



Lake Life Today (While planning for the Future)

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Be LakeSmart Lakes Environmental Association LakeSmart Tip: Spring Cleaning



As you open your camp this spring, consider the following suggestions for protecting your lake.

Cleaning Up Yard Debris

Pine needles, leaves, and other undisturbed vegetative material (small, downed branches and twigs) can help supplement your property’s “duff layer” at the shoreline. This is a layer of decaying leaf and undisturbed vegetative material that creates a buffer-like area to promote your landscape’s ability to infiltrate stormwater. Promoting vegetation at the shoreline’s edge will also protect the riparian zone for wildlife habitat on your shorefront property. It is advisable to retain as much of this natural duff layer as possible while still being able to enjoy your property.

- Pine needles and leaves should not be raked up except to provide a safety barrier around your fire pit or to maintain your (hopefully minimal) lawn. Regarding lawns generally: Please avoid importing “fancy aesthetics” to your lakeside, such as miniature or dwarf fruit trees. Instead go with more natural shoreline plants that would help stabilize your buffer. It is Maine’s lakeside natural environment that we all love. Go to [Shoreline Landscaping for Lake Protection, Maine Department of Environmental Protection](#) for more info.

- Downed branches and other debris should only be removed in areas where you recreate or walk.
- Leaving the natural duff layer is a critical part of the forest ecosystem and should be left intact outside of footpaths.
- Also, try to avoid using commercial fertilizers that contain concentrations of phosphorous (i.e., a nutrient that contributes to algae blooms in our lakes).

Activating Your Septic Tank

Septic tanks activate after the winter naturally. No additives are needed to get your septic tank's bacterial process started in the spring. Rid-X and similar bacterial enzyme additives interfere with natural tank bacterial action, often causing accelerated breakdown of solid and turning sludge into a slurry which can then enter and plug up your leach field. Do not waste your money on products that don't work and can harm your septic system!

Maintaining Water Diverters

Existing open top "box" culverts and/or so-called "rubber razors blades" installed along your camp road need periodic inspection and cleaning. Runoff into these diverters carries silt which builds up and can reduce or eliminate the diverter's capacity to function. In open top culverts, remove the silt which settles. Similarly, clean up the silt which builds along the uphill edge of any rubber razor blades, and dredge the outlet edge of all diverters to remove the silt that has built up there.

At the Water's Edge

- Inspect your dock entrance to ensure it is not allowing runoff into the lake.
- Assess whether there is any undercutting of the lake bank from waves crashing into your shoreline.

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WHY IS YOUR LAKE AT RISK?



PHOSPHORUS

Phosphorus is a naturally occurring nutrient that creates lake algae. A rapid increase or accumulation of too much phosphorus can cause a lake to be out of balance, creating massive algae blooms that turn lake water green from the algae’s pigments, smells terrible, degrades wildlife habitat, and can potentially harm human and pet health.

Phosphorus comes from lots of sources – pet waste, fertilizers, household cleaners, motor oil – none of which should ever find their way into a lake. But the biggest source of phosphorus is soil and sediment that is washed into a lake after a severe rain event. We know, due to climate change, that the rain events we are now experiencing are more intense. Severe storms cause phosphorous loading during the first hour of such events. This is called the “first flush.” Watch out for the “brownish” stormwater because it is laden with the nutrients, especially phosphorus.

Signs of erosion on your property show you that phosphorus in stormwater can take a direct path to your lake. Look around for stormwater channeling, or even more intense “gullying” left behind after a big storm, especially near buildings and parking areas where stormwater “sheet flows” off impervious surfaces and cascades its way to the waterbody.

Added together, even small sources of pollutants - a little stormwater runoff, a little pet waste on the lawn, a minor application of fertilizer - can all add up to create a much bigger problem for your lake. A little pollution from you, your neighbor and others around the lake, year after year, can put your lake at huge risk!

