



The **BUFFER HANDBOOK**

“A Guide to Creating Vegetated Buffers for Lakefront Properties”

Developed by

Phoebe Hardesty
Androscoggin Valley
Soil & Water Conservation District

Cynthia Kuhns
Lake & Watershed Resource
Management Associates

With funding provided by
U.S. Environmental Protection Agency, Boston Regional Office
and
Maine Department of Environmental Protection
1998



Property owners have a view of the lake while maintaining an effective vegetated buffer of trees, shrubs, and undisturbed ground layer.

Phoebe Hardesty
Androscoggin Valley
Soil & Water Conservation District
254 Goddard Road
Lewiston, Maine 04240

Cynthia Kuhns
Lake & Watershed Resource
Management Associates
P.O. Box 65
Turner, Maine 04282

Acknowledgements

This handbook was published with the help of the Clean Water Act, Section 319 funds, under a grant awarded to the Androscoggin Valley Soil & Water Conservation District, by the Maine Department of Environmental Protection and the US Environmental Protection Agency, Boston Regional Office. Special thanks to Kathy Hoppe and Karen Hahnel, MDEP, for their insightful comments, patience, and unfailing good humor. Rachel Gallant, AmeriCorps member at the MDEP, did the layout and additional editing.

Most of the graphics used throughout the text were developed by the University of Wisconsin-Extension, in cooperation with the Wisconsin Department of Natural Resources. Brian Kent drew the shoreland zoning picture on page 16, and John Luoma drew the buffer picture on page 18. Photographs were provided by Scott Williams, Lake & Watershed Resource Management Associates; Lisa Krall, Natural Resources Conservation Service, and Phoebe Hardesty, AVSWCD.

This electronic version is a 2011 recreation of the published manual. While some of the graphics are different in some sections and minor modifications, such as updating contact information, were made, the base information is essentially the same as the manual created in 1998 and reprinted in 2001.

Table of Contents

Introduction	3
What is a Vegetated Buffer?	4
Benefits of Vegetated Buffers	7
Understanding Your House Lot	9
Designing the Buffer	12
Other Considerations	16
Summary	19
References	20



Evergreen trees, mugo pines, and heather have been combined on this steeply sloped, sunny, dry site. Heather, given the right soil and light, can be grown in most areas of zones 4 and 5 in Maine.

Front cover: These two lake front homes exemplify the contrast between bufferless lawns and property with a good buffer.

Introduction

Maine's lakes and streams are among our state's greatest natural assets. As residents, we take for granted the availability of clean surface waters for fishing, swimming, and escaping from the hubbub of our daily lives. In fact, more and more people are choosing to live on or near lakes.

How do population increases in the watershed (the land whose surface water drains into the lake) put pressure on water quality? As land becomes more developed, trees and shrubs are removed to make room for our homes, businesses, and roads. This causes an increase in the amount of impervious area, which results in greater amounts of storm water runoff. The runoff sweeps the watershed of loose sediment and debris (called nonpoint source pollution, or *NPS*) and carries the pollution to the lake.

Over time, development anywhere within the watershed, whether along a stream or lake, combined with NPS pollution, can have serious effects on the quality of our lakes and streams. Values of shorefront properties are dependant on healthy waters, as are recreational opportunities such as camping, fishing, and boating. Visual signs of NPS pollution include increased weed growth along lake shorelines, reduced water clarity, algal blooms, sediment deltas, and altered wildlife habitats. Since the values of shorefront properties are dependent on healthy waters, it is vital to control NPS pollution.

We, as property owners, can...

- ◆ **reduce the effects of polluted runoff,**
- ◆ **protect the quality of our lakes and streams,**
- ◆ **and improve property values**

by establishing new vegetated buffers or enhancing existing ones!

Vegetated buffers, or areas of vegetation situated between the built environment and the water, trap sediments, excess nutrients, and other pollutants, prevent erosion, and help to stabilize sloped areas and the shoreline.

The purpose of this handbook is to help you get started on planting your shoreline. There are many options for design and plant materials, and we've included information to help you with your planning. Although the primary focus of this handbook is lakefront areas, the same principles apply to all waterfronts throughout the watershed.

Remember: clean water starts with you!

What is a Vegetated Buffer?

Buffer strips are trees, shrubs, and groundcover that catch sediment and nonpoint source pollution before they reach the lake. Environmental professionals highly recommend creating a vegetative buffer as an effective conservation practice (or Best Management Practice – “BMP”) for controlling storm water runoff pollution.

Elements of a good buffer

- **Don't let runoff reach a lake or stream before it is filtered -- the deeper the layer of protection, the better the water quality.**
- **Don't be discouraged if you have very small areas to work with.**
- **Any buffer is better than none at all!**



A typical lake front cabin with hardly any buffer. The owners are growing a lawn on the narrow space between the cabin and the lake.



