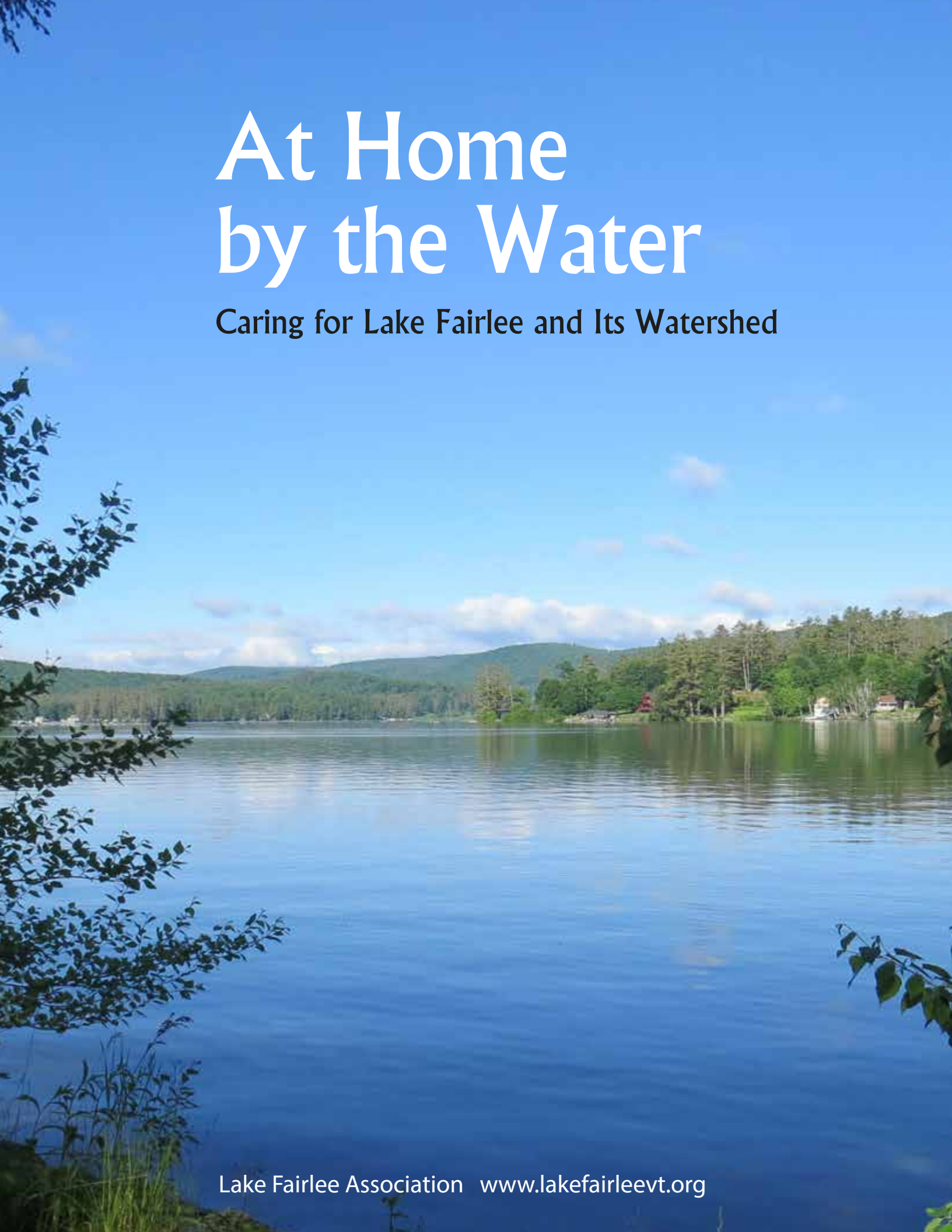
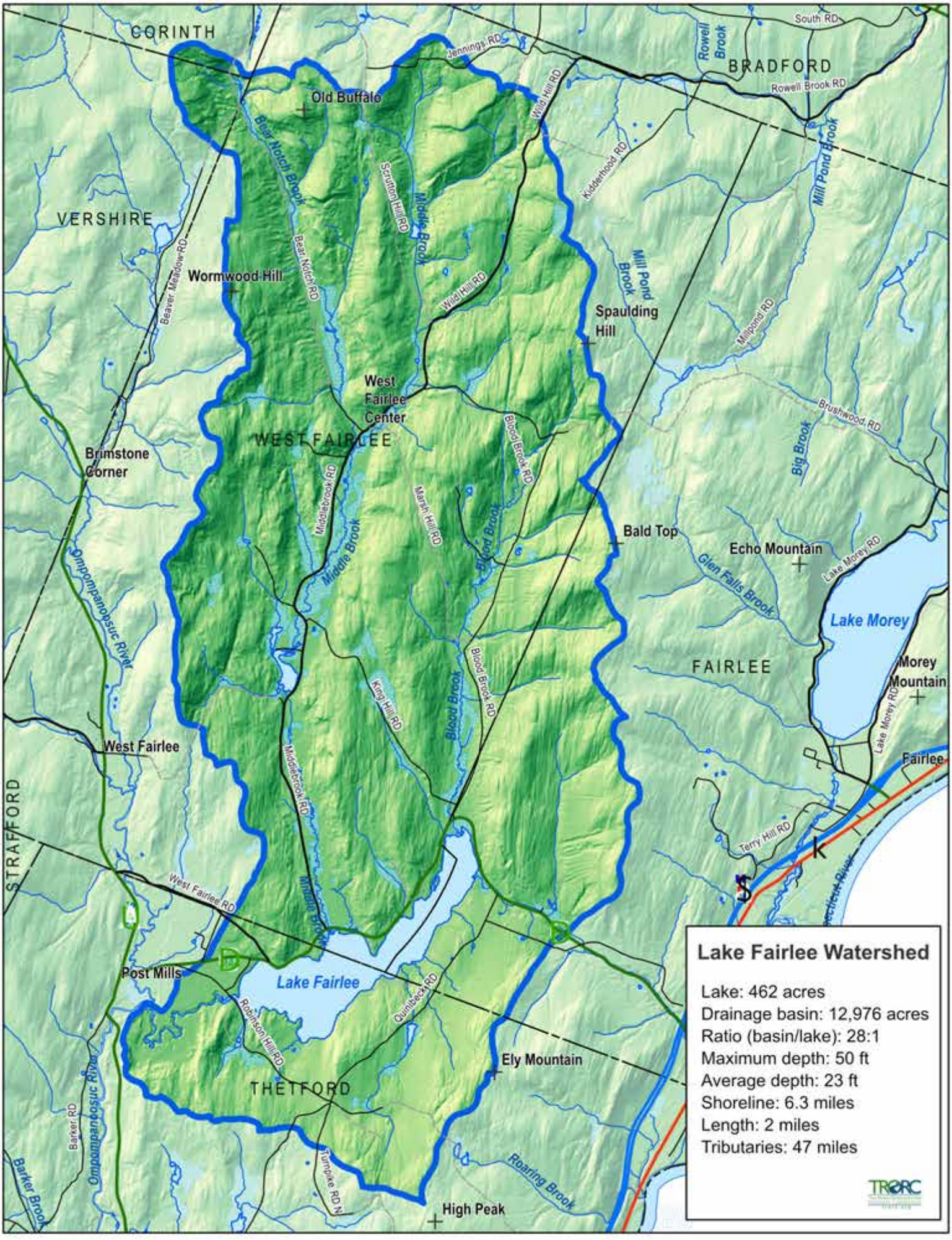
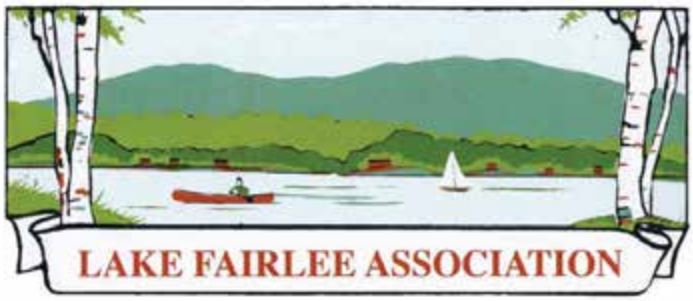


At Home by the Water

Caring for Lake Fairlee and Its Watershed

Lake Fairlee Association www.lakefairleevt.org


CORINTH
BRADFORD
VERSHIRE
WEST FAIRLEE
FAIRLEE
THETFORD
STRAFFORD
Old Buffalo
Wormwood Hill
Spaulding Hill
West Fairlee Center
Brimstone Corner
Bald Top
Echo Mountain
Lake Morey
Morey Mountain
Fairlee
West Fairlee
Post Mills
Lake Fairlee
Ely Mountain
High Peak
Jennings RD
South RD
Rowell Brook
Rowell Brook RD
Bear Notch Brook
Bear Notch RD
Beaver Meadow RD
Scruton Hill RD
Middle Brook
Wild Hill RD
Kidderhood RD
Mill Pond Brook
Millpond RD
Brushwood RD
Big Brook
Blood Brook
Blood Brook RD
Marsh Hill RD
Middlebrook RD
Middle Brook
Glen Falls Brook
Lake Morey RD
Ompompanoosuc River
King Hill RD
Terry Hill RD
West Fairlee RD
Robinson Hill RD
Quimbeck RD
Barker RD
Barker Brook
Turnpike RD N
Roaring Brook
Lake Fairlee Watershed
Lake: 462 acres
Drainage basin: 12,976 acres
Ratio (basin/lake): 28:1
Maximum depth: 50 ft
Average depth: 23 ft
Shoreline: 6.3 miles
Length: 2 miles
Tributaries: 47 miles
TRORC



The Lake Fairlee Association (LFA) Board of Trustees is pleased to provide you with this lakeshore and watershed property owner's guide. Lake Fairlee is a precious yet fragile resource enjoyed by many seasonal and year-round residents, renters, visitors, recreational enthusiasts, and wildlife. The LFA was founded "to preserve, protect, and enhance the distinctive ecology and natural resources of Lake Fairlee and its surrounding watershed" so all may continue to enjoy it.