What can you do? For a more complete list of those things you can do to help promote and protect your lake’s water quality, see information on *Lake Friendly Yard Maintenance* at Vermont’s Department of Environmental Conservation (Watershed Management Division):

https://cdn.branchcms.com/DrynVOJolO-1457/docs/Lake%20Library/LakeWiseInfoSheet_LakeFriendlyYardMaintenance.pdf

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The Value of a Watershed



A lake’s **Watershed** is the area of surrounding land that channels rainfall and snowmelt via creeks, streams, rivers, ditches, storm drains, and groundwater to the lake. Watersheds supply the water that replenishes our lakes, along with other elements critical to supporting life, such as nutrients and organic matter. Water moves through a never-ending loop from sky to land and back in various states of gas, liquid or solid, through a process known as the **Water Cycle**.

An **Undeveloped Watershed** helps keep lakes and rivers clean by absorbing rainfall and keeping excess nutrients, such as phosphorous, out of our waterbodies. Multiple layers of vegetation, from the tallest trees to tiny seedlings, and from shrubs to ferns and perennials growing on the forest floor, all help to intercept intense rain events, reducing the amount of water hitting the forest floor. Loose, deep layers of “duff” (accumulation of leaves and decaying organic matter on the forest floor) help to absorb water and nutrients, minimizing flow directly into waterbodies.

However, many of us live in a **Developed Watershed**. Developed watersheds have roads, houses and rooftops, manicured lawns, driveways, and parking lots that are known as **Impervious Surfaces**. These impenetrable surfaces prevent rain from soaking into the ground. Instead, rain channels over these impervious surfaces which then gather speed and size (i.e., volume) as well as excess nutrients as soil is eroded. Culverts, ditches, and stormwater systems transport eroded soil and direct the flow of rainwater to our waterbodies (this is the brown stormwater we see headed for the lake). While this is happening, many smaller sources of erosion around homes and camps are also contributing sources of pollutants and excessive nutrients into our lakes and ponds.

We all live in a watershed. Even if we are miles away from a lake, our actions can have consequences downstream that could be detrimental to our lake's water quality. The bottom line is that the health of Maine's lakes and ponds is determined by what happens in their surrounding watersheds.

If you would like to learn more about China Lake's Watershed you can view the 2022-2023 Watershed Based Management Plan here:

https://static1.squarespace.com/static/5eab2f65dba8ec0242288b7e/t/63efa15a18488028045989e0/1676648798459/ChinaLake_WBMP_Final_March%2722_v.2.pdf

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Buffers



Our last articles included information about phosphorus, its sources and how it impacts our lakes whether it is from shoreline properties or sources found in our watersheds. The next several articles will be sharing actions you can take to “*slow the flow*” of water on your property to keep nonpoint source pollution (NPS) from entering our lakes. The first action is creating a “*beneficial buffer*” along the water’s edge. This area is the last but most valuable line of defense we can use to keep NPS and other pollutants such as phosphorous from entering our lakes.

A **SHORELINE BUFFER** ideally starts at the water’s edge and extends 75’ or more into the upland area of your property. The best shoreline buffers are deep, wide, and continuous (with only a narrow path or other small break for access to the water). These buffers have many layers of vegetation, including tall trees (canopy), shorter trees (midstory), shrubs, perennials, and groundcover. A layer of duff (twigs, fallen leaves, and pine needles) also accumulates on the ground in a buffer.

Vegetation in a buffer intercepts raindrops so less rain impacts the ground. The uneven duff layer absorbs rain, and loose soils filters out pollutants. Tree roots help anchor soil in

place and absorb water and nutrients. Buffers act like a sponge, soaking up rainfall, absorbing nutrients and runoff, and reducing the flow of stormwater into the lake.

But that is not all buffers do. Buffers also provide habitat for insects, birds, small mammals, and believe it or not, sometimes even fish! Tree branches overhanging the lake provide cover for fish that need safe and cool places to protect themselves. Dropped leaves provide food for bugs and dropped limbs provide habitat structure for mammals. Ideally, shoreline buffers are composed of native vegetation, which is easier to maintain and better for wildlife.

