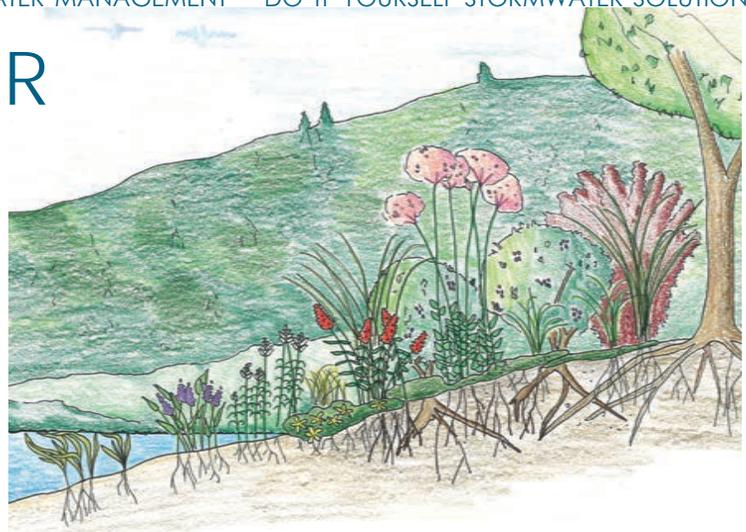


# VEGETATED BUFFER

A vegetated area along a waterbody that stabilizes the shoreline and provides wildlife habitat and shade. Buffers help slow down and clean stormwater runoff.



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## DESIGN CONSIDERATIONS

**STEP 1 – Location.** Buffers are beneficial along all types of waterbodies from small streams to large rivers and bays. Vegetated buffers are located between the water and the built portions of a property, such as buildings, driveways, patios and lawns.

**STEP 2 – Check for local and state regulations.** Be sure to follow any local or state regulations regarding working along shorelines. Permits and other permissions are often needed before doing any work close to surface waters or wetlands. Contact your municipal office and [NHDES Shoreland Program](#) for more information.

**STEP 3 – Sizing.** The larger the buffer, the more beneficial it is to waterbody and ecosystem health. Even a thin strip of vegetation can help stabilize the shoreline. Consider the following when sizing your buffer:

**Length.** Where possible, extend the buffer along the entire shoreline – particularly in areas with steeper slopes. Consider the placement of walking paths through the buffer or installing additional practices such as water bars or infiltration steps to clearly define water access.

**Width.** The wider the buffer, the greater the benefits. Table 1 suggests minimum buffer widths for water quality protection based on slope, however, even a narrow buffer will help to stabilize the shoreline, slow down runoff and intercept falling rain. A buffer can vary in width, being wide where space allows and narrower where necessary. See Figure 1.

### EQUIPMENT & MATERIALS

- ✂ Measuring tape
- ✂ Spray paint
- ✂ Stakes
- ✂ String
- ✂ Shovels
- ✂ Rakes
- ✂ Compost/Woodchips
- ✂ Mulch
- ✂ Wheel Barrow(s)
- ✂ Plants

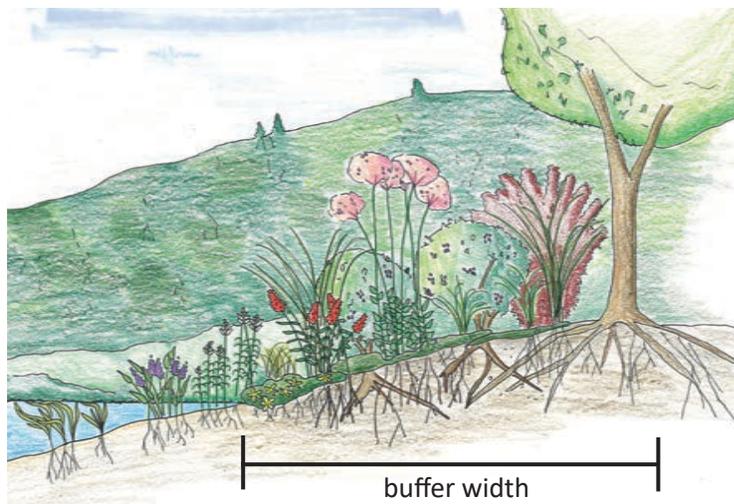
**Table 1 – Suggested buffer width by slope of land for water quality.**

Percent Slope	Buffer Width (ft)
0 - 1%	25
2 - 5%	35
6 - 9%	50
10 - 12%	65
13 - 15%	75

Note: Assumes buffer is not in wetland soils or ledge, and that the area does not receive channelized flow. Modified by the University of New Hampshire from USDA NRCS.

**Height.** We often think that buffers on shorefront properties will block the view of the water, but a well-designed buffer can enhance the view by:

- Layering the buffer with plants of various heights. Thoughtful placement of high and low vegetation can provide a screen where you want it, such as to block a neighbor's house, and can frame views that you want to emphasize, like the open water or the location of sunrises or sunsets.
- Selective removal of a few low branches can provide openings or "windows" to enjoy views from a house to the water without sacrificing privacy or the water quality and wildlife benefit of the buffer. Check local and state regulations before removing branches to make sure it is allowed.



