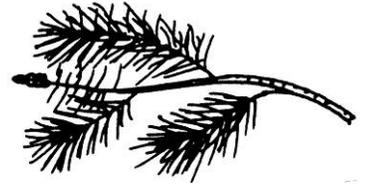


Plants and Plantings on Lakeshores

Go Wild!



The value and importance of well-vegetated lakeshores cannot be overstated. A mix of trees, shrubs and unmown groundcover is ideal; this is known as a **buffer strip**. Starting from scratch, lake shoreline camps would best be set back 125 feet from the lake with a 100-foot wide undisturbed vegetated buffer zone along the shore. But many camps have been in place for decades, built long before we understood the advantages of natural vegetation along water. The good news is you can make improvements to your camp lot to benefit the lake environment and help protect your favorite lake at the same time. This publication covers:

Why Bother with Buffers?

The Easy Way to a New Buffer: Go Wild!

Replacing Old Walls With New Banks

Planting a New Buffer

Creating a Planting Plan

Choosing the Right Plants

Planting and Caring for a Buffer

Why Bother with Buffers?

Privacy – Well-developed vegetation between the lake and your camp will offer you greater privacy and relaxation.

Scenic value – Everyone enjoys looking at lakes; think how your property looks from the lake. Most people agree vegetation enhances beauty.

Bird watching – A well-vegetated shore offers the opportunity to attract and observe birds and other wildlife.

Shoreline stability – A naturally vegetated shore provides long-term protection of your property from wave or ice erosion. Retaining walls are expensive, breakdown over time and just redirect the wave or ice energy elsewhere on the lakeshore.

Lake ecology – Shoreland vegetation provides an important aspect of lake ecology, that of the interaction between the water and land environment. Many birds nest only along shorelines, some water creatures crawl into leaf litter to overwinter or lay eggs, and insects fall from trees to become fish food. In addition, fallen branches and trees provide important fish habitat “structure” in the shallow areas.

Filtration of uphill runoff – Storm runoff from your lawn or driveway can be filtered and absorbed by natural vegetation and its duff layer, preventing pollutants from reaching the lake.

Protect property values – Buffers are the single most important water protection measure, and studies have clearly shown there is a link between a property’s value and cleanness of a lake’s water.



The Easy Way to a New Buffer: Go Wild!

The simplest action you can take is to take no action at all! Stop mowing a zone adjacent to the shoreline as wide as feasible for your property. Prioritize lawn areas and move them back from the shoreline wherever possible. Even if it is only a few feet beyond the top of the bank, it will help stabilize the shoreline. A “no-mow” zone will allow new woody plants to readily colonize the area and species that are already on the shoreline will move in and thrive. You can then selectively prune out the species you don’t want and encourage those you do. Woody plants (trees and shrubs), groundcover, wildflowers all hold the soil together better than mowed grass, which is shallow rooted. Spend your time enjoying the lake instead of mowing the lawn!

You can also add desired plants to a no-mow zone:

- Select native species to avoid spreading aggressive exotic species.
- Select plants based on their mature size and characteristics. For instance, choose shrubs if you want to be able to see over the top of them. Or select trees for privacy and shade, and as the tree grows prune off some of the lower branches so you can see the lake to the extent desired.
- If you want, select species that provide fruits for birds or yourself to eat, or shrubs with attractive flowers.
- Transplanting plants from farther uphill on your property to the lakeshore saves nursery costs and you can be sure the species grows well in your area. Late fall or early spring before the buds open are the best times to transplant.



This camp owner lets a 10-foot wide strip “go wild” adjacent to the lake. She clips out most woody vegetation to keep it open.



Here a winding path to the lake is maintained; the remaining shrubby growth is much more healthy for the lake than a large lawn would be.



By careful pruning of the native woods, this landowner maintains a view of the lake through the trees, and a winding mowed path to a small clearing on the shore and their dock.