It can be tempting to “limb up” trees in the buffer to increase lake views but most local ordinances allow only trimming the lower 1/3 of branches, and dead limbs can be removed. Remember, each branch left on the tree enhances the integrity of the buffer and provides more habitat value for wildlife. Let the trees frame your view!

Buffers are the last line of defense for a lake against NPS pollution and stormwater runoff coming from your property! You can make your buffer bigger and better by adding plants to fill in thin spots, even a few at a time. In fact, you can plant up to 24 plants along the shore each year without a permit from the Maine Department of Environmental Protection. Let leaf litter accumulate in the buffer, and limit the use of fertilizers, pesticides, and herbicides on your property. Note that pesticides and fertilizers are not allowed within 25’ of shore. With a healthy buffer, you are helping to ensure your view is of a clean, healthy, and blue lake!

One final point: buffers are not a one size fits all. The information shared above is for an ideal buffer. This information comes from **The Lake Book A handbook for Lake Protection from MaineLakes**. You can visit their site for more information about caring for our lakes in Maine at: <https://www.lakes.me/>

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Rain Gardens



Last week’s article covered what a “*beneficial buffer*” along the water’s edge could look like. This week’s submission is how to “*slow the flow*” of water using a rain garden before it reaches the buffer zone.

Rain gardens are attractive and functional landscaped areas that are designed to capture and filter stormwater from roofs, driveways, downspouts, and other hard (impervious) surfaces. Rain gardens collect stormwater in a depression in the ground, with water-loving native perennials and shrubs planted atop so that rainwater slowly soaks into the ground. This reduces the potential for erosion and minimizes the impact of pollutants flowing from your lawn into nearby streams and the lake. Rain gardens benefit our lakes, add beauty to our properties, as well as provide a food source and habitat for wildlife.

Installation

Rain gardens can vary in size but are most effective when built to 20-30% of the drainage area. Rain gardens for single-family homes will typically range from 150 to 300 square feet, but even a smaller one will help reduce stormwater pollution problems.

- The garden should be bowl-shaped, with the lowest point of the garden no more than 6” below the surrounding land.
- The sides should be gently sloping towards the center to prevent sudden drop-offs that could lead to erosion problems or walking hazards.
- Rain gardens are often placed in a preexisting or created depressions within a lawn, or in a location that receives roof runoff from a downspout.

- To avoid flooding improperly sealed foundations, build your rain garden 10' away from existing structures and direct stormwater into the garden with a grassy swale, French drain, or gutter extension.

Rain gardens can be placed in sunny or shady regions of your lawn, but plants should be chosen accordingly with the lowest point planted with wet tolerant species, the sides closest to the center planted with moist tolerant species, and the edges of the rain garden planted with moist to dry tolerant species. It is also important to check the permeability of your soil. Sandy soils only need compost added, but clay soils should be replaced with a mix (50- 60% sand, 20-30% topsoil, 20-30% compost). After construction of the garden is complete, the entire area should be covered with a thick layer of mulch, preferably Erosion Control Mix (ECM).

Maintenance

Watch during rainstorms and see how it works! Monitor infiltration capacity and make sure your rain garden does not get clogged by periodically removing accumulated debris and sediment from the inlet and bottom. Inspect the rain garden after large rain events and in the spring each year.

- Plants will likely need regular watering during the first growing season and in very dry periods thereafter.
- Remove weeds and invasive plants.
- Replace plants that die.
- Leave plants in the fall and remove dead plant material in late spring to allow for wildlife habitat.
- Embrace messiness! It is a living system and does not need to be manicured.

For more information on how to install a rain garden you can view this helpful video on building a Rain Garden: <https://www.youtube.com/watch?v=8pUdi5HYn5Q>

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Berms



Last week’s article covered rain gardens and how they help “slow the flow” of rainwater by capturing and filtering that stormwater from roofs, driveways, downspouts, and other hard (impervious) surfaces. This week’s article on **Best Management Practice** (BMPs) features “berms” and how they are an effective BMP to prevent pollutants and excess nutrients from entering the lake from your yard.