FROM THE EDITORS

We created this guide with two goals in mind: 1) help Lake Fairlee watershed property owners gain an increased understanding of how the watershed "works" and 2) provide clear action steps to help property owners, and those who use the lake, be the best possible stewards. The Do's and Don'ts in the following pages are based on compliance with the 2014 Shoreland Protection Act (SPA) and the science behind its Best Management Practices (BMPs).

Thank you for your commitment to our lake. Please share with others what you learn from this guide about Lake Fairlee, its watershed, and its care.

Why this guide *now*?

The troubling news: Lake Fairlee is at risk. In recent years, water samples of the lake have shown a concerning increase in phosphorus, a nutrient that helps living things grow. Too much phosphorus is a sign that the lake is unbalanced. This finding and other challenges, such as Eurasian milfoil, show the lake is approaching a tipping point requiring our individual and communal response. With this guide, we hope to raise awareness of the primary issues that threaten the health of our lake. Its goal is to give homeowners practical ways to be part of the solution for a healthy lake now and into the future.

If we do not take action to reverse negative trends, lakeshore owners and those who use the lake will be directly impacted. Lake property values are dependent on the lake's water quality. For every 3-foot decline in water clarity (turbidity), shorefront property values can decrease as much as 10-20%. Excessive nutrients make clear water murky, and dense plant growth clogs shallow coves. Both of these conditions negatively affect recreational activities and healthy habitats for fish and other aquatic species. High phosphorus can cause explosive growth of aquatic plants (including invasive Eurasian milfoil) and cause blue green algae (cyanobacteria) blooms which can be toxic to animals and humans.

Lake Fairlee and its watershed host one of the richest areas of biodiversity in the greater Upper Valley. This biodiversity is at risk from poor shoreline management, increasing levels of phosphorus, the introduction of other pollutants and aquatic invasive species, and the destruction of habitat.

Furthermore, the effects of climate change, particularly the increased intensity of rain and higher temperatures, compound existing threats to lake health and add to the urgent need for action.

The good news: It's not too late! With a consistent, collective effort, this discouraging situation can be reversed. Every individual effort has an impact, especially when multiplied by the actions of hundreds of other watershed and lakeshore landowners. Together we can help build resistance and resilience for our watershed and lake.

Table of Contents

A digital PDF of this complete Guide is available to download at:
tinyurl.com/AtHomeByTheWater

PUBLISHED JULY 2022

1
Introduction

What you should know: *The greatest impact on the water quality in our streams, lakes, and drinking water comes from what we do on our land.*

Without realizing it, we can pollute by feeding the lake with nutrient runoff from stormwater, faulty septic systems, and fertilizer and herbicides used on our yards. *Just because it disappears doesn't mean it goes away.* Further, we can unwittingly increase the runoff of nutrients and sediment by cutting too many trees or removing plants along the shore. These kinds of human activities accelerate the rate and extent of nutrification, which can cause aging of a lake, or parts of it, to occur in decades rather than the normal hundreds (or thousands) of years. This imbalance of nutrient and sediment enrichment in the water increases the rate of plant and algae overgrowth, ultimately depleting the oxygen levels available to other aquatic life, resulting in a die-off of many species.

Rarely does anyone intend to degrade the lake's water quality. However, we do not always know the lake-friendly way to manage our property. This guide will help clarify best practices for you. Athough it will not cover every single property management practice, it does address the most frequent situations. More detailed information can be found in the Lake Health section at: *www.lakefairleevt.org*

Where Do We Start? Use this guide. Leave it out on a table as your "go-to" resource. Adopt these lake-friendly practices. Share it with all who visit your home, including your property management contractors and renters. *In addition to highlighting the main standards of the Shoreland Protection Act, the best management practices presented in this guide will help everyone reverse specific threats to lake health, improve water quality, reduce pollution, and increase their property value. * **Note:** *Guidelines for contractors and renters are available to print under "Lake Health" at: www.lakefairleevt.org*

What's in it for you?

■ Clear, clean, safe lake and stream water that enhances fishing, swimming, and boating; scenic views with trees and natural vegetation; habitat for abundant wildlife.

■ Increased property values: A VPR report on lake property values in Georgia, Vermont found that lakefront homes declined in value by $50,000 each in areas of repeated algae blooms. A University of Maine study found that 98% of shorefront home buyers rate water clarity as one of the primary reasons they bought their homes. That's ahead of swimming (87%) and even scenic beauty (82%).

■ Robust economy for the community: Lake Fairlee draws a population that contributes greatly to the economy of our watershed towns of Fairlee, Thetford, and West Fairlee.

■ We all win: What happens in one part of the lake or watershed can impact the whole lake. Essentially, we all live downstream. When stewardship becomes the new culture practiced by all, it ensures a winning outcome for everyone using these waters, including wildlife.

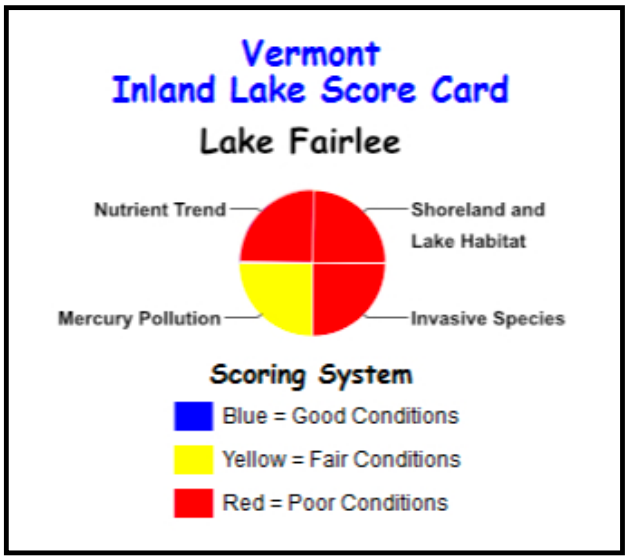
■ It's the right thing to do: Public lakes and ponds belong to the people of Vermont. Lakeshore and watershed property owners have a responsibility to protect public water resources. Complying with the Shoreland Protection Act upholds Vermont's "Public Trust Doctrine."

■ No fines or expensive mitigation: Complying with state regulations saves you money.

2
The Water Quality of Lake Fairlee

Each lake in Vermont is assessed annually by the state for four important criteria: nutrients, lake and shoreland habitat, aquatic invasive species, and mercury pollution. In 2019, it became clear that phosphorus levels in Lake Fairlee and a number of other Vermont lakes were rising. Lake Fairlee is currently rated "poor" for all the measurements except mercury.

Want to learn more about Lake Fairlee's scorecard? Read this article: *www.sidenote.news/untitled/*



Locating the sources of phosphorus, other nutrients, and pollutants is the first step toward a solution. This initiative is currently underway, but not yet completed. Together, we can help by taking steps to reduce nutrient and pollutant runoff into the lake and its tributaries.

The likely sources of pollution are several, whether located near the streams or the lake, such as:

- poor lakeshore or watershed management (e.g., lack of vegetative buffer)
- sediment runoff from dirt road grading and excavation
- failing septic systems
- nutrient runoff from over-fertilizing lawns and agricultural fields
- climate change impact on the release of phosphorus from the lake bed
- increased intensity of stormwater runoff
- erosion created by boat wakes

Damage from individual sources may be relatively small, but the cumulative effect from numerous sources can be substantial. Any activity that increases the rate of incoming materials speeds up the excessive nutrient richness within the watershed and lake.

What else impacts the water quality?

The lake continues to have a flourishing infestation of Eurasian milfoil, an aquatic invasive species that was introduced to the lake over two decades ago. For many years, the LFA has initiated and overseen thoughtful evidence-based strategies to help contain the spread of Eurasian milfoil. After trying many control techniques, treating the lake with an herbicide, combined with periodic diver hand-pulling, has been determined to be the most effective path forward. For a deeper look at this issue, please go to: *www.lakefairleevt.org/milfoil-treatment*

Additionally, the Greeter Program at the boat launch and other educational outreach (such as the LFA website, letters to members, this homeowner's guide, etc.) have been focused on preventing the introduction of new harmful aquatic invasives.

Milfoil Monster

3
Why Does the Watershed Matter?

Rain and snow runoff carries nutrients, soil, oils, and contaminants downhill to streams, ponds, and lakes. Global warming with its changing weather patterns creates more intense rains and winter runoff, carrying even larger particles downhill, from the upper watershed to the streams below.

In nature, the richly layered trees, shrubs, grasses, and sedges surrounding wetlands and damp areas buffer this process. *These layers of vegetation are key to protecting our valuable waters.* They slow the momentum of runoff, trap sediment, filter the water, and let it percolate into the ground, allowing our aquifers and wells to fill.

At the same time, this vegetative buffer provides rich habitat for thousands of species of wildlife: bobcat, bear, mink, otter, salamanders, turtles, blue heron, eagles, and trout to name a few. A wide variety of trees and shrubs provide shelter, food, and a welcoming place to live.

We traditionally cut this critical vegetation far too close to stream banks, losing the important benefits these trees, shrubs, and grasses provide. Crucial habitat is lost and runoff reaches the stream and ultimately the lake more swiftly and directly, degrading water quality.

What to do? *The single most important thing we can do to improve the health of the Lake Fairlee watershed is to widen stream buffers as much as possible and practical, and mow a smaller lawn.*

Reduced mowing and increased buffer:

- keeps our soil, water, and wells healthy
- increases much needed connected habitat
- helps combat climate change
- saves money and time
- means less maintenance

Ideally, stream buffers should be 35'-100'. BUT…ANY buffer increase is beneficial. This buffer doesn't have to be completely forested—you can find a balance between forested and open: make a lovely winding trail to the water and a cozy picnic spot!

Breakfast in the watershed

Middle Brook and Blood Brook contain miles of Class 2 wetlands, protected by the Vermont Wetland Rules. The rules require 50-foot vegetative buffers to provide their many benefits. (Farms are exempt from certain buffer requirements when planting crops and pasturing livestock). Where streamside fields are hayed, consider working with the person who hays to increase the buffer width. It may not be easy or practical where the stream valleys are narrow, but do consider together where it might be possible.
To learn more about buffers, please go to p.10 in this guide.

