

BERKSHIRE PLANNING TOOLS



One in a series of “toolbox” items to accompany the Regional Plan for the Berkshires

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VEGETATED BUFFERS

What is a Vegetated Buffer?

The primary function of vegetated buffers is to physically protect and separate a stream, lake or wetland from human disturbance or encroachment. Vegetated buffers can be strips of grass, shrubs, and/or trees along the banks of rivers and lakes that provide a transition zone between water and human land use activity. Buffers are also complex ecosystems that provide habitat and improve the stream and river communities they shelter.

One of the most important benefits of vegetative buffers is that they serve as ‘living filters’. Buffers impede unwanted pollutants and sediments from reaching the water body by physically filtering pollutants from surface runoff. They help to collect trash, trap animal waste, and filter and trap sediments by slowing down the velocity of stormwater runoff.

Vegetative buffers also work underground, filtering pollutants through soil and root systems and allowing for more constant water level and temperature through groundwater recharge.

What is the Importance of Vegetated Buffers?

Sediment Filter

Several pollutants are known to bond to sediment particles, so capturing it is especially important. Particulates are a major conduit for pollutants such as phosphorous, bacteria, petrochemicals and heavy metals. In addition, phosphorus and nitrogen from fertilizer, detergents and animal wastes can become pollutants in excessive amounts.

Sediment can also scour banks, causing erosion and more sediment in the water column. Sediment deposits can also smother habitat and developing fish eggs, and build up to a point that it lowers flood storage capacity.

Nutrient Transformer and Sink

As much as 80-85% of phosphorous in runoff can be captured when sediment is trapped in the buffer. This includes capturing sediment on the surface, filtering the water as it percolates through the soil, and absorbing soluble phosphorous through root systems.

Water Level and Temperature Regulator

Trees along the buffer zone cast their shade over the water and keep it cool for fish and other aquatic species, which is crucial in maintaining cooler water temperatures. Higher temperatures cannot hold oxygen as well as lower temperatures, and this causes harm to fish and other aquatic species. A few degrees difference in water temperature can have a major effect on fish survival.

By slowing the velocity of runoff and aiding infiltration through the soil, vegetative buffers also help to reduce flooding and recharge subsurface and groundwater flow. This allows for a more gradual recharge of the waterbody, helping to maintain water levels during the driest times of the year. Also, because water flows through the ground more slowly, it is cooled by the soil, reaching the water body at a more natural temperature as opposed to surface runoff.

Stabilize Eroding Banks

Vegetative buffers help to stabilize streambanks and prevent erosion from occurring. Tree roots and other vegetation help to keep the bank soil together. Vegetation on the bank minimizes the effects of flooding as well.

Contribute to the Natural Aquatic Food Chain

Leaves, twigs, and other organic matter from streamside vegetation can provide both food and breeding ground for instream invertebrates.

Provide Habitat and Travel Corridors for Wildlife

Buffers along rivers and lakes provide habitat to a distinct number of plant and animal species, including some that are rarely found outside the narrow region of a vegetated buffer zone, such as mink, muskrat, otter, and beaver. Ducks, belted kingfishers, eagles, osprey, herons, cormorants, and gulls also call vegetative buffers home. Some animal species, such as several kinds of turtles, frogs and salamanders need a combination of water and land to live and breed. Continuous stretches of buffer zone serve as wildlife travel corridors for these and several other types of animals. In addition, birds and butterflies need shrubs and the lower branches of trees to provide them with cover and a place to escape predators.

Provides Privacy to Landowners

Vegetated buffers can provide privacy to a homeowner's property, while at the same time be beneficial to wildlife and water quality. Vegetated buffers can be designed to meet the needs of the property owner -- a mowed path through the buffer can maintain access to the water and vista pruning of tree limbs can maintain views of the water.

Deters Canada Geese

In unnaturally large numbers, Canada Geese can be a source of high bacterial counts. They love succulent green grass, but will not travel through tall grasses or dense vegetation to get to it. Planting a mix of shrubs and trees acts as a barrier between the water and your lawn.

Attention Homeowners:

Follow These Tips for Better Buffers....

- Maintain or increase existing vegetated buffers along your water body.
- Enhance the grass buffers (lawns) you already have by planting native shrubs and trees. Natives provide the best habitat for our wildlife.
- Re-establish vegetated buffers where they have been lost.
- Plant and protect buffers in all streambank or lakefront restoration projects.

...And Realize These Backyard Benefits

- Less time spent mowing and maintaining yard due to less lawn.
- Less money spent on fertilizer, pesticides, and herbicides, because native plants generally require less care.
- Increased shade in summer and reduced air conditioning costs if yard and house are shaded by buffer trees and shrubs.
- Solar heat benefits continue when buffer trees are deciduous.
- More stable shoreline.
- Increased wildlife viewing in your yard.
- Clearer and cleaner water for recreation.
- Better flood protection.
- Increased general property values, due to the benefits listed above.

Attention Municipal Officials:

Education and Outreach

When homeowners understand the many environmental and aesthetic benefits that can be derived from vegetated buffers, they are often more receptive to the idea of creating buffers on their own property. Communities can create flyers or host informational workshops to spread the word. These are activities that can be sponsored by the conservation commission and/or the planning board.

