-lived plants.

WHAT ABOUT COST?

It's hard to put a dollar figure on your time behind a lawnmower or the value of watching wildlife. Here are some of the costs and benefits involved in adding a buffer to your backyard:

Costs

- ▶ wildflower seed
- ▶ plant material: use cuttings or bare root plants from a native source; nursery grown plants are more expensive but more reliable
- ▶ mulch; pine needles can be gathered and highway crews can supply chips for free
- ▶ labor in planting
- ▶ labor in mowing: once/year for meadows

Benefits

- ▶ less time spent mowing lawn and maintaining yard
- ▶ less money spent on fertilizer, pesticides, herbicides, fuel, and equipment maintenance
- ▶ reduced air conditioning costs if house is shaded by buffer plants
- ▶ reduced heating costs if buffer plants provide winter windbreak
- ▶ more stable shoreline: avoid costs of engineering design, permits, bank stabilization
- ▶ more interesting birds, butterflies, and wildlife to watch
- ▶ better fishing
- ▶ cleaner, safer, more attractive water for recreation
- ▶ safer, more reliable drinking water from on-site well
- ▶ better flood protection
- ▶ possible tax benefits from conservation easement on buffer
- ▶ increased general property value
- ▶ the buffer plants provide increased privacy