This is a computer enhanced image of the same cabin with a buffer strip added. Note the increased privacy!

Conservationists noted long ago that lakes with pristine shorelines suffered few of the water quality problems seen in more developed watersheds. In an ideal world, vegetation along a shoreline would be left undisturbed for distances of 50-250 feet, measured inland from the shoreline, depending on the degree of slope of the terrain. Settlement patterns in many of our lake watersheds are such that houses and camps have traditionally been situated very close to the shoreline, and ideal conditions no longer exist. Properties without vegetation have no barrier against sediments and pollution. Therefore it is very important to create and maintain a buffer strip on your property.

Lawns alone cannot provide sufficient water quality protection on your shorefront lot. The grasses used in common lawn mixes are shallow-rooted, and while they do protect against surface erosion, they can't provide adequate protection over the long haul. Lawns are best used as part of an overall landscape design, to provide open space for outdoor activities. But, to save yourself maintenance time and to protect water quality, keep lawn areas to a minimum. Avoid use of fertilizers, herbicides, and pesticides; use lime to build a heartier turf. Lime sweetens the soil and makes nutrients available to root systems.

How do vegetated buffers work?

- ◆ The tree and shrub canopy intercepts raindrops and reduces their impact on the soil.
- ◆ Leaf surfaces collect rain and allow for evaporation.
- ◆ Low herbaceous plants and the duff layer filter sediment and pollutants from runoff.
- ◆ Root systems hold soil in place and absorb water and nutrients.
- ◆ An uneven soil surface (with hummocks and depressions) allows rain and snowmelt to puddle and infiltrate.



Elements of a good buffer

To be effective, vegetated buffers need to be situated between the lake (or stream or drainage channel carrying water to the lake) and the developed area of your property. Remember, the purpose of buffers is to slow down runoff so that water and nutrients can filter slowly into the ground.



Buffers should not have straight channels through them, but paths that wind to the waterfront made of stable, nonerodible material. Straight pathways of bare soil act as conduits for pollutants, and are easily eroded. Uneven ground surfaces, with hummock and depressions, also help to slow down runoff, so that water can filter into the ground. Buffers should be as deep as possible, and span the entire length or width of the developed area you are shielding.

A good buffer should have several vegetation layers and a variety of plants to maximize the benefit of each type.

Trees. . .whether evergreen or deciduous, break up the impact of rain and wind, provide shade and habitat, and are long-lived. Their deep root systems absorb water and nutrients while maintaining the topographical structure of the land.



Shrubs. . .including flowering or non-flowering species, also deflect wind and rain, and are attractive to people and wildlife. Their medium-depth root systems absorb water and nutrients, and hold the soil in place.

Groundcovers. . .such as vines, ornamental grasses, flowers and herbs, slow down surface water flow, absorb nutrients and water, and trap sediment and organic debris. Their many forms are attractive, and their shallow root systems hold the soil in place while protecting the ground surface from erosion.

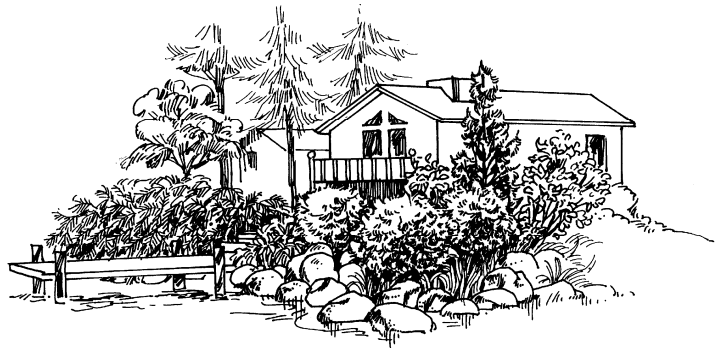


And finally, the duff layer. . . is the accumulated leaves, pine needles, and other plant matter on the forest floor. This layer acts like a sponge, to absorb water, trap sediment, and prevent erosion. Duff is a host to microorganisms that break down plant material and recycle nutrients.

Benefits of Vegetated Buffers

The mixed root systems of trees, shrubs, perennials, and groundcovers help to stabilize banks and access points.

Reducing overland flow of water helps to prevent siltation of shoreline areas. An overabundance of silts and sediments make the lake or stream bottom mucky, the rocks slippery, and destroys fish spawning areas. Excess sediments from eroded banks, camp roads, and pathways forever alter the shoreline ecosystem. Heavy deposits of sediment in shallow areas of the lake creates an ideal growing area for unwanted species of rooted lake plants which change the composition and distribution of plant communities in shoreline areas. They often conflict with recreational activities such as swimming and boating.



