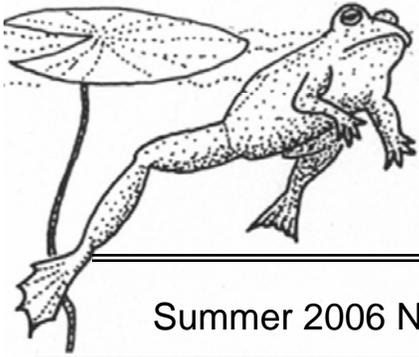
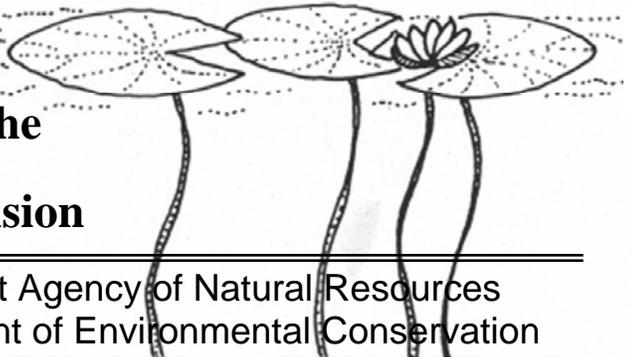


Out of the Blue



A Newsletter of the Water Quality Division



Summer 2006 No. 30

Vermont Agency of Natural Resources
Department of Environmental Conservation

THRILLS & CHILLS Fireworks on Our Lakes

(reprinted from "Lake Tides" a Univ. of Wisconsin publication)

It was a black and sultry night. Not a breath of air was stirring. The lake's surface was as flat as glass. The first starburst lit up the sky in a wild and sizzling display of crimson and white. The water mirrored an exact duplicate, doubling the visual thrill... the Independence Day celebration had begun.

How do you remember the Fourth of July at the lake? Barbeques, sparklers, boat parades around the lake? What about the day after when the nasty procession of scorched cardboard and plastic remains wash up on the lakeshore, not to mention how the noise has affected the loons!

Fireworks are big business in the USA. According to the U.S. Census Bureau, the value of fireworks imported from China in 2003 was \$163.1 million, representing the bulk of fireworks imports to this country. In 2003, the U.S. consumed 220.8 million pounds of fireworks. Fireworks consist of a wide range of products with a highly variable composition. Although the available safety and environmental effect data on fireworks are often incomplete, issues with fireworks usually fall into the categories of noise, accidents, property damage and pollution.

Noise

Complaints of noise caused by fireworks are common around lakes in the beginning of July. The sounds of fireworks going off at all hours of the day and night can be more than just an annoyance. The blast can terrify pets and wild animals alike,

See page 4, "Thrills and Chills"

Volunteer Watershed Monitoring: Partnering with LaRosa Laboratory Analytical Services

The Vermont Water Quality Division is pleased to report on the success of a water quality assessment program, the LaRosa Analytical Services Partnership Program, initiated three summers ago. This program provides laboratory slots to volunteer water quality monitoring groups throughout Vermont to characterize water quality conditions.

As part of how the LaRosa Laboratory is funded, the Department of Environmental Conservation buys so many analytical slots per year. The Water Quality Division provides any of its unused allocation to volunteer watershed organizations to augment water quality monitoring in waters of local importance. No funds are disbursed to the volunteer watershed groups, but they are granted a specified number of laboratory analyses to be performed by the LaRosa Laboratory free-of-charge.

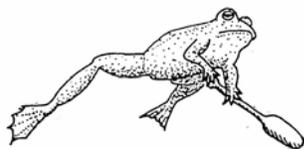
This summer is the fourth year of this partnership program and 14 volunteer monitoring groups have been awarded free analytical services. Several examples of the volunteer monitoring efforts receiving these services are show on page four.