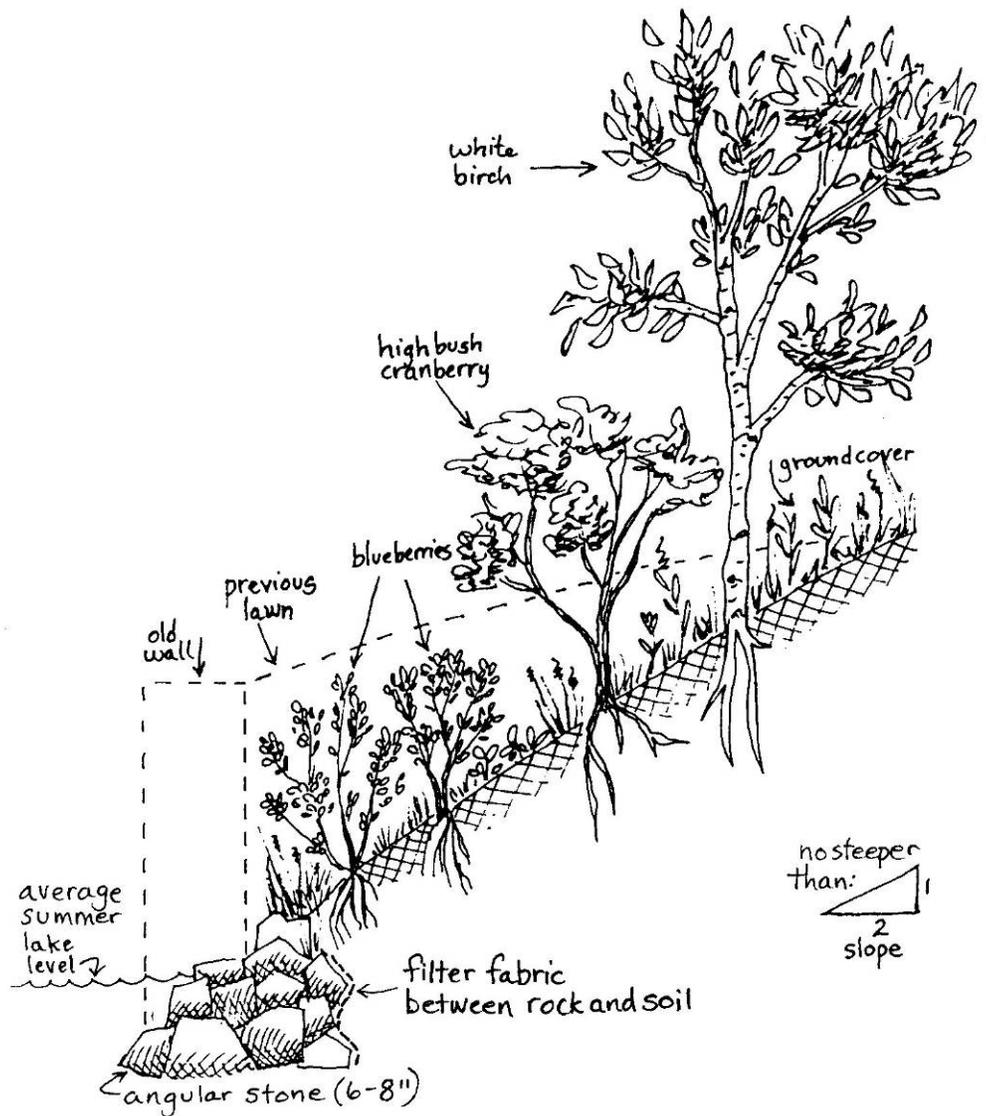


A strip of shrubs and trees on the bank provides stability, and a narrow opening provides access to the dock.

Trading Old Walls for New Banks

Many lakeshore residents have installed retaining walls to stem erosion of the shoreline, which is generally occurring because the natural, stabilizing vegetation has been removed. If you have a retaining wall that needs repair work, consider replacing it with a more natural shoreline that will require little maintenance and better protect land and water values.

Retaining walls usually require regular, expensive repairs. Often erosion occurs at the ends of a wall, and ice and wave action undermine and tilt a wall over time. Nature has taken centuries to create a stable lakeshore and will work against artificial structures. A natural sloped, slightly irregular bank is more stable than a vertical straight one, as the wave and ice energy is allowed to dissipate. Restoring a shoreline with vegetation of different types (groundcover, shrubs and trees) will stabilize the shore and require little maintenance. Lake access can be provided with a path and a small clearing at the lake's edge (leave a row of woody



vegetation on the bank), and shrubs and trees can be carefully pruned to allow views from camp. The following suggestions can be used in many shoreline areas to restore a more natural shoreline:

- Place angular stone rip rap (6-8 inch size) at the toe of the bank. Angular rocks lock in place better than rounded or flat stone, and rock much larger cause erosion by concentrating the wave and/or ice energy elsewhere. The stone should extend approximately six inches above the average summer water level so most of the waves hit the stone. Lay filter fabric between the rock and soil of the bank to prevent the washing out of soil from behind the rock.
- Grade bank back to no steeper than 2:1 (two horizontal to every one vertical foot). An erosion control fabric might be needed to hold seed in place until the vegetation becomes established.
- Plant a mixture of native groundcover, shrubs and trees and allow them to naturalize. Don't mow around the woody vegetation. Annual careful pruning can keep views open.
- Seek technical assistance to design shore restoration, as the above suggestion may not work for very steep slopes and all soil types.

