

Lake Dwellers' **HANDBOOK**

Getting to Know Mousam Lake
and Goose Pond, Boating Safety,
MLRA Events and Strategies for
Protecting Lake Water Quality



P.O. Box 333, Springvale, ME 04083

www.MousamLake.org

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Helpful Resources

“[Stormwater Runoff: A Threat to Water Quality in Maine Lakes](#)” is a short, informative video produced in 2020 by the MLRA thanks to a grant from the Maine DEP and the EPS. Learn how you can minimize the impact of stormwater runoff on your property. <https://youtu.be/2TaaWqYevls>

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Portland, ME Water District, Rubber Razors, https://www.pwd.org/sites/default/files/rubber_razors.pdf, May 2006.

RMB Environmental Laboratories, <https://www.rmbel.info/primer/lake-trophic-states-2/>, 2020.

The Buffer Handbook, Maine DEP, <https://www.maine.gov/dep/land/watershed/buffhandbook.pdf>, 1998.

University of Maine Extension, <https://extension.umaine.edu/publications/2500e/>, plants native to Maine, 2020.



Information about the MLRA Parade and other events are on p 8. [Like/Follow us on Facebook!](#)

Table of Contents

Helpful Resources	2
MLRA Mission Statement	3
Letter from MLRA President, Jamie Verity	4
Being Good Lake Neighbors	5
Boating Law Awareness and Boating Etiquette	6-7
MLRA Events ~ Fourth of July Parade and Kid's Fishing Derby	8
MLRA Beach at the "Foot of the Lake"	9
What is the Mousam Lake Watershed	10-13
What Threatens Our Lakes, Ponds and Streams?	11
Islands on the Lake and State Navigational Aids Map Link.....	12
Eutrophication from Phosphorus and Stormwater Runoff.....	13
How Can We Help Protect The Watershed?	14
Selection and Usage of Household Chemicals.....	15
Why Manmade Beaches are Prohibited by Law	16
Preventing Erosion and Sedimentation.....	17
Lawn, Garden and Footpath Guidelines.....	17-18
Vegetated Buffers are Beneficial to the Lake	19
Fireworks Emit Debris and Heavy Metals	20
Light Pollution Is Amplified Across the Lake	21
Thoughtful Road, Driveway and Culvert Design	22
Structures Construction and Maintenance	23
Septic System Maintenance	24
Organized Water-Quality Protection Efforts.....	25-29
Water Quality Monitoring on our Lakes.....	25
Mousam Lake Dive Team (Chinese Mystery Snail Removal)	26
Acton-Shapleigh Youth Conservation Corps ~ ASYCC	27
Invasive Plant Patrol ~ IPP.....	28
Invasive Land Plants	29
Municipal Laws and Ordinances for Lake Protection	30-31
MLRA-Produced Stormwater Mitigation Video Link	31



This Handbook is sponsored by Mousam Lake Region Association (MLRA), situated in Acton and Shapleigh, ME. Our thanks to L. Diemer FB Environmental Associates and Square Pond Improvement Association for sharing this Handbook format and granting usage of common handbook information. Cover photo, Kristi Borst.

Support the MLRA with your membership www.MousamLake.org and attend our annual meeting, held at the fair grounds each June. In addition to our water quality protection efforts, you receive off-season property inspections.

Mousam Lake

REGIONAL ASSOCIATION
PO BOX 333, Springvale, ME 04083

www.MousamLake.org
Facebook Page ~ tiny.cc/MLRA-on-FB

The Mousam Lake Region Association, a 501(c)3 non-profit organization, is organized for the purpose of preserving and protecting the natural character of Mousam Lake and its surroundings. We are particularly focused on monitoring and enhancing water quality and educating people about the responsible use of the lake as a public recreational facility for today and for future generations.

From our President ...

The Mousam Lake Region Association (MLRA) is providing this handbook to educate and encourage residents and seasonal visitors to become more involved in watershed protection efforts, while responsibly enjoying Mousam Lake and Goose Pond. If you are already a member of the MLRA, thank you! If not, please consider becoming a member by visiting our website at www.MousamLake.org.

The Mousam Lake Region Association (MLRA) was founded in 1956 and has focused on protecting the water quality of Upper and Lower Mousam Lake and Goose Pond. The MLRA remains active and is, in fact, one of the longest running and largest lake associations in Maine.

Mousam Lake has been officially monitored by the Maine DEP since 1974. The current data available indicates our water quality is average and stable, based on Secchi disk transparency readings as well as total phosphorus and chlorophyll levels. However, Mousam Lake has an elevated risk of future water quality problems (including the introduction of invasive aquatic plants) due to its high density of shoreline development and increasing boat traffic. The State's public boat launch here is one of the most heavily used in the state.

Protection of Mousam Lake's watershed requires watershed landowners and residents to become aware of water quality threats and to explore and implement actions that sustain or improve water quality. As property owners and, collectively, as an association, we can each do our part to protect our lake from pollutants, help minimize shoreline erosion, and protect the future of our lake. We hope you'll join our commitment and passion for this beautiful place!

Special thanks to Kristi Borst, Ann Brown, Jill Folsom, David Landry, Mark Rousseau, Judy Verity, and our friends at the Square Pond Improvement Association for their help in our publishing this MLRA version of the Lake Dwellers' Handbook.

Most especially, thanks to each of you who strives to be a good neighbor and a good steward of the Mousam Lake Watershed!



James (Jamie) Verity, MLRA President



Located in southwestern York County, Maine, Mousam Lake is a dual basin, 926-acre lake located in the towns of Acton and Shapleigh. Mousam Lake has a maximum depth of 95 feet and a mean depth of 17 feet. The larger, upper basin of Mousam Lake has an average flushing rate of 1.3 times per year and the smaller, shallower lower basin has a flush rate of 18 times per year. Mousam lake has a total combined watershed area of 21 square miles, inclusive of the associated Goose and Loon Pond watersheds. Mousam Lake is highly developed, with over 950 seasonal and year-round homes.

Being Good Lake Neighbors

Suggested "Bill of Rights" to help ensure a positive lake experience for all. We are stewards during our tenure ...

As a property owner, I recognize my right to use my land and water-craft in accordance with existing Municipal rules and laws.

In addition, I commit to build in harmony with my surroundings, and to preserve and protect the views and the quality of the Mousam Lake watershed. I will learn and follow Maine State Boating Laws.



As a good neighbor, I equally recognize my responsibility to respect my neighbors' rights by monitoring my actions. I will minimize my impact by ensuring that stormwater runoff, air pollution, light pollution (p 21), or noise do not migrate beyond my property.

I will respect State Navigational Aid Markers (p 10), particularly those for "headway speed" (slow zone) which help preserve Mousam's shoreline from erosion. I will endeavor to be fully aware and considerate of other boaters and natural wildlife out on the water.

I will not knowingly introduce any invasive species, pollutants such as gas and oil, chemicals (e.g., soap, shampoo, detergent, and others listed in "Selection and Usage of Household Chemicals", p 15).

I will also avoid blowing leaves or dumping grass clippings, fertilizers, pine needles and other yard waste into the lake. These contribute to algae bloom (see p 13 which explains this process of eutrophication).



Excerpts from Maine Boating Laws...

You may not operate at a rate of speed that is not reasonable and prudent for existing conditions.

Operators must regulate their speed to avoid endangering, injuring, or unnecessarily inconveniencing another watercraft and its occupants, whether anchored or underway.

Improper Speed or Distance is not operating watercraft with reasonable speed and distance.

Operators also must **consider the effect of their watercraft's wake** on waterfront piers, floats, other property or shorelines.

You may not operate a watercraft at greater than "headway speed" while **within 200' of any shoreline**, including islands.

You may not operate in areas marked or **buoyed for swimming**, or buoyed for bathing.

There are two terms that help explain these **Navigation Rules**:

- **Stand-on watercraft:** The watercraft that should maintain its course and speed
- **Give-way watercraft:** The watercraft that must take early & substantial action to avoid collision by stopping, slowing down, or changing course.

Who May Operate Boats & Personal Watercraft (PWC)

- **A person under 12 years of age may not operate** a motorboat propelled by machinery of more than 10 horsepower **unless** under the immediate supervision of a person in the motorboat who is at least 16 years of age.

- To operate a personal watercraft (PWC), the following restrictions apply:

No one under 16 years of age may operate a PWC.

Persons 16 and 17 years of age

may operate a PWC **only if**:

They've successfully completed an approved safety education course & carry on board proof of age & course completion

OR

They are accompanied on board by a person 18 years of age or older.

Power vs. Power



Meeting Head-On

Power vs. Power: Neither watercraft is the stand-on watercraft. Both watercraft should keep to The starboard (right).

Power vs. Sail: The powerboat is the give-way watercraft. The sailboat is the stand-on-watercraft.

Crossing Situations

Power vs. Power: The watercraft on the operator's port (left) side is the give-way watercraft. The watercraft on the operator's starboard (right) side is the stand-on watercraft.

