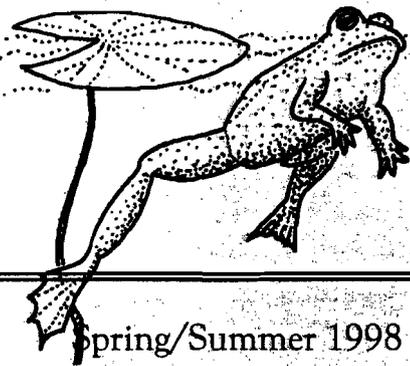
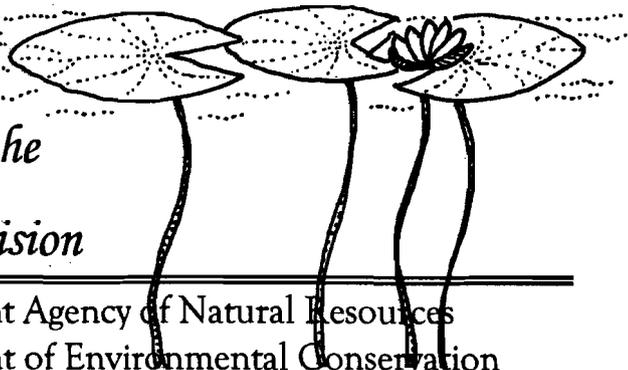




Out of the Blue



*A Newsletter of the
Water Quality Division*



Spring/Summer 1998 No. 16

Vermont Agency of Natural Resources
Department of Environmental Conservation

Do You Know Who is Helping Protect Your Lake?

Chances are the water quality of your favorite Vermont lake has been monitored by a volunteer lake monitor from the Vermont Lay Monitoring Program, possibly for as long as 20 years! The Lay Monitoring Program is a cooperative effort between the Water Quality Division of the Vermont Department of Environmental Conservation and lake users. People from all walks of life, actively involved in lake protection make up the backbone of the Lay Monitoring Program.

This summer the Vermont Lay Monitoring Program is celebrating 20 years of collecting lake data from more than 75 inland lakes and 35 Lake Champlain stations! The Vermont Lay Monitoring Program is the fourth oldest in the country and has been used as a model by many other states. Established in 1979, the LMP continues today with the same goals established 20 years ago: to describe water quality conditions on each lake participating in the program; to establish a database on each lake useful for documenting future changes in water quality; and to educate and involve lake residents in lake protection.

Under the LMP, a lake is sampled to measure its nutrient enrichment by monitoring the total phosphorus and chlorophyll-a concentration, and the water clarity. Excessive nutrients entering a lake are the most common cause of lake water quality problems.

Phosphorus is typically a limited nutrient in a lake system so when in excess, it accelerates the productivity (aging) of a lake. Phosphorus feeds aquatic plants, algae and other plankton (free floating, aquatic life), increasing a lake's productivity. Phosphorus may enter a lake from many sources; examples include, soil erosion

See "LMP" page 2

Out of the Blue Fattens Up

With this issue of *Out of the Blue*, the Water Quality Division is launching a new more comprehensive approach to the newsletter. Since the division deals with lake, river and wetland issues, indeed **watersheds**, the newsletter will now include topics from programs in addition to the Lakes and Ponds Section. Certainly in nature these resources function in an inter-connected manner. A lake, stream or wetland is influenced by the geology, vegetation, topography, land uses, and streams, wetlands and ponds of its watershed.

In this issue you will see some new topics discussed, and we plan to introduce more coverage in subsequent issues. Please let us know how you feel about this broader approach. While we think a more comprehensive coverage will increase everyone's understanding of the issues, we also don't want to lose our long-term readers. Your feedback, article suggestions and contributions are always welcome! Thank you!

See "Out of the Blue" page 2

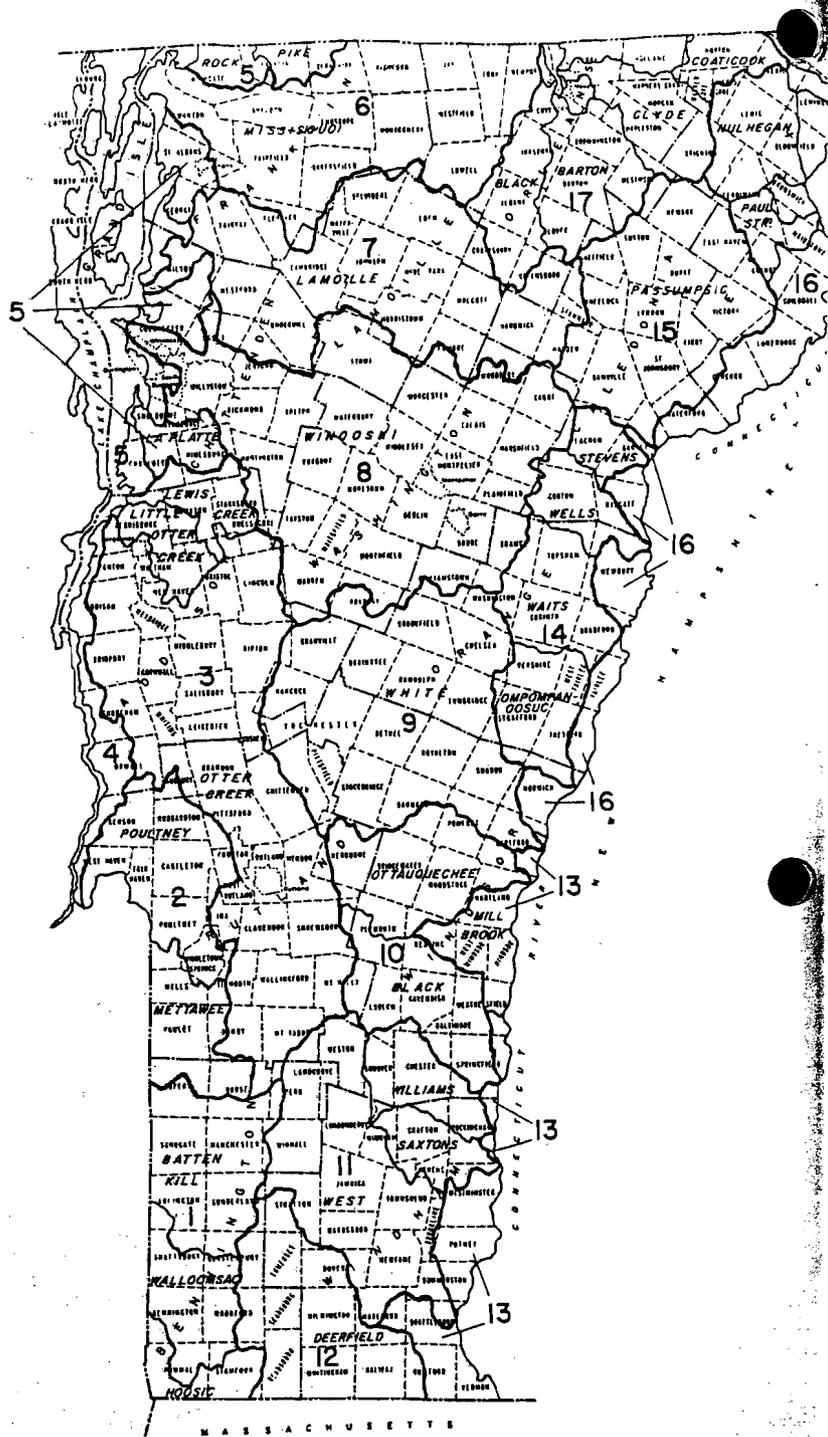
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Herbivores: Another potential stressor to milfoil in Lake Bomoseen is the native watermilfoil weevil, *Euhrychiopsis lecontei*. The VTDEC has been working with this insect for several years to try to determine if it can be used as a biological control agent for Eurasian watermilfoil. Weevils were first found to be naturally occurring in Lake Bomoseen in 1990. Several "no harvest" areas were established in the lake to give the weevils a chance to increase their population (mechanical harvesting removes weevils from the lake). In addition, many thousands of weevils were added to the "no harvest" areas in 1993, 1994, and 1996. Milfoil plants at the introduction sites were starting to show signs of extensive direct weevil damage by the end of 1996. Also, the type of feeding damage that weevils cause (holes in the stem and removal of plant tissue) could certainly make conditions more favorable for an attack by a pathogen such as MT.