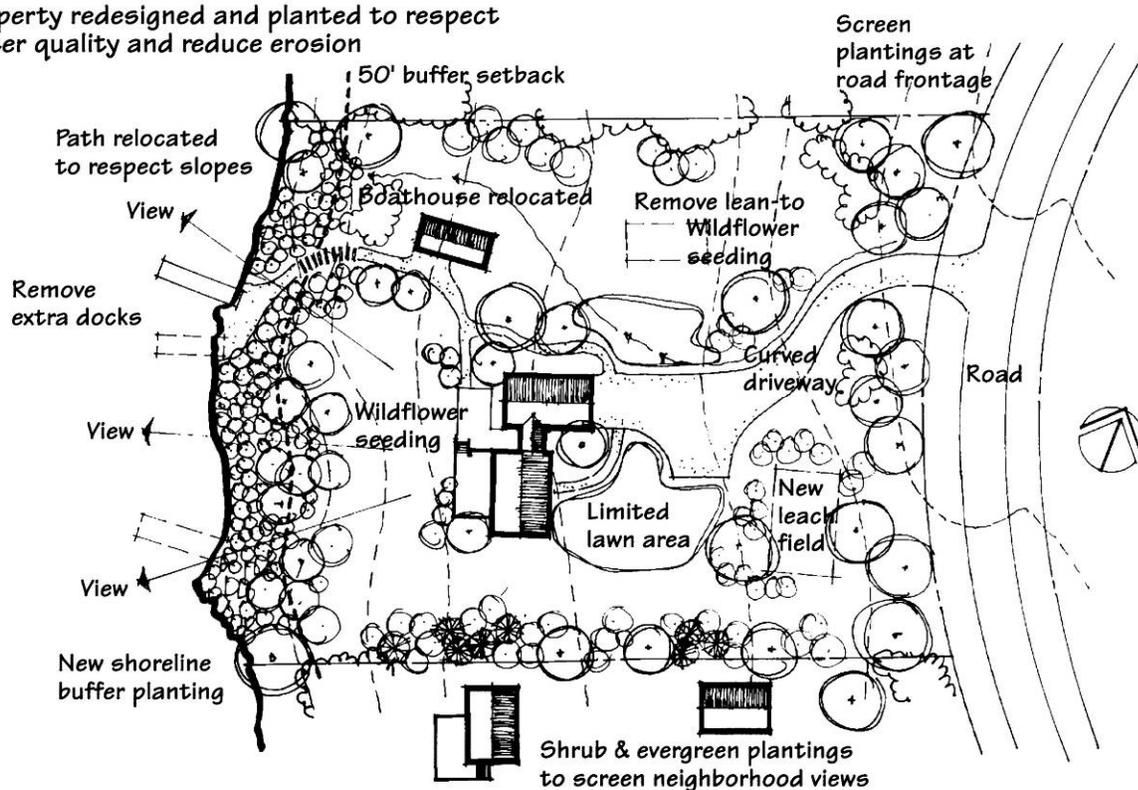
Any work that occurs in the lake (beyond the average summer water level) requires a Shoreland Encroachment Permit. Please call (802) 241-3777.

Planting a New Buffer: Creating a Planting Plan

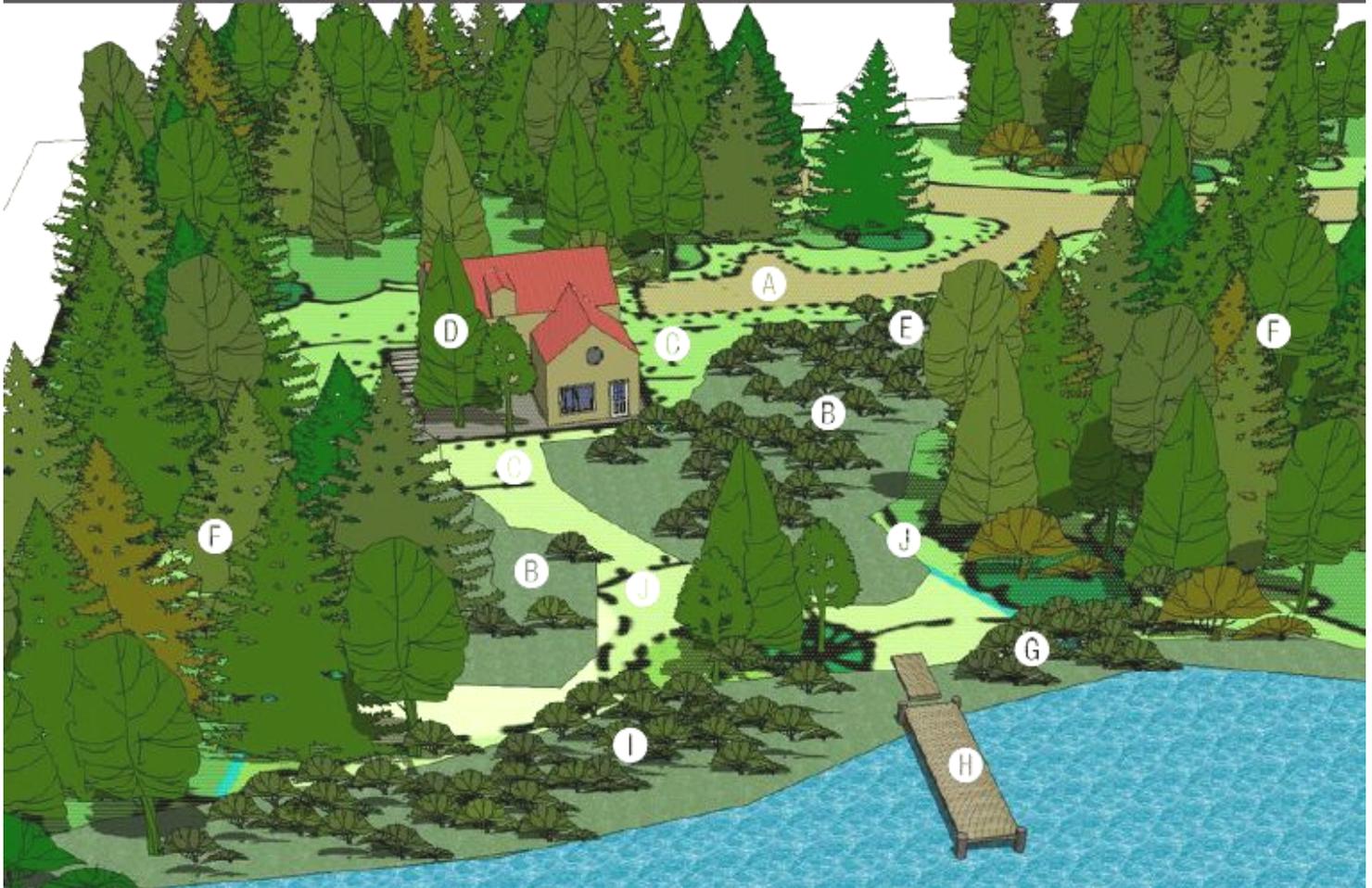
For an effective as well as aesthetically pleasing vegetative buffer strip, you should consider a multi-layered mix of plants, trees and shrubs. You also need to consider how much time you want to spend maintaining your buffer; you might want one that requires very little attention, or you may be an avid gardener looking for projects.

