



# Training Manual for LakeSmart Evaluators

A guide to the LakeSmart Visit  
and educating homeowners  
about lake-friendly practices

Photo by Whitney Baker





Cold Stream Pond, Penobscot County, started their LakeSmart program in 2015. *Photo credit: LightHawk June 2016.*

We encourage and welcome your feedback to improve and update this Manual and the LakeSmart program. Please reach out to us by phone or email to share your stories, ideas, and perspectives. We always appreciate hearing from you!

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We are thankful for the dedicated LakeSmart Evaluators and Coordinators who laid the groundwork for the processes and policies described in this Manual. LakeSmart would not be possible without these incredibly generous and knowledgeable volunteers.

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### LAND AND WATER ACKNOWLEDGEMENT

We would like to acknowledge and thank the people of the Penobscot, Passamaquoddy, Micmac, and Maliseet tribes, and their Wabanaki ancestors, for stewarding, protecting, and preserving the lakes, ponds, and watersheds within Pasamkuk, now known as the State of Maine, for thousands of years before the arrival of settler colonists.

We acknowledge that their land and water are still not ceded and that tribes in Maine do not have the same sovereignty enjoyed by other federally recognized tribes. To that end, Maine Lakes supports Maine Tribal Sovereignty efforts in the Maine Legislature and also pledges to steward lakes in the spirit of, and in collaboration with, the Wabanaki people long into the future.

*“The Wabanaki Tribes of what is now Maine sustained themselves for thousands of years living a community lifestyle based on the availability of land and natural resources. The forests provided the necessary food and medicines, materials for shelter, transportation, and tools for everyday existence, while the rivers and streams provided the transportation routes to get to the places to gather these life essentials, as well as allowing commerce between neighboring Indigenous tribes. The tribes lived in harmony with the ecosystems that sustained them. They moved with the seasons, adapting to Mother Earth’s natural cycles. They practiced land and natural resource conservation as an integral part of daily living.”*

A New Beginning For Wabanaki Land Relationships. A Story by John Banks 2021.  
[www.mainememory.net/mymainestory/landback](http://www.mainememory.net/mymainestory/landback)

# TRAINING MANUAL FOR LAKESMART EVALUATORS

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# 1. INTRODUCTION

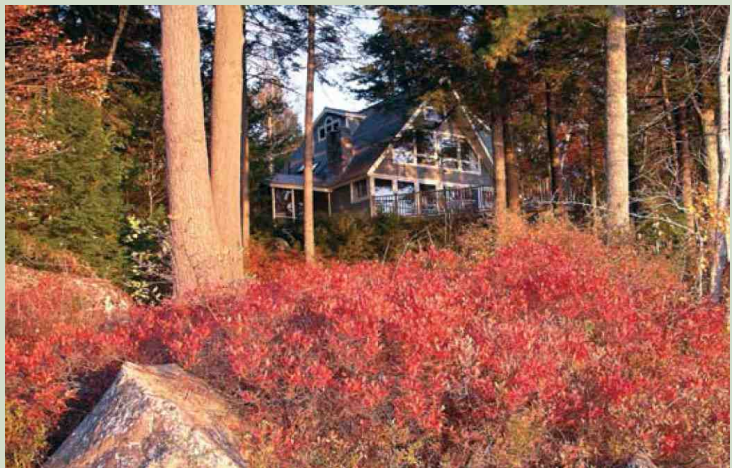
Welcome to the LakeSmart team and thank you for joining our vibrant community of lake enthusiasts! You are the “heart and soul” of the LakeSmart program and the reason for LakeSmart’s success as one of the most effective voluntary lake protection programs in the country.

LakeSmart is a first-in-the-nation lake resilience initiative and the flagship program of Maine Lakes. Since 1970, Maine Lakes has worked across the state to protect and preserve the values and benefits of Maine’s lakes, ponds, and watersheds for future generations. With more than 130 lake association members and many additional individual and business members, Maine Lakes facilitates member and partner connections and builds support for cooperative lake conservation activity that strengthens the capacity of lake ecosystems to resist destabilizing threats.

## LakeSmart History

In 2003, after a period of designing and testing a pilot LakeSmart program, the Maine Department of Environmental Protection (Maine DEP) began to (1) offer workshops about Best Management Practices for water quality protection, and (2) conduct property evaluation visits for lakefront homeowners. This ground-breaking initiative met with great success. After only two years, the pilot program had spread to 32 lakes in 8 counties!

However, it was expensive to use state employees to run the program. In addition, the public perceived an inherent tension in a regulatory agency overseeing a voluntary, non-regulatory program. In 2013, after several years of testing the idea that volunteers could be trained to successfully conduct property evaluation visits, the LakeSmart program was transferred to Maine Lakes, then known as the Maine Lakes Society. Maine Lakes has administered the statewide LakeSmart program ever since. In 2019, Maine DEP initiated annual funding for Maine Lakes to support and help sustain the program.



The first LakeSmart Award winning property. *Photo credit: Laura Wilson.*

The LakeSmart program relies on dedicated volunteers like you to visit homeowners in your communities, to share information about sources of stormwater runoff, and to offer recommendations for lake-friendly practices that protect lake water quality and wildlife habitat. The delivery of information from a trusted community member like yourself, rather than a paid professional “from away”, is one of the defining constructs of the LakeSmart program.

We look forward to working with you in your important role of sharing the message that together we can “slow the flow” of polluted runoff “for the sake of Maine’s lakes”.

## The Manual as a Resource for LakeSmart Training

The purpose of this LakeSmart Evaluator Manual is to provide a guide and an ongoing resource for the topics presented during the yearly Evaluator training offered by Maine Lakes and experienced Evaluators. We expect this Manual to be a “living document” with updates and improvements in the years to come.

The LakeSmart Evaluator training and the Manual together will help you prepare to visit lakefront properties to educate your community about lake stewardship and lake-friendly practices.



Evaluator Training at Togus Pond. *Photo credit: Laurie Curtis.*

## LakeSmart Training

Training for new LakeSmart Evaluators is provided by Maine Lakes staff and experienced Evaluators. The 4-part training includes two online webinars and one field-based session covering essential information about the LakeSmart program and the Evaluation process. After completing this formal training, new Evaluators are strongly encouraged to join experienced Evaluators on their **LakeSmart visits** to gain more familiarity with the process.

**(1) Introduction to LakeSmart:** This online session covers the background and history of LakeSmart, an overview of community-based social marketing, the basics of lake science, tips about organizing LakeSmart teams, and ideas for recruiting homeowners to the program. This first part of training is usually scheduled in May or June, with a recording posted to the Maine Lakes website.

**(2) Introduction to Survey 123:** An online session that covers how to enter evaluation data into Survey123, the statewide LakeSmart database developed in collaboration with the Maine DEP. All evaluation data are entered into Survey123 for review. Data can be recorded initially on a paper form but must then be transferred and submitted into



It is helpful for new Evaluators to **develop regional ties to other Evaluators** where feasible.

Such ties may promote a de facto mentoring system for new Evaluators within and between lake associations and facilitate teaming up for site visits. The more evaluations new volunteers can participate in, the more confident they will feel about transitioning to a lead Evaluator role. Some lake associations schedule 4-6 Evaluators for each LakeSmart visit, encouraging collaborative and lively discussions!

Survey123. This second part of training is usually scheduled in May or June, with a recording posted to the Maine Lakes website.

**(3) A practice “walk through” of a LakeSmart visit.**

This third part of training takes place at a lakefront property and is led by Maine Lakes staff or experienced evaluators at several locations each year. Volunteers are introduced to the LakeSmart standards for water quality protection, how to identify signs of erosion in different sections of a property, how to score the standards, and the Best Management Practices that will manage stormwater runoff.

**(4) LakeSmart visits with experienced Evaluators:**

Following the three formal training sessions, trainees should participate in LakeSmart visits with experienced Evaluators throughout the

LakeSmart season (May to October). Since all properties are different, this on-the-ground experience offers new Evaluators opportunities to become familiar with identifying sources of erosion, problem areas, and understanding the range of Best Management Practices to manage runoff and erosion.

Each year, “refresher” training sessions may also be scheduled for Evaluators trained in previous years who are interested in updating their skills.

## How the Manual is Organized

Below is a summary of the different parts of this Manual. Further discussion about certain topics is presented in green popout boxes. Important LakeSmart terms are emphasized with **dark blue bold text** and are included in the Glossary. Additional important points to remember are highlighted in **dark blue bold italics**. Tips about how to interpret the LakeSmart standards and other helpful information are highlighted in light blue boxes with a light bulb. These tips have been shared by experienced Evaluators in trainings, conversations, evaluation comments and reviews. Thanks to Roy Lambert, Maggie Shannon, Barbara Barrett, Jim and Laurie Fenwood, and John and Ginger Eliasberg for their contributions to these tips.

### 1. INTRODUCTION

2. **WHY LAKESMART?** The Manual begins with background information about the condition of Maine’s lakes and why the LakeSmart program is an effective approach to addressing the growing threats to our lakes.

3. **LAKE SCIENCE BASICS.** This section will introduce you to the terms used to describe how lakes function and the causes of water quality declines.



4. **AN OVERVIEW OF THE LAKESMART PROCESS.** The LakeSmart process is summarized here with more details in Parts 6 and 7.
5. **LAKESMART COLLABORATORS.** LakeSmart team members and their roles are described here.
6. **THE LAKESMART EVALUATION.** In this part of the Manual, you will learn about the LakeSmart standards for water quality protection, what to look for as you score the standards, Best Management Practices, the homeowner report, how to submit data from the LakeSmart evaluation into the Survey123 database, and the evaluation review. In addition to collecting data and recording results of the evaluation, the LakeSmart visit provides many opportunities to educate the homeowner about stormwater runoff and erosion and how to manage these problems using lake-friendly practices.
7. **BEFORE, DURING, AND AFTER THE LAKESMART VISIT: PUTTING IT ALL TOGETHER.** We provide a step-wise summary of the LakeSmart visit to help new evaluators navigate the process.
8. **INVOLVING YOUR COMMUNITY IN LAKESMART.** We offer suggestions to involve your community in LakeSmart and recruit homeowners to participate.
9. **RESOURCES.** This part of the Manual lists additional sources of information about LakeSmart, lake-friendly practices, and other interesting topics. We have also provided a list of organization and program contacts. Some of this information is included on the Lake Library page of the Maine Lakes website ([www.lakes.me/library](http://www.lakes.me/library)).
10. **GLOSSARY OF LAKESMART TERMS**
11. **APPENDICES**

## 2. WHY LAKESMART?

Our lakes are priceless resources. They offer a place to swim, boat, and fish, as well as clean drinking water for more than half of Maine's population. Clear water, abundant wildlife, and extraordinary natural beauty are hallmarks of Maine's more than 6,000 lakes. These remarkable qualities of our lakes sustain communities, economies, and countless summertime traditions. **Great Ponds**, lakes or ponds greater than 10 acres in size, are held by the State in trust for the People. The State manages these lakes in a way that balances healthy ecosystems with public use of the resource.

Lakes are living systems that support a diversity of plants and animals from microscopic algae to the iconic loon, a top predator. It may be a surprise to you that more than 85% of terrestrial (land-based) animals use the lake shoreland habitat at some point in their life cycle.

Many of us are unaware that Maine's lakes are fragile and constantly changing through the seasons and the years to stay in balance. A lake in balance hosts many plants and animals along with an assortment of essential but unseen nutrients. A healthy and natural equilibrium is maintained and no part of this complex system grows out of control or takes over the other parts.

Our lake and watershed ecosystems have changed in ways that make them less resilient and less able to sustain a healthy equilibrium with the biodiversity that existed prior to the arrival of European settlers. Maine's lakes may look healthy from a distance, but many are approaching or have passed a "tipping point" where they can no longer maintain this fragile balance. Too much **phosphorus** carried to lakes by sediments in stormwater runoff causes excessive algae growth, known as an **algal bloom** that turns lakes green and depletes oxygen. **Invasive plants** that are not native to a given area often outcompete communities of locally native plants and may degrade wildlife habitat.

The risks to lakes are also growing due to climate change. Warming air and water temperatures coupled with earlier ice out are lengthening the growing season for algae and aquatic plants, including invasive species. More frequent and intense storm events are increasing runoff and exacerbating soil erosion.

While it is often our actions that push lakes toward a "tipping point", we are also empowered to bring these treasured resources back into balance. This is the vision that drives the LakeSmart program.

LakeSmart is a highly successful community-based program that educates homeowners about how to manage their lakefront properties in ways that protect water quality. Participating homeowners learn about runoff and erosion on their property and site-specific tested practices that slow the flow of polluted stormwater into our lakes. These lake-friendly practices may include planting a **vegetated buffer** along a shoreline, diverting

runoff from an eroding driveway, or scheduling regular maintenance for a septic system. A LakeSmart Evaluator scores standards for water quality protection during a LakeSmart visit. A homeowner is rewarded with two LakeSmart Award signs if their property meets standards and is sustainably protecting the lake. LakeSmart properties serve as examples that incentivize neighbors and friends in the community to adopt conservation practices. Our goal is to see these practices become the “norm” in lake communities across Maine.

LakeSmart’s success in motivating homeowners to adopt lake-friendly practices is largely due to how the lake protection message is delivered. Lake associations and watershed groups deliver LakeSmart education in person, property-by-property, to cultivate a conservation ethic across lake communities. These one-on-one conversations follow the principles of **community-based social marketing**, an evidence-based approach that uses in-person conversations with trusted friends, neighbors, and family to change behavior.

***LakeSmart evaluations are educational, free, voluntary, non-regulatory, and confidential. Homeowners are encouraged but under no obligation to undertake lake-friendly recommendations.***

### **Community-Based Social Marketing**

*“Community-based social marketing is based upon research in the social sciences that demonstrates that behavior change is most effectively achieved through initiatives delivered at the community level which focus on removing barriers to an activity while simultaneously enhancing the activities’ benefits.”*

Doug McKenzie-Mohr

*Quick Reference: Community-Based Social Marketing*

Think of the last movie you saw, a recent book you read, or a restaurant you tried for the first time. Did a friend or neighbor recommend it to you? Our preference for the advice of family members, co-workers, and neighbors over that of experts, advertisements, and media campaigns is based on trust and is the reason the LakeSmart visit is so effective. The homeowner who requests a visit is more open to learning when it is part of a community-based program.

In 2003, Everett Rogers published a book called *Diffusion of Innovations* that looks at how new ideas are spread. He found that when 15% of a community adopts a new behavior (e.g., lake-friendly practices), the behavior tends to become the “norm” and begins to spread on its own.

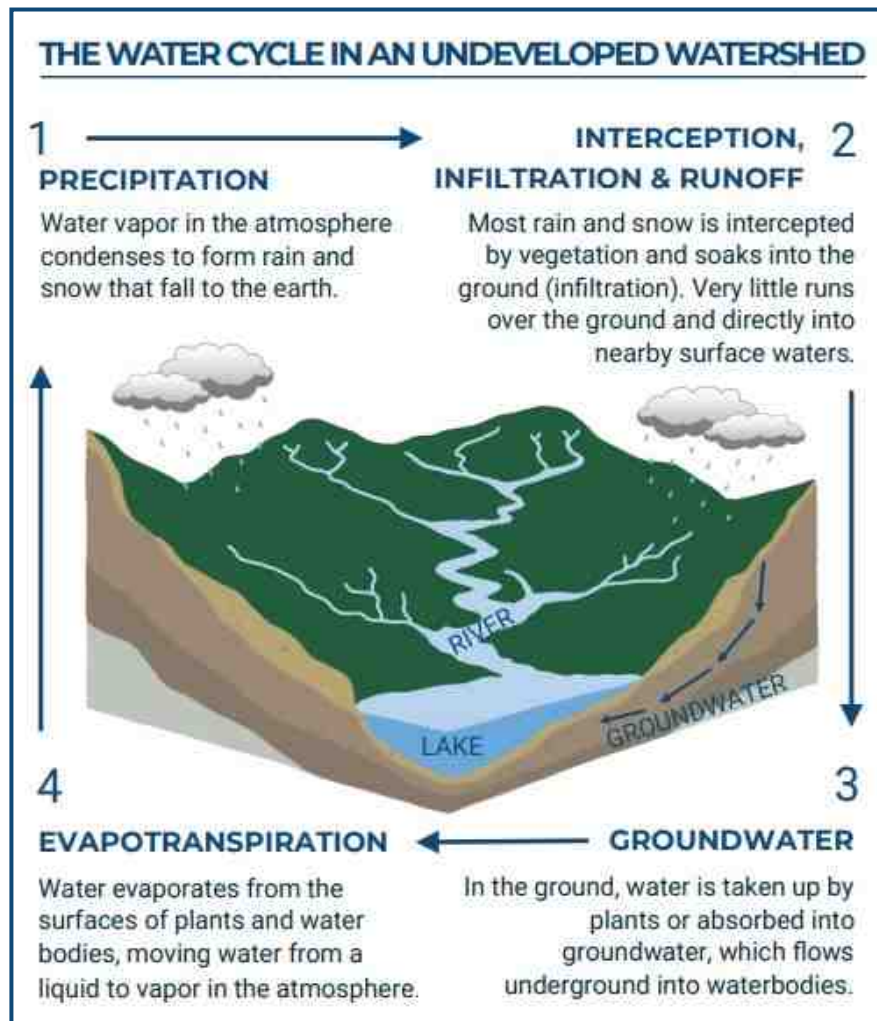
Lakes in Maine where 15% of the lakefront properties have earned LakeSmart Awards are recognized with **LakeSmart Gold Status**. This is an impressive accomplishment that highlights community support for lake-friendly practices while raising awareness of the LakeSmart program.

# 3. LAKE SCIENCE BASICS

Before we discuss the details of the LakeSmart program, an overview of the science and ecology of lakes and why lakes are at risk provides some important background for Evaluators. Parts of this discussion are excerpted from the Maine Lakes' 4<sup>th</sup> edition of *The Lake Book: A Handbook for Lake Protection*, an excellent resource for anyone who uses, visits, or lives on or near Maine's lakes and ponds. In addition to lake science, the handbook covers lake wildlife, **native plants**, our impact on lakes, and what we can do to protect lake water quality moving forward. You will receive a copy of *The Lake Book* as part of your training and we can provide you with additional copies to share with homeowners when you visit properties for LakeSmart evaluations. A digital version of this resource is available at [www.lakes.me/lakebook](http://www.lakes.me/lakebook).

## Watersheds and Water Cycles

A lake's **watershed** is the area of land surrounding a lake that channels rainfall and snowmelt along creeks, streams, rivers, and groundwater into the lake. Watersheds transport the water that replenishes our lakes, along with other elements such as nutrients and organic matter that are critical to supporting life. An **ecosystem**, such as a lake within



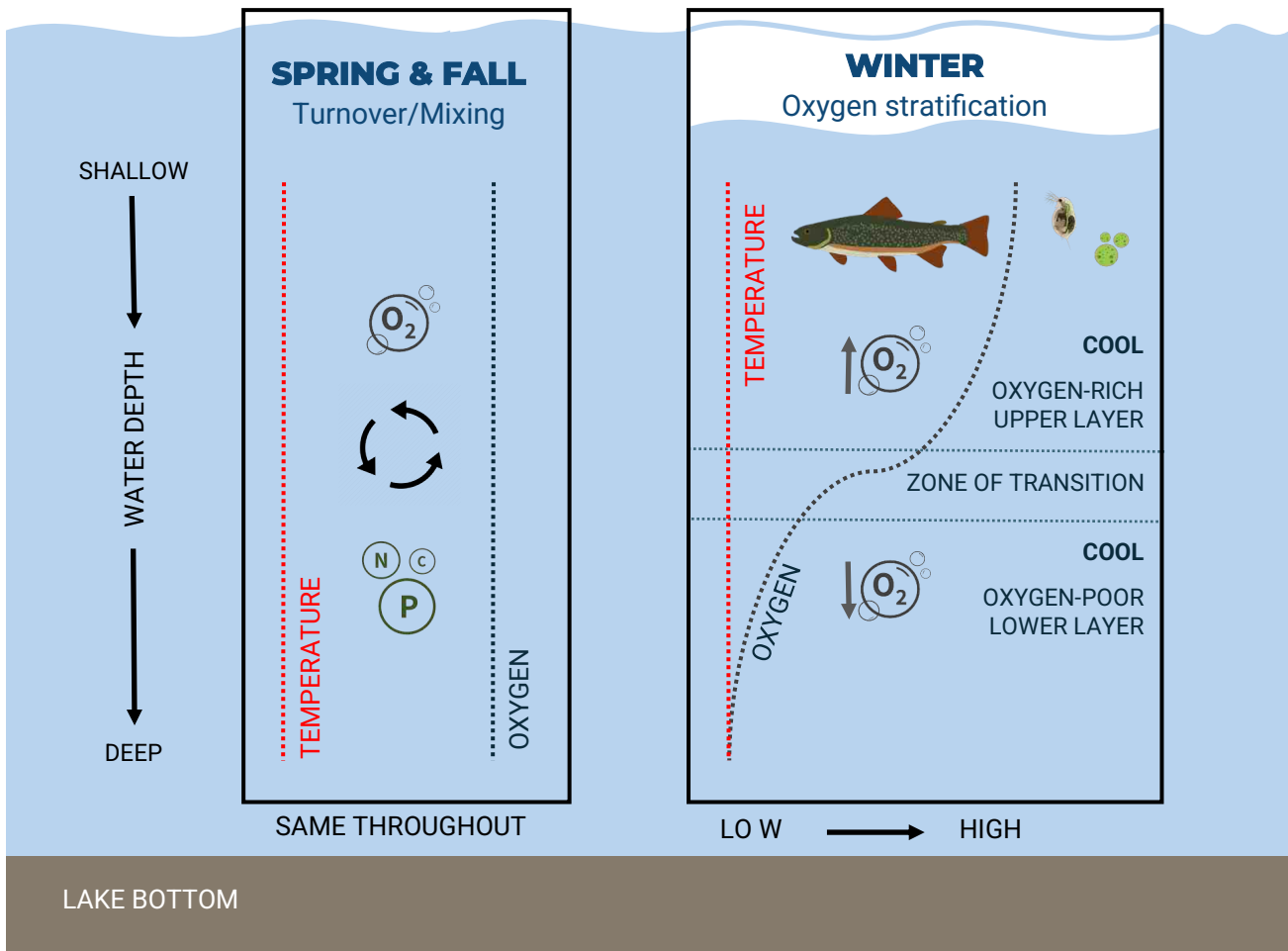
Source: *Lake Book, Maine Lakes.*

a watershed, is made up of many and diverse organisms - from algae to top predators like loons - that interact with non-living factors such as wind, sunlight, rain, snow, nutrients, oxygen, temperature, and alkalinity.

Water moves through a never-ending loop from the sky to the land and back in various states of gas, liquid, or solid, through a process known as the **water cycle** (see diagram on previous page). In naturally forested watersheds, rainfall and snowmelt soak into the ground where many nutrients are filtered out through the soil and by the roots of vegetation. Above ground vegetation (trees, shrubs, groundcover, fallen branches and leaves) also contribute to the interception of rainwater. Ultimately, filtered precipitation reaches the groundwater and flows into a waterbody such as a lake.

## Seasonal Changes in Lakes

Lakes are dynamic systems and, if large enough, cycle through seasonal changes each year. In the fall, the surface of the lake cools and winds pick up, causing the lake to mix or **turnover**. Fall turnover occurs when there is complete mixing of the warmer top surface layer of water with the colder bottom layer, yielding a uniform water temperature from the surface to the bottom of the lake. The process of turnover also mixes oxygen throughout the water column. Deeper water with little or no oxygen is mixed with oxygen-rich water in



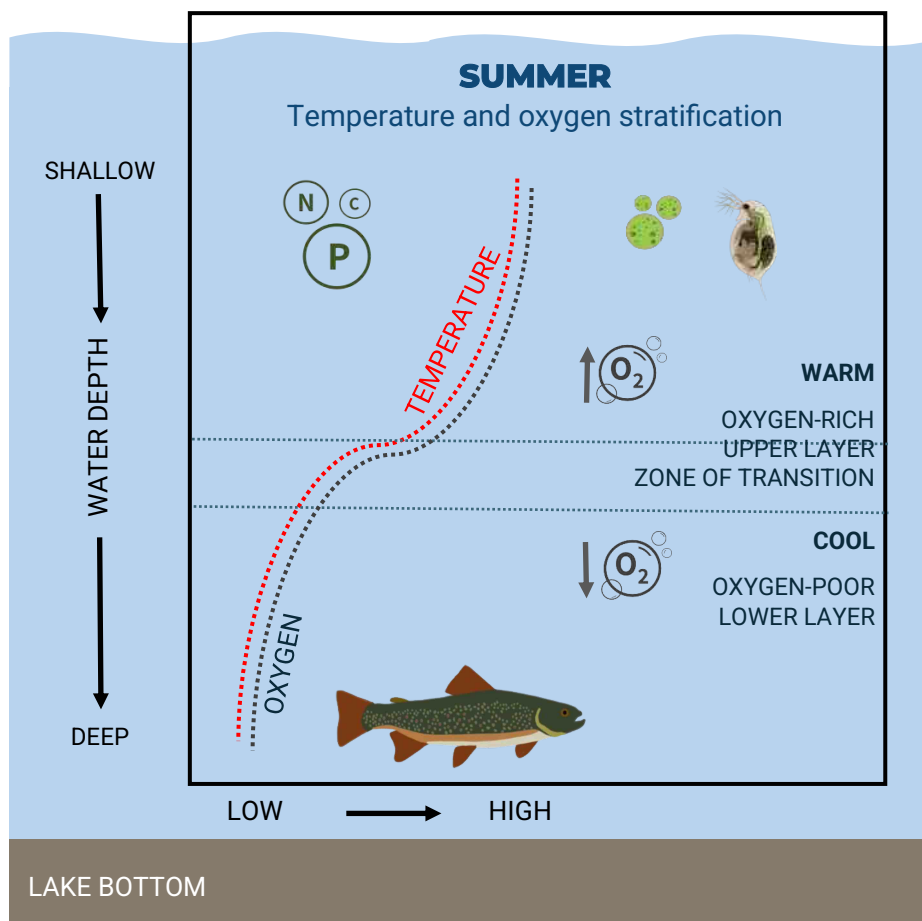


the upper layer. Much of lake life is dependent on this redistribution of oxygen through the water column.

Lakes freeze during the winter. The ice insulates the lake from the mixing effect of wind. Water temperature remains fairly uniform from the surface to the bottom. Because biological processes continue under the ice with no wind to mix the water and replenish oxygen, decomposers at the bottom of the lake deplete available or **dissolved oxygen**, causing winter stratification of oxygen-rich water on top and oxygen-poor water below. Lake life is still active under the ice. Microscopic organisms feed and grow and lakes can even “bloom” (an excessive growth of algae) when covered with ice!

As spring approaches and the ice melts, the temperature of the water at the surface begins to warm. Without ice as a barrier and with warmer, less dense water at the surface, spring winds help mix the water once again in a process called spring turnover. Spring turnover carries nutrient-rich waters to the surface and oxygen-rich waters to the bottom, equalizing conditions from the surface to the bottom of the lake.

Have you ever jumped into a lake in the summer and been surprised by the cold water below the surface? As the sun warms the lake surface in summer, the temperature differential between surface and bottom waters increases. In lakes more than about 12 feet deep, these differences create stratification in the water column that resists the



The boxes to the left show the temperature and oxygen profiles (red and black dotted lines) and the basic characteristics of a typical lake more than 12 feet deep through the year in terms of layers and lake life. Source: *Lake Book, Maine Lakes*.

wind's mixing force. Dissolved oxygen in the water is both produced and consumed during the summer by biological processes throughout the lake's water column. In the cooler, deeper waters of the lake, oxygen is eventually depleted. Dissolved oxygen in this bottom layer is not replenished until fall turnover.

## Developed and Undeveloped Watersheds

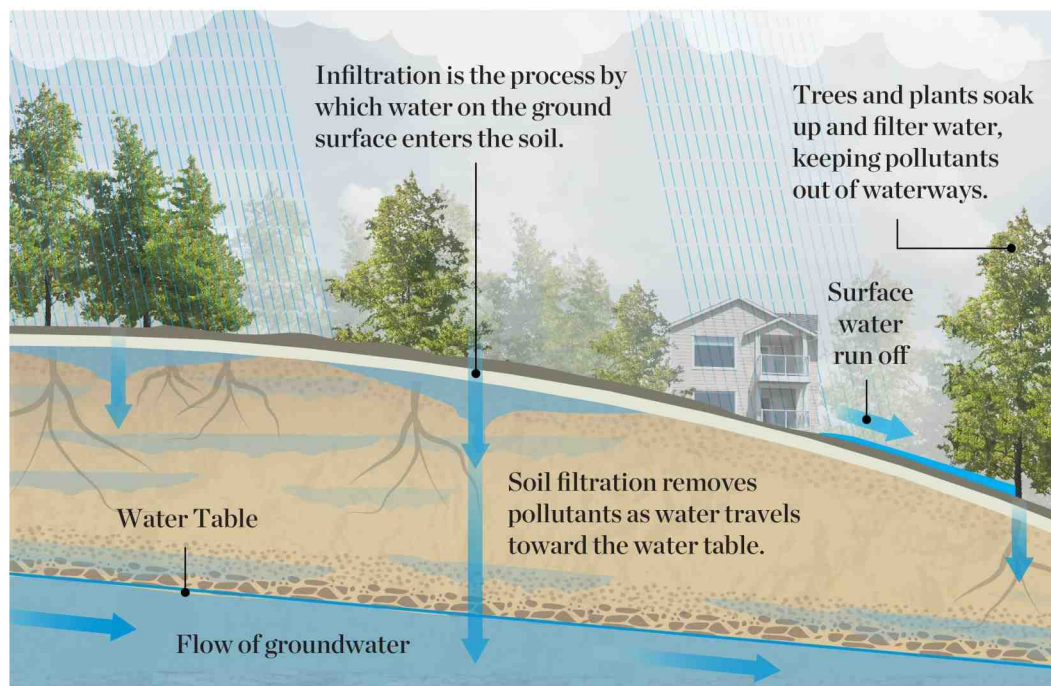
What happens in a lake is only part of the story. What happens around a lake matters too. Maine's lake watersheds are typically forested, although the extent and condition of the forested landscape can vary greatly. In an **undeveloped watershed** with no houses or roads, there are many layers of vegetation in the forests, from the tallest



**Duff** (partly decomposed organic matter) accumulates above humus (decomposed organic matter) and mineral soil. *Photo credit: John Maclaine presentation.*



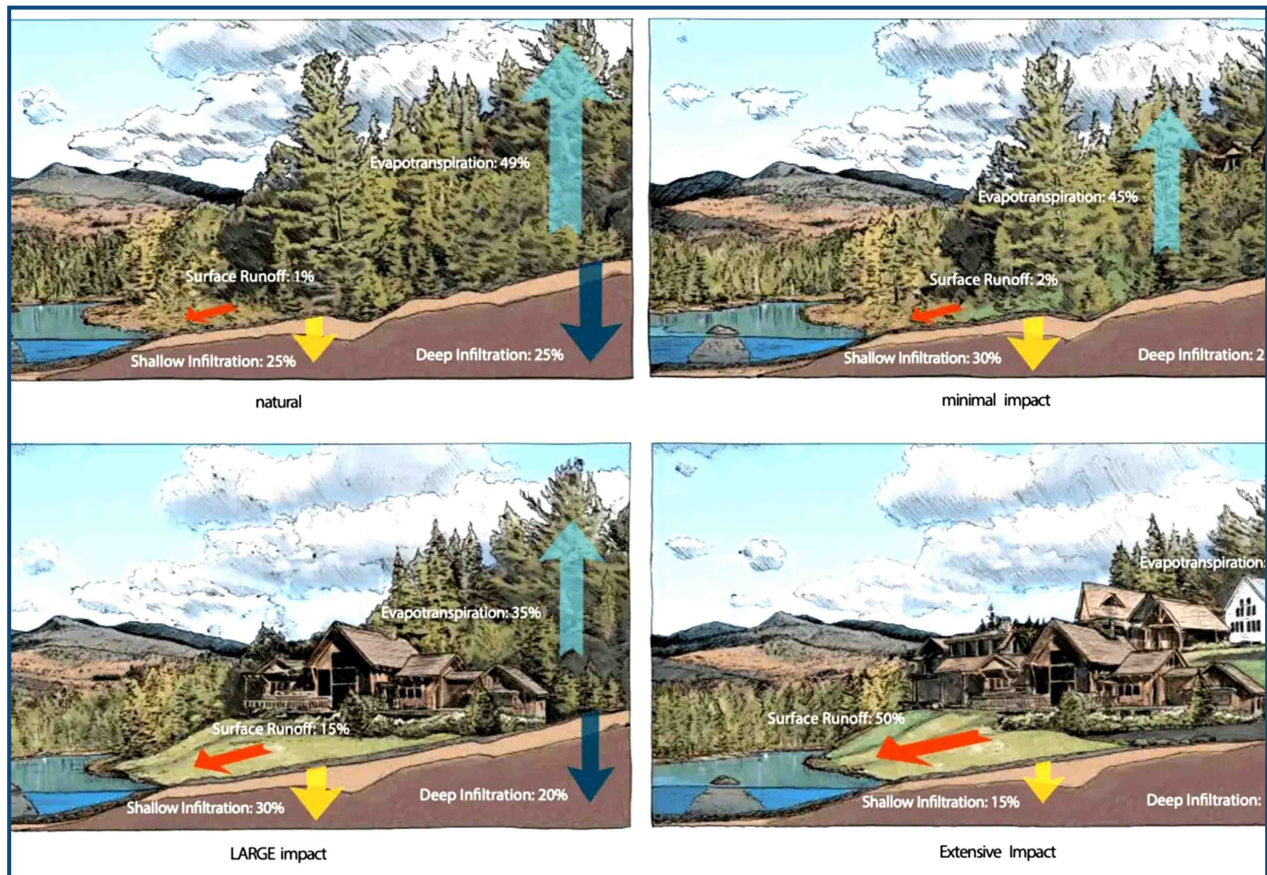
## Infiltration



In a healthy watershed, rainwater infiltrates into the ground, feeding plants and recharging groundwater. *Source: Nature Conservancy/Erica Sloniker.*



canopy trees to the midstory, shrubs, and groundcover on the forest floor. This multi-tiered structure intercepts rain and reduces the amount of water directly falling on the forest floor. The water that reaches the forest floor **infiltrates** into a loose, deep layer of **duff**, partly decomposed organic matter made up of leaves, woody debris, and dead plant material that is soft on the feet. This rich duff layer acts like a sponge, soaking up and minimizing the flow of rainwater directly into waterbodies. The intact forests and other natural areas in undeveloped watersheds keep lakes, rivers and streams clean by absorbing rainfall, minimizing erosion, and extracting excess nutrients, such as phosphorus.



As development increases on a site, the amount of stormwater runoff generated also increases. These illustrations show the level of stormwater runoff under different development scenarios. *Source: Figure 8, Do-It-Yourself Water Quality: A Landowner's Guide to Property Management that Protects Lake George. The Fund for Lake George and the Lake George Waterkeeper/Lake George Association. 2010.*

However, undeveloped watersheds are rarely seen in today's landscape. Every one of us lives in a **developed watershed**. Much of the forested land in watersheds that once slowed rainfall, absorbed excess water, stabilized soils, and extracted nutrients has been cleared for homes, driveways, and roads. Instead of absorbing the rain, these **impervious surfaces** of developed watersheds prevent water from soaking in, and by doing so, increase stormwater runoff. The resulting fast flows often concentrate into channels, eroding soil, and carrying nutrient-laden **sediments** and other pollutants into nearby lakes, degrading water quality and compromising lake ecosystems.

Many small areas of erosion around lakefront homes and camps are sources of pollutants and excessive nutrients in our lakes and ponds. Even the low-density residential development often seen around Maine's lakes can export 5 to 10 times as much phosphorus than a naturally forested watershed (Dennis, 1986).

***Polluted runoff is one of the greatest threats to clean water in the United States*** (EPA).

## Nonpoint Source Pollution and Phosphorus

**Stormwater runoff** is rainwater or snowmelt that flows over land or impervious surfaces. In a developed landscape, stormwater runoff carries sediment, phosphorus, and other pollutants downhill and into lakes when it rains. This is a big problem for Maine's lakes. You might see evidence of **soil erosion** when rainwater flows first in narrow **rills** (very small channels or trickles). If not managed, rills can grow into more serious **gullies** on a pathway, driveway, or camp road. Just one eighth of an inch of stormwater erosion over one acre is equivalent to 16 cubic feet of soil! Soil particles in runoff may carry pollutants, can scar fish gills, smother aquatic plants, and cloud water, inhibiting plant growth and degrading habitat for native plants and animals.

Most notoriously, eroding soils carry **phosphorus**. Phosphorus is an essential nutrient for plant growth that occurs naturally in rocks, soils, and organic material. A certain amount of phosphorus helps plants grow and thrive as part of a healthy, balanced ecosystem. However, too much phosphorus can rapidly deteriorate water quality and disrupt natural ecosystem processes, sometimes leading to **algal blooms** that make water cloudy, green, and smelly.



Severe erosion on a steep slope. *Photo credit: Maine DEP/Portland Water District Rubber Razor Factsheet.*



The cloudy and green water of an algal bloom. *Photo credit: Maine DEP.*



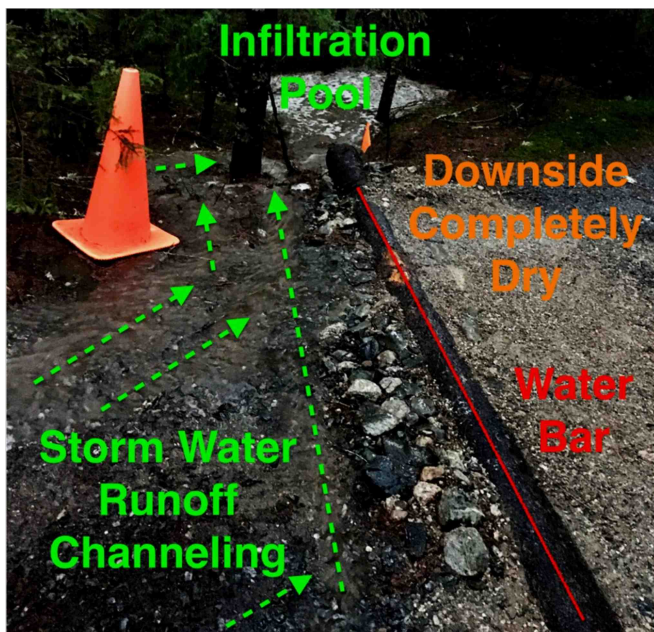
Phosphorus that is carried into lakes by soil particles is an example of **nonpoint source pollution** because it comes from a combination of many small and diffuse sources over a large geographic area. These sources can include fertilizers, herbicides, pesticides, oil, grease, bacteria or nutrients from faulty septic systems, heavy metals, pet waste, and manure. **Point source pollution**, on the other hand, comes from a single source, such as a pipe from a factory or sewage treatment plant, that directly discharges into a waterbody.

