

# Help Protect New Hampshire's Lakes

A guide to wise lake and  
watershed stewardship





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# Introduction

New Hampshire is home to nearly 1,000 lakes and ponds. Overall, these waterbodies are of high quality and are particularly important to the citizens of New Hampshire and its visitors since they provide for recreational opportunities. In addition, these waterbodies provide critical fish and wildlife habitat, and many serve as public drinking water supplies. Furthermore, numerous jobs in the state are dependent upon high quality lakes and ponds. Simply put, New Hampshire's lakes and ponds are important to the state's economy, its natural environment, and the overall quality of life.

The New Hampshire Lakes Association (NH LAKES) is a member supported, non-profit organization dedicated to protecting New Hampshire's lakes and their watersheds. NH LAKES has developed this guide to provide you with a basic understanding of lake ecology and watersheds, and the connections between lake quality and your activities in your home, on your property, along the shoreline, and out on the lake itself. This guide will also provide you with some simple suggestions on how to minimize your impacts on the lake, where to find more specific information about permit requirements for land clearing, structure building, and other development projects near lakes, and how to become actively involved in lake protection programs.

NH LAKES encourages you to join your local pond, lake, or watershed association, or start one if none exists (we can help!). NH LAKES also invites you to become a member of its organization. As a member of NH LAKES, you will receive numerous benefits in addition to having a voice at the state legislature on issues that affect you and your lake.

Thank you for helping NH LAKES protect New Hampshire's lakes and their watersheds!



# Section 1: Lake Basics

## What is a Watershed and How Do People Affect It?

A watershed is all the land that drains into a common waterbody, such as a lake, pond, or river. This waterbody is where all the water from precipitation and groundwater not used in other ecological processes eventually collects. A watershed can be only a few square miles or several hundred square miles in size. We all live in a watershed! You can determine the watershed boundary of a particular waterbody by connecting the points of highest elevation around that waterbody.

During rain events, soil and various pollutants such as fertilizers, pesticides and herbicides, oils and other chemicals, and animal manure (including septage) can be transported from the land surface within a watershed into waterbodies that are miles away.

Improper management of lawns, gullies and swales, malfunctioning septic systems, and runoff from urban and agricultural land allows higher concentrations of pollutants, including nutrients and sediments, to find their way into rivers and lakes than would normally occur. Increased nutrient loading can cause algae blooms and excessive aquatic plant growth, thus greatly accelerating the natural aging process of lakes, as well as polluting them with harmful chemicals.



We all live in a watershed, whether our home is located along the shoreline or miles away from the nearest body of water.

# The Life of the Lake

Lakes age with time. Most of New Hampshire's lakes are approximately 15,000 years old and have been going through a natural process of filling in over thousands of years. Although most of New Hampshire's natural lakes are approximately the same age, they are filling in at different rates. The natural aging process in which a lake fills in with material (such as sediment and decayed organic material) and gets shallower continues as a lake progresses to a pond, pond to marsh, marsh to meadow, and meadow to dry land.



Lake aging and filling in is a natural process.  
*(Photo courtesy of NHDES.)*

In New Hampshire, young lakes typically contain low concentrations of nutrients, are steep-sided, have clear water, have sand or rock along most of the shoreline, contain few aquatic plants and support little algal growth. Older-aged lakes contain high concentrations of nutrients, are shallow, have sediment accumulated on most of the lake bottom, contain extensive plant beds, and support much algal growth.

Humans can accelerate the natural lake aging process by increasing the amount of nutrients (particularly phosphorus) and sediment that would naturally flow into a lake from the watershed. Changes in how watershed land is used can result in changes in nutrient runoff into surface waters. Research studies have shown that the amount of phosphorus entering waterbodies from agricultural land is at least five times greater than from forested lands, and from urban areas is more than **ten times greater** than from forested lands!

# Phosphorus and Lake Quality

Phosphorus is a nutrient that all aquatic plants and animals need to survive, but in excessive quantities can have negative impacts on lake quality. The removal of natural vegetation within the watershed and the creation or expansion of surfaces that do not absorb water (called impervious surfaces), such as roofs or paved driveways, increases the amount of phosphorus reaching surface waters. Impervious surfaces do not allow rainwater or snowmelt water to sink into the ground where phosphorus can be removed by the soil. Sources of phosphorus include:

- Septic systems
- Lawn and garden fertilizers
- Washing cars and boats near the lake
- Doing laundry or bathing in the lake
- Soil erosion
- Feeding waterfowl
- Dumping/burning leaves in or near the lake

Increased phosphorus loading to a waterbody fertilizes the lake and can cause nuisance algal and plant growth. Algal blooms can cloud lake water and cause taste and odor issues. Excessive phosphorus can even lead to toxic blue-green algal blooms!

## Cyanobacteria (Blue-Green Algae)

Cyanobacteria are bacteria that use sunlight to produce their own food. They occur in all of our lakes, and have been there for thousands of years. When phosphorus in a waterbody is abundant, cyanobacteria may bloom and form surface scums. Some species of cyanobacteria are toxic. When toxic cyanobacteria become concentrated and are ingested, they can be harmful to wildlife, pets, and people. Human exposure to cyanobacteria may result in symptoms such as nausea, vomiting, diarrhea, mild fever, skin rashes, eye and nose irritations, and general sickness.



Generally, the water quality of New Hampshire's lakes is very good. However, lake water should not be consumed unless it is municipally treated for such uses. Neither in-home water treatment systems nor boiling the water will eliminate cyanobacteria toxins if they are present.

When toxin-producing cyanobacteria blooms occur in surface waters, the New Hampshire Department of Environmental Services (NHDES) will issue an advisory recommending that lake users avoid contact with the water in areas experiencing blooms.



Cyanobacteria blooms like this can be dangerous to your health.  
*(Photo courtesy of NHDES.)*

**If you observe a cyanobacteria bloom or scum:**

- Avoid swimming or wading in the water.
- Do not drink the water.
- Keep pets and livestock out of the water.
- Call NHDES at (603) 271-3414 or (603) 419-9229 to report the problem.