If you're planning a project that involves any clearing within 50 feet of a wetland, even if it's wet only part of the year, you are required to call the VT Agency of Natural Resources first. They are fair and very helpful.

Phone: (802) 828-1556 or *tinyurl.com/WetlandInquiry*

Note: *Please be aware that excavation and construction, agriculture, and forestry at any location in the watershed can have a significant impact on water quality in streams, wetlands, and the lake.* These areas will be addressed in detail on p.13–15 of this guide.

An excellent resource about the watershed and the value of your streams is: *Living in Harmony with Streams: a Citizen's Handbook to How Streams Work*. Find it at: *tinyurl.com/HowStreamsWork*

Vernal pool gem

Little red eft

4
Shoreland Protection Act

A BRIEF HISTORY

In 1970, Vermont passed a first in the nation Shoreland Protection Act (SPA). Then, allowing the act to lapse in 1975, the state chose to rely on a strategy of education and voluntary compliance to protect our shorelines. In 1971, Maine copied the Vermont law and strengthened it continuously over the years. As a result, Maine soon had much healthier shorelines and lake water quality than Vermont.

Almost four decades after the 1970 Shoreland Protection Act expired, a 2013 Vermont Agency of Natural Resources' report declared the state's education and voluntary compliance strategy a failure. The report cited a federal survey that found 82 percent of the shoreline on Vermont's 800 lakes and ponds was in fair to poor condition because of extensive clearing, lawns, and development close to the water's edge. The report explained that shorelines without natural vegetation result in more runoff and erosion, which degrades water quality for fish, wildlife, and human recreation. Cleared shores are also more susceptible to flood damage.

The need for restoring and protecting lake shorelines was clear. In response, the Vermont Legislature passed the Shoreland Protection Act, effective July 1, 2014. The act created a 250-foot Protected Shoreland Area which places standards and restrictions on:

- tree cutting
- vegetation removal
- gardening
- access paths
- lawns
- impervious (hard) surfaces—including houses, sheds, decks, patios, and driveways

Following these standards will help keep Lake Fairlee healthy for generations to come. For more information on these specific areas, see Chapters 5 and 6: p.10–21.

The act recognized that many shoreland properties in Vermont were already developed. These properties are "grandfathered" until the owner proposes redevelopment. The act also recognizes that there are small lots that cannot meet the standards completely. In these cases, the Vermont Agency of Natural Resources staff works with homeowners so that standards are met to the extent possible.

The many details and specific regulations of the SPA are beyond the scope of this booklet. For more complete information and requirements, find the Shoreland Handbook here: tinyurl.com/VTShorelandHandbook

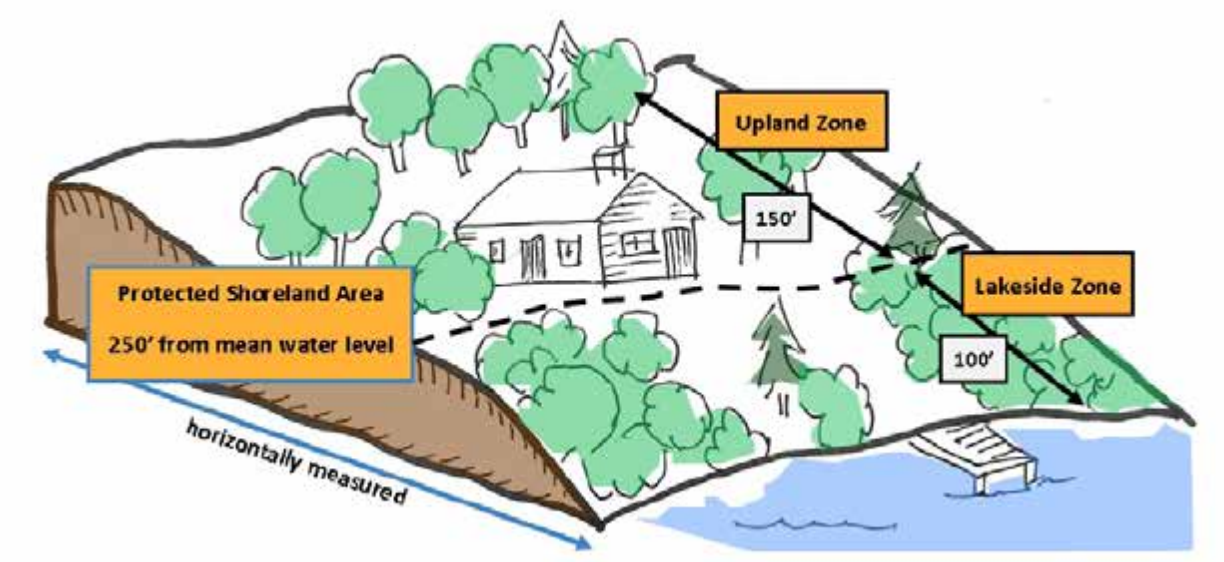
WHAT LAND IS PROTECTED?

The SPA regulations apply to the area within 250 feet, measured horizontally, from the mean water level. This area is referred to as the Protected Shoreland Area. Understanding the standards and where they apply within the Protected Shoreland Area is easiest to describe—and therefore manage—by breaking the shoreland area into two zones: the Lakeside Zone and the Upland Zone

The Lakeside Zone (The first 100 feet)

The Lakeside Zone encompasses the first 100 feet back from the mean water level and is especially sensitive. Activities in this area must meet the Vegetative Protection Standards (defined later). Within the Lakeside Zone, clearing and creation of impervious surfaces are limited. Many shoreland parcels are already developed within the Lakeside Zone or may be too small for implementation of the full set of standards. The SPA grants Shoreland Permitting flexibility to permit "non-conforming" parcels.

The Protected Shoreland Area



The Upland Zone **(The next 100 feet)**

The Upland Zone starts at the edge of the Lakeside Zone and extends an additional 150 feet to the outer boundary of the Protected Shoreland Area. On existing lots of sufficient size and new lots created after July 1, 2014, most new development will take place in the Upland Zone or further back from the shore. Parcels in existence as of July 1, 2014, may be significantly smaller than the full 250-foot depth of the Protected Shoreland Area and special rules may apply.

WHAT NEEDS A PERMIT AND WHAT DOESN'T?

I'm considering a project on my property. Do I need a permit?

Many, but not all projects within 250 feet of the shoreline require a permit. Use the Shoreland Project Worksheet to determine if your residential project requires a permit or registration (a simplified permitting process for smaller projects). You can find the worksheet at this link: *tinyurl.com/SPAWorksheet*

Permit requirements will vary depending on the preexisting conditions (i.e., those present as of July 1, 2014), the size of the parcel, and any site characteristics that affect where building can occur.

Parcels created after the effective date of the Act (July 1, 2014) must meet the standards.

Note: *Land located on the non-lake side of a municipal or state road, but within 250 feet of mean water level, does not have to conform to the Shoreland Protection Act. Land on the non-lake side of a private road, however, does have to comply with the Shoreland Protection Act.*

No permit is required for the following activities:

- Maintenance of buildings, driveways, gardens, landscaped areas, and lawns in existence as of July 1, 2014, without enlarging them.
- Tree thinning does not require a permit but does require following the Vegetation Protection Standards. See additional detail below or here: *tinyurl.com/VegetationStandards* and *p.14.*
- Pruning branches from the lower one-third of a tree's height (This preserves the canopy.)
- Removal of 250 square feet of vegetation under three feet tall, at least 25 feet from the mean water level, is allowed as long as the Vegetation Protection Standards are met and the duff layer is not removed.
- Removal of dead, diseased or dangerous trees, invasive species, nuisance plants, and noxious weeds, such as purple loosestrife, buckthorn, or poison ivy. Below-ground roots must be left in place, as they provide stability on fragile lakeshores. If no structures are at risk, consider letting the tree fall on its own.

Dead trees can provide wonderful habitat. Trees that have naturally fallen into public waters must remain in the water as they have become part of the public resource and create important aquatic habitats. For more information on trees: *tinyurl.com/SPATrees*

- Creation of a path no more than six feet wide to access the lake

Registration (a simplified permitting process) **is required for smaller projects** such as the following activities:

- Clearing an area up to 100 square feet or creating an impervious surface (such as a storage shed or gazebo) between 25 and 100 feet of the mean water level.
- Clearing an area up to 500 square feet or creating an impervious surface located more than 100 feet from the mean water level. There are required limits to the percentage of impervious surface, cleared land, and slope allowed within the Shoreland Protective Zone. *Find the Registration Application here*: *tinyurl.com/ShorelandRegistration*

A permit is required for the following activities:

- Constructing a new building
- Expanding an existing building
- Creating or expanding a driveway or building a new garage
- Installing, replacing, or upgrading septic systems and potable water systems
- Clearing existing natural vegetation or expanding lawns or gardens into wooded areas
- Tearing down a building and replacing it on a different footprint

Find a Permit Application here: tinyurl.com/ShorelandPermitApplication

Note: *It is strongly recommended that applications be submitted at least 45 days before the proposed project start date.*

What happens if I don't get a required permit?

Fines can easily run into thousands of dollars and generally require revegetating cleared areas or removal of an unpermitted structure. The Lakes and Ponds DEC staff are available to conduct site visits to provide technical assistance. They welcome the opportunity to discuss proposed plans and provide guidance through the permitting process. They are a great resource for lake-friendly practices. Email Shoreland Permitting at: *ANR.WSMDShoreland@vermont.gov.*

For violations: Vermont has environmental regulations such as the Shoreland Protection Act in place to protect Vermonters and the lands and waters of the state. Violations may occur, either inadvertently or through careless disregard. If you see anything of environmental concern you may file a report here: *tinyurl.com/EnvironmentalViolationReport*

Lake-friendly tree thinning with a view

5
Tending Your Land Along Stream and Lake

How can we, as lake and stream shore owners, preserve and improve the lake's water quality? Where and how does one begin?

MEET THE VEGETATIVE BUFFER

One might start with one of the most vulnerable yet functionally important areas on a lake—its shoreline. A healthy shoreline helps filter pollutants, deter erosion, and provides habitat for microorganisms, insects, amphibians, fish, birds, mammals, and other forms of wildlife.

