Vegetated buffers stabilize shorelines as well as slow and filter stormwater runoff from upland areas. Existing vegetated buffers like this area along Sunset Lake in Benson, VT, should be protected.

5.1 Vegetated Buffers

Description

Undisturbed or restored natural areas consisting of native vegetation and uncompacted soil that separate and buffer the lakeshore from developed land surfaces.

Purpose

A transition zone between the lakeshore and human activity. Runoff from developed lands is slowed, filtered, and infiltrated into the ground, reducing erosion and pollutant discharge to the lake. Banks are stabilized and protected from wave action, flooding, ice push, and other sources of erosion. Shading of shallow water habitat is also provided.

Conditions Where Practice Applies

Vegetated buffers are appropriate for all lakeshores and especially any lakeshore location where minimum setback and maximum slope as described in the Design Criteria section below is available. Vegetated buffers can be preserved existing areas where landscaping activities are ceased or reclaimed developed lands.

Tips and Considerations

Prior to new construction, existing vegetated buffer areas should be clearly delineated on site plans and by in-field demarcation to preserve the vegetation, native topsoil, and duff layer. For new vegetated buffer areas, erosion controls shall be utilized to stabilize planted buffer areas prior to full vegetation establishment. Buffer areas should be protected from disturbance during regular residential maintenance and remain ungraded and uncompacted for proper function. Where the inflow to the practice is concentrated flow from a pipe or channel, an engineered practice like a level spreader or other green stormwater infrastructure practice should be designed to convert the concentrated flow back to sheet flow to prevent erosion.

Plans and Specifications

Buffers should be as wide as possible but should be at least 15 feet in width for adequate root structure to take hold. For sloped banks, the zone should extend 15 feet in width beyond the top of the bank. Larger buffers provide increasing water quality benefits and wildlife habitat protection.

For some sites, simply ceasing mowing and allowing natural succession of native plant species will be appropriate. Presence of invasive species nearby should be noted to understand invasive species pressure. Invasive species shall be monitored and removed if they colonize the buffer area.

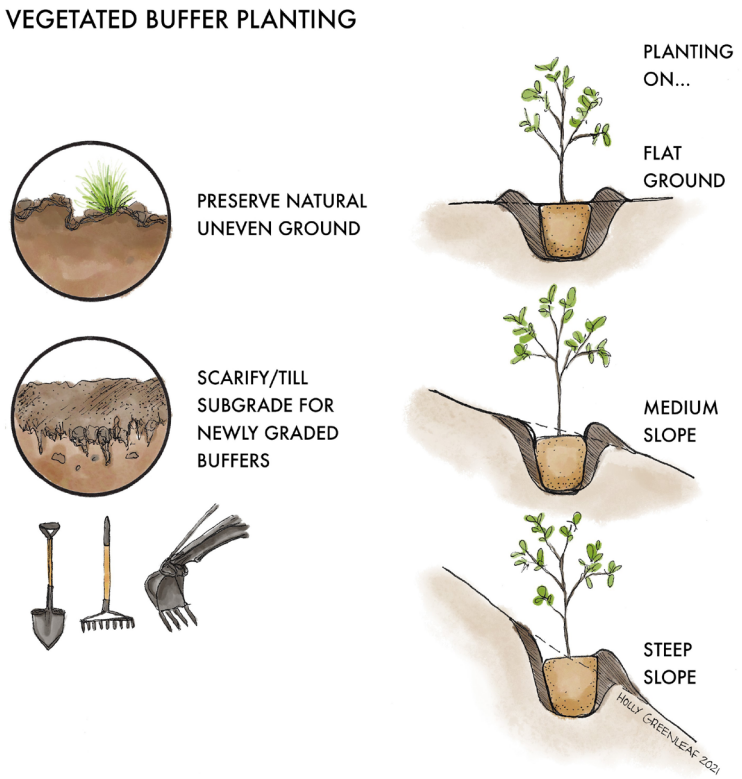
For new vegetated buffer installations, a topsoil layer may need to be applied. Prior to new topsoil installation, scarify or till subgrade to a depth of four inches. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification. Place four inches of screened and weed-free imported topsoil mix on the surface with a minimum organic matter content of four precent dry weight. Soils used in the mix shall be sand or sandy loam.

The prepared area shall then be planted. Plantings shall be all native species representative of local or regional lakeshore plant communities. Plantings shall be designed for vertical stratification, including a diversity of plant

heights and types. Trees, woody shrubs, and herbaceous perennials including groundcovers and taller species are recommended. Forest floor species and sapling replacement trees can be added later once the canopy has matured. Plantings shall also be designed for horizontal complexity (from lake to upland edge of buffer) with plant distribution in relation to flood depth, duration, and frequency, as well as variations in soils and drainage conditions (e.g., more wet-loving, flood tolerant plants near the shore and more drought-tolerant plants requiring good drainage in upland areas). See Section 4 for recommended plant species. Soils shall not be left bare but covered with erosion control matting prior to planting or mulched with organic materials (leaves, straw, wood chips/ mulch).

