FIFTY WAYS TO SAVE SQUAM

Conserving the Squam Watershed

MISSION STATEMENT

The Squam Lakes Association (SLA) is dedicated to conserving for the public benefit the natural beauty, peaceful character, and unique resource values of the lakes and surrounding area. In cooperation with local and state authorities and other conservation organizations, the Association promotes the protection, careful use, and shared enjoyment of the lakes, mountains, forests, and open spaces, and wildlife of the Squam Lakes region. Since 1904 the Squam Lakes Association has worked to preserve the character of the Squam Lakes.

FULFILLING THE MISSION

A key element to helping the SLA fulfill their mission is for every SLA member and visitor to voluntarily contribute to preserving the watershed. Every user of the watershed has an opportunity to contribute through the selection of any number of the following "Fifty Ways to Save Squam" to which they can commit.

SHOREFRONT

1. Keep as many trees and shrubs around buildings to screen visibility from the lake.

2. Choose native and varied plantings as opposed to grass/lawns that require fertilizers, pesticides and excess watering. This will reduce ground and surface-water pollution, reduce erosion, and encourage local wildlife. (Please refer to the SLA brochure 'Landscaping Lakefront Properties' for more information)

3. Avoid the use of pesticides and fertilizers. Their residues are environmentally persistent, enter ground water and the lakes and cause lake eutrophication. Under state law, only low phosphate, slow release nitrogen fertilizer may be applied from 250 feet from the waters edge. There may be no fertilizer applied within 250 feet or less of the waters edge. Check local regulations, as they may be more restrictive.

4. Adhere to current local and state regulations for docks and rafts. (Contact your town Conservation Commission for details)

5. Store movable equipment and portable boats away from the shorefront and out of sight when not in use.

6. Control noise levels. Loud music, voices, motors and other sounds carry over water.

7. Use only necessary exterior lighting. Indirect lighting, motion sensors, and switching off unused lighting reduces background illumination, allowing better viewing of the night sky.

8. Do not alter (moving soil, rocks or trees) the shoreline. Shoreline alteration requires a permit under the Shoreland Protection Act and will be considered only when it is the least impacting alternative.

9. Refrain from introducing sand to the lake to create swimming areas. Filling introduces unwanted nutrients, reduces water clarity, increases weed and algae growth and damages fish spawning sites.

10. Avoid alteration of wetlands. Wetlands provide wildlife habitat, storage for stormwater runoff and filtration of water. Alteration of wetlands requires federal, state and local permits and approvals.

11. Control surface-water runoff and erosion using the following:
    - Maintain natural, undisturbed vegetation within 250 feet of the shoreline.
    - Place drainage swales and vegetation near structures, driveways, and paths and direct stormwater away from the lake and septic fields.
    - Construct driveways and paths of pervious materials such as crushed stone.
    - Design walking paths so that they are curved and narrow.

12. Reduce the amount of nutrients added to lakes:
    - Keep piles of leaves and brush more than 250 feet from the shoreline or 50 feet from any drainage.
    - Do not burn leaves or brush within 250 feet of the shoreline or 50 feet from any drainage.

13. Prevent pollution through wise chemical/paint use:
    - Use drop cloths under exterior work areas.
    - Clean paintbrushes and tools using non-toxic citrus-based solvents in areas a minimum of 250 feet from the shoreline.
    - Buy chemicals/paints in quantities needed only for the task so there is no need to store or dispose of excess.
    - Never paint anything over or near the water.

14. Construct docks and floats with environmentally friendly material:
    - Avoid using pressure treated or painted wood. Studies have proved that these chemicals are harmful to living organisms.
    - Use materials such as cedar, redwood, cypress, recycled wood/plastic, or aluminum for dock and float construction.

15. Control erosion from construction sites. This is the leading cause of surface-water quality degradation in New Hampshire. Use the following construction practices:
    - Set structures back a minimum of 50 feet from the shoreline as required under state law and check local regulations as many towns have greater setbacks.
    - Construct roadways/driveways of pervious materials to minimize runoff.
    - Cut as few trees as possible and protect root systems. Removal of stumps and roots systems within 50 feet of the shoreline is prohibited under state law.