Buffers protect against noise and enhance privacy for lakefront residents.

Dense plantings of shrubs and/or trees dampen noise levels from watercraft and neighborhood traffic. Mixed plantings also furnish an attractive living screen against visual intrusion, and if carefully placed, can actually refine waterfront views. The lower branches of trees can be removed to provide openings for views from your camp or shoreline.

Buffers can be designed to provide protection against the effects of wind and sun.

Properly placed vegetation can divert chilling winds and provide shade, allowing the "living space" to remain more comfortable. Groundcovers not only protect bare soil, but they also deflect heat.

Whether we live at the water's edge, or elsewhere in the watershed, all of us want the lake to be clean when we get there. Vegetation along the shorefront benefits everyone.

Buffers supply shade, shelter, and a food source at the water's edge, ensuring habitat for wildlife that frequent shoreline areas.

- ◆ Fruits of the redosier dogwood are eaten by ruffed grouse, pheasant, wood duck, and many species of songbirds.
- ◆ The low, dense growth of the beaked hazelnut is ideal nesting and protective cover for wildlife; squirrels and chipmunks feed on the nuts, while grouse feed on the catkins.
- ◆ Leaves from trees and shrubs that fall into the water provide food sources for aquatic insects, themselves being food for fish and other small vertebrates.



Buffers are attractive, long-lived, easily maintained, and can be created at low costs.

Several options exist for buffer designs. A little time spent in planning can have big payoffs later in maintenance requirements. Just think -- less lawn to mow! Choose a plan that fits your lifestyle, and remember that you do not have to complete your buffer in one season.



Shrubs and flowering plants have been added to the natural growth of this buffer.

Preventing erosion saves time and money!

Understanding Your House Lot

To get started, you need to make a careful assessment of your property. The physical characteristics of your present landscape will provide you with a framework for your buffer design. Understanding the character of your lot is vital, so that you can put the right plants in the right places. Careful planning will save you time and money and yield results that will make you proud.

Site characteristics you must consider:

Location of buildings: As you develop your buffer design, take into account the size of your lot and how the buildings and driveway are laid out. If your lot is small or your buildings are set close to the lake, you may not be able to have a 100- or even a 75-foot buffer, but any buffer is better than no buffer. Older camps in particular are set close to the lake. Prior to the Shoreland Zoning law, when we did not understand how to protect our lakes, there was no building set back requirement or a very limited one (for more information on the Shoreland Zoning law, see page 16). Today, as a result of many studies, we understand that building close to a lake or stream significantly increases the pollution load going into the lake. Buffers help reduce this pollution load. Since the objective of the buffer is to prevent erosion and filter pollutants, planting buffers up slope of your home or down slope of the road will also help. The goal is always to prevent erosion and intercept water flow before it reaches the lake or stream.

Soil types and condition: It is highly important to understand the site's soil type, since good soil is the foundation for healthy plants. There must be a good match between the soil and the plants chosen for the buffer. Soil types may vary from place to place on your lot. For example, one section may be low and remain wet throughout much of the growing season, while another area may be sandy, rocky, shallow, or dry. Look at the plants that are growing there now, or in similar conditions off-site; they will give you good clues about the soil conditions. If you are planning to purchase material for your buffer, keep these varying conditions in mind. Soils with little organic matter -- often found in densely developed areas -- can be improved with the addition of compost and lime. See the folder pamphlet, *Know Your Soil*, for further discussion of how to assess your soil for plant needs.

Degree of slope: ... or more simply put, is your lot steep or flat? Steeper areas are more sensitive to erosion and require a variety of root types for permanent stabilization. (Remember, water runs downhill faster in steeper areas and carries larger soil particles farther and faster.) If your house or camp is located on a hillside, try to develop as deep a buffer as possible in order to absorb runoff from roofs, driveways, and outbuildings.



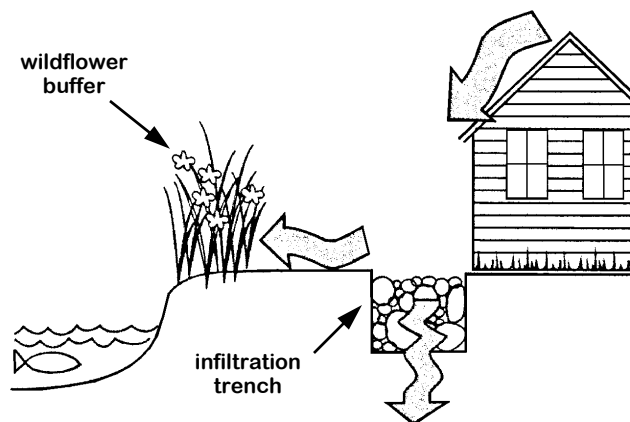
Exposure: Conditions on your lot are affected by the amount of exposure to the elements. Is your property located on a north-facing slope, and is therefore subject to cooler temperatures and higher winds? Or does it face south, with elevated temperatures or little air movement? Is your site partially protected by a hill or does it jut out on a point of land? Taking note of exposure will help you select appropriate plant materials and create a design that can provide shade on hot days or protection from high winds.