## Section 2: Lake-Friendly Actions

### In Your Home



Septic systems digest the waste from your household. The most common systems consist of a septic tank with a leach field connected to it. The septic tank holds solid waste, while the wastewater flows off into the leach field. The rocky soil around the leach pipes filters the water.

Nutrients can build up in household wastes and are dissolved in the water that ends up in the leach field. Those nutrients that do not get filtered out by the soil will eventually drain into groundwater or nearby waterbodies, including lakes. In order to minimize this, each of us must act wisely when addressing waste disposal in our home. Following these guidelines can help reduce the phosphorus load from our household to surface waters, groundwater, and ultimately lakes.

### **Conserve water.**

- When you use less water, the possibility of nutrients leaking into nearby waterbodies is decreased.
- Take shorter, less frequent showers, turn off the water while brushing your teeth, and run laundry or dishwashing cycles with full loads only.
- Install water-saving devices in your toilet tank, sink faucets, and shower head.

### **Use cleaning products containing no phosphates.**

- By choosing soaps and detergents containing no phosphates, you will avoid adding excess phosphorus into your wastewater, and ultimately into groundwater and surface waters.
- Just because something is biodegradable does not mean that it is good for the environment. Check the label for phosphates and other pollutants.
- You can purchase phosphate-free household products from environmentally-friendly companies.

### **Be careful what you flush.**

- Heavy toilet paper, paper towels, and cigarette butts can clog your septic system and are not easily broken down by natural processes.
- Paint products, bleach, septic tank additives, and toilet deodorizers can kill the good bacteria in your septic system that break down waste, causing the waste to accumulate and the system to malfunction.

### **Compost your kitchen waste.**

- Using a garbage disposal adds excess solid waste that can overburden your septic system, slow its function, and shorten its life.

- By decreasing the amount of solid waste in the system, you will not have to pump the tank as frequently.
- Composting kitchen and yard waste (away from the water) will help prevent nutrients from entering surface waters.

### **Pump your septic system.**

- Have your tank pumped at least every two or three years. If settled solids are not removed from the tank, they can wash into and clog the leach field.
- Organize a neighborhood septic system pump-out. You and your neighbors may be able to get a lower price!

### **Have your septic system inspected by a licensed inspector.**

- Upgrade or replace your septic system if it is outdated or undersized.
- Make sure that none of the pipes (such as the drain pipe from your washing machine) flow into or run off into streams, rivers, or lakes.
- The typical life expectancy of a conventional septic system and leach field is approximately 20 years. If your system is approaching this age, or if you have added bedrooms and/or bathrooms to your house since your septic system was built, have your system evaluated by a licensed septic system installer to determine if it is operating properly.



## On Your Property

No matter where you live, you live in a watershed. Whether you live next to a stream, river, or lake, or live miles away from the nearest waterbody, what you do on your property could potentially pollute and harm water quality. Fortunately, there are several simple ways you can reduce your impact on surface water quality in your watershed.



Can you see this house along this lake?  
Another way to minimize your impact on the lake and the surrounding watershed is to blend structures into the landscape.

### Minimize Landscaping

**Keep native deep-rooted trees, shrubs, and groundcover.**

- These are already suited for the environment and require less water and fertilizer than manicured lawns. They also stabilize erosion-prone soils and filter runoff before it reaches surface waters.

## Reduce the size of grassy areas and replace with native plantings.

- A mixture of trees, shrubs, and groundcover will add depth and diversity to your property, and habitat for wildlife.
- The University of New Hampshire (UNH) Cooperative Extension Family, Home and Garden Center can help you with selecting native plantings for your property. For assistance, contact (877) EXT-GROW or visit [extension.unh.edu/FHGEC/FHGEC.htm](http://extension.unh.edu/FHGEC/FHGEC.htm).

### Suggested Native Plant Species

#### **Trees:**

Balsam fir, White Spruce, White Pine, Eastern Hemlock, Red and White Oak, Red Maple, Sugar Maple, Shadbush and Sweet, Yellow or Paper Birch

#### **Shrubs:**

Alder, Arrow-wood, Dogwood (silky, gray, red-osier), Winterberry, Elderberry, Blueberry, Inkberry, Mountain Laurel, Witch Hazel, Rosebay Rhododendron, Swamp Azalea, Sweet Pepperbush and Viburnum (arrow-wood, nannyberry, hobblebush, highbush cranberry)

#### **Ground Covers:**

Virginia Creeper, Bunchberry, Barren Strawberry, Lowbush Blueberry, and Wintergreen

## **Don't fertilize your lawn or use herbicides or pesticides.**

- Try using alternatives made from natural ingredients. Look in bookstores and on the internet for all-natural gardening information or contact the UNH Family, Home and Garden Center for more information.

## **If you must use fertilizer, herbicides, or pesticides, use sparingly and according to the Comprehensive Shoreland Protection Act within 250 feet of lakes and rivers.**

- The Comprehensive Shoreland Protection Act prohibits the use of all fertilizers except limestone within 25-feet of the high water mark of lakes, ponds, and major rivers.
- Twenty-five feet beyond the high water mark, low phosphate, slow release nitrogen fertilizer or limestone may be used.

## **Manage Your Stormwater Runoff**

### **Reduce the amount of stormwater running off your property.**

- Collect rain water from your roof in a rain barrel and use it to water your garden.
- Create a rain garden and divert roof and surface water runoff into it. A rain garden is a depression in the ground vegetated with water-loving plant species.
- Replace grassy areas with a diverse mixture of native plantings.
- If you must have a grassy lawn, minimize the size of the area and leave or create a vegetative buffer (trees, shrubs, and ground cover) along streambanks and shorelines. Leave grass at least two to three inches high. The taller the grass, the deeper its roots and the greater its ability to absorb more water and nutrients, reducing the amount of water running off the landscape and into lakes and rivers.



**Before**

**After**

This rain garden (right) will help prevent erosion and reduce the amount of surface water running downhill and into the lake.