Change in Town Management Practices

Many communities can begin to promote vegetated buffers by changing the way they do business themselves. One way this could be achieved is to educate the local DPW on the importance of vegetated buffers, and ask that they incorporate buffers into new work. Another low cost technique, one that may actually save money, is to simply request that the DPW personnel stop mowing the grass along water bodies to encourage a natural buffer. A mowed path will maintain access.

Orders of Condition

As conservation commissions review development projects, there often exists an opportunity to specify that vegetated buffers either remain in their natural state or that they be planted as a component of the project. This must be specified in the Orders of Condition that is issued for the project.

Site Plan Review

A process for reviewing and approving commercial, industrial, and other large development proposals, site plan review is an opportunity to require developers to minimize negative environmental impacts. Maintaining or creating vegetated buffers along water bodies certainly play a role in this.

Overlay District

A special district can be placed over existing zoning districts around specific water bodies and wetlands, which supercedes requirements of the underlying zone. Certain uses can be prohibited and extra protection measures, such as vegetated buffer requirements, can be created.

Local Wetlands Bylaw

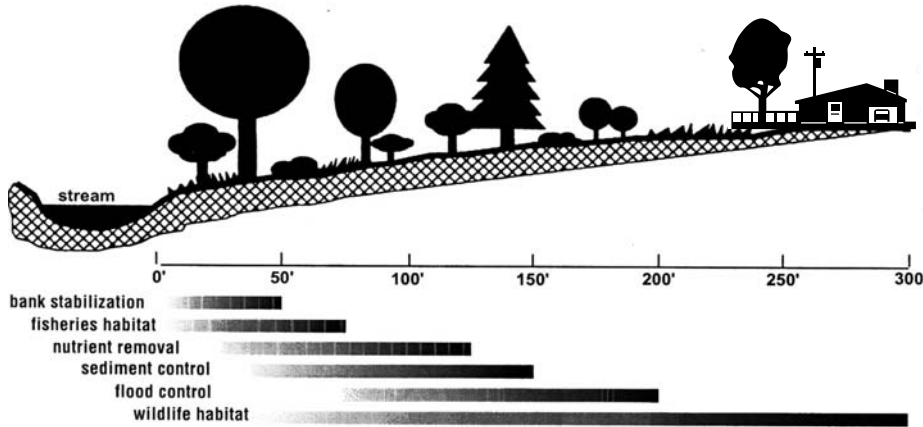
A non-zoning wetlands bylaw, administered by the conservation commission, gives a municipality the authority to regulate activities in or near wetlands by imposing stronger protective measures than the state Wetlands Protection Act. For example, a wetlands bylaw can designate upland areas within 100 feet of rivers, lakes and wetlands as resource areas, not merely buffer zones, and as such affords them added protection. It can also stipulate other protective measures, such as minimum building setbacks or “no build areas”, to protect water quality and wildlife habitat.

How Wide Should the Buffer Be?

-One size does not fit all! In general, at least a 100-foot vegetated buffer is best. However, it depends on what human activity one is buffering the water body from (development, agriculture, or industry) and what our site specifications are (soil type, slope, and the mix of vegetation within the buffer).

-However, even a small buffer is better than no buffer. A 35-foot buffer can function well along a residential property under the right conditions.

-Buffer width also depends on what the buffer is designed to accomplish (i.e. sediment filter and/or capture, nutrient sink, water level/temperature regulator, wildlife habitat, bank stabilization). For instance, some wildlife species require 200-600 feet of vegetation to flourish and breed successfully, while sediment and nutrient control requires 100-15 feet of buffer, and bank stabilization will require much less of a buffer. Remember, these are general terms and the true width of the buffer will depend on site specifics.



To the left are generally recommended widths for specific functions. True width depends on site specifics.
 Source: *Buffers Fact Sheet #1*, CT River Joint Commission, 1998

**Case Study:
 Landscaping With A Richer Mix Of Vegetation**

Pictured below is a photograph of a Western Massachusetts lakefront property. The vegetation along the lake is lush with native ferns, grasses, wildflowers, shrubs and trees. This picture was taken of the lake, with the house behind us. Some highlights of the property are these:



- Access to the lake is maintained by keeping a mowed, grassed pathway to the water.
- View of the lake is maintained by selective pruning (Note: leaving a few lower branches would be beneficial to birds and butterflies).
- Mix of upland lawn and lower natural cover provides a pleasant mix of sun and shade in the summer.
- Deciduous trees allow desired solar rays on the property during the winter.
- Mowed lawn is maintained around the house for picnicking, lounging, and family games.

- Unwanted shrubs or saplings are weed-whacked once every one or two years.
- Smaller lawn means less mowing and more time for enjoying the lake.
- Vegetation provides seasonal treats: fiddlehead ferns in spring and raspberries in summer.
- Canada geese do not visit the lawn because of the vegetated buffer near the water.

Resources For Homeowners

The Massachusetts Buffer Manual, BRPC, 2003. Available on www.berkshireplanning.org

Buffer Fact Sheets, available on the Conn. River Joint Commission website at www.crjc.org.

Resources for Municipal Officials

Model Wetlands Bylaw can be found at: Mass. Assoc. of Conservation Commissions, 617-489-3930 or www.maccweb.org

Zoning bylaw information can be found at: Citizen Planner Training Collaborative, UMass, Amherst or www.umass.edu/masscptc.