Sunlight: How much sunlight will your proposed buffer site be receiving? Watch the shadows caused by trees and buildings as the sun moves across the sky, noting areas of deep shade or those that are in full sunlight. This information will help you choose appropriate plants for varying conditions.

Plant zones: Using plants that are hardy in your temperature zone is important. A map showing the temperature zones of Maine has been included with the *Plant List*. Recommendations have been given for zones 3, 4, and 5. If you suspect you are in a marginal area, generally select plants for the cooler zone. Plants from a warmer zone may do well in protected areas of your property, but check with a reputable local nursery or landscaping business for advice. If you have questions about plant materials not covered in this folder, those same experts can provide answers.

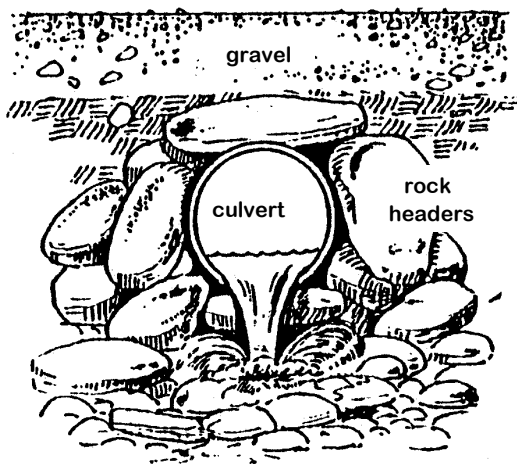
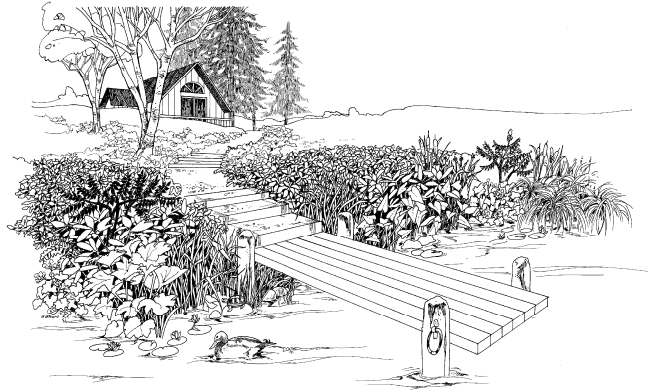
Other Conservation Practices

Best Management Practices (or *BMPs*) can help you to stabilize areas of minor to moderate erosion on your property and complement the performance of vegetated buffers in controlling runoff. Many will actually decrease property maintenance costs. The fact sheet entitled *Stormy Day Survey*, included with this folder, will help you to identify those areas which may need some structural attention. A short list of simple BMPs is given below. For information on how to install these practices, call your local Conservation District.



Rock-lined drip edges ... beneath the roof edge drip line, are very helpful in controlling erosion. They also will lengthen the life of a building's wood finishes by protecting the walls from splash. A trench dug 6-8" in depth is then filled with 3/4-inch stone. This will allow rainwater to collect and slowly dissipate. In areas of clay or heavily-compacted soils, a 2" lining of sand is recommended before stone is added. Use of a stone-lined drip edge behind foundation plantings will also help prevent damage to plants from roof runoff occurring during heavy rains and from ice and snow melt.

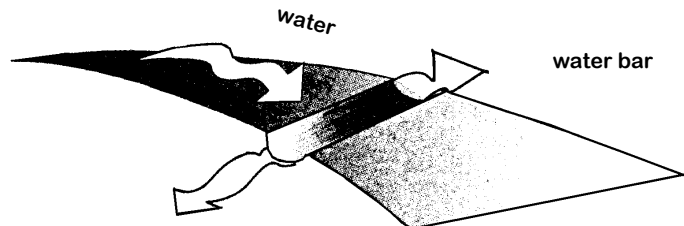
Stabilized pathways ... can be accomplished in a number of ways. The simplest method is to cover the pathway with a 2-inch layer of bark mulch or wood chips. This will have to be renewed periodically, as the material decomposes -- about once every couple of years. Other options include seeding the pathway with an appropriate grass mix; setting paving stones, bricks, cement tiles, or slate in a matrix of mulch, wood chips, or crushed stone; or by creating a boardwalk. Remember that winding pathways are preferred so that moving water will not create channels.