Phosphorus can also be sourced within a lake. Phosphorus occurs naturally in bottom sediments. However, when oxygen is readily available, this phosphorus is bound and is no longer available to feed growing plants. When a lake turns over or when oxygen is depleted at the lake bottom, phosphorus is released in a cycle of internal loading. Different soil types can bind (and release) more or less phosphorus so some lakes in Maine have less internal loading of phosphorus than others. LakeSmart focuses on managing nonpoint source pollution that is primarily from external sources of phosphorus coming from lakefront properties.

## Protecting Water Quality with Best Management Practices

Managing the erosive power of stormwater runoff is key to reducing nonpoint source pollution in Maine's lakes. Stormwater **Best Management Practices (BMPs)**, also known as conservation practices, are landscape features or devices that divert and redirect stormwater runoff, soak up surface water flow, prevent soil erosion, and correct unstable shorelines. **Stormwater BMPs help manage erosion by reducing the amount or quantity of rainwater reaching the ground** (e.g., by providing tree canopy cover and multiple layers of

vegetation) or by increasing the ability of the ground to soak up or **infiltrate** runoff (e.g., by providing areas where water can collect and then slowly soak into the ground). **Rainwater that soaks into the ground is filtered by soil, which traps unwanted pollutants and improves the quality of runoff that enters our groundwater and lakes.** Additionally, vegetation extracts nutrients from the soil as an essential part of its life cycle.



Example of a waterbar, a Best Management Practice that redirects runoff from a driveway or footpath into a vegetated area for infiltration.  
*Photo credit: John Eliasberg.*

Examples of stormwater BMPs include diverting rain flow with a waterbar on a driveway or footpath, capturing roof runoff in an infiltration trench, planting a rain garden to infiltrate runoff across a lawn, installing live stakes to stabilize a shoreline, applying **Erosion Control Mix (ECM)** to bare soil to manage erosion, or following a regular maintenance schedule for a septic system .



Some BMPs can be installed in an afternoon as do-it-yourself projects, while others may take months or require skilled contractors and state and local permits. All BMPs are investments in the long-term health of lakes. We will look at BMPs in more detail in Part 6 of this Manual.



**A newly installed rain garden, a BMP that captures and infiltrates runoff flowing from a trench.**  
*Photo credit: Acton Wakefield Watersheds Alliance.*



**A live stake, harvested from a dormant elderberry in the early spring, shows leaves sprouting near the top.**  
Live stakes can be used as a BMP to help stabilize shorelines. *Photo credit: Ted Danforth.*

## 4. AN OVERVIEW OF THE LAKESMART PROCESS

The purpose of the LakeSmart program is to provide lakefront homeowner education and stewardship. Evaluators empower homeowners with positive messages and tools for simple actions they can take to protect their lake's water quality. The discussion below offers a general overview of the LakeSmart process. More details are provided in Parts 6 and 7 of this Manual.

A lake or watershed organization interested in starting a LakeSmart program first needs to recruit a team of volunteers interested in becoming LakeSmart Evaluators. One person is designated as the LakeSmart Coordinator to oversee the progress of evaluations and spread the word about LakeSmart in their lake community.

Maine Lakes or LakeSmart Hubs, regional organizations that serve as administrators for Maine Lakes in their service area, provide training and support for volunteer Evaluators from lake and watershed associations. Evaluators visit lakefront properties from May through October to identify and assess sources of nonpoint source pollution and recommend Best Management Practices that mitigate risks to lake water quality. Five sections of a homeowner's property are evaluated, from the top of the driveway, through the developed property areas, including outdoor structures, paths, and living areas, to the shoreline of the lake. LakeSmart's water quality protection standards are evaluated for each of these sections and are scored based on how well the standards are met.



Evaluators scoring water quality protection standards during a LakeSmart visit. *Photo credit: Maine Lakes.*

After the Evaluator(s) walk a property, they meet with the homeowner to discuss observations and recommendations for managing runoff (BMPs). Evaluation scoring, comments, and BMP recommendations can be entered directly into the database in the field or onto a paper form and entered into the database at a later time. For quality control, all LakeSmart evaluations are reviewed by Hub or **Lake Coordinators** and/or Maine Lakes staff.

Properties that successfully meet LakeSmart standards in ALL sections of the evaluation and are favorably reviewed earn a LakeSmart Award. The homeowner is presented with two Award signs to display at their shoreline and on their road. The LakeSmart Award



signs identify properties that are models of lake-friendly living. LakeSmart homeowners are often recognized by lake associations in newsletters and at annual meetings.

Many properties do not satisfy LakeSmart standards after a first evaluation. These homeowners are recognized and congratulated for the steps they have already taken on their property to protect water quality. Ongoing communication, encouragement, and guidance is particularly important for these homeowners as they continue their LakeSmart journey. The LakeSmart “status” for these homeowners is referred to as a “Commendation” or a “Delayed Award”, with the expectation that the homeowner will install recommended BMPs to earn an Award in a follow-up evaluation.

Whether a property meets award standards or not, the Evaluator prepares a written report for the homeowner with photographs and site-specific recommendations for Best Management Practices to manage stormwater runoff.

When guided by LakeSmart practices, developed lakeshore properties can filter runoff and function in ways similar to the natural processes that protect water quality on undeveloped properties. The many benefits of managing stormwater runoff using LakeSmart approaches include clear, clean, and healthy water, outstanding recreational opportunities, stable property values, abundant and diverse wildlife, and a successful local economy.

The LakeSmart visit is not simply a one-time encounter. It is the start of an ongoing relationship between the LakeSmart team and the homeowner that will lead to improved stormwater management and sustainable lake protection for many years to come.



## 5. LAKESMART COLLABORATORS

The LakeSmart process is managed by dedicated teams of partner organizations and volunteers that work together to accomplish LakeSmart goals. Descriptions of the organizations involved with LakeSmart and the roles of team members are described below.

### Maine Lakes Staff

The Maine Lakes staff ensures that all volunteer lake association teams have the resources they need to run a successful LakeSmart program. Maine Lakes staff provides annual training in the spring for new and previously trained Evaluators, produces and distributes LakeSmart materials, including outreach brochures, pamphlets, and LakeSmart Award signs, and provides ongoing guidance and resources to LakeSmart volunteers and lake associations. Maine Lakes staff also helps manage volunteers, supports volunteer use of the online Survey123 database with Maine DEP, makes presentations at lake association meetings, and recruits new lake associations to the LakeSmart program.

### LakeSmart Work Group

The LakeSmart Work Group is made up of experienced and knowledgeable staff and volunteers from lake and watershed organizations, Maine DEP, and the Maine Lakes board. Members are invited to join the Work Group by Maine Lakes staff.

The Work Group steers the LakeSmart program at a high level, helping to set strategic priorities now and for the future. The Work Group also guides the Maine Lakes staff when needed, offering feedback, suggestions, and comments about challenges that arise during the LakeSmart season. The LakeSmart Work Group keeps the LakeSmart program on track while preparing it for the future.

### Lake Associations

Traditionally, Maine Lakes has partnered with lake associations across the state to help launch LakeSmart at their lakes, but we also welcome road associations and other watershed or community groups to participate in the LakeSmart program. We ask that lake associations or other groups interested in starting new LakeSmart teams commit to participating in the program for at least three years with the following expectations:

- Engage new and current volunteers in the program.
- Ensure new volunteers attend LakeSmart Evaluator training through online and on-site sessions.
- Appoint a Lake Coordinator to organize and steer the local program.
- Provide lake association board support to its LakeSmart volunteers and the program.
- Publicize the benefits of being LakeSmart in newsletters, social media, and websites.

- Share LakeSmart information at association meetings and public events.
- Recognize and thank homeowners who participate in the LakeSmart program.

LakeSmart Evaluators for a lake association are the front line of lake protection in their watershed and the agents of desired behavior change. As neighbors and community members, Evaluators become proficient through training and experience at making reliable on-site judgments about signs of soil erosion that contribute to nonpoint source pollution and the Best Management Practices to address these problem areas. Evaluators document findings from LakeSmart visits with photos and notes to support recommendations. They also share results with the homeowner, educate them about lake-friendly practices, and prepare homeowner reports that summarize findings and recommendations.

Some Evaluators work in teams of two or more. A collaborative approach can be helpful when there are complex issues or interpretations that may benefit from discussion. Using multiple Evaluators for LakeSmart visits at lakes that are new to the program is particularly important for training and consistency.

The Lake Coordinator for a lake association has a deep knowledge of the LakeSmart program and a commitment to their lake. The Coordinator is responsible for maintaining communication with volunteers and participating homeowners, overseeing outreach to the public to encourage interest in and requests for LakeSmart evaluation visits, keeping track of the status of evaluations, and reporting LakeSmart activity to their lake association. They are also the primary liaison with Maine Lakes staff.

The Lake Coordinator assigns Evaluators to LakeSmart visits, ensures that visits are timely and thorough, confirms that results are submitted into the Survey123 database for review, and ensures that reports are written and shared with homeowners. The Lake Coordinator also manages post-visit follow-up conversations with homeowners, including providing continuing guidance and additional resources.

The Appendix includes more thorough job descriptions for LakeSmart Evaluators and Lake Coordinators.

## LakeSmart Hub Partners

**LakeSmart Hub Partners** are regional organizations that are considered extensions of Maine Lakes. Hub Partners are under contract with Maine Lakes and receive a yearly stipend to help cover some of their expenses for managing the LakeSmart program in their service area. Hub Partners are some of the most experienced and knowledgeable LakeSmart team members in the state.

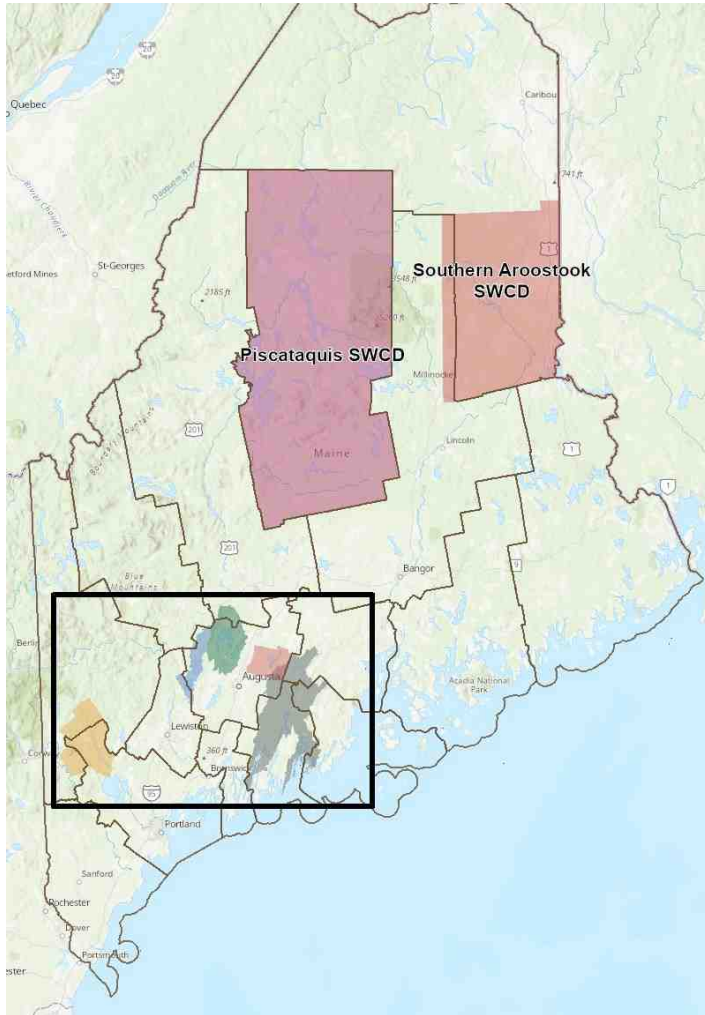
Each Hub Partner organization has a designated **LakeSmart Hub Coordinator**. A Hub Coordinator is often a staff member of the Hub organization, although the role may be assigned to an experienced volunteer Evaluator in the Hub's service area. The Hub Coordinator helps manage Evaluators and LakeSmart visits in their service area, provides



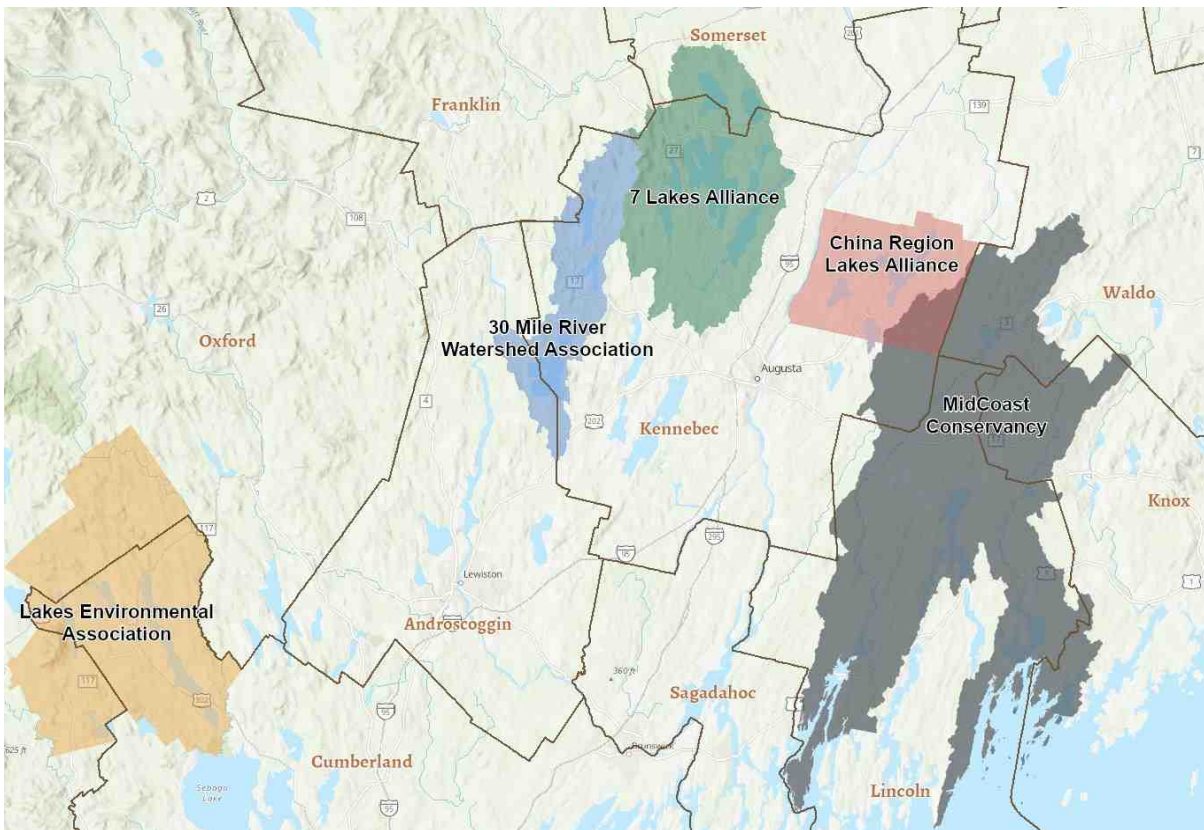
on-site training for new Evaluators, offers guidance and support to Evaluators with difficult or unusual evaluations, and reviews evaluations for consistency with LakeSmart standards. Hub Coordinators also publicize and grow their LakeSmart program and work closely with Maine Lakes staff.

The LakeSmart Hub Partners in 2023 include the 7 Lakes Alliance (Belgrade Lakes), 30 Mile River Watershed Association (Farmington), Lakes Environmental Association (Bridgton), Midcoast Conservancy (Edgecomb), Piscataquis County Soil and Water Conservation District (Dover-Foxcroft), the Southern Aroostook Soil and Water Conservation District (Houlton), and the China Region Lakes Alliance. See map on next page showing service areas of these hubs. Additional LakeSmart Hub Partners will be added as LakeSmart programs expand into new areas of the state.





LEFT: Map showing service areas of the 7 LakeSmart hubs across the state. BELOW: An enlarged map of the inset showing locations of 5 hubs in the southern half of Maine. *Map Credit: ArcGIS Online map by Caroline Murray, Maine Lakes.*



# 6. THE LAKESMART EVALUATION

The LakeSmart evaluation is perhaps the most visible role for LakeSmart volunteers and is the focus of this Manual. We will review and provide the rationale for LakeSmart standards in each section of the evaluation.

## LakeSmart Standards

The LakeSmart evaluation is an assessment of a property from high land down to the waterfront and is divided into five sections:

1. **Driveway and Parking Areas:** the areas where cars and other vehicles typically drive and park.
2. **Outdoor Structures:** main structure, unattached structures (sheds, garage, patios), septic system, heating tanks, chemical storage.
3. **Outdoor Living Areas:** walking paths, lawn, general use (pet waste, boat storage, fire pits, bare soil areas).
4. **Shoreline:** the interface between the water and the land along the entire owned shoreline of the property. This section also includes a standard for a vegetated buffer along a seasonal or year-round stream (if present) on the property.
5. **Shoreline Buffer:** the vegetated buffer between the development footprint and the lake.

The **development footprint** contains all areas of a property touched by human impact, including the driveway and parking areas, all structures, areas designated for outdoor use, pathways and access points, and any other area regularly used by people and their pets.



LakeSmart focuses on the development footprint as the area with the most direct human impacts and most likely to have erosion issues.



Areas within the development footprint are scored in sections 1, 2, and 3 of the evaluation. The entire owned shoreline along the edge of the lake is evaluated in section 4. The shoreline buffer evaluated in section 5 is located between the development footprint and the lake and aligns with the width of the development footprint.

Each section of the evaluation has its own **LakeSmart standards** for water quality protection that were developed to balance two considerations: (1) what could be achievable and generate widespread buy-in and participation from homeowners; and (2) what might ultimately be the most desirable for pollution reduction from a scientific perspective.

The sections of the evaluation can be thought of as source areas for nutrient runoff, with standards that identify potential problem areas for soil erosion and nonpoint source pollution entering the lake. Scores for each standard assess how well the property is protecting lake water quality today and into the future. The scoring options for the standards vary from most protective (highest score) to least protective (lowest score) of water quality. To qualify for a LakeSmart Award, a property must meet minimum scores for all sections of the evaluation.

The LakeSmart standards were updated in 2021 by Maine Lakes staff in collaboration with a team of experienced Evaluators, Maine DEP staff, and experts in the fields of lake science and water quality. The intent of the new standards is to address the accelerating impacts of climate change (more intense storms, warmer air and water temperatures, increased droughts, and earlier ice-out) and continuing lakeshore development pressure. The new standards were developed through an extensive review of the literature as well as interviews with lake experts. The 2021 standards were revised slightly in 2022 to address or clarify issues that came up during the first season the standards were used in LakeSmart evaluations.

## Loon Smart Merit Award

Maine Lakes partners with Maine Audubon to recognize homeowners whose practices protect loons, loon nesting habitat, and loon productivity. Common loons are well known summer residents of Maine's lakes. Their striking plumage and haunting calls have captivated many generations of shoreline property owners. As a top-level

predator that needs a healthy population of fish living in cold, clear water, loons are excellent **bioindicators** of water quality and lake health. Bioindicators are living organisms used to assess the condition of an ecosystem and the effects of environmental changes on the ecosystem. The presence of loons on a lake is a good sign that the lake is healthy.

Homeowners can choose to be considered for the **Loon Smart Merit Award** when completing their pre-evaluation Homeowner Questionnaire or within five years of a LakeSmart Award. Only LakeSmart Award properties can be recognized with the Loon Smart Award.





In addition to earning the LakeSmart Award, there are two additional steps to qualify for a the Loon Smart Merit Award:

1. The homeowner must agree to adopt five simple actions:
  - Fish lead-free because lead tackle is a leading cause of death for breeding adult loons.
  - Remove monofilament line from the lake and its shoreline to reduce the risk of loons becoming entangled in line.
  - Stay at least 200 feet away from loons and loon nests when boating to reduce the risk of disturbance.
  - Maintain a “no wake” speed within 200 feet of shore to reduce the chance that wakes will impact lakeside nests or wash away loon eggs.
  - Seal outdoor trash cans and feed pets indoors to deter predators likely to prey on loon eggs.
2. The LakeSmart evaluation of the property must also meet minimum Loon Smart scores for particular erosion-related and lakeshore buffer standards that correlate with high levels of water quality protection.

LakeSmart Awardees who qualify for the Loon Smart Merit Award are given a Loon Smart sticker to apply to their LakeSmart Award signs.

## How to Complete and Score the LakeSmart Evaluation

Before a property evaluation begins, the homeowner is asked to complete the LakeSmart **Homeowner Questionnaire**. This is a simple two-page form used to collect the homeowner’s contact information, a few property details such as the length of the owned shoreline frontage, septic system age, leach field location, and lawn maintenance practices. The Questionnaire also asks for permission to use photos taken during the evaluation and the homeowner’s name for LakeSmart educational and outreach purposes. The Homeowner Questionnaire should be completed and returned to the Evaluator before the LakeSmart visit.

The LakeSmart visit takes about an hour, although it may take more time if the property is complex or if the Evaluator is new to the process. When you arrive at the property, introduce yourself and the LakeSmart program, and ask the homeowner if they would like to walk with you around the property as you complete the evaluation. Many Evaluators prefer to walk the property without the homeowner as a first step, especially if they are working in a team with other Evaluators and scoring decisions are often made through collaborative discussions. This may be harder to do in the presence of a homeowner. If the homeowner does not walk the property with you, you should plan to meet with them afterward (or set up another time to return) to walk the property and share findings and recommendations.

Because LakeSmart is first and foremost a homeowner education program, any opportunity to meet with and follow up with the homeowner on their property is well worth your time. Continuing conversations will motivate the homeowner, provide opportunities to share positive messages about lake protection, and offer more information about recommended Best Management Practices.

***Along with walking the property and filling out the evaluation form, Evaluators are required to take at least four representative photos of the shoreline and vegetative buffer to submit with the evaluation results into the Survey123 database.***

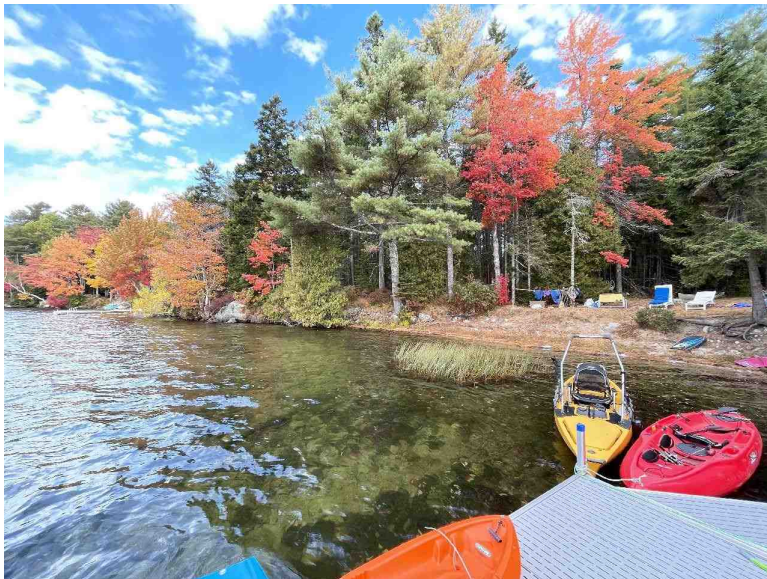
The required photos should show the following parts of the property:

Photo 1 – Shoreline from end of dock, looking left

Photo 2 – Shoreline from end of dock, looking right

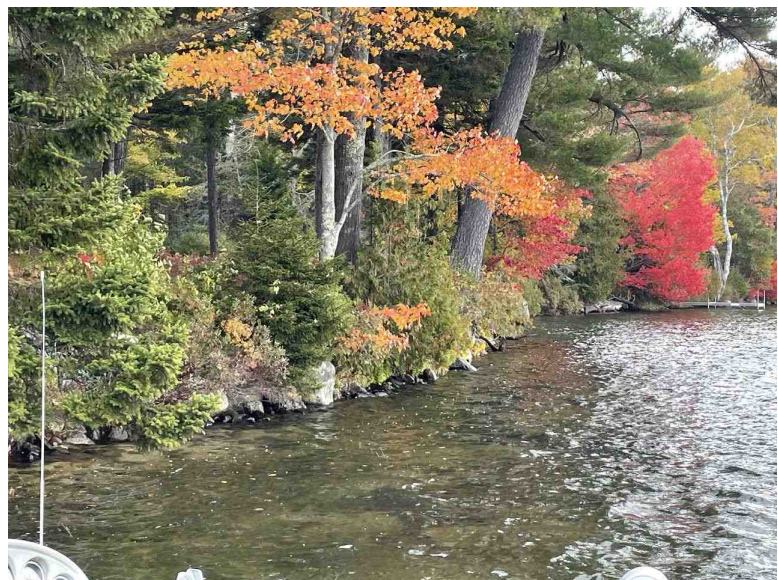
If there is no dock, the first two photos should most of the shoreline

Photos 3 and 4 – Representative buffer photos



**LEFT:** An example of required photo 1: the shoreline from the dock looking left. *Photo credit: Ginger Eliasberg.*

**RIGHT:** An example of required photo 2: the shoreline from the dock looking right. *Photo credit: Ginger Eliasberg.*



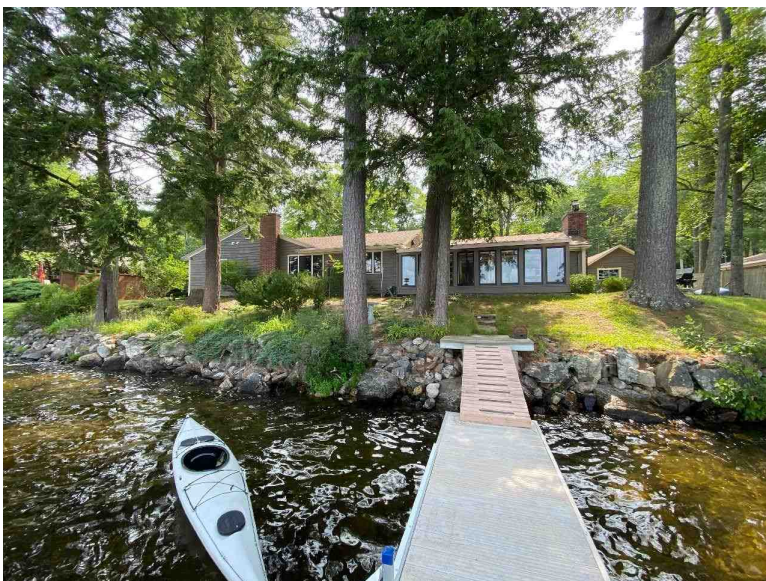




An example of required photos 3-4: a view of the buffer. *Photo credit: Ginger Eliasberg.*

**Three additional photos** beyond the required four photos can be uploaded into Survey123 with descriptions. We encourage you to submit these extra photos to communicate to reviewers about areas of concern on the property. Additional photos can provide more information to support the Evaluator’s scoring in unique or unusual situations.

A particularly helpful extra photo shows a view of the property from the dock (or shoreline) that includes as much of the buffer as possible with the house and development footprint in the background. This perspective often helps answer the question “would you consider this property LakeSmart?”



**LEFT:** An example of an additional photo showing a view of the property from the lake that includes the buffer and the development footprint. *Photo credit: Dana Little.*



The following pages walk through each section of the evaluation, including some background about why these areas are important as potential sources of nonpoint source pollution. Each standard in the evaluation is described in more detail in *green italic* (not included in the actual evaluation form) explaining what the standard is and why it is part of the LakeSmart evaluation. This background information was compiled by Ginger Eliasberg (Coordinator, Georges Pond) in a separate document called “LakeSmart Property Evaluation: Explanations and Talking Points” (see Appendix). The notes and talking points are helpful in conversations with homeowners following the evaluation and can be written into the homeowner report.

Maine Lakes has assembled an online **Evaluator Toolkit** that contains the current LakeSmart evaluation form, the Homeowner Questionnaire, examples of homeowner reports, Survey123 training videos, and LakeSmart outreach materials.

***The Evaluator Toolkit is only available to LakeSmart Evaluators and Coordinators and can be accessed at:***

[www.lakes.me/lakesmart-evaluator-toolkit](http://www.lakes.me/lakesmart-evaluator-toolkit)

There are no login credentials required to access these materials. We just ask that you do not share the page URL outside the LakeSmart volunteer community. Our goal is to simplify the distribution these materials for our Evaluators and Coordinators. Please feel free to reach out to the Maine Lakes LakeSmart staff ([lakesmart@lakes.me](mailto:lakesmart@lakes.me)) with any feedback and content suggestions for the Toolkit.



**Team of LakeSmart evaluators at Androscoggin Lake. Photo credit: Whitney Baker.**



## SECTION 1: DRIVEWAYS AND PARKING AREAS

### *Why do we care about driveways and parking areas?*

Soil erosion is a major source of nonpoint pollution that flows into our lakes and rivers. Many forested areas around lakes have been cut and managed for commercial, residential, or even industrial uses. This has led to a significant increase in **impervious surfaces** such as concrete and asphalt. Impervious surfaces increase the amount of stormwater runoff that flows over the surface from a rain or storm event. These surfaces do not absorb or allow rainwater to infiltrate into the groundwater.

During the **infiltration** process in natural landscapes, rainwater is absorbed into the ground, where it is filtered by the soil and contaminants are removed. However, rainwater that flows over impervious surfaces is not absorbed and filtered. Instead, it enters surface waters directly, carrying sediment, oils, debris, nutrients, chemicals, and bacteria along with it. Even without asphalt, a driveway or parking area can become impervious when the soil is compacted to the point where rainwater is not absorbed promptly.

Erosion from stormwater runoff often happens in stages (see diagram below), beginning with rain falling on a surface such as a driveway. Many raindrops from a storm land on the ground and cause **splash (raindrop) erosion**. This can transition into **sheet flow** (shallow but wide and concentrated flow over a surface) followed by the development of **rills**, then wider and deeper **gullies**, and progressing to more severe channel erosion.



Soil Erosion. Raindrop erosion occurs when falling raindrops hit and dislodge exposed soil particles. The dislodged soil particles are suspended in stormwater runoff and can easily be transported great distances. *Source: Kennebec County Soil and Water Conservation District and ME DEP Bureaus of Land Resources and Water Quality 2016. Gravel Road Maintenance Manual: A Guide for Landowners on Camp and Other Gravel Roads.*

### What does LakeSmart look like?

LakeSmart driveways and parking areas are well maintained with water primarily moving over surfaces as sheet flow with little or no channeling. Runoff is diverted into areas where it can soak into the ground and be filtered by duff, soil, and the roots of vegetation. This keeps pollutants out of lakes, reduces flood risks, and contributes to **groundwater recharge** or the replenishing of the groundwater resource.



ABOVE AND RIGHT: The progression of erosion from sheet flow (above) to shallow rills (right) to deep rills/gullies (far right). *Photo credit: Maine Lakes.*

BELOW: LakeSmart practices used to manage stormwater flow and erosion on a driveway. A crowned driveway with a stabilized ditch. *Photo credit: Maine Lakes.* Turnouts (insert) are installed in series as extensions of ditches to direct runoff into vegetated areas. *Photo credit: Maine DEP/Portland Water District Fact Sheet.*







**ABOVE:** A planted berm at the bottom of a driveway that captures runoff before it reaches the lake. *Photo credit: Maine Lakes.*



**LEFT:** An undefined parking area with stormwater runoff that has nowhere to go to infiltrate. *Photo credit: Maine Lakes.*



**RIGHT:** A well-defined parking area surrounded by LakeSmart infiltration practices. *Photo credit: SOAK Up the Rain New Hampshire.*



**The scoring options for each standard in the LakeSmart evaluation range from least protective (lowest score) to most protective (highest score) of water quality.**

| <b>Standard and Score - Section 1: Driveway and Parking Areas</b>   |
|---|
| <p>a. Is the driveway defined?<br/>           0 Undefined    1 Somewhat defined    2 Well defined or no driveway</p> <p><i>A "defined" driveway is easily identified, used consistently, and discourages driving over other property areas. A designated access for vehicles minimizes soil compaction beyond the defined driveway. Compacted soils increase the potential for erosion and do not adequately soak up and filter runoff.</i></p>   |
| <p>b. Is the parking area defined?<br/>           0 Undefined    1 Somewhat defined    2 Well defined or no parking area</p>  |
| <p>c. Do shoulders and ditches around the driveway and parking area show signs of erosion?<br/>           0 Many major signs<br/>           1 Many signs, mix of major and minor<br/>           2 A few minor signs<br/>           3 No signs or N/A</p> <p><i>Look for signs of soil being washed away by rills or channels.</i></p>   |
| <p>d. Do the driving surfaces show signs of erosion?<br/>           0 Many major rills (0.5" deep or more)<br/>           1 Some major rills<br/>           2 A few minor rills (less than 0.5" deep)<br/>           3 No signs of erosion</p> <p><i>Rills are small channels or trickles that form when surface water concentrates flow more quickly in lower areas. Rills turn into deeper gullies if not well managed.</i></p>   |
| <p>e. If there is identified erosion (questions 1c and 1d), how much of the runoff is directed to an effective BMP?<br/>           0 None    1 Some    2 Most    3 All or no BMP needed</p> <p><b>Loon Smart requires at least 2</b></p> <p><i>A Best Management Practice (BMP) promotes the diversion, infiltration, and treatment or filtering of stormwater runoff. Examples of BMPs that redirect stormwater from driveways to adjacent vegetated areas for infiltration include waterbars, open-top culverts, rubber razors, fire hose diverters, and the crowning of driveways.</i></p> |
| <p>f. Are there signs of grease or motor oil on the driveway or parking area?<br/>           0 Many or large signs    1 Some or small signs    2 No signs</p> <p><i>Motor oil and grease are harmful to aquatic wildlife and can contribute pollutants to groundwater.</i></p>  |
| <p><b>Total Available Points =15 (11 to qualify)</b></p>  |

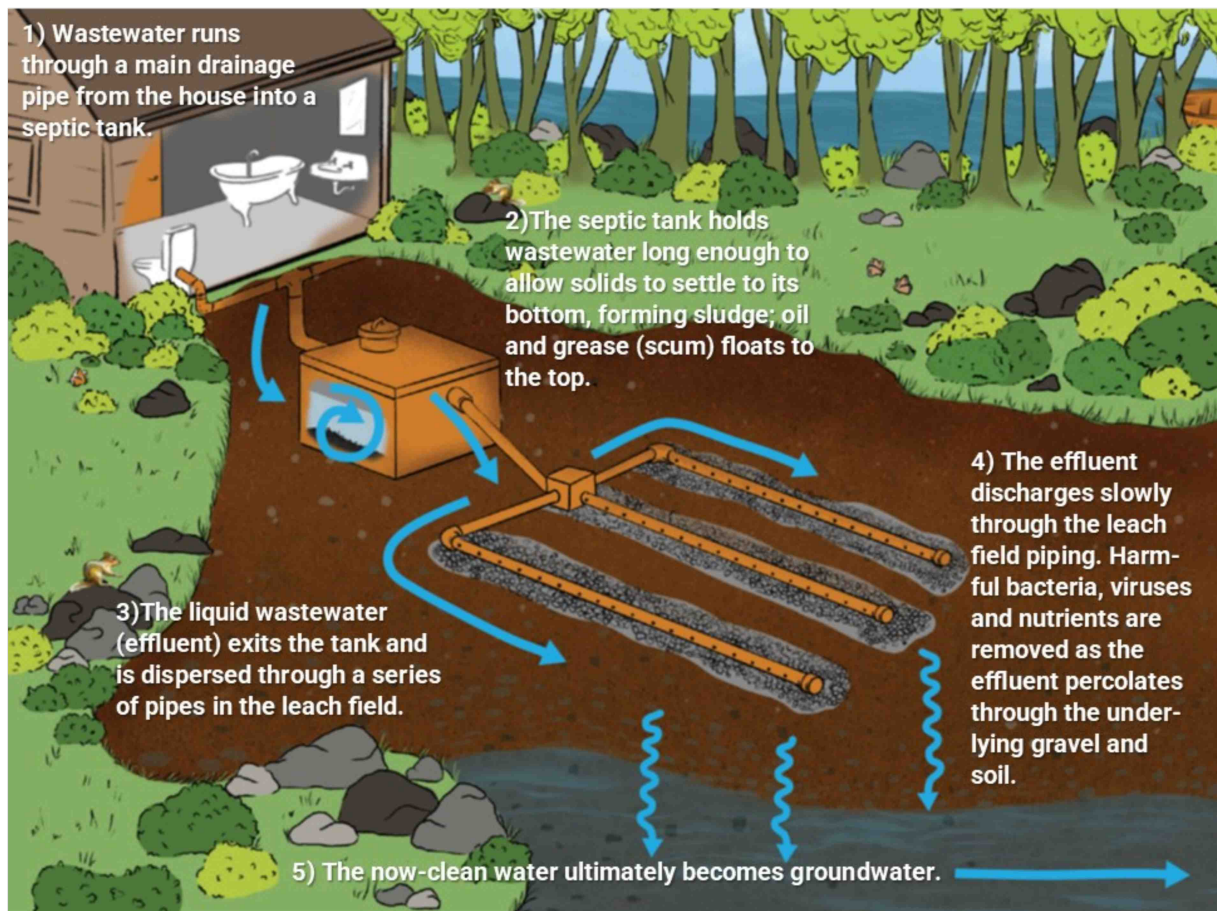
## SECTION 2: OUTDOOR STRUCTURES:

This section focuses on the water quality impacts of structures on the property including 1) the main structure and unattached structures (e.g., sheds, garages, patios), 2) the septic system, 3) outside heating oil tanks, if present, and 4) any outdoor storage of chemicals.