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**"Out of the Blue"
Available on the Web**



Check out the latest and future newsletter issues on the Water Quality Division Web Page at www.vtwaterquality.org

Out of the Blue

is produced semi-annually by the Lakes and Ponds Section. Our purpose is to share information on lake, river, and wetland environments, water quality and state activities through articles on aquatic ecology and Division programs. Feel free to let us know what articles you would like to see in future issues. To be placed on the mailing list, or to receive extra copies, please contact:

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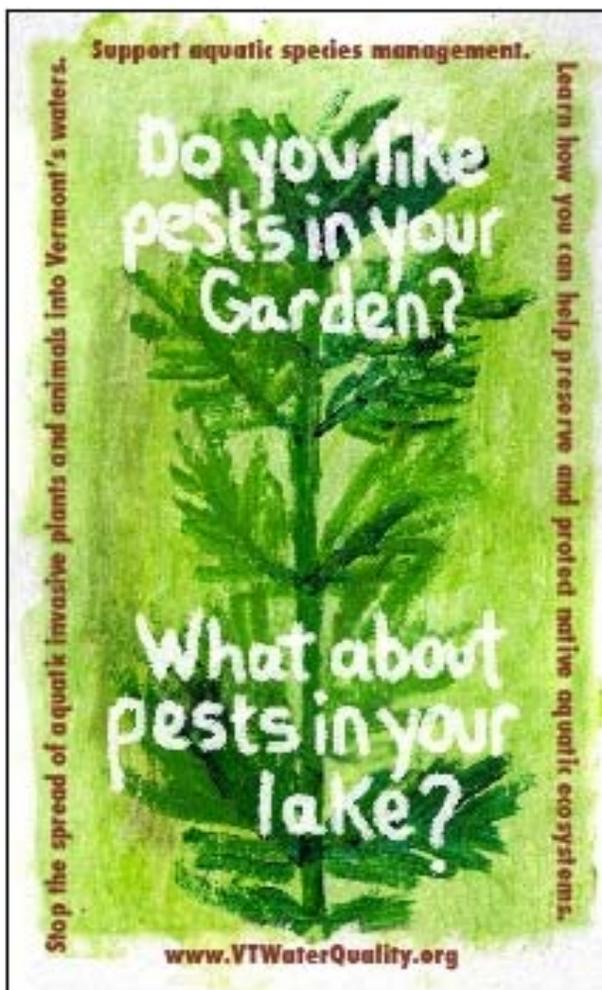
The Vermont Agency of Natural Resources, Department of Environmental Conservation, is an equal opportunity agency and offers all persons the benefits of participating in each of its programs and competing in all areas of employment regardless of race, color, religion, sex, national origin, age, disability, or other nonmerit factors.

Just Unveiled!

The Aquatic Nuisance Species Sticker

In January 2006, the Water Quality Division invited artists and students of Vermont to submit their artwork to the Aquatic Nuisance Species (ANS) Sticker Design contest. Talented Vermonters of all ages demonstrated their knowledge and concern about the topic by submitting excellent designs and design ideas. A panel of judges representing the Vermont Agency of Natural Resources, the artist community and the Federation of Vermont Lakes and Ponds, chose this lovely painting done by Holly Thompson, artist and college student from Morrisville, Vermont.

The design contest was a vital phase of the voluntary sticker program created by the Vermont Legislature in 2005. This unique little sticker has the big job of increasing public awareness about ANS issues and offering everyone living in or visiting Vermont a simple opportunity to contribute financially to the management of invasive aquatic plants and animals. The sticker price is \$10. Nine dollars of every sticker sale goes directly into the grants-in-aid program that financially supports Vermont towns, lake associations and others fighting local infestations or actively preventing



pests from spreading to their local waterbodies.

So buy a sticker this year and show it off the next time you go swimming or boating or fishing or tubing – it is art, it is important and it is easy to be involved! If you need help finding a sticker or want to become a distributor, please visit our website at www.vtwaterquality.org or call the Aquatic Nuisance Species Program at (802) 241-3777.