- Use sediment control structures such as hay bales and filter fences during construction.
- Phase vegetation removal and replace/restore vegetation to reduce erosion.

16. Use exterior finish materials that blend with the natural environment, for example:
    - Use cedar shingles which do not require painting or staining
    - Select colors in natural tones of brown, green and gray in shades consistent with surroundings.
    - Avoid reflective materials or surfaces.

17. In winter, use sand on driveways and walkways within 250 feet of the shoreline instead of salt and other de-icing agents.

SEPTIC SYSTEMS

Most septic systems consist of a settling tank and a leaching unit such as a leaching field or drywell. The tank removes solids and biologically degrades them into an inert sludge. The purpose of the leaching field is to allow liquid to percolate through a designed filtration layer of sand or gravel and then into the subsoil where it is purified before reaching ground water. Careful attention to the workings of a system ensures that its various components will continue to function properly for many years and reduce the release of nutrients to ground and surface water. A properly designed and functioning system has an expected lifetime of 20 years.

18. Have your septic systems inspected by a qualified specialist, if your home was built more than 15-20 years ago, to be sure that the septic tank and leaching field are operating properly and designed to handle the load it is currently receiving.

19. Pump your septic tank every one to three years. The proper frequency depends upon tank size, frequency of use, number of people, etc. - check with your local septic company. If sludge/solids are not removed as necessary, they clog the leaching field, causing the system to fail.

20. Inspect your system every year to ensure that all aspects of the system are operating properly.
    - If your septic system has a pump, ensure that the pump is functioning properly.
    - Look for signs of malfunction: odors, slow or backed-up drains, standing water on the leaching field.

21. Follow these additional ways to ensure that your system will continue to operate properly:
    - Use white toilet paper (colored paper takes far longer to decompose).
    - Collect cooking grease in an old can and dispose of it in the trash, not down the drain.
    - Remove your garbage disposal because fats and greases from food interfere with the normal bacterial activity.

- Keep the leaching field clear of parked cars, heavy stored objects and buildings. Excess weight will compact the soil in the field reducing permeability and/or break pipes causing failure.
- Keep deep-rooted trees and shrubs from growing on or near your leaching area or near any part of the septic system. Root systems can disrupt underground pipes or crack your tank, causing the system to fail. Ground covers, flowers or low-maintenance grasses are fine.
- Enzymes or commercial additives should not be added to your system. The bacteria already present in your system should provide all the digestion required.

22. Test your drinking water every year for e.coli/coliform and nitrogen levels. The presence of e.coli/coliform bacteria is a sign of human fecal contamination. Elevated nitrogen levels may mean that your septic system is leaking. Both can pose serious health hazards to humans as well as to the lakes. (Contact the Laboratory Services Unit of the NH Department of Environmental Services at 603-271-3445)

23. Reduce your water use and put less pressure on your well and septic system. The more water that flows through your system, the greater the possibility of nutrients leaching out unfiltered by the system. Here are some suggestions:
    - Avoid running the water when it is not needed (e.g. turn off the tap while brushing teeth or shaving, keep water in the refrigerator to cool, use a dishpan to wash dishes).
    - Replace regular showerheads, sink faucets, and toilets with low-flow fixtures (if toilets cannot be replaced, fill half-gallon bottles with water and put them in the toilet tanks).
    - Install composting toilets (especially if you live on an island - or have a holding tank system if you are close to the shoreline).
    - Purchase water and energy efficient appliances when replacing old ones (e.g. front-load clothes washers).
    - Repair leaking fixtures promptly.
    - Run dishwashers and clothes washers only when they are full, and stagger laundry loads over a period of days rather than doing them all at once.
    - Presoak soiled clothes so they need washing only once.