It's unlikely that weevils, in and of themselves, could have caused the lake wide decline seen in Lake Bomoseen in 1997, since the weevil population needed for that level of control would be quite large and harvesting in previous years probably would have prevented the population from increasing to that level. It is also unclear why, if weevils were the cause of the decline, unharvested milfoil north of the bridge, where weevils are numerous, did not show any signs of stress. In spite of this, however, in certain areas, milfoil plants could have collapsed due to weevil activity, and/or been stressed enough by weevils to become more vulnerable to collapse when other factors were involved. Weevils can affect the ability of milfoil to grow strong root systems and store carbohydrates, both of which are important to milfoil survival during the winter.

It is impossible to know to what extent, if any, the factors mentioned above played a role in the 1997 decline. It is also not known how these factors may have acted together to significantly stress milfoil plants to the point where they collapsed. It is very likely that no one factor was responsible. Illegal herbicide use has been suggested as a potential cause, but there were no apparent signs of this type of activity, particularly on a widespread basis, in 1997. In 1998, the Water Quality Division will conduct additional sampling for pathogens and will also monitor the weevil population in various parts of the lake.



For the purposes of assessing and reporting water quality information, the state has been divided into seventeen major drainage basins that have from four to twenty-two river sub-basins or main stem segments ("waterbodies") within them. The seventeen major basins drain to either Lake Champlain, the Connecticut River, Lake Memphremagog, or the Hudson River.

The Vermont Department of Environmental Conservation Water Quality Division has been conducting statewide river water quality evaluations every two years since 1980 for the purpose of reporting the conditions of the nation's waters to Congress as required by the Clean Water Act, section 305(b).

In 1988, the Division conducted a comprehensive nonpoint source pollution water quality assessment that greatly enhanced the base of water quality information we maintain. Other than in 1988, the biennial updates have been restricted to gathering information from a limited number of sources due to staff and time constraints. Potential information sources not fully used since 1988 include volunteer monitoring and watershed groups, educational institutions, other state and federal agencies, and local and regional planning commissions.

The Division has used information gathered during past assessments for the state's Clean Water Strategy, which determines nonpoint source pollution abatement priorities. The assessments have also provided information to the public on the water quality conditions in Vermont.

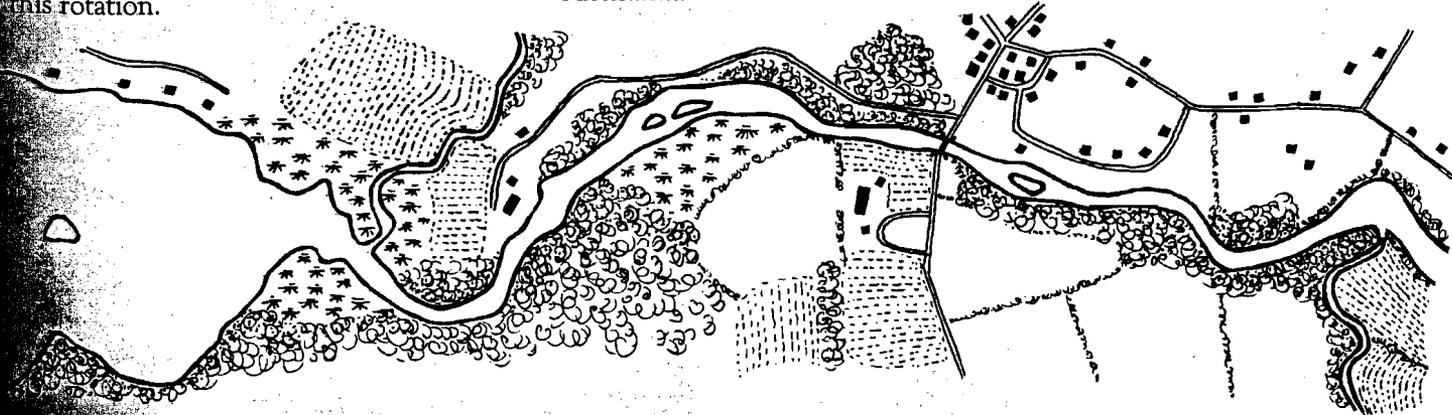
Five year Watershed Rotation Plan

In order to conduct a more thorough assessment of the state's basins, the Water Quality Division has developed a rotational watershed assessment process to ensure that the rivers and streams of all seventeen major basins (see map on left) in the state are evaluated once every five years. As much as possible, the Division's lake assessment work also follows this rotation.

The ability to concentrate on a limited number of watersheds each year provides the opportunity to: do a more systematic and intensive assessment of point and nonpoint pollution sources; determine the best characteristics of the river system to use as indicators of water quality and aquatic habitat change; evaluate program effectiveness; and determine research needs and priorities. This approach also provides an opportunity to involve watershed groups and the general public in the lake assessment process. Please call Cathy Kashanski at the Division's Water Quality Planning Section at 802-241-3770 for more information.

