

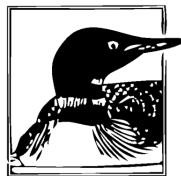
lake dweller's HANDBOOK

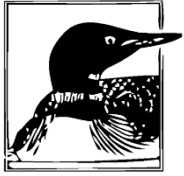
Citizen's Guide to Protecting Water Quality in the Kezar Lake Watershed



Kezar Lake Watershed Association

January 2018





Kezar Lake

WATERSHED ASSOCIATION

P.O. Box 88, Lovell, ME 04051 www.klwa.us

MISSION STATEMENT

Our purpose is to preserve, protect and maintain the ecological, scenic and recreational resources of Kezar Lake and its watershed for the benefit and enjoyment of residents, summer residents, and visitors, now and in future generations.

Located in the foothills of the White Mountain National Forest in western Maine, Kezar Lake and its six ponds and numerous tributaries form a uniquely beautiful and sensitive ecosystem. The lake is recognized for its clear waters, ecological diversity, recreational opportunities, and vital contribution to the local economy. Like other regional waterbodies, the water quality and biological integrity of Kezar Lake and its connecting surface waters are threatened by development and other activities that enhance the rate of nutrient enrichment or introduce invasive aquatic species.

Protection of the Kezar Lake watershed requires all watershed residents to become aware of water quality threats and commit to implementing actions that sustain or improve water quality. As part of an outreach campaign and in line with the Kezar Lake Watershed Association's mission, this handbook serves as a tool for watershed residents to learn about how our actions impact the health of surface waters and what specific strategies we can implement to protect surface waters from pollutants. Rules and regulations outlined in this handbook are for general information purposes only; residents should always refer to the full rules and regulations in state or local laws before acting.

Our hope is that this handbook will encourage watershed residents to become more involved in watershed protection efforts. Please consider becoming a member of the Kezar Lake Watershed Association by visiting our website at klwa.us. We thank Laura Diemer of FB Environmental Associates for the handbook's concept, design, and scientific message, association members and neighboring lake associations for their support and contribution, and a family foundation with strong ties to the region for funding creation and printing of this handbook.

A handwritten signature in black ink, appearing to read 'James Stone'. The signature is stylized with a large, sweeping initial 'J' and a long, horizontal tail.

James Stone
President, KLWA

A handwritten signature in black ink, appearing to read 'Heinrich Wurm'. The signature is cursive and somewhat compact, with a prominent initial 'H'.

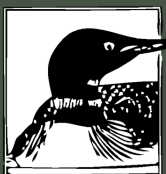
Heinrich Wurm
Director of Water Quality, KLWA

table of contents

What's the big picture? Why should we care?.....	1
What is threatening the lake, ponds, & streams?	2
Phosphorus in stormwater runoff causes eutrophication	3
How can we help protect the lake, ponds, & streams?	4
Laws & Ordinances	5
Specific Tips for Watershed Protection	
Beaches	7
Erosion & Sedimentation	8
Vegetation, Lawns, Gardens, & Footpaths	9
Roads, Driveways, & Culverts	11
Structures, Construction, & Maintenance	12
Septic Systems	13
Household Chemicals	14
Boats, Docks, & Boating	15
Waterfowl, Loons, & Fishing	16
Beaver	16
Invasive Aquatic Plants	17
Resources	18
Glossary	19
References	21



Co-sponsored by the Kezar Lake Watershed Association (KLWA) & Selectmen of Lovell, ME
Funding provided through the generosity of an anonymous family foundation
Designed and authored by L. Diemer, FB Environmental Associates
BECOME A MEMBER OF KLWA (GO TO klwa.us/membership)



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what's the big picture? why should we care?

TAKE HOME MESSAGE: Pollutants on land eventually make their way to streams, which feed into the lake or ponds where they can threaten water quality, aquatic life, and personal enjoyment.

The Kezar Lake Watershed

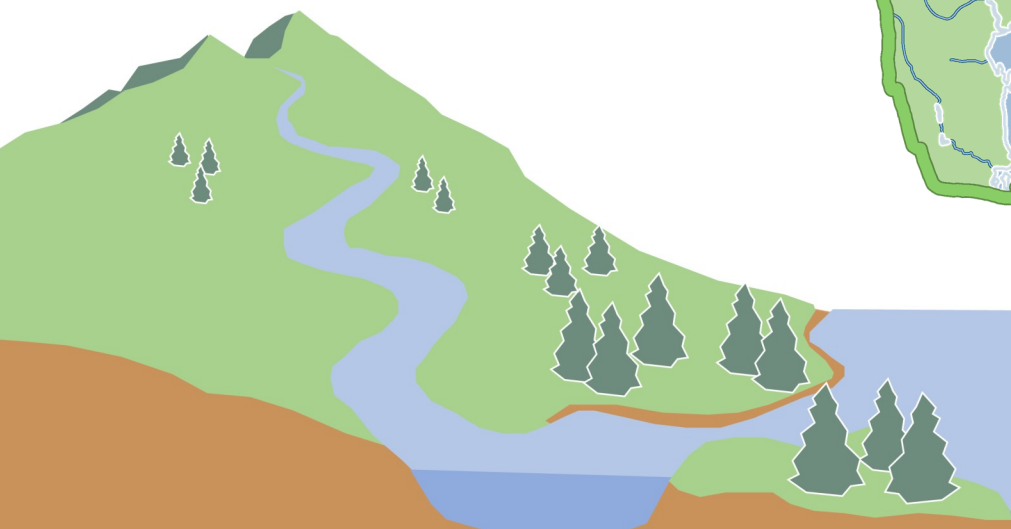
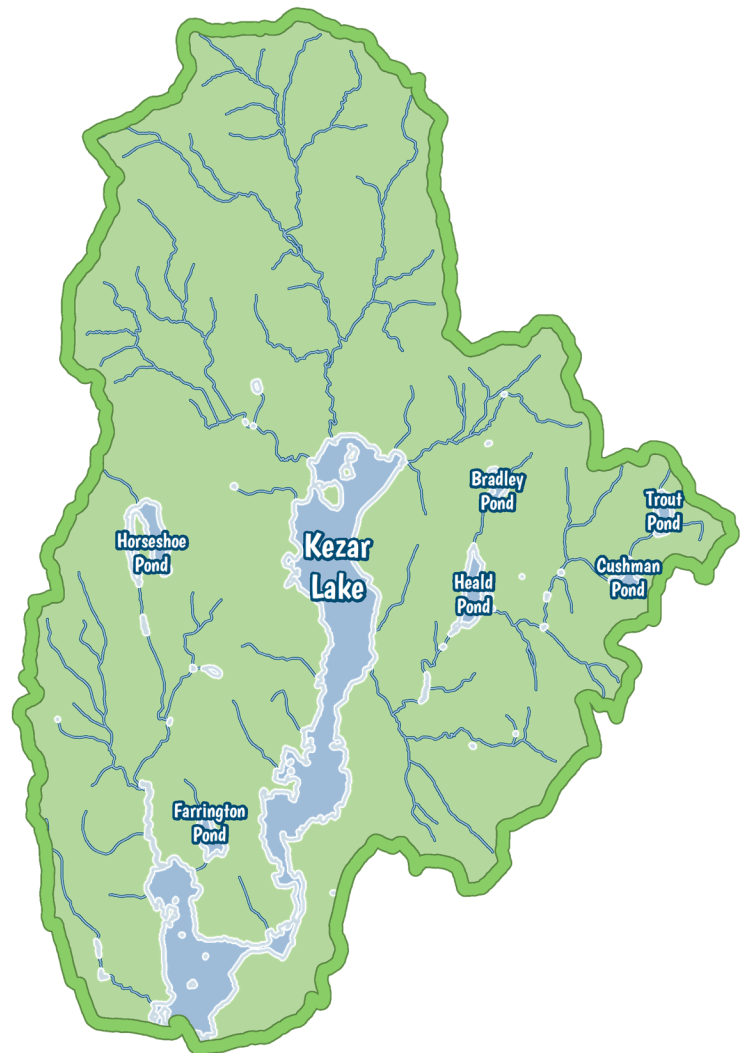
Kezar Lake and its watershed form a uniquely-beautiful and sensitive ecosystem in western Maine. The lake is recognized for its clear waters, ecological diversity, recreational opportunities, and vital contribution to the local economy.