Over the years, it became common practice to clear vegetation at the water's edge to access the lake, maximize lawns, and open views. We now know a far better approach is to keep plants, shrubs, and trees in place, or to plant a shoreline buffer zone—a width of land along the water's edge that is rich in native trees, shrubs, and flowering plants.

Why Buffer Zones?

There are few actions a property owner can take that have such an immediate and positive impact on water quality as a vegetative buffer zone.

Vegetative buffers protect water quality by slowing the flow of water that helps to:

- Stabilize banks with their roots. This minimizes erosion and its deteriorating impact on the clarity and purity of lake water.
- Absorb and filter runoff from driveways, roofs, etc., which pass along sediment along with excess nutrients, such as phosphorus and nitrogen.
- Mediate the harm caused by the unintended flow of strong household chemicals, waste, detergents, and fertilizers into the lake.

Vegetative buffers also contribute to the streams and lake in other significant ways. They:

- Add to the appearance and have proven to add value to a property by incorporating attractive native plants and trees. **Note:** *Such beauty is a bonus, not just from where you sit on your porch or dock. Others will appreciate the appealing view looking into your property from the water or their house across the lake.*
- Support native flora that, over time, have developed resistance to local pests and disease.
- Enhance wildlife and travel corridors, which are essential to many species.
- Help to maintain the water level in your well.
- Perhaps best of all, buffers require minimal upkeep once established.

Where Do I Begin?

Plan your Buffer

- Establish the size and location of your buffer zone
- Design the buffer to be as long and wide as possible, especially if the site is sloping, which makes it more vulnerable to runoff.
- Choose trees, shrubs, and groundcover plants that will be compatible with your lakeside setting.

1. Include a high, spreading tree canopy to disperse and slow rainfall and provide shade for flora, fauna, and fish.
2. Choose a group of understory trees, shrubs, plants of varying heights, and ground cover.
3. Plan to leave the "duff" layer intact. "Duff" is the spongy organic material on the forest floor that enriches soil as it decomposes over time and acts as a natural mulch.

A vegetative buffer is lake-friendly and beautiful. *Landscape Design for Healthy New England Lakes*. Published by the Federation of Vermont Lakes and Ponds (FOVLAP); 2017, p. 10

If you would like ideas for the configuration of your plantings, you might look to a few sample designs featured in *A Guide to Healthy Lakes Using Lakeshore Landscaping*, which is a downloadable booklet listed on the LFA (Lake Fairlee Association) website: *www.lakefairleevt.org/lakeshore-landscaping-guide*

If your focus is more about tending land along a stream, see this comprehensive, richly illustrated online book, *My Healthy Stream: A Handbook for Streamside Owners*. Find it at: *tinyurl.com/HealthyStream*

Why use native plants? If at all possible, try to acquire only native specimens. Native plants:

- generally have deeper and better root systems
- tend not to require artificial fertilizers and synthetic chemical pesticides and herbicides
- typically require less water than non-native plants
- provide critically important food, shelter, and nesting sites for songbirds, small mammals, reptiles, insects, and amphibians

For suggestions of native species that could provide a starting point in creating a buffer zone—or even just a few additions to one's property—go to: *www.lakefairleevt.org/shoreland-plant-list*

Be on the alert for invasives. When selecting plants from nurseries, be sure to check with the nursery staff to make sure it is a native plant and not an invasive.

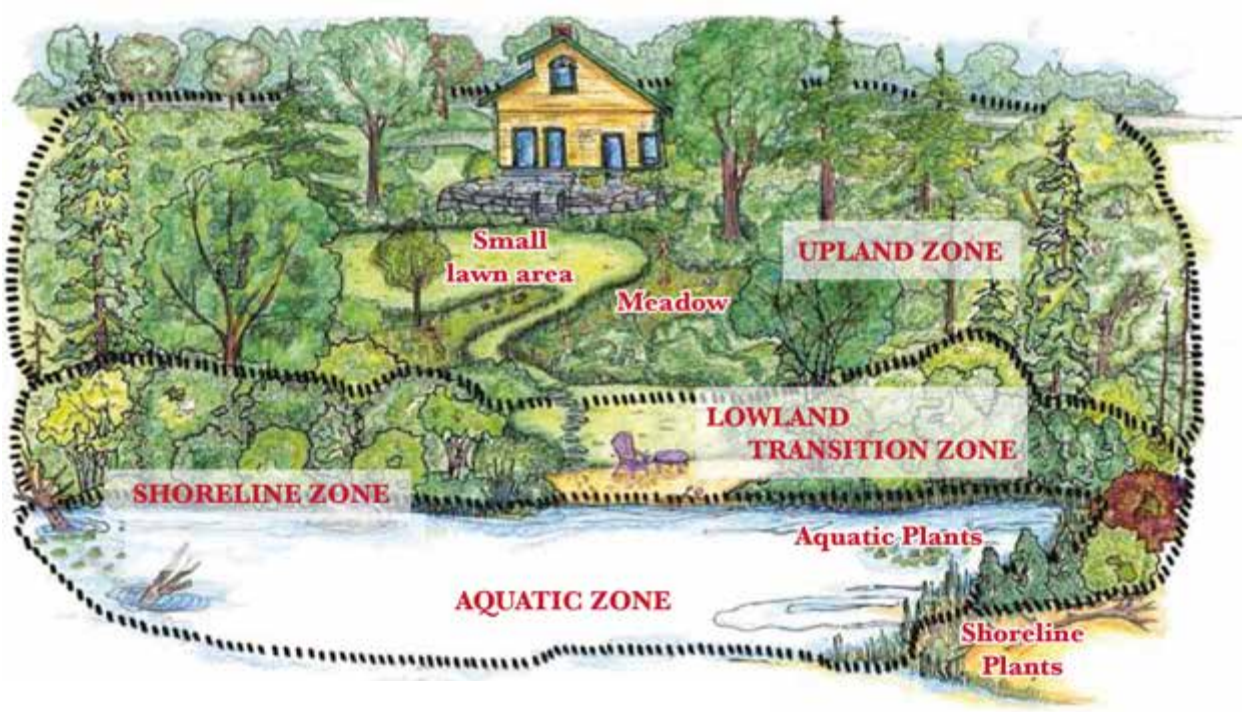
Some invasive species to avoid are:

1. Multi-flora rose (*Rosa multiflora*)
2. Amur honeysuckle (*L. maackii*), Morrow's honeysuckle (*L. morrowii*), Tatarian honeysuckle (*L. tatarica*), and Bell honeysuckle (*Lonicera x bella*).
3. Purple loosestrife (*Lythrum salicaria*) is a visually attractive plant that, sadly, has been choking out native wetland plants and the wildlife that depends upon them.

*** Some desirable native honeysuckles you could plant are American honeysuckle (*Lonicera canadensis*) and bush honeysuckle (*Diervilla lonicera*).

Note: *LFA members and other watershed residents may receive a 10% discount on trees and plants from E.C. Brown's Nursery in Thetford Center when undertaking buffer zone projects.*

How can I stabilize a slope using Mother Nature's help? Many lakeside properties slope toward the water—at times steeply—making the site especially prone to erosion and runoff. Swift, downward-moving water may also carry harmful household waste and excess nutrients, such as phosphorus and nitrogen. How can one diminish runoff while creating an attractive property?



Vegetative buffers include many layers and species of plants adapted to each of the zones and habitats, from aquatic environments to upland forests. Lauren Chase Rowell, *Landscaping at the Water's Edge*, c. 2007, UNH Extensions

Looking at the above illustration, from the top down, we see a modest, oval-shaped lawn near the house and a path that curves back and forth toward the waterfront. The curving path slows down runoff —a straight downward path would accelerate it. One can achieve a meandering route by simply mowing a path no wider than 6 feet through a lawn or, preferably, a meadow. With its thicker, more diversified grasses, a meadow will help slow the water's journey, while potentially adding visual interest and a wildlife corridor.

The illustration above suggests how a lakeside owner might minimize erosion by creating a richly vegetated property. The landscape presents a wide variety of trees and plants appropriate to each zone—upland, lowland transition, the shoreline zone, and aquatic plants.

- **The upland zone** is less likely to flood and therefore supports lawns, gardens, meadows, and a more heavily forested environment.
- **The lowland transition zone** is about 10 feet or more from the lakeshore, where more water-tolerant vegetation can thrive. Here we see more shrubs, small trees, and such plants as alders, high-bush blueberries, Joe-pye weed, and ferns.
- **The shoreline zone** borders the water and is adapted to wet soil. Common vegetation includes willows, elderberry, viburnums, dogwoods, winterberry, grasses, blue flag iris, and marsh marigolds.
- **Aquatic plants** can float and grow partially within the water, or along the water's edge. They include white water lilies, pondweeds, cattails, bulrushes, and sedges.

Less Lawn, More Meadow. If you have created —or plan to create—a vegetative buffer near the lakeshore, a meadow offers a natural transition between the water and a more conventional lawn.

Established meadows provide rewards far beyond freedom from mowing lawns. A native meadow's deep roots help to prevent erosion and absorb stormwater runoff. Unlike a lawn, a meadow creates an attractive mixture of ferns, grasses, and flowers that attract pollinators and beautify a property. As with vegetative buffers, meadows offer corridors for fauna and nesting grounds for small birds.

Creating a meadow requires next to no work if it is to take the place of an existing lawn. One might choose to mow a meadow once or twice a year, every other

year, or leave it alone, allowing it to return to its natural state. Wildflowers and grasses will emerge on their own over time. You might choose to add some favorite natives, such as lupine, for extra appeal.

As always keep an eye out for invasive plants common to Vermont, especially purple loosestrife, honeysuckle, Japanese knotweed, glossy buckthorn, and barberry. Such intruder species are easier to remove sooner rather than later.

A meadow is sure to enliven your property in ways you might not have imagined.

BEYOND BUFFERS

What Other Ways Can We Reduce Erosion and Runoff?

Moving away from retaining walls: In the past, it was common practice to build solid vertical retaining walls to stabilize banks along the water and reduce soil erosion. Unfortunately, we now understand that these retaining walls push back waves that then scrub around and under the wall's edge, causing an undercut in the bank.

Others opted for riprap (a permanent layer of large angular stones). It has been found that when riprap is used on stream banks, it transfers the problems of erosion downstream.