Aquatic Nuisance Species

HIGHLIGHTS

- **Unveiling the Aquatic Nuisance Species Sticker!** See facing page for details.
- **U.S. Army Corps of Engineer Funding.** Senator Leahy assisted in again securing funding from the Army Corps of Engineers for Vermont's Lake Champlain Basin water chestnut and Eurasian watermilfoil management in 2006. At least \$376,000 in cooperative cost-share funds (requiring a 50/50 match) is expected.
- **Grant-in-Aid Awards.** Thirty-five municipalities applied for Grant-in-Aid funding to support 36 locally run management projects in 2006. Proposed projects include Eurasian watermilfoil, curly leaf pondweed and purple loosestrife control, mechanical control of nuisance native plants, and ANS spread prevention programs, including public access "greeter" programs, lakewide searches and watch programs, and portable boat wash stations.
- **Water Chestnut.** For the 24th year, the Department of Environmental Conservation will manage water chestnut in Lake Champlain and other inland waterbodies. Many areas are managed in partnership with The Nature Conservancy. New York State Department of Environmental Conservation will conduct water chestnut control program of their own in southern Lake Champlain, in an effort to enhance Vermont efforts in that region of the lake.
- **Law Enforcement.** Lakes and Ponds Section staff in cooperation with the Lake Champlain Sea Grant and the Lake Champlain Basin Program again conducted ANS training sessions for the Vermont State Police Marine Patrol and Dept. of Fish and Wildlife Wardens this spring. State Troopers and Vermont Fish & Wildlife Wardens will actively enforce the Vermont ANS Transport Law during the 2006 boating season. It is illegal to transport Eurasian watermilfoil, water chestnut, zebra mussels and quagga mussels to or from any surface water in Vermont. Violators may be subject to penalties up to \$1,000.
- **ANS Watch.** Keep aquatic nuisance species from gaining a foothold in Vermont waters – help watch for ANS in a water body near you. To report a potential ANS sighting in Vermont or to learn how to become an ANS Watcher call 802-241-3777.
- **Welcome Leslie Matthews!** The Water Quality Division is pleased to welcome Leslie to the Aquatic Nuisance Species Management Program. Leslie's focus in the program will be spread prevention, including coordination of the ANS watchers and the voluntary sticker programs. Leslie also will coordinate management of animal invaders and can be reached by email at Leslie.Matthews@state.vt.us or by calling her at (802) 241-3777.



Above Photo: Lay Monitor, David Wood from Salem Pond in Derby, works with Amy Shedrick from the ANS Program too identify aquatic plants at the 2006 Lake Seminar held June 9th by the Federation of Vermont Lakes and Ponds and the Water Quality Divisions' Lakes and Ponds Section. In the background, Bob Briggaman of Miles Pond in Concord looks at plants specimens.

Examples of Volunteer Monitoring Using State Lab Services:

Basin 2: Poultney-Mettawee Watershed Partnership - This watershed-wide group measures *E. coli* at swimming locations, and characterizes nutrient concentrations in the Poultney, Mettawee, and Castleton Rivers and in a few tributaries.

Basin 3: Addison County Riverwatch Collaborative – This large, long-term program monitors phosphorus, *E. coli* and other physical attributes in Addison County rivers.

Upper Otter Creek Watershed Association - This watershed-wide group measures *E. coli* and characterizes nutrient concentrations in the Otter Creek and selected tributaries.