July 1996 - August 1997	Basin 3 - Otter Creek Basin 4 - Lower Lake Champlain Basin 9 - White River
July 1997 - August 1998	Basin 2 - Poultney, Mettawee Rivers Basin 7 - Lamoille River Basin 10 - Ottauquechee, Black Rivers Basin 14 - Ompompanoosuc, Waits, Wells Rivers
July 1998 - August 1999	Basin 1 - Battenkill, Walloomsac, Hoosic Rivers Basin 11 - West, Williams Rivers Basin 12 - Deerfield River Basin 13 - Lower Connecticut River
July 1999 - August 2000	Basin 5 - Upper Lake Champlain Basin 6 - Missisquoi River Basin 17 - Black, Barton, Clyde River
July 2000 - August 2001	Basin 8 - Winooski River Basin 15 - Passumpsic River Basin 16 - Upper Connecticut River

The table above shows the schedule for the Five-Year Rotational Watershed Assessment.



The Great Dip-In

The 1998 Great American Secchi Dip-In, scheduled for June 27 through July 12 will be the fourth year of Vermont participation in this national event to measure lake water clarity. Last year 33 Vermont lake monitors paddled, motored, and sailed to the middle of their favorite lake and dipped-in! During the dip-in the monitors take a water clarity reading by lowering (or dipping) from a rope an eight inch diameter plate, called a Secchi disk, into the lake to the distance at which it disappears. At the point the Secchi disk fades from sight the water clarity reading is taken. The water clarity readings in Vermont lakes range from 0.5 meters to 12 meters.

A lake's water clarity is affected by the different land uses in and around the lake. When human activity in the

watershed causes run-off or erosion, such as from poorly maintained backroads, nutrients and sediments will eventually be washed down to a lake. Excessive nutrients entering a lake can lead to algae blooms, which in turn lower a lake's transparency. By following the best management practices (BMPs) for backroads, logging, agriculture, and private property activities the amount of run-off entering our lakes is reduced.

The Great American Secchi Dip-In, an event run by Bob Carlson from Kent State University in Ohio, produces a snapshot of lake transparency throughout North America, helps monitor national and regional water quality trends, and proves that volunteers can make a difference in helping to monitor the environment.

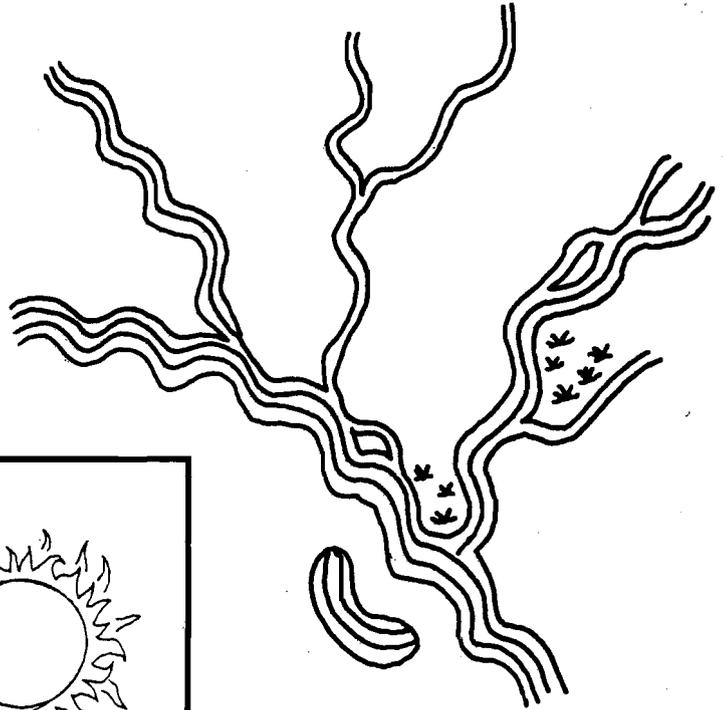
This table presents the results of Vermont and other states from the 1997 Great American Secchi Dip-In.

Country/State	# of Lakes Sampled	Average Transparency (meters)	Country/State	# of Lakes Sampled	Average Transparency (meters)
Australia	5	0.1	North Carolina	11	0.4
Canada/BC	16	4.9	North Dakota	2	1.6
Ireland	5	4.1	Nebraska	6	0.9
Alabama	8	1.1	New Hampshire	31	4.5
California	2	3.8	New Jersey	13	0.7
Connecticut	3	2.8	Nevada	1	20.2
Florida	69	1.6	New York	57	3.5
Georgia	2	2.6	Ohio	35	0.5
Iowa	5	0.2	Oklahoma	18	0.5
Idaho	1	4.6	Oregon	13	2.7
Illinois	50	1.0	Pennsylvania	1	3.2
Indiana	63	1.9	Rhode Island	25	2.2
Massachusetts	37	2.5	South Carolina	21	3.9
Maryland	4	1.0	South Dakota	6	1.5
Maine	121	5.1	Texas	17	0.5
Michigan	55	3.7	Virginia	19	0.5
Minnesota	487	2.6	Vermont	33	4.8
Missouri	17	1.3	Washington	36	3.8
Mississippi	1	0.6	Wisconsin	151	2.9
Montana	16	4.5			