24. Limit the amount of chemical cleansers introduced to your septic system. Everything that goes down a drain will likely affect ground water and end up in the lake and/or your well. Consider the following:
    - Use only eco-friendly cleansers and laundry/dishwasher detergents, etc., and do not use products with dyes, water softeners or synthetic perfumes. Companies that provide high-quality natural cleaning products include: Seventh Generation/Harmony, Ecos, Earth Rite, Ecover and Life Tree.
    - Use non-chlorine bleach alternatives such as hydrogen peroxide. Chlorine kills bacteria and thus inhibits a septic system from functioning normally. Also, waste chlorine bleach reacts chemically with organic materials in the soil and lake water to form poisonous compounds, such as dioxin, which have been linked to cancer,

reproductive and developmental mutations, immune system damage and hormone malfunction in humans and animals.
- Use baking soda followed by vinegar as an alternative drain cleaner.
- Use alternative bathroom cleaning products such as soap and water, baking soda, borax or other non-chlorine scouring powders. Toilet bowl deodorizing cakes contain dyes and bleaches as well. (For other alternatives, see notes at www.state.nh.us/des/hw-12.htm).

25. Avoid introduction of toxic and/or hazardous chemicals (such as solvents, pesticides, drain openers, polishes, wax, used oil, paint, paint thinner, etc.) to your septic system. These compounds impact ground and surface water and kill the naturally occurring bacteria that make septic systems function properly. Here are some suggestions to minimize their impact:
    - Do not dispose of toxic materials down the drain.
    - Buy non-toxic alternatives or less toxic products.
    - Buy quantities appropriate for the task.
    - Dispose of any residual materials at annual household hazardous waste collection day (call town offices for information about household hazardous waste collection).

RECREATIONAL LAKE USE

26. Adhere to safe boating practices. At a minimum:
    - Obtain a chart for the Squam Lakes and familiarize yourself with the lakes.
    - Obtain a copy of the current state Boating Guide and be thoroughly aware of current regulations.
    - Never operate a boat without having all necessary and legally required safety equipment aboard.
    - Be considerate of other lake users.

27. Adopt a maximum speed of 30 mph. (Over 100 SLA members have voluntarily pledged to this since 1997)

28. Travel at headway speed within 250 feet of shore for reasons of public safety, protection of water quality, protection of loons and other wildlife, and to encourage low-impact recreation like swimming, canoeing, kayaking, sculling, etc.

29. Operate your boat at headway speed in shallow waters to minimize disturbance to sediments and vegetation. Churning up the nutrient-laden sediments promotes algal growth and speeds lake eutrophication.

30. Stay clear of large weed patches while operating a powerboat to lessen the likelihood of spreading fragments to other sections of the lake (or other lakes), and report any suspected milfoil infestations to the SLA (968-7336).

31. Steer a wide course (approximately 500 feet) away from loons - singles, pairs, nesting or brooding (with young). A canoe, kayak, or sailboat can be just as disruptive as a powerboat if too close. (Loons are known to abandon their nests and/or young due to human disruption; 1-2 chicks are lost on Squam each summer because of being separated from their parent(s) by a boat).

32. Waterski or tube as far from shore as possible to avoid stirring up sediments, hitting submerged hazards, disturbing wildlife and people on shore. Note that under state regulation these activities are permitted only between sunrise and sunset.

33. Do not use jetskis (personal watercraft) on the Squam Lakes. One and two person jetskis are by law, prohibited on the Squam Lakes. With regard to larger jetskis, consider the following:
    - They are inherently unsafe with an injury rate eight times higher than for other powerboats.
    - Because they can be driven in shallow waters, they can easily disturb sediment, damage vegetation and destroy fish spawning areas.
    - Their operation has been shown to cause loons to abandon nests more often than other forms of watercraft.

34. Replace your older outboard motor with a new, cleaner burning, four-stroke or direct-fuel-injected or electronic fuel-injected two-stroke motor to reduce emissions into the air and water. While new motor technologies are slightly more expensive to purchase, they are cheaper to operate and maintain, have longer lifetimes, and pollute less. (Old 2-stroke motors release up to 25% of their fuel, unburned, into the lake).

35. Downsize your outboard or inboard motor when replaced; both the lakes and the recreational enjoyment of others would benefit.

36. Consider installing an auxiliary electric motor on your powerboat. This will avoid the release of emissions into sensitive areas of the lakes, be less disturbing to wildlife, and reduce annual propeller repair/replacement costs. Or, consider purchasing an electric boat. A number of companies in the U.S. now build luxury boats with electric motors. (Contact SLA or local marinas for more information).