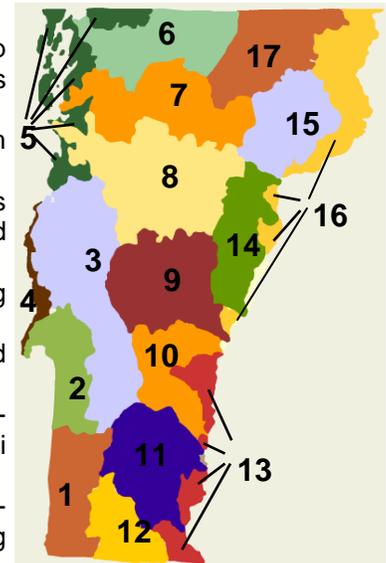
Basin 5: Alburg - Firehouse Road – This new project, initiated by residents along the Alburg shore of Lake Champlain, investigates sources of *E. coli* to the lake.

LaPlatte River Watershed Partnership - This group measures *E. coli*, nutrient and sediment concentrations.

Basin 6: Missisquoi River Basin Association - This watershed-wide monitoring network focuses on characterizing nutrient concentrations throughout the Missisquoi River Basin and its tributaries.

Basin 9: White River Partnership - This well-established group is evaluating nutrient and sediment sources in the White River watershed, as well as developing quality assurance data on their *E. coli* monitoring program.

Basin 17: Northwoods Stewardship Center – This group has developed a watershed-wide monitoring network in the Lake Memphremagog drainage to assess nutrient concentrations from the Barton, Black, Clyde, and Johns Rivers.



Vermont's 17 Major Watersheds

causing them to hide or be overcome with physical effects such as trembling. The noise from exploding fireworks can top 130 decibels (dB). According to acoustic health specialists, exposures to 105 dB for one hour can cause hearing damage. The typical lake environment has noise levels from 30 dB to 50 dB.

Accidents and Property Damage

Fireworks are dangerous. They can cause burns, loss of limbs and sometimes death. They are extremely hot – sparklers can burn at temperatures of over 1800 degrees. On average, annually about 9,000 people are injured severely enough by fireworks to require hospital treatment. Forty-five percent of those injuries occur to children younger than 15 years old. Annually, fireworks cause over 30,000 fires nationwide, resulting in millions of dollars of property damage.

Pollution

Some researchers believe heavy metal fallout from exploding fireworks poses a threat to the environment and us. Currently toxicological

studies on the effects of fireworks on the environment are limited and vary in results. The solid reaction products that give us the pretty colors and special effects include a nasty bunch of chemical additives. The unknown factor is the concentrations needed to cause a problem. Fireworks are often propelled by charges of black powder (which contain carcinogenic sulfur-coal compounds). Ammonium perchlorate, which can cause problems with the human thyroid gland, is another ingredient used in fireworks and is not a good thing to find in our water. Ammonium perchlorate has been found in ground and surface water in California, Nevada, Utah and West Virginia. White phosphorus is another toxic substance used in fireworks. Its residue can persist in aquatic environments and has caused die-offs of fish and waterfowl.

Fireworks contain a number of other toxic metals that are used to create a range of colors. Strontium produces blazing reds; copper compounds burn blue; magnesium, titanium and

What is a Mudpuppy ?

Mudpuppies are Vermont's largest salamander! Adults average about 12 inches in length, but have been reported to attain up to 19 inches! As our second-most rare salamander, the common mudpuppy (*Necturus maculosus*) is anything but "common" in Vermont. Its distribution is limited to a few waters of the lower Champlain Valley and in the lower to mid Connecticut River. Only the Champlain Valley population is thought to be native. Specifically it has been found in two locations in Lake Champlain and in the lower reaches of five lake tributaries.



This mudpuppy was found dead on the ice at Chipman Point on Lake Champlain in 1980. It resides, as a preserved specimen, at the Biomonitoring and Aquatic Studies Section of the Water Quality Division.

The mudpuppy is very secretive, being active mostly during the hours of darkness. Its ability to hide itself during the day has made it difficult to sample populations and determine its numbers in Vermont. The Champlain Valley rests on the north-eastern edge of its natural range which extends west through the Great Lakes to Manitoba, and south to eastern Kansas and Tennessee.