See "Great" next page

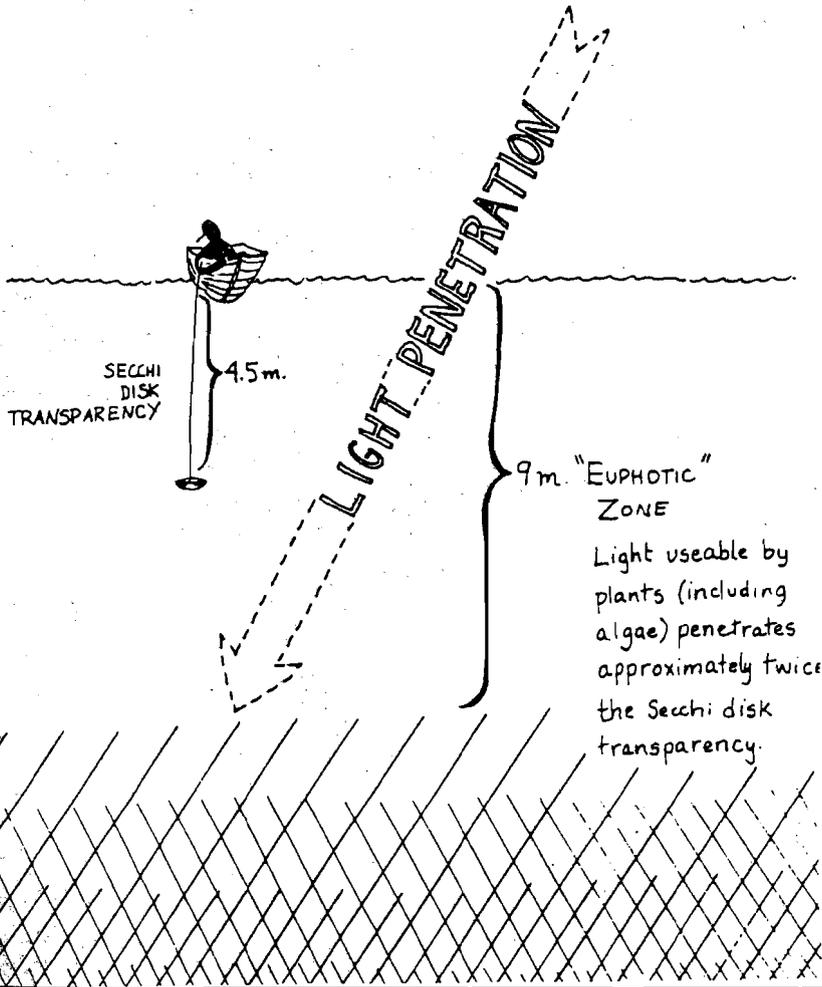
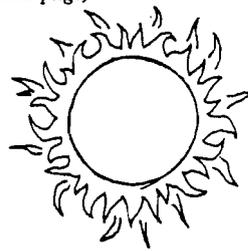
Vermonters form river watershed associations for many reasons. People come together with an interest in protecting something special about their local river or they join in their desire to restore a fishery, a swimming hole, or a sense of place that the river provides for their community. In almost all cases, when a river watershed association is formed it begins the seemingly never-ending process of getting to know the river.

In Addison County, Vermont river watershed associations formed for different reasons: conserving river-side lands, restoring aquatic and wildlife habitat, and bringing



Great Dip-In (continued from previous page)

Water clarity is related primarily to the amount of algae or silt suspended in the water. In addition, factors such as wave action, sun angle, cloudy weather and time of day can all influence the apparent water clarity on any given day.



local people together to celebrate and learn about their rivers. Throughout the years, the New Haven River Anglers, Lewis Creek Association, Otter Creek Audubon River Watch, and The Watershed Center at Little Otter Creek have studied chemical water quality parameters, aquatic biota, and some of the physical habitat characteristics of rivers and streams in their respective watersheds in Addison County.

Recently, these groups have joined together to cooperatively combine their river water quality monitoring efforts. In 1998, the river water quality monitoring programs will be further coordinated under the Addison County River Watch Collaborative. This collaborative recently received a grant from the Vermont Conservation License Plate Watershed Fund, in its first year of providing watershed grants, to hire a part-time coordinator and undertake a joint water quality sampling and reporting program during the summer and fall of 1998.

In recent years Vermont residents have heard media reports concerning mercury contamination of fish and loons. What is mercury? How does it move into and through lakes, and end up in fish and fowl?

What is mercury?

Chemically, mercury is defined as a metal. It exists in minute quantities in nature. In the laboratory it exhibits behaviors unlike other metals. Indeed, generations of chemists have been fascinated by *quicksilver*, its metallic appearance, predictable physical properties, and its propensity to form little liquid balls which roll about.

In one specific chemical configuration, mercury is extremely toxic, even in very low concentrations. This toxic form is called methylmercury. The concentrations of methylmercury found in Vermont lake water are believed to be far below toxic thresholds for humans. Indeed, one would not expect to get mercury poisoning by swimming in any Vermont lake.

Why, then, should we be concerned?

More than 90 percent of mercury found in fish tissue is in the toxic methylmercury form. Methylmercury is considered an extremely powerful neurotoxin which has particularly strong effects on fetal and childhood cerebral development. For this reason, fish consumption advisories have been posted across the northeast, specifically targeting children and women of childbearing age. By limiting fish consumption (the advisory calls for some age groups to eat NO fish from certain lakes) the accumulation of mercury in one's body can be kept within acceptable risk levels.

Where does the mercury originate?

In Vermont, mercury comes almost entirely from the sky. Airborne mercury is generated by industrial processes: power generation (coal burning), fuel combustion, and the incineration of solid waste.

Atmospherically transported mercury falls into lake watersheds both as dryfall and as wet precipitation. In higher-elevation, forested Vermont watersheds, approximately 24% of mercury deposited ends up in receiving waters (see figure above right).

How does mercury get into fish and waterfowl?

Mercury typically rests inert in lake sediments. However, under certain conditions, methylmercury will form and move into the food chain.

58 milligrams of mercury per acre falls from the sky annually.

44 milligrams of that mercury is retained in the forest soil.



Thus, 14 milligrams of mercury ends up in receiving waters.

Estimated annual total mercury deposition (adapted from ANR's "Environment 1997," research conducted by Tim Sherbatskoy, UVM School of Natural Resources).

The methylation process can begin when a lake's hypolimnetic (deep, coldest) waters become starved of oxygen, releasing sulfur compounds as a by-product. Sulfur-reducing bacteria consume these compounds, and associated biochemical reactions result in the methylation of some of the available sediment-bound mercury. Methylmercury, thus formed, moves into the water column where it is assimilated by plankton, algae and filter-feeding microscopic animals. The plankton are eaten by larger animals, which in turn are preyed on by even larger fish or waterfowl such as loons. As mercury passes through the food chain, it bioaccumulates and can reach toxic concentrations for animals at the top of the food chain.

Research suggests that methylation is accelerated in acid stressed lakes, lakes which are surrounded by coniferous watersheds and lakes which have a high proportion of peaty wetlands in their watersheds.

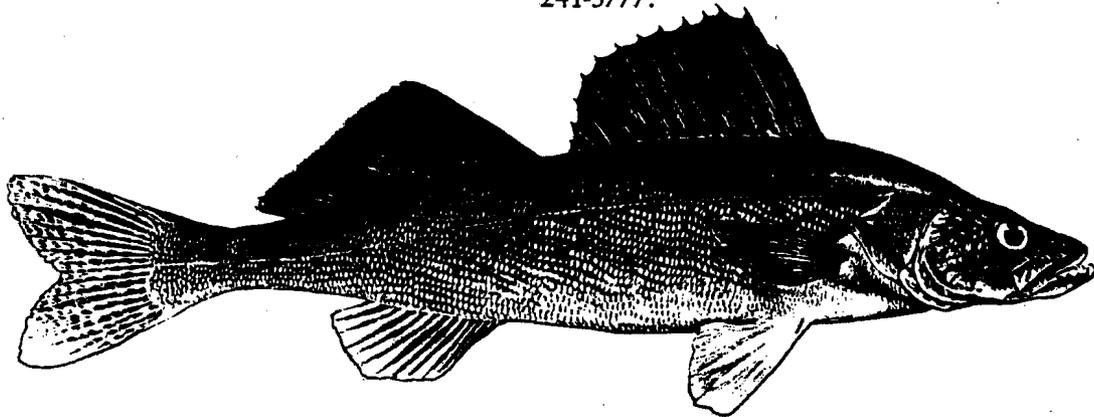
What is Vermont doing about mercury contamination?