Inlet and outlet protection for culverts:

To ensure culvert stability and to prevent erosion, the use of stone for headwall protection is strongly recommended. Larger flat rocks are placed on top and to the side of the pipe, and smaller rocks are used to fill in open spaces. Where there is a drop of 6" or more between the base of the culvert and the bottom of the ditch, additional stone should be added to create a small apron. These practices will greatly lengthen the life of a culvert, and will decrease the frequency of maintenance. Detailed plans for culvert protection are included in the *Camp Road Manual* .

Water diversions for camp roads or driveways: Several types of diversions can be installed on roads to divert water and sediments into stable, vegetated areas. This will not only control erosion, but save on maintenance costs of your gravel driveway or camp road. These diversions include open-box culverts, "rubber razor" water bars, or broad-based drainage dips. Detailed plans for installing open-box culverts and the broad-based drainage dips are included in the *Camp Road Manual* published by the Kennebec County Soil & Water Conservation District. Plans for the "rubber razor" are available from Androscoggin Valley SWCD. All are inexpensive to install -- much less expensive than frequent resurfacing.

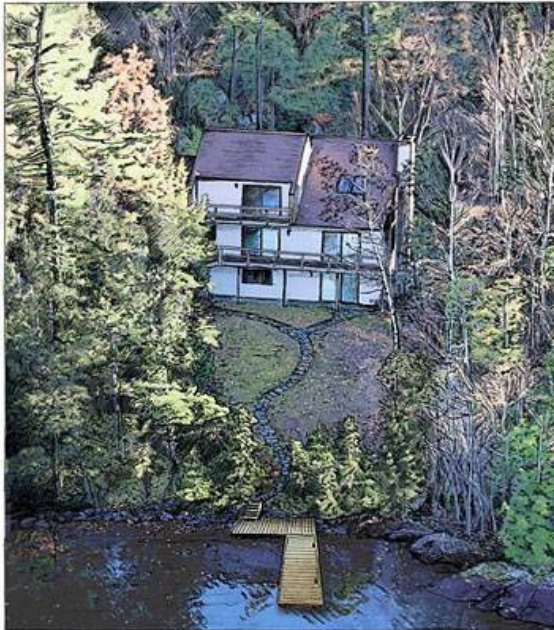


Our lakes and ponds are for all to enjoy!

Designing the Buffer

**You have several options when designing a buffer.
Look carefully at:**

- ◆ **your lot** -- bear in mind the site characteristics (see p. 9).
- ◆ **the developed areas you are treating** -- include your house and driveway, camp road or public way, pathway to the lake, boathouse, etc.
- ◆ **your budget** -- both for time (how much on-going maintenance do you want to do?) and financial constraints.



This design includes aspects of a good buffer.

Note:

- ◆ the curved driveway
- ◆ the small, defined yard
- ◆ the buffer between the road and the house
- ◆ the buffer between the house and lake includes low shrubs to maintain the lakeside view and a winding path.

Consider:

- ◆ **traffic patterns in your yard** -- do you wish to direct pedestrian traffic or limit access to the water? deter wandering pets?
- ◆ **pathways to the shoreline** -- do you have separate swimming and boating areas?
- ◆ **desire for privacy** -- do you wish to be shielded from the road? from neighboring lots? from recreationists on the water?
- ◆ **aesthetics** -- do you like to garden? wish to improve the looks and value of your lot?
- ◆ **recreation** -- do you need a play area? have family barbecues? enjoy bird watching?
- ◆ **effects of wind and weather** -- would you like to have a recreation area sheltered from wind or the hot sun?

Then decide whether you wish to have. . .

. . .a **natural** buffer. . .

an **enhanced** buffer. . .

. . .or a **landscaped** buffer.

A natural buffer is the simplest and least expensive of the three options. To develop this requires only a decision on your part about the size of the vegetated strip you wish to have, a commitment to stop mowing the area, and the patience to allow plant material to become established and grow. Plants establish themselves in succession, and it will probably be several years before shrubs and trees become rooted and thrive. Advantages of this option are that the native plants that *do* become established are tough and resilient and a natural part of the lake ecosystem -- and you've invested no personal funds.



This late fall photo shows an older camp where the owners have done an excellent job of maintaining an undisturbed buffer of native trees, shrubs, and groundcover between the lake and their camp.

Often folks feel that once a buffer is in place, they will lose control of their access to the water -- both physical and visual. Not so! Traffic can be directed by the use of appropriately placed shrubs and trees, which can be trimmed so that views of the water are preserved. Trees and shrubs that are pruned in an "open" manner also allow for better air circulation.