Mudpuppies are unusual in the sense that they are aquatic throughout their lives. As a result, mudpuppies, with their brown to gray bodies often speckled with dark spots, can be identified by their

conspicuous red feathery gills located on either side of their head. They can inhabit a variety of waters from muddy, weedy bays of lakes to small-to-large rivers. They prefer rock bottoms, but have been found over mud bottoms with abundant aquatic plant growth.

This nocturnal salamander is active throughout the year during the warm summer months (although often in deeper water) and under the ice in January. Anglers have taken them through the ice using live bait.

Mudpuppies spawn in the fall in nests that are carved-out excavations under rocks or logs. The female collects the mate's sperm and actually stores it until the following spring when she finally deposits the 18-180 eggs from May to June. The eggs incubate, suspended from gelatinous threads attached to the underside of the nest, for one to two months. Soon after hatching the female leaves the young to fend for themselves.

Mudpuppies are predators who are not particular about what they eat-live or dead. Organisms from crustaceans to small fish have been found in mudpuppy stomachs. They also seek insect larvae, snails, clams, and worms and have been reported to consume fish eggs. Despite its adaptable feeding habits, biologists are concerned that numbers of this species are dwindling over some parts of its range. Determining the population density of mudpuppies depends on rather difficult monitoring conditions, though sampling and recording the health of this big salamander is occurring when possible.

...Thrills and Chills

aluminum create brilliant white sparks. Sodium chloride generates orange-yellow fire; boric acid burns green; potassium and rubidium compounds produce purples and burning lithium glows red. Glittering greens are produced by radioactive barium. These ingredients drift on the winds and settle into our water and soils.

During the Stockholm Water Festival in 1996, air pollutant levels were measured before and after the fireworks display. Levels of airborne arsenic were found to be twice as much as normal, while levels of mercury, cadmium, lead, copper, zinc and chromium were as high as 500 times above normal. Concern about these effects on their waters and people caused organizers to



switch to a more environmentally-friendly laser light show.

Like so many other activities that we enjoy, watching fireworks comes at a price. Some of those costs, such as the noise and cardboard waste, are immediate and visible. Others, such as the carcinogenic chemicals let loose to contribute to the pollution of our soil, water and air, are not visible and often not thought about. Celebrating this Independence Day can be more enjoyable for everyone if we are all respectful of our neighbors and wildlife, cautious in how we use fireworks and concerned with the potential impact they may have.



State of the Lakes



Many possible shoreland vegetation management options are open to lakeshore owners.