### *Why do we care about outdoor structures?*

A tremendous amount of rainwater flows off roofs. More than 300 gallons of water will flow off a 25' x 40' roof during a moderate rainstorm! On structures without gutters, water accumulates along **driplines** on the ground directly below the edge of a roof. Roof runoff can generate erosion beyond the driplines of these structures. The water then flows over the ground, carrying sediments and other pollutants to the lake. Driplines of every structure on a property should be checked for signs of erosion. Best Management Practices can be used to infiltrate this source of nonpoint source pollution either at the driplines or nearby. A gutter downspout without a nearby drywell or rain garden can funnel fast-moving water like a fire hose into an area and cause erosion.

Septic systems are underground wastewater treatment structures that keep homeowners, neighbors, and lakes safe from the chemicals, bacteria, viruses, and nutrients in household waste. Regularly maintaining a septic system helps to identify potential septic problems



How does a septic system work? Source: *Maine Lakes, Lakeside Living: Caring for your Septic System.*

early and keeps the system working properly for decades. Ignoring septic maintenance can lead to system failures, requiring costly replacement of the tank, the leach field, or both. Untreated effluent that escapes from a failing septic system is a potential source of phosphorus in a lake. Chemicals, bacteria, and other toxins from untreated effluent may also contaminate drinking water wells. To keep a nearby lake clean, protect the homeowner's health, and save money, septic maintenance should be a high priority for all lakeside homeowners. Just one or two failing septic systems can adversely affect water quality (East Pond Watershed-based Management Plan 2018-2027).

Potential oil and chemical spills also present a risk to lake water quality. If poorly installed or maintained, outdoor oil tanks can become corroded or rusty due to age and exposure to weather. In addition, chemicals should not be stored in rusty and potentially leaking containers or exposed to water, snow, or ice. Oil and chemical leaks or spills can cause groundwater, surface water, and soil contamination, personal property damage, and may result in lower property values.

### ***What does LakeSmart look like?***

Septic systems are functioning with no smell, seepage, or signs of malfunction. All roof runoff is captured by Best Management Practices that infiltrate it into the soil where it falls (or within a short distance of where it falls) and without significant erosion. Oil tanks are covered to maintain their integrity. All chemicals, oils, fertilizers, or other contaminants are safely stored indoors.

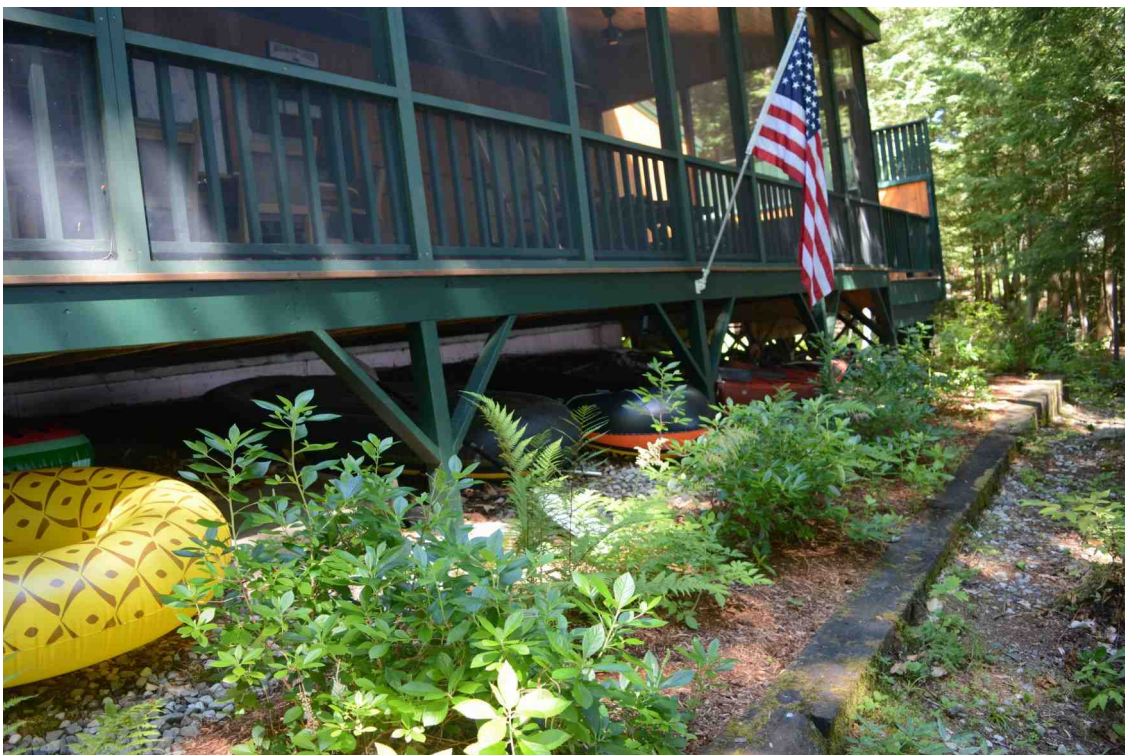


**A well-maintained LakeSmart leach field with no smell, seepage, or signs of malfunction *Photo credit: Maine Lakes.***





**ABOVE LEFT:** Runoff from a roof without gutters flows into a dripline. **ABOVE RIGHT:** An infiltration or dripline trench is a LakeSmart practice that collects and infiltrates runoff, reduces erosion and back splash, and protects the foundation of a structure. *Photo credit: Lakes Environmental Association.*



**Planting hardy native plants is a LakeSmart practice along a dripline. Plants effectively intercept and infiltrate runoff. Photo credit: Maine Lakes.**

## Standard and Score - Section 2: Outdoor Structures

a. Do you see signs of erosion from driplines of the main structure (camp/house)?

0 Many major signs

1 Many signs, mix of major and minor

2 A few signs but all minor

3 No signs

*Even a moderate rainstorm can produce gallons of water flowing off a roof! Check driplines of all structures without gutters to see if soil has been washed away into rills, gullies, or channels. Check erosion in areas around a structure with gutters to make sure gutters are working properly and draining into nearby areas for infiltration.*

b. Are there signs of erosion around any unattached structures (sheds, garages, patios, etc.) in the outdoor living area?

0 Many major signs

1 Many signs, mix of major and minor

2 A few signs but all minor

3 No signs or N/A

c. If there is erosion, how much is directed to an effective BMP?

0 None

1 Some

2 Most

3 All or N/A

### Loon Smart requires at least 2

*Examples of BMPs that manage erosion along or close to a dripline include an infiltration trench, water-loving native plants growing in the dripline or a nearby rain garden, or diversion of runoff to an existing vegetated area.*

d. Does the homeowner follow a recommended septic pumping schedule?

(See Question 13 of the Homeowner Questionnaire)

0 No

1 Yes

*While erosion from structures and roads is the biggest source of phosphorus entering lakes, untreated effluent draining from a failing septic system contributes 5-10% of the phosphorus that reaches lakes (Casco Bay Estuary Partnership and Cumberland SWCD, Septic Systems: How they work and how to keep them working). This effluent is also a source of bacteria to nearby lake water that could be harmful to you and your neighbors. Pumping a septic tank removes sludge and scum before it builds up and washes into the leach field, compromising or destroying the leach field's capacity to distribute and treat effluent.*

**If location of the leach field is unknown, score zero for questions e and f and skip to question g.**

*Encourage homeowners to research the location of their leach field. Consider holding a LakeSmart Award until the leach field is located.*

e. How much woody vegetation is growing over the leach field?

0 A lot

1 Some

2 None

*The roots of trees and shrubs can intrude into a leach field's pipes, compromising its function and shortening its life. Non-woody plants with roots less than 2 feet long such as some native grasses, ferns, and groundcover plants can be left to grow over the field. Shrubs and trees should be removed.*

f. Does the leach field show signs of malfunction?

0 Significant signs (strong odor, soft/wet ground, seepage of effluent)

1 Moderate signs (noticeably greener vegetation nearby)

3 No signs



**Standard and Score - Section 2: Outdoor Structures (cont'd)**

g. If there is an outside heating oil tank, is it in good condition?  
0 No, signs of rust/damage visible    1 Yes, good condition or N/A

h. If there is an outside heating oil tank, is it protected from falling ice and snow?  
0 No, not protected  
1 No, but valve cover protected  
2 Yes, entire tank and valve cover protected or N/A

*Falling ice can puncture an oil tank and cause an oil spill that can flow into the lake.*

i. Are chemicals stored under cover where they do not pose a threat to water?  
0 No, chemicals out in open    1 Yes or N/A

*Check for paint containers, pesticides, herbicides, fertilizers, cleaning products, and gas and oil cans.*

**Total Available Points =19 (13 to qualify)**



When evaluating the driveway and parking areas of a property in **Section 1**, look for the location of the **septic system's leach field**. Although the leach field is scored here in Section 2 (Outdoor Structures) of the evaluation, it is often located near the driveway or parking areas (Section 1). If the leach field is near the driveway, consider scoring the leach field standards (2e and 2f) while completing Section 1 to save a walk back.



LakeSmart practices recommend cutting woody species intruding into a leach field. *Photo credit: Ginger Eliasberg.*





### SECTION 3: OUTDOOR LIVING AREAS

In this section, we look at areas of a property that are used for recreation, accessing the shoreline, and storage. All these areas are within the **development footprint** of the property (all areas touched by human impact). How this area is used, how much of the area is used, and how intensely it is used impact runoff patterns and the type and amount of pollutants that are carried in runoff.

Standards in this section consider the condition of paths and whether the paths are narrow, defined, show signs of erosion, and are curved to divert runoff into adjacent vegetation. If there is a lawn, the homeowner's mowing practices and use of fertilizer are evaluated, as well as how and where stormwater flows across the lawn and the extent of erosion. Additional potential water quality risks that are scored in this section include pet waste, outdoor boat storage, and areas with bare soil (e.g. open fire pits near the water).

#### ***Why do we care about outdoor living areas?***

The activities and uses of outdoor spaces may impact water quality in the lake. Potential problem areas include 1) footpaths that are unnecessarily wide, thereby reducing areas of adjacent vegetation, 2) footpaths that do not promote infiltration of water flow because they are not surfaced with absorptive materials (e.g., mulch or crushed stone) or are compacted, 3) footpaths that serve as rivers to the lake during a rainstorm because they are not curved to divert flow into adjacent vegetation, 4) shallow-rooted grasses and compacted soils in lawns, limiting infiltration, 5) pet waste, a source of nutrients, bacteria, and pathogens that can enter the lake, and 6) soil compaction in other high traffic areas such as where boats are stored or around fire pits.

#### ***What does LakeSmart look like?***

Outdoor living areas on a LakeSmart property show no or very few signs of erosion. Narrow footpaths meander to the shore with rainwater diverted to vegetation or other areas where it can be absorbed. Lawns are minimal with little or no "traditional" maintenance. Fallen leaves are left in place to accumulate and decompose to become future duff and habitat for pollinators and other insects. Boats are stored on racks in designated areas, allowing natural vegetation to grow under the racks and concentrating foot traffic and soil compaction to fewer areas.



A LakeSmart practice is to store boats on racks to reduce areas of compacted soil. *Photo credit: Maine Lakes.*





**ABOVE:** An example of a LakeSmart footpath. The walking surface is narrow, covered with mulch so there is no bare soil, and stable. The path is also curved and winding to divert runoff into vegetated natural areas to infiltrate. *Photo credit: Maine Lakes.*



**LEFT:** Keeping leaves in place on the ground once they have fallen (rather than raking them up) is a practice that provides food and shelter, especially in winter, for invertebrates, including native pollinators. Fallen leaves can be used as free and effective mulch for your garden. These leaves will decompose to form a duff layer in a forested landscape. *Photo credit: Andrea Stevens.*



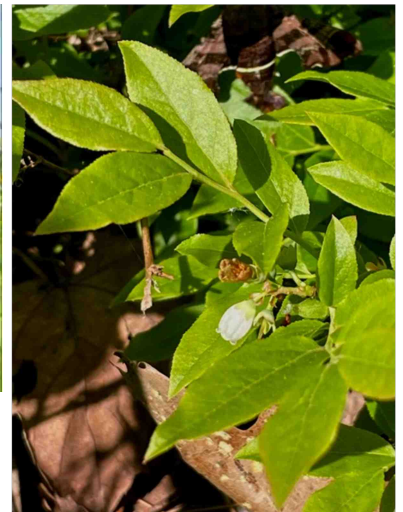


LEFT: The shallow-rooted grasses of traditional lawns do little to resist erosion or stabilize soil. Lawn surfaces can also become compacted and prevent runoff from soaking into the ground. Fertilizer applied to a lawn can enter the lake and increase the phosphorus load. *Photo credit: Janna Townsend.*

RIGHT: A no-mow zone where plants can grow on their own without cutting. Native plants with deeper roots than turf grass may become established in the unmowed area. Invasive or unfavorable weeds can be removed to favor native species. Enhance a no-mow zone by planting native groundcover and shrubs. No-mow zones help stabilize shorelines, filter and extract nutrients from runoff, reduce erosion, and provide habitat for pollinators and other wildlife. *Photo Credit: The Federation of Vermont Lakes and Ponds, A Guide to Healthy Lakes using Lakeshore Landscaping.*



ABOVE LEFT: An alternative to lawns on a lakefront property is to plant a native meadow for pollinators. Native meadows are communities of grasses and wildflowers that are attractive landscape features and provide food and shelter for pollinators. A first step in planting a native meadow requires removing turf grass. A meadow can then be seeded in (native seeds available from Wild Seed Project: [www.shop.wildseedproject.net/](http://www.shop.wildseedproject.net/)) or planted with plugs or potted plants. *Photo credit: New Hampshire Extension. Fact Sheet: Planting for Pollinators: Establishing a Wildflower Meadow from Seed. Cathy Neal, Extension Professor/Specialist.*



ABOVE RIGHT: Another lawn alternative is to transition turf grass into a native edible garden. Planting lowbush blueberry (available as native sod) is a good choice for establishing an edible garden in Maine. *Photo credit: Andrea Stevens.*

## Standard and Score - Section 3: Outdoor Living Areas

### Paths and Walkways in the Development Footprint:

a. Are the walking paths well-defined? 0 No 1 Yes (all or most)

*Soil compaction caused by dispersed foot traffic can damage plant roots, compromise wildlife habitat, and reduce infiltration. Define footpaths to concentrate and direct foot traffic. Keep paths to no more than 6 feet wide. Ideally, paths should be 3-4 feet wide or only as wide as necessary. A narrow path helps limit soil compaction and maintain bordering natural areas that will soak up stormwater runoff.*

b. Are there signs of erosion along the walking paths?

0 Many major signs                      1 Many signs, mix of major/minor  
2 A few signs but all minor            3 No signs or N/A

*Rills and other channeling are indicators of runoff and erosion on footpaths. Exposed tree roots may also be signs of erosion and soil compaction. Paths can be covered with absorptive materials (e.g., mulch or crushed stone) that promote infiltration and reduce erosion in areas of bare or compacted soil.*

c. Are walking paths that lead to the buffer mostly curved/winding?

0 No                      1 Yes (all or most)

*Curved paths divert runoff from walking surfaces into bordering natural areas where it can be absorbed into the ground. Linear paths channel runoff and can act like a runway, increasing the speed of water flow and the amount of eroded material carried to the lake.*

### Lawns:

d. Is there a lawn that is being maintained (mowed, fertilized, etc.)?

0 Yes, large area of lawn, lots of maintenance  
1 Some lawn, minimal maintenance  
2 No lawn

*Traditional lawns are made up of shallow-rooted grasses that do not resist erosion or stabilize soil like most vegetation. For this reason, **lawns are not considered vegetated areas** for the purposes of LakeSmart. Lawn surfaces can become compacted and prevent runoff from soaking into the ground. Fertilizer containing phosphorus that is applied to lawns can enter lakes and accelerate aquatic plant growth, contributing to algal blooms. The University of Maine Cooperative Extension recommends limiting the use of fertilizer containing phosphorus to newly established lawns, areas of re-seeding, or if recommended by a soil test (see University of Maine Cooperative Extension Bulletin 2154, *Fertilizing a Home Lawn in Maine* and Bulletin 2286, *Know Your Soil: Testing Your Soil*). Most soils in Maine naturally have enough phosphorus to keep a lawn green. Application of herbicides and pesticides on lawns should be avoided. These chemicals can be harmful to fish, frogs, turtles, mussels, and other wildlife. Mowed grass clippings left to decompose provide a natural fertilizer and contribute to the retention of soil moisture. Reducing the size of lawns by identifying and managing low or no-mow areas is a simple and easy Best Management Practice for a homeowner to consider.*

**Standard and Score - Section 3: Outdoor Living Areas (cont'd)**

- e. Is stormwater flow over the lawn directed to a BMP?  
0 None      1 Some      2 Most      3 All or no lawn

*Examples of BMPs that capture and redirect stormwater flow over the lawn for infiltration include grading by installing a berm or swale to divert water flow promptly off the lawn into an adjacent vegetated area and rain gardens. Infiltration steps are also a good choice on moderate slopes.*

**General Use:**

- f. Do you see pet waste in any outdoor areas?  
0 Lots of waste      1 Some waste      2 No waste

*Pet waste contains nutrients that accelerate plant and algae growth in a lake and may contain bacteria and pathogens that can make water unsafe for swimming. Pet waste should never be tossed into the lake and should be removed from shoreline areas for pollution reduction.*

- g. Are boats stored in a designated area?  
0 No      1 Some are and some aren't      2 Yes or N/A

*Boats kept outside are best stored on racks or blocks, minimizing soil compaction, and keeping the vegetation under the boats intact to allow for infiltration. Boats are also kept in better condition when elevated above the ground. When using racks for boat storage, there may also be less tendency to drag the boats, which disturbs the soil and increases the potential for pollutant-laden runoff.*

- h. Are areas of bare soil covered with duff or mulch?  
0 No, all or almost all areas not covered  
1 Mixed, but bare areas > covered areas  
2 Mixed, but covered areas > bare areas  
3 Yes, all/most areas covered

*Duff accumulates below the leaf litter and above the mineral soil in a natural forest. It is full of partly decomposed organic matter including leaves, woody debris, and dead plant material, making it very soft to walk over. Duff protects topsoil from erosion, nourishes soil and plants, and helps trap and infiltrate runoff. Erosion Control Mix (ECM) can be added to areas of bare soil to provide some, but not all, the benefits of natural duff.*

- i. Are there signs of erosion from the areas described in questions g and h?  
0 Many major signs      1 Many signs, mix of major/minor  
2 A few signs but all minor      3 No signs or N/A

*Bare soil, rills, gullies, and channels are visible indicators of erosion.*

- j. If there is erosion, how much is directed to an effective BMP?  
0 None      1 Some      2 Most      3 All or no BMPs needed

**Loon Smart requires at least 2**

*Examples of BMPs that manage erosion in bare or compacted areas include rain gardens, nearby vegetated buffers, and infiltration steps.*

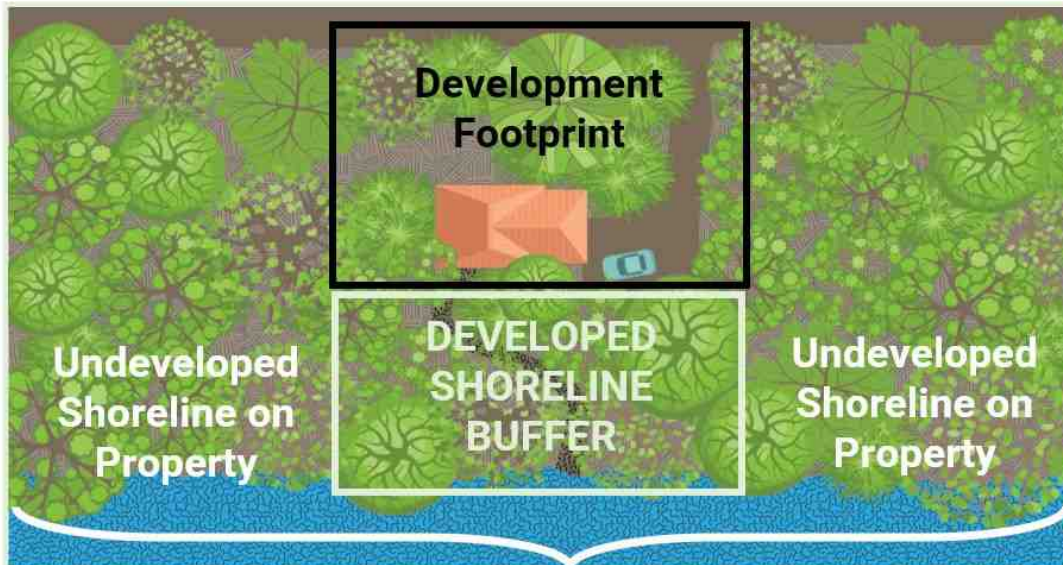
**Total Available Points = 23 (16 to qualify)**



## SECTION 4: SHORELINE (including the entire owned shorefront where the water and land meet)

The shoreline is the land right next to the lake at the interface between the water and the land. It is one of the most important areas where LakeSmart practices can effectively keep runoff and pollutants from entering the lake. This section looks primarily at the stability of the shoreline along the entire owned shorefront.

### Where is the Shoreline for Section 4?



The entire owned shoreline is evaluated in Section 4

### *Why do we care about shorelines?*

A healthy, stable shoreline keeps soil out of the water, can withstand wakes produced by wind and boats, and maintains the property's shorefront integrity. An unstable shoreline may have banks that have been undercut by wave action causing bank **slumping**, particularly in shoreline areas without deep-rooted native plants. Unstable shorelines contribute phosphorus to the lake and can significantly reduce the square footage of a property and lower its long-term value. Wildlife habitat may also be impacted by shoreline rocks that are not shaded by trees or large shrubs. Vegetation over shoreline rocks keeps them from warming during the day and protects **littoral habitat** (near shore shallow water) that is vital to aquatic wildlife.

If present, streamside vegetated buffers are also evaluated in this section and offer similar benefits to the shoreline buffers scored in Section 5.



***What does LakeSmart look like?***

A LakeSmart shoreline is stable with no signs of bank erosion or undercutting. If the shoreline is rocky, shade provided by trees keeps the rocks cool to minimize warming of lake water. Any streams on the property have a robust vegetated buffer of at least 10 feet in depth along both banks.



**ABOVE:** A stable shoreline anchored by vegetation and natural rocks. *Photo credit: Chris Brink.*



**LEFT:** A stable shoreline with near shore aquatic vegetation in the littoral zone and a robust, multi-layered buffer. Aquatic plants stabilize sediment, absorb wave energy, and provide habitat, nurseries, and food sources for aquatic wildlife. *Photo credit: Ginger Eliasberg.*

## Standard and Score - Section 4: Shoreline

a. Is the shoreline stable?

- 0 Mostly unstable, significant erosion
- 1 Moderately unstable, some signs of erosion
- 2 Mostly stable, minor signs of erosion
- 3 Completely stable, no signs of erosion

*If the bank of the shoreline is slumping, undercut, or tree roots are exposed, erosion is compromising shoreline stability and polluted soil particles are likely entering the lake. Naturally occurring undercut banks, however, can provide important habitat and shelter for fish and some invertebrates, especially in unshaded areas.*

b. If people have placed rocks or riprap along the shoreline, is there vegetation covering/shading the stones most of the day?

- 0 No vegetation
- 1 Some vegetation and shading
- 2 Mostly vegetated/shaded
- 3 All vegetated/shaded or N/A

*The roots of shoreline vegetation help stabilize rocks on the bank. Shade provided by shoreline vegetation cools the shallow waters of the lake and important habitat for many wildlife species. These near-shore shady niches in shallow waters offer protection from predators for aquatic nurseries.*

c. Are there signs of erosion where the dock joins the shoreline/path?

- 0 Many major signs or a mix of major and minor signs
- 1 A few signs but all minor
- 2 No signs or N/A

d. If there are seasonal and/or year-round streams on the property, is there a vegetative buffer that protects these streams?

- 0 No stream buffer or buffer is <10 ft deep
- 1 Stream buffer is 10-20 ft deep
- 2 Stream buffer is >20 ft deep or N/A

*Protecting the water quality of streams that flow into a lake protects the water quality of the lake. Vegetated buffers along streams provide root networks that stabilize stream banks and manage erosion and flooding.*

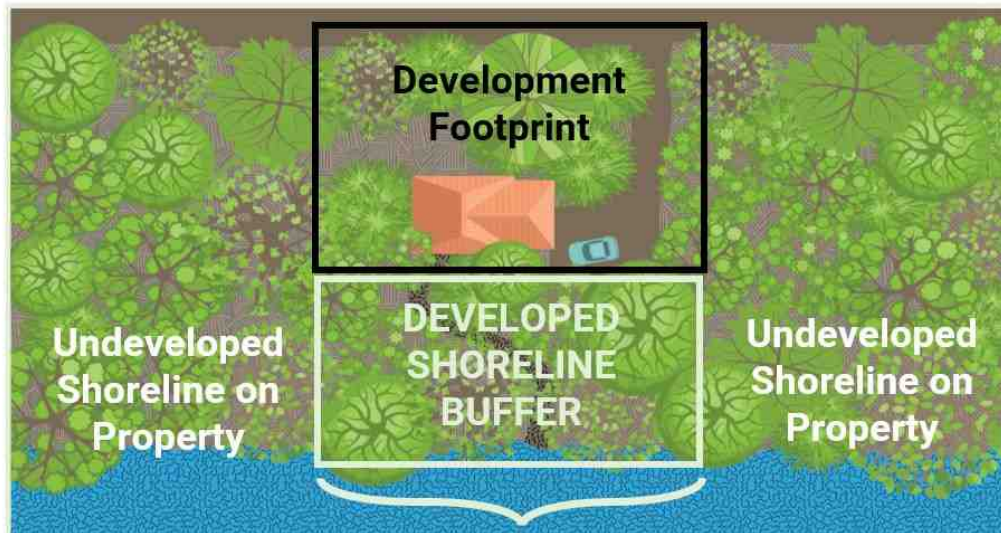
**Total Available Points = 10 (7 to qualify)**



## SECTION 5: SHORELINE BUFFER (the vegetative buffer between the development footprint and the lake)

In this last section of the evaluation, we look at the buffer of vegetation (canopy, midstory trees, shrubs, groundcover, duff) along the shoreline downslope from the development footprint. A robust buffer catches sediment, intercepts rainwater, extracts nutrients, and reduces the amount of runoff reaching the lake. Lakes with deep vegetated buffers along shorelines are better protected from excess nutrients and runoff than those with lawns up to the water's edge or with narrow vegetated strips or veneers along the shoreline.

### Where is the Shoreline Buffer for Section 5?



**The vegetated buffer between the development footprint and the lake is evaluated in Section 5**

#### ***Why do we care about the shoreline buffer?***

We could maximize protection of water quality and the maintenance of the highest quality wildlife habitat by leaving undisturbed vegetation as much as 250 feet from the water's edge. However, our homes and roads are rarely so far from the shoreline. The good news is that we can restore much of the value of deep, natural, undisturbed buffers by taking steps to revegetate shorelines with layers of native canopy trees, understory, shrubs, and groundcover, mimicking a small natural forest. A well vegetated, robust buffer will offer many years of water quality protection.

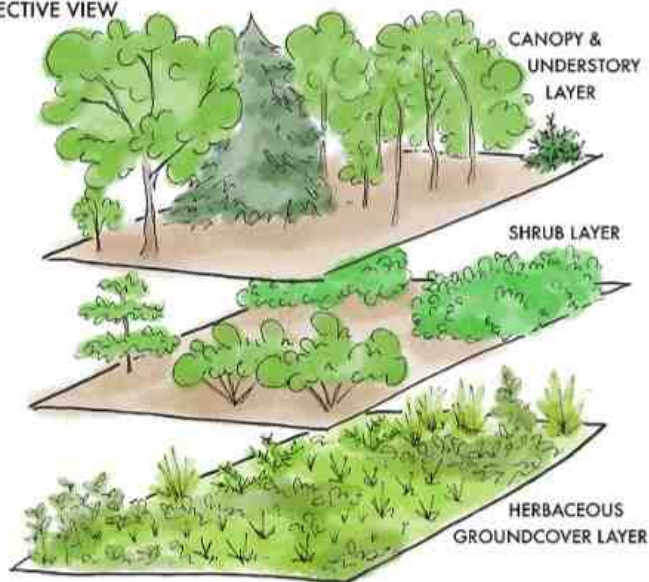
***The vegetation along the shoreline is critical for healthy lakes and acts as the last line of defense in slowing and infiltrating nutrient-laden stormwater runoff before it enters the lake.***

The root systems of vegetation in a shoreline buffer absorb water, extract nutrients, and are critical to preventing erosion in this vulnerable area. The leaf surfaces of tree and

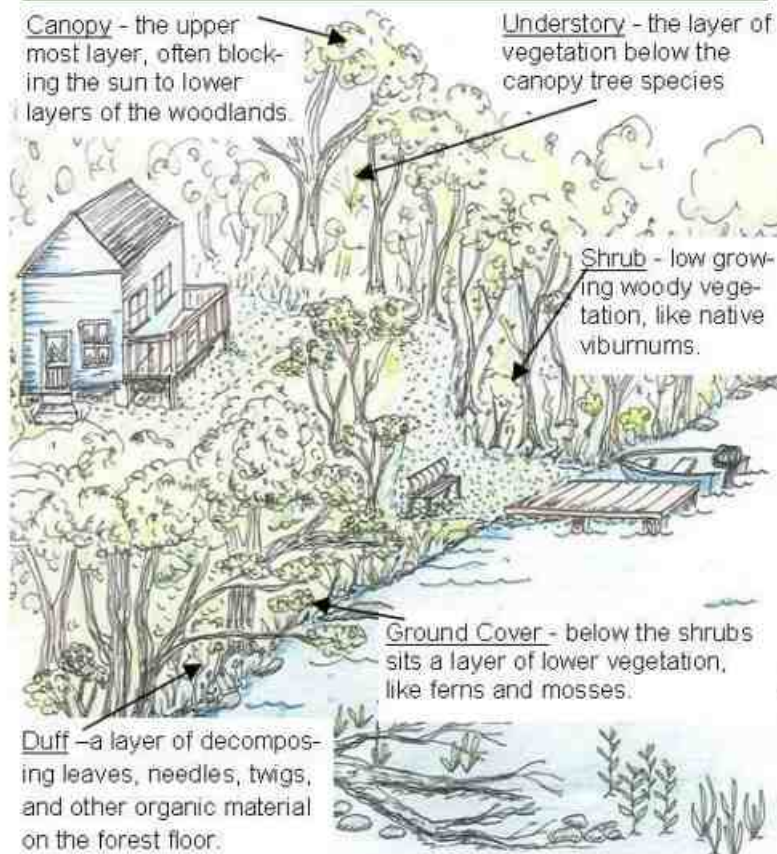
shrub layers intercept rain and allow for evaporation, reducing the impact of water falling directly on bare soils (splash erosion). The groundcover and duff layers promote infiltration of rainwater and filter sediment and pollutants from runoff. An uneven soil surface in the buffer allows rain and snowmelt to puddle and infiltrate into the ground.

A LakeSmart buffer offers shade, woody debris, and nutrients to both terrestrial and shallow water aquatic wildlife. It also displays a changing landscape of color and texture through the seasons for lakefront residents and visitors.

MULTI-LAYERED BUFFER PLANTING  
PERSPECTIVE VIEW



### Five Tiers of Vegetation



**Note: lawn is not effective at filtering runoff and protecting water quality or wildlife habitat**

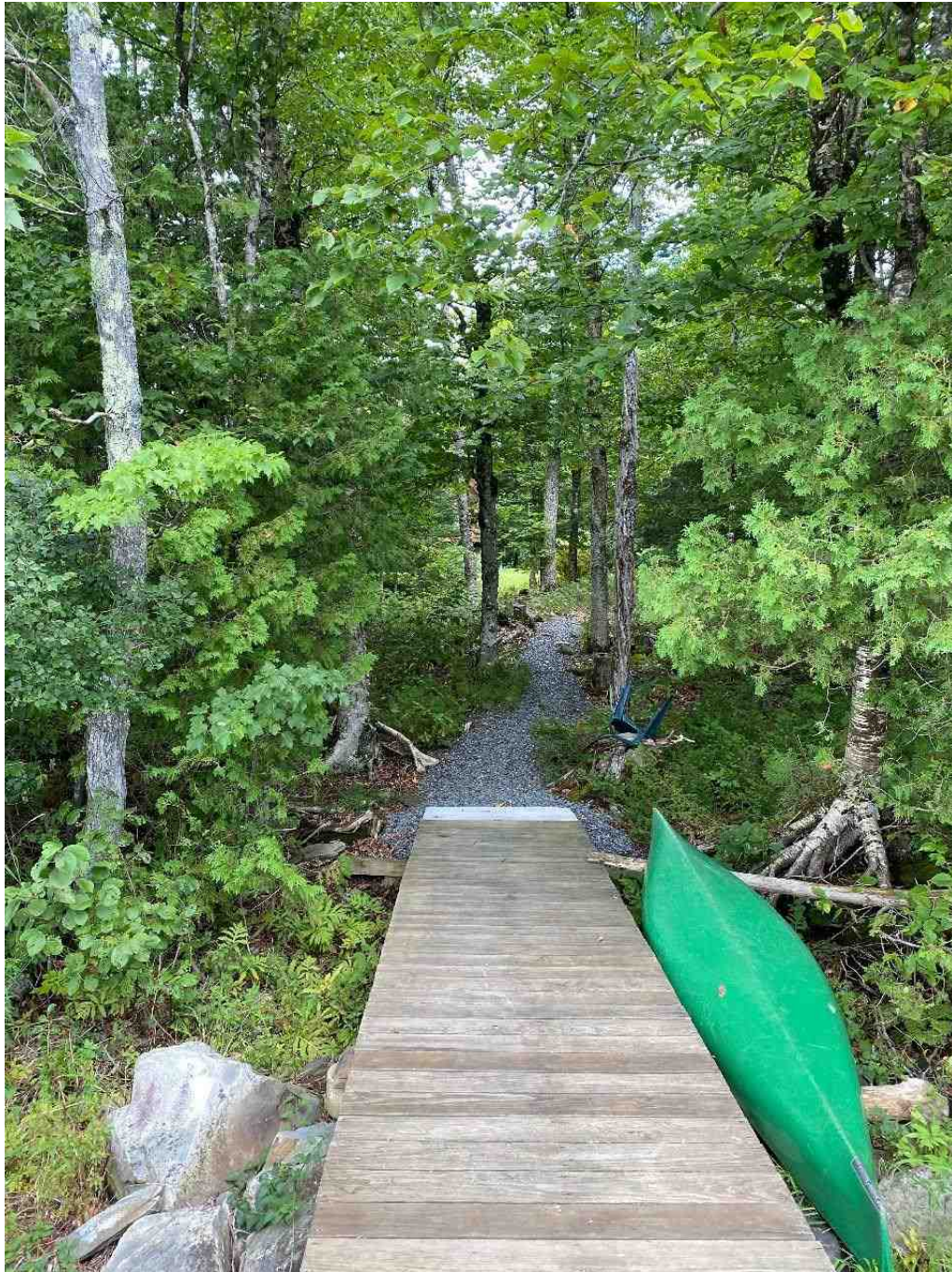
ABOVE and LEFT: An ideal LakeSmart buffer has 5 layers of vegetation: the canopy, understory or midstory, shrub, groundcover, and duff. The diagram above shows the separate layers above the duff. *Source: Vermont Bioengineering Manual 2022.* The sketch to the left identifies each layer. *Source: Property Evaluation Lake Wise Awards Program VT. DEC, Lakes and Ponds. 2019.*

Mosses are part of the groundcover in a LakeSmart buffer. They often colonize bare soil on the forest floor. This evergreen member of the plant kingdom does not have true leaves, stems, or roots. However, the root-like structures of mosses help anchor the soil, reducing the potential for erosion in shallow soil and on hillsides. Mosses are like sponges and are very effective at storing water.



***What does LakeSmart look like?***

A LakeSmart buffer should have at least three layers of native vegetation and be at least 10 feet deep along the shoreline. The buffer should have few, if any, breaks. Viewed from the lake, an ideal LakeSmart buffer often hides much of the house and the development footprint of a property.



**A LakeSmart buffer with 5 layers of vegetation (canopy, midstory, shrubs, groundcover, and duff). *Photo credit: Kacey Weber.***





A LakeSmart buffer with 3-4 layers of vegetation (canopy, shrub, groundcover and duff).  
*Photo credit: Ginger Eaton.*



A LakeSmart buffer with lots of visible duff at the base of trees. *Photo credit: Bill Dexter.*



RIGHT: Uneven ground in a LakeSmart buffer with hummocks (mounds or knolls) and depressions where water can puddle and soak into the ground. Photo credit: Ginger Eliasberg.



This buffer has small breaks that are less than 6 feet wide. Photo credit: Deb Cayer.



It is a good idea to **become familiar with what a LakeSmart buffer looks like from the water**. Does the buffer fit the image of a lake-friendly property? If a property displays a LakeSmart Award sign, this “look” serves as a model of LakeSmart standards for neighbors and the community.