- Sketch out your lakeshore property, indicating existing trees and shrubs. Identify lawn areas you want to remain as lawn, with an eye to reducing the amount of lawn right on the shoreline and between the camp and shore as much as possible. For instance, perhaps the area where kids play ball can be along side or behind the camp.
- Sketch in an existing or new path to the shore. If your shoreline is steep, putting the path in at an angle or making it switchback down the slope is a good way to reduce erosion. If you already have a lawn, keeping grass cover on the path is good. If it is too steep, you may need to use log steps set into the slope, waterbars, or other techniques to lessen erosion.
- Add a few lines to indicate views of the lake you want to preserve. Plan on shrubs in this area, or trees with the lower branches pruned off for these “viewsapes.” Draw in other tree and shrub locations, remembering how tall or wide a mature tree will be. Generally, place trees 15 feet apart, and shrubs 5 feet apart to create a dense buffer; allow more space for an open buffer.
- Grouping several plants of the same species together can result in attractive landscaping. Also, mixing evergreens and deciduous shrubs with trees of different heights can achieve nice results.
- If you favor a low maintenance buffer strip, allow the groundcover to establish itself (assuming there is grass there currently). As you stop mowing, other herbaceous species will establish themselves. Or you can plant some selected groundcover plants, see page 6.
- If you want to garden in your buffer, plan your groundcover planting and mulches accordingly. Use manure and mulches to fertilize, rather than chemical fertilizer within 100 feet of the lake.

Property redesigned and planted to respect water quality and reduce erosion



Principles of Watershed/Landscape Enhancement for Water Quality, Habitat & Aesthetics