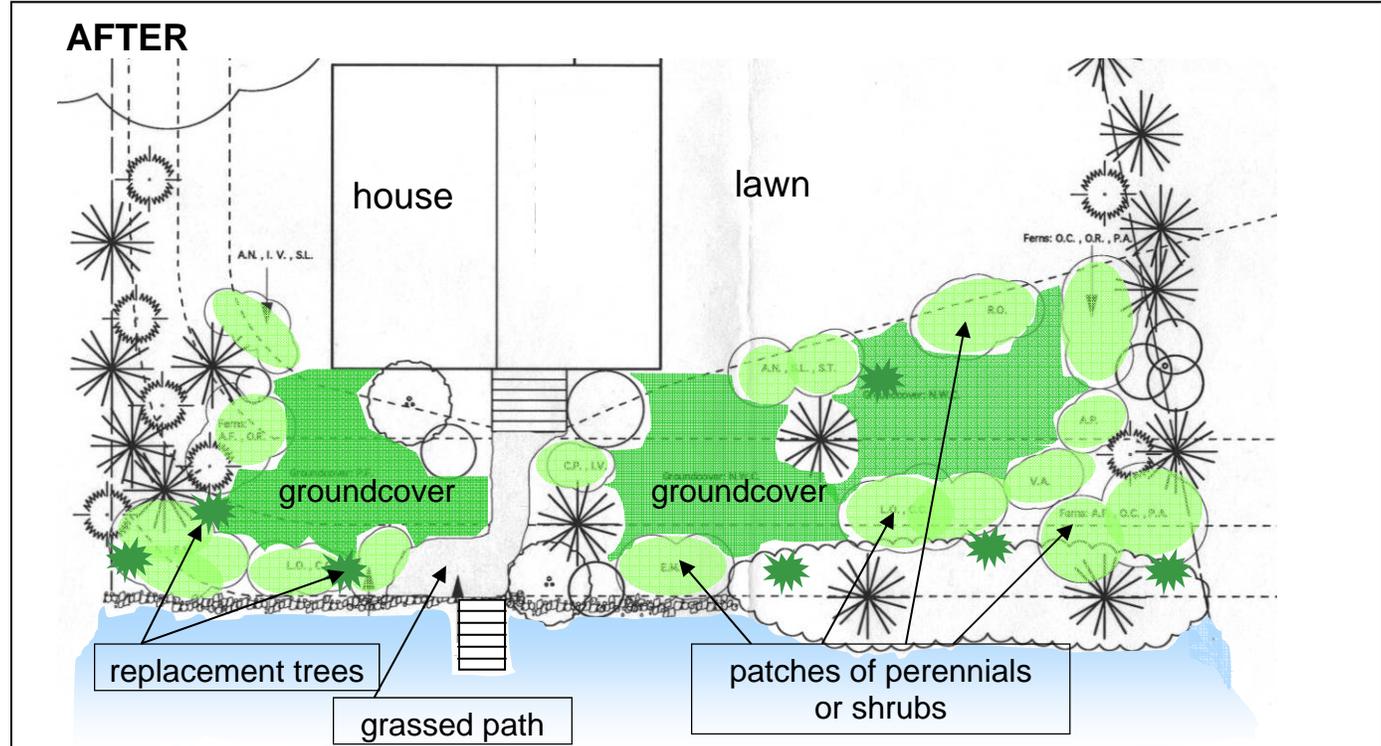
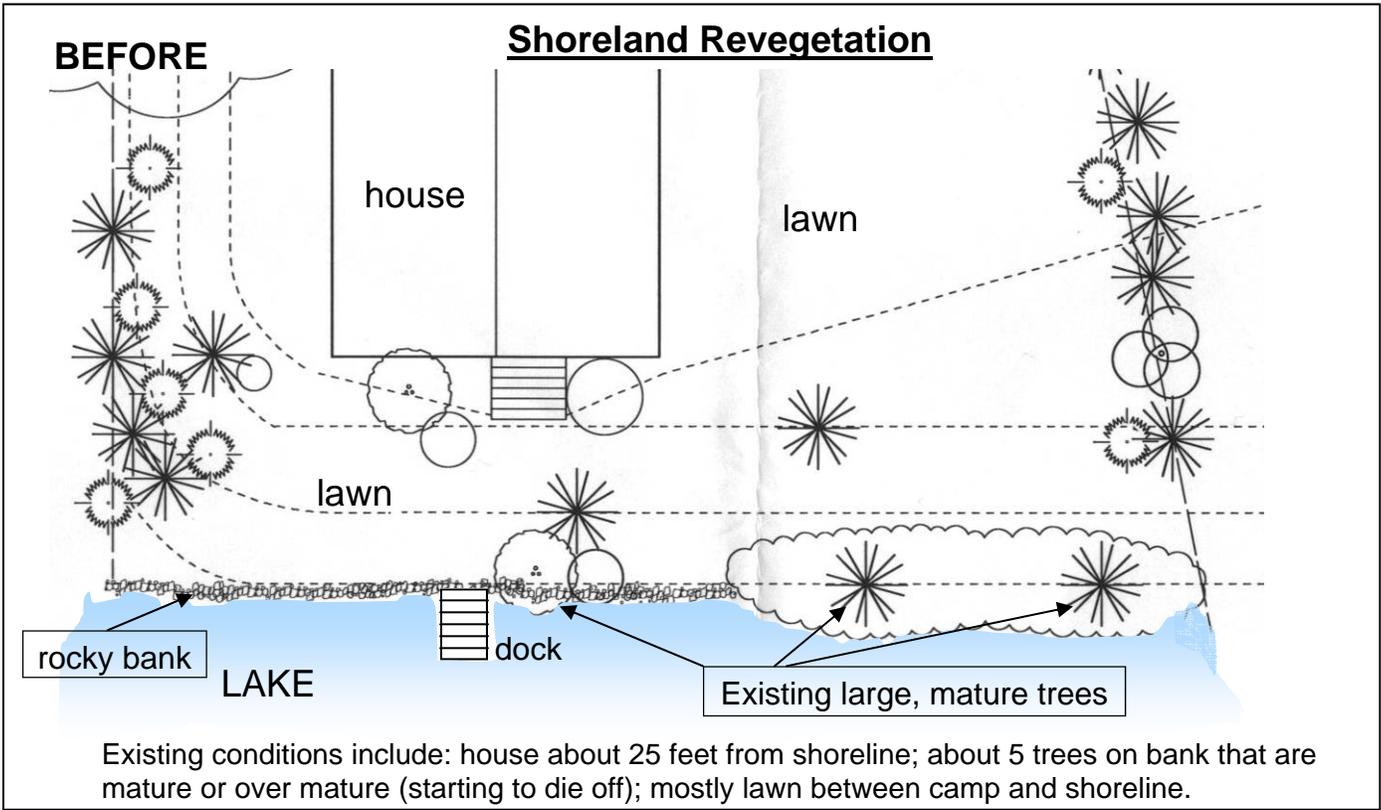
Below are some basic principles to strive for to reduce shoreland activities from impacting the lake.