Maintenance Considerations

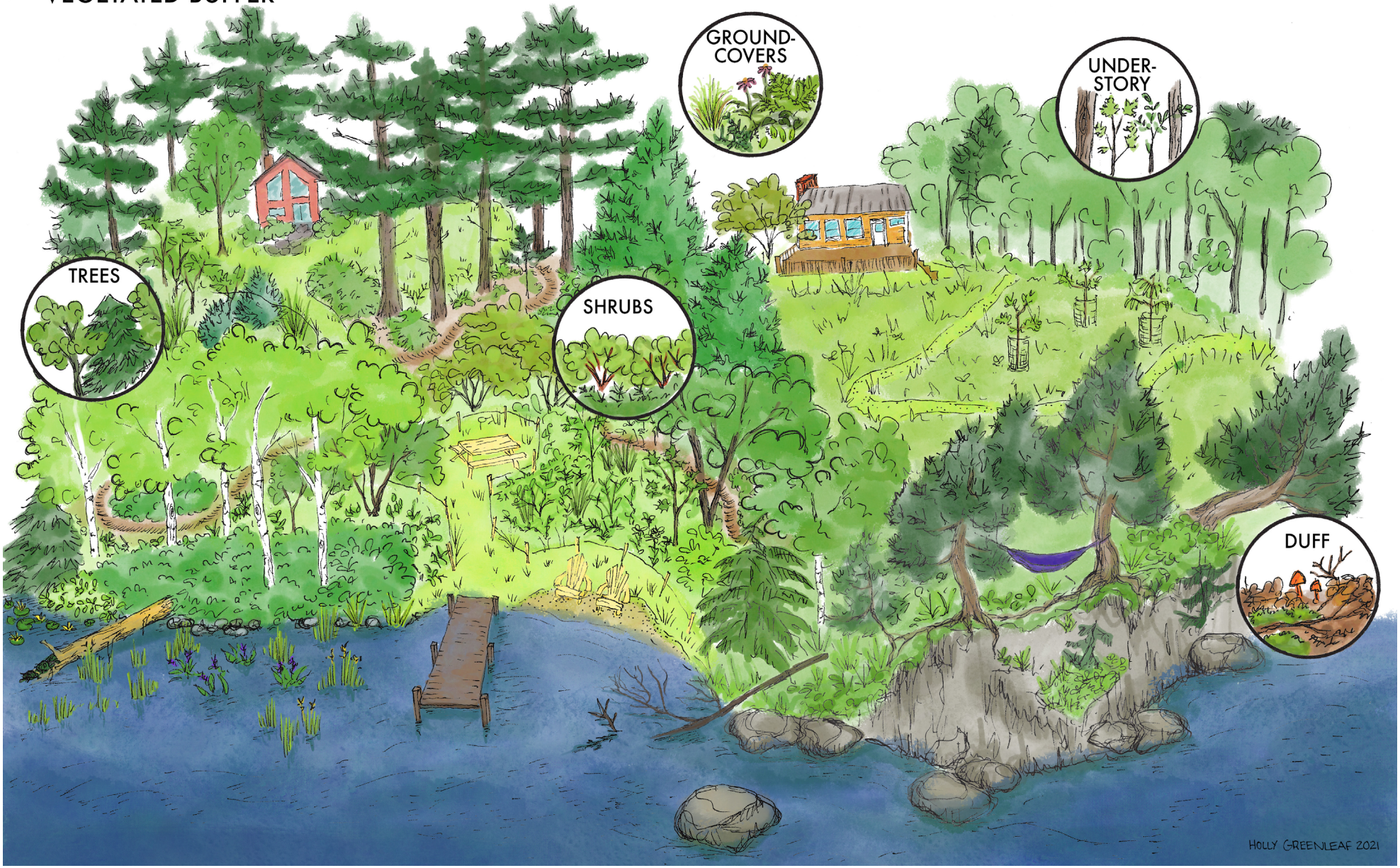
Vegetated buffers shall remain in a natural state and must be protected to ensure that no future development, disturbance, or clearing may occur within the area. This includes not removing the duff layer or woody debris (no raking). Areas of erosion or loss of plantings shall be restored by installing new soil and vegetation. Invasive species shall be monitored and removed if found in the vegetated buffer.