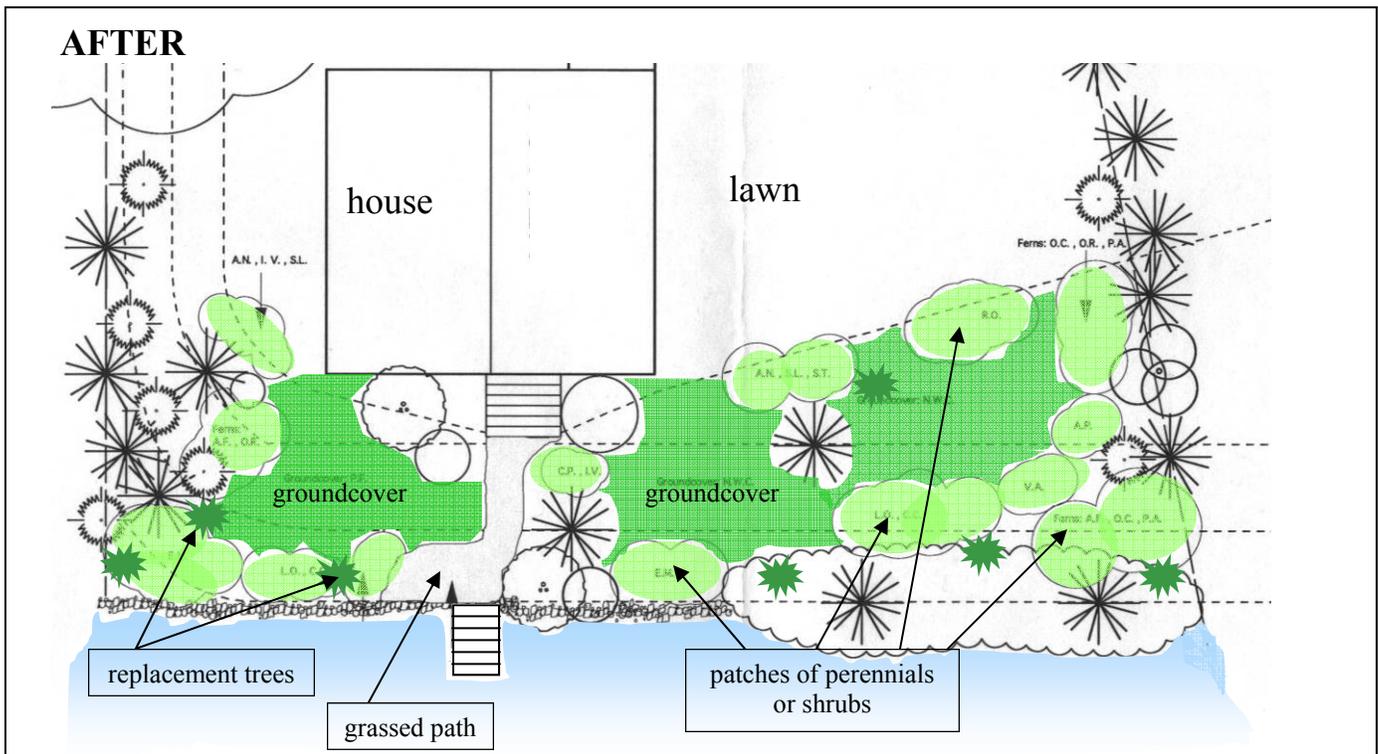
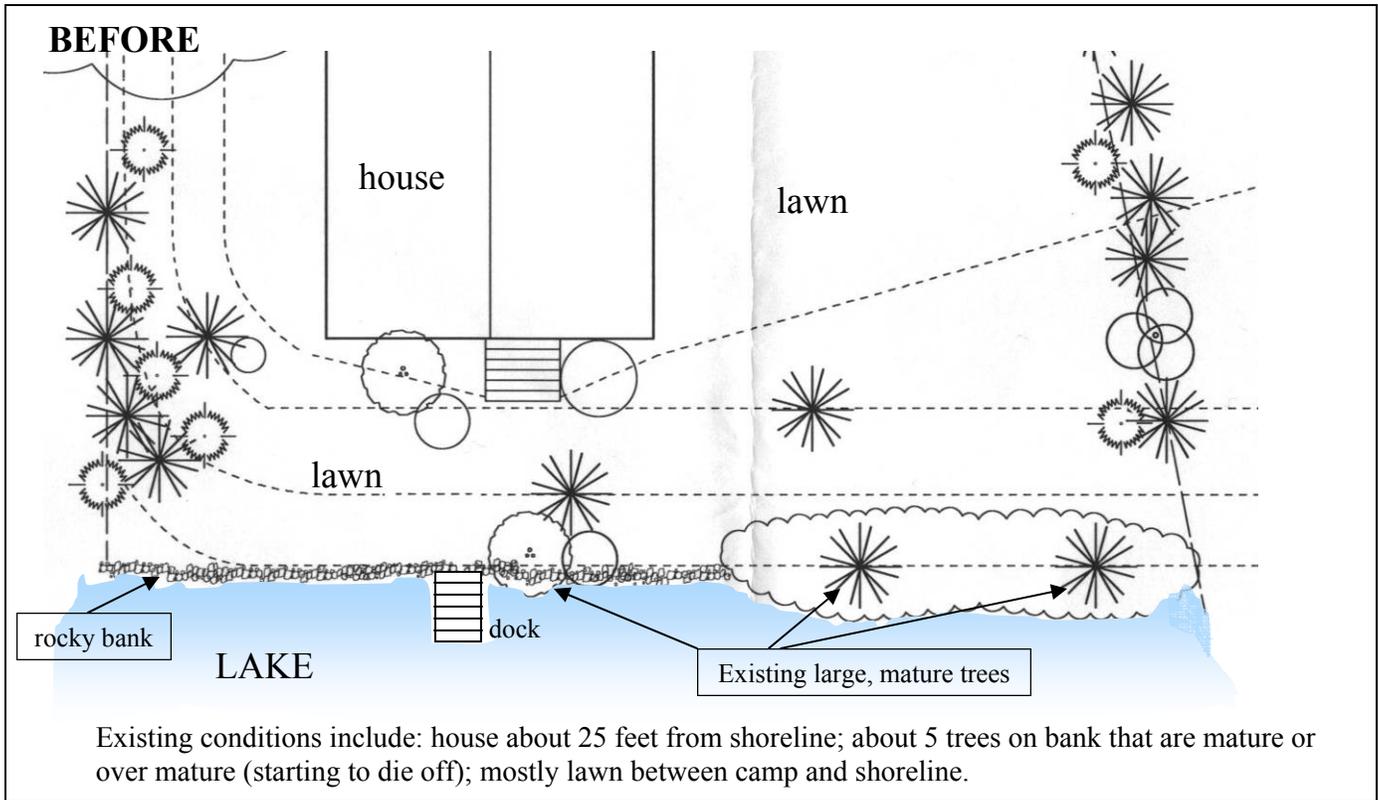
Many possible shoreland vegetation management options are open to lakeshore owners. Below are some basic principles to aim for to reduce your impact on the lake.

Illustration by LandWorks of Middlebury)

- A. Driveway with minimal cut and fill, set back from lakeshore, slanted or with waterbars to allow runoff into vegetated areas
- B. Native groundcover replacing lawn especially near lakeshore (ferns, wildflowers, partridge berry)
- C. Small lawns around camp/house; winding grass path to lake edge
- D. Native shade trees
- E. Maintain vegetated swales (gentle ditches) to receive runoff from driveways or roofs
- F. Native woodland management promotes bio-diversity and habitat
- G. Limited lakeshore access to allow native vegetation along most of shore
- H. Removable dock
- I. Stabilize and maintain shoreland with native vegetation, add replacement trees before large ones die off
- J. Open view windows by planting low vegetation or pruning tree branches