- Re-vegetate bare areas to help hold soil in place.
- Place crushed stone at the outfall of gutters to help prevent erosion and allow for water to soak into the ground.
- Install porous (pervious) pavers or pavement on your driveway which allow water to soak into the ground. This will reduce the amount of water running off the landscape.



**Before**

**After**

A dripline trench of crushed stone was installed (right) to catch water that runs off of the roof, allowing it to sink into the soil below instead of running downhill and picking up pollutants before flowing into the lake.

*(Photos courtesy of the Acton Wakefield Watersheds Alliance Youth Conservation Corps. [www.greastlake.org/2006Projects.html](http://www.greastlake.org/2006Projects.html).)*



## **Improve the quality of the stormwater running off your property.**

- Correct erosion problems by planting deep-rooted vegetation and groundcover.
- Divert the flow of runoff water from driveways and roofs to rain gardens and other vegetated areas. Never divert runoff into streams, rivers, or lakes.
- Do not use fertilizer, herbicides, or pesticides.
- During the winter, use deicing agents and sand on your driveway and walkways sparingly. Sweep up residues between storms and at the end of winter.

## **Along the Shoreline**

The New Hampshire Comprehensive Shoreland Protection Act (CSPA), RSA 483-B, was passed in 1991 and became fully effective in 1994. It protects surface water quality by setting minimum standards and requirements for the development, use, and subdivision of land within the 250-foot shoreland buffer zone. If you plan to clear any land or build any structure near the shoreline, you should consult the Comprehensive Shoreland Protection Act well-before starting your project. (*See Section 5 for required permit information.*)

If wisely managed, your shoreline can be an efficient natural buffer system between the lake and the surrounding landscape.

*Please note that all of the guidelines discussed in the “On Your Property” section of this guidebook are also applicable to shoreline properties.*

### **Avoid dumping sand or creating new beaches.**

- Sandy beaches that are not naturally occurring will not last. The sand will either be carried away by water currents or will slowly settle into the bottom of the lake, where it will contribute to the rate of lake filling in and aging.

- The addition of sand along the shoreline will smother bottom-dwelling organisms, alter the food chain, destroy fish spawning and nesting sites, and damage gills. As the lake becomes shallower, more sunlight will reach the lake bottom, which can lead to increased plant growth.
- It is illegal to dump sand or create a beach in New Hampshire without a permit from the New Hampshire Department of Environmental Services. *(See Section 5 for required permit information.)*

### **Leave the shoreline and nearshore area in its natural state.**

- Do not remove trees and other vegetation within 250-feet of the shoreline unless you have received a Comprehensive Shoreland Protection Act Permit which allows you to do so. Trees and shrubs help to stabilize the soil and reduce the amount of stormwater runoff that flows into and pollutes lakes and other surface waters.
- Do not remove rocks and native aquatic plants. Rocks and aquatic plants help break waves and prevent erosion.

### **Restore altered shorelines.**

Much of the shoreline along New Hampshire's lakes has already been altered and degraded by removing natural vegetation for the construction of docks, houses, lawns, and roads. While it is not required by law for shoreline property owners to restore altered shorelines, it is encouraged. It is also relatively easy!

- Convert a human-made sandy beach to a completely vegetated area.
- If you must have a sandy human-made beach, make it smaller, or construct a perched beach. A perched beach is one with little or no slope that is set back from the water. Perching a beach will help correct erosion problems on a sloping, sandy beach that leads directly to the water. Contact the New Hampshire Department Environmental Services for permit requirements. *(See Section 5 for required permit information.)*



Perched beaches like this one help minimize the erosion of sand into lakes.

- Limit foot-traffic to and from the shoreline by providing only one meandering pathway surrounded by vegetation.
- Prevent stormwater runoff from flowing off your property and into the lake by redesigning walkways and paths, and by adding rain gardens and vegetative buffers.
- Contact NH LAKES to find out if there is a Lake Conservation Corps<sup>SM</sup> group working in your watershed. They may be able to help you restore your shoreline property by providing technical guidance and labor.



**Before**

**After**

Reducing the steepness of an eroding soil pathway and stabilizing it with vegetation and gravel reduces the potential for erosion into the lake. *(Photos courtesy of the Acton Wakefield Watersheds Alliance Youth Conservation Corps. [www.greateastlake.org/2006Projects.html](http://www.greateastlake.org/2006Projects.html).)*

## Avoid attracting waterfowl.

- Don't feed the waterfowl.
  - ◆ Feeding waterfowl will attract more to the site. A single goose can create up to three pounds of waste per day. Waterfowl waste can contain significant amounts of phosphorus.
  - ◆ Fecal matter can contain harmful parasites and bacteria that can contaminate swimming areas, causing what is commonly called “swimmers itch” for some people.
  - ◆ Waterfowl are healthier when they consume the foods they naturally forage.
- Make shoreline property unattractive to waterfowl.
  - ◆ Grassy lawns attract geese and ducks. Providing barriers, such as dense shrubs, between the shoreline and the property will discourage waterfowl from the visiting the lawn.

While waterfowl may be pretty to look at, they can negatively affect the quality of a lake.  
(*Photo courtesy of  
www.wildernessclassroom.com.*)



## Do not bathe yourself or your pets in the water.

- Soaps and shampoos will add nutrients and other pollutants to the lake. Even camping soaps or biodegradable soaps may contain undesirable pollutants.
- Bathing in the lake can introduce bacteria scums and particulates.

## Do not remove aquatic plants without a permit.

- Aquatic plants help prevent erosion by stabilizing lake bottoms and shorelines with their roots and by absorbing wave energy.
- Aquatic plants are also important for fish spawning and nursery areas, and provide habitat for the insects and other organisms that support the entire food chain of the lake.
- Not only is it illegal to remove aquatic plants without a permit, removing native plants may open up habitat for invasive plants to take over.
- Before any exotic plant, such as variable milfoil, can be managed, the waterbody must have a long-term management plan approved by the New Hampshire Department of Environmental Services. *(See Section 5 for required approval information.)*



*(Photo courtesy of NHDES.)*

## Section 3: Lake-Friendly Boating and Recreation

Motorboats, skicraft, and personal watercraft can affect lake quality, plants and animals, and the stability of the shoreline. If you use a motorboat or craft, following these guidelines can help ensure a healthy lake environment.