To develop an enhanced buffer, add to what is already there, or plant a few desirable things and let the rest of the area revert around them. For instance, if you have a number of trees on your lot, in relatively close proximity to the shoreline, you can fill in the spaces between them with shrubs, herbaceous plants, and groundcovers. Following this option generally means it will take fewer years to get the buffer fully established, and will require only a moderate commitment of time and money on your part. Advantages of this option are that you will have more choices in the plants that you want to have as a part of your landscape, and you will have a head start on getting the buffer in place.



This property owner added beds of perennials and shrubs to the tree line above a steep banking. The steep banking was allowed to revert to native species. Use of shorter plants between the trees allows residents to still observe activities on the lake.

Using Native Plants in Vegetated Buffers*

Native plants are defined as those that were observed in the natural landscape at the time of contact between Europeans and indigenous peoples (about 1450 A.D.). Use of native plants in landscaping, particularly in vegetated buffers, are of value for the following reasons:

- ◆ The plants are **appropriate for our regional climate**. They have adapted to this area over time; therefore, there is less maintenance required for these plants.
- ◆ Native plants **have significant wildlife value**, as they are used by many birds and animals for food sources, and for breeding habitat.
- ◆ **One-third of the plants native to New England are endangered**; there are many invasive exotics that displace natives.
- ◆ Use of native plant materials allows us to **celebrate our regional differences**.
- ◆ **There are many beautiful native plants**. Many local nurseries carry such material, and can provide specific recommendations for appropriate siting.

-From a presentation given by Jeff Horton, Shaker Hill Nursery, Poland, ME

*The native or naturally-occurring plants described in this booklet are marked with an **N**.

Choosing a landscaped buffer generally means that it will take a lot less time to establish a protective strip, but will require a more concentrated effort and generally more money. You can spread out your planting over several seasons or several years; an example might be to plant trees the first year, followed by shrubs, and groundcover the second year. This way, you will have absolute control over the design.



The installation of this landscaped buffer is in progress.
Note how the design enhances, not blocks, lake views.

Or, combine the options to accommodate your needs as well as those of the buffer strip. For example, abandon mowing along the immediate shoreline, and install a landscaped design to the landward side of that strip for you and your family to enjoy. Which ever option you choose, try to visualize what you want the buffer to look like in five, ten, or more years.

- ◆ Choose plant material appropriate for your plan. Don't, for instance, plant trees that grow tall naturally and then try to prune them heavily, instead, opt for a tall shrub.
- ◆ Make use of hardy species that require little maintenance, and no fertilizers.
- ◆ If you are purchasing plants, deal with a reputable, local firm that can help you select the healthiest plant material available, and who can answer questions on planting considerations.

The most important decision to make about your buffer is when to get started. A good design and action plan are vital for sustainability, but do not delay your project. Vegetated buffer strips are a proven means of controlling erosion and other sources of nonpoint source pollution. Help to protect the water quality of your favorite lake or stream by starting your vegetated buffer project as soon as possible.

Other Considerations about Buffers. . .

Clearing Vegetation for Development in the Shoreland Zone

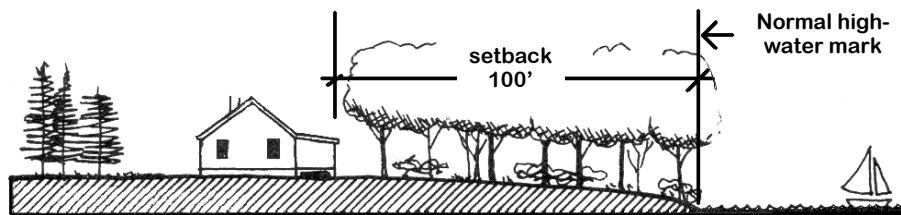
The guidelines for development as outlined in the Mandatory Shoreland Zoning Act require that:

(1) no cleared openings be created within 100 feet of great ponds (a great pond is defined as being 10 acres or larger), or within 75 feet of other water bodies, streams or wetlands, *with the exception of a winding pathway no wider than 6 feet to provide shoreline access;*

(2) selective cutting of trees *and shrubs* shall not exceed 40 percent in a 10-yr. period;

(3) tree pruning is limited to the lower third of the tree, to create views, and to the removal of dead branches in order to maintain healthy trees. Shrubs such as alders may be pruned to improve the view of the water, and may be thinned if less than 4 inches in diameter, but no new openings may be created;

(4) natural vegetation and ground cover shall be maintained within 100 feet of lakes.



A copy of the DEP Issue Profile, "Clearing of Vegetation in the Shoreland Zone", has been included with this handbook. In some municipalities, local ordinances are more restrictive. If you have questions about permissible activities within the shoreland zone, contact your Code Enforcement Officer.

Planting your buffer

Before you start work on your project, you will have to decide whether to create beds or add plant material with point plantings. There are advantages and disadvantages to both methods.