Shoreland Revegetation Example 1

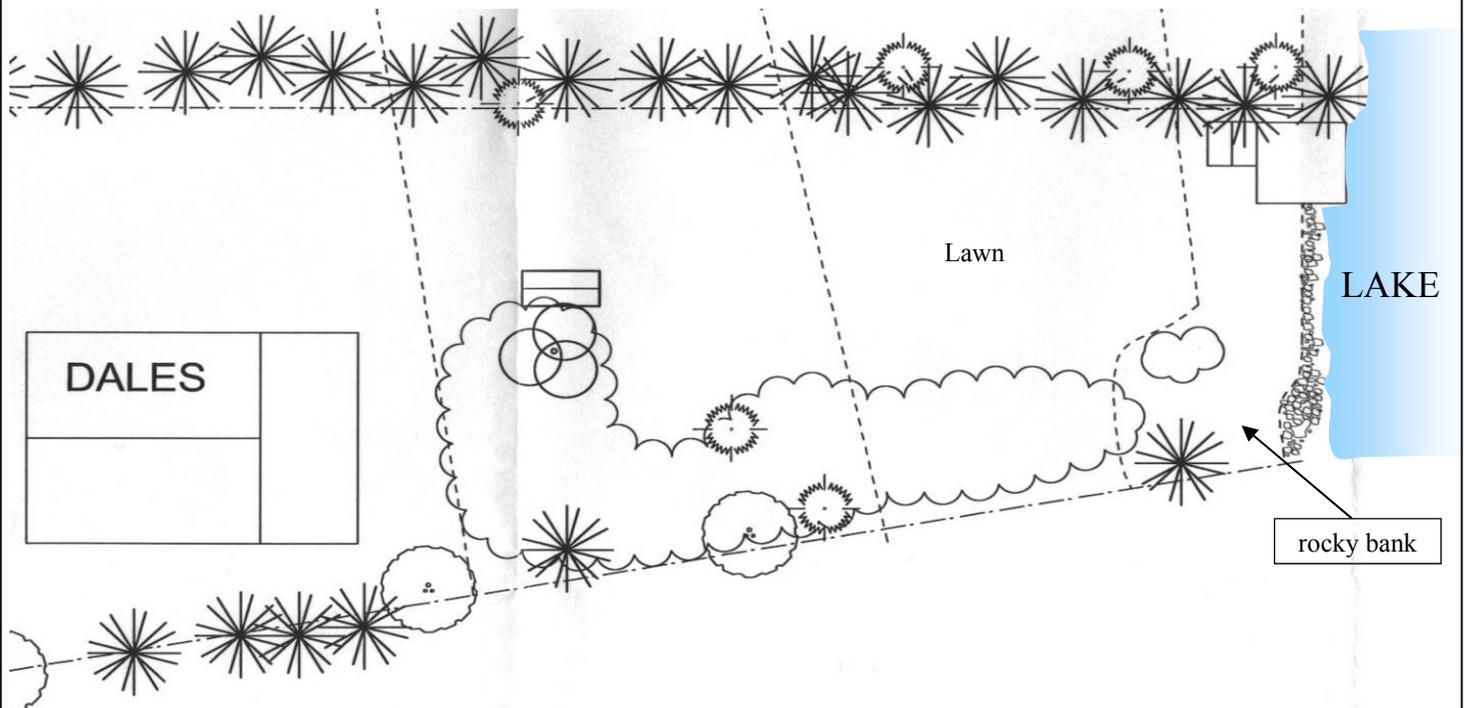


Planting Plan:

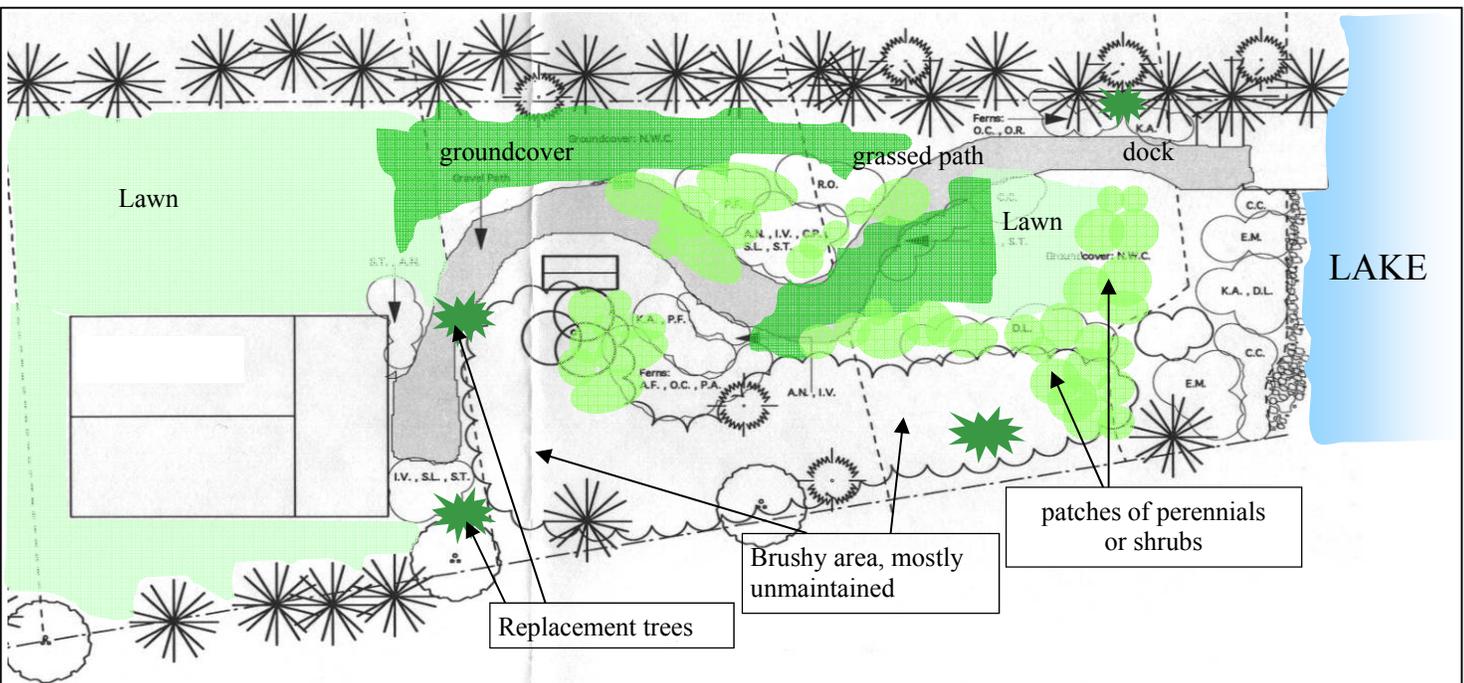
1. Plant replacement native trees between existing mature trees
2. Remove older trees as they begin to die-off
3. Plant irregular shaped patches of native perennials intermixed with groundcover between house and shoreline
4. Lawn maintained to side and behind house
5. Add a grassed path to access dock