Neither of these physical strategies is sustainable in preventing erosion along a shore. We now know that the most effective way to stabilize banks is with trees, shrubs, and plants. **Note:** *Installation of retaining walls or riprap requires a Lake Encroachment Permit.* *See p. 23.*

When doing work on your land, keep stormwater runoff in mind. When it rains, stormwater runs off your property's impervious surfaces (rooftops, paved or other hard surfaces such as terraces or decks), lawns, and bare soil, gaining momentum as it flows. If a streambank or shoreline lacks an adequate width of trees, shrubs, and plants, the runoff does not have a chance to be properly absorbed and filtered before entering open waters. Stormwater is contaminated by everything it picks up along the way: soil, pesticides, fertilizers, salt, pet and yard waste, motor oil, gas, trash, and nutrients from leaky septic systems.

Lawns offer a direct path for stormwater runoff.

EXCAVATION AND CONSTRUCTION TIPS

A poorly managed construction site can produce more sediment in one season than the amount generated over many years from all other kinds of land and home projects. Driveways, excavation for houses or outbuildings, creation of impervious surfaces, and roadway grading are all sources of sedimentation in the watershed that can reach the lake.

- Soil runoff: Divert downhill runoff with water bars, silt fences, hay bales, etc. This may cost a little more upfront but helps minimize clean-up costs.

A silt fence protects water from sediment runoff.

Re-directing drainage can add beauty.

■ Drainage: Avoid making culverts, drains, or ditches that discharge stormwater directly into streams or the lake. Instead, apply designs that filter stormwater into the ground, including porous pavement, and gravel wetlands. OR create shallow, gravel-filled trenches to catch, slow down, and redirect runoff, perhaps to a rain garden.

■ Compaction and erosion: Avoid the use of heavy equipment (including riding mowers) within 10 feet of a stream or lake. The weight of the equipment can lead to soil compaction and crumbling banks. Discuss with your contractor.

■ Impervious surfaces: Avoid paving or using other impermeable materials for driveways, walkways, patios, or tennis courts. Instead, use porous materials that help absorb stormwater. Strategies to shape and stabilize driveways can be found in The Vermont Guide to Stormwater Management for Homeowners (#7, p. 41-42) *tinyurl.com/StormwaterGuide*

■ Tree removal during construction: Minimize removal of trees and vegetation to prevent erosion. Make sure requirements of the Shoreland Protection Act are followed.

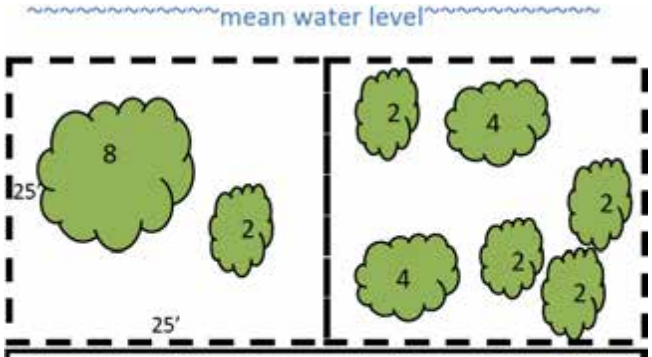
■ For technical guidance for contractors working near water, see the LFA website: *www.lakefairleevt.org/contractor-tips*

TREE THINNING AND PRUNING

What if I want to thin and prune trees along the water?

■ A wooded shoreland is essential for a healthy lake ecosystem. Most of the lake's wild species spend all or some of their life close to shore. Tree roots hold the bank together and protect against erosion while branches shade the shallow waters.

■ Vegetative cover within 100 feet of the mean water level must be managed according to the Vegetation Protective Standards (VPS). The VPS is a point and grid method that allows for selective thinning of shore-



The plot on the left has only 10 points, so all vegetation must remain. The plot on the right has 16 points – some trees can be thinned.

land vegetation. This method allows a landowner to remove individual trees for a view, while still preserving the ecological benefits of a forested shoreland. Find additional information here: *tinyurl.com/VegetationStandards*

■ Pruning branches from the lower one-third of a tree's height is allowed. This process can provide views through the trees while preserving the canopy that slows down raindrops, limiting erosion.

■ To see if your tree work along the lakeshore requires a permit or not, go to p.8 under "I'm considering a project on my property. Do I need a permit?"

Forest with path

FORESTRY

What if I have a forest to manage?

■ Seek advice from a licensed forester before engaging a contractor for tree harvest. Why?
The forester's oversight of proper construction of forest roads, tree selection (including leaving legacy trees), and regard for slopes, wetland, and harvest openings will reduce sediment runoff to streams. Registered foresters know the Acceptable Forest Management Practices that protect water quality.

■ Sensitive ecological forest management can enhance wildlife habitat and forest health while providing carbon storage and recreation. Forests can be actively or passively managed. A forester works with the landowner to achieve their goals.

■ An excellent bulletin on managing for old-growth forests, for homeowners: *tinyurl.com/ManageOldGrowth*

AGRICULTURE

When planting crops or grazing livestock, how can I protect water quality?

Adding just one improvement each year from the Vermont Required Agricultural Practices Manual (*www.agriculture.vermont.gov/rap*) can make a difference to water quality and habitat on the farm and downstream.

■ Consider restoring wetlands and streamside vegetation where possible and sensible with added buffer width. Although farms are exempt from certain buffer requirements for crops and pasturing livestock, this strategy can help minimize runoff and stabilize banks in periods of heavy water flow.

■ If making land conversions, such as thinning out a wetland area forest to make pasture, or putting in a barn in a wetland area, check in with Vermont Agency of Natural Resoures first: 802-828-1556 or: *www.dec.vermont.gov/feedback*

■ White River Natural Resource Conservation District staff are happy to visit small farms to help think about ways to improve. Phone: (802) 369-3167 or *www.whiterivernrcd.org*

Farmland with protective buffer

SEPTIC SYSTEMS

The Ins and Outs of Your Septic System (a.k.a "wastewater system")

A properly sited and functioning septic system is a must. Why does this matter? It:

- keeps extra nutrients out of the lake that would act like fertilizer to increase plant and algae growth, including the possibility of toxic algae blooms
- protects people and the lake's ecosystem from bacteria and potential disease-causing organisms
- keeps your drinking water clean and safe
- protects the value of your home
- safeguards you from potential legal liability
- saves you money: malfunctioning systems can cost $3,000-$40,000 to repair or replace compared to maintenance costs of about $250-$500 every 3-5 years

Do Your Part / Be Septic Smart

1. Know your system:

- Learn where it is and sketch its location with measured distances from stationary objects. (e.g., a corner of your house). Septic pumping companies are experts at locating systems.
- Keep records of design specs, maintenance, and inspections.

2. Inspect it and protect it:

- Have your system inspected by a septic service professional at least every three years to ensure that all aspects of the system are operating properly. If you have any questions or concerns or are expecting to sell your property, you should have it inspected by a licensed designer or engineer.

3. How often should you have the tank pumped?

The proper frequency depends upon the tank size, frequency of use, number of people, etc. Check with your local septic company.

- For year-round residents: pump the tank every 3-5 years.
- For seasonal residents: pump the tank every 3-4 years (generally).
- For rental properties, when the number of guests may sometimes extend beyond what is considered appropriate for the size of your system, the tank should be pumped every 1-2 years.

4. Look for signs of malfunction:

- Septic backing up into your toilets, tubs, or sinks
- Odors, especially when accompanied by soggy ground or water discharging in a nearby ditch, even if the discharge is not constant
- Slow or backed-up drain, particularly after a weather event
- Standing water on the leach field

Note: *A septic system does not always show onshore signs of malfunction. You may notice a dense patch of plants or algae in the lake where nutrients from a failing system are entering.*

5. Follow these tips to help your septic system operate properly:

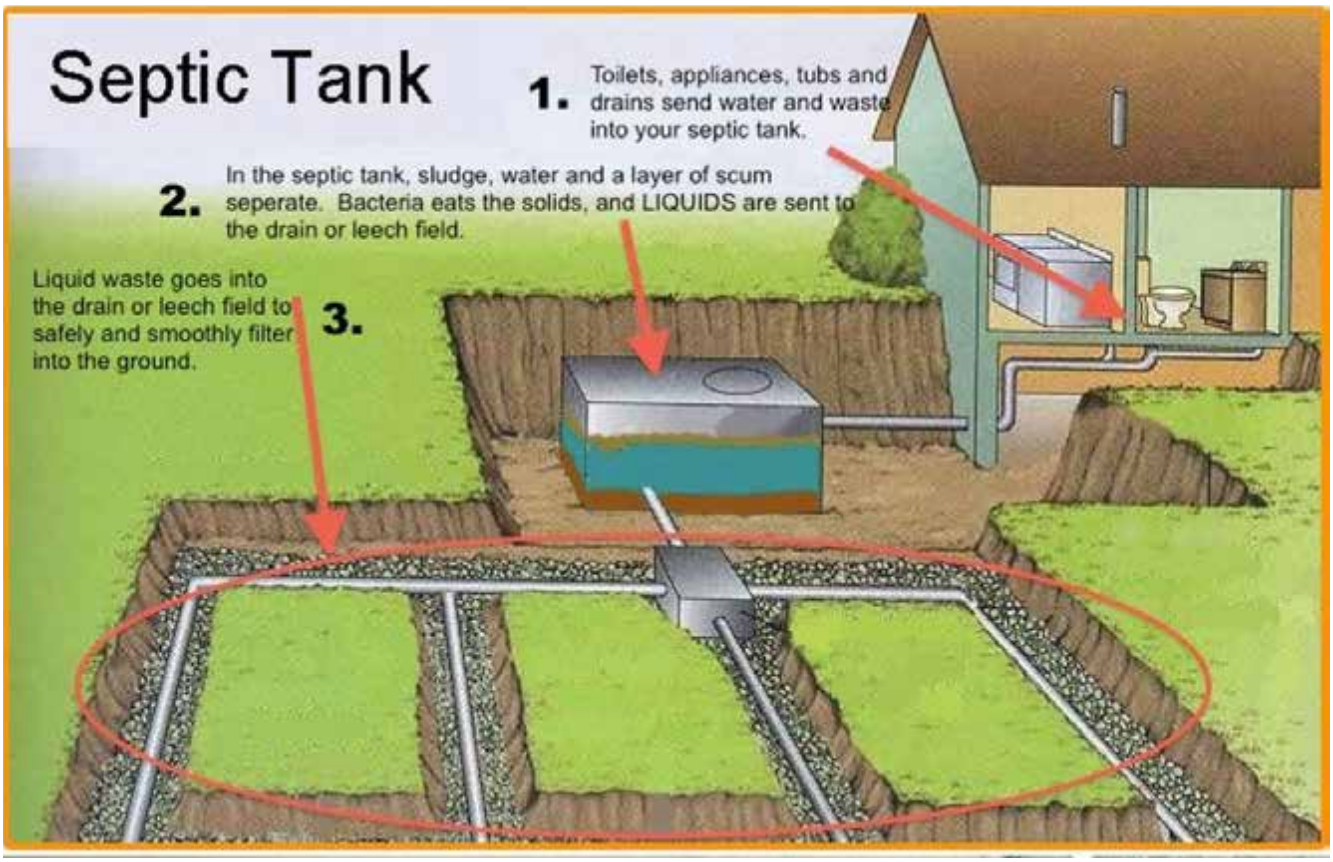
Think at the Sink: Your septic system contains a collection of living organisms that digest and treat household waste. Pouring toxins down your drain can kill these organisms and harm your septic system.