Our Connection

As residents or visitors of the watershed, we are intimately connected to the health of all the plants, animals, and other natural resources in the area. The health of the watershed and the water quality of our lake, ponds, and streams drives quality of life for people and wildlife and greatly influences property values.

Our Impact

Our actions can increase the amount and transport of harmful pollutants and can introduce dangerous foreign materials to surface waters. These pollutants eventually make their way to our streams, ponds, and lake where they can cause serious water quality issues.



A watershed is the area of land that drains water to the outlet of a waterbody.

what is threatening the lake, ponds, & streams?



Natural Threats

Acid Rain / Granite Geology

Impact

Lowers pH (more acidic); stresses aquatic life; may cause fish population decline



Human-Induced Threats

Uncontrolled Stormwater Runoff

Land Clearing, Inadequate Buffers, Bare Soil, Impervious Areas, Erosion & Sedimentation, Lawns

Impact

Increases transport and quantity of sediment, nutrients, and harmful chemicals to surface waters; clouds water and fuels algae and plant growth



Shoreline Erosion

Artificial Beaches, Inadequate Buffers, Wave Action from Boat Wakes

Embeds habitat, undercuts banks, disturbs loon nests and other shoreline habitat



Chemicals

Household, Automotive, Fertilizers

Generates chemical imbalance in water quality that causes metabolic and reproductive challenges for aquatic life



Failing Septic Systems

Improper Siting, Lack of Biomat for Filtration, Bedrock or Groundwater Restriction, Inadequate Maintenance

Increases pathogen and nutrient load to surface waters; nutrients fuel algae and plant growth, leading to reduced water clarity and lower property values



Invasive Aquatic Plants

Plant Fragment Transport on Watercrafts from Waterbody to Waterbody

Outcompete native aquatic plants; change shoreline habitat and supported native species composition; difficult to eradicate once established



Climate Change

Greenhouse Gas Emissions During Fossil Fuel Combustion & Farming

Increasing air temperature and more frequent and intense precipitation threaten native plants and animals and infrastructure (e.g., culverts) and exacerbate existing human-induced threats

phosphorus...

Phosphorus is a key nutrient for growth, but excessive amounts of phosphorus can stimulate **ALGAL BLOOMS** and abundant plant growth.

Excess phosphorus can enter a waterbody in eroding sediment, groundwater (e.g., aging septic systems), or **STORMWATER RUNOFF**, containing fertilizers, detergents, or other phosphorus-based products.

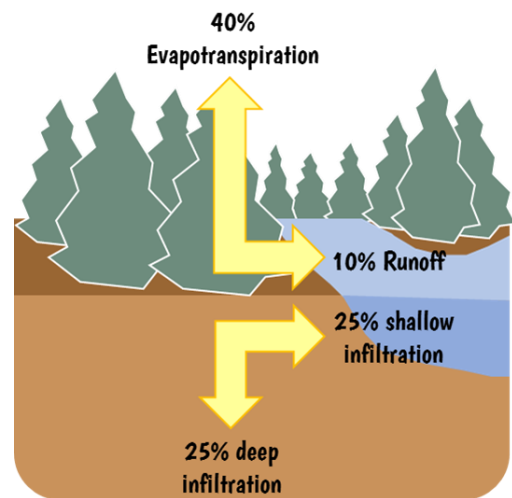
Decomposition of excess algae and plant material depletes oxygen in the lake, leading to fish kills. Low oxygen in bottom waters can also release phosphorus back into the water column, creating a positive feedback to **EUTROPHICATION**.



...in stormwater runoff...

As development increases, more water runs off the land than infiltrates or evaporates. This overland flow can transport sediment and other pollutants directly to surface waters, which can decrease water clarity and reduce shoreline property values.

FORESTED



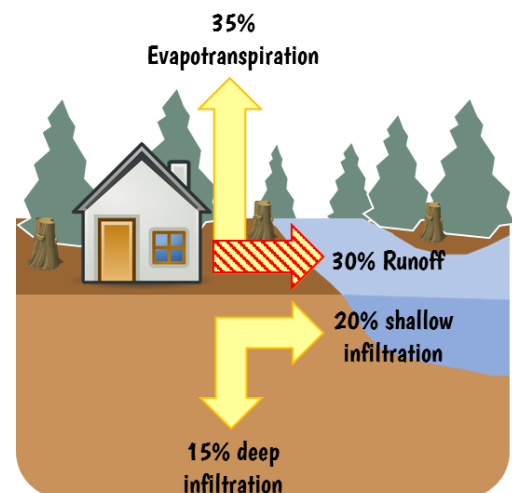
...causes eutrophication.

Eutrophication is the process by which nutrient inputs to a waterbody accumulate over time, causing an increase in lake **PRODUCTIVITY** (or algae and plant growth). Lakes naturally become more productive or "age" over thousands of years. In recent geologic time, humans have enhanced the rate of nutrient enrichment and lake productivity, speeding up this natural process by tens or hundreds of years.



The degree of lake productivity is determined by multiple factors, including water clarity, phosphorus, chlorophyll-a, plant growth, and dissolved oxygen in bottom waters.

DEVELOPED



how can we help protect the lake, ponds, & streams?

strategies

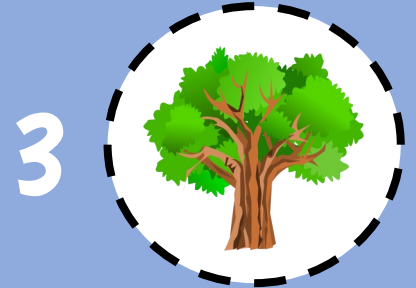
We can help protect our lake, ponds, and streams in three simple steps.



Reduce hard surfaces that quickly transport runoff



Minimize pollutants that may be carried off in runoff



Infiltrate runoff to vegetated areas

Plan new construction to limit hard surfaces or impervious areas, such as driveways, building footprints, walkways, etc. Or reshape and convert existing impervious areas back to vegetation.

See also:

- Roads, driveways, & culverts
- Structures, construction, & maintenance

Handle oils, chemicals, and fertilizers with care and away from surface waters, preferably in secondary containment areas. Minimize sediment erosion.

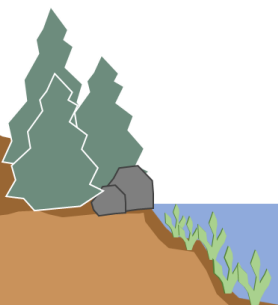
See also:

- Beaches
- Erosion & sedimentation
- Structures, construction, & maintenance
- Septic Systems
- Household Chemicals
- Boats, docks, & boating
- Waterfowl, loons, & fishing
- Invasive aquatic plants

Control stormwater runoff from existing impervious areas by diverting and infiltrating water to vegetated or other treatment areas.

See also:

- Vegetation, lawns, gardens, & footpaths
- Structures, construction, & maintenance



laws & ordinances

NATURAL RESOURCES PROTECTION ACT (NRPA)

STATE LAW DEFINING ACTIVITIES THAT REQUIRE A PERMIT NEAR OR WITHIN CRITICAL WATERBODIES (38 MRSA §480)

A permit must be submitted to Maine DEP for any work that occurs below the normal high water line of a lake, stream, or wetland or disturbs soil within 75 feet of the normal high water line of a lake, stream, or wetland. Examples include:

- 1) Dredging or moving materials, including rocks, below the normal high water line,
- 2) Constructing or repairing permanent structures, including retaining walls or riprap, below the normal high water line,
- 3) Placing fill in an area that may be washed to a surface water, and
- 4) Bulldozing or scraping of land in an area that may be washed to a surface water.

There are two types of permits:

- 1) Permit-by-Rule (PBR) is used for minor activities (e.g., moving rocks or vegetation, installing riprap, establishing an access way, replacing a structure, etc.). This permit is considered approved within 14 days of submittal unless DEP reaches out.
- 2) Full Permit is used for major activities and can take up to 5 months to obtain formal approval.