Berms are vegetated mounds of earth with gradual sloping sides that “slow the flow” and soak up stormwater runoff. They run parallel to the shoreline with a 4:1 ratio (meaning that for every vertical foot, there will be four horizontal feet to create the proper slope). Berms are usually built on top of the existing “duff” (the accumulation of leaves, pine needles, etc. that have dropped below the trees). Depending on the area where a berm is located, or the height of the berm which is needed, some minimal groundwork may be required.

Here are the directions on how to build a simple berm:

- (1) lay a bed of large stones to form the berm’s foundation.
- (2) cover the stones with soil.
- (3) cover the berm with mulch and pine needles.

Stormwater flowing beyond a berm should be directed into dense, permanent vegetated areas capable of absorbing the stormwater.

Adding plants to a berm increases its effectiveness. The best plants to use are native plants, including grasses and shrubs. The goal is to cover the entire berm with vegetation.

Note: Any project involving more than minor soil disturbance within 75 feet of the water requires a permit from the Maine Department of Environmental Protection (DEP). Local municipal permits may also be required depending on the distance from the water, and these distances may vary by municipality.

For more information on how to install a berm go to:

dec.vermont.gov/sites/dec/files/documents/LakeWiseInfoSheet_FilterBerms.pdf

Also, a helpful site to find native plants can be found at Maine Audubon: <https://mainenativeplants.org/>

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Pathways



Do you have a pathway from your home to the lake’s shore? Chances are you do. Water flowing over improperly designed paths and



walkways is one of the ways pollutants find their way into our lakes and waterbodies. **Properly designed pathways** for foot traffic minimize compaction to soils in surrounding areas, help to absorb water, reduce the rate of stormwater runoff flow, protect soil from erosion, and prevent pollutants such as sediments from entering the lake.

What does a properly designed path or walkway look like?

Properly designed pathways are meandering, shed runoff regularly preventing erosion, and stabilize high traffic areas. Stormwater runoff should be directed into adjacent vegetation.

Ideally, paths should be no more than **3’- 4’ wide**. The walking surface should be covered with **3”- 4” of material** such as Erosion Control Mix

(ECM), pine needles, wood chips, crushed stone, or other material. This will well-define the path, guide foot traffic, and reduce soil erosion.

Steeper slopes may require water-bars to divert stormwater runoff to vegetated areas, or infiltration steps. These topics will be covered in future articles. Whenever possible avoid steeper slopes for your pathways.

If new pathways are not clearly defined, they can be marked with strategic plantings, stones, solar lights, etc. along the edges. This will show the preferred route for foot traffic.

It is important to maintain your pathways by periodically removing accumulated debris from the surface. Mulched pathways may need to be re-shaped and additional material may be needed to replace what has washed or worn away.

For more information about pathways take a moment to read this helpful information sheet:

https://dec.vermont.gov/sites/dec/files/documents/LakeWiseInfoSheet_PlanningPathways.pdf

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Infiltration Steps



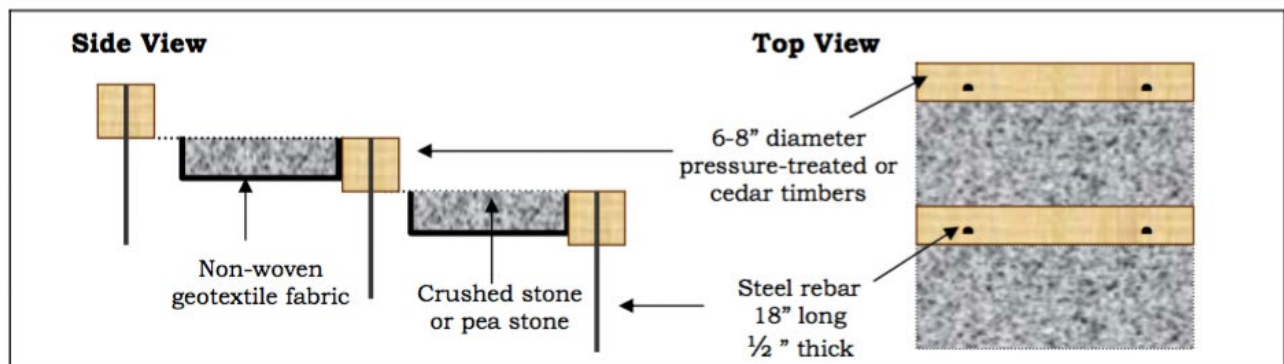
The previous article provided information on how to properly design pathways to benefit the lake. Pathways designed properly will slow the flow of stormwater, giving runoff time to be absorbed into the soil which prevents pollutants from entering our lakes and ponds.