Power vs. Sail: The powerboat is the give-way watercraft. The sailboat is the stand-on watercraft.

Overtaking

Power vs. Power: The watercraft that is overtaking another watercraft is the give-way watercraft. The watercraft being overtaken is the stand-on watercraft.

Power vs. Sail: The watercraft that is overtaking another watercraft is the give-way watercraft. The watercraft being overtaken is the stand-on watercraft.

Power vs. Sail



Loons, Nests and Wildlife ...

Never use your PWC or boat to disturb, chase or harass wildlife. Please stay away from nests.

Stand-Up Paddleboards MUST HAVE ...

a **Personal Flotation DEVICE** (PFD) on board for each person
a **SOUND-PRODUCING** device such as a whistle

NAVIGATION LIGHTS when used between sunset and sunrise (may be a flashlight or headlamp with a white light)

Boat Etiquette

- Headway speed for regular boat/personal watercraft activity within 200' of shoreline
- Maintain 300' from shoreline when wakeboarding
- Avoid shallow areas (10' or less)
- Minimize contact with aquatic vegetation
- Be aware of wake between islands - headway speed encouraged

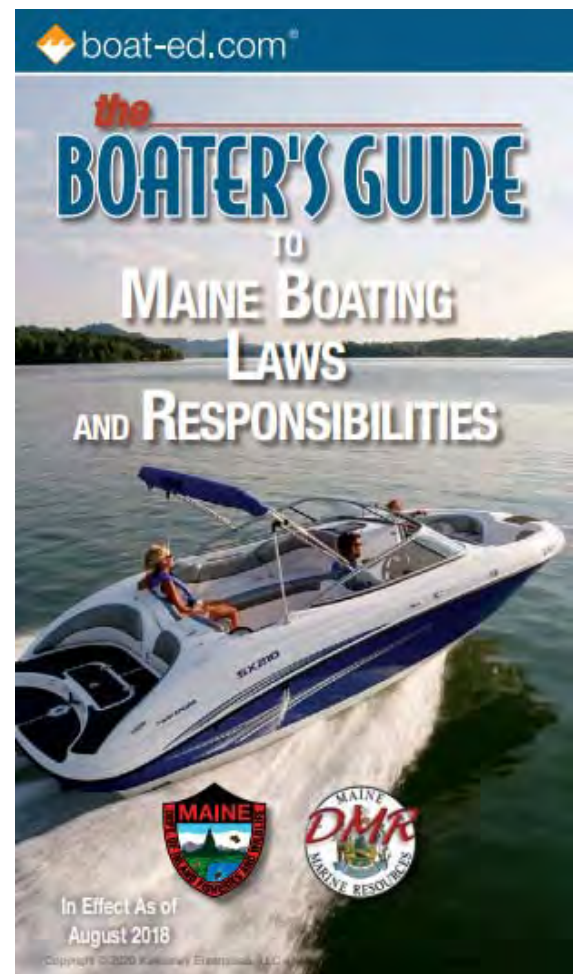
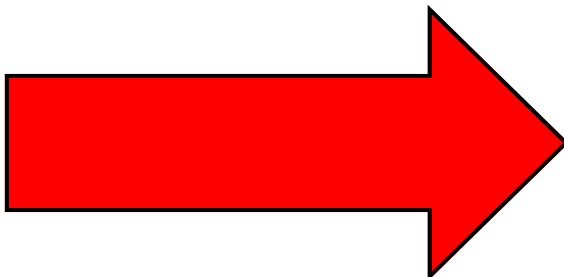
Headway speed is < 6 mph OR the **SLOWEST SPEED** the boat can operate and maintain steerage.

Towing, Wakeboarding, Water Skiers, Tubers, Etc.

Watercraft designed particularly for wake boarding may create waves hazardous to small watercraft, swimmers, and the shoreline. Operating in more shallow areas may result in increased turbidity and enhanced algae blooms.

- All persons being towed behind a watercraft on water skis, surfboards, or any other device must wear a PFD, which cannot be of inflatable design. Exception: Performers engaged in exhibitions or tournaments authorized by the MDIFW do not need to comply with this requirement. Please review MDIFW rules for trick water-skiing exemptions.
- It is illegal for motorboat operators to tow persons on water skis, a surfboard, or any other device between one-half hour after sunset and one-half hour before sunrise. If the towing watercraft is a PWC, it may tow between sunrise and sunset only.
- Every watercraft towing a person(s) on water skis, a surfboard, or any other device must have on board, in addition to the watercraft operator, a responsible person at least 12 years of age in a position to observe the towed person(s) continuously.
- It is illegal to operate a watercraft towing a person(s) on any device within 200 feet of any shoreline, including islands, unless operating in a manner that does not endanger any person or property while picking up or dropping off a person on water skis, surfboard, or other device.

***PLEASE ENSURE YOUR GUESTS
AND/OR TENANTS ARE FAMILIAR
WITH***



Maine Boater's Guide available online:

<https://www.maine.gov/ifw/docs/maine-boating-laws.pdf>

MLRA Annual Fourth of July Lake Parade and Kids' Fishing Derby

Each July, the MLRA hosts a Fourth of July Parade and a Kids' Fishing Derby. Dates will be announced early in the summer.

The route for the parade typically alternates each year, but registration is always at 11 am in Carpenter's Cove. Join in ~ Get creative ~ Have FUN! We encourage you to LIKE our **MLRA FB page** and subscribe to notifications.



MLRA Beach at the “Foot of the Lake”

MLRA owns and maintains the beach area at the foot of Mousam Lake. The beach is adjacent to the Rogers Bridge which separates Lower Mousam from Upper Mousam.

The MLRA has invested significant funds and labor into this area, including landscaping designed to improve our water quality by limiting erosion and rain water run-off from entering our lake.

We are also focused on the safe access and enjoyment of this beach by our members and the community. The MLRA asks that beach users stay on the defined path while accessing the beach and to please be respectful of the plant and mulch buffer zone designed to slow down and collect rainwater runoff.

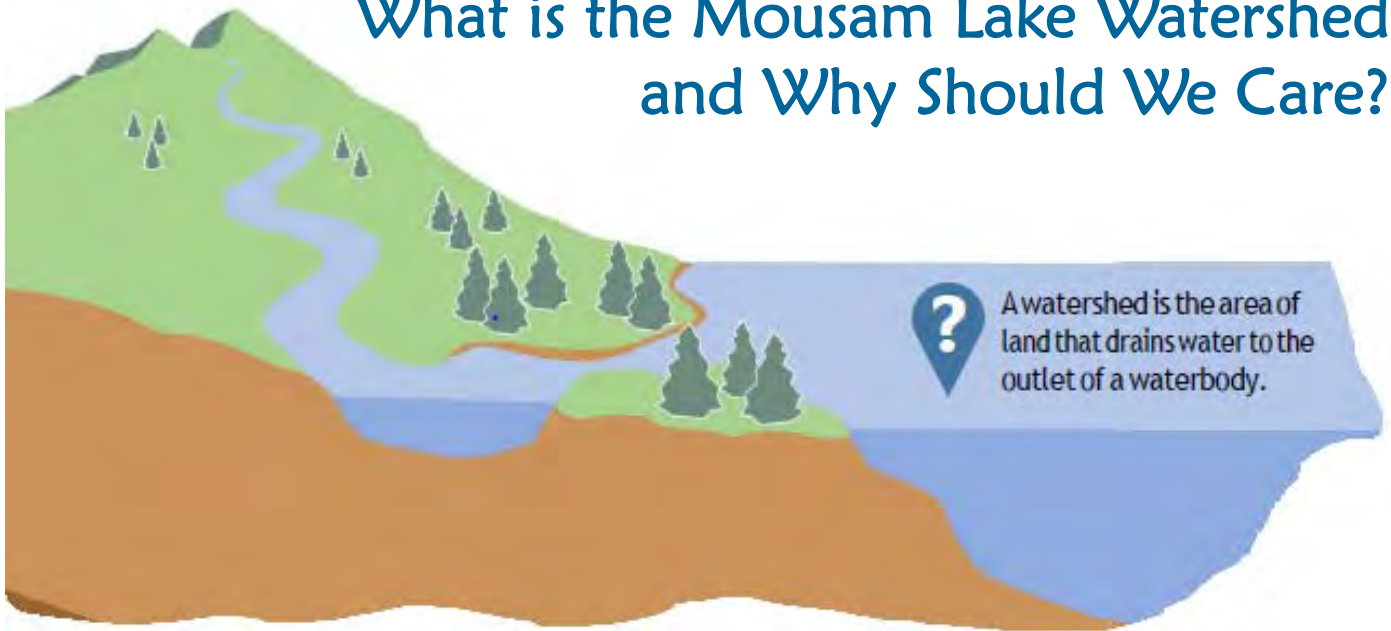


The beach is a “carry in / carry out” location and we ask users to bring all their trash home, including cigarette butts. Please adhere to the beach rules posted at the beach bulletin board. Please help the MRLA by picking up any trash you may find and prevent these items from entering our lake.