### Buying a Motor Boat

Low-pollution 4-cycle and 2-cycle direct fuel injection outboard engines have been developed to reduce toxic air emissions from marine engines and reduce the release of gasoline into waterways. As of 2006, you can no longer purchase a non-direct fuel injection engine. By purchasing and using these cleaner burning engines, you can help protect New Hampshire's air and water quality, while greatly

reducing your fuel costs. Although these engines may cost more up-front, they provide many economic and environmental benefits since they:

- Burn 35 to 50 percent less gasoline, which means more fuel savings.
- Use up to 50 percent less oil.
- Reduce air emissions by 75 percent.
- Reduce the amount of gasoline released into surface waters.
- Are much quieter!

## Operating Your Boat



### **Operate away from shallow areas.**

- Motors can churn-up sediment on the lake bottom. This leads to phosphorus being re-suspended in the water, which contributes to algal growth and decreased lake clarity.
- Motors can fragment exotic plants, such as variable milfoil, potentially causing new areas of infestations as the fragments travel to other parts of the lake.
- Wildlife and waterfowl may be frightened away from their homes and nests by noisy motors.

## **Eliminate unnecessary idling.**

- It pollutes the air and water, and the wasted fuel can be expensive.

## **Do not operate within 150 feet of any shoreline at greater than headway speed (6 mph).**

- Not only is it illegal, but wakes erode the shoreline and damage wildlife habitat. Excessive speed is also a danger to others.



## **Maintaining and Fueling Your Engine**

### **Keep engines well-tuned.**

- Routinely check for fuel leaks and keep a shallow pan under engines to collect any leaking liquids.

### **Avoid overfilling fuel tanks.**

- Use a funnel or a spout with an automatic stop device to prevent overfilling the gas tank. Use absorbent materials or petroleum absorption pads while fueling to catch splash-back and any drops when the nozzle is transferred back from the boat to the fuel dock.



## **Avoid pumping any bilge water with an oily sheen.**

- Use absorbent biosocks or pads in the bilge area that capture or digest oil and dispose or recycle this material properly. Contact your local marina to purchase biosocks or pads.

## **Cleaning Your Boat**

### **Wash boat hulls by hand out of the water.**

- Use non-toxic and phosphorus-free detergents and cleaning products. If possible, use natural cleansers such as baking soda or lemon juice.
- Rinse water should not be discharged to surface waters or storm drains.

## **Disposing of Wastes**

### **Use marina sewage pumpout and dump stations.**

- It is illegal to discharge boat sewage in any surface water in New Hampshire. It contains nutrients and potentially disease-causing organisms. Pumpout stations allow you to empty holding tanks and portable toilets after a day on the water. The New Hampshire Department of Environmental Services maintains information on the locations of pumpout and dump stations. (*See Section 6 for program and contact information.*)



## Prevent the Introduction and Spread of Exotic Plants and Animals

Exotic aquatic plants are those species of water-loving plants that are not native to New Hampshire, and that have certain characteristics that allow them to grow more rapidly than native vegetation, thereby allowing them to take over a waterbody. Native aquatic plants, on the other hand, are vital to a healthy lake or pond; their growth is regulated through natural controls including predators and other environmental factors. Exotic species can also be animals. The zebra mussel is an example of an exotic animal that is not in New Hampshire, but it is still a threat to our waters.



Many exotic species threaten New Hampshire's lakes, including (clockwise from top left): Brazilian elodea, Eurasian milfoil, Fanwort, Variable milfoil, Zebra mussels, and water chestnut (seed shown in center).

*(Photos courtesy of NHDES.)*

As of the writing of this guide, exotic aquatic plants are found in 68 waterbodies in New Hampshire. Fifty-nine waterbodies have variable milfoil, three have Eurasian milfoil, one has Brazilian elodea, eight have fanwort, and one has water chestnut. Some waterbodies have multiple infestations of plants.

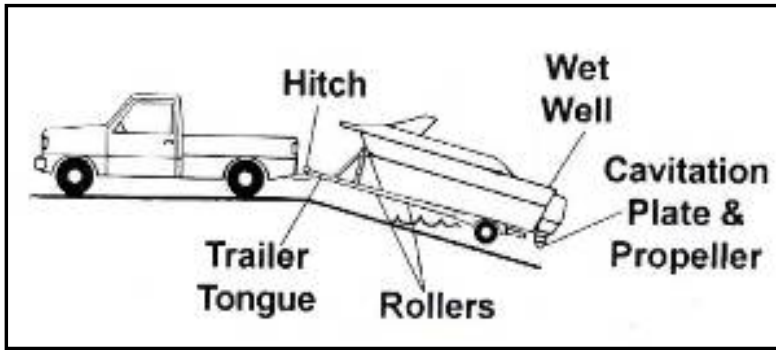
Exotic species infestations make recreation in and on the water dangerous and unpleasant, disrupt the ecological balance of lakes, reduce shoreline property values, and are difficult and expensive to control. Exotic species also pose a threat to many native species and valuable wildlife habitats. Some of the ways exotic species may have been introduced and spread from lake to lake in New Hampshire include:

- Dumping fish tanks or aquarium plants into waterbodies
- Importation of plants and animals for research
- Boaters transporting exotic species from infested to uninfested waterbodies
- The sale of aquarium plants in pet stores
- Natural transport (waterfowl, animals, etc.)

As of January 1, 1998, the sale, distribution, importation, purchase, propagation, transportation, or introduction of exotic aquatic weeds into New Hampshire is prohibited.

### **You can help prevent spreading!**

- Always check your boat, motor, trailer, vehicle, fishing lures, bait buckets, and anything else you may have put into surface waters, for hitchhiking plants **before entering** and **after leaving** any waterbody.
- Remove all plants attached to your boat, vehicle, or gear. **Don't throw plant fragments back in the water or leave them where they can wash back into the lake.**



Make sure to check all these areas for hitchhiking aquatic plants. (Photo courtesy of NHDES.)