Infiltration Steps is yet another way to slow the flow of stormwater from entering our waterbodies. Infiltration steps can be used where foot traffic is causing erosion to take place, and are used where there is a moderate slope, usually less than 45 degrees. These infiltration steps minimize the potential for erosion and runoff from a footpath that is often used. As a result, infiltration steps prevent excess nutrients, sediments, and other pollutants from entering the lake. Rainwater falling on the infiltration steps ultimately soaks into the ground and is **filtered** by the soil, trapping unwanted pollutants, and helping improve the overall health of our waterbodies.

Infiltration Steps are built with timbers. Geotextile fabric is anchored into the “bottom” of the step, and then backfilled with crushed stone to slow runoff and allow water to soak into the ground. Existing steps may be retrofitted into infiltration steps in some instances.

Installation:

1. Remove several inches of soil from the location of each step. Dispose of excavated soil in a place where it will not wash into the lake or other resource.
2. Line the bottom and sides of the excavated area with geotextile fabric. This fabric allows water to infiltrate through it and will separate the stone from the underlying soil.
3. Backfill the hole with washed 3/4" crushed stone (or pea stone) so that the tread is level, or it just slightly slopes up to meet the step above. Paving stones can also be set into crushed stone to provide a smooth surface for bare feet-as long as ample crushed stone is exposed to allow infiltration, but there must be adequate spacing between the pavers to allow for the infiltration of stormwater.
4. To firmly secure the wooden framework, drill 1/2" diameter holes 6" from the ends of each timber. Then drive 1/2" diameter 18" long steel rebar through the holes with a sledgehammer. For gentle slopes, wooden stakes or large rocks can also secure the timbers.



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.



If you think infiltration steps would be a good fit for your property here are a few other resources that could help with your decision:

<https://www.youtube.com/watch?v=j88AO4Kv5tk>

https://dec.vermont.gov/sites/dec/files/wsm/lakes/Lakewise/docs/LP_BMPInfiltrationSteps.pdf

<https://awwatersheds.org/retrofitted-infiltration-steps-do-it-yourself-conservation-practices/>

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Septic System

Get your septic tank pumped!