The swim zone is outlined by buoy markers. Therefore, boats of all types (including kayaks and paddle boards) are prohibited from entering this swim area.

Use of the beach and swimming is at your own risk, as there is no lifeguard on duty.

What is the Mousam Lake Watershed and Why Should We Care?



OUR ACTIONS HAVE AN IMPACT Pollutants on land eventually make their way to streams which feed into the lake or ponds. Subsequently, they can threaten water quality, aquatic life & personal enjoyment. But with awareness and forward-thinking, we can minimize our impact and even improve water quality!

The Mousam Lake Watershed

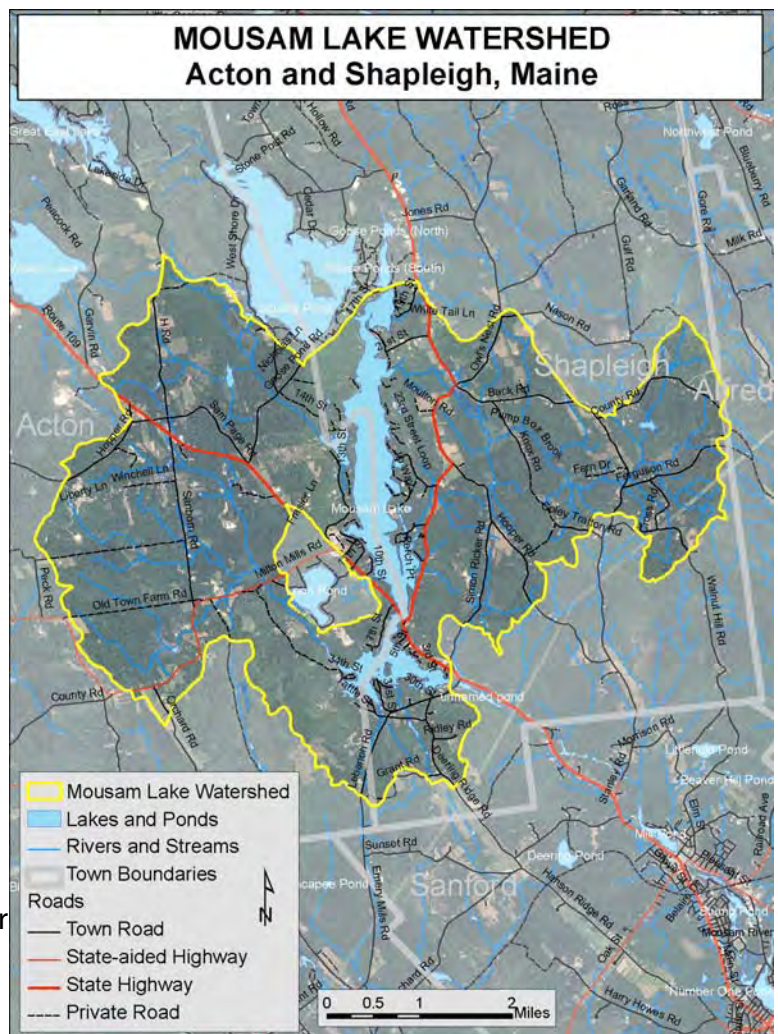
Mousam Lake and its watershed form a uniquely beautiful and sensitive ecosystem in south western Maine. The lake is recognized for its clear waters, ecological diversity, recreational opportunities and vital contribution to the local economy.

Our Connection

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

Our Impact

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



What is Threatening Our 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

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



Shoreline Erosion

Artificial Beaches, Inadequate Buffers, Wave Action from Boat Wakes

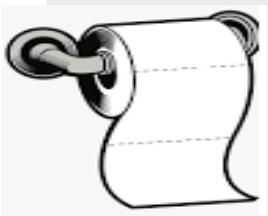
Impedes habitat, undercuts banks, disturbs loon nests & other shoreline habitat



Chemicals

Household, Automotive, Boat Fuels, Fertilizers, Fireworks

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



Failing Septic Systems

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

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



Invasive Aquatic Plants

Plant Fragment Transport on Water crafts from Waterbody to Waterbody

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



Climate Change

Greenhouse Gas Emissions During Fossil Fuel Combustion & Farming

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

Islands on the Lake

Mousam Lake has about a dozen islands ranging from very tiny ones that are only exposed during periods of lower water, such as Beef Island in the middle of Mousam, to the almost 6.5-acre Birch Island in Lower Mousam. Almost all are uninhabited and most are unnamed.

Many of Mousam's islands are privately owned, and boaters are reminded to respect property owners' rights. The islands also provide sanctuary for wildlife, including breeding areas for loons.

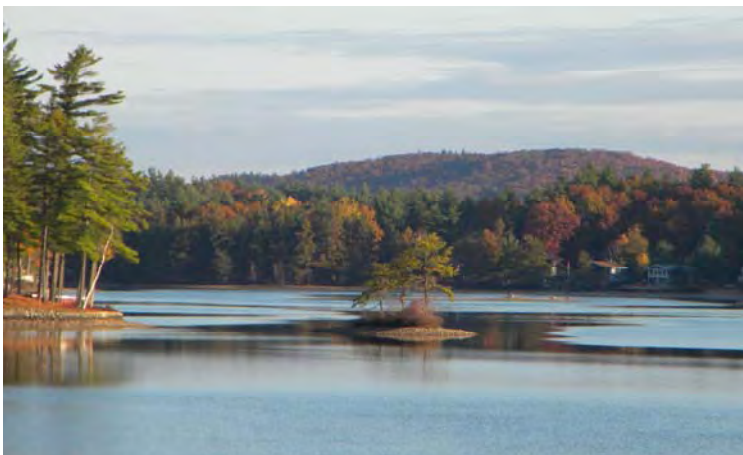
The shore lines are vulnerable to erosion that is exacerbated by waves from boat activity occurring too close to shores. Please be respectful of the islands, for their beauty, wildlife habitat value, and private ownership interests.

Keep proper boating distance to minimize wave action on shorelines, not only near islands, but also throughout the lake.

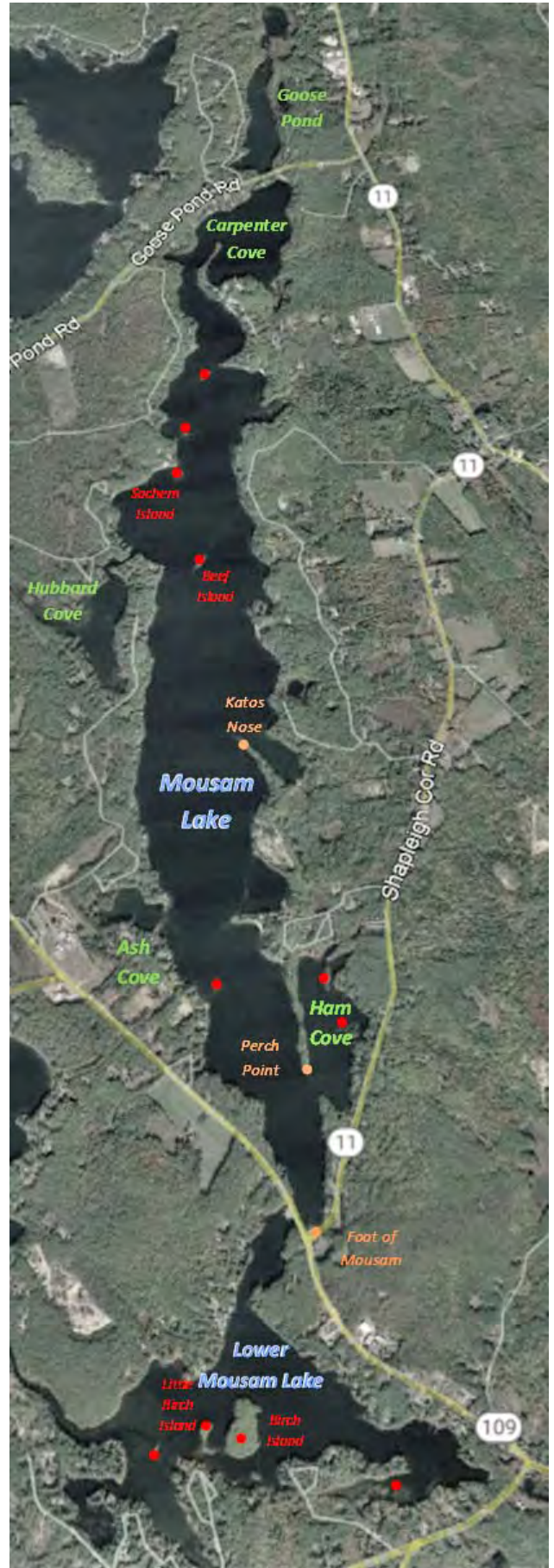
State-owned Aids to Navigation are placed near islands that represent boating hazards. To view a map of **Mousam Aids to Navigation** please scan the QR code or [download map here](#).