- Dry, burn, or compost (away from the water) unwanted aquarium plants, or dispose of them in the trash. Or, you may be able to donate them to the science department at a local school or to the Aquaculture Education and Research Center’s Aquarium Adoption Program. (See Section 6 for contact information.)
- While boating on the lake, do not travel through areas designated as “Restricted Use Areas.” These are areas with small, contained exotic species infestations. Limiting access to the area helps prevent fragmentation and spreading of the exotic plant.
- Look for a sign posted by the New Hampshire Department of Environmental Services at the public boat launch. The sign will tell you whether or not the waterbody has an exotic species infestation.



When launching your boat, check for signs like this (left) to find out whether or not the lake has an exotic species infestation. Also, when on the lake avoid Restricted Use Areas (right). (Photos courtesy of NHDES.)

## Section 4: Get Involved!



### **Join a local lake association!**

If your lake has an association, join it! Lake associations are typically non-profit, voluntary organizations that are concerned with lake protection efforts and other local lake-related issues. Most associations have a variety of members, including shoreline property owners, neighboring residents, and lake enthusiasts, and are usually open to any interested individual wishing to join.

Lake associations serve many functions, including providing outreach and educational opportunities, assisting with water quality and exotic species monitoring, and working closely with stakeholders on developing lake management plans. Also, being a member of a lake association is a great way to make friends and have fun!

If there is no lake association in your area, start one! NH LAKES can help.

## **Join NH LAKES!**

NH LAKES is a statewide, nonprofit, member-supported organization dedicated to protecting New Hampshire's lakes and their watersheds. NH LAKES serves as a source of information about lakes and lake issues through educational materials and programs, and through work with state legislators. NH LAKES advocates on issues of water quality, boater education and boating safety, invasive species prevention, appropriate public access, wildlife habitat protection, shoreland and watershed protection, and balanced use of lakes.

**For more information call (603) 226-0299,  
email [info@nhlakes.org](mailto:info@nhlakes.org), or visit [www.nhlakes.org](http://www.nhlakes.org).**

## **Support lake protection legislation!**

Educate yourself on a particular lake or watershed issue. Write letters to, call, or e-mail your legislator(s). Follow legislation by attending committee hearings, testifying, and working with individual legislators one-on-one. Or, organize volunteers in your local area to help!

**For more information call (603) 226-0299,  
email [info@nhlakes.org](mailto:info@nhlakes.org), or visit [www.nhlakes.org](http://www.nhlakes.org).**

## **Become a Lake Host!**

Developed in 2002 by NH LAKES, in cooperation with the New Hampshire Department of Environmental Services, the Lake Host™ Program is the first line of prevention when it comes to exotic aquatic species. Trained Lake Hosts at public motorized boat launch sites do the following:

- Educate visiting boaters about exotic plants by explaining the problems associated with exotic aquatic plants, distributing brochures, and answering questions.
- Conduct courtesy, voluntary boat, trailer, and recreational gear inspections on vessels entering and leaving public waters.

- Show boaters where to look for plant hitchhikers on boats, trailers, and recreational gear.
- Remove all plant material found.
- Send samples of suspicious plants to the New Hampshire Department of Environmental Services for identification.



**For more information call (603) 226-0299,  
email [lakehost@nhlakes.org](mailto:lakehost@nhlakes.org), or visit [www.nhlakes.org](http://www.nhlakes.org).**

## **Become a Weed Watcher!**

The Weed Watcher Program is a cooperative program between lake residents, lake associations, and the New Hampshire Department of Environmental Services. Weed Watchers are trained to monitor lakes and ponds for the growth of exotic species. Volunteers are instructed on how to conduct a weed survey, what to look for, and who to contact if there is a problem.

Weed Watchers are the best form of early detection because they are often the most familiar with the waterbodies they choose to monitor, allowing them to notice even a subtle change in plant growth. If new exotic species infestations are caught early, methods like hand pulling can keep them under control and prevent a whole-lake infestation. Once large areas of a lake are infested with an exotic species, controlling the problem can be labor and cost intensive for lake residents, lake associations, municipalities, and the state.



*(Photo courtesy of NHDES.)*

**For more information call 271-2248,  
email [Amy.Smagula@des.nh.gov](mailto:Amy.Smagula@des.nh.gov),  
or visit [www.des.nh.gov/wmb/exoticspecies/survey.htm](http://www.des.nh.gov/wmb/exoticspecies/survey.htm).**

### **Participate in a water quality monitoring program!**

Volunteer lake monitoring efforts throughout the state supplement those efforts of both the New Hampshire Department of Environmental Services and the University of New Hampshire. By collecting water samples from a lake and the streams that flow into and out of it several times each year over a period of years, volunteer monitors help detect changes in water quality and identify pollution sources before the lake is seriously impacted. If pollution sources can be eliminated, this saves lake residents, lake associations, municipalities, and the state the cost of expensive lake clean-up projects.

**The Volunteer Lake Assessment Program (VLAP)** is a cooperative program between lake residents and the New Hampshire Department of Environmental Services.

**For more information, call (603) 271-2658,  
email [Sara.Sumner@des.nh.gov](mailto:Sara.Sumner@des.nh.gov),  
or visit [www.des.nh.gov/wmb/vlap](http://www.des.nh.gov/wmb/vlap).**



**The Lakes Lay Monitoring Program (LLMP)** is administered jointly through the Cooperative Extension and the Center for Freshwater Biology at the University of New Hampshire.

**For more information, call (603) 862-3696,  
email [bob.craycraft@unh.edu](mailto:bob.craycraft@unh.edu),  
or visit [cfb.unh.edu/programs/LLMP/nhllmp.htm](http://cfb.unh.edu/programs/LLMP/nhllmp.htm).**



*(Photo courtesy of NHDES.)*

## **Participate in the Mercury in Fish Program!**

Studies have shown that fish from lakes and ponds in New Hampshire contain mercury and can pose a potential human health risk. Mercury is emitted by volcanoes, forest fires, weathering, and through activities such as burning of municipal waste and fossil fuels (which is the greatest cause of emission). Mercury then becomes incorporated into the aquatic food chain and concentrated in certain fish.