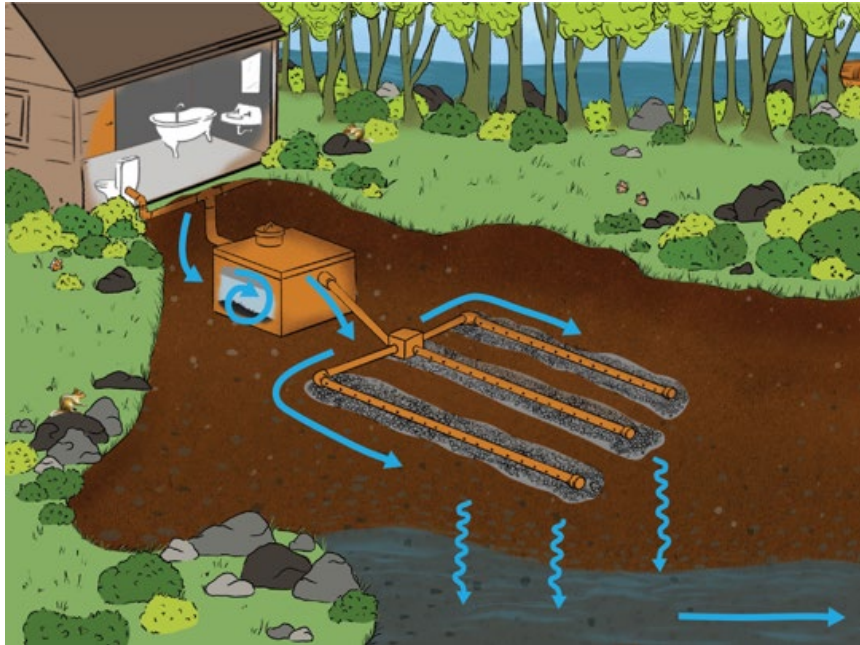
It’s that time of year when we start thinking of the change of seasons. Along with the change of seasons it’s also time to think about how your septic system is functioning, and specifically about maintaining your **septic tank**. It’s always a good idea to know where your septic tank and field are located, and to look for signs of any malfunctions. Foul odors, lush and tall green grass, and certainly outbreaks of black effluent (i.e., liquid waste or sewage) are some signs of a failed septic field.

Untreated effluent that escapes from a failing septic field is a potential source of additional and unwanted phosphorus into the lake. Also, other chemicals and other toxins that may be part of the untreated effluent may also contaminate nearby drinking water wells. That same untreated effluent may break out of the septic field and run over the ground and into the lake, or flow directly into groundwater which then carries unwanted nutrients, bacteria, and viruses along with it. This is not good for you, your family, your pets, your neighbors, and especially your lake.

Your treatment (septic) tank is an essential component of your septic system. There are baffles at the inlet and outlet of the tank, but it’s the outlet baffle that prevents “suspended solids” from exiting beyond that point. If the outlet baffle fails, this could be a major source of compromising your septic field’s capacity to distribute and treat effluent as the septic field clogs with suspended solids. Pumping your septic tank removes sludge and scum before it builds up and potentially flushes into your septic field due to a failed outlet baffle. While pumping your septic tank it’s extremely important to have your septic pumper check the septic tank’s baffles, particularly the outlet baffle.

The major factors affecting the frequency of pumping are the number of people using the septic system. This amounts to the total wastewater volume entering the septic field based upon your septic tank size.

It's a good idea to check with your service provider at the time of pumping to see if they think you are on a schedule that fits your tank's capacity and volume.



As a rule of thumb, you should pump your septic system's tank every two to three years for year-round residents and every three to four years for seasonal residents.

Many owners of seasonal properties pump their septic tank far less often in the mistaken belief that their camp's limited seasonal use justifies an extended pumping schedule. In fact, most seasonal properties have at least several weeks of intensive use due to large family occupancies or large numbers of visiting guests. This intensive use can put a huge demand on the septic system's capacity. Regular pumping on a conservative schedule is the best way to assure your septic field isn't compromised, which could result in shortening your septic system's useful life. The prorated cost of regularly pumping your septic tank and checking your baffles is a minor cost compared to the substantial expense of having to completely replace your septic field.

For more tips on caring for your septic system see:

<https://cdn.branchcms.com/DrynVOJolO-1457/docs/Lake%20Library/Septic-two-pager-11x17-FINAL-5.14.21.pdf>.

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The LakeSmart Laker’s Dozen

Lakes are fragile, Care for them today.
Enjoy them tomorrow.



As I listen to fewer loon calls at night and watch them gathering in social groups during the day, I am aware summer’s coming to a close. By the time you read this final Lake Life article of the season Meteorological Autumn will have begun. My hope has been that these Lake Life resources over the summer months would inspire you to take action and, knowing the difference you can make in the future, protect our lakes and ponds. One of my favorite quotes is, “*Alone we can do so little; together we can do so much.*” (Helen Keller) It seems very fitting about what needs to be done. Pick one or choose all 13 of the LakeSmart’s Dozen and make a difference for the future of our lakes and ponds.