NOTE: NRPA permit standards are often less strict than Shoreland Zoning, so be sure to follow local regulations.

SHORELAND ZONING LAW

STATE LAW REQUIRING INCORPORATION OF SHORELAND ZONING LANGUAGE TO MUNICIPAL ORDINANCES; GIVES MUNICIPAL AUTHORITY WITH STATE OVERSIGHT (38 MRSA §438-A AND LOVELL, MAINE, ZONING ORDINANCE (AMD. 2012))

Shoreland zoning is administered by municipalities and sets regulations for building within 250 feet of the normal high water line of a lake, pond, or non-

forested wetland > 10 acres, any river that drains at least 25 square miles, and all tidal waters and saltwater marshes, as well as 75 feet of the normal high water line of a stream (including outlet streams of great ponds and streams below the confluence of two perennial streams).

Minimum requirements are as follows:

- 1) Conforming new lots for inland residential uses must have at least 200 feet of water frontage and be at least 40,000 square feet in area.
- 2) Structures (including septic tanks and leachfields) must be at least 100 feet horizontal distance from the normal high water line (setbacks increase 10 feet for every 5% increase in slope above 20%), < 35 feet in height as measured from the downhill side of the building to roof peak, and at least 1 foot above the 100-year flood elevation.
- 3) The total lot area covered by non-vegetated areas is limited to 20%.
- 4) Non-conforming structures that existed on January 1, 1989 and built within the allowable setback of 100 feet may only increase in both floor area and volume by < 30% for the portion of the structure within the required setback.
- 5) Development within the shoreland zone must have an approved soil erosion and sediment control plan.
- 6) Vegetation removal is limited within the shoreland zone (see Vegetation, Lawns, Gardens, and Footpaths).
- 7) Cleared openings cannot exceed 250 square feet within 100 feet of a great pond and 75 feet of streams or 10,000 square feet (25% of a lot) within 250 feet of waterbodies.

laws & ordinances

EROSION & SEDIMENTATION CONTROL LAW

STATE LAW ENFORCED LOCALLY (38 MRSA §420-C)

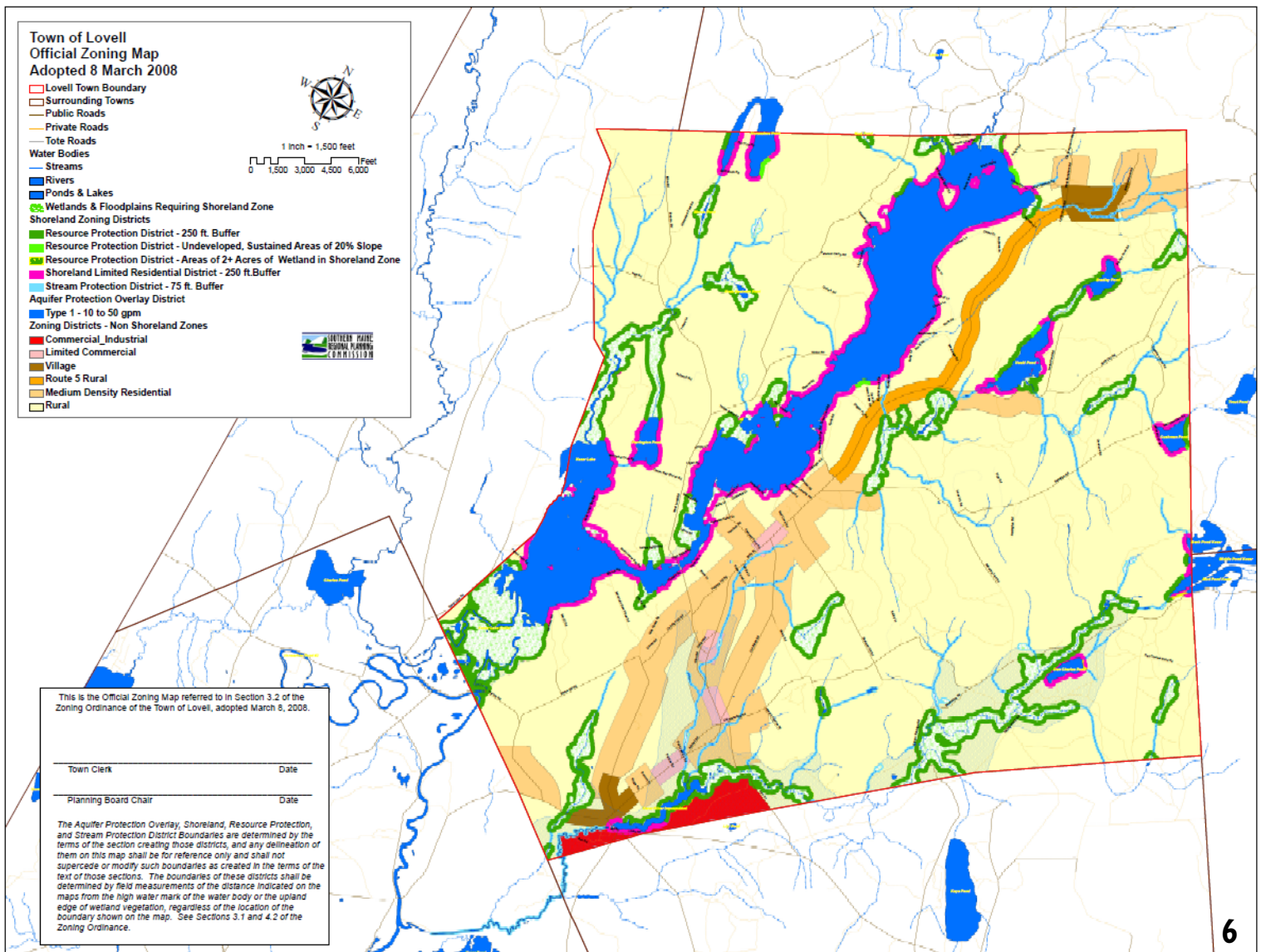
Requires the use of erosion control measures for activities that expose soil to erosion and applies to all areas (including the shoreland zone). For Lovell, any site within 100 feet of the shoreland zone requires a permit and a written soil erosion and sedimentation control plan. The plan must include provisions for mulching and revegetation of disturbed soil, temporary runoff control features such as hay bales, silt fencing, or diversion ditches, and permanent stabilization structures such as retaining walls or riprap. Any exposed

ground must be stabilized within one week from the start of the activity, using riprap, sod, seed, mulch, or other effective measures. The purpose of this regulation is to prevent unreasonable erosion of soil from a project site to a waterbody.

STORMWATER MANAGEMENT LAW

STATE LAW (38 MRSA §420-D)

For projects that disturb an acre or less and create less than an acre of impervious surface, a permit-by-rule is sufficient. For all other projects that create more than an acre of impervious surface, a full permit is required.



IT'S THE LAW

(38 MRSA §480)

No sand can be placed in the water or in an area where it may be washed to water.

What is allowed?

- A 10-foot-wide swath may be cleared for water access at the shoreline; 4-foot-wide steps are allowed over embankments (permit-by-rule required).
- Rocks may be moved, but must be kept in the water (permit-by-rule required).
- Sand in water that was moved from a beach can be reclaimed (permit-by-rule required).
- Beaches may be tilled (permit-by-rule required).