## Standard and Score - Section 5: Shoreline Buffer

**a. Depth:** What is the average depth of vegetation along the shoreline buffer?

- 0 < 10 feet    2 10-20 feet    3 20-30 feet  
4 30-50 feet    5 50+ feet

*A LakeSmart buffer is at least 10 feet deep along the property shoreline with at least 3 layers of vegetation. A vegetated buffer soaks up runoff, stabilizes soil, extracts nutrients, and provides shade and wildlife habitat.*

**b. Slope:** How steep is the average slope of the buffer down to the lake?

*Steeper slopes require deeper buffers to be effective.*

- 3 Very steep (difficult/impossible to walk up)  
-1 Steep (similar incline as a staircase)  
0 Flat/Gradual

*Water runs downhill faster on steeper slopes, increasing the amount of pollutants carried in runoff and allowing less time for infiltration. While a homeowner cannot "fix" a steep slope, properties with steeper slopes need deeper and more robust buffers to slow and infiltrate fast-moving water, especially with the larger and more intense storms expected in a changing climate.*

**c. Layers:** An ideal buffer is made up of 5 layers: canopy trees, midstory trees, shrubs, groundcover, and duff. Looking across the buffer, are there:

- 0 Two or fewer layers throughout most of the buffer  
2 A mix of three or more layers throughout most of the buffer, tree layer not robust  
3 A mix of three or more layers throughout most of the buffer, robust tree layer  
4 Five layers present throughout most of the buffer

*Multiple layers of vegetation in a buffer provide the most protection for a lake because rain is more likely to be intercepted by leaves before directly landing on the soil and causing erosion. Raindrops can fall up to 30 feet per second or more than 20 miles per hour, greatly impacting bare soil. Native plants are highly recommended when enhancing buffers because they are adapted to local conditions, well suited to intercepting and infiltrating rainwater, and are easy and less costly to maintain. Native plants that are already growing and doing well on or near a lakefront property are good choices when selecting species to enhance buffers.*

**d. Breaks:** Does the buffer extend across the entire development footprint with no major breaks?

- 0 Buffer has one or more major breaks (>6' wide) of lawn, bare soil, fire pit, etc. or there are signs of erosion in the buffer that are not effectively managed.  
1 Buffer is mostly continuous but has 3 or more smaller breaks (<6' wide) and any erosion is effectively managed.  
2 Buffer is continuous or has 1-2 winding/well-placed paths (<6' wide) and any erosion is effectively managed.

*A continuous buffer with dense layers of vegetation is more effective at protecting a lake from polluted runoff than a buffer with gaps. If there is any erosion in the buffer that is not channeled into an effective Best Management Practice, this standard is scored with 0 points. A footpath through the buffer should be no more than 6 feet wide but is best kept to 3-4 feet wide or only as wide as necessary.*



## Standard and Score - Section 5: Shoreline Buffer (cont'd)

**e. Ground:** Is the ground surface uneven and conducive to infiltration of stormwater in low places?

- 0 Ground surface is smooth
- 1 A few low/uneven places that capture water
- 2 Many low/uneven places that capture water
- 3 Ground is uneven, with hummocks and depressions throughout

*An uneven soil surface with hummocks (small mounds) and depressions promotes puddling and infiltration of rain and snowmelt. When the ground surface is smooth, surface runoff travels more quickly to the lake without infiltrating.*

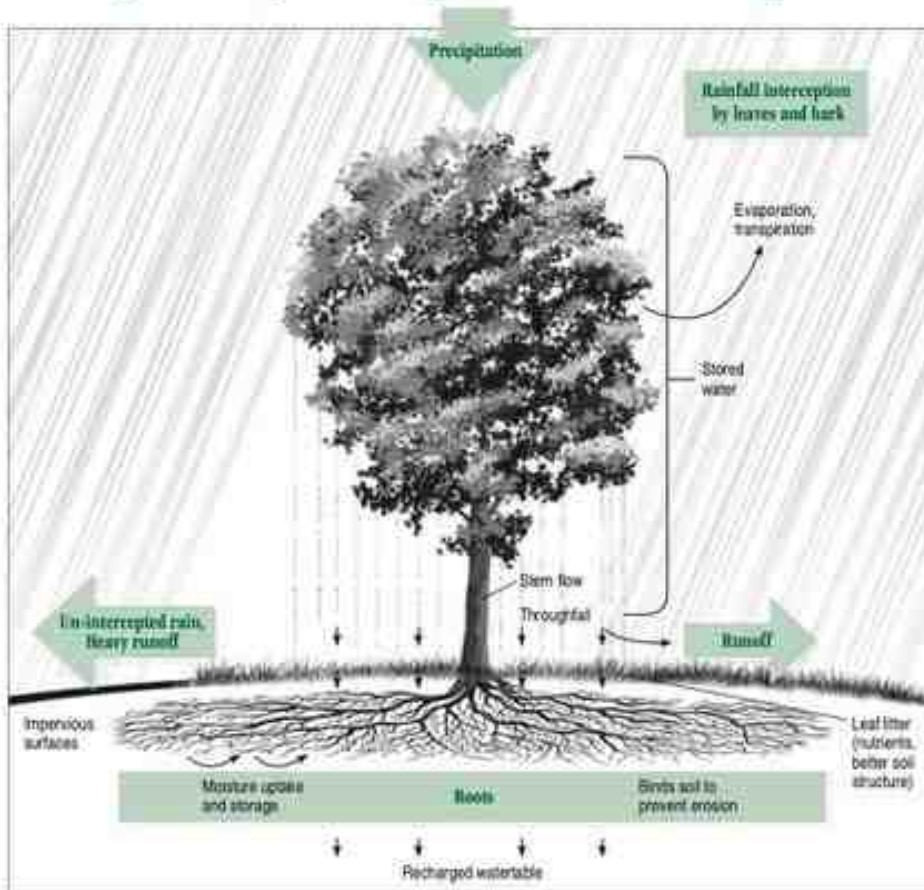
**f. Erosion:** Do you see signs of erosion around structures, paths or stairs in the buffer?

- 0 Many major signs
- 1 Many signs, mix of major and/or minor
- 2 A few minor signs
- 3 No signs or N/A

**Total Available Points = 17 (12 to qualify)**

**Loon Smart requires at least 14**

### Important Ways a Tree Helps with Stormwater Management

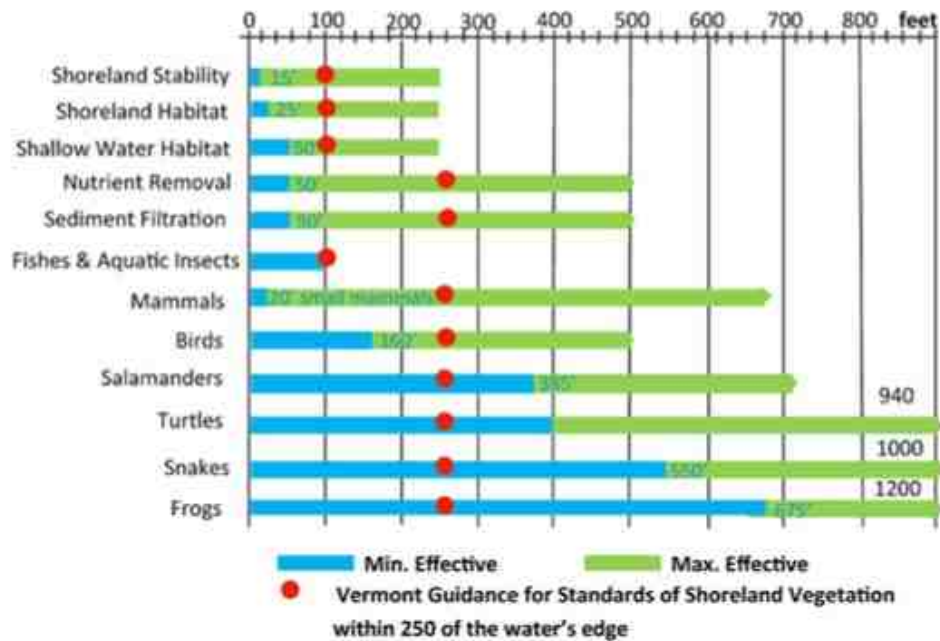


In addition to the many ways trees help with stormwater management illustrated here, the extensive root system of trees is highly effective at taking up nutrients such as nitrogen and phosphorus from stormwater runoff as it infiltrates into the soil. This removal of nutrients protects the lake from pollutants that feed algae and may cause algal blooms.

*Source: Tree City USA Bulletin No. 55, Arbor Day Foundation. 2010.*

## Widths of Lakeshore Vegetation For Lake Protection

*measured horizontally in feet*



Widths of lakeshore vegetation for lake protection. Source: VT Agency of Natural Resources, Lake Wise Program [https://dec.vermont.gov/sites/dec/files/wsm/lakes/Lakewise/docs/lp\\_shorewidth.pdf](https://dec.vermont.gov/sites/dec/files/wsm/lakes/Lakewise/docs/lp_shorewidth.pdf)

## SCORING THE EVALUATION

If a property evaluation meets the minimum passing score in all sections (see table below) and is approved in the LakeSmart review process, the homeowner receives a **LakeSmart Award**.

A homeowner is recognized with a **LakeSmart Commendation** if their property does not meet the minimum score in all sections of the evaluation. Some Lake Associations and Hubs use the term **Award Deferred** for properties that do not meet Award standards. LakeSmart teams should encourage homeowners to work toward an Award by installing recommended Best Management Practices to manage areas of runoff and erosion on their property.

### Minimum passing score needed in each section of the LakeSmart evaluation:

| Section | Name                       | Standard | Score | Qualify? (y/n) |
|---------|----------------------------|----------|-------|----------------|
| 1       | Driveway and Parking Areas | 11/15    |       |                |
| 2       | Outdoor Structures         | 13/19    |       |                |
| 3       | Outdoor Living Areas       | 16/23    |       |                |
| 4       | Shoreline                  | 7/10     |       |                |
| 5       | Shoreline Buffer           | 12/17    |       |                |

### FLAGS: DOES THE EVALUATION SCORE SEEM REASONABLE?



**FLAG:** This property needs additional review. The scoring does not accurately reflect the status of the property regarding award eligibility. *(Please elaborate below.)*

Although we have made our best efforts to quantify the LakeSmart evaluation, every property is different and there will always be situations that are unusual. In these cases, the scoring matrix designed for LakeSmart simply may not work. A property evaluation should be “**flagged**” when the evaluator believes scoring does not accurately reflect Award eligibility.

The intersection of a qualitative interpretation of the landscape with LakeSmart’s quantitative approach can be tricky. LakeSmart teams should be ready to consider gray areas carefully. Here are some examples of situations that could be flagged for further review:

- An evaluation scores just below or just above the minimum passing score in at least one section.
- One or more sections of the evaluation barely pass but there is a significant erosion issue that is an ongoing source of phosphorus into the lake. A LakeSmart Award can be denied or delayed until the erosion is managed.



- A final score does not reflect the actual condition of the property. The property may be very effective at capturing stormwater runoff, but the standards score otherwise. For example, an ice (or other) berm along the shoreline prevents runoff from entering the lake.
- A septic system is not functioning and needs replacement and updating before a LakeSmart Award is considered.

In these situations, it is important for the Evaluator to add specific notes in the evaluation explaining the reason for the flag and submit additional photos that clearly show the unusual or questionable areas. The evaluation reviewer(s) may schedule a second visit with a Lake or Hub Coordinator and/or Maine Lakes staff before a decision about LakeSmart status is made.

***LakeSmart Awards should not be promised to the homeowner prior to evaluation review by Coordinators and Maine Lakes staff.***

See additional guidance about evaluation reviews in the Evaluation Review and LakeSmart Status discussion below.



If a property does not meet LakeSmart standards after a first evaluation, the homeowner can make improvements by installing recommended BMPs and then requesting a **re-evaluation**. It is best to treat a second evaluation as a new evaluation, rather than a revised first evaluation. Two separate evaluations also offer an opportunity to consider “before” and “after” conditions with comparative photos.

If new plantings are made on a property and they become well established and healthy after a first growing season, the newly planted area is credited in a second evaluation as if the plants are mature.

## Recommended Best Management Practices

Standard and tested techniques for converting stormwater runoff into groundwater and stabilizing land are known as Best Management Practices (BMPs). In a broad sense, BMPs perform one or more purposes:

1. **Re-direct or divert stormwater runoff** to places where water will soak into the ground
2. **Infiltrate** rainwater carried by surface water flow
3. **Extract nutrients and filter pollutants** from runoff
4. **Stabilize** the land

Each BMP is a variation on the theme of one or more of these functions. Once the sources of erosion on a property are identified in a LakeSmart visit, it becomes clear which BMP(s) may be good “fixes” for the problems.

It is helpful to consider how BMPs can work together to address stormwater runoff across the whole property, rather than as independent solutions within parts of the property. Having a general idea of how stormwater flows through a property after a storm, from the top of the driveway to the shoreline, will help inform how BMPs could effectively work in sequence to mimic natural conditions.

There is a wealth of information and resources available for BMPs. We will present this topic in several parts:

1. We will begin by providing an overview of the *state and local laws* that regulate certain activities (including BMPs) in shoreland areas.
2. A tabular *summary of BMPs* listed by the purpose of the BMP. Many BMPs are described and illustrated in the “Conservation Practices for Homeowners Factsheet Series” developed by Maine DEP and Portland Water District. Links to these fact sheets and other BMP resources can be found on the Maine Lakes website ([www.lakes.me/bmps](http://www.lakes.me/bmps)). Following the table is a one-page summary of LakeSmart standards and BMP options that could be recommended to homeowners. This summary is attached to the evaluation form and the BMP options are listed in a drop-down menu in Survey123. Following the tabular summary of BMPs, we have included an illustration of BMP opportunities on a lakeshore property from the LakeSmart brochure.
3. A *photo gallery of BMPs* followed by a discussion of the many benefits of using native plants and a pop-out box offering information about *supporting homeowners interested in installing BMPs*.

## SHORELAND REGULATIONS

Most land uses within the shoreland zone are subject to the regulation of Maine's **Mandatory Shoreland Zoning Act** enacted in 1971. The shoreland zone is defined as within 250 feet of Maine's rivers, wetlands, lakes, the ocean, and within 75 feet of certain streams. This Act serves two purposes:

- (1) to protect water quality, wildlife habitat, wetlands, archaeological sites and historic resources, and
- (2) to conserve shore cover, public access, natural beauty, and open space.

Most relevant to properties participating in the LakeSmart program, the law regulates activities within 250 feet of Great Ponds (i.e., lakes or ponds that are 10 acres or larger). Municipalities in Maine are required to develop and administer local shoreland zoning ordinances that meet or exceed minimum standards set by the Maine DEP, including the following:

- There are set back requirements for new buildings and septic systems (100 feet from shore).
- There are restrictions for canopy openings based on a point system for the number and size of trees in an area with a minimum score for trees that need to remain.
- There are height limits for pruning trees for views. Within 100 feet of the shoreline:
  - ⇒ Trimming the bottom 1/3 of tree branches is permitted.
  - ⇒ Removal of vegetation less than 2 inches in diameter and 3 feet high and other groundcover, *including leaf litter and forest duff*, is prohibited, except: (1) to remove safety hazards, (2) to cut a winding shoreline path not to exceed 6 feet wide, and (3) to maintain openings in existence prior to 1971.

A second regulation relevant to shoreland areas is the **Natural Resources Protection Act** or **NRPA** (1988). This Act is administered by Maine DEP and its purpose is to protect or enhance the recreational, historical, and environmental value of the natural resources in the State to present and future generations. NRPA requires a permit from the Maine DEP for projects located in, on, over, and adjacent to protected natural resources, including Great Ponds.

Activities in or within 75 feet of a waterbody or wetland that require a permit include dredging, bulldozing, removing or displacing soil, sand, vegetation, or other materials, draining, ditching, or dewatering, constructing, altering, or repairing permanent structures, and filling.

A streamlined 14-day **Permit-by-Rule** (PBR, Chapter 305) option under the NRPA gives approval for limited or small projects and must be filed prior to beginning work. Applicants must agree to comply with prescribed standards for the proposed activities. Check the Maine DEP website for the Permit-by-Rule Notification form which lists all projects that fall under this permit.



Some common activities that are regulated under the Permit-by-Rule option include:

- Activities adjacent to Protected Natural Resources (Section 2)
- Replacement of Structures (Section 4)
- Shoreline Stabilization (Section 8)
- Stream Crossings (Section 10)

A digital version of the Permit-by-Rule Notification Form can be accessed online at <https://www.maine.gov/dep/land/nrpa/nrpa-pbr-notification.pdf>.

***Homeowners interested in installing BMPs on their property should take pictures of the proposed project area(s) and contact their local Code Enforcement Officer (CEO) to inquire about permitting requirements within the shoreland zone. The CEO may direct homeowners to Maine DEP if the project falls under NRPA regulations.***

The Maine Land Use Planning Commission (LUPC) serves as the planning and zoning authority for the unorganized and deorganized areas of the State, including townships and plantations. LUPC maintains vegetation removal and clearing limits/prohibitions for shoreline areas that are similar to the minimum standards set by Maine DEP for municipal shoreland zoning. Homeowners should check the LUCP website for more information: <https://www.maine.gov/dacf/lupc/>

*Maine Shoreland Zoning: A Handbook for Shoreland Owners* is a comprehensive resource for laws protecting Maine's lakes and can be accessed at [www.lakes.me/library](http://www.lakes.me/library).

## SUMMARY OF RECOMMENDED BEST MANAGEMENT PRACTICES (BMPs)

Additional BMP resources are listed in Part 9 (Resources).

| <b>BMP should: INTERCEPT and/or RE-DIRECT stormwater runoff on driveways and paths to reduce erosion</b> |  |
|--|--|
| <b>Recommended BMP</b>   | <b>Description of BMP</b>  |
| <b>Rubber Razor</b><br>on driveways, paths   | A diagonal (30°) channel across a driveway or footpath that reduces erosion by intercepting and diverting water into nearby vegetated areas for infiltration. Made of conveyor belts. Not recommended for plowed driveways. <b>(1)</b>   |
| <b>Open-Top Culvert</b><br>on driveways, paths   | Purpose same as rubber razor. Made of cedar or pressure treated timbers. Not recommended for plowed driveways. <b>(1)</b>  |
| <b>Firehose Diverter</b><br>on driveways   | Purpose same as rubber razor and open-top culvert, but firehose diverters are best used on paved driveways. Made of old firehoses that can be removed seasonally <b>(2)</b> . The firehose diverter is a good solution when used during the spring, summer, and fall. Removing the firehose diverter for the winter does not solve the winter runoff problem.  |
| <b>Waterbar</b><br>on driveways, paths   | Purpose same as options listed above. Often used on footpaths. Can be made of rot-resistant logs. <b>(1)</b>   |
| <b>Berms and Swales</b>  | Berms and swales can slow and redirect runoff to a rain garden, dry well, or other vegetated area where it can infiltrate before reaching the lake. A berm is a raised mound or low wall of soil that can be planted to maintain its structure. A swale is a shallow depression or trench that partially infiltrates and channels runoff into vegetated areas. |
| <b>Turnouts</b><br>from driveway ditches   | Turnouts are extensions of ditches that are contoured with the land to direct water as sheet flow into nearby vegetated areas. Turnouts should intersect driveway ditches at the same level and are ideally located every ~50 feet to divert small volumes of water in series. <b>(1,3)</b>  |
| <b>Crown or slant</b><br>driveways and parking surfaces  | A crowned driveway is graded so that the highest point is in the middle and slopes downward on each side to redirect runoff away from driveway surface. Slanted driveways are graded to tilt in one direction, directing water to one side. Ungraded flat road surfaces tend to puddle and form potholes. <b>(3)</b>   |

Sources:

- (1) Portland Water District and Maine Department of Environmental Protection. 2006-2009. *Conservation Practices for Homeowners Factsheet Series*. [www.lakes.me/bmps](http://www.lakes.me/bmps)
- (2) New Hampshire Lakes. *Firehose Diverter Fact Sheet*.
- (3) Kennebec County Soil and Water Conservation District and Maine Department of Environmental Protection. *Gravel Road Maintenance Manual: A Guide for Landowners on Camp and Other Gravel Roads*. April 2016.
- (4) Portland Water District and Lakes Environmental Association. *Lakes Like Less Lawn*. 2017.
- (5) Portland Water District. *Sebago Lake Ecology Center's Pervious Pathway: A Low Impact Development Demonstration*. 2007.
- (6) Burlington Vermont Public Works. *Why Should You Consider a Stormwater Friendly Driveway?*
- (7) Maine Lakes. *Lakeside Living: Caring for your Septic System*. 2021.

| <b>BMP should: CAPTURE, SLOW, and INFILTRATE runoff to allow for filtering of pollutants or CAPTURE and RE-USE runoff</b> |  |
|---|--|
| <b>Recommended BMP</b>  | <b>Description of BMP</b>  |
| <b>Dry Well</b><br>at downspouts  | Collects and infiltrates runoff from roof at gutter downspouts and other areas and manages downslope erosion. Lined with non-woven geotextile fabric and filled with crushed stone. Often about 9 cubic feet (3'x3'x3'). Works best in sand and gravelly soils. <b>(1)</b>   |
| <b>Infiltration Trench</b><br><b>Dripline Trench</b>  | Collects and infiltrates stormwater from impervious surfaces such as rooftops and paved driveways. Controls erosion along driplines of roofs without gutters. Made of crushed stone and lined with non-woven geotextile fabric. Works best in sand and gravel soils. <b>(1)</b> . NOTE: Rooftop gutters are not considered a BMP in Maine where gutters routinely fill with ice/snow and are difficult to maintain. If a house does not have gutters, dripline trenches are a good option.   |
| <b>Rain Barrel</b>  | Captures runoff from a roof at a gutter downspout. This water can be recycled for watering lawns, gardens, and indoor plants, washing a car, or cleaning outdoor furniture. <b>(1)</b>   |
| <b>Infiltration Steps</b>   | Steps built with timbers, lined with non-woven geotextile fabric, and filled with crushed or pea stone. Best installed on moderate slopes such as on a footpath to the shoreline. <b>(1)</b>   |
| <b>Rain Gardens</b>   | Bowl-shaped landscaped areas planted with water-loving native shrubs and perennials that capture and filter stormwater from roofs, driveways, and other impervious surfaces. Best to locate rain gardens in existing wet depressions, if present, and at least ten feet from structures. <b>(1)</b>  |
| <b>Planting and Maintaining Vegetated Shoreline Buffers</b><br>(also along streams)                                       | Vegetated shoreline buffers are most effective when layered with native canopy and midstory trees, shrubs, groundcover, and duff. Buffers hold soil in place, catch and filter sediment and pollution, extract nutrients during infiltration, intercept raindrops to reduce erosion, and provide high quality wildlife habitat. Buffers should be designed to mimic natural conditions in the local area. <b>(1)</b>   |
| <b>Choose Native Plants</b><br>for rain gardens,<br>vegetated buffers, bare<br>soil areas                                 | Native plants are best adapted to local conditions, do not need fertilizers, and are low maintenance once established after the first year. Native plants also offer food and shelter for wildlife, including native pollinators, many of which are in decline. The native plants that are growing and doing well on a property are good choices when visiting local nurseries. Homeowners should know the light and soil conditions (sun, shade, wet, dry) on their property and select species that do best in these conditions. Fall and spring are the best seasons for planting. <b>(1,4)</b> |
| <b>Grass Pavers</b><br>for parking area   | A grid-like honeycomb system made of recycled plastic covered with gravel, sand, and topsoil, and planted with grass. The grid protects roots from compaction to allow for infiltration and reduces runoff from a parking area. <b>(5,6)</b>   |



| BMP should: <b>STABILIZE SOIL and shoreline BANKS</b> |  |
|---|--|
| Recommended BMP                                       | Description of BMP   |
| <b>Erosion Control Mix (ECM)</b>                      | ECM is made of partially composted bark, wood fragments, sand, gravel, and stone and is heavier than most mulches. Cover an area with ECM to a depth of 3-4" to protect soil from erosion, retain moisture, control weeds, and improve the soil as it decomposes. <b>Superhumus™</b> is a form of ECM that has a finer grade and best used in landscaped areas. Superhumus is easier on the feet than the coarser ECM. <b>(1)</b>  |
| <b>Manage Lake-Friendly Pathways</b>                  | Ideally, paths should be 3 to 4 feet wide or only as wide as necessary. Paths should be curved and meandering to allow runoff to flow into bordering vegetated areas. Mulch can be used to cover bare surfaces on paths. If Superhumus is not available, use pine needles, bark mulch, crushed stone, or wood chips to define paths and manage runoff. <b>(1)</b>  |
| <b>Live Staking shorelines</b>                        | Live stakes are dormant cuttings of woody plants. Cuttings from some shrub and tree species root quickly when planted in wet soils along shoreline banks and are an effective and low-cost source of deep-rooted native plant materials that help restore shoreline vegetation. Live stakes stabilize banks, provide shade and food for aquatic wildlife, and filter pollution. While live stakes are establishing roots during the first two years after planting, additional erosion control measures such as mulching are recommended. Harvest and plant live stakes in the spring (March-April) before leaf out or in the fall until the ground is frozen (~November). Live stakes are occasionally available at nurseries. <b>(1)</b> |
| <b>(Lake Shoreline Riprap)</b>                        | Riprap should only be used as a last option to manage unstable shorelines and should never replace a stable, naturally vegetated shoreline. Controlling shoreline erosion often does not require riprap. Limiting foot traffic, diverting stormwater runoff, and stabilizing banks with native vegetation can help manage shoreline erosion and are less costly. <b><i>A Maine DEP permit is required to install or repair riprap along water bodies.</i></b> <b>(1)</b> . Maine DEP is currently developing a policy to encourage living shoreline approaches to bank stabilization rather than riprap.   |





# LAKESMART STANDARDS *and* BEST MANAGEMENT PRACTICES

Circle any standards of concern along with BMP recommendations for homeowners. BMP technical fact sheets can be found at [lakes.me/BMPs](http://lakes.me/BMPs). Refer to list of resources in Evaluator Training Manual or contact Maine Lakes ([lakesmart@lakes.me](mailto:lakesmart@lakes.me)) for other BMP recommendations.

## 1. DRIVEWAYS & PARKING AREAS

### Standards

- Driveways and parking areas defined
- No signs of erosion *or*
- Erosion directed to effective BMPs
- No signs of grease or motor oil

### BMPs

- Resurface with gravel and crown/slant to shed water
- Divert runoff with a rubber razor, open-topped culvert, turnout, waterbar, or berm/swale
- Install culvert for large flows to deliver water under drive to catch basins
- Add gravel/vegetation to ditches
- Direct runoff to vegetated areas or catch basins where it can be absorbed.
- OTHER:

## 2. OUTDOOR STRUCTURES

### Standards

- Roof runoff captured and infiltrated *or*
- Any erosion directed to effective BMPs
- Septic tank regularly pumped
- Leach field functional, no woody vegetation
- Outside oil tanks in good condition/protected
- Chemicals stored safely

### BMPs

- Install infiltration trench
- Add crushed stone, mulch, plantings at dripline
- Install gutters, downspouts, rain barrel, drywell, rain garden to capture water
- Install vegetated swale to divert runoff
- Pump septic tank per septic service recommendations
- Clear woody vegetation from on/around leach field
- OTHER:

## 3. OUTDOOR LIVING AREAS

### Standards

- Paths well defined, winding, no erosion
- Lawn minimized/low maintenance
- No pet waste
- Boats stored in designated area
- Bare soil areas covered with mulch/duff
- No signs of erosion *or*
- Erosion to effective BMPs

### BMPs

- Wind paths, cover with ECM, crushed rock, etc.
- Install infiltration steps, rain garden, waterbar, vegetated swale to manage runoff
- Define recreation and boat storage areas.
- Plant vegetation in bare areas
- Minimize lawn, mow high, leave cuttings
- Use fertilizer only after soil test or with new lawn but not within 25' of lake
- Use herbicides/pesticides sparingly, if at all
- Cover soil with mulch in cultivated areas
- Eliminate water channels by infiltrating/diverting at source
- OTHER:

## 4 & 5. SHORELINE & BUFFER

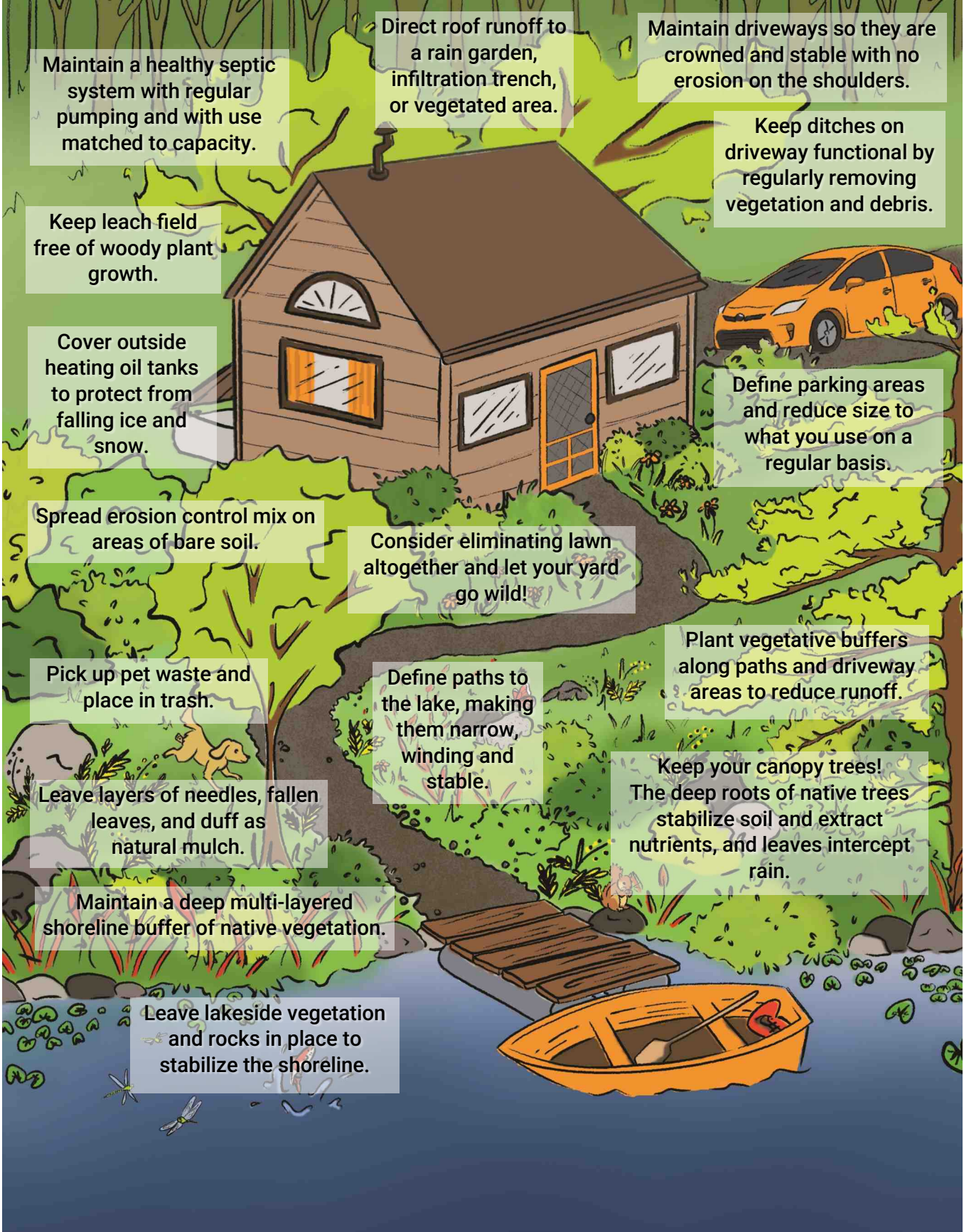
### Standards

- Stable shoreline, bank not undercut by waves/ice
- Shaded riprap (if present)
- No erosion at dock
- Deep, multi-layered vegetative buffers
- Minimal breaks; healthy canopy
- Ground uneven
- No signs of erosion

### BMPs

- Enlarge buffer with native plants, live stakes, ECM over bare soil
- Plant different layers for future growth
- Reduce breaks, wind paths, install BMPs for erosion
- Reinforce where dock meets path with stones, water bar, crushed rock, plants
- Let duff accumulate
- Treat slumping shore with plants/live stakes, with woody shrubs behind to stabilize. Use riprap as last resort (riprap always needs a permit)
- Leave plants, stones and rocks in the shallow near-shore area
- OTHER:





Maintain a healthy septic system with regular pumping and with use matched to capacity.

Direct roof runoff to a rain garden, infiltration trench, or vegetated area.

Maintain driveways so they are crowned and stable with no erosion on the shoulders.

Keep leach field free of woody plant growth.

Keep ditches on driveway functional by regularly removing vegetation and debris.

Cover outside heating oil tanks to protect from falling ice and snow.

Define parking areas and reduce size to what you use on a regular basis.

Spread erosion control mix on areas of bare soil.

Consider eliminating lawn altogether and let your yard go wild!

Pick up pet waste and place in trash.

Define paths to the lake, making them narrow, winding and stable.

Plant vegetative buffers along paths and driveway areas to reduce runoff.

Leave layers of needles, fallen leaves, and duff as natural mulch.

Keep your canopy trees! The deep roots of native trees stabilize soil and extract nutrients, and leaves intercept rain.

Maintain a deep multi-layered shoreline buffer of native vegetation.

Leave lakeside vegetation and rocks in place to stabilize the shoreline.

**POSTER FROM THE LAKESMART BROCHURE**



## PHOTO GALLERY OF BMPs

Additional photos of BMPs are included in “What does LakeSmart Look Like?” and in descriptions of sections of the evaluation earlier in this Manual.

**RIGHT:** A rubber razor across a driveway intercepts and diverts runoff into bordering vegetation for infiltration. *Photo credit: Maine Lakes.*



**LEFT:** A series of waterbars (before and after views) along a footpath intercepts and diverts runoff into bordering vegetation for infiltration. *Photo credit: Maine DEP/Portland Water District Fact Sheet: Waterbars.*



**LEFT:** A drywell collects and infiltrates water from a gutter downspout. *Photo credit: Maine DEP/Portland Water District Fact Sheet: Drywells.* **BELOW:** A drywell installed at the end of a rubber razor. *Photo credit: Acton Wakefield Watersheds Alliance.*





Infiltration steps installed on a moderate slope with signs of erosion (before and after). Infiltration steps capture, slow, down, and infiltrate stormwater runoff. *Photo credit: Maine Lakes.*



ABOVE: Mulching a footpath covers and protects bare soils prone to erosion. *Photo credit: Acton Wakefield Watersheds Alliance.*

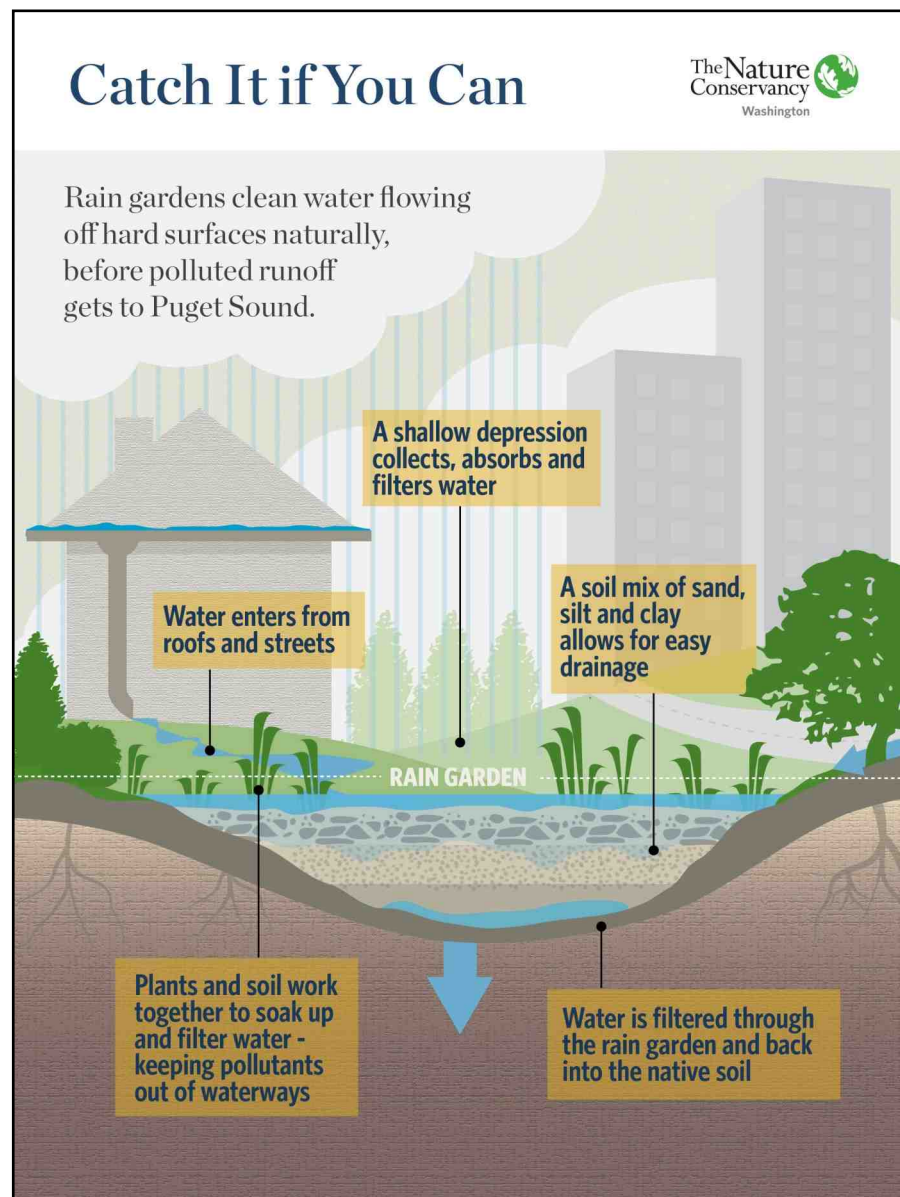
RIGHT: Erosion Control Mix (ECM) is a mulch made of partially decomposed bark, wood fragments, sand, gravel, and stone and is heavier than most mulches. ECM protects soil from erosion, retains moisture, controls weeds, and improves the soil as it decomposes. Maine DEP provides a list of suppliers for Erosion Control Mix at <https://www.maine.gov/dep/land/training/2020-esc-materials-mix-list.pdf>. *Photo credit: Maine DEP/Portland Water District Fact Sheet: Erosion Control Mix.*







This rain garden, similar to a small wetland, absorbs runoff from the lawn. *Photo credit: Vermont Lake Wise Program.*



Source: The Nature Conservancy Washington/  
Erica Sloniker.