The New Hampshire Department of Environmental Services Mercury in Fish Program, with the help of volunteers, samples fish from the state's lakes and ponds for mercury content. This data is used to determine statewide and waterbody-specific fish consumption guidelines.

**For more information, call (603) 271-3414 or visit  
[www.des.nh.gov/wmb/VLAP/mercury/volunteer.htm](http://www.des.nh.gov/wmb/VLAP/mercury/volunteer.htm).**

**For the latest fish consumption guidelines, visit  
[www.des.nh.gov/pdf/Mercury\\_Fish.pdf](http://www.des.nh.gov/pdf/Mercury_Fish.pdf).**

## Section 5: Required Approvals and Permits

If you are planning a land development project either in the watershed or along a waterbody, in addition to any local permits that are needed, your project may require a state permit from the New Hampshire Department of Environmental Services (NHDES). For projects that do not require a state permit, there may be standards you must follow during construction. Information regarding the most common state permits needed for watershed or shoreline land development projects is provided below. If you have any questions about whether or not your project requires a permit, do not hesitate to contact your municipal office, as well as NHDES at (603) 271-3503. A quick phone call could save you time and money and protect the water resources in your community.

### New Hampshire Department of Environmental Services (NHDES)

29 Hazen Drive, PO Box 95  
Concord, NH 03302-0095  
(603) 271-3503  
[www.des.nh.gov](http://www.des.nh.gov)

### **Shoreland Protection Program**

(603) 271-7109  
[www.des.nh.gov/cspa/shoreland@des.nh.gov](http://www.des.nh.gov/cspa/shoreland@des.nh.gov)

The Comprehensive Shoreland Protection Act provides protection to the state's public waters by establishing a 150-foot forested buffer area as well as restricted use areas within 250 feet of lakes, ponds, and our state's largest rivers.

As of April 1, 2008, a **Shoreland Protection Program Permit** is needed for all construction, excavation, or filling activities within 250 feet of the shoreline. In addition, a 50-foot waterfront buffer

in which vegetation removal is restricted, the application of pesticides and herbicides are prohibited, and impervious surface limitations apply has been established.

### Alteration of Terrain Permits

(603) 271-2303

[www.des.nh.gov/aot/](http://www.des.nh.gov/aot/)

- Tree cutting (anywhere) must meet Best Management Practices for Timber Harvesting.
- Earth moving or excavation with an impact greater than 50,000 square feet within 250 feet of public waters requires a permit.

### Exotic Species Program:

(603) 271-2248

[www.des.nh.gov/wmb/ExoticSpecies/](http://www.des.nh.gov/wmb/ExoticSpecies/)

- If your waterbody contains an exotic aquatic plant, the waterbody must have a New Hampshire Department of Environmental Services approved **long-term management plan** before any control activities can be conducted.

### Subsurface Systems Bureau

(603) 271-3501

[www.des.nh.gov/ssb/](http://www.des.nh.gov/ssb/)

- Purchase and sales agreement on developed waterfront within 250 feet of tidal waters or a great pond without municipal sewer requires a **Site Assessment Study**.
- Building a residential dwelling, adding bedrooms, or expanding living space anywhere not serviced by municipal sewer requires a **Construction Approval and Operational Approval**.
- Subdividing land for a single family home, condominium, apartment, or campground anywhere not serviced by municipal sewer requires a **State Subdivision Approval**.
- Installing a well closer than 75 feet to a property line (anywhere) requires a **Recorded Well Release**.

## Wetlands Bureau

(603) 271-2147

[www.des.nh.gov/wetlands](http://www.des.nh.gov/wetlands)

A **Standard Dredge and Fill Permit** is required for:

- Installing, repairing, or expanding a dock or shoreline structure in any surface water.
- Impacting the bank of any waterbody.
- Adding sand to a beach or constructing a new beach.
- Dredge, fill, or construction in any jurisdictional wetland, tidal buffer zone, or sand dune.

## New Hampshire Department of Safety

If you are planning on operating a motorized boat on a New Hampshire waterbody, or would like to place a boat mooring, swim raft or platform, or delineate a swimming area on a waterbody, you should find out the legal requirements before doing so by contacting the New Hampshire Department of Safety.

## Division of Safety Services

(603) 293-0091

[www.nh.gov/safety/ss/index.html](http://www.nh.gov/safety/ss/index.html)

- NH Law now requires that **all** persons who operate a powerboat with a motor greater than 25 horsepower to obtain a Boating Education Certificate.
- Moorings in six New Hampshire lakes. (Lake Ossipee, Lake Sunapee, Lake Winnepesaukee, Lake Winnisquam, Newfound Lake, and Squam Lake.)
- Delineating swimming areas.
- Installing swim rafts/platforms.

## Section 6: Programs and Contact Information

The following list of program contact information for New Hampshire watershed and lake-related non-profit organizations, governmental agencies, and academic institutions should help you to find out more information about the lake and watershed programs that you are interested in and also answer any questions that have not been answered in this guide. If this listing does not help you find the information you are looking for, please do not hesitate to contact NH LAKES and we will help you find the answers to your questions.