Shoreland Revegetation Example 2

BEFORE



Existing conditions include: house about 125 feet from shoreline; mostly lawn between house and shore; one brushy area, shoreline bank rocky, mown to edge.



Planting Plan:

1. Establish curving mown path to dock; leave 20x20 foot area above dock mown for benches etc.
2. Select saplings already established in brushy area to grow to mature trees, prune lower branches as they grow to maintain view
3. Establish shrubby top of bank for stability
4. Plant irregular shaped patches and clumps of native perennials and shrubs along sides of path
5. Lawn maintained to sides of house
6. Transplant flowering raspberry bushes from above house to between house and shore

Planting a New Buffer: Choosing the Right Plants

- Use native species. Many trees, shrubs and herbaceous plants used in landscaping are exotic or non-native species. A number of these plants have escaped from cultivations and threaten native species and diversity. In particular, avoid multi-flora rose, honeysuckles, and purple loosestrife. A complete list of species to avoid is available from the Water Quality Division.
- Trees and shrubs that are native to the northeast are resistant to most diseases and insects, thus requiring less care, provide good food and habitat for wildlife, and have the same landscape values of cultivated species. Many nurseries will carry at least some native species. A list of nurseries in Vermont that regularly carry native species is available from the Water Quality Division.
- To be sure you are getting native species, you need to know the scientific (Latin) name. Often the same common name is used for several varieties.
- The best clue to what will grow well on your lakeshore is to look at undeveloped stretches of the lake and observe what is growing there. If you own land uphill of the lake you can transplant some species down to the lakeshore.

The following three tables list trees, shrubs and groundcover plants that generally grow well on lakeshores in Vermont. Note some species do better in either dry or wet soils, or acidic or alkaline soils. A more complete descriptions of plants for buffers can be found in “Native Vegetation for Lakeshores, Streamsides, and Wetland Buffers” available from the Water Quality Division.



Red osier dogwood

Trees	Soil Conditions	Mature Height	Aerial Spread	Comments
Red Maple (<i>Acer rubrum</i>)	Wet to dry	75-100 ft	50-75 ft	Bright red fall foliage, fast growing
Shadbush or Serviceberry (<i>Amelanchier canadensis</i>)	Drier soils	10-15 ft	8-10 ft	Lovely early spring flowers and fruits, (a favorite of birds), colorful foliage
Paper birch (<i>Betula papyrifera</i>)	Well-drained soil, tolerant of less well-drained situations	75+ ft		White attractive bark, small cones are good winter bird food
Green ash (<i>Fraxinus pennsylvanica</i>)	Moist, tolerant of periodic flooding	60-80 ft	35-50 ft	Relatively rapid growth, attractive branching
White pine (<i>Pinus strobus</i>)	Moderately well-drained, creates acidic soils	75-100 ft	20-40 ft	Long-lived evergreen, good for wildlife, little grows under mature trees
Red oak (<i>Quercus rubra</i>)	Drier soils	70-90 ft	60-75 ft	Grand tree with reddish-brown bark, dark leaves, good for wildlife
Northern white cedar (<i>Thuja occidentalis</i>)	Moist, intolerant of acidic soils	25-50 ft	10-15 ft	Can be maintained as a hedge, easily shaped