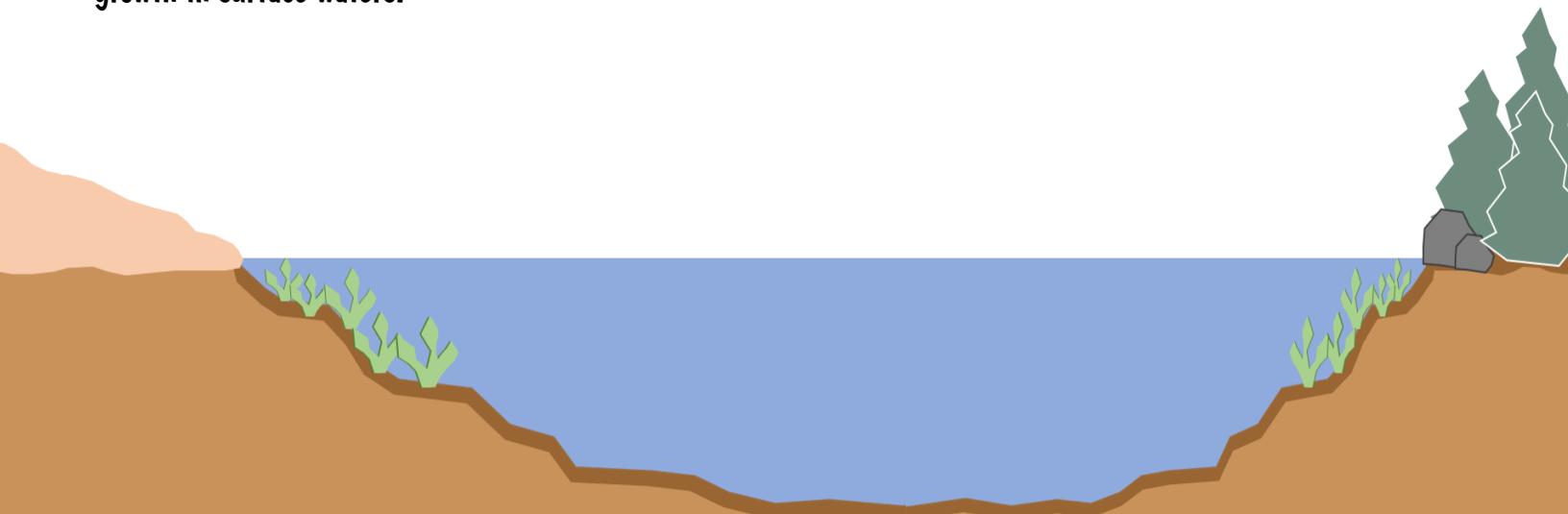
Otherwise, the shoreline should be left in its natural condition. A good vegetated buffer maintains the scenic quality of the lake and provides important stabilization and pollutant filtering advantages.

Why are artificial beaches bad?

Natural processes erode artificial beach sand, making it nearly impossible to create and maintain a stable artificial beach that doesn't require new additions of sand on a regular basis. Eroding beach sand can diminish valuable lake habitat by embedding these critical areas around the shoreline. Sand also carries phosphorus, a nutrient that fuels algal and plant growth in surface waters.



A single public beach can often be less harmful than several private beaches around a lake or pond.



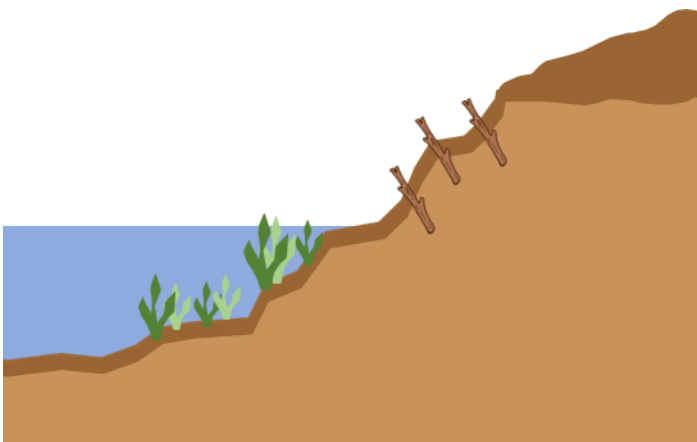
erosion & sedimentation

Clearing land for development can increase stormwater runoff if the proper controls are not put in place (see Structures, Construction, & Maintenance). Uncontrolled stormwater runoff can lead to erosion and sedimentation, carrying phosphorus-laden sediment to surface waters. Phosphorus stimulates excess plant and algal growth and sediment clouds the water, clogs fish gills, and embeds critical habitat. Shorelines can be stabilized using **VEGETATION** or **RIPRAP** for trapping or preventing eroding sediment.

Vegetation

Live stakes from woody shrub cuttings (such as Red-Osier Dogwood, Grey Dogwood, and Pussy Willow) can be planted on 3:1 or flatter shoreline slopes. Slopes should be seeded or mulched until the live stakes take root. The dogwoods and willows love full sun, but the dogwoods can grow in partial shade up to 6-15 feet tall. Spring before leaf-out is the best time to plant!

- Live stakes should be 2-3 feet long with all side branches and leaves removed
- Plant live stakes 1-3 feet apart within 24 hours of harvesting from the parent plant
- Drive 3/4 of live stakes into soil perpendicular to slope surface
- Cover bare soil with erosion control mulch, annual grasses, or hay mulch to hold soil and prevent weeds until live stakes take root



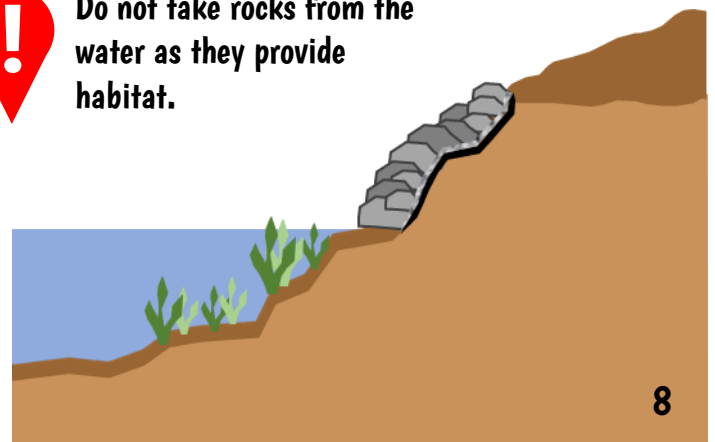
Riprap

Riprap is heavy stone stacked on the shoreline bank to protect against wave action and erosion. Any stone movement or introduction requires a Maine DEP permit-by-rule. Riprap should only be used as a last resort and on slopes 3:1 or steeper (but no steeper than 1:1).

- Create a trench on the slope toe with a row of large anchor rocks
- Place filter fabric and 3" of clean 3/4" crushed stone before layering the riprap stones on top
- Aim for the riprap layer to be twice as thick as the average rock diameter
- Stop the riprap about 2 feet above the normal high water line
- Soil above the riprap should be planted with vegetation or mulched



Do not take rocks from the water as they provide habitat.



vegetation, lawns, gardens, & footpaths

Shoreland Zoning Rules

- Vegetation removal within 75 feet of a great pond zoned for Resource Protection is prohibited, unless for safety concerns.
- Selective cutting within 100 feet of a great pond and 75 feet of a stream must follow the point system for 25'x50' plots and cannot exceed 250 square feet in canopy clearance.
- No more than 40% of the total volume of trees over 4 inches in diameter and taller than 4.5 feet within any lot may be harvested in a 10-year period.
- Branch pruning in the bottom third of trees is allowed, but existing vegetation under 3 feet, including groundcover, must be kept in place.
- Clearance for a 6-foot wide footpath is allowed (must meander and not create a clear line of sight to the water through the buffer). Structural development of footpaths that include fill material are prohibited, unless a 4-foot-wide set of stairs over a steep slope is approved by permit.

What is a buffer?

A buffer is a strip of natural vegetation along a shoreline that provides habitat, stability, filtration, privacy, and aesthetic value. Good buffers have multiple canopy layers, including groundcover, herbaceous plants, shrubs/saplings, and trees. A complex canopy structure allows for multiple points where rain can be intercepted and slowed down, lessening the chance for erosion.

Recommendations

- ✓ Install or maintain a shoreline buffer that covers 50-75% or more of water frontage.
- ✓ Plant a rain garden to capture stormwater runoff from a house or driveway (must meet minimum shoreline setback requirements and/or obtain a permit prior to construction).
- ✓ Stabilize and meander pervious footpaths.
- ✓ Leave or compost duff and grass clippings.
- ✓ Minimize lawn area and cut grass to 3".
- ✓ Minimize use of fertilizers and pesticides (prohibited by Maine Law within 25 feet of fresh waters).
- ✓ Plant or mulch bare soil.
- ✓ Become LakeSmart certified (see Resources).