Drawings by LandWorks of Middlebury

Principles of Watershed/Landscape Enhancement for Quality, Habitat and Aesthetics



- A. Driveway with minimal cut and fill, set back from lakeshore, slanted or with waterbars to allow runoff into vegetated areas
- B. Native groundcover replacing lawn especially near lakeshore (ferns, wildflowers, partridge berry)
- C. Small lawns around camp/house; winding grass path to lake edge
- D. Native shade trees
- E. Maintain vegetated swales (gentle ditches) to receive runoff from driveways or roofs
- F. Native woodland management promotes bio-diversity and habitat
- G. Limited lakeshore access to allow native vegetation along most of shore
- H. Removable dock
- I. Stabilize and maintain shoreland with native vegetation, add replacement trees before large ones die off
- J. Open view windows by planting low vegetation or pruning tree branches



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Vermont Lay Monitoring Program: Start of Its 28th Season!

The Vermont Lay Monitoring Program, a statewide, citizen-based lake sampling program, started its 28th year of consecutive summers of lake sampling. Under the LMP, lakes are sampled weekly for their nutrient enrichment. This program is a cooperative effort between dedicated volunteers and the Vermont Water Quality Division. This summer 56 lakes and 15 stations on Lake Champlain will be monitored. For more information, contact Amy Picotte at (802) 241-3789.

Happenings

Coming Soon....

The 2006 Annual Meeting of the Federation of Lakes and Ponds, Monday, July 24th in Montpelier at the Elks Club. For more information, contact Jackie Sprague at (802) 633-4994.

Check Them Out!

New Vermont Lake Protection Series — 10 topics are covered as stand alone hand-outs or as part of a booklet. Topics range from planting and restoring lake-shores, preventing driveway erosion and lake monitoring. Contact Susan Warren in the Lakes and Ponds Section at (802) 241-3794 for more information.

New Crown Point, Lake Champlain Monitors, Mark Thompson and Chip Morgan, record their station location.



Danby Pond Lay Monitors, Bob and Ruth Easton, start their 14th year of sampling.