37. Try lower impact boating in place of internal combustion motor boating: electric motors, canoes, kayaks, sailboats, windsurfers, etc.

38. Operate powerboats in accordance with the following:
    - Limit idle and/or full-throttle operation as much as possible to reduce hydrocarbon emissions and minimize wear and tear on the motor.
    - Observe the 150' safe passage distance when near land, other boats, swimming areas or people. If you are within 150’ of any of these objects, by law you must reduce to headway speed.

39. Maintain your powerboat in accordance with the following:

- Clean boats and tune motors each year before using.
- Eliminate spillage while refueling (e.g. fill portable tanks on the fuel dock or on shore, do not top off fuel tanks as the expansion vent will allow fuel to spill if the tank is too full).
- Ensure that fuel tanks, hoses and all fuel connections are not leaking.
- Replace old and rusting fuel tanks (and store others out of sun and water to extend lifetime).
- Use petroleum-absorbing pads when performing engine repairs and maintenance, to avoid accidental fuel and oil spills, and dispose of them properly.
- Don't fog the motor in the lakes at the end of the season. Purchase a garden hose adapter from your local marina and fog away from shore.
- Use biodegradable hull cleaners that **do not** contain phosphoric acid.
- Install a bilge sock around your bilge pump that will absorb oil and fuel and prevent them from being displaced into the lakes.

40. Use an onboard toilet or makeshift substitute to prevent introducing human waste to the lakes. Note that boats with toilets **and** sleeping facilities are not permitted on the Squam Lakes.

41. Wash boats, trailers and other equipment (water skis, fishing equipment, etc.) thoroughly before use in the Squam Lakes. Visiting other water bodies, either fresh or salt, provides a mechanism to transfer exotic aquatics (e.g. milfoil and zebra mussels). The recommended procedure is washing with very hot water, well away from the lakes, flushing the motor, and letting it dry for two days before launching. (Contact the SLA or the DES Biology Bureau for up-to-date information regarding milfoil and other exotic species in New Hampshire's lakes, 603-271-3503. See Notes for more information regarding exotic species).

GENERAL

42. Place a conservation easement on your property to protect it from future development. Not only could this reduce your property taxes, conservation easements increase open space for future generations to enjoy. (See Final Notes for more information).

43. Reduce insecticide use. For example, put up a bat house. A single small brown bat devours up to 1200 mosquito-sized insects an hour.

44. Don’t use phosphorus-based soaps or detergents. Phosphorus is the single most harmful compound to water quality in the lakes. Humans, dogs, or boats should not be washed in or near the lake.

45. Wash motor vehicles outside of the 250' Shoreland Protection Zone; detergent runoff increases phosphorous levels in lake-water promoting aquatic weed and algal growth.

46. Don’t defecate or urinate (animals and humans) in or within 200 feet of the lakes. Keep animal manure far from the shoreline or streams to prevent phosphorous and other nutrients from becoming washed into the lake by rain. DES recommends cleaning up after pets in areas close to the waterfront.

47. Dispose of pressure-treated wood by taking it to your local landfill or transfer station. Treated wood should not be illegally dumped or burned because toxic chemicals can be emitted to ground and surface water or to the atmosphere.

48. Cover or store garbage and trash in an enclosed area to avoid attracting seagulls, raccoons and other scavengers that pose a threat to loons.

49. Do not feed ducks. Encouraging the duck population in your area of the lake can result in increased risk of swimmers' itch that comes from duck feces.

50. Install aquatherm (bubbler) pumps at shallow depths to avoid sediment disturbance. Operate pumps only during the necessary winter months when temperatures are at or below freezing.

FINAL NOTES

Eutrophication

A watershed is defined as the geographic area where all water running off the land drains to a given stream, lake, wetland or other water body. Anything we can do to reduce the input of nutrients (phosphorous, nitrogen, etc.) and sediment into a watershed is good for the lakes. The term "eutrophication" is now generally used to refer to the natural aging process of a water body, and to describe an increase in nutrient levels in excess of natural conditions. Any activity by which humans increase the rate of incoming materials (such as land clearing, watershed development, sand dumping) or nutrients (such as fertilizers, leaking septic systems) speeds up the eutrophication, or aging, process of the Squam Lakes. Although New Hampshire's lakes have the same chronological age, they age at different rates because of differences in runoff and watershed characteristics.