250 ft

100 ft

75 ft

Shoreland Zoning Regulations (Great Ponds)

Limited Vegetation Removal (Great Ponds)

Shoreland Zoning Regulations (Streams)
NRPA Permit Standards (All Surface Waters)
Limited Vegetation Removal (Streams)



Great Ponds are waterbodies that are 10 acres or more in size.

vegetation, lawns, gardens, & footpaths

Choosing native plants not only sustains natural habitats for local species, but also requires less maintenance - saving you time, money, and effort!

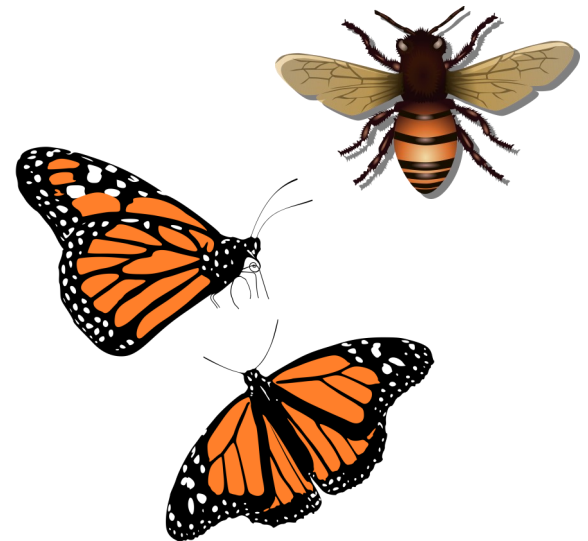
List of Native Plants

Be sure to consider soil type, sunlight, drainage, and slope.

- ✓ Tall White Beardtongue
- ✓ New England Aster
- ✓ White Turtlehead
- ✓ Blue Flag Iris
- ✓ Culver's Root
- ✓ Joe Pye Weed
- ✓ Labrador Violet
- ✓ Cardinal Flower
- ✓ Wild Geranium
- ✓ Beebalm
- ✓ Great Blue Lobelia
- ✓ Foamflower
- ✓ Switchgrass
- ✓ Red-Osier Dogwood
- ✓ Viburnums
- ✓ Northern Bayberry
- ✓ Chokeberry
- ✓ Cutleaf Coneflower
- ✓ Milkweed
- ✓ Goldenrods
- ✓ Sensitive Fern
- ✓ Bergamot
- ✓ Winterberry
- ✓ Summersweet
- ✓ Spicebush
- ✓ Arrowwood
- ✓ Elderberry
- ✓ Witch Hazel
- ✓ Highbush Blueberry
- ✓ Sweetfern

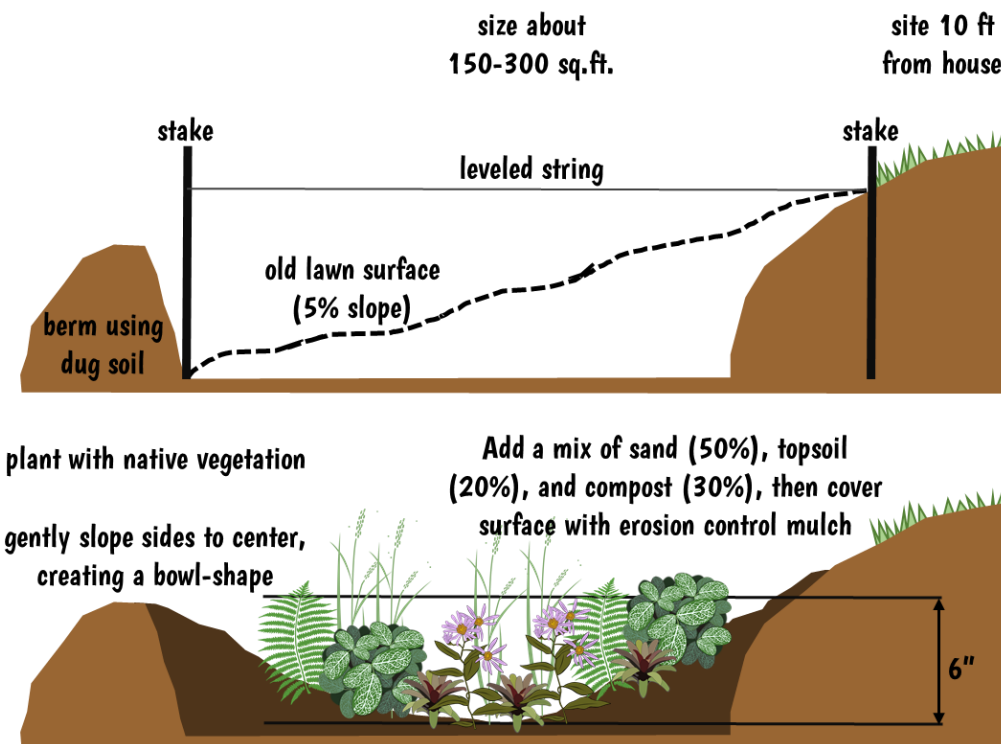


Select native plants that attract butterflies, hummingbirds, bumblebees, and other pollinators.



HOW TO BUILD A RAIN GARDEN

EXAMPLE OF A RAIN GARDEN INSTALLED ON A SLOPE



WATCH OUT!

List of Invasive Plants

- ⊗ Autumn Olive
- ⊗ Black Locust
- ⊗ Burning Bush
- ⊗ Common Buckthorn
- ⊗ Creeping Jenny
- ⊗ Japanese Barberry
- ⊗ Multiflora Rose
- ⊗ Norway Maple
- ⊗ Oriental Bittersweet
- ⊗ Porcelainberry
- ⊗ Purple Loosestrife
- ⊗ Shrubby Honeysuckles
- ⊗ Yellow Iris

roads, driveways, & culverts

Improperly-maintained roads and driveways can be a major source of phosphorus-laden sediment erosion to waterbodies.

Well-maintained existing roads and driveways should have the following characteristics:

- Crown with no ridges along outer edge of road
- U-shaped ditches with vegetation and/or check dams to slow water
- Slope of 2:1 for road ditches
- High quality gravel (3/4" crushed stone)
- Grading for water turnouts and diversion to direct runoff to forested areas
- Rubber razor installation in steep driveways to direct runoff to forested areas
- Culverts sized for large storm flows