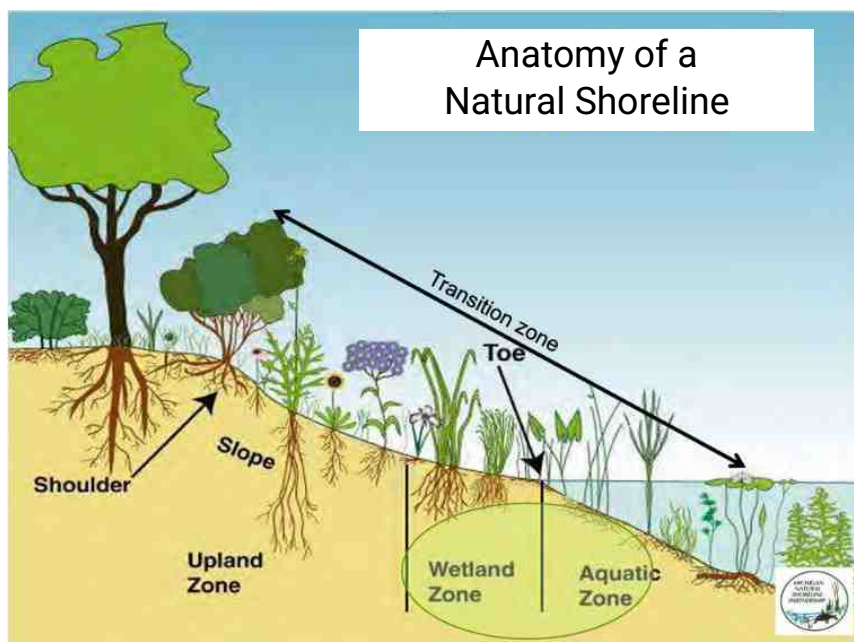
**Healthy, stable, and sustainable shorelines offer many ecological benefits.** These critical areas of transition between the land and the water provide wildlife habitat for many terrestrial and aquatic species. Stable shorelines buffer wave energy and ice movement and protect a property from erosive forces. The roots of plants (especially trees) in shoreline buffers stabilize soils and extract nutrients from runoff that would otherwise enter the lake.

Shorelines are evaluated in Section 4 of the LakeSmart evaluation and may be one of the more challenging areas of the property to score particularly when looking for signs of unstable conditions. Causes of unstable shorelines include runoff from impervious surfaces, compacted soil, and lawns; the removal of vegetation from the land and the water; waves; wind; ice movement; and fluctuating water levels.

Identifying an unstable shoreline requires some practice in recognizing visual signs or cues along the length of the entire shoreline, including:

- Are there areas of bare soil or channeling of water along the shoreline?
- Are trees leaning toward the lake or already fallen into the water? Are roots exposed?
- Is soil falling off the bank, collapsing to fill a gap created by an undercut? Soil deposition into the lake is harmful to the environment and often concerning to homeowners losing land. Note that some properties may have undercut shorelines that are stable, provide habitat for aquatic wildlife, and do not require management.
- Is the shoreline receding or moving landward in some areas?
- Does the base of the shoreline bank have silt or sand deposits or is there muddy lake water in some areas?

There are many ways to manage unstable shorelines. The goal of recommendations offered by the LakeSmart program is to mimic (as much as possible) natural or undeveloped shorelines. Natural approaches for stabilizing shorelines have recently been found to be the most ecologically and economically sustainable options for lakeshore properties.



A cross-section anatomy of a natural shoreline showing well-vegetated ecological zones, and the shoreline shoulder and toe. *Source: Michigan State University Extension Land and Water Unit. Accessed from Natural Shoreline Landscapes on Michigan Inland Lakes: Workshop for Property Owners. Michigan Natural shoreline Partnership.*

Kacey Weber, Education Coordinator for Piscataquis County Soil and Water Conservation District and a LakeSmart Hub Coordinator, suggests the following tips for working with homeowners to manage unstable shorelines.

- Acknowledge and commend what has already been done by the homeowner to manage runoff on their property!
- Recognize and understand the challenge of balancing homeowner goals with LakeSmart standards.
- Clearly define a lake access point with a pathway. If a pathway to the lake is moderately sloped and eroding, consider installing infiltration steps.
- Where a dock meets the top of the bank, plant layers of native vegetation on either side of the access and gradually extend plantings to the rest of the shoreline.
- Slow down erosion pressure upslope on the property so that polluted runoff does not reach the shoreline.

John and Ginger Eliasberg, LakeSmart Coordinators for Georges Pond, offer the following suggestions for managing unstable shorelines that do not need immediate or urgent attention:

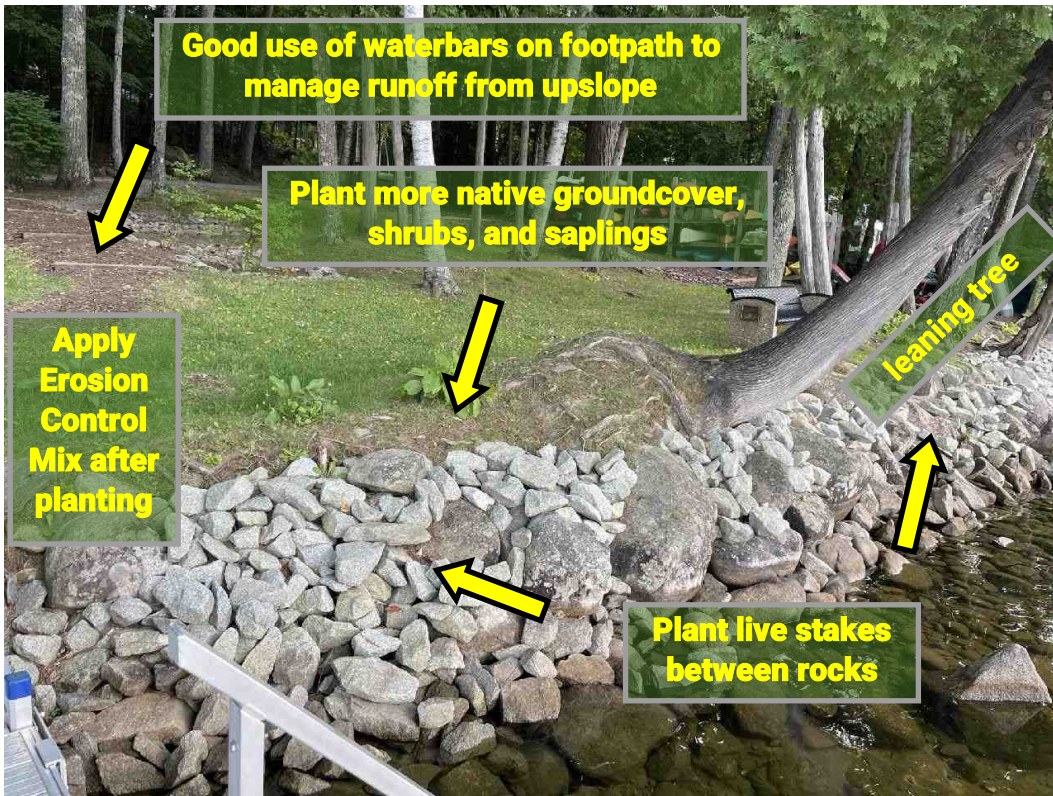
- Do no harm. Avoid unnecessary riprap that may disturb the shoreline and wildlife habitat by warming it up. Avoid adding fill.
- Restore the shoreline with vegetation. Let the buffer grow, add layers and depth, stop mowing areas near the shoreline and plant a meadow, an edible garden, or pollinator habitat. Leave aquatic plants in near-shore areas to buffer waves and provide habitat for fish and other aquatic wildlife.
- Plant the shoreline bank with native species (live stakes, bare root, or potted plants). Biodegradable coir logs can be installed to stabilize the toe of the bank and support live stakes. Coir blankets are helpful in controlling erosion until newly installed plants are established. Limit walking paths and boat storage in sensitive shoreline areas.
- Leave fallen trees and branches on the shore and in the water (unless a hazard) to provide habitat for fish and wildlife. Keep any duff in place on the bank.



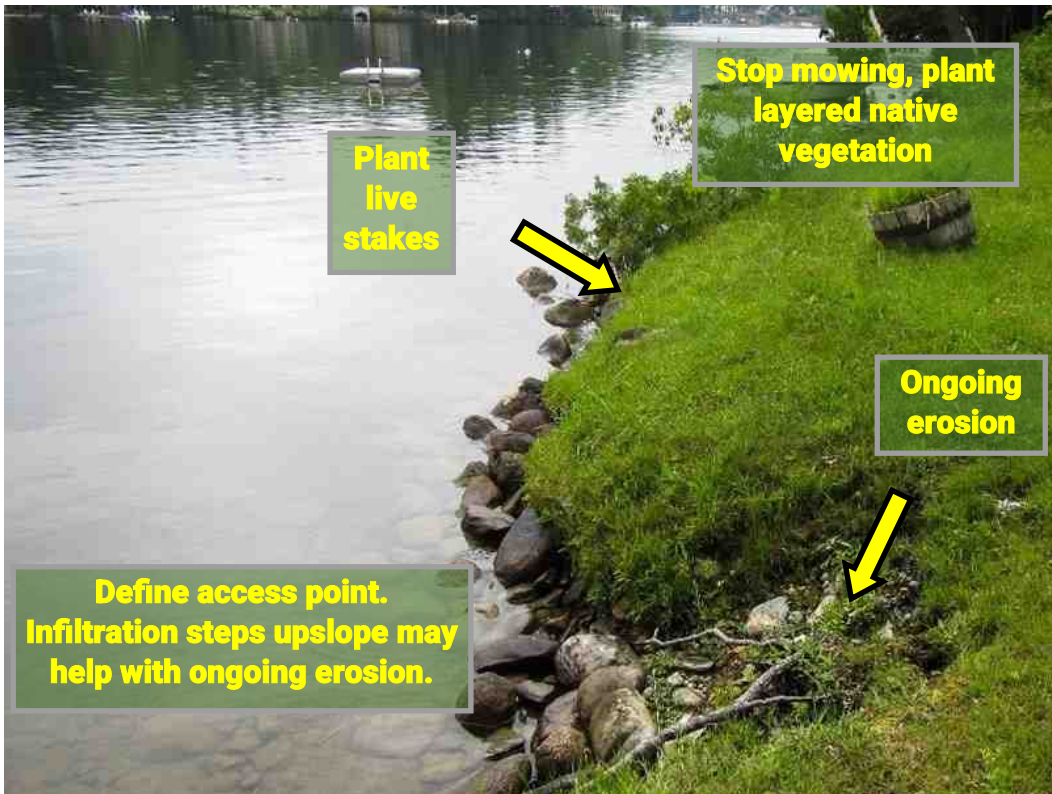
A **coir log** stabilizes an undercut bank with deep-rooted native species planted above. Source: *Minnesota DNR* <https://www.dnr.state.mn.us/rys/sl/shoreline.html>

If these approaches are not enough to stabilize a shoreline, additional reinforcing of the shoreline may be necessary. This may include adding rocks along the bank, such as approved riprap with as much vegetation as possible, or shaping the shoreline to manage steep slopes. Consult a professional about the design and installation of an unstable shoreline that requires more than planting vegetation. Any plans to stabilize a shoreline will likely need a permit. Check with your Municipal **Code Enforcement Officer**, Maine DEP, or the Land Use Planning Commission before beginning work.



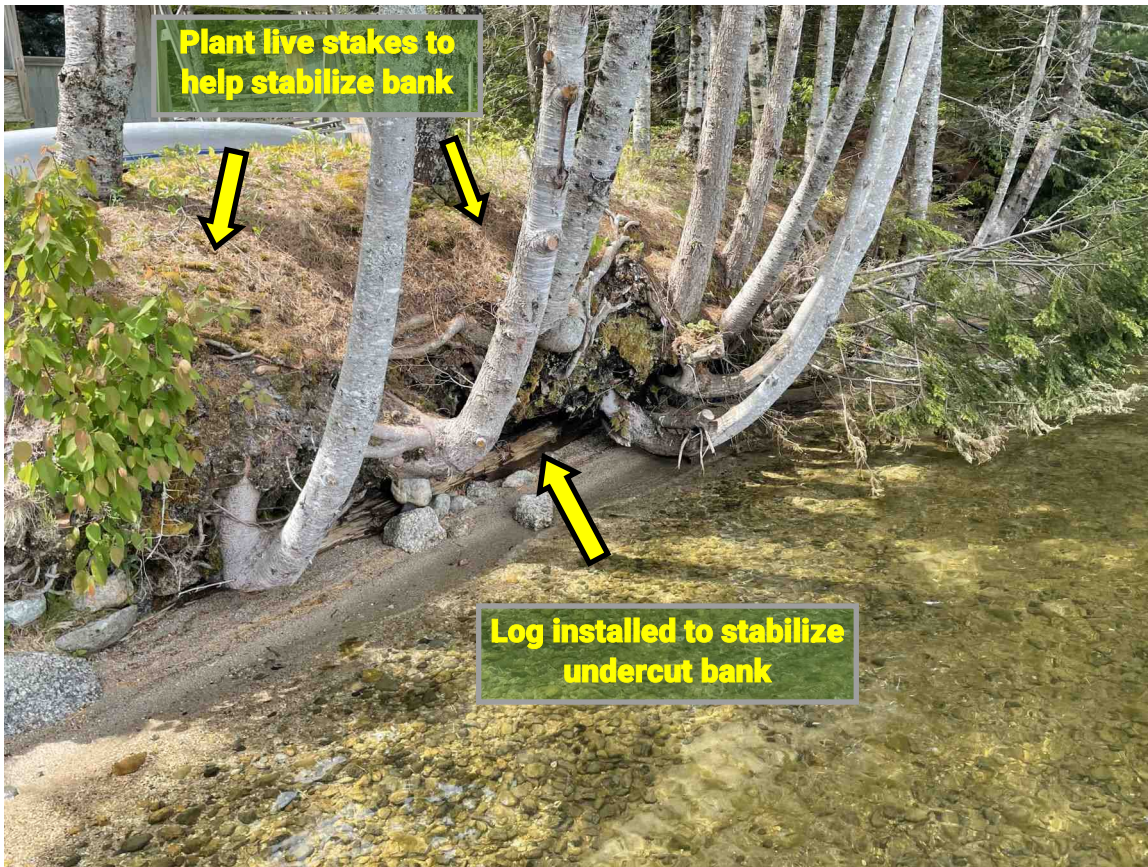


An unstable shoreline can cause trees to lean toward the lake and will need additional deep-rooted plants for stabilization. *Photo credit: Janna Townsend.*



An undercut shoreline where soil is moving away from rocks, probably due to wave pressure, ice scouring, and/or lack deep-rooted vegetation. *Photo credit: Maine Lakes.*





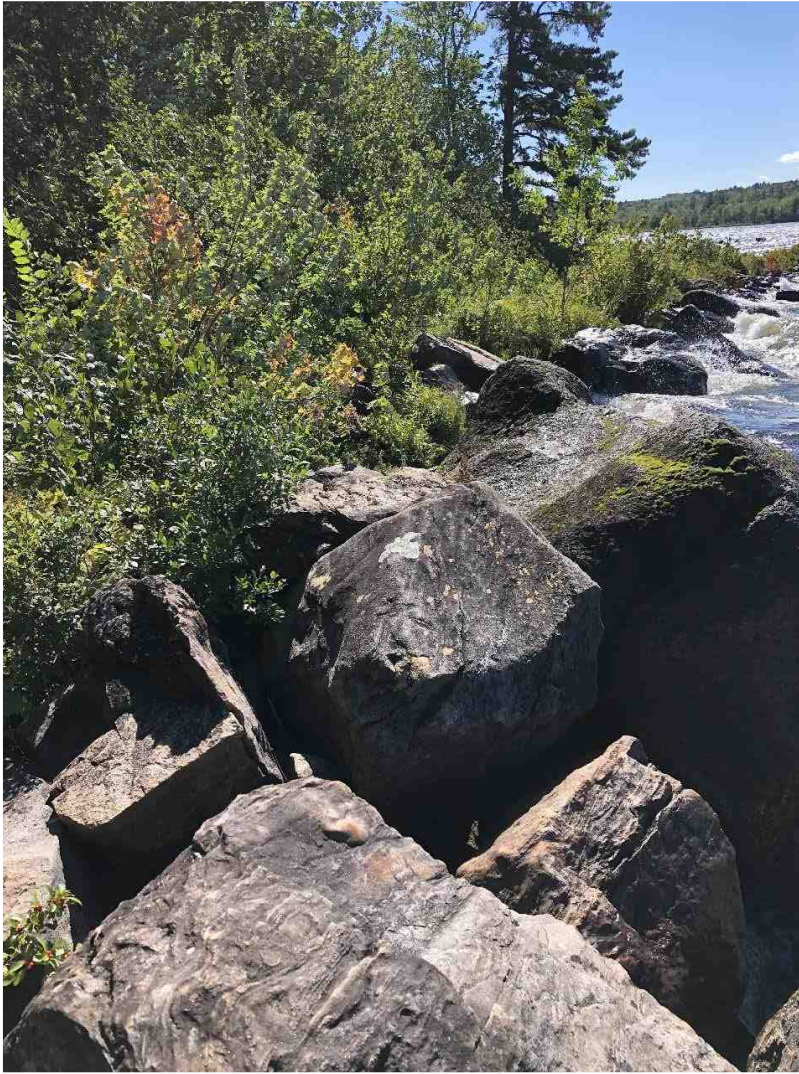
This undercut shoreline is somewhat stabilized by the placement of a log under lip. Planting live stakes on the slope will help with bank stability. *Photo credit: Ginger Eliasberg.*



LEFT: Erosion (bare soil and exposed roots) where dock meets shoreline. *Photo credit: Andrea Stevens.*

ABOVE: Planting **live stakes** is an economical and easy way to stabilize a shoreline and enhance a buffer. Pictured here is a pussy willow live stake (left) planted on April 4, 2021 and the same plant on July 1, 2021 (right). *Photo credit: John and Ginger Eliasberg.*





**(LEFT and BELOW)** Two views of a stable and rocky shoreline with deep-rooted vegetation. *Photo credit: Cynthia Giguere-Unrein.*





**Enhancing a shoreline buffer is one of the most frequent Best Management Practices recommended to lakeshore homeowners in the LakeSmart program.** Buffers can become more effective at infiltrating and filtering stormwater runoff by adding depth and layers, closing breaks, and managing erosion.



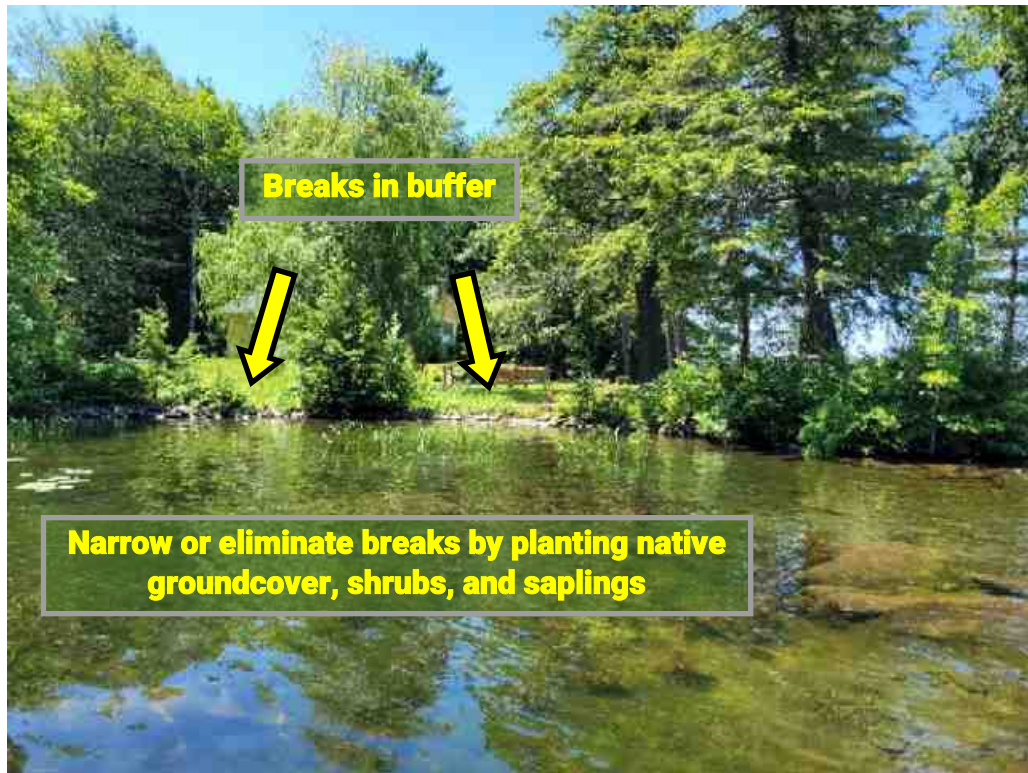
A shallow buffer next to a lawn. This homeowner can consider leaving part of the lawn unmowed to naturally revegetate. Other options include planting a meadow, an edible garden, or a natural forest to replace the lawn and deepen the buffer. *Photo credit: Michele Windsor.*

Some low-growing plants such as blueberries (shown on right), ferns, and mosses are available as **native sod** and sold by the square foot. Native sods are sold with established root systems in a soil base and provide an instant groundcover for areas of bare soil that may be eroding or prone to erosion.

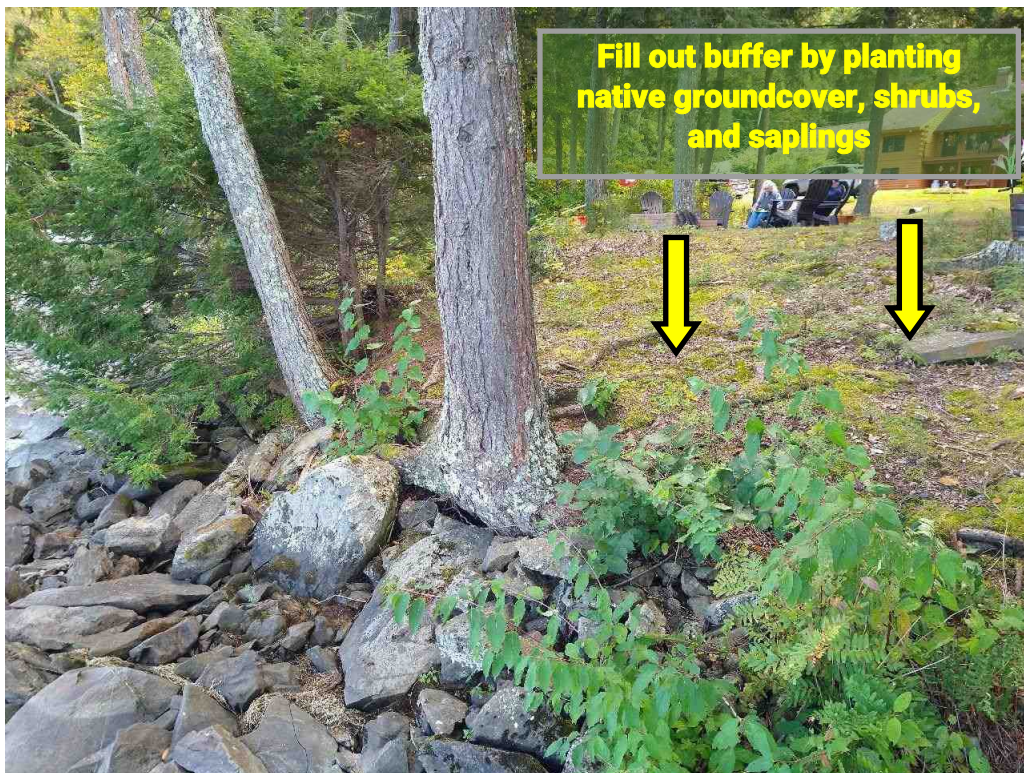
*Photo credit: [www.WildSodsofMaine.com](http://www.WildSodsofMaine.com).*







Breaks in a buffer. Filling in these breaks with native plants in layers will help protect the lake. *Photo credit: Dave Hallee.*



This buffer could be enhanced with more layers and depth. A LakeSmart recommendation could be to add midstory, shrub, and groundcover layers for a more robust structure and greater buffer depth. *Photo credit: Jennifer Lacombe.*

## The Many Benefits of Native Plants

We have mentioned native plants several times in this Manual and you may be wondering why native plants matter. Native plants have evolved over thousands of years with the soil and climate conditions of a local area. Here are some of the many benefits of choosing native plants for a lakeshore property.

- The roots of native plants are deeper than non-native plants and better able to store water, reduce the flow of stormwater runoff to a lake, and prevent erosion.
- Native plants have evolved with the local wildlife, providing food and shelter (habitat) for pollinators (insects, birds), small mammals, and even fungi and other tiny organisms living in the soil. The monarch butterfly co-evolved with the milkweed plant, an important food source for the monarch caterpillar.
- Native plants are low maintenance and easy to grow! Once established, they require less water than non-native plants, and no fertilizer or pesticides. This leaves more time for the homeowner to relax and watch them grow!
- Native plants may even make your landscape more resilient to climate change! (Shepherd, M. April 20, 2022 Xerces Blog. *For Wildlife and Humans, Native Plants are a Key to Climate Resilience*).

The list of Resources at the end of this Manual includes sources of information about native plants, often in pamphlets and manuals describing rain gardens and shoreline buffers. Native plants are usually listed based on the conditions of sun, shade, wet, or dry that the plant prefers.

Check out a comprehensive list of where to buy native plants on the Wild Seed Project website:

[www.wildseedproject.net/buy-native-plants/](http://www.wildseedproject.net/buy-native-plants/)

You can search for plants by site condition, bloom time, and size at Maine Audubon's Native Plant finder:

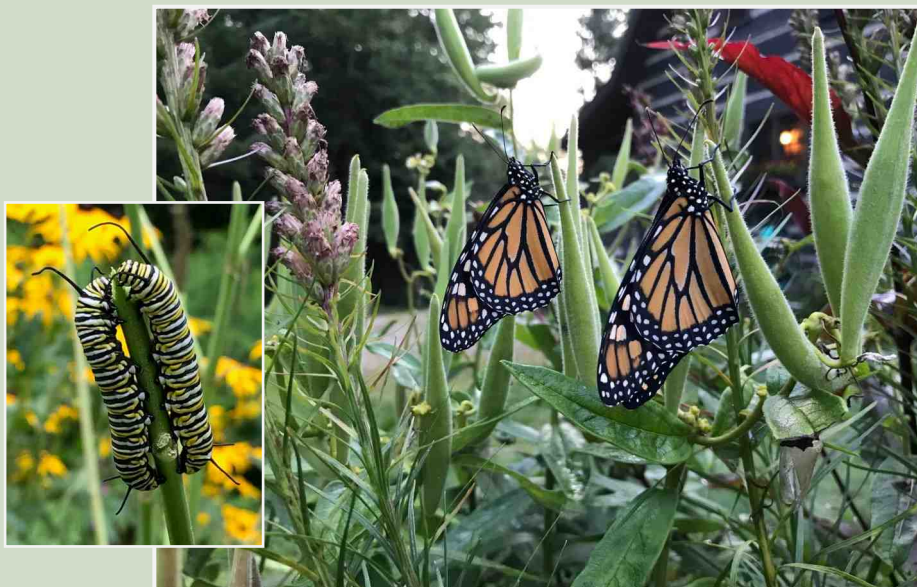
[www.mainenativeplants.org](http://www.mainenativeplants.org).

Visit your local nursery to ask about their collection of native plants.

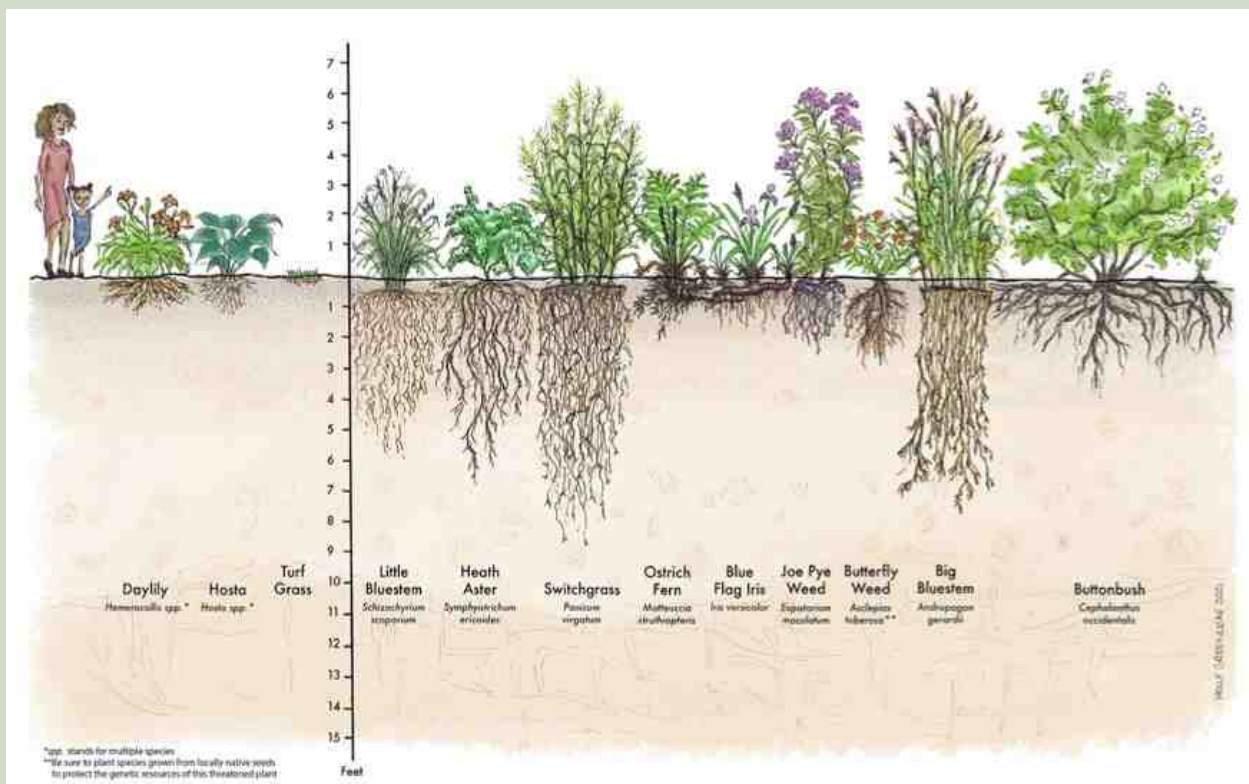


Native plant sale at Maine Audubon. *Photo credit; Andrea Stevens.*





Monarch caterpillars (far left) and Monarch butterflies newly emerged from chrysalises. Photo credit: Andrea Stevens.



A comparison of root depths of common non-native (left of depth line) and native (right of depth line) plants. A variety of root types are shown, including fibrous roots (grasses; all plants shown have some fibrous roots, a network of roots with similar widths), rhizomes (underground plant stems in iris, joe pye weed, ferns, daylily, hosta), tubers (butterfly weed), and woody roots with a taproot (straight, thick, dominant root in buttonbush). Artistic rendering of root depth and architecture is based on photos, professional experience, and research by the Conservation Research Institute (1995). Source: *Vermont Bioengineering Manual: A Technical Manual for Lakeshore Contractors and Homeowners* (p.23). Vermont Agency of Natural Resources. January 2022.

## Support for Homeowners Installing BMPs

Homeowners may find it challenging to fund and install Best Management Practices recommended by LakeSmart Evaluators. Here are some options to consider.

Some lake associations offer *reimbursement programs for BMPs*, often requiring a cash match from the homeowner.

The **Youth Conservation Corps** (YCC) employs high school students to reduce sources of pollution in lakes by installing Best Management Practices such as rain gardens, vegetated buffers, infiltration trenches and steps, waterbars, and erosion control mix. YCC projects help homeowners install LakeSmart BMP recommendations and meet LakeSmart Award standards. Maine organizations host several YCC teams, with Maine DEP providing technical assistance to the programs. LakeSmart Hubs with YCC programs include 30 Mile River Watershed Association, 7 Lakes Alliance, China Region Lakes Alliance, and Midcoast Conservancy. The Thompson Lake Association also hosts YCC crews.

YCC programs are often initially funded through Nonpoint Source Water Pollution Control Grants under Section 319 of the Clean Water Act. **319 grants** help fund the restoration or protection of waters identified as Nonpoint Source “Priority Watersheds” (see Maine DEP website for an updated Priority Watersheds list). YCC programs may continue beyond the funding period for these grants under local funding sources. If a LakeSmart evaluated property is located within a YCC service area, it is helpful for the Evaluator to sketch a baseline map of the property showing problem areas and proposed BMP locations as a guide for a YCC team. A photo of the sketch could be submitted into Survey123 with the evaluation.

**Erosion Control Certified Contractors.** Maine DEP Certification in Erosion Control Practices for most earthwork contractors and inspectors is a voluntary certification in which individuals can demonstrate their commitment to protecting natural resources using proper erosion and **sedimentation** control practices. Maine law requires that any contractor working in the municipal Shoreland Zone must ensure an individual who is certified in Erosion and Sedimentation Control Practices by Maine DEP is present on the site during all phases of soil disturbance. The certified contractor is responsible for the installation and maintenance of any Best Management Practices. NOTE: Homeowners can install BMPs without being certified.

***Before installing a BMP in the shoreland zone, always check with the Town Code Enforcement Officer (CEO) about permitting under the local shoreland zoning ordinance.***

## The Homeowner Report

The written **homeowner report** documents findings and recommendations from the LakeSmart visit and can be drafted after the evaluation is complete. The homeowner report can be presented to the homeowner when the final review of the evaluation is complete. The report should thank the homeowner for supporting the LakeSmart program and acknowledge and congratulate them for what they have already done to manage erosion on their property. For each of the five sections of the evaluation, the report should include (1) an explanation of what the Evaluator looks for in the section, (2) what the Evaluator found or observed during the evaluation, and (3) recommendations for Best Management Practices to manage stormwater runoff moving forward, often presented as links to fact sheets and/or other resources.

Prioritizing recommendations in the report and providing a timeline in steps that are manageable for the homeowner may be helpful in the planning of what may seem like insurmountable improvements.

LakeSmart homeowner reports vary in complexity and content. Some Evaluators focus more on homeowner education and less on the scoring, while others see the scoring as a way to motivate homeowners. Evaluators sometimes include photos in the report that may be annotated and marked-up to show where BMPs could be installed or landscaping ideas.

Homeowner report templates have been developed by several lake associations and offer suggestions for language to address common situations. Examples of homeowner report templates are included in the Appendix of this Manual. LakeSmart teams may revise the template language to align with their own tone and brand with links to their favorite resources.

It is important that homeowner reports be readable and easy to understand. They should focus on the positive, highlighting the good things that were observed on the property during the LakeSmart visit. New Evaluators should have their first few homeowner reports reviewed by either their Hub Coordinator or another experienced Evaluator.

The homeowner report is an important outreach tool that will make the homeowner feel excited about participating in the LakeSmart program and moving forward with opportunities to install BMPs to make their property more lake-friendly.

## Survey123: Entering and Submitting Evaluation Results

The LakeSmart program uses ArcGIS **Survey123**, an application for a cell phone, tablet, or computer, as a secure statewide database that stores evaluation scores, recommended BMPs, notes, photos, and reviewer comments and decisions. Responses from the LakeSmart Homeowner Questionnaire are also transferred into Survey123. Survey123 can be used on mobile devices during the LakeSmart visit even when cellular or a Wi-Fi connection is not available. Some Evaluators prefer using the paper form of the evaluation during the visit and entering the data into Survey123 when they return home. The data are



stored in the cloud and are only accessible to LakeSmart Hub and Lake Coordinators and Maine Lakes staff for review.

In May or June each year, the GIS Coordinator for Maine DEP presents an online training for Evaluators and Coordinators about installing and using Survey123. This session is recorded and uploaded into the Evaluator Toolkit.

All users of the LakeSmart Survey123 database agree to the following security guidelines when accessing the stored data :

- Take precautions to manage data in a secure manner.
- Pledge not to copy, save, sell, or use data for any purpose other than to record accurate LakeSmart survey data.
- Pledge not to edit data belonging to another organization.
- Keep passwords secure and do not share them with anyone who has not been trained to use Survey123 safely.

## Evaluation Review and LakeSmart Status

***To maintain the integrity and consistency of the LakeSmart standards, all evaluations are reviewed by experienced LakeSmart team members.***

Evaluations are reviewed by Hub or Lake Coordinators and Maine Lakes staff. Coordinators provide a first review of evaluations within their service area for completeness and consistency with LakeSmart standards. Maine Lakes staff makes the final decision about minimum LakeSmart Award standards. The review process for Hubs is described in their contract agreement with Maine Lakes.

For evaluations located outside Hub service areas, Lake Coordinators have the option, if they have not participated in the evaluation, of providing a first review of their lake's evaluations prior to a final review by Maine Lakes staff. Lake Coordinators are encouraged to participate in the review process if they have the time and interest. Many Lake Coordinators focus on other tasks and choose to pass all review along to Maine Lakes.

***If a Hub Coordinator, Lake Coordinator, or Maine Lakes staff member participates in an evaluation, they may not also review the evaluation.***

The review process may require discussion between reviewers and Evaluators, especially if an evaluation is flagged for review or near the Award threshold in one or more sections. Reviewers may make a second visit to a property before making an Award decision.

Lake and Hub Coordinators are provided access to the Survey123 database to monitor, review, and enter comments about evaluations and the Evaluator-recommended Award or Commendation for a property in their LakeSmart program. Maine Lakes staff notifies Hub

and Lake Coordinators when a final LakeSmart decision has been made and entered into the database.

Once a final decision about LakeSmart status has been confirmed, the Evaluator can share the decision and the final report with the homeowner. All homeowners, whether they receive a LakeSmart Award or not, should be recognized and congratulated for the actions they have already taken to manage erosion on their property and encouraged to continue to maintain and adopt Best Management Practices to protect their lake.

## Volunteer Time and Mileage

Volunteer time is tremendously valuable! Tracking volunteer hours can help Maine Lakes grow and improve the LakeSmart volunteer program and strengthen the organization. Grant funders often encourage volunteer “in kind” donations of time and mileage as “matching” funds that can be included in the budget for grant proposals. The equivalent dollar value of volunteer time can be used to match a grant award. In 2022, the Independent Sector valued volunteer time at \$26.77 per hour in Maine. For example, if a volunteer gives 10 hours of time to the LakeSmart program, that time can be valued as a \$267 contribution to program funding!