The Vermont Agency of Natural Resources continues to work at the national level to curb mercury emissions from other states. The VTDEC in conjunction with the Vermont Department of Health has an ongoing, statewide program of testing fish tissue for mercury contamination.

Additionally, in October, the Water Quality Division was awarded a \$191,000 USEPA grant to study mercury in lakes and ponds across Vermont and New Hampshire. This project, a partnership effort with the New Hampshire Department of Environmental Services, will evaluate levels of mercury and methylmercury in lake sediments, waters, and relate these information to mercury levels in fish. The study will also determine historical

patterns of mercury deposition across both states by examining lake sediments. Through this study, VTDEC will contribute valuable information to the complex scientific field of mercury in lakes, as well as provide critical information for refinement of existing fish consumption advisories.

For more information regarding mercury, an excellent overview can be found on the Massachusetts DEP's World Wide Web site (<http://www.state.ma.us/dep/files/mercury/hgtoc.htm>). For information regarding the VTDEC mercury research project, contact Neil Kamman, at the Lakes and Ponds Section, (802) 241-3777.



HEALTH ALERT - Vermont Department of Health Fish Advisory - July, 1997

Due to mercury contamination, the Vermont Dept. of Health has issued this health advisory warning to people to limit consumption of fish caught in Vermont waters. Scientific studies have linked mercury with developmental problems, and kidney and nervous system damage. Call the Dept. of Health for more information at 1-800-439-8550.

GENERAL ADVISORY:		
	Women of childbearing age (particularly pregnant women, women planning to get pregnant, and breast-feeding mothers) and children age 6 and under	All other individuals
Walleye	0 meals	No more than 1 meal per month
Lake Trout Smallmouth Bass Chain Pickerel	No more than 1 meal per month	No more than 3 meals per month
Brown Bullhead Pumpkinseed	No advisory	No advisory
All other fish	No more than 2-3 meals per month	No more than 9 meals per month
EXCEPTIONS:		
Walleye in Lake Carmi	No more than 4 meals per month	No advisory
Lake Trout in Lake Champlain >25"	0 meals (includes all children under age 15)	No more than 1 meal per month
All fish except Brown Bullhead in these Deerfield chain lakes (Grout Pond and Somerset, Harriman, Sherman, and Searsburg Reservoirs)	0 meals	No more than 1 meal per month

CT River Watershed Initiative Takes on Exotic Invaders

Seven projects were recently funded under the Silvio Conte National Fish and Wildlife Refuge's Connecticut River Watershed/Long Island Sound Invasive Exotic Plant Control Initiative (see *Out of the Blue*, F/W 1997-98 No. 15).

Projects in Vermont include the control of black swallow-wort at sites of the federally endangered Jesup's milk vetch, control of Japanese knotweed in an exemplary floodplain forest community, and control of Eurasian watermilfoil in Lake Morey. Connecticut projects include control of purple loosestrife, Japanese barberry, and Asiatic bittersweet at eight priority preserves under the stewardship of The Nature Conservancy, control of *Phragmites* to protect nesting habitat of the federally and state endangered roseate tern, and eradication of a small hydrilla population (the northernmost infestation of hydrilla in the U.S.). In Massachusetts, the exotic plants moneywort and forget-me-not will be removed at sites of the regionally rare and state endangered winged monkey flower. The Conte Refuge grant is providing \$25,000 toward these projects.

The matching funds provided by the Water Quality Division helped the Refuge secure another invasive exotic plant grant from the National Fish and Wildlife Foundation in 1998. The new \$20,000 federal grant will focus on implementation of priority projects identified in the strategic plan currently being developed for the Connecticut River watershed. For more information, please contact Holly Crosson at the Lakes and Ponds Section, (802) 241-3777.

From the "1998 Vermont Guide to Hunting, Fishing and Trapping Laws"

STOP the Spread of Aquatic Nuisance Species

When moving between waterbodies...

 **Inspect** your boat, trailer, and equipment (anchors, centerboards, rollers, axles) and **remove** any plants and animals.

 **Discard** unused bait in the trash or leave with someone fishing in the same waterbody.

 **Drain** water from the motor, live well, bilge, and transom wells while on land and before leaving any waterbody.

 **Rinse** boat and equipment with tap water (preferably hot) or at a car wash.

 **Dry** boat and equipment in the sun for at least 5 days.

 **Learn** how to identify aquatic nuisance species.

 **Report** sightings of suspected aquatic nuisance species to the Depts. of Fish & Wildlife, 802-241-3700, or Environmental Conservation, 802-241-3777.

Notice!

Transporting Eurasian Watermilfoil or Zebra Mussels is Illegal

(pursuant to 10 V.S.A. § 1206)

Violators could be subject to civil penalties of up to \$10,000 a day for each day of violation and criminal penalties including imprisonment for up to six months and/or fines up to \$25,000.

Aquatic Nuisance Species

An increasing number of nonnative aquatic plants and animals are invading waters of Vermont. Many of these species can cause significant economic and ecological impacts.

EURASIAN WATERMILFOIL Prolific aquatic plant found in Lake Champlain and many inland lakes in Vermont. Interferes with boating, fishing and swimming, and displaces native plants. Easily spread when plant fragments are caught and moved on boat trailers, propellers, anchors and other equipment, or in wet wells. 

ZEBRA MUSSEL Tiny D-shaped mollusk, well established in Lake Champlain. Clog water intake pipes, damage boat engines, obscure historic shipwrecks, and alter native species populations. Adult zebra mussels can attach and be moved on boat hulls, engines, and other equipment. Microscopic larvae can get trapped and moved in water of boat engines, bilges, bait buckets, and live wells. 

WATER CHESTNUT Prolific annual plant found in southern Lake Champlain, Lake Bomoseen, and a few inland lakes. Interferes with boating, hunting and fishing, and displaces native plants. Spread by seeds (1), or rosettes (2) caught on boats and equipment. 

ALEWIFE Small bait fish recently found in Lake St. Catherine. May displace smelt and other native forage fish. Can be introduced to new waterbodies if it is accidentally or intentionally caught and used for bait, or dumped from bait buckets or live wells. 

MUTE SWAN Very large white bird with orange bill, observed annually in Vermont since 1993. Highly aggressive during the nesting season and may drive away or kill native waterfowl. May also attack humans and negatively impact aquatic habitats. The Dept. of Fish & Wildlife's position is that mute swan populations should not be allowed to become established in the wild. 