*Please note that the individual names and contact information provided below were current when this guidebook was printed, but may change over time.*

### New Hampshire Lakes Association (NH LAKES)

3 Silk Farm Road  
Concord, NH 03301  
(603) 226-0299  
info@nhlakes.org  
www.nhlakes.org



*Members dedicated to protecting lakes*

- **Lake Host™ Program and Lake Conservation Corps<sup>SM</sup> Program**  
(603) 226-0299  
info@nhlakes.org  
www.nhlakes.org

### The New Hampshire Department of Environmental Services (NHDES)

29 Hazen Drive, PO Box 95  
Concord, NH 03301  
(603) 271-3503  
www.des.nh.gov



- **Beach Program**  
Sonya Carlson, Coordinator  
(603) 271-8803  
Sonya.Carlson@des.nh.gov  
[www.des.nh.gov/Beaches/index.asp](http://www.des.nh.gov/Beaches/index.asp)
  
- **Clean Lakes Program**  
Andy Chapman, Coordinator  
(603) 271-5334  
Andrew.Chapman@des.nh.gov  
[www.des.nh.gov/wmb/cleanlakes/](http://www.des.nh.gov/wmb/cleanlakes/)
  
- **Clean Vessel Act**  
Jody Connor, Limnology Center Director  
(603) 271-3414  
Jody.Connor@des.nh.gov  
[www.des.nh.gov/wmb/cva/](http://www.des.nh.gov/wmb/cva/)
  
- **Exotic Species Program**  
Amy Smagula, Coordinator  
(603) 271-2248  
Amy.Smagula@des.nh.gov  
[www.des.nh.gov/wmb/exoticspecies/](http://www.des.nh.gov/wmb/exoticspecies/)
  
- **Lakes Management Program**  
Jacquie Colburn, Coordinator  
(603) 271-2959  
Jacquie.Colburn@des.nh.gov  
[www.des.nh.gov/wmb/lakes](http://www.des.nh.gov/wmb/lakes)
  
- **Limnology Center**  
*(Water quality complaints, Mercury in Fish Program, cyanobacteria and bacteria advisories)*  
Jody Connor, Limnology Center Director  
(603) 271-3414  
(603) 419-9229 – Cyanobacteria Hotline  
Jody.Connor@des.nh.gov  
[www.des.nh.gov/wmb/vlap/mercury/](http://www.des.nh.gov/wmb/vlap/mercury/)  
[www.des.nh.gov/Beaches/index.asp](http://www.des.nh.gov/Beaches/index.asp)

- **Public Information Center**  
 (603) 271-2975  
[pip@des.nh.gov](mailto:pip@des.nh.gov)  
[www.des.nh.gov/deslette.htm](http://www.des.nh.gov/deslette.htm)
  
- **Shoreland Protection Program**  
 Arlene Allen, Outreach Coordinator  
 (603) 271-0862  
[Arlene.Allen@des.nh.gov](mailto:Arlene.Allen@des.nh.gov)  
[www.des.nh.gov/cspa/](http://www.des.nh.gov/cspa/)
  
- **Volunteer Lake Assessment Program**  
 Sara Sumner, Coordinator  
 (603) 271-2658  
[Sara.Sumner@des.nh.gov](mailto:Sara.Sumner@des.nh.gov)  
[www.des.nh.gov/wmb/vlap/](http://www.des.nh.gov/wmb/vlap/)
  
- **Watershed Assistance Section**  
 Eric Williams, Supervisor  
 (603) 271-2358  
[Eric.Williams@des.nh.gov](mailto:Eric.Williams@des.nh.gov)  
[www.des.nh.gov/wmb/was/](http://www.des.nh.gov/wmb/was/)

## [The New Hampshire Fish and Game Department](#)

11 Hazen Drive  
 Concord, NH 03301  
[www.wildlife.state.nh.us](http://www.wildlife.state.nh.us)



- **Aquatic Resources Education**  
 (603) 271-3212  
[aquatic-ed@wildlife.state.nh.us](mailto:aquatic-ed@wildlife.state.nh.us)
  
- **Inland Fisheries Division**  
 (603) 271-2501 or (603) 271-2502  
[fish@wildlife.state.nh.us](mailto:fish@wildlife.state.nh.us)

## [The New Hampshire Department of Resources & Economic Development](#)

172 Pembroke Road, PO Box 1856  
 Concord, NH 03302  
 (603) 271-2411  
[www.dred.nh.gov](http://www.dred.nh.gov)

## [The New Hampshire Department of Safety Division of Safety Services](#)

### **Bureau of Marine Patrol**

31 Dock Road  
Gilford, NH 03249  
(877) 642-9700  
[www.nh.gov/safety/divisions/ss/](http://www.nh.gov/safety/divisions/ss/)



## [The University of New Hampshire](#)

### ■ **Cooperative Extension Family Home and Garden Center**

(877) EXT-GROW ((877)-398-4769)  
[extension.unh.edu/FHGEC/FHGEC.htm](http://extension.unh.edu/FHGEC/FHGEC.htm)

### ■ **Lakes Lay Monitoring Program**

Bob Craycraft, Educational Coordinator  
Spaulding Hall Room G18  
38 College Road, Durham NH 03824  
(603) 862-3696  
[bob.craycraft@unh.edu](mailto:bob.craycraft@unh.edu)

Jeff Schloss, Coordinator  
Spaulding Hall, Room 133  
38 College Road, Durham, NH 03824  
(603) 862-3848  
[jeff.schloss@unh.edu](mailto:jeff.schloss@unh.edu)  
[cfb.unh.edu](http://cfb.unh.edu); [extension.unh.edu](http://extension.unh.edu)

## [Aquaculture Education and Research Center](#)

### ■ **Aquarium Adoption Program**

(603) 926-5446



# References

Connor, Jody N., and Robert H. Estabrook. *Answers to Common Lake Questions*. 3<sup>rd</sup> edition. Concord, NH: New Hampshire Department of Environmental Services, 1992.

Holdren, Chris, Bill Jones, and Judy Taggart. *Managing Lakes and Reservoirs*. Madison, WI: North American Lakes Management Society and the Terrene Institute, 2001.

Moore, John L. *A Special Place - New Hampshire's Lakes*. Lake Winnepesaukee Association, 1994.

Moore, Libby. *The Lake Book: Actions You Can Take to Protect Your Lake*. 6<sup>th</sup> edition. Congress of Lake Associations of Maine. Yarmouth, ME, 1993.