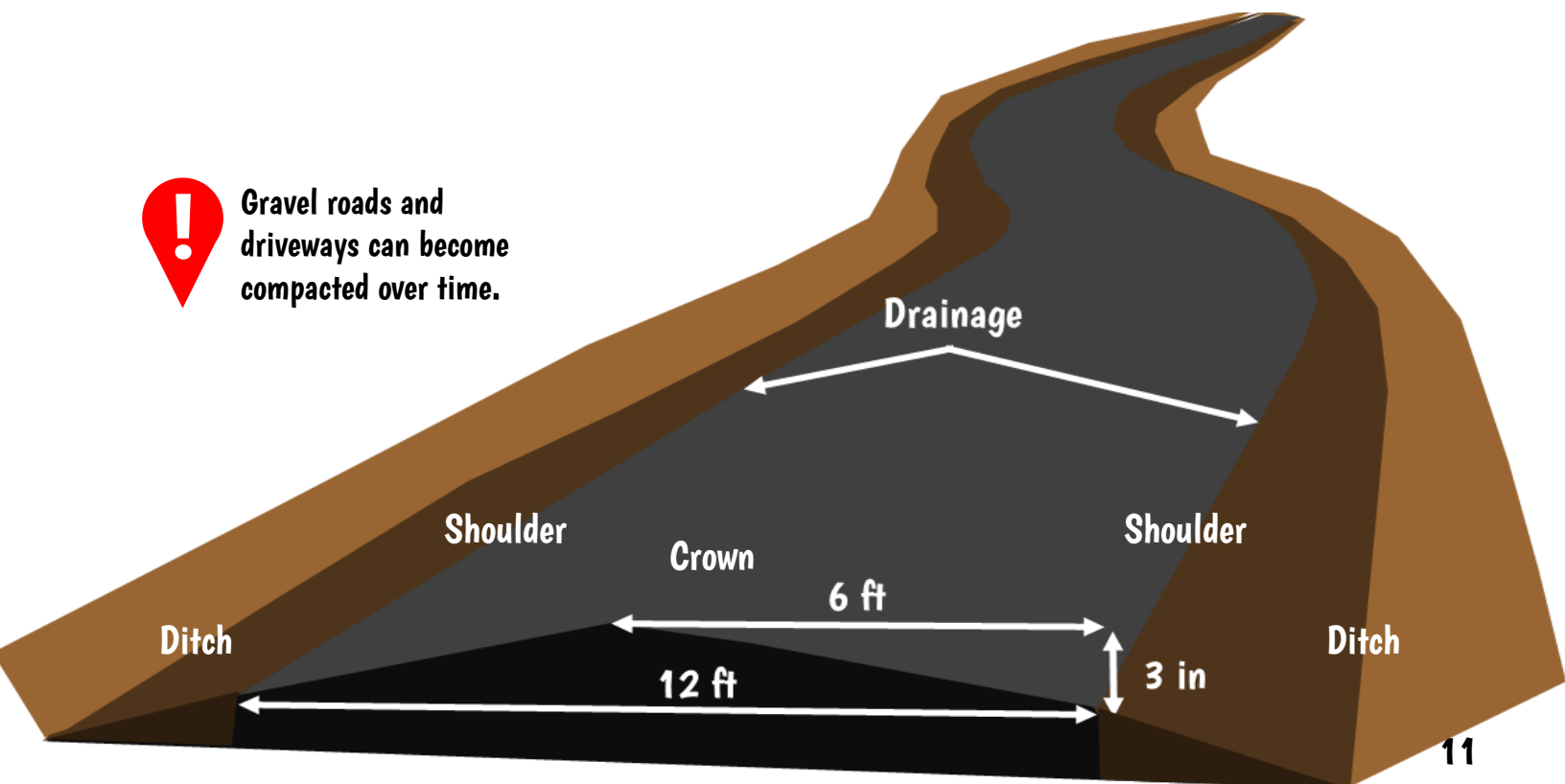
Be sure to also minimize and define driveways and parking areas and use permeable surfaces, whenever possible.



PHOTO: A culvert survey of town roads within the Kezar Lake watershed was completed in 2015. Each culvert was assessed and prioritized for replacement.



Gravel roads and driveways can become compacted over time.



structures, construction, & maintenance

New construction or rebuilds can generate soil erosion from project sites to surface waters. Erosion within 100 feet of the shoreline is controlled under the Erosion and Sedimentation Control Law (see Laws & Ordinances). A soil erosion and sedimentation control plan must be developed and followed during the construction process.

- Keep existing native vegetation, wherever possible
- Avoid parking or driving heavy machinery near trees to prevent soil compaction
- Install straw bales or log berms to trap sediment on any downslopes from the site
- Protect soil piles with tarps and properly-installed silt fences
- Replant bare soil quickly by covering with topsoil, seeding, and mulching with straw

The roof drip lines of existing buildings should be trenched and filled with crushed stone to infiltrate roof runoff. Gutters can also be used to divert roof runoff to rain gardens, dry wells, or other vegetated areas.

Maintenance of existing, permanent structures requires a permit-by-rule through the Maine DEP.

Silt Fence Not Maintained



Silt Fence Not Trenched



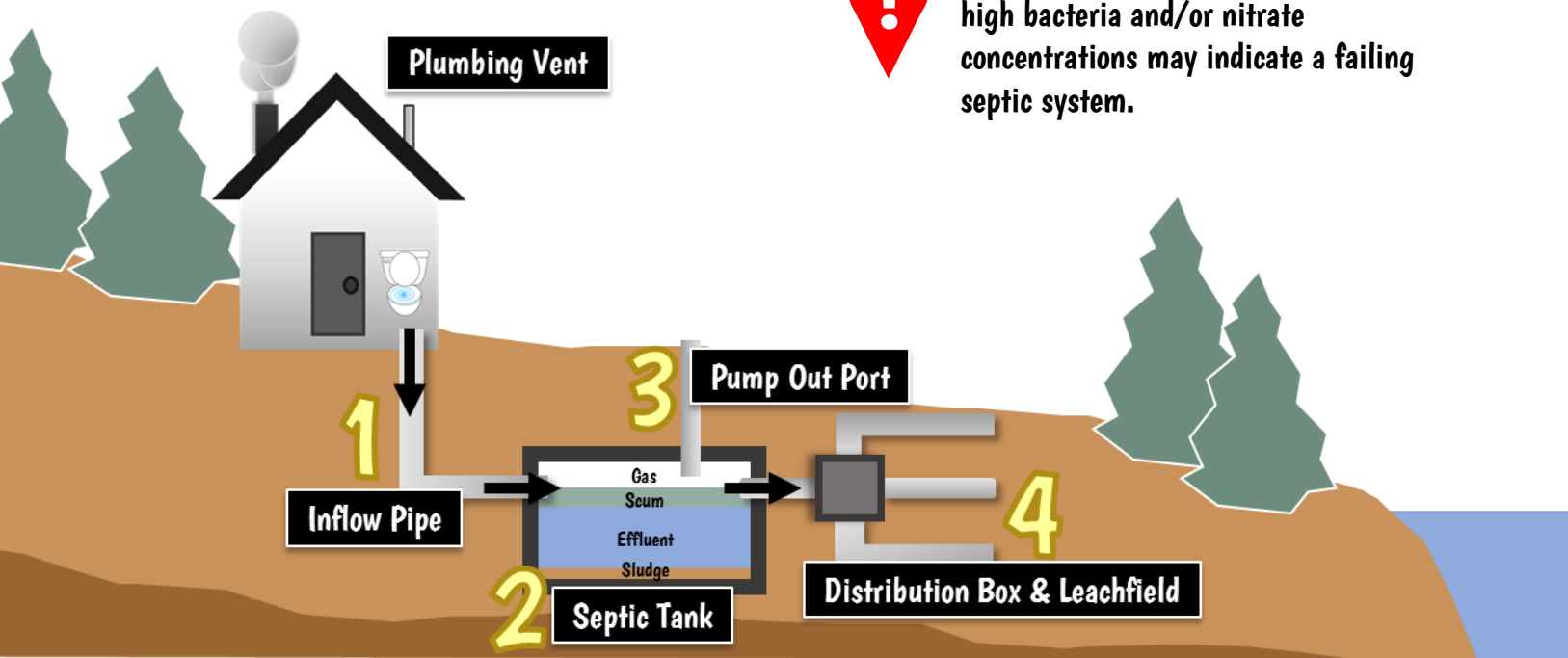
Working Silt Fence with Hay Bale Reinforcement



PHOTOS: Courtesy of Maine DEP and Portland Water District Construction BMPs fact sheet.



septic systems



Excessive weed or algae growth in the water near the shore or well water with high bacteria and/or nitrate concentrations may indicate a failing septic system.

Functions of a Septic System

1. Wastewater enters the septic tank from your house.
2. Heavy solids settle out (sludge) and grease, oils, and lighter solids rise to the top (scum). Sludge is decomposed by naturally-occurring bacteria.
3. Septic tanks are pumped on a regular basis to ensure that accumulated sludge and scum do not clog the leachfield.
4. Liquids flow out of the tank to the leachfield where bacteria, viruses, and some nutrients are removed through a biomat. Filtered water percolates to groundwater.

One of the biggest threats to water quality is the undetected failing septic system. Some failures are obvious and appear as smelly, surface break-outs. Most failures, however, are not obvious and may be the result of an inadequate biomat (for filtration), high soil permeability (sandy), high groundwater table, bedrock restriction, etc.