Expanding your buffer with point plantings means that you will dig a hole (deeper and wider than the root ball), add compost, peat moss, or other organic matter, insert the plant and extra soil, and cover the exposed area with several inches of good mulch. The grass around the new plants can be mowed until the plants are large enough to shade out surrounding grasses, or the grasses can be left to grow up. Either way is okay for the plants, but this is a question of aesthetics and time-management. Choose a maintenance program that you can live with.

Developing a buffer strip by digging beds requires more up-front work and in some areas, may require permitting -- check with your CEO about local and state ordinances. This method involves removing sod from the entire area you are going to plant and replac-



ing it with plants and additional soil. Once all plants are in place, the whole bed should be mulched with at least four inches of well-rotted bark mulch or compost. The mulch will absorb moisture, discourage weeds, and eventually decompose into the foundation of that well-regarded duff layer.

Remember to keep new plants watered throughout their *first and second* seasons. Once the root systems are well-established, the plants can survive with little attention, except in times of extreme drought. Give them a little "TLC" to get them started.

If the soil in your area is lacking in organic matter, is clayey, or is heavily-compacted, you will want to add compost to your plantings for the first few years in order to build a healthy soil. Keep in mind that a healthy soil supports small organisms that help to break down nutrients and pollutants for uptake by plants.

Mulching your buffer plants

In undisturbed wooded areas, a natural duff layer builds up over time. Duff is an important part of the ecosystem for a number of reasons. Plant waste (fallen leaves, pine spills, and branches) decompose over time and provide a natural fertilizer for living plants -- this is nature's way of recycling nutrients. Duff also holds quantities of water in reserve, by soaking up runoff and allowing the moisture to be slowly absorbed by plants and underlying soils.

Mulch, such as composted wood fiber or composted yard wastes, mimics natural systems. Newly-planted shrubs and perennials (or herbaceous plants) will benefit from this added layer of protection. Mulch protects areas of bare soil and will also deter unwanted "weeds" in the more formally-designed buffer systems. Be sure to use mulch that has been composted for six months to a year so that nutrients are not leached from the soil. Use about four inches of the material around plants and on any area of bare soil. Remember though, to give plants about an inch of "breathing room" around their bases so that the plants aren't smothered. After planting, allow leaves and evergreen needles to accumulate.

Composting yard and kitchen wastes

Composting is a good way to recycle nature's resources, and for most property owners, there is already an abundant supply of raw materials at hand. Leaves, grass clippings, and other yard waste, as well as non-meat kitchen scraps, can be combined and allowed to decompose for a year. The compost provides a fine mulch or soil amendment for use in your buffer or other garden sites. Well-rotted compost is a soil amendment which has been approved for use in the shoreland zone by the Maine Department of Environmental Protection. A brochure developed by the University of Maine Cooperative Extension Service (in the folder) will help you establish a system for composting yard wastes. See the reference section for further sources of information.



Use of fertilizer and pesticides

One of the most important roles of buffers is the uptake of excess nutrients; in lake watersheds, phosphorus is the nutrient of greatest concern. When planting your buffer, choose materials that will not require constant feeding and spraying and that are naturally hardy and resistant to insects and disease. Keep air circulation open to avoid fungal diseases. If plants still appear sick, remove and destroy them to prevent spread of the disease among similar plants.

If you really feel that you must use a fertilizer, use it sparingly! Apply a liquid that will immediately soak in and will not sit on the surface to be washed into the water by heavy rains. Be stingy -- apply fertilizer only during the growing season so that it is taken up immediately. If

you must spray for pests or disease, start treatments with the most benign method of control possible, such as baking soda combined with water and a small amount of horticultural oil or a non-phosphate dish soap and water. Use pesticides as a last resort; they are harmful to aquatic life and beneficial insects. Selecting plants that will attract a variety of birds provides the added benefit of an effective means of bug control. Information on safe means of pest and disease control is available from your Cooperative Extensive Service, from organic gardening references, and from many reputable nurseries.