Algal blooms are an indication that a problem exists within the watershed. These plants are receiving so many nutrients that they are reproducing in vast quantities. The only complete solution is to locate the source of nutrients and reduce their availability to the lake. We can all start within our own homes.

Exotic Species

These are not native to the State of New Hampshire. Most exotic species have few competitors and, once established, are difficult and usually impossible to eradicate. Exotic plants can quickly inhabit valuable shoreline, crowding out native species, impairing recreational activities and reducing property values. Exotic species found in New Hampshire include the following:

Milfoil (*Myriophyllum heterophyllum*) - A submerged green aquatic plant with fine densely packed narrow leaves whorled around a main stem. Milfoil can grow up to twenty feet high and may exhibit a three inch green spike-like flower above the water line. A cross section of the stem will reveal "pie shaped" air chambers. This exotic species of milfoil has been in New Hampshire since the late 1960s and can currently be found in over fifty NH lakes and ponds. It reproduces and spreads primarily through fragmentation: plant fragments break off from the parent plant through wind action or boat traffic, settle in a new location, take root and establish a new plant.

Eurasian Milfoil (Myriophyllum spicatum) - A submerged aquatic plant with whorled feather-like leaves that appear to have been clipped on the end. It can grow up to 10 feet high and exhibits a reddish shoot near the surface. It forms dense mats of tangled plants in lakes and ponds. It originally came to the United States from Europe and Asia, and can be found in Vermont, Massachusetts, and in two New Hampshire waterbodies (Lake Mascoma, Enfield and Connecticut River, Charlestown). It is introduced to new water bodies by boats.

Fanwort (Cabomba caroliniana) - A submerged bright green aquatic plant with narrow leaves arranged in a fan shape manner oppositely located on a long narrow stem. The plant stands about 20 inches tall, with slender stems coated in a gelatinous slime. Small, lily-like leaves float on the water's surface next to small white flowers, which bloom July through September. This exotic plant is native to the southern U.S. and Central and Latin America. It was discovered in New Hampshire in the late 1960s; it entered the state on the back of a transient boat trailer or was dumped from a tropical fish aquarium. It is now growing in Arlington Mill Pond in North Salem, Island Pond in Derry, Captain Pond in Salem, Phillips Pond in Sandwon, Mine Falls Pond in Nashua and the Nashua River in Nashua.

Water Chestnut (Trapa natans) - The name is derived from the single-seeded horned fruits on these plants; this is not the edible water chestnut used in Asian cooking. Each plant has two types of leaves: submerged leaves that are feather-like and oppositely pared along the stem, and waxy floating leaves that are triangular and form a rosette on the water's surface. The leaf stalk of the floating leaves has a bladder-like swelling filled with air and spongy tissue which provides buoyancy. Cord-like plant stems can attain lengths of up to 16 feet. Water chestnut seeds germinate in early spring, plants begin to flower in mid to late July, and their nuts ripen about a month later; flowering and seed production continue until frost kills them in late fall. A single seed can produce 300 new seeds in only one year. Water chestnuts can completely cover the surface of a water body and cause ecological hardship to native plants and animals while making recreational activities difficult if not impossible. In July 1998, the NH DES confirmed that this exotic species has infested the Nashua River in Nashua.

Zebra Mussel (Dreissena polymorpha) - Zebra mussels are small shellfish marked by alternating bands of light and dark. They are typically two inches or less in size, and have a life span of 4 to 8 years. They are able to reproduce by one year of age, and have

an extremely high reproductive rate - 30,000 to 1,000,000 per year. Zebra mussels are native to the drainage basins of the Black, Caspian and Aral Seas and probably came to the United States in freshwater ballast which was discharged into ports of the Great Lakes. The zebra mussel was discovered in Lake Champlain, Vermont in 1993 and in East Twin Lake, Connecticut in 1998. It is anticipated that zebra mussel arrival in New Hampshire is just a matter of time.

If you see any of these species or other unfamiliar looking weeds in the Squam Lakes or other New Hampshire lakes, please notify the SLA and/or DES at 603-271-3503.