Septic System Maintenance Tips

- ✓ Pump out your system every 2-3 years (less frequently, if seasonal; more frequently, if use garbage disposal)
- ✓ Have your system inspected by a professional, especially if older than 25 years
- ✓ Ensure usage matches septic capacity (e.g., a 4-bedroom septic design cannot handle 12 renters in one stay)
- ✓ Divert storm drains, basement pumps, or runoff away from your system
- ✓ Reduce garbage disposal use by composting kitchen scraps
- ✓ Avoid flushing bulky items like paper towels and feminine products or fats and greases down the drain
- ✓ Avoid pouring chemicals or unnecessary additives down your drain or toilet - bleach can kill the good bacteria in your tank!
- ✓ Operate heavy machinery away from and keep trees from growing on or near your leachfield

household chemicals

Brief list of household contaminants that can be harmful to water quality

- Motor oil
- Lawn fertilizer & grass clippings
- Paint, paint thinner, & wood stains
- Pesticides, herbicides, & fungicides
- Pet & human waste
- Oils & greases
- Detergents, soaps, & other cleaners
- Septic tank effluent
- Garbage/Trash
- Pharmaceuticals
- Coal-tar driveway sealant
- Synthetic fragrances
- Antimicrobial products



PAINT DISPOSAL

Before disposing, solidify latex or acrylic paint in paint cans with kitty litter or set out to dry completely. Don't pour down the drain! Oil-based paint must be disposed of properly as a hazardous waste (www.envdepot.com).



PHARMACEUTICALS

A nationwide study found that antibiotics, hormones, contraceptives, and steroids were detected in 80% of streams. Find a collection day in your area (www.dontflushyourdrugs.net) or dispose of them in a tightly sealed bag.



Tips for managing household chemicals

- ✓ Check car for leaking fluids
- ✓ Clean up oil spills with kitty litter, then dispose of oil properly (most auto service shops will take used oil)
- ✓ Wash car or boat on lawn or take to a commercial car wash
- ✓ Reduce household chemical and phosphorus-based product use
- ✓ Dispose of pet waste in trash or toilet
- ✓ Avoid using fertilizers, herbicides, and pesticides within 150 feet of lake, ponds, and streams (prohibited by Maine Law within 25 feet of fresh waters)
- ✓ Report dump sites within the watershed to the Town of Lovell or Maine DEP

LAWN CARE

More than 90% of lawns do not need additional phosphorus, so get your soil tested before applying phosphorus fertilizers! Avoid over-fertilizing by calibrating your spreader to apply half the recommended amount on the bag's label. Apply in September for best results; avoid applying before spring leaf-out. Leaving grass clippings will act as a natural fertilizer by recycling nutrients back into the soil. Younger lawns may need nitrogen, so look for bags with 10-0-0 labels.

Get soil test kits through the University of Maine Cooperative Extension (umaine.edu/soiltestinglab/).



It is illegal in the State of Maine to put any kind of pesticide into public waters.

boats, docks, & boating

Non-permanent docks and swimming floats that are taken out before winter (in the water for less than 7 months per year) do not require a permit. The Town of Lovell will not permit any new permanent docks. Permanent structures remove habitat, change the flow of water, and can exacerbate erosion around the structure.

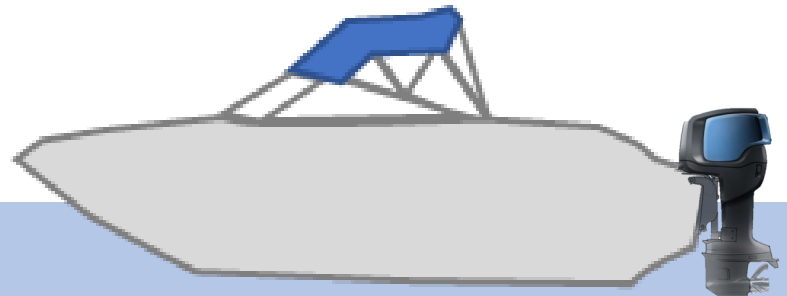
Pressure-treated wood today uses less toxic materials, but be sure that the sawdust or ash of pressure-treated wood is disposed of away from surface waters.

Using a community public boat ramp instead of many private ones can help alleviate shoreline erosion and protect the lake from invasives during volunteer boat inspections. If a private boat ramp already exists, be sure to divert runoff (especially if it is located on a steep slope), use non-erodible materials, and minimize the width of the ramp to 12 feet or less.

Store gas and oil in approved secondary containers. Handle carefully where spills may enter or runoff to surface waters. Use bilge snakes to quickly absorb any spilled oil. Dispose of gas and used oil at local auto repair shops.

Inspect your boat by removing mud and plants before leaving or entering any body of water. Drain all water by emptying the bilge, live well, and engine cooling system. Dry your boat by keeping it in the sun for 5 or more days or clean boat if using sooner in a different waterbody.

Avoid unnecessary idling. Keep away from the shoreline; if near the shoreline, use **HEADWAY SPEED**.



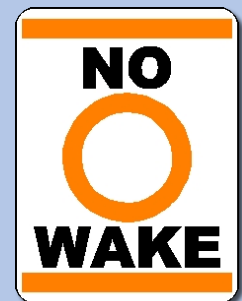
WAKEBOARDING

Watercraft designed for wake boarding may create waves hazardous to small watercraft, swimmers, and the shoreline. Operating in shallow lakes, like the lower bay, may result in increased turbidity and enhanced algae blooms. Recommendations for wake boat operators include:

- reduce speed within 300 feet of shore;
- avoid shallow areas (10 feet or less);
- minimize contact with aquatic vegetation;
- flush, treat, and dry ballast tanks before launching boat in another lake.



Headway speed is <6 mph or the slowest speed that the boat can operate and maintain steerage.



Waterfowl, loons, & fishing

While the adult loon population at Kezar Lake has been stable with some annual variation in the last 30 years, the chick population has declined. Eagle predation may be one cause.

The following actions can help protect our loons:

- ✓ Use lead-free sinkers (causes lead poisoning!)
- ✓ Remove fishing line from water (causes entanglement!)
- ✓ Avoid fishing near loon nests or swimming loons
- ✓ Enjoy loons from a distance (at least 200 feet)
- ✓ Support the KLWA loon watch program that deploys loon nesting platforms around the lake
- ✓ Use headway speed near the shoreline (loons and their nests are sensitive to wave action from motor boats)

Anecdotal information has shown that smallmouth bass and their prime habitat (gravel bars along the shoreline) have been declining since 2008. Loss of crayfish (their food source) due to acidification may be one cause.

The following actions can help protect our fish:

- ✓ Consider making Kezar Lake catch and release only for smallmouth bass
- ✓ Debar all fish hooks to avoid fish injury

beaver

Beavers help to establish and maintain wetlands and should be viewed as a natural and beneficial component of the ecosystem. However, beaver dams can also cause flooding if streams back up to a beaver dam. There are several strategies when dealing with beaver dams that are threatening public safety and infrastructure:

- ✓ Install a screen to block beavers from building near or at culverts and bridges
- ✓ Install barriers or guards around individual trees to reduce access to dam-constructing materials
- ✓ Insert a pipe through the dam to manage water levels
- ✓ Contact Maine IF&W before disturbing beavers and their dams directly (relocating beavers can only be done by regional biologists)
- ✓ Lethal beaver trapping can be used during the recreational trapping season from late fall to early spring - a license is required
- ✓ Visit the Maine IF&W website for more information: www.maine.gov/ifw/wildlife/human/lww_information/beavers.html



Incidents involving fish tackle entanglement of loons or other waterfowl should be reported to the Maine Warden Service in Gray, ME at 1-800-228-0857 and KLWA at 207-925-8020.