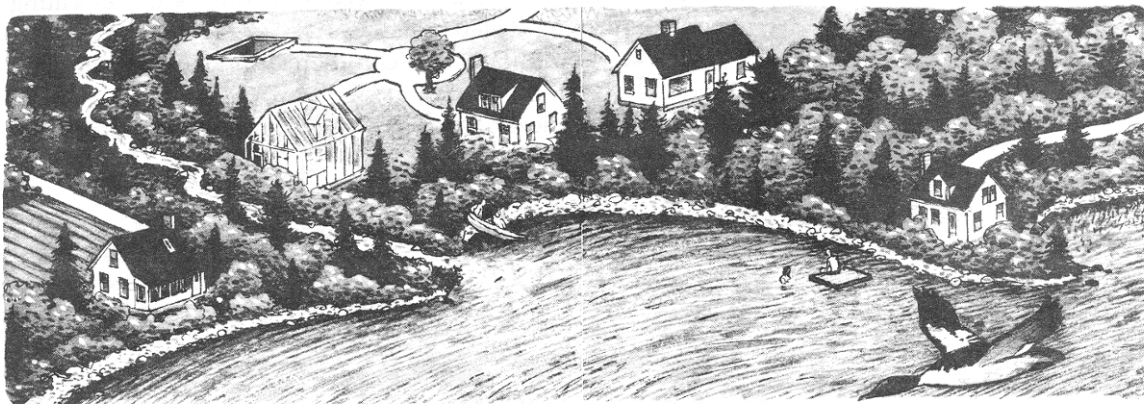
Improving soil health

Where soils have been highly disturbed as a result of construction, or have become heavily compacted as a result of years of foot traffic, it is recommended that well-rotted compost be added when plants are introduced. Mulch plants well and water thoroughly until the plants are established. Most shrubs, once established, are actually best left to fend for themselves. Remember too, phosphorus and nitrogen will be supplied by runoff, and will be recycled from fallen plant wastes.



Where you have a lawn, such as in the area next to your home or camp, spread lime to sweeten (increase pH) the soil. Adding lime changes the pH of the soil which in turn will help deter the spread of many weeds. Hand digging weeds is another “environmentally friendly” way of controlling unwanted species. Set your lawn mower high enough so that grass length is two to three inches or more. Should you need to rake the lawn, save those clippings for your compost pile!

Work to improve soil health. Compost and mulch will help to provide a beneficial environment for soil organisms and will also help to make the soil more absorbent because of the addition of organic matter. **Providing a healthy soil for your buffer plants will help to keep pests to a minimum.** A pamphlet on soils has been included in this folder, which will help you to assess your site's conditions.



To Sum Up. . .

Planting a vegetated buffer between your house and the lake or stream is one very positive step you can take to protect water quality.

The steps you follow to get started are these:

(1) Survey your property for storm water runoff, preferably following a rainstorm. The *Rainy Day Survey* included in this folder will help you to see some of the areas of erosion that exist on site. Take notes.

Tools: survey brochure, pencil, notepad.

(2) Develop a sketch plan of your lot; it is useful in organizing your work. It is helpful to make the drawing to scale. Include cultural features such as your house, outbuildings, driveway, boat launch, utility and recreation areas, swimming access points, and pathways. Also include landscape and topographic details such as areas of slope, existing vegetation, stone walls, ledge outcrops, and wet and dry areas. Make note of your lot's orientation (N-S-E-W) as well as where shadows are cast by buildings.

Tools: graph or drawing paper, pencil, tape measure, ruler, compass, and photographs of your property if you have them.

(3) List your objectives for the project. Examples might be: adding vegetation near the shoreline, stabilizing pathways, directing traffic to a single access point for swimming, catching runoff from roofs and driveways, and degree of maintenance for project. Make a realistic estimate of your time frame and budget for project completion. Select the approach best-suited to your objectives.

(4) Implement your plan! The work you do now will prevent erosion, reduce water quality problems, and enhance the value of your property.



References*

- Brookes, J. (1994) Garden design workbook. Doring Kindersley Publishing, Inc: New York.
- Campbell, Frederick C. and Richard L. Dube. (1997) Landscaping makes cents: smart investments that increase your property value. Storey Communications, Inc. Pownal, Vermont.
- Composting to reduce the waste stream. (undated) Northeast Regional Agricultural Engineering Service, Cooperative Extension: New York. NRAES-43.
- Engineering Field Handbook: Soil Bioengineering for Upland Slope Protection and Erosion Control. (1992) USDA/Natural Resources Conservation Service: Washington, D.C. Chapter 18.
- Fuller, D. (1995) Understanding, living with, and controlling shoreline erosion. Tip of the Mitt Watershed Council: Conway, Michigan.
- Herson-Jones, L.M., M. Heraty and B. Jordan. (1995) Riparian buffer strategies for urban watersheds. Metropolitan Washington Council of Governments: Washington, D.C.
- Hynes, E. and S. McClure. (1994) Rodale's successful organic gardening - low maintenance landscaping. Rodale Press: Emmaus, Pennsylvania.
- Kennebec Co. SWCD (undated) Camp road maintenance manual: Augusta, Maine.
- Lobdell, Raymond. (1994) A guide to developing and re-developing shoreland property in New Hampshire. North Country Resource Conservation and Development Area Inc.: Meredith, New Hampshire.
- Taylor's guide to garden design. (1961) Houghton Mifflin Co.20 Boston.

*References for plant materials will be found in the *Plant List*.



Androscoggin Valley SWCD

254 Goddard Rd
Lewiston, ME 04240



State House Station, 17
Augusta, ME 04333

DEPLW0094-A2001