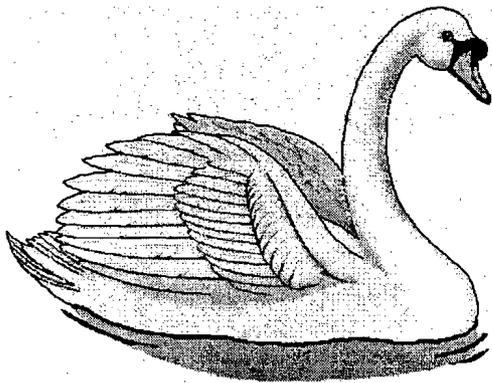
Mute Swans are a Threat to Native Wildlife

There has been considerable news coverage this year about the killing of mute swans at Arrowhead Mountain Lake in Milton. John Hall, Information Specialist for the Department of Fish and Wildlife, presents his Department's perspective on this issue.

The mute swan (*Cygnus olar*) is an exotic species. Like the starling, it originated in Europe and Asia and was introduced into North America by private individuals. Also, like the starling, the mute swan is very aggressive in establishing and defending its nest. Starlings are believed to be a major cause in the decline of bluebirds by taking over natural nesting cavities in trees. Mute swans take over a large area in a marsh and do not allow any other waterfowl to nest and rear their young.

Two other species of swans are native to North America. The tundra swan (*Cygnus columbianus*) breeds in northern Canada and was formerly known as the whistling swan. The other is the trumpeter swan (*Cygnus buccinator*), which breeds in Wyoming, Montana and the Canadian Rockies.

You probably have seen a mute swan before. It is depicted throughout literature as a majestic white swan with an orange bill that has a black knob on top. When displaying, it folds its wings in an arch over its back as it swims presenting a stunning and beautiful sight. Adults weigh 20 to 35 pounds and have five-foot wing spans. At first glance, a mute swan invokes awe and admiration, but that is only part of the story. Most of us never get to know the bird up-close-and-personal.



The mute swan is native to an area from Denmark and central Sweden east across northern Germany, central Russia, Asia Minor and Turkestan to Mongolia and East Siberia. Wild mute swans disappeared in England prior to the 13th century because they were captured, pinioned and kept in domesticated flocks.

In the late 1800s mute swans were imported and

kept in ponds on large estates in New York and southern New England. Some of these swans escaped or were turned loose to populate nearby marshes.

Today, mute swans have reverted to the wild and spread as far north as Maine and Michigan, and as far south as Virginia with large concentrations in many states. Between 1986 and 1993 mute swan numbers along the Atlantic coastal states increased by 65 percent to an estimated 10,000 birds.

Mute swans are large, aggressive birds that will not allow other wildlife in a four-to-six acre area around their nest. The male, or "cob," will not tolerate other waterfowl nesting or passing through its domain. They have been observed driving away or killing native waterfowl, including Canada geese. They also will attack people who get too close during nesting season, and they pose a serious threat to children in or near the water.

Mute swans consume large amounts of aquatic vegetation. Where they concentrate in large numbers, they cause significant habitat damage. Their heavy feeding destroys vegetation, and their wastes can excessively fertilize a marsh.

Last fall, Vermont Fish & Wildlife personnel knew of eight mute swans in the wild in Vermont. One adult nesting pair had been nesting at Arrowhead Mountain Lake since 1993. The others had not nested yet due to their young age.

How do the personnel at our Fish & Wildlife Department see their role in the mute swan issue? It shows in their Mission Statement, which is based on Vermont law: "... the conservation of fish, wildlife and plants and their habitats for the people of Vermont. In order to accomplish this mission, the integrity, diversity and vitality of all natural systems must be protected."

The people at Fish & Wildlife are trying to protect native wildlife by removing the mute swans before they can get firmly established. The Vermont Audubon Council and the Vermont Institute of Natural Science have backed the VT Fish & Wildlife Department's position.

Last fall, VT Fish & Wildlife issued a policy that mute swans would not be tolerated in the wild in Vermont in order to protect native wildlife. Three mute swans caught during their non-flying fall molt were shipped to a private wildlife facility to Texas. This spring, a small number of mute swans that were found in Vermont were shot, according to the policy.

If you would like a copy of a fact sheet on mute swans, contact VT Fish & Wildlife, 103 South Main Street, Waterbury, VT 05671 0501, Tel. (802) 241-3701.

First Round of Watershed Grants Awarded



The first group of Watershed Grants under the Conservation License Plate program were announced in February. A Citizens Review Committee of seven members reviewed and ranked 79 project proposals requesting a total of \$249,000. Sixteen projects were selected for funding and approved by Fish and Wildlife Commissioner Elser, totaling \$23,000.

The funded projects represent a great variety of watershed concerns and approaches. The Review Committee was very impressed by the number and quality of applications, the diversity of groups applying, and looks forward to having more funds to grant out next year. "It was so exciting to see how much watershed work is already happening. I feel the selected projects give the Watershed Grants program a great start in that they cover the whole state and a good mix of restoration, assessment, recreation and education efforts," says Jackie Sprague of the Review Committee. "It was hard choosing from among so many good and deserving projects, and hopefully we will be able to fund many of these projects in the future."

The following projects received funding (*lake association projects are in italics*):

Mini-grants (\$1000 or less)

Addison County River Watch Collaborative
 Connecticut Riverfest-Big Splash Event
 Elizabeth Mine Remediation Project, Strafford
Integrated Crop Management, Lake Carmi
 Lord's Creek Model Restoration Project, Memphremagog
 North Branch River Park Bridge, Montpelier
 Outdoor Classroom for Vernal Pool Cons, Castleton St.Col.
 Poultney Riverbank Stabilization
Lake Parker Watershed Survey, Glover
Willoughby Lake Survey, Westmore
 Windsong Wildlife Sanctuary Observation Deck

Type of Project

Water quality monitoring
 Watershed education, festival
 Watershed & Fish Habitat Restoration.
Watershed Restoration
 Streambank Restoration
 Recreation/Wetland Education
 Wetland Education, Watershed Restoration
 Streambank Restoration
Watershed Assessment
Watershed Assessment
 Wetland Education

Grants (more than \$1000)

VT YCC Watershed Restoration Project
 Connecticut River, Hazen Trail, Hartford
 Hazen's Notch Watershed Inventory, Montgomery
 Green River Dam Fishway, Guilford

Streambank Restoration
 Land Acquisition, Recreation
 Watershed Assessment
 Historical/Cultural, Fish Habitat Restoration

The Watershed Fund receives money from the sale of the new Conservation License Plate, which began selling in March of 1997. The first year a plate is purchased, the \$20 annual fee is divided \$5 to the Watershed Fund, \$5 to the Nongame Wildlife Fund, and \$10 to the Transportation Fund. In the second year, the proceeds are divided \$9 each to the Watershed and Nongame Wildlife funds, and \$2 to the Transportation Fund. As of the beginning of June approximately 5200 plates had been sold. If plate sales continue at their present rate in 1998, at least twice as much money should be available for next year's Watershed Grant program. For more information, contact Susan Warren.