- Avoid the use of a garbage disposal. Dispose of fats and greases in the trash.
- Do not dispose of toxic materials down the drain (oil-based paints, solvents, polishes, used oil, paint thinner, chlorine bleach, etc.).
- Avoid chemical drain openers for a clogged drain. Instead, use boiling water or a drain snake.
- Use eco-friendly products for cleaning and laundry.

Don't overload the commode: Flush only human waste and toilet paper down the toilet.

Be water wise: All of the water a household sends down its pipes winds up in its septic system. Efficient water use improves the operation of a septic system and reduces the risk of failure.

- Avoid running water when not needed; repair leaking fixtures promptly.
- Replace showerheads, sink faucets, and toilets with low-flow fixtures.
- Purchase water and energy efficient appliances when replacing old ones.



Components of a septic system

■ Run dishwashers and clothes washers only when full; stagger loads over several days.

Shield your field:

■ Keep the leach field clear of parked cars, heavy stored objects, and buildings. Don't drive on it. Excess weight will compact the soil in the field, which reduces permeability and can break pipes, leading to failure of the system.

■ Keep deep-rooted trees and shrubs from growing on or near your leaching area or any part of the septic system. Root systems can disrupt underground pipes or crack your tank, causing the system to fail. Ground covers, flowers, or low-maintenance grasses are fine.

■ Divert all drainage away from the leach field.

■ Do not add enzymes or commercial additives to your system. The bacteria already present in your system should provide all the digestion required.

When do I need to obtain a wastewater permit?

1. New septic systems in Vermont are required to obtain a state permit.

2. Upgrades to an existing septic system along a lake or stream require a Vermont Wastewater Permit when:

■ changing your home from seasonal to year-round use

■ expanding your home with new bedrooms or adding a new structure to be served by water. The appropriate size of a system is based on the number of bedrooms in your home.

Note: *The standard in Vermont designates the appropriate capacity as being two people/bedroom for the first three bedrooms and one person/bedroom beyond that. If you rent your home, make sure renters are aware of these limits so they don't overstress your septic system.*

■ conducting minor repairs (essentially a crushed pipe or cracked septic tank). You must check with the regional office to see if you need a permit.

Information for Landowners and Designers: *tinyurl.com/WWSystemInfo*

OUTDOOR HOME PROJECTS

1. Yard maintenance

■ Avoid pesticide and herbicide use. These substances can leach into the ground contaminating groundwater or runoff into our tributaries and lake. They can also harm useful insects and vegetation. 90% of the insects in your garden and lawn are not harmful. Use physical or biological controls for unwanted pests instead.

■ Make sure rainwater flows down your drain spouts and soaks into the soil or a rain garden near your house, not into the lake.

■ Prevent sediment from driveways, walkways, and drainages from entering the lake by using Best Management Practices for redirecting stormwater and construction runoff. Please see p.13–14.

■ Contain and cover piles of soil, compost, and organic material, or use for duff layer in the upland zone. Piles of organic matter on banks can overwhelm waterways with unhealthy amounts of nutrients.

■ Do not burn leaves or brush within 250 feet of the shoreline or 50 feet from any drainage. Nutrients remain behind to be washed into the lake with the first rain.

2. Less Lawn Care Means More Lake Protection

■ Don't use fertilizer near the lakeshore. It will wash into the lake.

■ Leave grass clippings on the lawn for a natural "fertilizer" or add them to your compost.

■ Maintain a height of around 4" for lawns to promote deeper roots, discourage weeds, and allow more efficient absorption of nutrients and moisture.

■ Try not to water your lawn. Dormancy is a natural progression for cool-season grasses during a drought. Well-distributed shade trees will help protect lawns from excessive heat and drought.

3. Building and Painting Tips

■ Use non-toxic paint or stain on the outside of buildings.

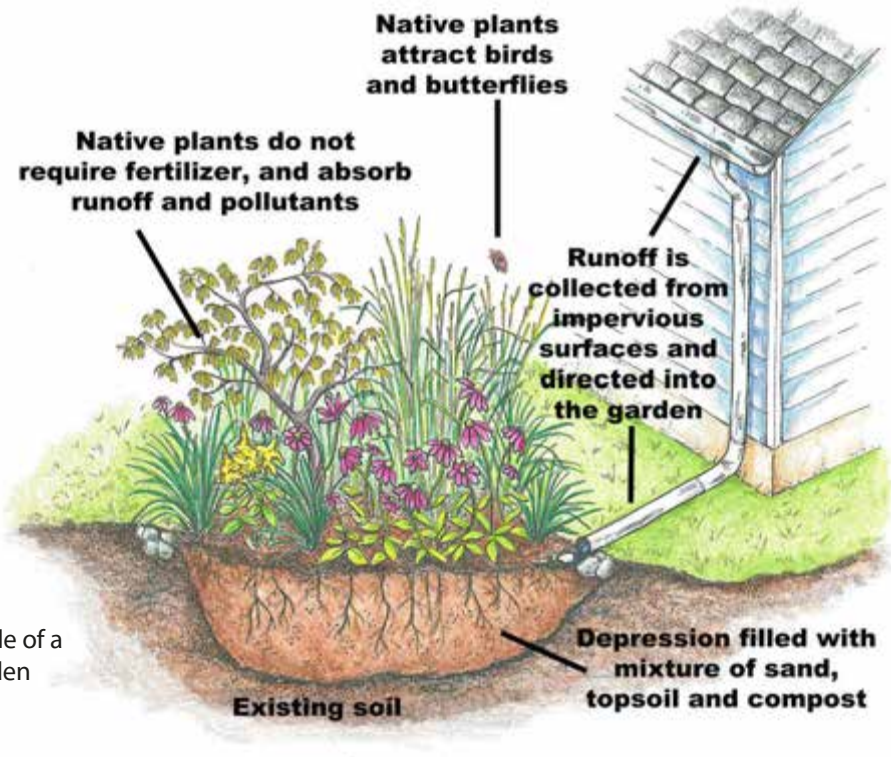


Figure 6
The imortant role of a simple rain garden

A permeable pathway

■ Take extra care when painting anything over or near the water.
■ Use drop cloths under exterior work areas.
■ Clean paintbrushes and tools using non-toxic citrus-based solvents in areas a minimum of 250 feet from the shoreline and streams. Use recommended paint recycling or disposal methods.
■ Consider using shingles or siding that do not require painting or staining.
■ Use alternatives to pressure-treated wood. Pressure-treated wood must be legally dumped because it contains chemicals that can leach into the atmosphere, ground, and surface water.

The Lebanon solid waste facility (landfill) accepts construction debris from GUV towns (Thetford and West Fairlee). A permit is required. Here's how to get one: *www.lebanonnh.gov/1514/Solid-Waste-Permits*

If the material is from Fairlee, contact their solid waste district: *www.cvswmd.org/*

4. Pets and Wildlife:

■ Scoop the poop! Do not allow human or animal defecation or urination in or within 150 feet of the lake (including an outhouse). Pet waste can be a health risk to humans and other pets.
■ Humans or dogs should not be washed in or near the lake.
■ Do not feed ducks or geese. Encouraging waterfowl runs the risk of increasing disease-causing bacteria in the water as well as the incidence of swimmer's itch.
■ Do not release non-native plants or animals into the lake or watershed. Dispose of aquarium contents far away from the water. Aquarium species are considered non-native invasives and can rapidly displace native organisms in the watershed.

5. Cars and Boats:

■ Wash cars and boats outside of the 250-foot Shoreland Protection Zone on a porous surface like lawn or gravel.
■ Use non-toxic phosphate-free biodegradable soap.
■ Dispose of all auto fluids and old batteries, etc. by recycling them at a service station, auto supply store, or a hazardous waste collection. Never use a hose to wash away big spills. Use kitty litter, sawdust, or woodchips—then sweep up and dispose of properly.

6
Lake Wise: Guidance for Lakeshore Landscaping

Property owners wishing to make lake-friendly improvements to their shoreland can receive free technical assistance from Vermont's Lake Wise program. The staff scientists will assess your property for runoff and erosion problems and offer sustainable solutions. To get help, go to: *tinyurl.com/VTLakeWise*

The goal of Lake Wise is to establish a new normal, a new culture of lakeshore landscaping that is proven to help protect the lake. This initiative also recognizes model shoreland properties with a Lake Wise award. This certifies that a property is well-managed and reflects shoreland Best Management Practices.

Native buffer plantings

List of Shoreland BMPs

Lake Wise Conditions, BMPs and Fact Sheets

While living along a shore, it's critical to understand the conditions that help protect the functions and values of lakes, such as water quality; aquatic habitat; fishing; swimming; boating; bird-watching; property values; and others. Using Best Management Practices (BMPs) will help achieve the healthy shoreland conditions needed to protect the lake.