Evaluators should submit the time spent on an evaluation and the miles driven to and from the LakeSmart visit. This information is entered in the “Evaluator Data” section at the end of the LakeSmart Property Evaluation Form and in Survey123. The time of all evaluation participants should include anything each volunteer does that relates to the evaluation, whether it is before, during, or after the visit. This includes the visit itself, entering data into Survey123, writing the homeowner report, checking in with the Lake or Hub Coordinator, and travel time.

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**EVALUATOR DATA:** Use decimals for time (e.g. 90 minutes = 1.5, 75 minutes = 1.25, etc.) For mileage, round off to nearest whole number.

|   |  |
|---|--|
| Hours spent on Survey, including speaking with homeowner prior to survey: |  |
| Hours spent travelling to and from the site:                              |  |
| Hours spent writing to homeowner and reporting to your Coordinator:       |  |
| <b>Total Time Spent Completing This LakeSmart Visit:</b>                  |  |
| Mileage to and from survey site:  |  |





# 7. BEFORE, DURING, AND AFTER THE LAKESMART VISIT: PUTTING IT ALL TOGETHER

As you have probably realized, a typical LakeSmart visit follows a series of activities, tasks, and communications with members of your LakeSmart team and the homeowner. The following step-by-step roadmap of the LakeSmart process begins when a homeowner learns about the program and is interested in participating. While it may end with a post-visit follow-up or a second visit after BMP installations, in many ways we hope LakeSmart connections continue well beyond the first visit. LakeSmart homeowners are key supporters and advocates for lake protection. Some may become LakeSmart volunteers or recruit neighbors and friends into the program.

The steps below provide a framework for the many and sometimes overlapping parts of the LakeSmart visit.

## Before the Visit

### 1. Contact with homeowner

An interested homeowner contacts Maine Lakes or their Lake Coordinator and requests a LakeSmart visit. Often this is a result of a lake association's LakeSmart outreach initiatives in their community, through newsletter articles, press releases in a local paper, letters to homeowners, a presentation by Maine Lakes staff at a membership meeting, or simply talking with a neighbor about their LakeSmart property.

Some LakeSmart programs promote participation by going door-to-door to encourage homeowner participation. If you or your program would like to know more about how this outreach approach works and how to maximize its effectiveness, please contact the Maine Lakes staff. We will connect you with a program that uses this more active program solicitation method for some guidance.

### 2. Send Homeowner Questionnaire

A LakeSmart Homeowner Questionnaire is sent to the homeowner. This form requests information about the property and how it is managed. The completed questionnaire is returned to the LakeSmart team prior to the LakeSmart visit.

### 3. Schedule the visit

The Lake Coordinator assigns an Evaluator to the visit. The Evaluator reaches out to the homeowner and schedules the visit, preferably at a time when the homeowner is present. We recommend that first-year Evaluators shadow an experienced Evaluator in their first few LakeSmart visits. Some Evaluators continue to work in teams or pairs beyond their first year. This provides opportunities for discussing questionable areas or unusual issues observed during the visit.

## During the Visit

### **4. Introduce LakeSmart and what to expect during the visit**

On the day of the visit, the Evaluator introduces (or re-introduces) the homeowner to the LakeSmart program and provides an overview of the evaluation and the review process. An Evaluator may prefer to walk the property and conduct the evaluation without the homeowner, then meet with the homeowner when the evaluation is finished to share observations and suggestions (see item 6 below). Some Evaluators present a LakeSmart brochure to the homeowner to review while the evaluation takes place and to reinforce the purpose of the program.

### **5. Collect and record evaluation data**

The Evaluator walks the property and completes the evaluation form or enters data directly into Survey123 for each of the five sections of the property.

Data recorded include the scores for standards, four required photos and three additional photos, if needed, recommended Best Management Practices, and comments for each section and the overall visit. If the evaluation is flagged for review, additional notes and photos should be submitted that explain the reason for the flag.

Until the preliminary data are submitted into the Survey123 database, they may be regarded as the Evaluator's cryptic notes to themselves. Such notes can facilitate initial drafting of the homeowner report. If the preliminary data are used as notes, an Evaluator should more fully expand these notes before submitting the final evaluation into the database.

### **6. Discuss evaluation results with homeowner**

The evaluation team meets with the homeowner and walks the property to review findings, problem areas, and recommendations for Best Management Practices that will help manage areas of erosion. This walk-and-talk with the homeowner provides an excellent opportunity for a series of "teaching moments", encouragement, and recognition for measures already taken to protect the water quality of the lake. It is also a good time to go over the next steps in the evaluation with the homeowner, including the LakeSmart evaluation review process and the homeowner report.

While Evaluators can share the preliminary conclusions for each section of the evaluation with the homeowner and explain what the conclusions suggest in terms of an Award or a Commendation, sharing the details of the scoring with the homeowner is discouraged. We suggest that Evaluators focus instead on what they have observed on the property and how it may or may not be protecting water quality. The homeowner should know that all LakeSmart evaluations, even those with the highest scores and completed by the most experienced Evaluators, go through a comprehensive review before a final decision is made about LakeSmart Award or Commendation status.



## After the Visit

### 7. Send thank you letter

The Evaluator or Coordinator often send a brief letter to homeowners immediately following the visit to thank them for supporting the LakeSmart program and for their interest in protecting their lake.

### 8. Draft homeowner report

The Evaluator drafts a report for the homeowner highlighting the areas on their property that are already well managed to protect water quality and identifying other areas that need improvement to meet or maintain LakeSmart standards. The report should not be shared with the homeowner until after the evaluation has been reviewed and their LakeSmart status has been confirmed.

### 9. Submit final evaluation results into Survey123

Evaluation data are finalized and submitted into Survey123. Notification of the submitted evaluation is automatically forwarded to Maine Lakes staff.

### 10. Evaluation review and LakeSmart status

Evaluations are reviewed by Hub Coordinators, Lake Coordinators, and Maine Lakes staff in Survey123. When a final decision is entered into the database, Maine Lakes notifies the Lake or Hub Coordinator.

### 11. Present Award signs to LakeSmart homeowner

A homeowner is recognized with a LakeSmart Award if their property meets the minimum standards in all sections of the evaluation and their evaluation successfully passes through the review process.

Awardees are presented with two distinctive LakeSmart Award signs to display on their property. The delivery of the signs is a great opportunity for a celebratory photo for a newsletter article or a social media post. We recommend that one sign be placed at the top of the driveway and the second sign at the shoreline facing the lake. Maine Lakes also offers smaller LakeSmart medallions (4"x6") to post near front or back doors.



A sticker with the year of the evaluation is added to each sign. If the homeowner meets the Loon Smart standards, a Loon Smart sticker is also displayed on the signs.

The LakeSmart signs signal to all passers-by that the homeowners are active stewards of the lake and demonstrate lake-friendly practices on their property. In addition to recognizing homeowners, the signs also build trust and public support for the LakeSmart program.

## 12. Follow-up with homeowner

Follow-up communications with the homeowner are important for setting reasonable action goals, tracking the progress of recommended Best Management Practices, and cultivating a relationship with a LakeSmart supporter.

A LakeSmart team member at each lake should be assigned to follow up with homeowners, providing encouragement and guidance and tracking the progress of BMP installations.

The LakeSmart Award is not permanent. Properties change hands, new owners may not keep up with LakeSmart standards, and conditions on the ground may shift to compromise LakeSmart status. LakeSmart standards may occasionally be updated to better address the impacts of climate change. Maine Lakes staff and the LakeSmart Work Group are working on a plan to periodically recertify properties with older LakeSmart Awards.



An old sign from the early days of LakeSmart when the program was administered by Maine DEP.  
*Photo credit: Maine Lakes.*



Jim Fenwood, Lake Coordinator and Evaluator at Cold Stream Pond. Jim and Laurie Fenwood always offer to put up the LakeSmart Award signs for the homeowners when they are delivered.  
*Photo credit: Laurie Fenwood.*

# 8. INVOLVING YOUR COMMUNITY IN LAKESMART

Picture this...

Your lake association is fully committed to launching a LakeSmart program. You have completed the LakeSmart training, read through this training Manual, and everyone on your team understands their roles. You feel confident in your ability to conduct LakeSmart visits and are ready to go.

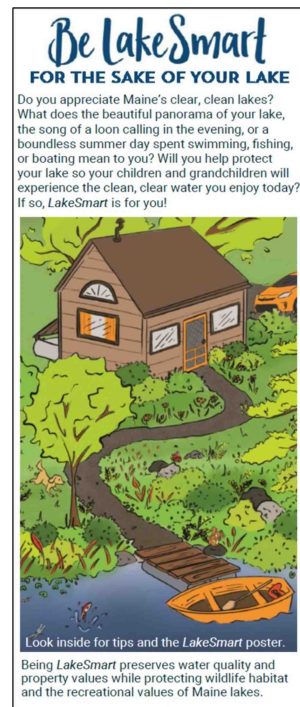
So, the calls start rolling in, right? Not necessarily. Publicizing LakeSmart takes some effort and creativity. Here are a few strategies to get you started:

- Write articles for your lake association’s newsletter and post stories on social media.
- Send a press release to your local newspaper with photographs of LakeSmart Awardees on their lake-friendly property.
- Visit meetings of other local organizations to promote LakeSmart.
- Plan a display table at annual meetings for your town, lake association, or road association where homeowners can sign up for a LakeSmart visit.
- Add a LakeSmart page to your lake association’s website and encourage your town to post LakeSmart information on their website.
- Put together information packets about LakeSmart and visit potential homeowners to talk with them about the program. Maine Lakes can provide outreach materials, including a brochure that features an attractive poster showing the many ways a property can be lake-friendly.

The following Maine Lakes brochures and pamphlets are available to order at no cost. These outreach materials can also be viewed at [www.lakes.me/library](http://www.lakes.me/library).

1. Be LakeSmart for the Sake of Your Lake
2. Lakeside Living: Caring for your Septic System
3. Protect Your Pond with Native Buffer Plants
4. Common Shrubs of Central Maine Shorelines
5. The LakeSmart Laker’s Dozen

The Maine Lakes Lake Book can be viewed online ([www.lakes.me/lakebook](http://www.lakes.me/lakebook)) or purchased for \$8.50 each, including tax and shipping. As long as supplies last, copies of the Lake Book are distributed to LakeSmart volunteers free of charge and can be given to participating homeowners at the time at their LakeSmart visit. Extra copies can be purchased.







# 9. RESOURCES

## Sources of Information about LakeSmart Practices

### BMP FACT SHEETS

Portland Water District and Maine Department of Environmental Protection. 2006-2009. *Conservation Practices for Homeowners Factsheet Series*. <https://www.lakes.me/bmps>

- Dripline Trench:** Managing Roof Runoff on Homes without Gutters
- Dry Wells:** Managing Roof Runoff from Homes with Gutters
- Erosion Control Mix:** Mulching to Stabilize and Enrich the Soil
- Infiltration Steps:** Controlling Erosion on Steep Paths
- Infiltration Trench:** Managing Runoff from Rooftops and Paved Areas
- Lake Shoreline Riprap:** Stabilizing Severe Erosion on Lakefronts
- Live Staking:** Stabilizing Banks of Streams, Rivers, Lakes
- Native Plant Lists:** Part to Full Sun, Shade, Dry to Wet conditions
- Open-Top Culverts:** Diverting Water off Gravel Roads and Driveways
- Paths and Walkways:** Managing Foot Traffic for Lake Protection
- Permitting:** Understanding Environmental Laws and Requirements
- Planting and Maintaining Buffers:** Using Vegetation to Protect Water Quality
- Rain Barrels:** Managing Roof Runoff in Your Backyard
- Rain Gardens:** Managing Roof Runoff in Your Backyard
- Rubber Razors:** Managing Runoff on Gravel Roads and Driveways
- Turnouts:** Diverting Water off Roads and Driveways
- Waterbars:** Diverting Water off Paths and Trails

Cumberland County Soil and Water Conservation District. Yardscaping Fact Sheets. [www.cumberlandswcd.org/documents-1/yardscaping](http://www.cumberlandswcd.org/documents-1/yardscaping)

Massachusetts Office of Coastal Zone Management. *Stormwater Solutions for Homeowners Fact Sheets*. 2022. [www.mass.gov/info-details/stormwater-solutions-for-homeowners](http://www.mass.gov/info-details/stormwater-solutions-for-homeowners)

Soak up the Rain NH. DIY Fact Sheets. [www4.des.state.nh.us/SoakNH/resources-2/diy-fact-sheets/](http://www4.des.state.nh.us/SoakNH/resources-2/diy-fact-sheets/)

Vermont Department of Environmental Conservation, Watershed Management Division. *Lake Wise Info Sheets: Shoreland Best Management Practices for Lake-friendly Living*. Updated 2022. [www.dec.vermont.gov/watershed/lakes-ponds/lakeshores-lake-wise/bmp](http://www.dec.vermont.gov/watershed/lakes-ponds/lakeshores-lake-wise/bmp)

### MANAGING EROSION FROM DRIVEWAYS AND PARKING AREAS

Burlington Vermont Public Works. *Why Should You Consider a Stormwater Friendly Driveway?*

Kennebec County Soil and Water Conservation District and Maine Department of Environmental Protection. *Gravel Road Maintenance Manual: A Guide for Landowners on Camp and Other Gravel Roads*. April 2016.

New Hampshire Lakes. *Firehose Diverter Fact Sheet*.

## BUFFERS

- Gawler, S. and Bouchard, J. *Common Shrubs of Central Maine Shorelines*. Maine Lakes. 2015.
- Hardesty, P. and C. Kuhns. *The Buffer Handbook Plant List*. Androscoggin Valley Soil and Water Conservation District and Cynthia Kuhns, Lake and Watershed Resource Management Associates. 2009 revision.
- Hardesty, P. and C. Kuhns. *The Buffer Handbook: A Guide to Creating Vegetated Buffers for Lakefront Properties*. 1998.
- Maine Lakes. *Protect Your Pond Brochure*.
- Portland Water District and Lakes Environmental Association. *Lakes Like Less Lawn*. 2017.
- The Federation of Vermont Lakes and Ponds, Buffers for Blue Lakes Program. *What is a Buffer? Planning Your Blueberry Buffer, Planting Your Blueberry Buffer, Care of Your Blueberry Buffer*.
- The Federation of Vermont Lakes and Ponds. *A Guide to Healthy Lakes Using Lakeshore Landscaping: Design Templates and Easy-to-Use Planting Plans*. 2015.
- University of New Hampshire Cooperative Extension. *Landscaping at the Water's Edge: An Ecological Approach. A Manual for New Hampshire Landowners and Landscapers*. 2007.

## SHORELINES

- Michigan Natural Shoreline Partnership. *Natural Shoreline Landscapes on Michigan's Inland Lakes: Guidebook for Property Owners*. Extension Bulletin E-3145. Reprint January 2013.
- New York Department of Environmental Conservation. *Shoreline Habitats*.
- New York Department of Environmental Conservation. *Shoreline Stabilization Brochure*.
- Strayer, D., Tumblety, L. *Managing Shore Zones for Ecological Benefits: Handbook*. In association with the Hudson River Sustainable Shorelines Project, Staatsburg, NY. 2015. [www.hrnerr.org/sustainable-shorelines](http://www.hrnerr.org/sustainable-shorelines).
- Vermont Department of Environmental Conservation, Watershed Management Division. *Lake Wise Info Sheet: Bioengineering*.

## RAIN GARDENS

- University of Maine Cooperative Extension Bulletin #2702. *Landscapes for Maine: Adding a Rain Garden to Your Landscape*. 2020.
- University of New Hampshire Cooperative Extension Fact Sheet. *Native Plants for New England Rain Gardens*.

## NATIVE PLANTS AND SOD

- Maine Audubon. *Maine Native Plant Finder*. [www.mainenativeplants.org](http://www.mainenativeplants.org)
- University of Maine Cooperative Extension Bulletin 2256, Fact Sheet No. 227. *Sources of Lowbush Blueberry Plants and Sod*. 2022.
- University of Maine Cooperative Extension Bulletin 2502. *Native Plants: A Source List*. 2018.
- Wild Seed Project. *Where to Buy Native Plants*. [www.wildseedproject.net/buy-native-plants](http://www.wildseedproject.net/buy-native-plants)



## MAINTAINING SEPTIC SYSTEMS

Environmental Protection Agency (EPA), SepticSmart materials: [www.epa.gov/septic/septic-smart-education-materials](http://www.epa.gov/septic/septic-smart-education-materials)  
Maine Lakes. *Lakeside Living: Caring for your Septic System*. 2021.

## HOMEOWNER GUIDES TO LAKES AND STORMWATER MANAGEMENT

Lakes Environmental Association. *Lakes Environmental Association Homeowner's Guide: Practical Ways to Protect Lakes and the Value of your Property*.  
Maine Lakes. *The Lake Book: A Handbook for Lake Protection*. 4<sup>th</sup> Edition. 2022.  
Portland Water District. *Sebago Lake Ecology Center's Pervious Pathway: A Low Impact Development Demonstration*. 2007.  
Soak up the Rain New Hampshire. New Hampshire Department of Environmental Services. *New Hampshire Homeowner's Guide to Stormwater Management: Do-it-Yourself Stormwater Solutions for your Home*. 2019.  
University of New Hampshire Cooperative Extension. *Landscaping at the Water's Edge: An Ecological Approach. A Manual for New Hampshire Landowners and Landscapers*. 2007.  
Vermont Department of Environmental Conservation, Watershed Management Division. *Vermont Bioengineering Manual: A Technical Manual for Contractors and Homeowners*. 2022.  
Vermont Department of Environmental Conservation. *Vermont Guide to Stormwater Management for Homeowners and Small Businesses*. 2018.

## DOCKS

Lake Sunapee Protective Association, New Hampshire. *Lake Friendly Dock Choices* (brochure).  
New Hampshire Department of Environmental Services. Environmental Fact Sheet. *Pressure-Treated Wood: Can it be Used in New Hampshire's Waters?* 2019.

## PERMITTING AND SHORELAND ZONING

Maine DEP. *Shoreland Zoning Handbook*. 2008.  
Merrell, K., Deeds, J., Mitchell, M., and Bouchard, R. *Determining if Maine's Mandatory Shoreland Zoning Act standards are effective at protecting aquatic habitat*. Vermont Department of Environmental Conservation and Maine DEP. 2013.

## COMMUNITY-BASED SOCIAL MARKETING

McKenzie-Mohr, D. *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing* (3<sup>rd</sup> edition). New Society Publishers, British Columbia, Canada. 2011.  
Rogers, E. *Diffusion of Innovations* (5<sup>th</sup> edition). Free Press, NY. 2003.

## ARTICLES ABOUT MAINE'S LAKESMART PROGRAM

Cole, F.R., Junker, A., Bevier, C.R. et al. *Assessing LakeSmart, a community-based lake protection program*. *Journal of Environmental Studies and Science* 8, 264–280. 2018.  
Shannon, M., Junker, A., Nyhus, P., Bevier, C. Cole, R. *The Evolution of a Model Volunteer Lake Protection Program*. LakeLine e-magazine, North American Lake Management Society (NALMS). 2017.

Welch, B., and Smith, C. *From pilot to statewide: lessons learned*. LakeLine e-magazine, NALMS. Fall 2008.

### ADDITIONAL PEER-REVIEWED ARTICLES OF INTEREST

Dennis, J. *Phosphorus export from a low-density residential watershed and an adjacent forested watershed*. *Lake and Reservoir Management* 2:1. 401-407. 1986.

James, W. *Internal P Loading: A Persistent Management Problem in Lake Recovery*. LakeLine e-magazine. NALMS. Spring 2016.

Merrell, K, Howe, E.A., Warren, S. *Examining Shorelines, Littorally*. LakeLine e-magazine. NALMS. Spring 2009.

## Organization and Program Contacts

**Maine Lakes:** A statewide nonprofit that works to keep Maine’s lakes healthy by managing the LakeSmart program, supporting local lake associations, promoting freshwater education initiatives, advocating for sound lake policies, and providing resources and a “lake library” for lake residents and visitors.

P.O. Box 91

Yarmouth, ME 04097

(207) 495-2301

[lakesmart@lakes.me](mailto:lakesmart@lakes.me)

[www.lakes.me/lakesmart](http://www.lakes.me/lakesmart)

### LAKESMART HUBS

**China Region Lakes Alliance (CRLA):** Founded to preserve and protect the water quality of area lakes through education and erosion control work. Members include the Towns of China and Vassalboro and the China Lake, Three-Mile Pond, and Webber Pond Associations.

P.O. Box 6339

China Village, ME 04926

[info@crlamaine.org](mailto:info@crlamaine.org)

[www.crlamaine.org](http://www.crlamaine.org)

**Lakes Environmental Association (LEA):** A multi-lake association based in the upper Sebago Lake region, LEA works to protect water quality on 41 lakes and ponds in western Maine. LEA manages the statewide Courtesy Boat Inspection (CBI) program, hosts the annual Milfoil Summit, and runs the Maine Lake Science Center. LEA offers technical services to lakefront landowners and municipalities.

230 Main Street

Bridgton, ME 04009

(207) 647-8580

[www.mainelakes.org](http://www.mainelakes.org)

**Midcoast Conservancy:** Protects and restores vital lands and waters in Lincoln, Knox, and Waldo Counties, encompassing 24 towns and the 450 square miles of the Damariscotta Lake, Medomak River, and Sheepscot River watersheds.

290 Route One

Edgecomb, ME 04556

(207) 389-5150

info@midcoastconservancy.org

[www.midcoastconservancy.org](http://www.midcoastconservancy.org)

**Piscataquis County Soil and Water Conservation District (PCSWCD):** Protects the soil, water, forests, and farms in the county. A leader in agriculture and forestry by providing education and technical assistance to promote the conservation of natural resources.

USDA Service Center

42 Engdahl Drive

Dover-Foxcroft, ME 04426

(207) 564-2321

info@piscataquisswcd.org

[www.piscataquisswcd.org](http://www.piscataquisswcd.org)

**7 Lakes Alliance:** Conserves the lands and waters of the Belgrade Lakes Region for all by engaging the community in achieving clean water, well stewarded lands, and a vibrant economy.

137 Main Street

Belgrade Lakes, ME 04918

(207) 495-6039

[www.7lakesalliance.org](http://www.7lakesalliance.org)

**Southern Aroostook Soil and Water Conservation District (SASWCD):** Works as the grass roots connection between local, state, and federal agencies and producers. Education for all landowners is an important part of the Southern Aroostook SWCD's work.

304 North Street

Houlton, ME 04730

(207) 254-4126

[www.saswcd.org](http://www.saswcd.org)

**30 Mile River Watershed Association:** Works as a community for clean and healthy lakes, ponds, and streams in the watershed. A public-private collaboration of seven rural towns, eight lake associations, and two land trusts. Helps the region's communities respond to threats from development and invasive species with a comprehensive and organized approach.

165 Front Street

Farmington, ME 04938

(207) 860-4043

[www.30mileriver.org](http://www.30mileriver.org)



## OTHER LAKE AND WATERSHED ORGANIZATIONS

**Lake Stewards of Maine (LSM):** A statewide nonprofit protecting lakes and promoting lake stewardship through widespread citizen participation in the gathering and dissemination of credible scientific information about lake health. LSM trains, certifies, and supports hundreds of volunteers who monitor a wide range of indicators of water quality, assess watershed health and function, and screen lakes for invasive aquatic plants and animals.

24 Maple Hill Road

Auburn, ME 04210

(207) 783-7733

[stewards@lakestewardsme.org](mailto:stewards@lakestewardsme.org)

[www.lakestewardsofmaine.org](http://www.lakestewardsofmaine.org)

**North American Lake Management Society (NALMS):** NALMS is a national organization with a mission to forge partnerships among citizens, scientists, and professionals to foster the management and protection of lakes and reservoirs. Their website offers many excellent resources and publications, although access to some resources is limited to NALMS members.

P.O. Box 5443

Madison, WI 53705-0443

(608) 233-2836

[www.nalms.org](http://www.nalms.org)

## MAINE CONSERVATION ORGANIZATIONS

**Maine Audubon:** A statewide nonprofit that works to conserve Maine's wildlife and wildlife habitat by engaging people in education, conservation, and action. Maine Audubon manages the Maine Loon Count and offers resources and information about loon nesting and behavior.

Gilsland Farm Audubon Center

20 Gilsland Farm Road

Falmouth, ME 04105

(207) 781-2330

[info@maineaudubon.org](mailto:info@maineaudubon.org)

[www.maineaudubon.org](http://www.maineaudubon.org)

**Wild Seed Project:** A Maine nonprofit whose mission is to rewild landscapes with native plants. Wild Seed Project offers many informational resources, programs, and events encouraging homeowners to plant native plants and sells seeds native to Maine.

21 Memorial Highway, Suite A

North Yarmouth, ME 04097

[info@wildseedproject.net](mailto:info@wildseedproject.net)

[www.wildseedproject.net](http://www.wildseedproject.net)

## COUNTY AND STATE AGENCIES IN MAINE

**Soil and Water Conservation Districts (SWCD):** There are 16 SWCDs in Maine that provide technical expertise for landowners. Two are LakeSmart Hubs. A map and contact information for SWCDs by county is available at [www.maine.gov/dacf/about/commissioners/soil\\_water/index.shtml](http://www.maine.gov/dacf/about/commissioners/soil_water/index.shtml)

**Maine Department of Environmental Protection (DEP):** The Maine DEP oversees water quality monitoring, manages algal blooms, monitors lake and river toxins and pollution, supports invasive aquatic plant programs, and provides outreach materials on a wide variety of lake and water topics. Maine DEP staff offer technical expertise on shoreland zoning, stormwater management, septic system permits, watershed planning, and much more.

17 State House Station

Augusta, ME 04333

(207) 287-768

[www.maine.gov/dep](http://www.maine.gov/dep)

### **Additional DEP Links:**

Lake Contacts:

[www.maine.gov/dep/water/lakes/contact.html](http://www.maine.gov/dep/water/lakes/contact.html)

Lake Assessment Program:

[www.maine.gov/dep/water/lakes/index.html](http://www.maine.gov/dep/water/lakes/index.html)

Invasive Aquatic Species Program:

[www.maine.gov/dep/water/invasives/index.html](http://www.maine.gov/dep/water/invasives/index.html)

Nonpoint Source Water Pollution Grant Program:

[www.maine.gov/dep/water/grants/319.html](http://www.maine.gov/dep/water/grants/319.html)

Water Program Areas: [www.maine.gov/dep/water/programs/index.html](http://www.maine.gov/dep/water/programs/index.html)

Water Pollution Prevention Publications:

[www.maine.gov/dep/land/watershed/materials.html](http://www.maine.gov/dep/land/watershed/materials.html)

Shoreland Zoning Information and Contacts: [www.maine.gov/dep/land/slz/index.html](http://www.maine.gov/dep/land/slz/index.html)

Maine Shoreland Zoning Handbook: [www.lakes.me/library](http://www.lakes.me/library)

To find certified erosion control contractors: [www.maine.gov/dep/land/training/cccec.html](http://www.maine.gov/dep/land/training/cccec.html)

**Maine Department of Inland Fisheries and Wildlife (IFW):** IFW oversees boating and fishing laws on inland waters, as well as the Lake and River Protection Sticker program that provides funding for invasive species management from boat registrations.

353 Water Street

Augusta, ME 04330

(207) 287-8000 [www.maine.gov/ifw](http://www.maine.gov/ifw)

### **Additional IFW links:**

Boating Handbook (includes watercraft restrictions):

[www.maine.gov/ifw/docs/maine-boating-laws.pdf](http://www.maine.gov/ifw/docs/maine-boating-laws.pdf)

Fishing Handbook:

[www.maine.gov/ifw/fishing-boating/fishing/laws-rules/index.html](http://www.maine.gov/ifw/fishing-boating/fishing/laws-rules/index.html)

Fish Consumption Advisories:

[www.maine.gov/ifw/fishing-boating/fishing/laws-rules/consumption-advisory.html](http://www.maine.gov/ifw/fishing-boating/fishing/laws-rules/consumption-advisory.html)

**University of Maine Cooperative Extension:** There are Cooperative Extension offices in most counties, offering technical expertise, workshops and publications on natural resource management, yard and gardening, and invasive species. For a list of county offices: [www.extension.umaine.edu/county-offices](http://www.extension.umaine.edu/county-offices)

### **LAKE ORGANIZATIONS AND AGENCIES IN VERMONT AND NEW HAMPSHIRE**

**Federation of Vermont Lakes and Ponds (FOVLAP):** One of the oldest nonprofit stakeholders to promote Vermont water quality, The FOVLAP is dedicated to fostering environmental quality standards and preserving Vermont lakes, ponds, watersheds, and aquatic ecosystems.

P.O. Box 766

Montpelier, VT 05601

[www.vermontlakes.org](http://www.vermontlakes.org)

**Vermont's Lake Wise Program:** Built from the LakeSmart model, Vermont's Lake Wise Program is part of Vermont's Agency of Natural Resources and awards lake-friendly shoreland property, including state parks, town beaches, private homes, and businesses. The goal of Lake Wise is to establish a new culture of lakeshore landscaping that is proven to protect the lake. The Lake Wise Award certifies a property that is well managed, using shoreland Best Management Practices, and is maintained to care for the lake.

[www.dec.vermont.gov/watershed/lakes-ponds/lakeshores-lake-wise](http://www.dec.vermont.gov/watershed/lakes-ponds/lakeshores-lake-wise)

**NH Lakes:** A statewide nonprofit working to protect New Hampshire's lakes. Their LakeSmart program was modeled after Maine's program and has a similar system of evaluations and awards.

17 Chenell Drive, Suite 1

Concord, NH 03301

(603) 226-0299

[www.NHLakes.org](http://www.NHLakes.org)



## 10. GLOSSARY OF LAKESMART TERMS

**Algal Bloom:** Too much phosphorus carried to lakes by sediments in stormwater runoff causes excessive algae growth, known as an algal bloom, that turns lakes green and depletes oxygen.

**Best Management Practices (BMPs):** Standard and tested techniques for converting stormwater runoff into groundwater and stabilizing land, thereby reducing the amount of sediment and pollutants entering surface waters.

**Bioindicators:** Living organisms used to assess the condition of the environment and the effect of changes in the environment.

**Code Enforcement Officer (CEO):** a person employed by a municipality to enforce all enabling state laws and local ordinances in the following areas: shoreland zoning, land use regulation, internal plumbing, subsurface waste water disposal, and building standards (30-A MRS, Section 4451).

**Community-Based Social Marketing:** The concept that in-person conversations with people you know are the most effective approach to changing behavior.

**Developed Watershed:** Watersheds where human impact, including land cleared for houses, roads, and parking lots, has reduced the ability of the land to absorb rainwater.

**Development Footprint:** All areas of a property touched by human impact.

**Dissolved Oxygen:** The amount of oxygen available to organisms in a lake and critical for sustaining lake life.

**Driplines:** The line directly below a roof without gutters where water drops to the ground and may accumulate and cause erosion.

**Duff:** Partially decomposed organic matter made up of leaves, woody debris, and dead plant material that accumulates on the forest floor and slows the flow of rainwater.

**Ecosystem:** A biological community consisting of many diverse organisms, from microscopic algae to top predators like loons, and their interactions with non-living factors such as wind, sunlight, rain, snow, nutrients, oxygen, temperature, and alkalinity.

**Erosion Control Certified Contractors:** Earthwork contractors and inspectors who have obtained a voluntary Maine DEP Certification in Erosion Control. These individuals have completed training on proper erosion and sedimentation control practices.

**Erosion Control Mix (ECM):** A heavy mulch made of sand, gravel, stone, bark and wood fragments. The wood products in the mixture have longer fibers than regular mulch which, and when combined with gravel and soil, lock together to protect the underlying soil from erosion.

**Evaluator Toolkit:** A webpage available only to LakeSmart Evaluators and Coordinators that includes an updated evaluation form, Homeowner Questionnaire, examples of Homeowner Reports, training recordings, and outreach materials. URL should only be accessed by LakeSmart teams: [www.lakes.me/lakesmart-evaluator-toolkit](http://www.lakes.me/lakesmart-evaluator-toolkit)

**Flagged Evaluation:** A situation in a LakeSmart evaluation when the scoring does not accurately reflect Award eligibility. The Evaluator marks an evaluation as flagged to request further review.

**Great Ponds:** Lakes or ponds greater than 10 acres in size that are held by the State in trust for the public.

**Groundwater Recharge:** The process of downward surface water infiltration that replenishes groundwater resources.

**Homeowner Questionnaire:** A form that asks for a homeowner's contact information and a few property details that are helpful for the evaluation, including the length of shoreline frontage, lawn maintenance practices, septic system information, and permissions to use property photos and the homeowners name for LakeSmart education and outreach.

**Homeowner Report:** A document for the homeowner that is prepared by a LakeSmart Evaluator after the LakeSmart visit and contains photographs and site-specific recommendations for Best Management Practices to manage stormwater runoff.

**Impervious Surface:** Surfaces that do not absorb or allow rainwater to percolate into groundwater, increasing stormwater runoff from rain or storm events.

**Infiltration:** The process by which rainwater or stormwater is soaked up into the ground, eventually entering and recharging the groundwater. On its way, pollutants can be filtered by soils or extracted by plant roots.

**Invasive Plants:** Plant species that are not native to a given area, sometimes spread quickly, and may outcompete native plants and degrade wildlife habitat.

**Lake Coordinator:** An individual at a lake who acts as a point person for the LakeSmart team and a liaison with Maine Lakes. The Lake Coordinator oversees scheduling of evaluations, helps spread the word about LakeSmart, and may participate in or review evaluations and homeowner reports.

**LakeSmart Award:** Recognition given to lakeshore homeowners whose properties have met LakeSmart evaluation standards and have been recommended for an Award in the evaluation review process. LakeSmart homeowners are presented with two LakeSmart Award signs to post on their property. A LakeSmart property serves as a model for lake-friendly practices in the community.

**LakeSmart Commendation or Award Deferred:** A recognition for homeowners with properties that do not meet the minimum score in all sections of their LakeSmart evaluation but are encouraged to install recommended BMPs to work toward meeting standards for a future Award.

**LakeSmart Gold Status:** A recognition for lakes in Maine where at least 15% of lakefront residents have earned LakeSmart Awards.

**LakeSmart Hub Partner and Hub Coordinator:** LakeSmart Hub Partners are regional organizations that serve as administrators for Maine Lakes, providing training and support for volunteer Evaluators from lake and watershed associations in their service areas. Each LakeSmart Hub is managed by a Hub Coordinator, a staff member or experienced volunteer of the Hub organization.

**LakeSmart Standards:** Each section of the LakeSmart evaluation has LakeSmart standards for water quality protection that balance two considerations: (1) what could be achievable and generate widespread buy-in and participation from homeowners; and (2) what might ultimately be the most desirable for pollution reduction from a scientific perspective. Standards are scored during the LakeSmart visit.

**LakeSmart Visit:** During the LakeSmart visit, an Evaluator meets with a homeowner to assess whether their property meets the qualifications to earn a LakeSmart Award and, most importantly, to provide guidance about how to manage stormwater runoff and erosion to protect the lake.

**Littoral Habitat:** Habitat in the near shore shallow water area of a lake where light reaches the bottom. Well-buffered shorelines have been found to protect the wildlife and aquatic vegetation in this near shore area.

**Loon Smart Merit Award:** An additional merit that can be earned by homeowners who have received a LakeSmart Award and agree to adopt practices that protect loon habitat.

**Mandatory Shoreland Zoning Act:** A Maine law regulating development activities in the shoreland zone or 250 feet of the normal high-water line of lakes and ponds over 10 acres. Shoreland areas bordering freshwater wetlands, rivers, streams, tidal waters, and saltwater marshes are also regulated under this law.

**Native Plants:** The Wild Seed Project ([www.wildseedproject.net/faq/](http://www.wildseedproject.net/faq/)) describes native plants as “species of trees, vines, wildflowers, grasses, and ferns that grow regionally, with origins prior to colonization, and have coevolved over millennia with the region’s animals, insects, amphibians, bacteria, and fungi. Many of these native species depend on one another for survival and their interrelationships help sustain ecosystems”. Regionally often means within a given ecoregion, defined by the EPA as an area that contains similar environmental characteristics such as climate, vegetation, soil type, and geology. Plants native to an ecoregion in Maine are well adapted to their ecoregion’s climate, are more sustainable in a changing climate, provide habitat, shelter, and food for native wildlife, and require less maintenance.

**Native Sod:** Sold by the square foot, native sods have established root systems in a soil base and provide an instant groundcover for areas of bare soil that are prone to erosion.

**Natural Resources Protection Act (NRPA):** An Act administered by Maine DEP with the purpose of protecting or enhancing the recreational, historical, and environmental value of the natural resources in the State to present and future generations. The Act requires a permit from the Maine DEP for projects located in, on, over, and adjacent to protected natural resources, including Great Ponds, natural lakes larger than 10 acres or 30 acres if impounded by a dam, and freshwater wetlands.

**Nonpoint Source Pollution:** Pollutants that come from a combination of many small and diffuse sources over a large geographic area.

**Permit-by-Rule (PBR):** A streamlined permit process under the Natural Resources Protection Act through the Maine DEP that gives approval for small or limited projects. Applicants must agree to comply with prescribed standards for the proposed activities and a Permit-by-Rule Notification Form must be filed prior to beginning work.



**Phosphorus:** An essential nutrient for plant growth that occurs naturally in rocks, soils, and organic material. Excess phosphorus from stormwater runoff, failing septic systems, and lawn fertilizers can rapidly deteriorate water quality, disrupt natural ecosystem processes, and lead to algal blooms.

**Point Source Pollution:** Pollution coming from a single source, such as a pipe from a factory or sewage treatment plant, that directly discharges into a waterbody.

**Sediments and Sedimentation:** Sediments are eroded soil particles of sand, silt, clay. Pollutants are often bound to sediments carried in stormwater runoff. Sedimentation is the process by which eroded soil particles in runoff, often carrying nutrients such as phosphorus, settle out and are deposited.

**Slumping Shoreline:** Slumping shorelines have collapsed due to undercut banks, sometimes a result of frequent wave energy. Undercut banks and slumping are signs of an unstable shoreline.