Lake Parker Benefits from Backroads Grant Program

Better Backroads Program Announces Second Year of Grant Awards

Eight road erosion control projects and two road inventory and planning projects were funded by the Small Grants Program of the VT Better Backroads Program. The program, a collaborative effort between several organizations concerned with clean water and town financial health, awarded a total of \$18,000 to further the goal of encouraging good maintenance and erosion control practices on town and private gravel roads.

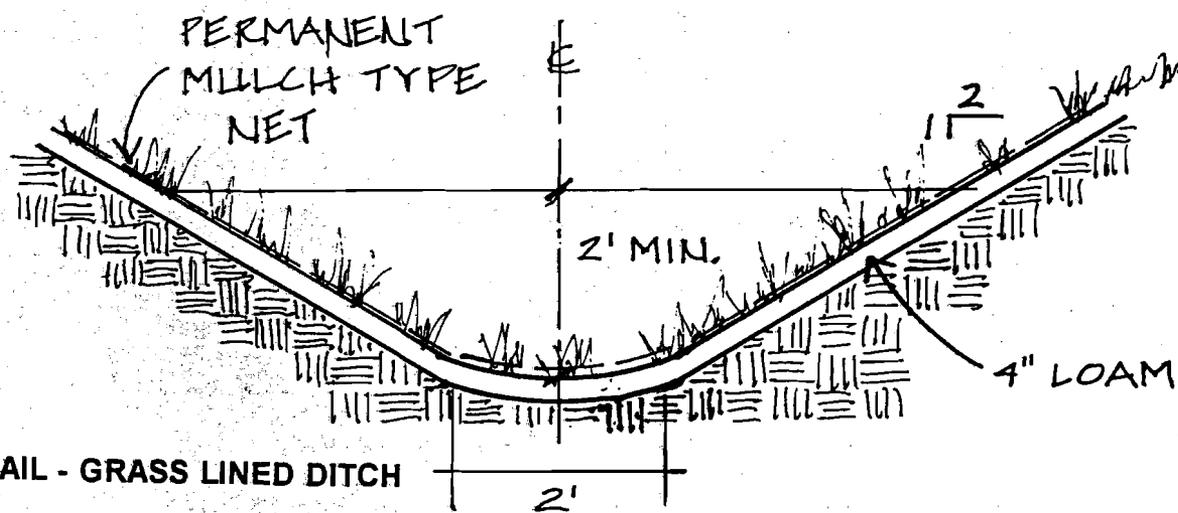
The towns receiving grants were Waterford, Royalton, Elmore and Wolcott, Poultney, Glover, Corinth, Rochester, Townsend, Randolph, and Marshfield.

The town of Glover's successful application was the result of a cooperative effort between the Lake Parker Association and the town of Glover. The association has been involved for several years in inventorying sources of water pollution in the lake's watershed. As part of this effort, communication has increased in many positive ways between the association and the town government. Damage to roads in town during the flash floods of 1997 helped to bring the partners together. The Lake Parker Association prepared a grant application to stabilize 300 feet of a road ditch that parallels the lakeshore along the northwestern shore. The Better Backroads Program awarded the town of Glover \$2200 to complete this work.

Also of great interest to the Small Grants selection committee are the grants to the towns of Randolph and Marshfield to support the development of a road inventory and capital budget plan for correcting problem erosion situations. "The Better Backroads Program feels such planning is essential to ensuring the proper correction of erosion on town roads," says Beth Ann Finlay of the No. VT Resource Conservation and Development Council, administrator of the grants. "Many towns are caught trying to band-aid problem spots, without planning for adequate resources to correct a problem permanently. By identifying and prioritizing problems, and then appropriating funds to correct one or two sites a year, substantial long-term savings can be realized."

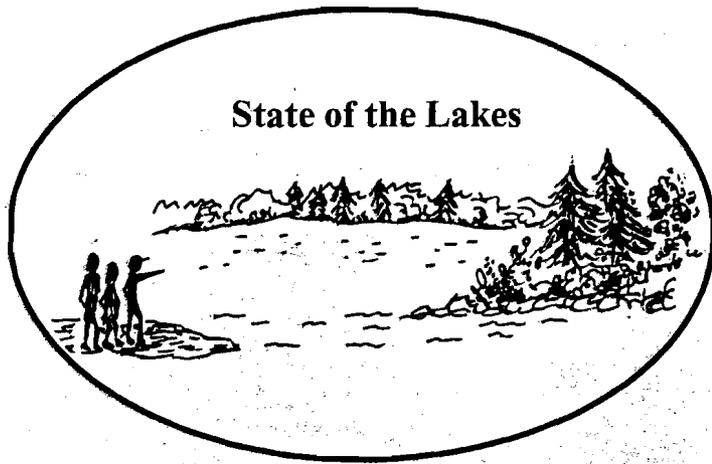
Grant applications for work on private roads, such as those along lakeshores, are also eligible to apply for a Better Backroads small grant. (Two such grants were given in 1997, but none were in 1998.) Anyone interested in discussing such a project is welcome to contact Susan Warren.

The VT Better Backroads Program is a collaborative effort between VTDEC, the VT Local Roads Program, Vermont's two Resource Conservation and Development Councils, and other organizations.



DETAIL - GRASS LINED DITCH

In addition to protecting surface water, stable ditches can save towns or associations significant money. Unstable ditches cost every year by necessitating continual maintenance, involving personnel and materials costs. By stabilizing road-side ditches with grass (or crushed rock on slopes over 5%), annual maintenance costs can be reduced or eliminated, resulting in savings of two to three times the original maintenance costs over 10 to 20 years.



State of the Lakes

This article was contributed by Rod Willard and Mark Goodrich, Lay Monitors at Champlain Station #36, Whitehall.

The Whitehall, NY High School Senior Science class has recently joined the Lay Monitoring Program. This class, which is composed of high school seniors involved in Advanced Placement Biology, Physics and Environmental Science, will be collecting data in southern Lake Champlain near where the Poultney River meets the lake on the New York and Vermont border.