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- ✓ Ensure 10 lb. test strength for fishing line; check line for fraying
- ✓ Follow Maine guidelines for fish catch limits
- ✓ Use functioning live wells

invasive aquatic plants

Kezar Lake and its six ponds are fortunate to not have any invasive aquatic plant infestation with the exception of Cushman Pond. Invasive plants, such as Eurasian water milfoil and variable-leaf water milfoil can easily out-compete native aquatic plants and spread rapidly by capitalizing on available nutrients and sunlight. The following provides a list of recommendations for keeping invasives at bay:

- ✓ Remove all plants and plant fragments from hitch, rollers, axle, wet well, motor, propeller, and any other part of the boat that was in contact with the water - plant fragments can survive out of water for several days
- ✓ Check fishing gear for plants and plant fragments
- ✓ Join the Lovell Invasive Plant Prevention Committee to help conduct regular shoreline surveys and/or volunteer as a Courtesy Boat Inspector at public landings on Kezar Lake (meetings are held in the Stephen and Tabitha King Meeting Room of the Charlotte Hobbs Library at 7pm on the 4th Thursday of each month)
- ✓ Report suspicious aquatic plants to the Lovell Invasive Plant Prevention Committee (LIPPC125@gmail.com)

Visit www.mainevlmp.org/mciap/FieldGuide.pdf for the Maine VLMP Field Guide to Invasive Aquatic Plants.



Variable water-milfoil



Fanwort

INVASIVE PLANTS

MAINE'S ELEVEN MOST UNWANTED INVASIVE AQUATIC PLANTS

This section covers eleven invasive species that are listed by law as posing a threat to Maine waters. Following the description of each plant is a list of possible look alike plants that may be confused with the invader.

18 Maine Volunteer Lake Monitoring Program

Invasive aquatic plants

- Eurasian water-milfoil
- Variable water-milfoil
- Parrot feather
- Water chestnut
- Hydrilla
- Fanwort
- Curly-leaf pondweed
- European naiad
- Brazilian waterweed
- European Frog-bit
- Yellow floating heart



RESOURCES

LAKESMART / MAINE LAKES SOCIETY

Free assistance is available to assess your property's condition in meeting good watershed protection practices. Contact Betty Smith, LakeSmart consultant at bgreatful41@gmail.com.

Visit mainelakessociety.org/lakesmart-learning to learn more about LakeSmart.

ROAD MAINTENANCE MATERIALS

Read the Maine DEP Gravel Road Maintenance Manual at www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf

Visit <http://www.maineroads.org> to learn how to form a road association.

LOVELL CODE ENFORCEMENT OFFICER (SHORELAND ZONING)

1069 Main Street
Lovell, ME 04016
207-925-6272
www.lovellmaine.us

MAINE DEP (PERMIT-BY-RULE)

312 Canco Drive
Portland, ME 04103
207-822-6300
www.maine.gov/dep/land/nrpa/ip-pbr.html

GREATER LOVELL LAND TRUST (GLLT)

208 Main Street
Lovell, ME 04016
207-925-1056
info@gllt.org
www.gllt.org

KEZAR LAKE WATERSHED ASSOCIATION

P.O. Box 88
Lovell, ME 04051
207-925-8020
klwa.us

LOVELL INVASIVE PLANT PREVENTION COMMITTEE (LIPPC)

To volunteer as a Courtesy Boat Inspector or become a steward for shoreline surveys of invasive plants, visit the website.
www.lovellmaine.us/lake-ponds-2/lake-ponds

VOLUNTEER LAKE MONITORING PROGRAM (Maine VLMP)

24 Maple Hill Road
Auburn, ME 04210
207-783-7733
vlmp@mainevlmp.org
www.mainevlmp.org

LAKES ENVIRONMENTAL ASSOCIATION (LEA)

230 Main Street
Bridgton, ME 04009
207-647-8580
lakes@leamaine.org
www.mainelakes.org

MAINE AUDUBON SOCIETY

20 Gilsland Farm Road
Falmouth, ME 04105
207-781-2330
info@maineaudubon.org
www.maineaudubon.org

glossary

Algae: Microscopic floating plants or phytoplankton. An excess of nutrients, like nitrogen and phosphorus, can cause an overgrowth of algae or an algae bloom.

Buffer: A vegetated strip of land that helps slow the progress of runoff, erosion, and sedimentation and prevent nutrients and pollutants from entering a waterbody.

Chlorophyll-a (Chl-a): A measurement of the green pigment found in all plants, including microscopic plants like algae. It is used as an estimate of algal biomass; higher Chl-a equates to greater amount of algae in the lake.

Color: The influence of suspended and dissolved particles in the water as measured by Platinum Cobalt Units (PCU). Sources that contribute to the types and amount of suspended material in lake water include weathered geologic material, vegetation cover, and land use activity. Colored lakes (>25 PCU) can have reduced transparency readings and increased total phosphorus concentrations. When lakes are highly colored, the best indicator of algal growth is chlorophyll-a.

Dissolved Oxygen: The concentration of oxygen that is dissolved in water. DO is critical to the healthy metabolism of many creatures that reside in water. Too little oxygen severely reduces the diversity and abundance of aquatic communities. DO levels in lake water are influenced by a number of factors, including water temperature, depth, concentration of algae and other plants in the water, and amount of nutrients and organic matter that flow into the waterbody from the watershed.

Eutrophication: the process by which nutrient inputs to a waterbody increase over time, causing an increase in lake productivity (or algae and plant growth). Lakes naturally become more productive or "age" over thousands of years. In recent geologic time, humans have enhanced the rate of nutrient enrichment and lake productivity, speeding up this natural process to tens or hundreds of years.

Internal Recycling of Phosphorus: This occurs when oxygen depletion in lake water frees phosphorus previously trapped in bottom sediments. The released excess phosphorus can fuel algae blooms.

pH: The standard measure of the acidity of a solution on a scale of 0-14. Most aquatic species require a pH between 6.5 and 8. As the pH of a lake declines, particularly below 6, the reproductive capacity of fish populations can be greatly impacted as the availability of nutrients and metals changes. pH is influenced by bedrock, acid rain or snow deposition, wastewater discharge, and natural carbon dioxide fluctuations.

Phosphorus: The total concentration of phosphorus found in water, including organic and inorganic forms. Phosphorus is one of the major nutrients needed for plant growth, and is generally present in small amounts. Humans can add phosphorus to a lake through stormwater runoff, lawn or garden fertilizers, and leaky or poorly-maintained wastewater disposal systems. Excess phosphorus can lead to increased plant and algae growth in lakes.

Stormwater Runoff: Water from rain, hail, and snowmelt that flows overland rather than soaking or percolating into the ground.

glossary

Temperature: The measure of the degree of heat in water. Temperature affects the density of water (e.g., cooler water sinks), the solubility of gases (e.g., cooler water holds more dissolved oxygen), the rate of chemical reactions, and the activity of aquatic organisms (e.g., metabolic growth rates peak at different temperatures for different species; some species such as trout and salmon prefer cooler, more oxygen-rich waters; others such as bass prefer warmer waters). Humans can alter temperature by removing shade-providing trees near surface waters, constructing dams or other impoundments that restrict free flowing waters, and causing soil erosion (e.g., turbid water absorbs more heat from the sun). Climate change is predicted to increase surface water temperatures at a much faster rate than the observed increase in air temperature; thus, water temperature serves as a critical indicator of climate change impacts to ecological systems.

Total Alkalinity: A measure of the buffering capacity of a lake, or the capacity of water to neutralize acids. It is a measure of naturally-available bicarbonate, carbonate, and hydroxide ions in the water, which is largely determined by the geology of soils and rocks surrounding the lake. Alkalinity is important to aquatic life because it buffers against rapid changes in pH.

Trophic State Indicators: Indicators of biological productivity in lake ecosystems, including water clarity, total phosphorus, and chlorophyll-a. The combination of these parameters helps determine the extent and effect of eutrophication in lakes, and helps signal changes in lake water quality over time.

Water Clarity: A vertical measure of water transparency (ability of light to penetrate water) obtained by lowering a black and white disk into the water until it is no longer visible (a.k.a., Secchi disk transparency). Changes in transparency may be due to increased or decreased algal growth or the amount of dissolved or particulate materials in a lake, resulting from human disturbance or other impacts to the watershed.

Watershed: All the land that drains to a given body of water.

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- York County Soil & Water Conservation District. Thinking of adding sand to replenish your beach? Think again. Funding in part by Maine DEP Section 319. www.yorkswcd.org/Lakes/ADDING%20SAND%20TO%20BEACHES.pdf