The navigation markers are placed in specific locations utilizing GPS coordinates dictated by the State of Maine. It is prohibited by law to move, remove or tamper with these navigational aids.



Sachem Island, aka Three Tree Island (photo, Mary Gannon)



Phosphorus in Stormwater Runoff

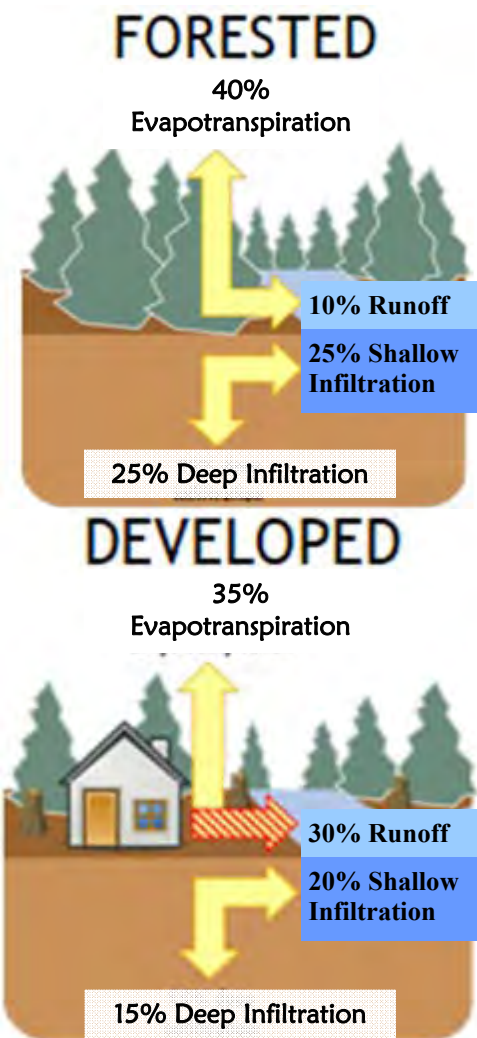
Phosphorus is a key nutrient for growth, but excessive amounts of phosphorus can stimulate ALGAL BLOOMS and abundant plant growth.

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 & 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.



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



... causes eutrophication

Eutrophication is the process by which **nutrient inputs** to a waterbody accumulate over time, causing an **increase in lake PRODUCTIVITY (or algae & 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 & lake productivity, speeding up this natural process by tens or hundreds of years. Trophic (TROH-fik) classifications exist: oligotrophic (highest/best rating), mesotrophic (middle rating), & eutrophic & hypereutrophic lowest ratings (least desirable qualities). Mousam Lake is at the Oligotrophic end of Mesotrophic per Lake Assessment Biology Department, Maine DEP.



How Can We Help Protect the Watershed?

Smart Strategies

We can help protect our watershed in 3 simple steps:



Reduce hard surfaces that quickly transport runoff

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

In This Handbook:

- Road, driveway & culvert design (p 22)
- Structures, construction and maintenance (p 23)



Minimize pollutants that may be carried off in runoff

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

In This Handbook:

- Why Beaches Are a No (p 16)
- Erosion & Sedimentation (p 17)
- Structures, Construction & Maintenance (p 23)
- Septic System Maintenance (p 24)
- Chemical Usage (p 15)
- Waterfowl & loons highlighted under Maine Boating Laws (p 6)
- Invasive aquatic & land plants (pp 28-29)

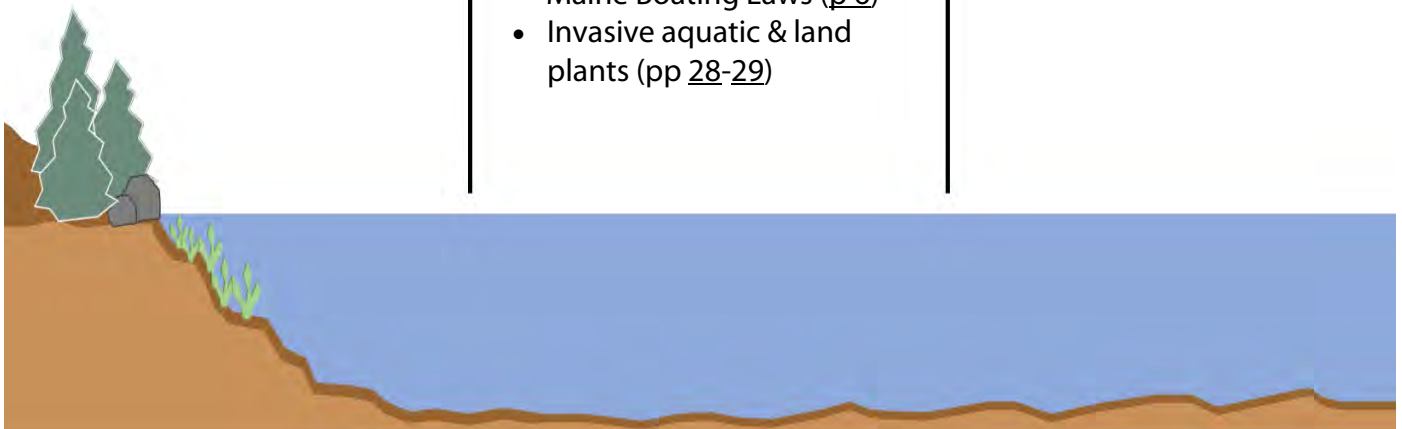


Infiltrate runoff to vegetated areas

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

In This Handbook:

- Vegetation, lawns, gardens & footpaths (pp 17-19)
- Structures, construction & maintenance (p 23)
- Laws & Ordinances (pp 30-31)
- [MLRA Stormwater Video Link](#) (p 31)



Selection and Usage of Household Chemicals

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

- Motor oil
- Lawn fertilizer
- Septic tank effluent
- Gas spills from boat filling
- Pesticides, herbicides & fungicides
- Paint, paint thinner & wood stains
- Pet & human waste
- Oils & greases
- Garbage/Trash
- Pharmaceutical, pills
- Coal-tar driveway sealant
- Synthetic fragrances
- Antimicrobial products
- Detergents, soaps, shampoos, conditioners, and other cleaners for bodies, cars, or boats



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 (<http://envprojects.com/>)

PHARMACEUTICALS

A nationwide study found that antibiotics, hormones, contraceptives & steroids were detected in 80% of streams. Find a collection day in your area: www.eyesopenforme.org/drug-take-back/



Tips for managing household chemicals

- ✓ Check car for leaking fluids
- ✓ Clean up oil spills with kitty litter, then dispose of oil properly
- ✓ Wash car or boat on lawn or take to a commercial car wash
- ✓ Reduce household chemical & phosphorus based product use
- ✓ Dispose of pet waste in trash or toilet
- ✓ Avoid using fertilizers, herbicides & pesticides with 150' of lake, ponds, & streams (**STATE LAW IS WITHIN 25' OF FRESH WATERS**)
- ✓ **Report dump sites within the watershed to the Towns of Acton or Shapleigh 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 (fee based) through the University of Maine Cooperative Extension (<https://umaine.edu/soiltestinglab/home/kit-request/>)



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



Why Manmade Beaches are Prohibited

IT'S THE LAW !

(38 MRSA 480-B)

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

What is allowed?

There are a variety of activities that MAY be able to take place within the shoreland protection area. Some activities will qualify by a Permit-By-Rule that satisfies the Natural Resources Protection Act (NRPA). The NRPA standards can be viewed online through DEP, 38 MRSA 480-B.

Local approvals are also needed and in some cases, activities may need to meet other State or Federal requirements.