Driveway

Condition	BMP and Fact Sheets
• Defined and minimized driveway • Minimized soil compaction • No erosion • Runoff channeled away from the lake	• Crowned driveways, good gravel, & rock- or grass-lined drainage ditches • Open-top culverts & rock aprons • Infiltration trenches • Turnouts • Pervious pavement • Non-structural BMPs

Recreation Area

Yards, Footpaths, Gardens, Patios

Condition	BMP and Fact Sheets
• Minimum of 15 ft of vegetation from shoreline • Minimal lawn area • Soil erosion is not occurring on site • No pet waste accumulation • No solid waste scattered • No pesticide, fertilizer, or runoff to lake	• Infiltration steps • Rain gardens • Waterbars • Lake-friendly yard maintenance • Planting & re-naturalizing areas • Planning pathways • Establishing no-mow zones • Vegetated swales • Vegetated Berms • Vegetation Protection Standards

Structures/Septic

Condition	BMP and Fact Sheets
• Less than 20% of property contains impervious surfaces • Properly functioning leach field • No uncovered oil tanks • No erosion caused from impervious surface runoff	• Septic system primer • Ensuring septic system quality • Dripline trenches • Drywells • Infiltration trenches • Rain gardens • Vegetated swales

Shorefront

Condition	BMP and Fact Sheets
• Natural conditions • Stable bank • Minimum of 15 ft width of vegetation area for developed sites • Minimum of 100 ft width for undeveloped sites • No unfiltered runoff to the lake • Shallow water areas natural and not "cleaned up"	• Conserving lakeshores • Resloping, rock toes & riprap • Live staking vegetation • Planting & re-naturalizing areas • Planning pathways • Waterbars • Establishing no-mow zones • Vegetation Protection Standards

7
Beaches, Docks, and Boating

BEACHES

Why can't we add sand to our shorelines?

Owners of waterfront property may be tempted to dump sand to create or "renew" an existing beach. However, *adding sand to create or renew a beach is not allowed in Vermont and many other states.* Why?

- Just like other types of soil, sand carries the nutrient phosphorus, which provides food for algae. One pound of phosphorus can produce 10,000 pounds of algae. It essentially fertilizes the lake, clouds the water, and decreases fish habitat.
- Sand also creates a perfect environment for shoreline invasive plants, such as Eurasian milfoil.
- The sediment generated from adding sand to shorelines smothers wildlife that relies on shallow water areas for nesting and feeding (think of fish and amphibian eggs, etc.).
- Sand migrates around a waterbody. Waves, inlets/outlets, and seasonal ice push the lakebed around. Sand that is artificially added to one area of shoreline will likely get carried over to another section of the lake, where it could block navigation and reduce water depths unnaturally. One person's sand beach project may end up negatively impacting a neighbor's access to the lake.

DOCKS

What you need to know before installing a dock.

Some docks may require a Lake Encroachment Permit (LEP). Docks meeting the following criteria will not need an LEP if:

1) constructed of wood or metal (no concrete or other solid fill) and mounted on floats or posts.
2) no longer than 50 feet in total length.
3) the combined surface area of all docks, rafts, and floats does not exceed 500 square feet.

What other shoreline projects do not require an LEP?

Provided the projects do not unreasonably impede navigation or boating, an LEP is not required for the following:

- installing a water intake pipe no larger than two inches in diameter
- adding temporary extensions of existing structures during periods of low water, not to exceed six months
- taking on ordinary repairs and maintenance, not including an expansion or complete replacement
- placing duck blinds, floats, rafts, and buoys on a lake

Docks and other projects that do not meet these rules must be reviewed under Lake Encroachment Permitting to ensure that encroachment is as minimal as possible, that all other less intrusive options have been considered, and that the project is consistent with the Public Trust Doctrine" (i.e. all shoreland property owners are responsible for protecting the lakes, ponds, and streams of Vermont).

Projects that commonly require a Lake Encroachment Permit include:

- installation of a shoreline stabilization project, including retaining walls or riprap "see riprap and retaining walls," p.13
- additions or removal of fill, including creating a beach or adding more sand to an existing beach
- commercial docks, docks involving concrete, and large docks (including private docks that exceed the private dock exemption—see above for details)
- dredging or filling activity
- repair or replacement of existing encroachments (e.g. boathouse, retaining wall)

What happens if I don't get a permit when it is required?

Fines can easily run into thousands of dollars and generally require revegetating cleared areas or removal of an unpermitted structure.

Find more Lake Encroachment Permitting information here: *tinyurl.com/LEPermitting*. Find a Permit Application here: *tinyurl.com/LEPermitApplication*

BOATING

Best Boating Practices, Rules, and Regulations that Protect Water Quality

Wakes and powerboat propeller wash can have a big impact on the health of the lake, wildlife, and other users. The Vermont regulations listed below apply to Lake Fairlee. Abiding by these rules can limit shoreline erosion, protect wildlife, such as the loons, and enhance shared enjoyment of the lake by users of all types of recreation.

Rules and Regulations:

- Protection of Loon Nesting Sites: Between May 1 and July 31 all persons and vessels are prohibited within 300 feet of any loon nesting site that is identified by signs and buoys or other clear on-site markings.
- 200 Foot Rule: Within 200 feet of shore, dock, swim area, a person in the water, and other vessels or anchorage, speed must be less than 5 mph and must not create a wake. Wakes close to shore cause shoreline erosion and can scour shallow lake bottoms, stirring up phosphorus which can lead to toxic algae blooms and create unsafe conditions for near-shore water activities: swimming, paddling, etc.
- Personal watercraft: The use of personal watercraft (jet skis) is prohibited on Lake Fairlee.

Good Lake Neighbor Boating Practices:

- Be aware of milfoil patches. These tend to be found in depths less than 20 feet. Try to avoid these areas when boating, especially with powerboats whose props can cut and propeller wash can fragment the plant. Milfoil spreads when these fragments take root.
- Start and stop waterskiing at least 200 feet from shore. Starting and stopping create much larger wakes which erode the shoreline, spread milfoil, and impact the lakebed in shallow water. This stirs up sediment and nutrients such as phosphorus which can encourage cyanobacteria algae blooms.

Aquatic Invasive Species Inspection:

Lake Fairlee already has Eurasian milfoil, an aquatic invasive species (AIS). The LFA spends tens of thousands of dollars each year to mitigate this plant. What will be the cost of a second invasive species?

AIS are spread when watercraft, trailers, and recreational equipment travel between waterbodies. The most effective way to prevent spread is through education and equipment inspections designed to catch invasive species "hitching a ride." Preventing the spread of aquatic invasive species is far more effective and economically sensible than trying to eradicate invasive species once they are established.

Greeter inspecting boat for aquatic invasive species

Transport of Aquatic Plant and Animal Species Rule: A person shall not transport an aquatic plant, aquatic plant part, or aquatic nuisance species to or from any Vermont water. It is required that persons shall inspect any vessel, vessel trailer, motor vehicle, and other equipment upon entering and departing a waterbody. Persons will also be required to remove any aquatic plants, plant parts, and aquatic nuisance species found on vessels or equipment. Persons are required to have their vessel and equipment inspected and decontaminated at an authorized inspection station if one is available.

The Lake Fairlee Greeters inspect boats at the public boat landing from mid-May through mid-October, seven days a week. If you enter the lake when Greeters are not on duty or from a private location, please thoroughly self-inspect your boat, trailer, and all your gear.

Follow the "Clean, Drain, Dry" protocol before entering and leaving any water body.

- **Clean:** Visually inspect and clean your boat (inside and out, including any live well tanks), motors, trailer (including wheels, underbody, etc.), and any gear, if applicable. Remove all aquatic plants, animals, and mud before leaving or entering the water access.
- **Drain:** Make sure all water is drained from the motor, live well tanks, bilge area, and other water-containing devices before leaving the lake access area. Standing water can carry AIS. Do not discharge drained water into the lake.
- **Dry:** Dry everything for at least five days OR wipe with a towel before reuse. AIS survival rate is greater in damp environments. This is especially important if the boat was most recently in a waterbody known to be infested with AIS.
- **For Anglers:** the additional step of DISPOSE is recommended: DISPOSE of unwanted bait, worms, and fish parts in the trash. When keeping live bait, drain bait containers and replace them with spring or dechlorinated tap water. Never dump live fish or other organisms from one water body into another.
- Always make sure your boat is "Clean, Drain, Dry" before returning it to Lake Fairlee.
- Keep in mind if your boat is at high risk for transporting AIS: Has it recently been in a water body with known AIS? Is the boat dirty, slimy, crusty or has plant material attached? Does it contain standing water? If yes, then take additional steps to be sure the boat is decontaminated.
- If you suspect an aquatic plant or animal may be invasive, please report it here: (802) 828-1000 or email: *fwinformation@vermont.gov*
Please also email: *board@lakefairleevt.org* and inform the LFA Greeters at the Route 44 Boat Launch.
- If you suspect a cyanobacteria (blue-green algae) bloom, please report it here:
tinyurl.com/VTCyanobacteriaReport

STOP AQUATIC HITCHHIKERS!™
Be A Good Steward.
Clean. Drain. Dry.
StopAquaticHitchhikers.org

8
Inside Your Home

Water protection begins at home. Even little things matter. Here are some "pollution solution" tips to help us all limit the inflow of harmful substances into our lake and watershed.

1. Use only eco-friendly cleansers and laundry/dishwasher detergents.

Everything that goes down the drain affects the groundwater and ultimately ends up in the lake and/or your well. Consider doing the following:

■ Use phosphate-free soaps and detergents; detergent runoff increases phosphorus levels in lake water which can increase toxic cyanobacteria blooms. See: *epa.gov/greenerproducts*

■ Do not use products with dyes, water softeners, or synthetic perfumes. Try products from companies such as Meyers, Seventh Generation, Simple Green, etc.

■ Use non-chlorine bleach alternatives such as hydrogen peroxide. Chlorine kills bacteria and inhibits normal wastewater (septic) system function. Also, waste chlorine bleach reacts chemically with organic materials in the soil and lake water, forming hazardous compounds.

■ Use baking soda followed by vinegar as an alternative drain cleaner.