New Hampshire Department of Environmental Services. "Commonly Asked Shoreline Questions." 2001. Wetlands Bureau Fact Sheet WB-13. 1 Aug 2007. <[www.des.state.nh.us/factsheets/wetlands/wb-13.htm](http://www.des.state.nh.us/factsheets/wetlands/wb-13.htm)>

New Hampshire Department of Environmental Services. "Got Permits?" March 2007. New Hampshire Department of Environmental Services. 1 Aug 2007 <[www.des.nh.gov/wetlands/pdf/gotpermitsposter-2006.pdf](http://www.des.nh.gov/wetlands/pdf/gotpermitsposter-2006.pdf)>.

New Hampshire Department of Safety Marine Patrol. *The Boaters Guide of New Hampshire: A Handbook of Boating Laws and Responsibilities*. 3<sup>rd</sup> edition. Boat Ed. Dallas, TX, 2007.

New Hampshire Fish and Game Department, NH Department of Environmental Services, Aquaculture Education and Research Center. "*Aquarium Plants and Animals: Don't Leave Them Stranded*." Concord, NH. <[www.wildlife.state.nh.us/outdoor\\_recreation/exotic\\_aquatics\\_brochure.pdf](http://www.wildlife.state.nh.us/outdoor_recreation/exotic_aquatics_brochure.pdf)>

New Hampshire Lakes Association (NH LAKES). *Watershed Steward Program: A Citizen's Guide to Watershed Protection*. NH LAKES. Concord, NH, 2000.

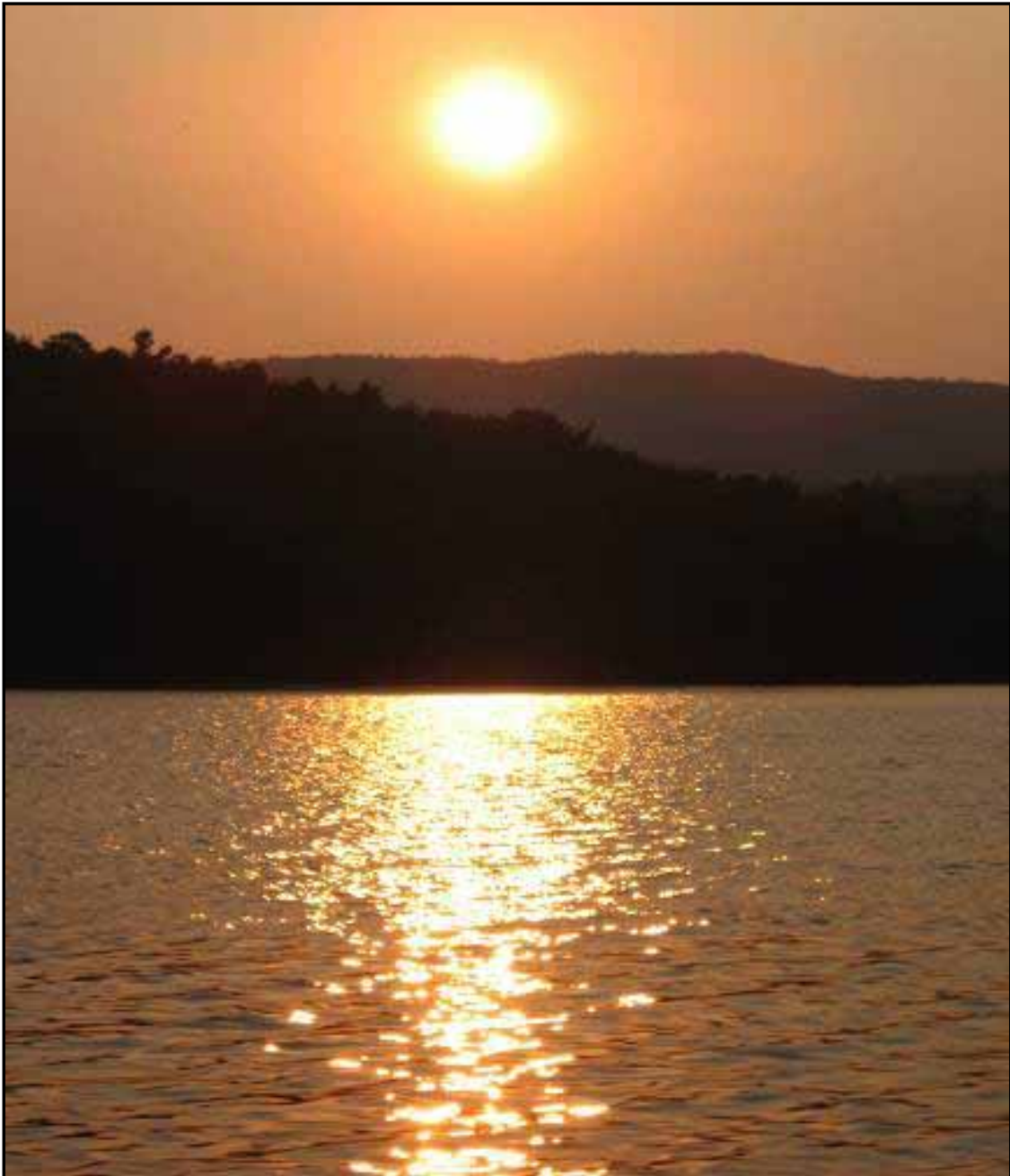
Phillips, Nancy, Martin Kelly, Judith Taggart, and Rachel Reeder. *The Lake Pocket Book*. 1<sup>st</sup> edition. Alexandria, VA: Terrene Institute, 2000.

United States Environmental Protection Agency. *Shipshape Shores and Waters, A Handbook for Marina Operators and Recreational Boaters*. Office of Wetlands, Oceans and Watersheds. Washington, DC, 2003.

University of New Hampshire. *Landscaping at the Water's Edge: An Ecological Approach*. 1<sup>st</sup> edition. University of New Hampshire Cooperative Extension, 2007.

Vigmostad, Karen E. *“Your Lake & You.”* North American Lake Management Society. Vol. 1 (2001): 1-8.

York County Soil and Water Conservation District (YCSWCD). *“For Your Lake's Sake.”* brochure, produced by York County Soil and Water Conservation District, ME.



*(Photo courtesy of Jen Drociak.)*



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