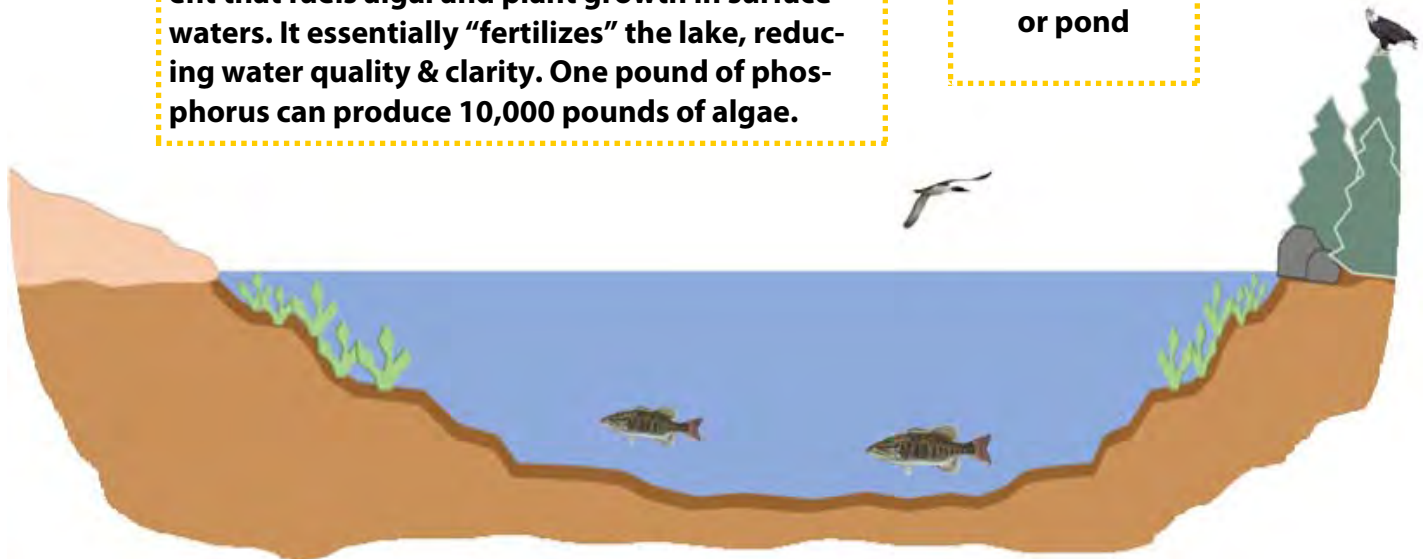
Otherwise, the shoreline should be left in its natural condition. A good vegetated buffer maintains the scenic quality of the lake & provides important stabilization & pollutant filtering advantages.

Why are artificial beaches bad?

Natural processes erode artificial beach sand, making it nearly impossible to create & maintain a stable artificial beach that doesn't require new addition of sand on a regular basis. Eroding beach sand can diminish valuable lake habitat by filling in other critical natural habitats around the shoreline. Sand also carries phosphorus, a nutrient that fuels algal and plant growth in surface waters. It essentially "fertilizes" the lake, reducing water quality & clarity. One pound of phosphorus can produce 10,000 pounds of algae.



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



Preventing Erosion & Sedimentation

Clearing land for development can increase stormwater runoff if the proper controls are not put in place (see Structures, Construction & Maintenance p 23). Uncontrolled stormwater runoff can lead to erosion & sedimentation, carrying phosphorus-laden sediment to surface waters. Phosphorus stimulates excess plant & algal growth. Sediment clouds the water, clogs fish gills & endangers critical habitat. Shorelines can be stabilized using **VEGETATION** or **RIPRAP** for trapping or preventing eroding sediment. See your town's ZONING ORDINANCE . Details on pp 30-31.

Lawn, Garden and Footpath Guidelines

Shoreland Zoning Rules <https://www.maine.gov/dep/land/slz/#rule>, **Chapter 1000 guidelines adopted January, 2015**

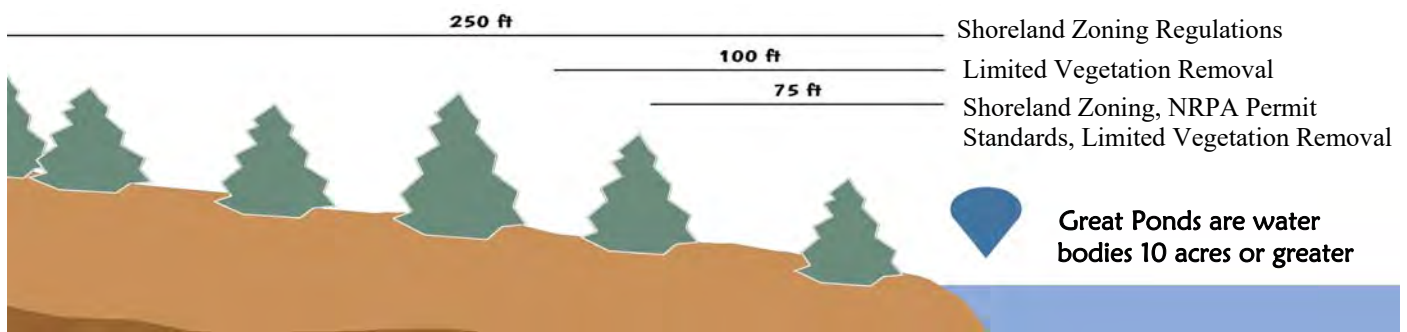
- **Vegetation removal within 75 feet of shoreline is prohibited. Safety concerns must be professionally documented.**
- **Selective cutting within 100 feet of the shoreline must be permitted & follow specific guidelines, not to exceed 250 square feet in canopy clearance.**
- **State Shoreland Ordinance allows for no more than 40% of total volume of trees over 4" in diameter & taller than 4.5' within a lot to be harvested in a 10 year period. TOWN ordinances may be more stringent! Pre-approvals are required.**
- **Branch pruning in the bottom ONE THIRD is allowed, but existing vegetation under 3' INCLUDING GROUND-COVER, must be kept in place.**
- **Clearance for a 6' MEANDERING footpath, not to create a straight line of sight to the water, is allowed. Structural development of footpaths that include fill material are prohibited, unless a 4' wide set of stairs over a steep slope is approved. Permit required.**

What is a buffer?

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

Recommendations

- ✓ Install or maintain a shoreline buffer that covers 50-75% of water frontage.
- ✓ Plant a rain garden to capture stormwater runoff from a house or driveway (must meet minimum shoreline setback requirements; check local ordinances).
- ✓ Stabilize & meander pervious footpaths.
- ✓ Leave or compost duff & grass clippings
- ✓ Minimize lawn area & cut grass to 3"
- ✓ Minimize use of fertilizers & pesticides (prohibited by Maine Law within 25' of fresh waters)
- ✓ Plant or mulch bare soil.
- ✓ Become LakeSmart certified (see: Resources p 2)



More Lawns, Gardens & Footpath Guidelines

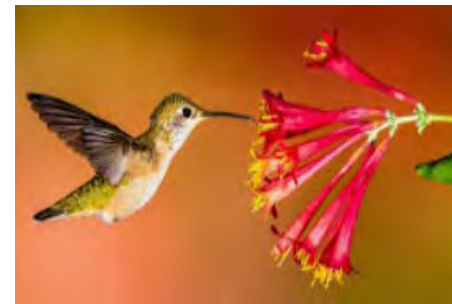
Choosing native plants not only sustains natural habitats for local species, but also requires less maintenance, saving you time, money & effort! The photos below are some ASYCC Projects.

Some Native Trees, Shrubs, Vines, Flowers ~
 Be sure to consider soil type, sunlight & slope.

- | | |
|-----------------------|---------------------|
| Balsam fir | Button bush |
| Red maple | Hobblebush |
| Paper birch | Blue flag iris |
| White ash | Bergamot |
| Jack pine | Milkweed |
| Red pine, Norway pine | Goldenrods |
| Black cherry | Cut-leaf coneflower |
| Eastern hemlock | Viburnums |
| Button-bush | Spicebush |
| Sweet-fern | Arrowwood |
| American hazelnut | Elderberry |
| Bush cinquefoil | Witch hazel |
| Winterberry | Highbush blueberry |
| Rhodora | Northern bayberry |
| Common juniper | Wild bee-balm |
| Flowering raspberry | Dewdrop |
| Low sweet blueberry | Whorled Aster |
| | New England Aster |



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



DO NOT USE
 INVASIVE PLANTS!!

INVASIVE PLANTS!!!

- Autumn Olive
- Black Locust
- Burning Buckthorn
- Bush Honeysuckle
- Creeping Jenny
- Japanese Barberry
- Japanese Knotweed
- Multiflora Rose
- Norway Maple
- Oriental Bittersweet
- Porcelainberry
- Purple Loosestrife
- Shrubby Honey-Suckles
- Smooth & Common Buckthorn
- Yellow Iris



Waterbars along the path slow flow and divert runoff into vegetated areas.

A plunge pool is an area where water is collected and allowed to infiltrate.

Vegetated Buffers Are Beneficial to the Lake

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

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



Buffers protect against noise and enhance privacy for lakefront residents.

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

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

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

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

Remember: clean water starts with you!

Fireworks Emit Debris and Heavy Metals

Despite the fact that the visual displays can be quite spectacular, there are growing concerns about the potential for fireworks to pollute lakes and groundwater.

Fireworks are comprised of a long list of chemicals used to create colors, noise & propulsion into the sky. Often, these displays occur near or over water to enhance viewing pleasure. Once launched, the chemicals can potentially be deposited directly into the lake or washed in from the shore after a rainstorm. In addition, the debris left behind after fireworks explosions can be coated with these same harmful chemicals.