■ Use alternative bathroom cleaning products such as soap and water, baking soda, borax, or other non-chlorine scouring powders. Avoid using toilet bowl deodorizing cakes containing dyes and bleaches.

2. Avoid the introduction of toxic chemicals to your septic system, water, or soil

(for example, solvents, pesticides, drain openers, polishes, wax, used oil, paint, paint thinner, etc.). These compounds impact ground and surface water. They kill the naturally occurring bacteria required for proper septic system function and can even find their way into our wells! Lastly, even small amounts of chemicals entering the water can be toxic to fish and other microorganisms.

Suggestions to minimize toxic/hazardous impact:

■ Do not dispose of toxic materials down the drain.

Dispose of leftover materials at the annual hazardous waste collection day (call the town office for information).

■ Do not flush expired or unwanted prescription and over-the-counter drugs down the toilet or drain. Ask your local pharmacy or police department about "take-back" programs or watch for community collection events.

3. Be water wise: Efficient water use in the home prevents overwhelming your leach field, causing nutrients to leach into groundwater. Energy-efficient appliances, low-flow fixtures, and thoughtful water use when washing dishes and clothes can protect your system.

Lake Fairelee Watershed

9
Additional Resources and Contacts

Lake Fairlee Association Annual Meeting

Please go to the Lake Fairlee website: *www.lakefairleevt.org*

A digital PDF of this complete Guide is available to download at: *tinyurl.com/AtHomeByTheWater*

For a list of additional resources and contacts, go to: *www.lakefairleevt.org/additional-resources*

Contractor tips for various kinds of property management are available to share at: *www.lakefairleevt.org/contractor-tips*

Lake-friendly reminders for renters may be shared at this link: *www.lakefairleevt.org/renter-guidelines*

To report an environmental concern:

Vermont has environmental regulations such as the Shoreland Protection Act in place to protect Vermonters and the lands and waters of the state. Violations may occur, either inadvertently or through careless disregard. If you see anything of environmental concern you may file a report here: tinyurl.com/EnvironmentalViolationReport

If you suspect an aquatic plant or animal may be invasive, please report it here: (802) 828-1000 or email: fwinformation@vermont.gov. Please also email board@lakefairleevt.org and inform the LFA greeters at the RT 244 boat launch.

If you suspect a cyanobacteria (blue-green algae) bloom, please report it here: *tinyurl.com/VTCyanobacteriaReport*

10
Join the Community

How Can I Help?

The Lake Fairlee Association:

If you have not yet become a member, please join us in our efforts to protect and improve this beautiful lake. If you are already a member, we thank you for your support. The LFA has many ongoing projects that you can become part of and welcomes proposals for new initiatives. *www.lakefairleevt.org*

Treasure Island Advisory Committee: The Treasure Island Advisory Committee consists of seven citizens of Thetford, West Fairlee, and Fairlee. The team considers approaches to rejuvenating Treasure Island as an inviting, affordable environment for public recreation that highlights the rich natural world that exists within Lake Fairlee's ecosystem. *www.lakefairleevt.org/treasure-island-advisory-committee*

Lake Fairlee Water Quality Action Committee: The mission of this group is to develop, on behalf of the Lake Fairlee Association, a plan to deal with rising nutrient levels in Lake Fairlee. *www.lakefairleevt.org/water-quality-action-committee*

Tri-town Commission: The Tri-town Commission is responsible for the operation and maintenance of the Lake Fairlee Dam under the interlocal agreement between the towns of Thetford, Fairlee, and West Fairlee. Members are appointed by the selectboards. Responsibilities include preparing a budget, managing business affairs, maintaining compliance with all local, state, and federal laws and regulations, and ensuring that the dam is safe and secure. *www.lakefairleevt.org/tri-town-commission*

Note: *Your help is also needed as a volunteer on your town Conservation Commission or Planning Board which make key decisions for your town.*

Preparing a loon nesting raft (The Vermont Center for Ecostudies and local volunteers)

"Winter Wander," sponsored by the Thetford and West Fairlee Conservation Commissions, and the Treasure Island Advisory Committee

Vermont Invasive Patrollers: "VIPs" are volunteers trained to identify aquatic invasive species, conduct annual surveys on their lake to identify potential invaders, and report new findings to the state Dept. of Environmental Conservation. A response team is then dispatched to verify the invasive species and take action to stem the introduction of a new species. If you would like to be trained for this valuable service, contact: *tinyurl.com/Invasive Patrol*

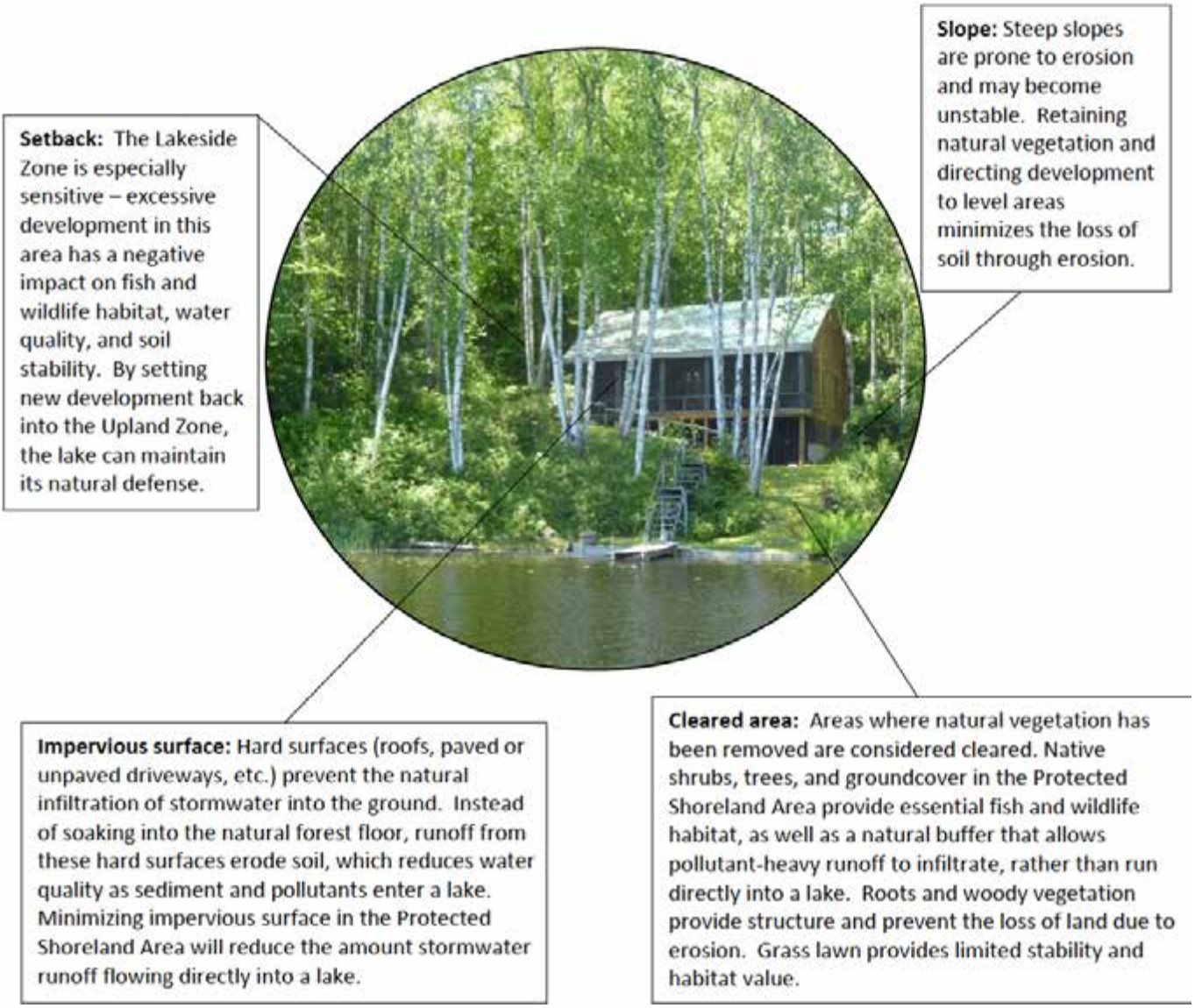
Lay Monitors: Volunteers who track lake water quality by collecting weekly water samples throughout the summer months. *tinyurl.com/LayMonitoring*

Westshire School children plant trees for a streamside buffer (with "Trees for Streams" program).

Collecting water samples

The Bottom Line

Lake Fairlee's ecosystem is fragile. The greatest impact on the water quality in our streams, lakes, and drinking water comes from what we do on our land. Through thoughtful stewardship and shared responsibility, all who live, work, and recreate in the watershed can help prevent the deterioration of its water quality and wildlife habitat. ***Please handle with care.***



ACKNOWLEDGMENTS

We join the LFA in celebrating the volunteer initiatives that are critical to the protection and restoration of water quality in Lake Fairlee and its watershed. In addition, we would like to recognize the essential ingredients to successful stewardship of our watershed—the commitment and financial support from individuals and the Towns of Fairlee, Thetford, and West Fairlee, and the State of Vermont.

We'd also like to acknowledge the people and resources who helped bring this guide to fruition.

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Libby Chapin	(Lakefest)
Bonnie MacAdam	(Fairlee)
Tom Ward	(Thetford)
Peggy Willey	(West Fairlee)

NOTES

Lake Fairlee Watershed

Significant Natural Communities and Wildlife Observations










iNaturalist Observations

- Actinopterygii (Fish)
- Amphibia (Amphibians)
- Arachnida (Spiders)
- Aves (Birds)
- Fungi (Mushrooms)
- Insecta (Insects)
- Mammalia (Mammals)
- Mollusca (Shellfish)
- Plantae (Plants)
- Reptilia (Reptiles)

Significant Natural Communities

- Very Rare in Vermont
- Rare in Vermont
- Uncommon in Vermont
- Common in Vermont
- Very Common in Vermont

0.5 0 0.5 1 mi

Sources: Vermont Agency of Natural Resources;
iNaturalist - Available from https://www.inaturalist.org/observations?place_id=168234&subview=map. Accessed June 14, 2022.

Sharing the Water