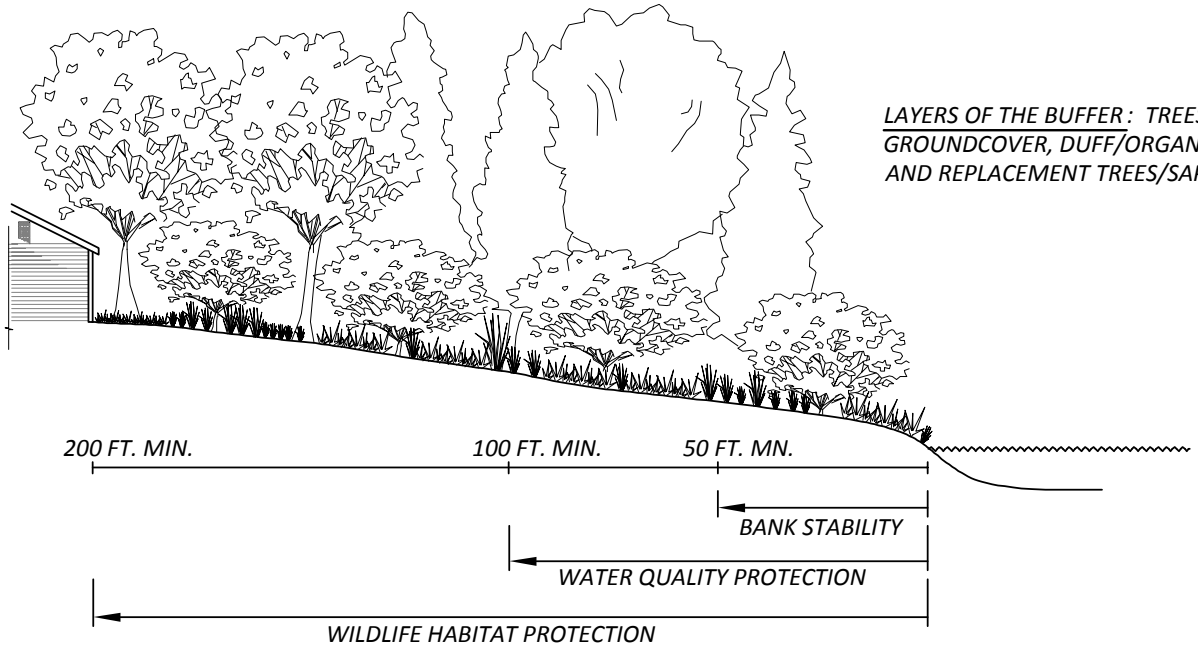


Design Criteria

Dimension	Name	Typical Unit	Guidelines	Description
A	Buffer Width	Feet	15 foot minimum, 50 feet for bank stability, 100 feet for water quality, 200 feet for wildlife habitat protection.	Horizontal width as measured from the top of bank adjacent to the lakeshore to developed lands (managed turf or impervious area).
B	Buffer Slope	Foot:Foot, Percent (%)	Less than 2:1 (50%).	Ratio of horizontal run to elevation rise of buffer as measured from the top of bank adjacent to the lakeshore to developed lands (managed turf or impervious area).
C	Vegetation	Feet / Density	Plant every 2-3 feet; select plants appropriate to soil, water, sun exposure and other planting conditions. See Section 4 for more planting information.	Potted plants or live stakes. Vegetative layers include trees, understory saplings and small trees, woody shrubs, herbaceous plants, groundcovers, and maintaining organic duff on ground. Prioritize plants that naturally occur in native plant communities nearby or in similar areas.

VEGETATED BUFFER





NO MOW VEGETATED BUFFER

LAKEWISE BIOENGINEERING CONSTRUCTION DETAILS

VEGETATED BUFFER CHARACTERISTICS AND BENEFITS:

- *BAND OF NATIVE VEGETATION THAT CREATES A TRANSITION ZONE BETWEEN A LAKE, STREAM OR WETLAND, AND PROTECTS IT FROM HUMAN ACTIVITY OR LAND DISTURBANCE*
- *IDEALLY HAS GOOD LAYER OF ORGANIC MATTER AND NATURALLY UNEVEN GROUND SURFACE THAT HAS NOT BEEN COMPACTED OR GRADED*

VEGETATED LAYER:

- *ROOTS HOLD SOIL IN PLACE, STABILIZE BANK, AND PREVENT EROSION.*
- *BIOMASS ABSORBS UPLAND WATER RUNOFF AND FILTERS OUT POLLUTANTS.*
- *PLANTS UPTAKE AND CYCLE NUTRIENTS.*
- *TREES AND SHRUBS ON THE SHORE SHADE WATER AND REGULATE TEMPERATURES FOR THERMAL PROTECTION.*
- *BUFFER PROVIDES AQUATIC AND TERRESTRIAL HABITAT, INCLUDING FISH SPAWNING GROUNDS AND WILDLIFE CORRIDORS.*
- *WOODY DEBRIS, LEAF LITTER, AND DETRITUS (DUFF) PROVIDE ORGANIC MATTER TO BUILD SOIL WATER-HOLDING CAPACITY, PROTECT AND FEED MACROINVERTEBRATES AND FISH, AND BUILD SHORELAND BIODIVERSITY.*

BUFFER WIDTH:

MINIMUM: 15 FT. MINIMUM
BANK STABILITY: 50 FT. MINIMUM
WATER QUALITY PROTECTION: 100 FT. MINIMUM
WILDLIFE HABITAT PROTECTION: 200 FT. MINIMUM

Plan design: Watershed Consulting Associates, LLC.