**Soil Erosion and Sheet Flow, Rills, and Gullies:** The process of stormwater carrying away soil particles causes soil deterioration evidenced by sheet flow (overland flow downslope in a thin layer), rills (small rivulets), and gullies (larger channels).

**Splash or Raindrop Erosion:** This first part of the erosion process occurs when raindrops fall on bare ground and loosen soil particles that are carried by stormwater runoff.

**Stormwater Runoff:** Rainwater or snowmelt that flows over land or impervious surfaces.

**Survey123:** The LakeSmart database where completed evaluations are submitted and stored. Survey123 was developed in collaboration with Maine DEP.

**Turnover:** Lake turnover is a natural process that occurs in the spring and fall where the top surface layer of a lake mixes with the bottom layer, yielding uniform water temperature and nutrient density from the surface to the bottom of the lake.

**Undeveloped Watershed:** Watersheds without houses or roads and characterized by multi-layered forests of canopy and midstory trees, shrubs, ferns, groundcover, and duff.

**Vegetated Buffer:** An area of vegetation along the shoreline that catches sediment, intercepts rainwater, and reduces the amount of runoff reaching the lake, if it meets LakeSmart standards.

**Water Cycle:** The natural process whereby water moves through a loop from the sky to the land and back in various states of gas, liquid, or solid.

**Watershed:** The land area surrounding a lake that channels rainfall and snowmelt via creeks, streams, rivers, and groundwater into the lake.

**Youth Conservation Corps (YCC):** A summer employment program for high school students interested in working in natural resources. YCC groups install Best Management Practices such as waterbars, dry wells, rain gardens, and vegetated buffers to reduce nonpoint source pollution.

**319 Grants (Nonpoint Source Water Pollution Control Grants):** Funds from Section 319 of the Clean Water Act allocated by Maine DEP that help support communities in restoring or protecting waters identified as Nonpoint Source "Priority Watersheds". Grants fund the development and implementation of watershed-based plans.

# 11. APPENDICES

*The documents included here and other supporting materials are available for download on the LakeSmart Evaluator Toolkit webpage:*

[lakes.me/lakesmart-evaluator-toolkit](https://lakes.me/lakesmart-evaluator-toolkit)

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# 2023 LAKESMART HOMEOWNER QUESTIONNAIRE

Thank you for having a LakeSmart evaluation on your property! We are excited to visit your property, to discuss steps you can take to protect your lake, and to recognize what you have already done. Please complete this form and return to your evaluator prior to their visit.



You will receive a written report summarizing your LakeSmart evaluation with specific recommendations for your property. You don't need to be present during the site visit. Please share your preference:

- YES, I would like to be present during the site visit.
- NO, I will not be present during the site visit.

Evaluator Name & Phone/Email: \_\_\_\_\_

## HOMEOWNER CONTACT INFORMATION

Primary Homeowner Name(s): \_\_\_\_\_

Site Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email Address: \_\_\_\_\_

Preferred Mailing Address: \_\_\_\_\_

## PROPERTY DETAILS

1. Has this property been previously evaluated?  YES  NO
2. What year was the home built? \_\_\_\_\_ 3. How long have you owned the home? \_\_\_\_\_
4. Do you live here year-round?  YES  NO
5. Do you belong to a camp, road, or other lake organization? (if so, please list) \_\_\_\_\_  
\_\_\_\_\_
6. What is the estimated shoreline frontage of the property? \_\_\_\_\_

## PROPERTY MAINTENANCE

7. How often do you use herbicides and pesticides?  
 NEVER  RARELY (once or twice/year)  OFTEN (three or more times/year)
8. How often do you use fertilizer?  
 NEVER  RARELY (once or twice/year)  OFTEN (three or more times/year)
9. Do you mow grass? If so, where is your lawn mower blade set?  
 HIGH  MEDIUM  LOW  I DON'T MOW

## SEPTIC SYSTEM INFORMATION

10. Do you know where your septic tank and leach field are located?  YES  NO  
If yes, please describe/sketch where they are below. If you do not know, visit [lakes.me/septic](https://lakes.me/septic) for a link to a searchable database of septic permit applications, dating back to 1974.

11. Do you know when your septic system was installed?  YES; Year installed: \_\_\_\_\_  NO  
12. Do you know the size of your septic tank?  YES; Number of gallons: \_\_\_\_\_  NO  
13. Do you have a regular tank pumping schedule?  YES; Frequency: \_\_\_\_\_  NO

## LOON SMART MERIT AWARD

14. Will you take the 5 actions (see next page) for the Loon Smart Merit Award?  YES  NO  
15. Will you share these actions with three neighbors?  YES  NO

## PERMISSIONS

The LakeSmart program is a voluntary, educational, and non-regulatory program. Information collected through participation in the LakeSmart program will NEVER be used for regulatory purposes and will not be shared without expressed permission of the homeowner.

16. May we post your name/lake on our website for participating in the program?  YES  NO  
17. May we use photos for teaching/promotion (no names/addresses shared)?  YES  NO

**Thank you for scheduling a LakeSmart visit and taking this step to protect your lake!**

## LOON SMART MERIT AWARD

Maine Lakes has partnered with Maine Audubon to recognize LakeSmart homeowners whose practices protect loons and their habitat. Standards include both land use on the property as well as the practices and commitments of property owner(s).



- Loons are visual predators, so minimizing runoff and siltation to maintain water quality is critically important to their ability to fish and find food for their young.
- Loons are sensitive to disturbance, both on their lakeside nests and on the water. Being aware of where loons are and keeping a good distance away, especially in canoes and kayaks in wetlands and shallow water will help minimize stress.
- Loons nest right next to the water, where boat wakes can flood the nest and wash the eggs away. Keeping to headway speed as required in the 200' Boater Safety Zone will reduce that risk.
- Loons can pop up unintentionally in the path of oncoming boats. In fact, boat strikes are known to be one of the leading causes of adult loon mortality in Maine. Watching for loons while boating can help reduce this risk.
- Predators including skunks and raccoons can make quick work of loon eggs. Reducing attractants to keep these predators away from nesting areas will help improve overall nesting success.
- The ingestion of lead tackle and entanglement of loons in monofilament line are ever present problems for loons in Maine. Fish lead free and properly dispose of tackle and line to help keep our loon population healthy for years to come.

LakeSmart Awardees who qualify are given a Loon Smart sticker showing a loon and baby chick to add to their LakeSmart Award signs.

## FIVE ACTIONS TO PROTECT LOONS

To qualify for a Loon Smart Merit Award, adopt these 5 simple actions:

- 1) Fish lead-free
- 2) Remove monofilament line from the lake and its shoreline
- 3) Stay at least 200 feet away from loons and loon nests when boating
- 4) Maintain "no wake" speed within 200 feet of shore
- 5) Seal outdoor trash cans and feed pets indoors to deter predators





## 2023 LAKESMART PROPERTY EVALUATION

Date: \_\_\_\_\_

Property Owner Name(s): \_\_\_\_\_

Evaluator Name: \_\_\_\_\_

Coordinator Name: \_\_\_\_\_

Organization/Lake Association Name: \_\_\_\_\_

Waterbody Name: \_\_\_\_\_



### ATTACH HOMEOWNER QUESTIONNAIRE TO THIS SURVEY

#### PROPERTY OVERVIEW

Estimated **total** shoreland frontage: \_\_\_\_\_ feet  
(See Question 6 of the Homeowner Questionnaire):

Estimated shoreland frontage in front of **development footprint**: \_\_\_\_\_ feet

#### PHOTOS:

At least four representative photos must be submitted with the evaluation. Please keep the camera setting at a 1:1 ratio - don't use wide angle or zoom out. *Additional photos are helpful, especially for unique situations or for questions needing clarification.* If you FLAG the review, include photos of the issue. Photos should be submitted in Survey123. If not, photos may be submitted separately by email to your coordinator.

- Photo 1 – Shoreline from the end of the dock, looking left
- Photo 2 – Shoreline from the end of the dock, looking right
- Photo 3 & 4 – Representative buffer photos

Please include a brief description of additional photos submitted in Survey123.

## SECTION 1: DRIVEWAY AND PARKING AREAS

Within the development footprint

| Standard and Score  | Points                         |
|---|--------------------------------|
| a. Is the driveway defined?<br>0 Undefined    1 Somewhat defined    2 Well defined or no driveway   |                                |
| b. Is the parking area defined?<br>0 Undefined    1 Somewhat defined    2 Well defined or no parking area   |                                |
| c. Do shoulders and ditches around the driveway and parking area show signs of erosion?<br>0 Many major signs<br>1 Many signs, mix of major and minor<br>2 A few minor signs<br>3 No signs or N/A   |                                |
| d. Do the driving surfaces show signs of erosion?<br>0 Many major rills (0.5" deep or more)<br>1 Some major rills<br>2 A few minor rills (less than 0.5" deep)<br>3 No signs of erosion   |                                |
| e. If there is identified erosion (questions 1c and 1d), how much of the runoff is directed to an effective BMP?<br>0 None            1 Some            2 Most            3 All or no BMP needed<br><i>Loon Smart requires at least 2</i> |                                |
| f. Are there signs of grease or motor oil on the driveway or parking area?<br>0 Many or large signs    1 Some or small signs    2 No signs  |                                |
| <b>Total Available Points =15</b>   | <b>(11 to qualify) Total =</b> |

### Homeowner Talking Points:

✓Impermeable Surfaces

✓Surface Materials

✓Best Management Practices

### Comments:



## SECTION 2: OUTDOOR STRUCTURES

Within the development footprint (Structures within the buffer are evaluated in Section 5)

| Standard and Score   | Points                         |
|--|--------------------------------|
| a. Do you see signs of erosion from driplines of the main structure (camp/house)?<br>0 Many major signs                      1 Many signs, mix of major and minor<br>2 A few signs but all minor              3 No signs   |                                |
| b. Are there signs of erosion around any unattached structures (sheds/garages/patios/etc.) in the outdoor living area?<br>0 Many major signs                      1 Many signs, mix of major and minor<br>2 A few signs but all minor              3 No signs or N/A |                                |
| c. If there is erosion, how much is directed to an effective BMP?<br>0 None              1 Some              2 Most              3 All or N/A  |                                |
| <i>Loon Smart requires at least 2</i>  |                                |
| d. Does the homeowner follow a recommended septic pumping schedule?<br>(see Question 13 of the Homeowner Questionnaire)<br>0 No                      1 Yes   |                                |
| <b><i>If location of the leach field is unknown, score zero for questions e and f; skip to question g.</i></b>   |                                |
| e. How much woody vegetation is growing over the leach field?<br>0 A lot                      1 Some                      2 None   |                                |
| f. Does the leach field show any signs of malfunction?<br>0 Significant signs (strong odor, soft/wet ground, seepage of effluent)<br>1 Moderate signs (noticeably greener vegetation nearby)<br>3 No signs   |                                |
| g. If there is an outside heating oil tank, is it in good condition?<br>0 No, signs of rust/damage visible    1 Yes, good condition or N/A   |                                |
| h. If there is an outside heating oil tank, is it protected from falling ice and snow?<br>0 No, not protected                      1 No, but valve cover protected<br>2 Yes, entire tank and valve cover protected or N/A  |                                |
| i. Are chemicals stored under cover where they do not pose a threat to water?<br>0 No, chemicals out in open              1 Yes or N/A   |                                |
| <b>Total Available Points =19</b>  | <b>(13 to qualify) Total =</b> |

### Homeowner Talking Points:

✓Water Conservation

✓Septic Management

✓Erosion Control

### Comments:

## SECTION 3: OUTDOOR LIVING AREAS

Within the development footprint (paths/walkways through the buffer are evaluated in Section 5)

| Standard and Score  | Points                         |
|---|--------------------------------|
| <b>Paths and Walkways in the Development Footprint:</b>   |                                |
| a. Are the walking paths well-defined? 0 No 1 Yes (all or most)   |                                |
| b. Are there any signs of erosion along the walking paths?<br>0 Many major signs 1 Many signs, mix of major and minor<br>2 A few signs but all minor 3 No signs or N/A  |                                |
| c. Are walking paths that lead to the buffer mostly curved/winding?<br>0 No 1 Yes (all or most)   |                                |
| <b>Lawns:</b>   |                                |
| d. Is there a lawn that is being maintained (mowed, fertilized, etc.)?<br>0 Yes, large area of lawn, lots of maintenance<br>1 Some lawn, minimal maintenance<br>2 No lawn   |                                |
| e. Is stormwater flow over the lawn directed to a BMP?<br>0 None 1 Some 2 Most 3 All or no lawn   |                                |
| <b>General Use:</b>   |                                |
| f. Do you see pet waste in any outdoor areas?<br>0 Lots of waste 1 Some waste 2 No waste  |                                |
| g. Are boats stored in a designated area?<br>0 No 1 Some are and some aren't 2 Yes or N/A   |                                |
| h. Are areas of bare soil covered with duff or mulch?<br>0 No, all or almost all areas not covered<br>1 Mixed, but bare areas > covered areas<br>2 Mixed, but covered areas > bare areas<br>3 Yes, all/most areas covered |                                |
| i. Are there visible signs of erosion from the areas described in questions g and h?<br>0 Many major signs 1 Many signs, mix of major and minor<br>2 A few signs but all minor 3 No signs or N/A                          |                                |
| j. If there is erosion, how much is directed to an effective BMP?<br>0 None 1 Some 2 Most 3 All or no BMPs needed   |                                |
| <i>Loon Smart requires at least 2</i>   |                                |
| <b>Total Available Points =23</b>   | <b>(16 to qualify) Total =</b> |

### Homeowner Talking Points:

✓Soil Compaction

✓Lake Friendly Lawn Care

✓Pet Waste

### Comments:

## SECTION 4: SHORELINE

Along the entire owned shorefront (the interface between the water and the land).

| Standard and Score   | Points                        |
|--|-------------------------------|
| a. Is the shoreline stable?<br>0 Mostly unstable, significant erosion<br>1 Moderately unstable, some signs of erosion<br>2 Mostly stable, minor signs of erosion<br>3 Completely stable, no signs of erosion   |                               |
| b. If people have placed rocks or riprap along the shoreline, is there vegetation covering/shading the stones most of the day?<br>0 No vegetation<br>1 Some vegetation and shading<br>2 Mostly vegetated/shaded<br>3 All vegetated/shaded or N/A                               |                               |
| c. Are there signs of erosion where the dock joins the shoreline/path?<br>0 Many major signs or a mix of major and minor signs<br>1 A few signs but all minor<br>2 No signs or N/A   |                               |
| d. If there are seasonal and/or year-round streams on the property, is there a vegetative buffer that protects seasonal and/or year-round streams?<br>0 No stream buffer or buffer is <10 ft deep<br>1 Stream buffer is 10-20 ft deep<br>2 Stream buffer is >20 ft deep or N/A |                               |
| <b>Total Available Points = 10</b>   | <b>(7 to qualify) Total =</b> |

### Homeowner Talking Points:

✓ Shoreland Zoning and Permits

✓ Living Shorelines

✓ Stream Buffers

### Comments:



## SECTION 5: SHORELINE BUFFER

Applies to the vegetative buffer between the development footprint and the lake

| Standard and Score  | Points                                |
|---|---------------------------------------|
| <p><b>a. Depth:</b> What is the average depth of vegetation along the shoreline buffer?</p> <p>0 &lt; 10 feet                      2 10-20 feet                      3 20-30 feet<br/>           4 30-50 feet                      5 50+ feet</p>   |                                       |
| <p><b>b. Slope:</b> How steep is the average slope from the edge of the buffer to the lake?<br/> <i>Steeper slopes require deeper buffers to be effective.</i></p> <p>-3 Very steep (difficult/impossible to walk up)<br/>           -1 Steep (similar incline as a staircase)<br/>           0 Flat/Gradual</p>  |                                       |
| <p><b>c. Layers:</b> An ideal buffer is made up of 5 layers: canopy trees, midstory trees, shrubs, groundcover, and duff. Looking across the buffer, are there:</p> <p>0 Two or fewer layers throughout most of the buffer<br/>           2 A mix of 3 or more layers throughout most of the buffer, tree layer not robust<br/>           3 A mix of 3 or more layers throughout much of the buffer, robust tree layer<br/>           4 Five layers present throughout much of the buffer</p> |                                       |
| <p><b>d. Breaks:</b> Does the buffer extend across the entire development footprint with no major breaks?</p> <p>0 Buffer has one or more major breaks (&gt;6' wide) of lawn, bare soil, etc. or there are any signs of erosion in the buffer<br/>           1 Buffer is mostly continuous but has 3 or more smaller breaks (&lt;6' wide), no signs of erosion<br/>           2 Buffer is continuous or has 1-2 winding/well-placed paths (&lt;6' wide), no signs of erosion</p>              |                                       |
| <p><b>e. Ground:</b> Is the ground surface uneven and conducive to infiltration of stormwater in low places?</p> <p>0 Ground surface is smooth<br/>           1 A few low/uneven places that capture water<br/>           2 Many low/uneven places that capture water<br/>           3 Ground is uneven, with hummocks and depressions throughout</p>   |                                       |
| <p><b>f. Erosion:</b> Do you see any signs of erosion around structures, paths or stairs in the buffer?</p> <p>0 Many major signs                      1 Many signs, mix of major and/or minor<br/>           2 A few minor signs                      3 No signs or N/A</p>  |                                       |
| <p><b>Total Available Points = 17</b><br/> <i>Loon Smart requires at least 14</i></p>   | <p><b>(12 to qualify) Total =</b></p> |

### Homeowner Talking Points:

- ✓Native Plants
- ✓Reducing Impact of Rain
- ✓Significance of Slope

### Comments:

**SCORING** (Note: Awards must be reviewed **BEFORE** signs are distributed!)

| Section | Name                       | Standard | Score | Qualify? (y/n) |
|---------|----------------------------|----------|-------|----------------|
| 1       | Driveway and Parking Areas | 11/15    |       |                |
| 2       | Outdoor Structures         | 13/19    |       |                |
| 3       | Outdoor Living Areas       | 16/23    |       |                |
| 4       | Shoreline                  | 7/10     |       |                |
| 5       | Shoreline Buffer           | 12/17    |       |                |



**FLAG:** This property needs additional review. The scoring does not accurately reflect the status of the property regarding award eligibility. (Please elaborate below.)

**NOTES:**

**SECTION 6: LOON SMART MERIT AWARD**

| Loon Smart Standards  | Yes/No |
|---|--------|
| a. Did homeowner answer “yes” to the two Loon Smart questions on the Homeowner Questionnaire? |        |
| b. Did homeowner score at least a 2 on Standard 1.e?  |        |
| c. Did homeowner score at least a 2 on Standard 2.c?  |        |
| d. Did homeowner score at least a 2 on Standard 3.j?  |        |
| e. Did homeowner score at least a 14 for Section 5: Shoreline Buffers?                        |        |
| Does homeowner qualify for Loon Smart Award?  |        |

**EVALUATOR DATA:** Use decimals for time (e.g. 90 minutes = 1.5, 75 minutes = 1.25, etc.) For mileage, round off to nearest whole number.

Hours spent on Survey, including speaking with homeowner prior to survey:

Hours spent travelling to and from the site:

Hours spent writing to homeowner and reporting to your Coordinator:

**Total Time Spent Completing This LakeSmart Visit:**

Mileage to and from survey site:



# LAKESMART STANDARDS *and* BEST MANAGEMENT PRACTICES

Circle any standards of concern along with BMP recommendations for homeowners. BMP technical fact sheets can be found at [lakes.me/BMPs](http://lakes.me/BMPs). Refer to Evaluator Training Manual or email lake coordinators or [lakesmart@lakes.me](mailto:lakesmart@lakes.me) for other resources or recommendations.

## 1. DRIVEWAYS & PARKING AREAS

### Standards

- Driveways and parking areas defined
- No signs of erosion or
- Erosion directed to effective BMPs
- No signs of grease or motor oil

### BMPs

- A. Resurface with gravel and crown/slant to shed water
- B. Divert runoff with a rubber razor, open-topped culvert, turnout, waterbar, or berm/swale
- C. Install culvert for large flows to deliver water under drive to catch basins
- D. Add gravel/vegetation to ditches
- E. Direct runoff to vegetated areas or catch basins where it can be absorbed.
- F. OTHER:

## 2. OUTDOOR STRUCTURES

### Standards

- Roof runoff captured and infiltrated or
- Any erosion directed to effective BMPs
- Septic tank regularly pumped
- Leach field functional, no woody vegetation
- Outside oil tanks in good condition/protected
- Chemicals stored safely

### BMPs

- A. Install infiltration trench
- B. Add crushed stone, mulch, plantings at dripline
- C. Install gutters, downspouts, rain barrel, drywell, rain garden to capture water
- D. Install vegetated swale to divert runoff
- E. Pump septic tank per septic service recommendations
- F. Clear woody vegetation from on/around leach field
- G. OTHER:

## 3. OUTDOOR LIVING AREAS

### Standards

- Paths well defined, winding, no erosion
- Lawn minimized/low maintenance
- No pet waste
- Boats stored in designated area
- Bare soil areas covered with mulch/duff
- No signs of erosion or
- Erosion to effective BMPs

### BMPs

- A. Wind paths, cover with ECM, crushed rock, etc.
- B. Install infiltration steps, rain garden, waterbar, vegetated swale to manage runoff
- C. Define recreation and boat storage areas.
- D. Plant vegetation in bare areas
- E. Minimize lawn, mow high, leave cuttings
- F. Use fertilizer only after soil test or with new lawn but not within 25' of lake
- G. Use herbicides/pesticides sparingly, if at all
- H. Cover soil with mulch in cultivated areas
- I. Eliminate water channels by infiltrating/diverting at source
- J. OTHER:

## 4 & 5. SHORELINE & BUFFER

### Standards

- Stable shoreline, bank not undercut by waves/ice
- Shaded riprap (if present)
- No erosion at dock
- Deep, multi-layered vegetative buffers
- Minimal breaks; healthy canopy
- Ground uneven
- No signs of erosion

### BMPs

- A. Enlarge buffer with native plants, live stakes, ECM over bare soil
- B. Plant different layers for future growth
- C. Reduce breaks, wind paths, install BMPs for erosion
- D. Reinforce where dock meets path with stones, water bar, crushed rock, plants
- E. Let duff accumulate
- F. Treat slumping shore with plants/live stakes, with woody shrubs behind to stabilize. Use riprap as last resort (riprap always needs a permit)
- G. Leave plants, stones and rocks in the shallow near-shore area
- H. OTHER:







# LAKESMART PROPERTY EVALUATION: Explanations & Talking Points



This document is a summary of the “why” behind the questions asked in each section of the LakeSmart Property Evaluation, as well as information for Homeowner Talking Points.

Think of the property visit as a series of teaching moments when the real learning happens! Whether the homeowner is present for the evaluation or the Evaluator summarizes their findings afterwards in a second walk-through, this is where the theory of lake protection becomes a reality!

## SECTION 1: DRIVEWAY AND PARKING AREAS

Stormwater runoff from driveways and parking areas can wash pollutants that may be attached to eroding soil into the lake. Properly maintaining driveways and parking areas, as well as directing any runoff into areas where it can be absorbed, is important for the health of our lakes. LakeSmart driveways and parking areas are free of erosion and do not convey stormwater runoff to the lake.

### A. Is the driveway defined?

Driveway and parking areas should be well defined and used consistently, while other areas are not used for driving/parking. This helps minimize the amount of compacted soil on the property. Compacted soil cannot soak up stormwater runoff, thereby increasing runoff and possible erosion.

### B. Is the parking area defined? (See 1a above)

### C. Do the shoulders and ditches around the driveway and parking area show signs of erosion?

Look for rills, ruts, or channeling as evidence of soil being washed away.

### D. Do the driving surfaces show signs of erosion?

Look for rills, ruts, or channels created by stormwater runoff.

### E. If there is identified erosion (questions 1c and 1d), how much of the runoff is directed to an effective Best Management Practice (BMP)?

An effective BMP promotes the diversion, infiltration, and treatment of stormwater runoff. BMPs include the use of waterbars, open-top culverts, rubber razors, or fire hose diverters to direct runoff into a vegetated buffer for infiltration.

### F. Are there signs of grease or motor oil on the driveway or parking area?

Motor oil and grease are harmful to aquatic animals and can contribute pollutants into the groundwater and the lake.

## Homeowner Talking Points – Section 1:

### ✓ Impermeable Surfaces

Impermeable surfaces do not allow infiltration or absorption of stormwater. Paved or



hardscaped surfaces are impermeable. Compacted soils in driveways and parking areas and even well-maintained lawns can also act as impermeable surfaces.

#### ✓ **Soil Compaction**

Healthy non-compacted soil freely infiltrates runoff into the ground. However, compaction of soil by cars or continual foot traffic makes the ground impervious to infiltration, thereby promoting erosion. It is for this reason that LakeSmart encourages clear delineation of parking areas and foot paths so that people will follow clearly marked areas for parking and walking.

#### ✓ **Best Management Practices for Section 1**

If eroded, resurface driveway/parking area with gravel and crown or slant these surfaces to shed water. Divert runoff with a rubber razor, open-topped culvert, swale, turnout, or waterbar. Large flows may need a culvert to deliver water under driveway to catch basins. Ditches may need gravel or vegetation. Runoff should be directed to vegetated areas or catch basins where it can be absorbed.

#### **BMP informational sheets:**

[Waterbars](#)

[Open-Top Culverts](#)

[Fire Hose Diverters](#)

[Rubber Razors](#)

[Turnouts](#)

## **SECTION 2: OUTDOOR STRUCTURES**

### **(Within the development footprint)**

A tremendous amount of rainwater flows off roofs! Roof runoff can generate erosion at the driplines, which can carry soil and other pollutants to the lake. Activities and products used in the home, as well as malfunctioning wastewater treatment systems, can contribute pollutants to groundwater and the lake.

#### **A. Do you see signs of erosion from driplines of the main structure (camp/house)?**

Check to see if soil has been washed away from the dripline in channels, or narrow trenches, caused by falling water from the roof. A moderate rainstorm of ½ inch over a 25x40 foot roof produces 300 gallons of water!

#### **B. Are there signs of erosion around any unattached structure (sheds/garage/patios/etc.) in the outdoor living area?**

Check to see if soil has been washed away from driplines in channels or narrow trenches caused by water falling from roofs or running off patios.

#### **C. If there is erosion, how much is directed to an effective BMP?**

Ideally, all runoff is directed to a BMP for effective infiltration. Examples of BMPs include gutter-drywell, infiltration trench, and rain garden.

#### **D. Does the homeowner follow a recommended septic pumping schedule?**

Regular septic pumping is the single most important maintenance item to keep a septic system working properly. Not only does this protect the lake, but it also saves money by extending the life of the system.

#### **E. How much woody vegetation is growing over the leach field?**

The roots of trees and large shrubs will intrude into the leach field's piping, compromise its function, and shorten its life. Grasses, ferns, and groundcover are okay to leave growing over the field. If you don't know where your septic system is located, you can search for your septic plan on the state's database. A link can be found at [www.lakes.me/septic](http://www.lakes.me/septic). You can also check your yard for a tank or leach field venting pipe or tank lid. Septic system service providers can help locate the tank.

#### **F. Does the leach field show any signs of malfunction?**

Strong odors, wet ground, seepage of effluent, and noticeably greener vegetation are signs of malfunction.

#### **G. If there is an outside heating oil tank, is it in good condition?**

Do you see any signs of rust or deterioration on the tank? Age, exposure to weather, corrosion, or poor installation or maintenance can adversely affect a heating oil supply tank. The result can lead to spills that can cause groundwater, surface water and soil contamination, personal property damage, and lower property values.

The LakeSmart Program only evaluates oil tanks and not propane tanks, as propane is less of a threat to the lake. Although propane is heavier than air, if there is a propane leak outdoors, the gas quickly dilutes in the atmosphere and dissipates through wind and other environmental factors.

#### **H. If there is an outside heating oil tank, is it protected from falling ice and snow?**

Falling ice can puncture the tank and cause an oil disaster that can flow to the lake!

#### **I. Are chemicals stored under cover where they do not pose a threat to water?**

As with heating oil tanks, chemicals should not be stored in rusty or leaking containers, or under roof driplines where they could be damaged by falling water or snow/ice and pose a threat to the lake.

### **Homeowner Talking Points – Section 2:**

#### **✓Septic Management**

Just one or two failing septic systems can adversely affect the health of a lake. Here are some tips for managing septic systems:

- Pump septic tank on a regular schedule, generally every 3-5 years, more often if a camp is rented out.
- Use water efficiently to avoid tank overflow.
- Do not use a garbage disposal grinder.
- Keep chemicals and additives out of the system.
- Keep your leach field free of intrusive (woody) plant roots.

#### **✓Water Conservation**

Septic tanks are limited in the amount of water they can hold at any one time. Excess water is a major cause of system failure. Too much water from laundry, dishwashers, toilets, baths, and showers may not allow enough time for sludge and scum to separate.

### ✓ **Erosion Control**

Eroded soil carries phosphorus with it and can load the lake with this nutrient that feeds excess algae growth. Erosion can be controlled by diversion of runoff into vegetated or mulched areas where it can infiltrate into the ground. Erosion can also be managed by heavily mulching areas where stormwater runoff flows with Erosion Control Mix (ECM) to stop the flow and allow infiltration.

### ✓ **Erosion Control Mix (ECM)**

Erosion Control Mix is different from the typical landscaping mulch. It is a chunky mix of composted bark, sand, gravel, stone, and wood fragments. It is much heavier than other types of mulch and its mixture of elongated fibers, gravel, and soil locks together to protect the underlying soil from erosion. Like other mulches, it also retains moisture, controls weeds, and improves the soil as it decomposes. It can be used over bare ground on paths, slopes and between plantings.

### ✓ **Best Management Practices for Section 2**

For severe runoff, install an infiltration trench. In most cases, add crushed stone, Erosion Control Mix and/or plants, install gutters, downspouts, rain barrel, drywell, and rain garden to capture water.

Pump septic tank per septic service provider recommendation. Clear woody vegetation from leach field and consult septic service provider about root incursion from trees with branches that overhang the field.

#### **BMP informational sheets:**

[Erosion Control Mix \(ECM\)](#)

[Dripline Trench](#)

[Infiltration trench](#)

[Rain Gardens](#)

[Rain Barrels](#)

[Drywells](#)

[Caring For Your Septic System](#)

## **SECTION 3: OUTDOOR LIVING AREAS**

### **(Within the development footprint)**

This is the area where family and friends spend time together outside. How this area is used, how much of the area is used, and how intensely it is used affects stormwater runoff patterns and the types and amounts of pollutants in the runoff.

#### **Paths and Walkways:**

##### **A. Are the walking paths well-defined?**

Well-defined paths direct foot traffic to social areas and the water access. Paths should not be wider than needed (maximum 4 to 6 feet wide). Directing foot traffic along pathways helps to confine soil compaction to a defined area and keeps other areas of the property in a natural condition to help soak up runoff. Soil compaction caused by foot traffic damages plant roots, reduces wildlife habitat, and does not absorb rain and runoff very well.

##### **B. Are there any signs of erosion along the walking paths?**

Rills, ruts, channeling, and gullies are indicators erosion of stormwater runoff.

If there are exposed tree roots present in the footpaths, this is strong evidence of soil



compaction and erosion. Paths covered with absorptive materials (ECM or crushed stone) promote infiltration and reduce erosion of bare soil.

**C. Are walking paths that lead to the lake mostly curved/winding?**

Curved paths can divert stormwater runoff off path surfaces into vegetated and natural areas where it is absorbed into the ground. Straight paths channel runoff and can increase the speed and amount of eroded material carried into the lake.

**Lawn:**

**D. Is there a lawn that is being maintained (mowed, fertilized, etc.)?**

Over time, lawn surfaces can become compacted, and compacted soil does not allow stormwater runoff to soak into the ground. The taller the grass, the deeper the roots. Deep-rooted lawns hold more soil in place, shade out weeds, and recover more quickly from droughts. Grass clippings left on the grass act as a natural fertilizer and help the soil retain moisture. Fertilizer washed into the lake speeds up plant and algae growth and may cause harmful algal blooms. Herbicides and pesticides can be harmful to fish, frogs, turtles, mussels, water birds and other wildlife.

**E. Is stormwater flow over the lawn directed to a BMP?**

Grass does not slow, absorb, or filter stormwater as well as an established buffer or other BMP.

**General Use:**

**F. Do you see pet waste in any outdoor areas?**

Pet waste contains nutrients that speed plant and algal growth in the lake and may contain bacteria and pathogens that can make the water unsafe for recreation.

**G. Are boats stored in a designated area?**

Boats should be stored on racks or blocks or inside structures. This allows groundcover vegetation to infiltrate runoff and reduces soil disturbance by concentrating the area receiving foot traffic (and therefore soil compaction). Additionally, storing boats off the ground keeps them in better condition!

**H. Are non-vegetated areas covered with duff or mulch?**

Stabilizing and covering all areas of bare soil will minimize the amount of soil worn away by foot traffic, wind, and rain, and reduce sediment and nutrients carried to the water that might contribute to plant and algae growth and harmful algal blooms. **Duff** is an important natural mulch that lies below the leaf litter and above the mineral soil and feels soft on the feet. It is full of fungus and decomposing plant materials such as pine needles and leaves. Thick areas of duff are soft to walk on and reduce the impact of raindrops on the soil and slow stormwater runoff to help it soak into the ground.

**I. Are there visible signs of erosion from the areas described in questions g and h?**

Rills, ruts, channeling are indicators of erosion from stormwater runoff.

**J. If there is erosion, how much is directed to an effective BMP?**

Ideally, all runoff is directed to a BMP for effective infiltration. Examples of BMPs are rain gardens, a vegetated buffer, and ECM.

## Homeowner Talking Points – Section 3:

### ✓ **Herbicides/Pesticides/Fertilizers**

Herbicides, pesticides, and fertilizers contain chemicals that will ultimately find their way into the lake. Fertilizers typically contain phosphorus, the primary food for lake algae. Too much algae growth can result in a catastrophic algae bloom. Studies have shown that Maine's soil generally has no need for added phosphorus. If fertilizer is to be used, look for zero-phosphorus options where the middle number is zero: nitrogen (N) – phosphorus (P=0) – potassium (K).

### ✓ **Lawns as an Impermeable Surfaces**

Lawns are considered impermeable surfaces in terms of infiltration. Their shallow roots do not resist erosion nearly as well as deep-rooted vegetation. It is still possible to protect the lake, reduce the size of your lawn, and still have a beautiful landscape. See the brochure - [Lakes Like Less Lawn](#).

### ✓ **Lawns and Mowing Practices**

Mowing practices can affect the shallow root depth of lawn grass. Allowing grass to grow long by mowing at the highest setting encourages a deeper root system. The taller the grass, the deeper the roots. Deeper-rooted lawns hold more soil in place, shade out weeds, and recover quickly from droughts. This is why LakeSmart recommends setting the mower bar at 3" or higher. In addition, leaving grass clippings on the lawn can be beneficial as a natural fertilizer and helps the soil retain moisture.

Consider dethatching the lawn and overseeding with clover, which is inexpensive, low-maintenance, and drought tolerant. This nitrogen-fixing legume provides free, lake-friendly fertilizer by adding nitrogen to the soil.

### ✓ **Soil Compaction**

Healthy, noncompacted soil and duff freely infiltrate runoff into the ground. However, compaction of soil by continual foot traffic makes the ground more impervious to infiltration, thereby promoting runoff and erosion. It is for this reason that LakeSmart encourages the clear delineation of foot paths.

### ✓ **Pet Waste**

According to the Environmental Protection Agency (EPA) pet waste is a non-point source pollutant that creates nutrients for weeds and algae that grow in waterways. EPA estimates that two or three days of droppings from a population of about 100 dogs could contribute enough bacteria to temporarily close a bay and all watershed areas within 20 miles of it to swimming and shell fishing.

### ✓ **Best Management Practices for Section 3**

Curve paths, cover with ECM, crushed rock, etc. Install infiltration steps, rain gardens, waterbars, a vegetated swale to manage runoff. Define recreation and boat storage areas. Plant vegetation in unused areas. Minimize the lawn, mow high, leave grass cuttings. Use fertilizer only after a soil test or with a new lawn. Use herbicides and pesticides sparingly, if at all. Cover soil with mulch in cultivated areas. Eliminate water channels by identifying the source and infiltrating or diverting to infiltration areas. Remember, wildlife needs food and shelter.

## **BMP informational sheets:**

[Paths & Walkways](#)

[Infiltration steps](#)

[Erosion Control Mix \(ECM\)](#)

[Waterbars](#)

[Rain Gardens](#)

## **SECTION 4: SHORELINE**

**(Along the entire owned shoreline – the interface between the water & the land)**

The land right next to the lake is one of the most important areas to implement lake-friendly living practices to keep runoff water and pollutants out of the lake.

### **A. Is the shoreline stable?**

If the bank of the shoreline is slumping, is undercut, or tree roots are exposed, the shoreline is not stable and likely contributes soil into the lake.

### **B. If people have placed rocks or riprap along the shoreline, is there vegetation covering/shading the stones most of the day?**

Vegetation will help stabilize shoreline rocks. Vegetation will also help keep shoreline rocks and shallow water cooler as rocks absorb heat from the sun and warm the waters near the shore. Vegetation is also beneficial for near-shore aquatic nurseries and wildlife, as it provides shade, protection from predators, and important habitat.

### **C. Are there signs of erosion where the dock joins the shoreline/path?**

Check that there are no signs of stormwater erosion at water access points.

### **D. If there are seasonal and/or year-round streams on the property, is there a vegetative buffer that protects seasonal and/or year-round streams?**

Protecting the water quality of streams helps protect the water quality of lakes. Stream buffers protect properties from erosion and flooding by stabilizing the stream bank.

Note that this standard only applies if a stream is present on a property.

## **Homeowner Talking Points – Section 4:**

### **✓ Shoreland Zoning and Permits**

The strip of land adjacent to every lake in Maine has special zoning requirements that regulate construction and soil disturbance. Your town's Code Enforcement Officer can give you the particulars of your lake's shoreland zoning ordinance. Typically, construction and soil disturbance within 100 feet of the lake requires a permit from the Maine Department of Environmental Protection. Your town's Code Enforcement Officer can provide guidance for obtaining a permit.