**Figure 1.** The wider the buffer, the greater the benefits to the waterbody.

**STEP 4 – Plant selection.** If creating a landscaped or enhanced buffer (see Table 2), selecting plants is similar to planning a perennial garden. Soil, light, wind and climate need to be considered. Salt tolerance may also need to be considered if your buffer will be next to a tidal waterbody or treated roadway. Consider the following recommendations when selecting plants for your vegetated buffer:

- Select a variety of groundcover, herbaceous plants, shrubs and trees appropriate for each zone within the vegetated buffer.
- Refer to *Landscaping at the Water's Edge: An Ecological Approach* for plant suggestions in the different buffer zones, including salt-tolerant species that survive well in estuarine and coastal landscapes.
- Refer to *Native Plants for New England Rain Gardens* for plant suggestions. While this list was developed for rain gardens, many of the species would do well in buffer plantings.
- Choose New England native plant species to enhance the ecological function of the buffer by supporting native wildlife species, including birds and pollinators.
- Consider the type of soil – sand, loam, clay – and select plants that prefer that soil type. If you are uncertain, look at what is already growing in the buffer zone on your property or nearby. As long as they are not invasive, add plants of the same species and feel confident they will likely grow well.
- Review the spacing suggestions for each plant and design your plan accordingly to give plants the space they need to grow to full maturity.
- Consider how you want the buffer to look and how much time you have to maintain it. Table 2 gives different approaches to establishing buffers.

**STEP 5 – Paths and water access design.** Access to the water through the buffer will likely be needed. Consider the following when planning pathways and access:

- Avoid straight paths. Instead meander paths across the slope to prevent channels from forming.
- Use materials that can infiltrate runoff, such as pea stone with stepping stones, or consider materials that can be compacted and do not easily erode, such as stone dust. Incorporate water bars to shed water off of the path and into nearby vegetation.
- Consider installing infiltration steps on steep slopes.

**Table 2 – Approaches to establishing buffers.**

Natural Buffer	Landscaped Buffer	Enhanced Buffer
<ul style="list-style-type: none"> <li>• Designate an area to stop mowing/maintaining and allow to grow.</li> <li>• Plants will slowly grow and fill in – must watch for invasives.</li> <li>• Takes the longest time.</li> <li>• Often the simplest and least expensive approach.</li> </ul>	<ul style="list-style-type: none"> <li>• Plant purchased or transplanted native and other non-invasive plants.</li> <li>• Quickest results – can be planted in phases.</li> <li>• Often the most labor intensive.</li> <li>• Often most expensive if plants need to be purchased.</li> </ul>	<ul style="list-style-type: none"> <li>• Combination of natural and landscaped – allow to grow in and add plants where desired.</li> <li>• Good middle ground for effort, cost, time and appearance.</li> </ul>

## INSTALLATION

**STEP 1 – Site preparation.** It may be useful to mark the perimeter of the buffer area with stakes and string. This is particularly helpful to identify no-mow areas if you are going to allow a natural buffer to grow. If you created a planting plan, identify where your plants will be placed, where your pathways will meander, and where your access points will be.

In New Hampshire, fertilizer use is prohibited within 25 feet of the reference line of a waterbody, which is usually the high water mark, and is restricted to slow-release nitrogen and low- or no-phosphorus fertilizer within the 250 feet of the reference line. Check your local rules, which may be stricter.

**STEP 2 – Planting landscaped or enhanced buffers.** Use good planting practices, such as those listed below. Place plants, while still in their pots, into the buffer according to the planting plan. Make adjustments for spacing as needed. When you are ready to plant, remove one plant at a time from its pot.

- Dig a hole twice as wide as the plant’s rootball and no deeper than the rootball.
- Loosen and rough up the rootball before planting, especially those rootbound in the container, to encourage healthy root growth.
- Set plants as deep as they were in their pots.
- If staking trees, make sure the trunks are allowed to sway in the wind.
- Water: For landscaped or enhanced buffers, water thoroughly (to a depth of two inches) just after

planting and daily during the first week. During the second week, water every other day. Then, water twice a week through the first growing season.

**STEP 3 – Mulching.** Spread two to three inches of mulch over the root zone of plants to provide weed suppression, slow release of nutrients, and additional moisture retention. Be sure to keep mulch a few inches away from plant stems and trunks.

## MAINTENANCE

**WATER:** Newly planted vegetation needs regular watering for the first two growing seasons. A good rule of thumb is give plants about an inch of water twice a week. Cut back to watering once a week in fall and in the next growing season.

**INSPECT:** Inspect plants frequently for stress – wilting, discolored leaves, etc. If one type of plant doesn't do well, consider replacing it with a species that is thriving.

**WEED:** Weed as needed, or allow native and non-invasive “weeds” like goldenrod, Queen Anne's lace and yarrow to grow. Be on the look out for invasive plants, such as oriental bittersweet and purple loosestrife. Carefully remove invasives in a way that will not spread seeds and cause more to grow.

## DESIGN REFERENCES

Hardesty and Kuhns. *The Buffer Handbook*. 1998.

University of New Hampshire Cooperative Extension. *Landscaping at the Water's Edge: An Ecological Approach*. 2007