Alternative Chemical Cleaners

- Baking soda is an effective scouring powder for kitchens and bathrooms.
- Baking soda also makes a great carpet deodorizer as well as a laundry detergent.
- Apple cider vinegar works well on windows and for cleaning kitchens and bathrooms.
- Vinegar removes stains such as grease while acting as a deodorizer.
- Silver can be polished by soaking it in warm water with a little baking soda, salt and a piece of aluminum foil.
- Other metals can be polished with a paste made from vinegar, salt and a little flour.

Some Impacts of Petroleum Use on the Environment

The U.S. Environmental Protection Agency has determined that the gasoline marine engine is one of the largest average contributors of hydrocarbon emissions to the atmosphere in the United States. EPA has estimated that one hour of operation by a 70-horsepower two-stroke motor emits the same amount of hydrocarbon pollution into the air as driving 5,000 miles in a modern automobile. Petrochemicals break down slowly in water, and extremely low levels of hydrocarbon pollution can lead to chromosomal damage, malformations, reduced growth and high mortality rates of fish and fish larvae.

Septic Systems

Prior to 1967, there was no state regulation of septic system design and installation. Many homes were equipped with cesspools or dry wells, which are in-ground stone or concrete structures for the infiltration of wastewater. This type of system offers limited treatment of wastewater prior to its entry into the soil.

Conservation Easements

Conservation easements are permanent deeded restrictions against future land use development. The purpose of conservation easements is twofold: to protect the land from future development or change, and to minimize property and estate taxes. Through the use of conservation easements, property owners voluntarily transfer to another party (the easement holder - a municipality or private conservation organization) their legal rights to develop or alter land in the future. Property owners do not surrender ownership of their land; rather, such easements give the holder the legal power to prohibit the landowner

from altering land. The land must be of adequate significance to the municipality or land trust to justify expenditure of administrative effort, professional fees and future monitoring expenses. The nature of the rights to be given up, and the resulting reduction in taxes, are determined through a development potential analysis which looks at factors such as the amount of waterfront to be set aside and whether or not the land can be subdivided, etc. For more information about conservation easements, contact the Squam Lakes Conservation Society or other local conservation organizations.

The Comprehensive Shoreline Protection Act (RSA 483-B)

This Act became effective on July 1, 1994 and identifies prohibited and permissible uses within the protected shoreland - within 250' of water bodies. It also established minimum standards for the future subdivision, use and development of land within the protected shoreland. These standards include septic system setbacks, subdivision approval, terrain alteration, natural woodland buffer, tree stumps, primary structures and lot size. For more information about the Act's requirements and penalties, contact the Commissioner's Office of DES at 603-271-3503 or the DES Shoreland Program at 603-271-7109/271-6876. Local authorities should be contacted as well because municipal ordinances and regulations may be more restrictive than the original Act.

Information Contacts

Contact for more detailed information on any of the aforementioned topics.

Squam Lakes Association
P.O. Box 204
Holderness, NH 03245
Phone: 603-968-7336
Fax: 603-968-7444
E-mail: info@squamlakes.org
Web page: www.squamlakes.org

Contact Information for Other Organizations

For information regarding Squam Lakes water quality and local regulations:

UNH Cooperative Extension Taylor Hall
University of New Hampshire
Durham, NH 03824
603-862-1520

Town Offices:

Ashland	968-3862
Center Harbor	253-4561
Holderness	968-7536
Meredith	279-4538

Moultonborough	476-5757
Center Sandwich	284-7113

For additional lake and watershed info contact:

New Hampshire Lakes Association
7 South State Street
Concord, NH 03301
603-226-0299
www.nhlakes.org

For more information regarding DES and its services or to report a possible pollution source on or near the Squam Lakes, contact:

NH Department of Environmental Services (DES)
Water Supply & Pollution Control Division
6 Hazen Drive, Box 95
Concord, NH 03301
603-271-3503

The information provided in this booklet is derived from a variety of sources, including the NH Department of Environmental Services; Nungesser and Hill, Meredith, NH (information regarding conservation easements); and NH state and local regulations and legislation.