1. Support Lake Associations.

Join the Board of Directors. Attend your Annual Lake Association’s meeting. Get involved. Visit lakes.me/map to see a map of Maine’s Member Lake Associations.

2. Stop The Spread of Invasives.

Clean plant fragments off your boat, trailer, and boating equipment before moving your boat.

Drain bilges away from the lake when you leave a waterbody.

Dry your boat or let it sit several days between uses on different water bodies.

Never transfer water or fish from lake to lake.

This is the law as of 2023:

<https://www.maine.gov/ifw/docs/Clean%20Drain%20Dry%20Frequently%20Asked%20Questions.pdf>

3. Follow Shoreland Zoning Rules.

What happens on land doesn't stay on land. Actions you take on your property can have devastating consequences for the health of your lake. Before any project, check with your local Town Office or Code Enforcement Officer to see if you need a permit for work within the shoreland zone, the 250 foot deep strip of land along the edge of a lake.

4. End Erosion.

On a rainy day check around your buildings, paths, driveways, and roads to identify places where soil is eroding or washing away. Erosion drives phosphorus into the lake, which in turn feeds algae and causes lakes to turn green and "bloom." Fix erosion by planting vegetation downslope; installing crushed stone or erosion control mulch where needed; or by constructing swales or rain gardens. For more information on these and other stormwater Best Management Practices visit lakes.me/BMPs.

5. Build Better Buffers.

Trees, shrubs, and grasses protect water quality by slowing down rainwater in order for phosphorus and other pollutants to filter out in the soil before washing into the lake. Deeper buffers are better, as are those with more layers of vegetation. Native plants do more for pollinators, birds, and other wildlife. Visit Maine Audubon Native Plant finder for resources on buffer plantings. <https://mainenativeplants.org/>

6. Ditch Fertilizers, Herbicides and Pesticides.

Long-lasting chemicals in these products can harm children, pets, and aquatic life. They can also feed algae in your lake and turn it green and smelly.

7. Take a Break. Stash Your Rake. Save the Lake!

Limit lawn size, mow less often, and leave clippings and you won't need fertilizer. Try not to rake within 75' of the shore. This comes highly recommended under Shoreland Zoning Guidelines and is also a practice that helps promote native pollinators, and shelters and feeds wildlife.

8. Don't Stress Your Septic.

Check your septic system for signs of malfunction and pump the septic tank regularly. Have your service provider check the tank's baffles. Use phosphorus-free cleaners and detergents. Stagger laundry loads and dishwasher runs to occur no more than once a day. Avoid using the (garbage) disposal, and minimize water use when possible. Don't put toxics or grease down the drain. Visit lakes.me/septic for more info.

9. Build Lake-Friendly Docks.

Cedar, cypress, plastic, or aluminum are good dock materials.

10. Don't Treat Your Lake Like a Washtub.

Dogs, humans, or boats should *never* be washed in the lake! Soap is not good for water quality. It feeds algae and isn't good for fish or other wildlife.

11. Observe Headway Speed Close to Shore.

Maine law prohibits wakes from boats within 200' of shore. Boating wakes in shallow water disturbs aquatic habitat, stirs up sediment, destabilizes the shoreline, and can damage or destroy nearby loon nests.

12. Give Wildlife a Chance.

Lake shallows and land near the water provide food and shelter for more than 60 native wildlife species and can also serve as nurseries for their young. Don't "Tidy them up!"

13. Learn About LakeSmart.

LakeSmart provides site-specific suggestions to homeowners on how to protect water quality, enhance property values, and prevent lake degradation. To learn more, visit lakesmart.org or contact Maine Lakes at lakesmart@lakes.me.

If you have any questions about what you can do to ensure the integrity of your valued lake or if you would like a free LakeSmart evaluation you can reach Elaine Philbrook by email at chinalakesmart@gmail.com and read past Lake Life Articles in the Townline Newspaper.

"Live lightly on the land for the sake of the lake (LakeSmart)."