Potential for Pollution:

While the amount of debris left after the ignition of fireworks displays may seem minor, multiple home displays around a lake can cumulatively contribute a significant amount of debris to a water body. In addition to being unsightly, debris are a potential source of chemical contaminants when deposited or washed into the water. Although Mousam's trophic rating is currently on the more favorable end of Mesotrophic (*closer to the desirable Oligotrophic state vs the unfavorable Eutrophic state*), heavy metals and chemical contamination may further degrade our lake's rating. (read more on p 13, 'Phosphorus in Stormwater Runoff Causes Eutrophication').

Heavy metals, such as copper, and other elements are used in fireworks to create many of the colors we observe. Another chemical compound, perchlorate (ClO_4^-), is used to assist in the skyward propulsion of fireworks. Studies have raised concerns regarding its ability to disrupt the body's synthesis of thyroid hormones. Fish development can also be affected by high concentrations of perchlorate. Fireworks can also contain nutrients (phosphorus and nitrogen compounds) that contribute to algal and other undesirable plant growth in lakes (more on this on p 13).

Please limit use of fireworks to the first two weeks of July and not after 10PM, keeping in mind that clean-up is a priority. Landlords: it would be helpful if your rental agreements prevented use of fireworks. If you have tenants, please consider posting this at your property.

Did you know??

Navigating in open waters with your **DOCKING LIGHTS** on can blind oncoming captains. Kindly, equate these lights with the high beams on your car, and turn docking or other bright lights off to oncoming traffic.

Light Pollution Is Amplified Across the Lake

Light pollution is artificial light that is allowed to illuminate, or pollute areas not intended to be lit. Outdoor lighting is important for safety & visibility. Not all lighting is equal, however. Much outdoor lighting is wasted since it is not aimed at its target and escapes to the sky. The challenge is to determine what is adequate lighting (e.g. lighting that is THE LEAST INTENSITY necessary to accomplish the light's purpose). Successful designs will provide nighttime security and safety while reducing energy consumption and emitting less light pollution, keeping skies dark. There are five types of light pollution defined below:

- Light Trespass: Lighting on one property that intrudes unnecessarily on an adjoining property.
- Over Illumination: The excessive use of light, including security lighting.
- Glare: Light reflection that can cause visual distortion including visual "white out".
- Clutter: An excessive grouping of lights.
- Sky Glow: the "glow" effect that is visible above populated areas.

Not addressing light pollution wastes energy, can be a nuisance to adjacent properties and the general aesthetics of the lake community. Please consider this information and the following suggestions when designing, maintaining and updating outside lighting on your property.

USEFUL



ALL LIGHT SHOULD HAVE A CLEAR PURPOSE

Before installing or replacing a light, determine if light is needed. Consider how the use of light will impact the area, including wildlife and the environment. Consider using reflective paints or self-luminous markers for signs, curbs, and steps to reduce the need for permanently installed outdoor lighting.

TARGETED



LIGHT SHOULD BE DIRECTED ONLY TO WHERE NEEDED

Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.

LOW LIGHT LEVELS



LIGHT SHOULD BE NO BRIGHTER THAN NECESSARY

Use the lowest light level required. Be mindful of surface conditions as some surfaces may reflect more light into the night sky than intended.

CONTROLLED



LIGHT SHOULD BE USED ONLY WHEN IT IS USEFUL

Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.

COLOR



USE WARMER COLOR LIGHTS WHERE POSSIBLE

Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.

Excessive lighting, including security lights, diminishes others' ability to view the night sky.

Thoughtful Road, Driveway and Culvert Design

Improperly maintained roads and driveways can be a major source of phosphorus-laden sediment and erosion into waterbodies (see p 13, Eutrophication).

Well maintained existing roads & 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 flow
- Slope of 2:1 for road ditches
- High quality gravel (3/4" crushed stone)
- Grading for water turnouts & 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 & define driveways & parking areas & use permeable surfaces whenever possible.



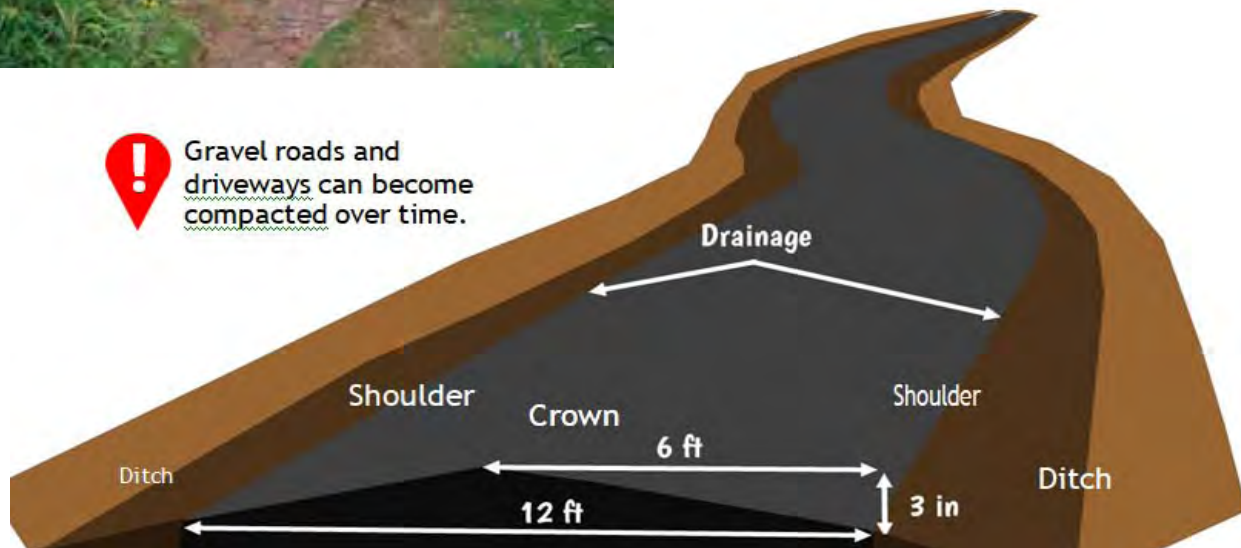
PHOTO of town culvert ~ assessed & prioritized for replacement



PATHWAYS made of semi-pervious pavers meanders to water. Runoff is distributed into vegetated gardens where it infiltrates the ground before reaching the shore.



Gravel roads and driveways can become compacted over time.



Structure Construction and Maintenance

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

- **Keep existing native vegetation wherever possible**
- **Avoid parking or driving heavy machinery near trees to prevent soil compaction**
- **Install proper silt fencing**
- **Protect soil piles with tarps & properly installed silt fences**
- **Replant bare soil quickly by covering with topsoil, seeding, & mulching**



Portland Water District
Helpful Construction Best Management Practices (BMP) PDF Guide

Roof drip lines of existing buildings should be trenched & 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. These are all projects within the realm of the Action-Shapleigh Youth Conservation Corps (ASYCC) Details of their offerings are on p 27.

Maintenance of existing, permanent structures requires a permit-by-rule (PBR) through Maine DEP and may need a local permit as well.



An infiltration trench was constructed to catch roof runoff at this lakeside home.

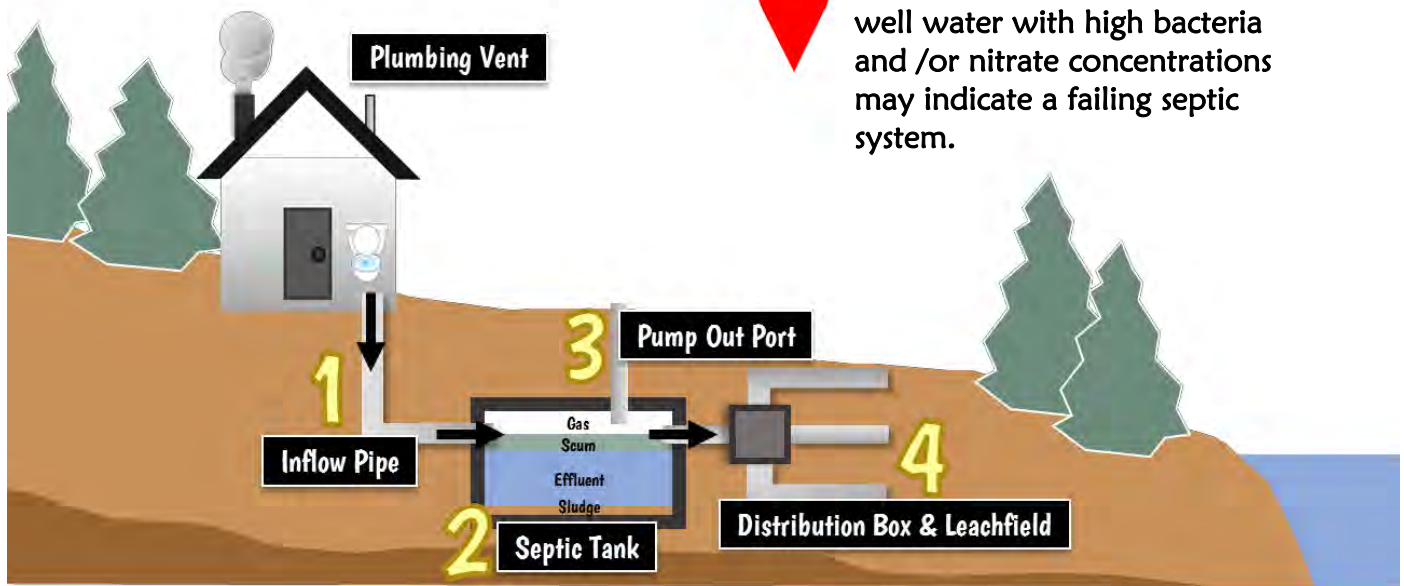


Another example of a drip edge along roofline.