Shrubs	Soil Conditions	Light Tolerance	Mature Height	Comments
American hazelnut (<i>Corylus americana</i>)	Drier soils	Adapted to shade but does well on an edge or more open situations		Reddish and ornamental
Silky dogwood (<i>Cornus amomum</i>)	Wet to dry	Full sun but has fair shade tolerance	6-8 ft	Relatively rapid growth, good food and cover for birds
Red-osier dogwood (<i>Cornus stolonifera</i>)	Moist to wet	Fair shade tolerance	6-10 ft	Bright red stems that are especially distinct in winter, spreads rapidly by underground stems
Witch hazel (<i>Hamamelis virginiana</i>)	Moist	Shade tolerant		Delicate clusters of yellow flowers in the fall after leaves fall off, good as an understory species in moist areas
Winterberry (<i>Ilex verticillata</i>)	Wet to moist	Full or partial sun	6-8 ft	Bright red berries persist into winter
Highbush cranberry (<i>Vaccinium corymbosum</i>)	Acid, wet soils to drier conditions	Sun or shade	Up to 10 ft	Attractive form, berries
Nannyberry (<i>Viburnum lentago</i>)	Drier soils but tolerant of wet conditions	Sun or shade	Up to 20 ft	Spreads relatively aggressively, retains berries into late winter and thus good for birds

Groundcovers	Site Conditions	Size	Comments
Cinnamon fern (<i>Osmunda cinnamomea</i>)	Wet soils, mostly shady	2-4 ft high	Vase-shaped clumps, attractive fertile fronds
Interrupted fern (<i>Osmunda claytonia</i>)	Wet to somewhat dry soils, mostly shady	2-3 ft high	Vase-shaped clumps
New England aster (<i>Aster novae-angliae</i>)	Fertile soil, adequate moisture, full sun	4 ft high	Attractive dark purple late summer flowers, will spread by rhizomes
Bunchberry (<i>Cornus canadensis</i>)	Cool and shady, adequate moisture, acid soil	6 inches	Spreading groundcover of attractive leaves, white flowers, red berries
Blue flag iris (<i>Iris versicolor</i>)	Wet soil, full sun	1-3 ft high	Spreads well, avoid the invasive yellow iris
Partridgeberry (<i>Mitchella reptans</i>)	Shady, acid soils	1-2 inches	Dark green attractive leaves, red berries, trailing plant
Cardinal flower (<i>Lobelia cardinalis</i>)	Wet to moist soils, sun and shade	2-4 ft high	Brilliant red flowers loved by hummingbirds

Planting a New Buffer: Planting & Caring for a Buffer

- Early spring or fall are the optimum times to plant.
- Dig a hole twice as big as the root ball, and partially fill the hole with existing soil. If the soil is poor, compost or topsoil can be mixed in.
- Be sure the plant is placed in the hole so that the original soil level on the stem matches the new soil level.
- Press the fill around the plant using your hands, not feet. If the roots are bare, carefully spread them out in a natural shape and gently press soil in around them.
- Water but don't fertilize the plants at planting time. Continue to water often so that the soil remains moist for at least 6 weeks. If planting has occurred in the summer, plan on watering the plant every other day for 8 weeks.
- Pruning should not occur until the plant has had one or two full growing seasons (with the exception of removal of broken branches). Pruning too early will weaken the plant. When pruning do so lightly so as not to stress the plant. Eventually you can prune regularly and selectively, keeping hedges low and encouraging trees to grow tall.
- Make sure you always have plenty of young "replacement" trees on the way. Either allow saplings to grow naturally, or occasionally plant new small trees in your buffer.
- Do not mow or otherwise maintain a lawn under your buffer's trees and shrubs. The spongy duff layer of fallen or rotting plant material is critical to the water-cleansing function of a buffer.
- Fertilize plants with composted vegetation or manure rather than chemical fertilizer.
- Leave dead, dying or down trees unless they threaten to fall on structures; they are important habitat for numerous species of birds. If a tree right on the lake bank is dying and needs to be removed, cut it in the winter and leave the roots and stump in place. Note that a tree fallen in the water makes great fish habitat, so its OK to leave them there.



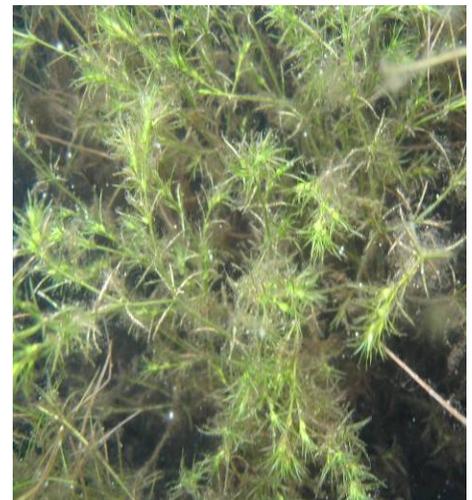
When planting a "bare root" tree or shrub, spread the roots out carefully and fill in soil by hand, pressing gently but firmly to avoid leaving air holes.



Mulch around the newly planted tree or shrub to keep competition down while it gets established. Don't pile up the mulch around the stem. The mulch should be shallow right at stem so that the correct ground level is maintained.

One More Note:

Fallen trees, leaves, overhanging braches, aquatic plants and rocky bottoms are where its at in terms of healthy fish and wildlife habitat in a lake. Try to leave some sections of your shoreline "wild;" don't rake, or remove trees and aquatic plants in some areas of your shoreland. By coordinating these sections with your neighbors, you can provide areas of good habitat between camps of greater size.



For more information or to obtain other topics in the Lake Protection Series, contact the Lakes and Ponds Section at (802) 241-3777 or visit www.vtwaterquality.org/lakes.htm.