### **✓ Live Staking**

Live staking is an easy and inexpensive way to grow new woody plants along a lakefront where the soil is typically moist, and the setting is often sunny for at least a good part of the day. A live stake is a dormant cutting taken from an established plant. The cutting is typically about 2 to 3 feet long and is pushed into the soil or inserted into a pre-drilled hole 18 inches to 2 feet into the ground in the spring before the active growing season. Keep in mind that a 50% survival rate is considered successful for live-staked plants and there are only a few plant species that do well as live stakes.



### ✓ Stream Buffers

A stream buffer is a forested strip of land on both sides of a stream composed of trees, shrubs, herbaceous and woody-stemmed groundcover plants, and duff. Stream buffers clean and reduce stormwater before it reaches a stream bed by slowing and infiltrating runoff. Stream buffers also protect properties from erosion and flooding by stabilizing the stream bank. Protecting the water quality of streams helps protect the water quality of lakes.

### ✓ Riprap

A riprap shoreline consists of angular stones (typically 6-12" in size) underlain by nonwoven geotextile fabric to ensure soils do not erode underneath the riprap stone.

For ultimate stability, the addition of native plants and/or live stakes installed within riprap will ensure that your shoreline is stable (plant roots stabilize better than rock armoring). Planting within existing riprap will not only increase the longevity and effectiveness of the newly armored shore, but will provide shade, benefit wildlife, and increase the overall natural aesthetic of the shorefront.

The LakeSmart Program encourages vegetative approaches to managing shoreline erosion, with riprap considered only as a last resort. Riprap installation within the shoreland zone **ALWAYS** requires a permit. Shoreline riprap should only be installed by a contractor certified by Maine DEP in erosion and sediment control. Find certified contractors in your area here: [Contractors Certified in Erosion Control Practices](#).

### ✓ Best Management Practices for Section 4

Stabilize paths with mulch or crushed rock. Where the dock meets a path, reinforce with stones, water bar, crushed rock, plants. A slumping shoreline may be managed with plants together and planting woody shrubs upslope. Riprap can stabilize undercut banks too, but consider other options first and remember that riprap always needs a permit. Be aware that removing plants, stones, and rocks from shallow waters near shore is illegal.

### BMP informational sheets:

[Erosion Control Mix \(ECM\)](#)

[Live Staking](#)

[Lake Shoreline Riprap](#)

**Native Plants Lists:**

[Shade & Wet](#)

[Sun & Wet](#)

[Part Sun & Wet](#)

[Permitting](#)

[Planting & Maintaining Buffers](#)

[Shade & Dry](#)

[Sun & Dry](#)

[Part Sun & Dry](#)

## SECTION 5: SHORELINE BUFFER

### (Applies to the vegetative buffer between the development footprint & the lake)

The shoreline buffer is the last line of defense to protect the lake from stormwater runoff. This buffer is the continuous stand of natural vegetation growing along the shorefront. Buffers are important to both aquatic and terrestrial wildlife that live in or near the lake or rely on the lake ecosystem for survival. The deeper the buffer is and the more layers of vegetation it has, the better it will protect water quality. This section looks at only the part of shoreline buffer that is **downslope from the development footprint**. The development footprint on a property is the area that includes driveways and parking areas, structures, areas developed for outdoor use, pathways and access points, and any other non-natural area impacted by humans.

#### A. Depth: What is the average depth of vegetation along the shoreline buffer?

A **LakeSmart buffer should be at least 10 feet deep** running along the shoreline. Buffers soak up stormwater runoff, hold soil in place, and provide important wildlife habitat, and can, if sufficiently wide and tall, deter geese from visiting a property. Deeper buffers are always better.

#### B. Slope: How steep is the average from the edge of the buffer to the lake?

Sites with steep slopes are more prone to erosion as water travels faster and can carry more soil as it flows down steeper slopes to the lake. Fast-flowing water can increase the amount and impact of related erosion. While you generally can't change slope, steeper slopes need deeper buffers or other BMPs to "slow the flow" of rainwater. Practices that interrupt the flow of stormwater down a steep slope will slow the water's velocity and thus reduce erosive forces. For steeper slopes, the buffer should be deeper to slow the flow and increase the likelihood of infiltration.

#### C. Layers: An ideal buffer is made up of 5 layers: canopy trees, midstory trees, shrubs (3-6 feet), groundcover (0-3 feet) and duff. (Grass does NOT count as a layer!)

A **LakeSmart buffer has at least 3 layers of vegetation** and more are better. Multiple layers of vegetation provide the most protection by intercepting more rain. The deep roots of native plants help absorb rainwater and extract phosphorus and pollutants.

#### D. Breaks: Does the buffer extend across the entire development footprint with no major breaks (excluding access paths less than 6 feet wide)?

A continuous buffer is the last line of defense across the development footprint to protect a lake from stormwater runoff. A buffer densely populated with vegetation also minimizes the impact of rainwater falling directly on the ground and the potential for erosion.

#### E. Ground: Is the ground surface uneven and conducive to infiltration of stormwater in low places?

An uneven soil surface with hummocks (small mounds) and depressions allows rain and snowmelt to puddle and infiltrate. When the ground surface is graded, as when lawns are installed or around new construction, the surface is smoothed and surface runoff can travel more quickly toward the lake.

## F. Erosion: Do you see any signs of erosion around structures, paths, or stairs in the buffer?

Look for bare soil, rills, ruts, or channeling and recommend BMPs to mitigate.

## Homeowner Talking Points – Section 5:

### ✓ Buffer as the last line of defense

The shoreline buffer is the last line of defense to protect a lake from stormwater runoff. A LakeSmart buffer should be at least 10 feet deep, continuous across the development footprint, and made up of at least three layers of vegetation (tree canopy, understory, shrubs, groundcover, duff). On steeper slopes, the buffer needs more depth to protect the lake.

### ✓ Native Plants

Native plants are those that grow naturally in Maine, are acclimated to our local conditions, and require less maintenance than non-native species. Maine's terrestrial and aquatic wildlife rely on native plants. Native plants offer many benefits for pollinators such as nectar sources, shelter and nesting sites, as well as pollen. More and more nurseries are supporting the move toward native plants. But if you are having difficulty locating particular species, "near-native" plants (i.e., cultivars of natives) would be better than non-native plants.

The [Wild Seed Project](#) is a nonprofit organization with a mission to return native plants to the Maine Landscape and is an excellent resource for native plants that grow here.

### ✓ Invasive Plants

Invasive plants are non-native plants that spread aggressively in new environments, displacing native plants and compromising native habitats in the process. Japanese knotweed, Japanese barberry, and purple loosestrife are just a few of the invasive plants that have been introduced to Maine.

### ✓ The Importance of Slope

The slope of the bank may be the most important variable in determining effectiveness of the buffer in trapping sediment and retaining nutrients. The steeper the slope, the higher the velocity of overland water flow, the more nutrients they can carry, and the less time it takes these nutrients and other contaminants to pass through the buffer.

### ✓ Duff

Duff consists of organic material or plant litter (leaves, needles, twigs, etc.) that accumulates on top of the soil in a natural forest setting. Duff protects topsoil from erosion, nourishes the soil and plants, and helps trap and infiltrate stormwater runoff.

### ✓ Best Management Practices for Section 5

If the buffer is thin or shows patches of bare ground, add native plants, use live stakes, and consider adding Erosion Control Mix (ERM).

## BMP informational sheets:

[Erosion Control Mix \(ECM\)](#)

[Live Staking](#)

[Permitting](#)

[Planting & Maintaining Buffers](#)



**Native Plants Lists**

[Shade & Wet](#)

[Sun & Wet](#)

[Part Sun & Wet](#)

[Infiltration steps](#)

[The Buffer Handbook](#)

[Shade & Dry](#)

[Sun & Dry](#)

[Part Sun & Dry](#)

[Infiltration steps - Retrofit](#)

[Construction BMPs](#)



## Homeowner Report Template #1

*Thank you for participating in LakeSmart!*

Lake:

Home Owner:

Site Address:

Evaluators: Roy Lambert, Lakes Environmental Association

Evaluator contact:

Lake association:

LakeSmart Award Status: Award Confirmed

### Driveway and Parking Areas

#### What we look for:

- We want to be sure there is no runoff or erosion down or around the driveway or parking areas and, if there is runoff, that it is quickly directed to an area where it can be absorbed.
- We also look at the parking area to see if it is well-defined to limit vehicle traffic and soil compaction.

Findings: There are signs of significant erosion at the bottom of the parking area next to the garage. Discussion with the property owner suggests that some of these signs may result from winter plowing in this area.

Recommendations: We suggest consideration be given to creating a turnout approximately 20 feet below the end of the parking area (immediately north of the granite bench) to divert runoff flow below the parking area into the adjacent highly vegetated area to the north. Creation of this turnout may require simply raking the leaves in this area; if more is required, it appears that digging in this area is not within the 100-foot shoreland zone where permitting would be required.

Attached to this report is a photo of a turnout created on a hiking trail. It illustrates the principle of flow diversion intended for the suggested turnout.

### Outdoor Structures

#### What we look for:

- A tremendous amount of water runs off roofs. We want to make sure that there is no erosion being generated on the ground at the roof driplines. To achieve this end, we want to make sure that any water that is coming off the roof is either immediately absorbed at the dripline or is being quickly directed to an area where it can be absorbed.
- We also look at the septic system to see if there is any woody vegetation growing atop the distribution field (also called the leach field) where root intrusion might cause it to malfunction. We also check for any obvious signs that the field is not working like soggy ground or a telltale smell.

Findings: There is no indication of septic system malfunction. We note however that there is not presently a regularly scheduled pumping of the septic tank.





**Recommendations:** We suggest establishing a 4-year scheduled pumping of the septic tank with your service provider. This schedule will assure that pumping occurs sufficiently to avoid damage to the septic system, with the catastrophic cost that might result.

## **Outdoor Areas**

### What we look for:

- We are looking for any erosion or runoff and the quick diversion of any water flow to an area where it can be absorbed.
- We are also looking to see if most of the ground is covered with vegetation or, if not, by effective absorbing material such as duff or mulch. Vegetation resists erosion, infiltrates water, and extracts nutrients; duff and mulch offer only the first of these two benefits.
- We also look for well-defined footpaths. Without well identified paths, people walk everywhere, compacting the soil and preventing vegetation from naturally generating. Clearly marked paths provide visual direction to people about where you want them to walk.
- We are looking for footpaths surfaced with absorptive material such as mulch or crushed stone; doing so promotes infiltration so that the path does not allow water flow.
- We are looking for meandering footpaths, i.e., footpaths which divert any water flow off the path, rather than becoming an easy route for water flow to reach the lake.

**Findings:** We did not identify any concerns applicable to this section.

**Recommendations:** None

## **Shoreline Buffer and Water Access**

### What we look for:

- We look at the entire shoreline for its stability and for the robustness of the plant buffer. Lakes and their water quality like extensive plant buffers. That is why the 250' shoreline zoning requirements were put in place (and particularly the most stringent protection offered the first 100' of shoreline), to protect that buffer. A strong buffer consists of an extensive tree canopy, shrubs, and other 3' tall plants, and natural vegetated groundcover or duff; with limited open space areas – and no breaks (other than appropriate footpaths) in the buffer along the shoreline.
- The robustness of the lakefront vegetated buffer is evaluated based on the interplay of (1) the depth of the buffer; (2) the extent of the various tiers of vegetation it provides; and (3) the average steepness of the land in the buffer.

**Findings:** The lakeshore vegetated buffer is the best protection any property can provide to the lake. The vegetated buffer on this property is deep and generally robust, with the limited exceptions noted below.

LakeSmart is a program of Maine Lakes ([www.lakes.me](http://www.lakes.me)) sponsored by the Lakes Environmental Association ([www.mainelakes.org](http://www.mainelakes.org)) in its service area.

We noted an area between the lawn wall and the lake in the northern portion of the vegetated buffer which lacked profuse robust shrubs equivalent to those in the southern portion of the lakeshore buffer. We also noted a general absence of tall shrubs or mid-story trees throughout the portion of the buffer between the house and the lake.

Recommendations: Consideration should be given to planting tall shrubs or mid-story trees in the buffer and to planting additional low shrubs (e.g., low bush blueberries) in the northern portion of the buffer.

*Overall, this is a very loved property of which you should be proud. We hope you will choose to get started with several suggestions made in this report. If you do, your property will be even more lake friendly. We will support your effort, with repeat evaluations, and information. However, awards notwithstanding, it is change that promotes change. Our experience has demonstrated making a visual positive change on your property is more likely to influence a neighbor than if no change was needed at all.*

*Please remember: the Moose Pond Association has a grant subsidy program (50% of project cost, up to \$1000) for costs incurred in undertaking lake protection actions. You can learn more from the Association about this program by contacting it directly.*

*Please let me know if you have any questions or feedback for us.*

*Thank you for participating in LakeSmart!*

LakeSmart is a program of Maine Lakes ([www.lakes.me](http://www.lakes.me)) sponsored by the Lakes Environmental Association ([www.mainelakes.org](http://www.mainelakes.org)) in its service area.







*Thank you for participating in LakeSmart!*

**Name:** -----

---

**Location:** Georges Pond Road, Franklin, Maine 04634

---

**Reviewers:** -----

---

**Date of Evaluation:** May 28, 2022

---

**Status:** Commendation

---

Dear ----:

Thank you for allowing us to survey your property on Georges Pond for LakeSmart, one of the most effective lake protection programs available today and the flagship program of Maine Lakes. The alum treatments, applied in 2020 and 2021, produced record water clarity levels - almost 25 feet, the best since 1977 when records were first kept. However, this success will not last if we do not *also* address stormwater runoff, which carries phosphorus from each of our properties into the pond. Phosphorus is what fuels algal blooms and LakeSmart addresses stormwater runoff! Also, LakeSmart evaluations play a critical role as we apply for grant funding to address issues in our watershed.

Like many of us, your family has a rich and sentimental history on Georges Pond. We loved hearing about your family and friends enjoying Georges throughout the years, and the pictures you showed us were fun and informative. We hope our collective efforts to restore Georges will make a difference in the legacy we leave for future generations.

We sincerely appreciate your desire and commitment to protect the pond and your willingness to consider any recommended Best Management Practices (BMPs). BMPs are lake friendly techniques to slow, spread, capture or infiltrate stormwater to turn it into groundwater before it can harm the lake.

LakeSmart reviews how stormwater runoff is captured throughout the property in five sections: **Driveway and Parking Areas; Outdoor Structures; Outdoor Areas; Shoreline; and the Shoreline Buffer.**

Each of us can make improvements to benefit our pond, and we *Commend* you for the efforts already taken on your property and your support of the GPA. In order to earn the highest LakeSmart recognition, please continue to build up your shoreline buffer, which protects water quality by slowing and infiltrating stormwater runoff and by stabilizing the shoreline.

Remember, the following Best Management Practices (BMPs) are *only suggestions* to further enhance your property and protect our pond. Participating in our current 319 Grant can provide even more suggestions and funding. If you do make improvements to your property, please consider taking photos and sharing them with us. Not only will your efforts provide inspiration for others, but it will also document our collective community effort to fix the lake. All improvements, large and small, help protect our pond!

## Section 1: Driveway and Parking Areas

Overall, this section looks good! We did not find any erosion of the driveway or parking surfaces or shoulders. The driveway is well-defined, but the parking areas closer to the camp could be better defined with large rocks or logs to indicate where vehicles should park. LakeSmart likes to limit parking areas for vehicles, so that soil in the yard does not become compacted. Compacted soil cannot readily absorb stormwater runoff. You mentioned concern about the dip at the driveway entrance which we will address with our grant consultant when she visits Georges.

Logs or rocks can help define and limit parking spaces.



---

## Section 2: Outdoor Structures:


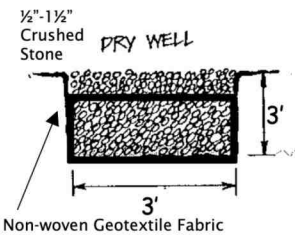


### Structures:

A moderate rainstorm of  $\frac{1}{2}$  inch over a 25x40 foot roof produces 300 gallons of water. However, recently we have had rainstorms of *several inches* at a time - a *lot* of water all at once! While there are no significant issues with erosion from roof runoff, remember grass has a shallow root system that does not readily absorb stormwater.

Roof runoff at the back of the camp appears to come off of the gutter on the right side (as you face the pond) and flows toward the pond. We talked about putting a rain garden near the downspout to help retain and infiltrate rain water. Another alternative is to put a dry well under the gutter downspout to capture the roof runoff, rather than have it course its way to the pond. We don't see the same signs of runoff on the left back side of the camp.

You have some beautiful ferns growing in front of the porch on the pond side! We encourage you to let these thrive and spread across the entire span, including the shorter section beside the porch door. These plants act as a rain garden to absorb roof runoff, while adding natural beauty to your landscape.



|  |  |  |   |
|--|--|--|---|
| <p>A rain garden with some of your hardy ferns could help absorb and infiltrate stormwater from the gutters.</p> | <p>A dry well is another alternative to help infiltrate stormwater. On this corner of the camp, you can see where the stormwater is heading toward the pond.</p> | <p>Spread out these beautiful ferns across the entire roof dripline.</p>           | <p>More hostas or ferns under this roof dripline will help protect the pond.</p>    |
|                                 |   |  |  |

**Helpful Resources:**

- [Rain Gardens](#)
- [Dry Wells](#)

**Septic System:**

We note that you had your septic tank pumped in August, 2020 and have blocked off vehicle access to your leach field. Both actions are excellent! Driving or parking over any part of the septic system (tank or leach field) can result in broken pipes or a cracked tank. As we discussed, there are some small trees growing on the leach field which should be removed to prolong the life of the leach field. Roots from trees can grow into the perforated pipes and interfere with the proper functioning of the leach field, resulting in an expensive fix.

Getting the septic tank pumped is the single most important maintenance item to keep a septic system working properly, followed by keeping the leach field free of woody vegetation. LakeSmart suggests that the septic tank be pumped on a regular schedule, usually every 3-5 years for a year-round home, and more often if the camp is rented out. We have learned that just one or two failing septic systems can adversely affect the water quality of Georges Pond.

**Helpful Resources:**

- [Septic System Maintenance](#)
- [Septic System Inspection](#)
- [Landscaping over Septic Leach Fields](#)



### 3: Outdoor Areas:

Thank you for not using herbicides, pesticides or fertilizers which ultimately find their way into the pond. Lawns typically have very shallow root systems and do not infiltrate runoff into the soil well. Allowing grass to grow long (by mowing at the highest setting - 3" or higher) encourages a deeper root system. Depending on how much of the lawn area your family uses for outdoor recreation, consider reducing the footprint of the lawn by letting some areas naturalize with native plants. Also, let the duff (pine needles and leaves) accumulate throughout the property as it helps slow and filter stormwater. LakeSmart's motto is, "Take a break; Put down the rake; Save the lake!"

Although we don't see any problematic signs of erosion in this section, one suggestion is to add some defined paths to direct foot traffic to social areas and the water access. Directing foot traffic with pathways helps to reduce soil compaction by keeping other areas of the property in a natural condition to help soak up stormwater. An easy way of establishing a protective path is with Erosion Control Mulch (ECM). ECM is a chunky mix of composted bark, sand, gravel, stone and wood fragments which locks together to protect the underlying soil from erosion and absorbs storm runoff. It can be used on paths, slopes and between plantings, and can help control weeds and improve soil as it decomposes. ECM is different from garden mulch which can easily be washed away. If you need help locating ECM, let us know.

We also discussed storing boats in a designated area on racks or simple sawhorses. This allows ground vegetation to infiltrate runoff and reduces compaction of soil.

### Helpful Resources:

- [Paths and Walkways](#)
- [How ECM is different from other mulches](#)
- [Erosion Control Mix](#)
- [Lakes Like Less Lawn](#)

|  |  |
|--|--|
| <p>Defined pathways can direct foot traffic through the yard to water access points (dock and beach), reducing soil compaction throughout the yard allowing for absorption of runoff. Naturalize the yard with native plants as much as possible to protect the pond..</p> | <p>A simple solution for boat storage. Sawhorses would work, too.</p>                |
|   |  |




**Section 4: Shoreline**

The area along the entire owned shorefront is the interface between the water and the land. It is one of the most important areas to implement lake-friendly living practices to keep runoff water and pollutants out of the lake.

The far left and far right areas of your property are exemplary of an ideal shoreline! We realize that it is also somewhat impractical for lakeside living! Still it is up to us to protect our pond as much as possible if we want future generations to enjoy what we have now. Consider expanding the vegetation from the edges of your property as much as possible, while still allowing access and a beautiful view. We encourage a “filtered” view of the Pond as the “LakeSmart view”.

There is an undercut shoreline present with leaning trees and exposed tree roots. The tree trunk your husband placed under the lip acts as a protective barrier against onshore wave action! Eventually the leaning trees on the bank will fail and you could lose some land when that happens. For this reason, we recommend planting saplings as the next generation of trees to replace the leaning trees. Do not cut down trees along the shoreline as their deep roots hold the bank, absorb stormwater, and their canopy provides protection from driving rain that can erode soil. Consider adding native plants along the shoreline to reinforce the bank.

The entrance to the dock shows minor erosion as you step from the grass onto the dock. We will ask our 319 grant administrator to look at this to see if an infiltration step would help stabilize this area.

|  |  |   |
|--|--|---|
| <p>The trees on the far left and far right of your property represent the <i>ideal</i> shoreline.</p> <p>Selecting appropriate native plants can help protect the pond without losing your beautiful view.</p> | <p>The undercut shoreline is evidenced by leaning trees and exposed roots, but the deep root structure helps hold the bank. Consider planting saplings for the next generation of trees. Other ground cover and native plants can help, too.</p> | <p>An example of infiltration steps to the dock at ---- ----’s camp, done with 319 Grant funding in 2021.</p> |
|   |    |                          |

**Helpful Resources:**

- [Infiltration Steps -retrofit](#)
- [Infiltration Steps - steep slopes](#)



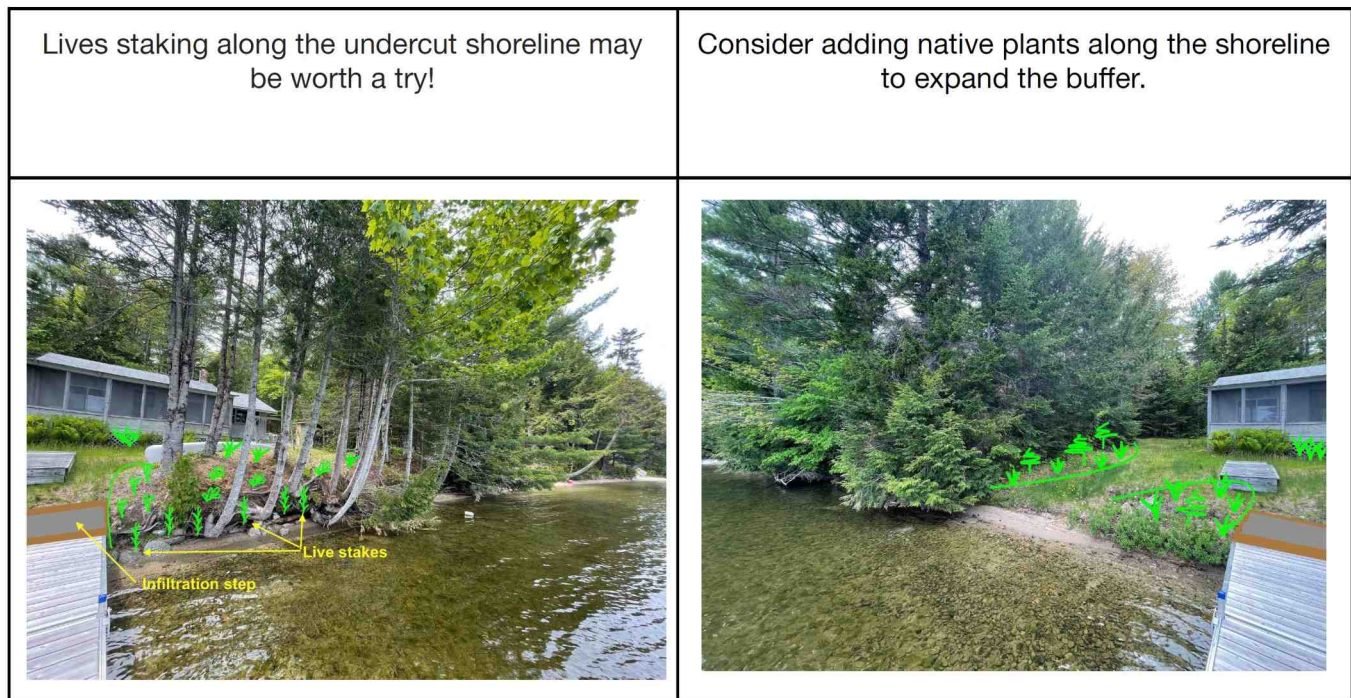
## Section 5: Shoreline Buffer

This section applies to the vegetative buffer between the *development footprint* (which includes the driveway, parking areas, structures, yard, and access points) and the lake. This buffer is the continuous stand of natural vegetation growing along the shoreline. It is the last line of defense protecting our pond from stormwater runoff. Buffers are also important to both aquatic and terrestrial wildlife that live in or near the lake or rely on the lake ecosystem for survival.

The ideal LakeSmart buffer slows and absorbs rain and stormwater and has five layers of vegetation - canopy, midstory, shrubs, ground cover, and duff (pine needles and leaves). The buffer should be at least 10 feet deep with narrow access points to the water and permeable, curving paths. Plants should be mostly native or native-friendly. LakeSmart always recommends “*beefing up the buffer*” by planting saplings and shrubs anywhere the buffer appears thin, allowing the next generation of trees and shrubs to grow in the buffer.

Our survey revealed that this section of your property needs the most attention in terms of protecting the pond. Like many of our camps, your camp is sited closer to the pond than current regulations would allow, but implementing LakeSmart BMPs (Best Management Practices) can protect the pond.

In general, the goal is to add depth to the buffer with several layers of plants which can be carefully selected to retain your gorgeous filtered view of the pond. The added plants and rain gardens would fully protect the pond. An easy BMP to try would be placing some live stakes in front of the undercut shoreline. Live stakes are dormant cuttings of pussy willow or dogwood varieties taken from an established plant. The cutting is typically 2-3 feet long and inserted into a pre-drilled hole 18 inches into the ground in the spring, before the active growing season. We have had some success with this technique in the last two years at a few camps around the pond. You can read more about live stakes in the link below. Let us know if you are interested as we hope to plant more live stakes next spring.

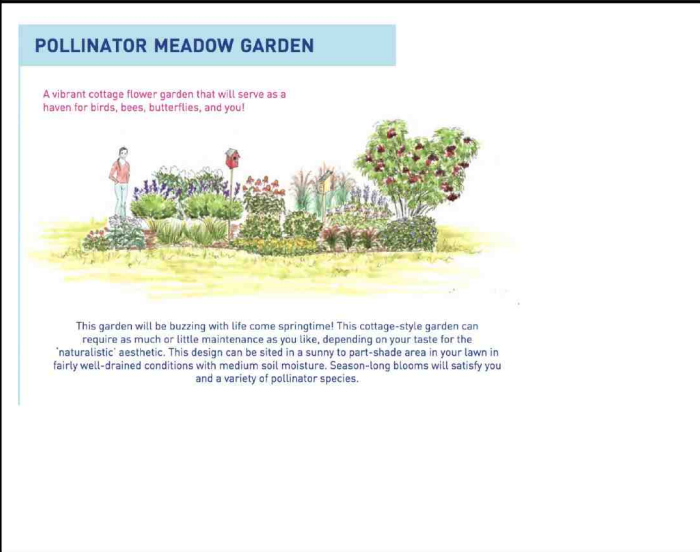
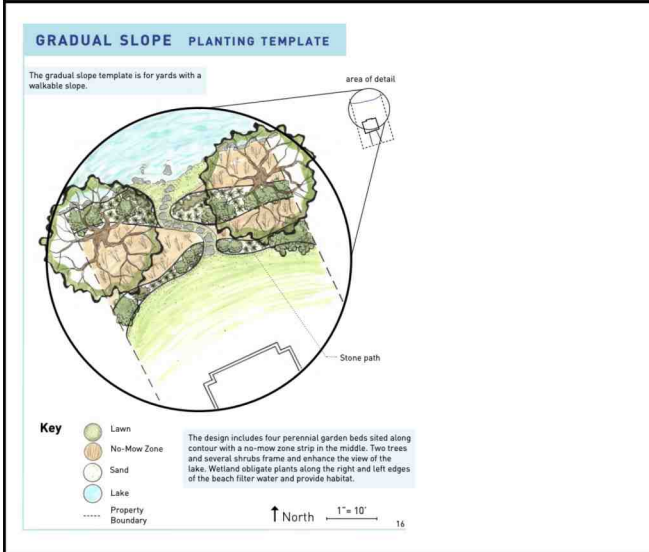


Vermont has a program called Lake Wise, which is modeled after LakeSmart. They published a wonderful pamphlet with some buffer designs. The pamphlet is linked below as a PDF for you to browse.



Planting template showing a curved path to the water and rain gardens on either side of the path.

Rain garden ideas from Lake Wise. Lake Wise is Vermont's version of LakeSmart. See the link, [Lake Wise pamphlet](#), for more ideas and design templates.



## Helpful Resources:

- [Lake Wise pamphlet](#)
- [Live Stakes](#)
- [Planting and Maintaining Buffers](#)
- [Buffer Plant List](#)
- [Plants for Sun and Dry Soil](#)
- [Plants for Part Sun and Dry Soil](#)

Some of these ideas may be good projects for our Phase 2 - 319 Grant. We will plan a visit with you this summer along with our Grant Consultant and draw up a proposal for you. You are under no obligation to execute any of the suggested plans, but if you do move forward, there is an opportunity to receive matching funds.

Thank you for allowing us to survey your property, for your consideration of the suggested BMPs, and for being a great steward of the pond. You can find lots of great information from the [Maine DEP](#) for all types of lake-friendly living practices - from roads to rain gardens.

Please don't hesitate to contact us if you have any questions.

With Sincere Appreciation,

-----  
LakeSmart Coordinator  
Georges Pond Association

"The greatest threat to our Pond is the belief that someone else will save it."  
(Adapted from a quote by Robert Swan, explorer.)

[GeorgesPondAssociation@gmail.com](mailto:GeorgesPondAssociation@gmail.com)  
GeorgesPondAssociation.org  
Facebook @GeorgesPondAssociation

June, 2022



## Job Descriptions for Volunteer LakeSmart Coordinators and Evaluators



The **LakeSmart COORDINATOR** has a deep knowledge of and commitment to LakeSmart, enjoys working with people, communicates effectively, and understands the importance of keeping accurate records.

The LakeSmart Coordinator is responsible for creating an interest in and demand for LakeSmart visits, ensuring visits take place in a timely and thorough manner, tracking evaluation outcomes submitted through Survey123, reviewing and making sure evaluation reports are prepared and delivered to homeowners, and overseeing follow up with homeowners, especially those working toward a LakeSmart Award.

The Coordinator is expected to maintain timely communications with volunteers and with participating homeowners to follow-up with progress toward installing Best Management Practice (BMP). It is helpful if the Coordinator becomes experienced at conducting evaluations.

Specific responsibilities:

1. Build teamwork, group knowledge, and program success by keeping volunteers informed about LakeSmart updates and developments, convening volunteer meetings and trainings, as needed, providing materials and guidance, and recognizing contributions made by team members.
2. Provide outreach about LakeSmart to the community. Tasks may be shared among team members as interest, skills, and time allow. For example, team members could reach out to real estate offices, set up a LakeSmart sign-up table at Town Meetings, fairs, or farmer's markets, make sure all LakeSmart awardees are recognized in association newsletters and local weeklies, and speak about LakeSmart to road associations and other local groups.
3. Field inquiries from homeowners and record requests for LakeSmart visits in a master list of participants by year.
4. Assign Evaluators to LakeSmart visits to conduct evaluations. Follow up with visits to ensure evaluation scoring, comments, and reports are thorough and timely.
5. Optional: Review and comment on evaluations in Survey123 prior to Maine Lakes review.
6. Record the result of the Maine Lakes final evaluation review and inform the Evaluator. Either the Coordinator or Evaluator will let the homeowner know about their LakeSmart status and send the homeowner report, relevant Best Management Practice (BMP) handouts, and a cover letter thanking them for participating in the LakeSmart program. A "thank you" note could also be sent to the homeowner immediately following the evaluation. LakeSmart Award signs for qualified properties are usually delivered by the Evaluator.



7. Send the names of LakeSmart Award Winners and Commendation recipients to the lake association.
8. Follow up with participating homeowners in subsequent months and years to help plan and encourage BMP installments to manage stormwater runoff.
9. Track property transfers requiring re-evaluations.

**LakeSmart EVALUATORS** are the front line of lake protection in the watershed. Evaluators deliver the knowledge and practices of lake protection to participating lakefront homeowners.

A LakeSmart Evaluator enjoys meeting people and understands the delicate task of bringing new understanding to homeowners unaware of the problem of nonpoint source pollution. As an Evaluator performs LakeSmart visits and communicates their findings and recommendations to homeowners, they become agents of the desired behavior change. They are expected to record their findings accurately and in a timely fashion in Survey123, to write a report highlighting findings and recommendations in positive and encouraging terms and document the visit with photos and notes. Maine Lakes can provide good examples of homeowner reports.

Specific responsibilities:

1. Participate in LakeSmart training and gain sufficient practice in performing evaluations to make reliable on-site judgments about sources of nonpoint source pollution and to recommend the BMP's to address them. All potential Evaluators should attend/watch the LakeSmart Training Courses and participate in an on-site practice evaluation with Maine Lakes staff or an experienced Evaluator at their home lake or a nearby lake. If this isn't possible before beginning to make visits, new Evaluators should shadow experienced team members to become familiar with the range of situations encountered on lakeshore properties.
2. Plan time carefully and don't overcommit. Enjoy making LakeSmart visits, meeting new neighbors, seeing other lakefront homes, and helping others and the lake.
3. Maintain proficiency by completing or participating in 5 or more LakeSmart visits each year, or approximately a 20-hour commitment over the course of the season (June-October).
4. Accept assignments for LakeSmart visits from the Coordinator and schedule visits promptly. Make sure the homeowner receives and completes the LakeSmart Homeowner Questionnaire prior to the visit and record their answers in Survey123.
5. Document the findings of the LakeSmart visit with photos and make notes in the narrative section to explain recommendations. In addition to the four required photos needed for the evaluation, additional photos can be submitted showing problem areas and unusual situations where feedback is needed.
6. Walk the property with the homeowner to share what has been observed. This is the best opportunity to make recommendations and suggest technical help such as the names of local contractors, Youth Conservation Corps, and Soil and Water

Conservation Districts to address improvements. Homeowner information sheets can be given to the homeowner at this time or can be sent later with the homeowner report.

7. Enter data into the property evaluation form (to be uploaded into Survey123 later) or directly into Survey123. These should be sent to the Coordinator along with photos and suggestions for BMP handouts (e.g., Erosion Control Mix, dripline trench, buffer plantings, etc.).
8. Maine Lakes reviews the evaluation results in Survey123 and notifies the Coordinator. The Coordinator or Evaluator who made the visit notifies the homeowner and sends the final homeowner report with a cover letter thanking them for participating in the program. If the homeowner earns a LakeSmart Award, the Evaluator delivers two Award signs and takes a photo of the homeowners with the signs!







# Privacy Policy

Maine Lakes respects the privacy of our donors, members, and volunteers. Maine Lakes will not sell, trade, rent or share personal information about our donors, members, or volunteers with anyone else, nor will we send mailings on behalf of other organizations.



## The LakeSmart Program

Maine Lakes trains and supports LakeSmart evaluators, who conduct site evaluations as part of the LakeSmart Program. Evaluators routinely collect personal information that is generally publicly available (including names, addresses, email addresses and phone numbers) as well as property photos during LakeSmart evaluations. That information is entered by evaluators into Survey123, a secure online database. Access to LakeSmart data in the Survey123 database is password protected and limited to a small number of key staff and volunteer coordinators who assist evaluators with evaluation review and approval. Evaluators are limited to viewing only the data they submit to Survey123. Maine Lakes has the utmost confidence in the security of ArcGIS, the parent company of Survey123, to keep LakeSmart data safe and secure.

For more information about security measures at Survey123, please visit:

<https://doc.arcgis.com/en/survey123/reference/security.htm>

*Information collected through participation in the LakeSmart program is never used for regulatory purposes.*

Contact information may be used to ask additional questions about evaluations, provide follow-up support and communication, and for occasional LakeSmart communications. LakeSmart participants may opt out of future communications at any time.

Capacity limits of LakeSmart program staff require the use of the electronic database described above to manage large volumes of LakeSmart data and to keep program costs down as the program grows. Involvement in the LakeSmart program indicates acceptance of this privacy policy.

## Financial Information

Credit card information entered onto forms on the Maine Lakes website is handled by Stripe, a company with the most stringent level of certification available. For more information, visit

<https://stripe.com/docs/security/stripe>. Registrations for webinars on our website are through Zoom.

While no credit card information is collected, the measures for protecting personal information can be found here <https://explore.zoom.us/en/privacy/>.

## Donor Information

Maine Lakes does not share donor information with any other organization or entity unless required by law to do so. Donor information is maintained in a secure online database maintained by Little Green Light. To learn more about the security of information on their site, visit <https://www.littlegreenlight.com/blog/data-security-best-practices/>.

## Email Communications

Maine Lakes communicates via email with members, volunteers, and donors to reduce costs and increase efficiency. Our email communications are through Constant Contact. Recipients may opt out of email communications at any time by clicking the "unsubscribe" button at the bottom of messages. More information on the security of information stored in Constant Contact accounts is here:

[https://knowledgebase.constantcontact.com/articles/KnowledgeBase/5632-security-of-my-data-on-constant-contact-servers?lang=en\\_US](https://knowledgebase.constantcontact.com/articles/KnowledgeBase/5632-security-of-my-data-on-constant-contact-servers?lang=en_US)

Please direct any questions to Susan Gallo, Executive Director at [sgallo@lakes.me](mailto:sgallo@lakes.me) or (207)956-1965.

Policy adopted by the Maine Lakes Board, March 2022