A swale constructed along this roadway captures road runoff and prevents it from entering the lake, to the left.

Septic System Maintenance



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 (sludge) settle out & grease oils & 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 & 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 & 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 using garbage disposal)
- ✓ Have your system inspected by a professional, especially if older than 25 years
- ✓ Ensure usage matches septic capacity (e.g., a 3 bedroom septic design cannot handle 12 renters in one stay)
- ✓ Divert storm drains, basement pumps, or runoff away from your system
- ✓ Reduce garbage disposal usage by composting kitchen scraps
- ✓ Avoid flushing bulky items like paper towels & feminine products or fats & 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.

Organized Water-Quality Protection Efforts

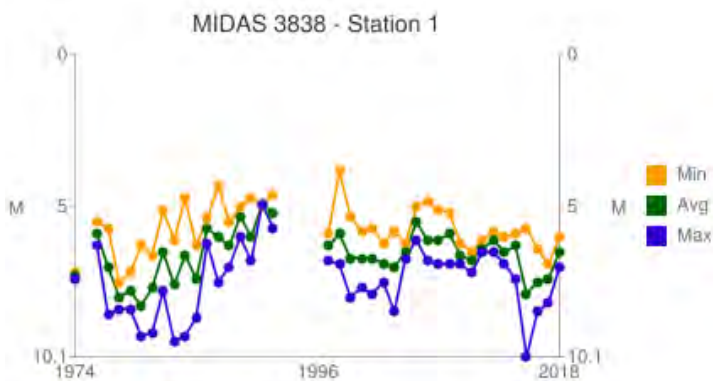
Water Quality Monitoring on Mousam Lake...



Mousam Lake provides head waters to the Mousam River, a 29.7-mile-long river that flows into the Atlantic Ocean just west of Kennebunk Beach. The Lake basin occupies 926 acres with a total drainage area of almost 30 sq. miles. At 95', Mousam is one of the deepest lakes in York County.

Mousam is a spring fed lake, with water exiting the lake through the Emery Mills Dam at the southern end in Lower Mousam. The average turnover rate of water in the lake is 1.26 /year; it takes about 290 days to exchange the water in the lake. Like many recreational water bodies, Mousam Lake is very susceptible to erosion, contaminants and any invasive plants or aquatic life.

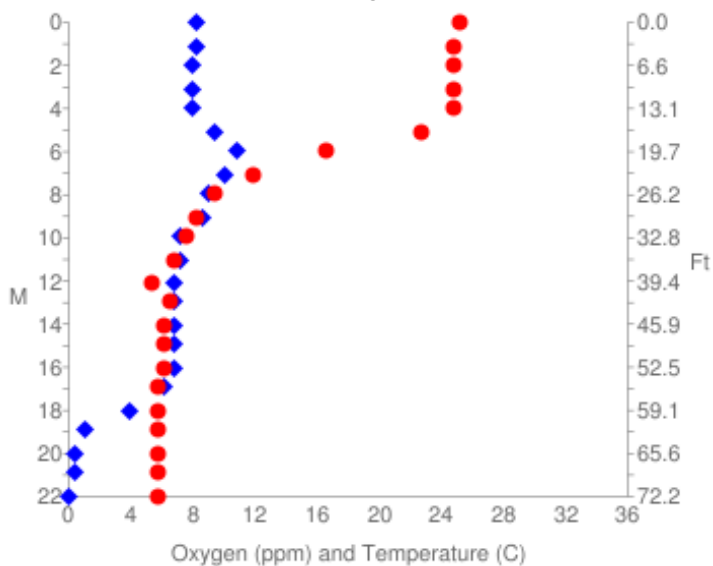
There are numerous monitoring efforts occurring on Mousam, including looking at key indicators to assess lake health and changes over time. For several decades, volunteers have collected data on water transparency (Secchi Disk), Dissolved Oxygen (DO), and ice-out date (when unimpeded navigation from one end of the lake to the other can occur). Secchi Disc and DO data is collected at several established stations on the lake, at the deepest points, and is repeated every two weeks from late spring into the fall.



Water transparency is a basic measurement whereby a graphic disc on a tape measure is lowered into the water. The point at which the disk is no longer visible is recorded. Changes in transparency is one of the first indicators that external factors may be affecting the health of the lake.

DO is measured using a probe attached to an electronic meter that is calibrated annually. Water temperature increases and phosphorous (from runoff plus plant and algal growth) are factors that can contribute to decreases in lake DO Levels.

Mousam Secchi Readings, 1976 to 2018



Data is sent to the Maine Volunteer Lake Monitoring Program (VLMP) where it undergoes quality assurance review before the data is entered into the Maine Inventory and Data Analysis System (MIDAS) database. Lake Stewards of Maine houses a searchable database of lake monitoring data on their website. To learn more about data collected on Mousam, visit www.LakesOfMaine.org. Use **MIDAS Code 3838** to view data for Mousam Lake. At left is some historical information from our Station No. 1.

It is extremely important that everyone take steps to reduce runoff into the lake as this can bring contamination from many different sources. It is much easier to control run off than to fix problems once they are affecting water quality.

Mousam Dissolved Oxygen Levels, 8/20/2018

Mousam Lake Dive Team (Chinese Mystery Snails)

MLRA Dive Team was founded in 2022 and is focused on scouting for Invasive Aquatic Plants (p 28) and combating the extremely invasive Chinese Mystery Snail (*Cipangopaludinachinensis*).

Although the Chinese Mystery Snail (CMS) is native to **Southeast Asia**, they were brought to the United States for Asian food markets. Unfortunately, they were released into our waters by people dumping contents of household aquariums. They have spread across North America, impacting fresh lakes and ponds. There is a large snail presence in our lake.

CMS Identification

- Large globe shaped shells, up to 3 inches with six to seven whorls.
- Concentrically marked white to blue colored opercula (opening in shell).
- Often found in high density. May be on lake bottom, rocks or partly buried in sand.
- May be seen, floating with operculum closed.
- After death, their shells turn olive green and they may wash up on shore.

CMS Spread and Habitat

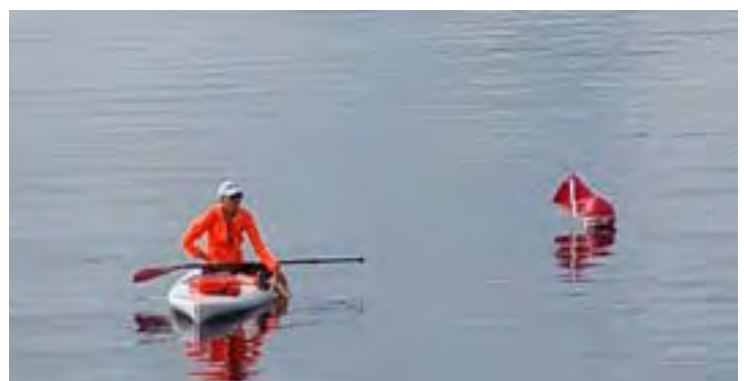
- Young CMS can be **as small as a grain of rice**. Adults and young, which may be hidden in mud and debris, can stick to anchors and ropes as well as to scuba and fishing equipment. The snails' operculum allows them to close their shells and survive out of water for multiple days.
- They prefer quiet, shallow waters in soft, sandy or muddy bottoms.
- The species is also host to parasites that may spread infection.

We realize that total elimination of the snails may not be possible, so trying to keep them in check is our goal. If you have a concentration of CMS in your area, please reach out; we can help! Remember ... never empty or clean aquariums in the lake. "Police" your waterfront, wearing disposable gloves when touching CMS, bagging, and taking to the dump.

The MLRA Dive Team consists of volunteer snorkelers, certified SCUBA divers, boat and surface support, and dive site hosts. Volunteers are trained to use our surface breather and do not need to be certified divers. Snorkelers and Scuba Divers generously use their own equipment.

Team members use kayaks, pontoon boats and paddleboards to partner with each diver that is in the water. This provides logistical support and protects the divers from boat traffic. Volunteers also help with after dive clean up, equipment maintenance and snail disposal.

We would love additional members on our team. If you'd like to get involved in any way, send an email to MLRADiveTeam@gmail.com. It's a great way to give back to our beautiful lake and get to know your lake neighbors!



Acton-Shapleigh Youth Conservation Corps

The **ASYCC** is a non-profit organization founded in 2001, working to protect Mousam Lake, Square Pond, Goose Pond and Loon Pond collectively known as the Mousam Lake - Square Pond Watershed. The ASYCC provides education, community outreach, technical assistance, courtesy boat inspections and the installation of erosion control practices in the watershed. The goal of the ASYCC is to sustain and protect the valuable water resources for its ecological importance as well as for the enjoyment of the local community, businesses and visitors.

The ASYCC provides two important resources to help protect the Mousam Lake - Square Pond Watershed:

1 CBI (Courtesy Boat Inspection) Program works to protect Mousam Lake and Square Pond from invasive aquatic plants and organisms by inspecting boats going into and coming out of our local waterways.

Invasive species threaten New England water bodies more and more each year. The CBI program was designed to detect the transportation of invasive aquatic species.

2 The ASYCC Erosion Control Program provides education, technical site visits and plans; helps with setting up the necessary permits; and installs a variety of erosion control and conservation measures to minimize shoreline erosion. **There is no cost for the crew's labors!** The landowner only has to pay for the materials, permits and a small overhead fee.

Additionally, the ASYCC leaders work closely with landowners providing education regarding the necessary maintenance of conservation practices that were



installed on the property.

The ASYCC is always looking for new Erosion Control Projects for the summer season. If you think you may have an erosion issue on your property,

please contact ecleader@asycc.com. A representative from ASYCC will meet with you for a FREE site evaluation.

www.ASYCC.com



Above, boat launch invasive species inspection. Below, samples of erosion control.



Invasive Plant Patrol (Mousam Lake IPP)

Definition of Invasive Plant: A plant that is not native and has negative effects on our economy, environment and/or human health.

The Mousam Lake Invasive Plant Patrol: The group that patrols the water shoreline to the littoral zone (the place where the sun light no longer reaches the bottom) looking for invasive plants.

Effect of Invasive Plants on water quality: Plants such as curly leaf pondweed (first two images), Eurasian water-milfoil (second two images) and other submerged and floating aquatic plants can easily out-compete native plants and spread rapidly, impeding navigation for anglers and boaters, as well as impacting wildlife natural habitats.

The importance of Mousam Lake IPP team to locate invasive plants: Early detection and eradication of small infestations and prevention of new infestations are the most cost effective way to manage invasive plants. Your help is needed in locating these invasive species. Be on the lookout. The more eyes we have on the water the better.

Invasive plants left unchecked will limit many property uses now and for the future. They will also lower property values.

Although Mousam Lake is fortunate not to have any invasive aquatic plants, here are some recommendations for keeping them at bay.

- **Check for and remove all plants and plant fragments from your boat trailer hitch, rollers, axle, wet well, motor, propeller or 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.**
- **Report suspicious aquatic plants to the Mousam Lake IPP Leader by sending an email to the address below.**
- **Join the Mousam Lake IPP Team.**

If you are interested in learning more about what we do or even joining our IPP Team, please send an email to General@MousamLake.org. We would welcome your support and participation.

At right, images of Curly Leaf Pondweed (top two) and Eurasian Water Milfoil (bottom two)



Invasive Land Plants

There are two known invasive land plants in the area of Mousam Lake.

1) Japanese Knotweed ~ *Polygonum cuspidatum* (Fallopia Japonica)

Japanese Knotweed is an invasive that grows quickly and aggressively, forming dense thickets. It thrives especially in riverbanks, roadsides and moist areas.



Dense thickets can clog small waterways and lower the quality of wetland habitats.



Leaves are oval or heart-shaped with pointed tips, 6 inches long, 4 inches wide.



Flowers are small and white and grow in showy lace-like branched clusters.



Spreads aggressively, sprouting from rhizomes which can be 30 feet long.



Bamboo-like, hollow, reddish-brown stem that can grow 3 to 9 feet tall.



Each female flower can produce 1000 wing-like seeds.

2) Purple Loosestrife (Lythrum Salicaria)

2019 Status in Maine: Widespread. Very Invasive.

Description: Robust, perennial herb, 4-6', base of mature plant feels woody. Leaves: Simple, opposite or whorled, lanceolate to oblong, entire, sessile.

Flowers: In long, crowded spikes, deep pink-purple, 5-7 petals, 1/2-3/4" wide, mid-late summer in Maine. Asynchronous flowering - bottom of spikes open first.

Fruit: Brown, dry capsules persisting on stem. Stem: Four-angled.

Reproduction: By seeds, which are viable for several years. Seeds are readily transported by water and can float for up to three days, or they may hitchhike on wildlife or in soil or fill.

Habitat: Wetlands, river shores, lakeshores, and wet open areas such as roadsides, agricultural swales and power-line corridors. Tolerates saturated conditions (organic/peat) and damp mineral soils. Most prolific in full sun, will survive in partial shade.



If you think you might have any of these invasive plants on your property or in the water, please email General@MousamLake.org for further investigation.

Landowner Laws & Ordinances

NATURAL RESOURCES PROTECTION ACT (NRPA) STATE LAW DEFINING ACTIVITIES THAT REQUIRE A PERMIT NEAR OR WITHIN CRITICAL WATERBODIES (38 MRSRSA 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 area, and
- 4) Bulldozing or scraping of land in an area that may be washed to a surface water area.

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 longer to obtain formal approval. NOTE:NRPA permit standards are often less strict than Shoreland Zoning but **be sure to follow local regulations.**

When a PERMIT IS NEEDED, SEE Maine Shoreland Zoning Ordinance and your respective Town ordinances.

SHORELAND ZONING LAW

(amended 2015) **IS STATE LAW REQUIRING INCORPORATION OF SHORELAND ZONING LANGUAGE TO MUNICIPAL ORDINANCES; GIVES MUNICIPAL AUTHORITY WITH STATE OVERSIGHT (38 MRSA 438-A AND ACTON & SHAPLEIGH, MAINE ZONING ORDINANCE).**

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 greater than 10 acres, any river that drains at least 25 square miles, and all tidal waters and saltwater marshes, as well as within 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 40,000 square feet in area.
- 2) **All structures - principal, accessory, temporary, or permanent - must meet the water setback requirement** except structures requiring direct access to the water as an operational necessity, such as piers, docks, or retaining walls. A structure located next to the water for convenience does not meet the test of operational necessity. A recreational boat storage building is not functionally water-dependent, and must meet water setback requirements.
- 3) **Total lot covered by non-vegetated areas** is limited to 20% in Acton, 10% in Shapleigh.
- 4) **The 2015 amendments** regulate expansion of non-conforming structures based on footprint and height. A municipality may choose to limit expansion of a non-conforming structure by footprint, by square footage or by percent; therefore it is essential to review local shoreland zoning ordinances before calculating the expansion of a structure.
- 5) **State law prohibits new cleared openings** from being created within 25' of the shoreline, referred to as the buffer area. If removal of vegetation less than two inches in diameter will create cleared openings, enough vegetation must be retained to prevent the creation of such openings. Also, if five saplings less than 2 inches in diameter do not exist in a 25-foot by 50-foot plot, no woody stems less than two (2) inches in diameter can be removed until five saplings are recruited into the plot. Furthermore, in order to protect water quality, vegetation less than three (3) feet in height and other ground cover must be maintained within the buffer strip. PERMIT NEEDED.
- 6) **Vegetative cutting is prohibited** abutting a great pond zoned Resource Protection for a

distance of 75 feet inland of the normal high-water line, except to remove **approved** safety hazards. Elsewhere, in any Resource Protection District the cutting or removal of vegetation shall be limited to that which is necessary for uses expressly authorized in that district. PERMIT NEEDED.

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 & applies to all areas including the shoreline. A permit & written soil erosion & sedimentation control plan is required by both Acton and Shapleigh. The plan must include provision for mulching and re-vegetation of disturbed soil, temporary runoff control features such as hay bales, silt fencing, or

diversion ditches, & 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.

Additional information about the harmful effects of Erosion and Sedimentation are on [p 17](#).

PLEASE NOTE ~ Rules and regulations outlined in this handbook are for general information only; landowners should always refer to official State and local rules/regulations and obtain any necessary permitting before work is done on a residential or commercial property within the watershed.

Stormwater Runoff: A threat to water quality in Maine lakes

[VIDEO LINK](#)



In 2020, as part of a Maine DEP and US EPA Federal Clean Water Act Section **319(h)** grant, the MLRA produced this video. You'll see how some small changes (erosion-control steps, drip-edge drains, rubber razor blade, buffer strips, and conservation mulch, and lakefront buffer strips) can help minimize the negative effects of stormwater runoff. [VIEW video](#) hosted on Youtube.com.

In being here,
we are called to be STEWARDS
(1) for the creatures that rely on the
watershed as their homes,
(2) for those who came before and
(3) for those who will come after.

We do not OWN this,
we are borrowing it!

Kristi Borst



P.O. Box 333, Springvale, ME 04083