The Senior Science class has been involved in studying this area, known as East Bay, for several years now. The Lay Monitoring Program offers an additional means of learning about this unique natural area as well as contributing to a statewide database. This area is adjacent to the Nature Conservancy's Bald Mountain Preserve in Vermont, a 1500 acre gem which contains three miles of undeveloped Lake Champlain shoreline as well as rare plant and animal species, wetlands, and unusual forest habitats. It is home to the five-lined skink, Vermont's only lizard, the endangered timber rattlesnake as well as nesting peregrine falcons. Ecologists have identified 18

rare plant species on the property and 14 distinctive habitats including talus slopes, and oak-hickory stands.

As part of their focus for this class, the senior students at Whitehall have monitored water quality in the South Lake, the Poultney River, and tributaries throughout a large area of the surrounding watershed. Students have also communicated with researchers from the U.S. Fish and Wildlife Service and the U.S. Geologic Survey about their data. They hope that their work may contribute to answering some of the environmental problems facing the area such as the depletion of certain mollusk species in the Poultney River and the large number of malformed frogs found in the nearby wetlands.

The problem of illegal dumping of trash is a perennial problem in the East Bay area, especially along the West Haven, Vermont side of the Poultney River. Senior Science participants have twice given direct testimony in the Vermont State House of Representatives to influence legislation that raise penalties for illegally depositing trash and to allow evidence found in illegal trash heaps to be used in court. This has heightened not only the students' awareness of the urgency of the situation, but it has involved community members to the point that there seems to be a renewed interest in this natural area.

Through funding from the Lake Champlain Partnership Program, Senior Science students have constructed a sign that will be erected at the entrance to the East Bay area informing visitors about the unique character and natural charm it has to offer. By providing maps, brochures, wildlife checklists, and a self-guiding nature trail, it is expected that the public will continue to use the area for passive recreational uses and will participate in guarding and respecting its uniqueness.



Happenings

LakeFEST '98! - the first annual all-Vermont celebration of lakes and ponds and the people who work to protect them.

Date: July 18-26, 1998

Location: Events at many lakes around the state and three workshops. See enclosed flyer.

LMP 20th Anniversary Celebration and Volunteer Awards Ceremony - celebrating 20 years of sampling under the VT Lay Monitoring Program, and giving well-deserved recognition to volunteers active in lake protection projects.

Date: July 17, 1998

Location: Radisson Hotel, Burlington 4:00-6:00 p.m.

Water Chestnut Watchers Training Workshops - learn how to prevent the spread of the non-native aquatic plant, water chestnut in Vermont.

Dates: August 6 and 11 Times: 6:30 p.m.

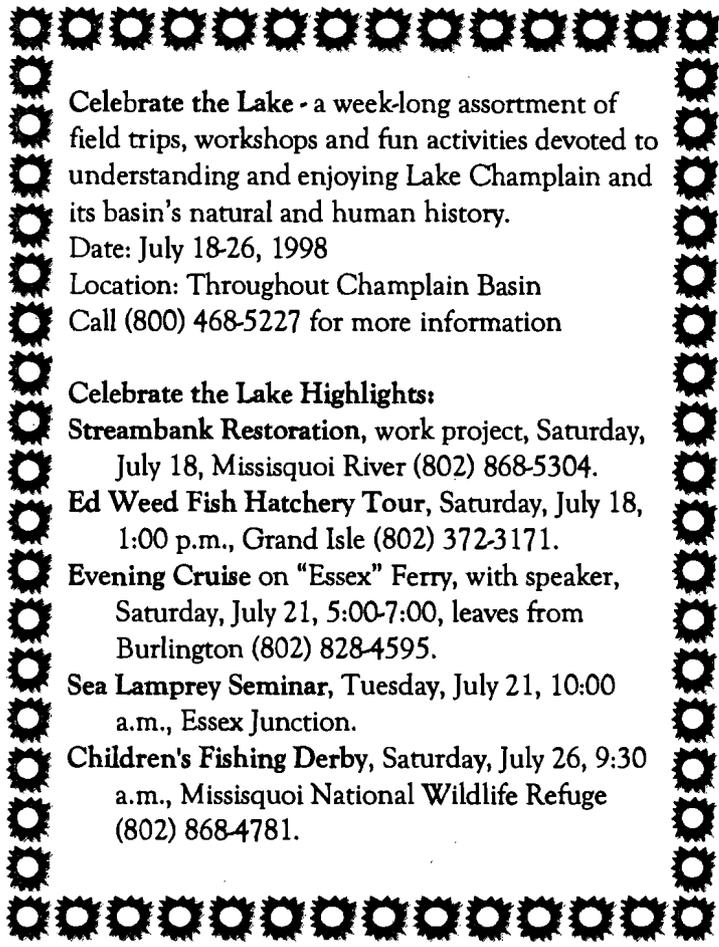
Locations: Lake Champlain Maritime Museum (Vergennes) and Charlotte Town Hall

(Call Tim Hunt, Lakes and Ponds Section, 802-241-3787)

Innovative Stormwater Technologies Trade Show (ISTTS) - a forum where manufacturers can showcase innovative small-scale stormwater treatment systems.

Date: October 27, 1998

Location: Snowshed Lodge at Killington Ski Area (Sherburne)



Celebrate the Lake - a week-long assortment of field trips, workshops and fun activities devoted to understanding and enjoying Lake Champlain and its basin's natural and human history.

Date: July 18-26, 1998

Location: Throughout Champlain Basin

Call (800) 468-5227 for more information

Celebrate the Lake Highlights:

Streambank Restoration, work project, Saturday, July 18, Missisquoi River (802) 868-5304.

Ed Weed Fish Hatchery Tour, Saturday, July 18, 1:00 p.m., Grand Isle (802) 372-3171.

Evening Cruise on "Essex" Ferry, with speaker, Saturday, July 21, 5:00-7:00, leaves from Burlington (802) 828-4595.

Sea Lamprey Seminar, Tuesday, July 21, 10:00 a.m., Essex Junction.

Children's Fishing Derby, Saturday, July 26, 9:30 a.m., Missisquoi National Wildlife Refuge (802) 868-4781.

Recently Made Available

Check out our new **Aquatic Nuisance Species** website at <http://www.anr.state.vt.us/>

Water Chestnut Watch Card - a small guide to identifying water chestnut, available in quantity (VTDEC, 1998).

Use of Aquatic Weevils to Control a Nuisance Weed in Lake Bomoseen, Vermont - an eight page summary of the aquatic weevil studies in Vermont (EPA, October 1997).

Vermont Invasive Exotic Plant Species Fact Sheet Series - a new guide to the 36 exotic aquatic and terrestrial species to watch out for, including identifying illustrations (VTDEC, VT Fish and Wildlife, and the Nature Conservancy, 1998).

Lake Champlain 1997 Zebra Mussel Monitoring Program - 36 page report on last summer's sampling season (VTDEC, May 1998).

Local Planning and Zoning Options for Water Quality Protection - a guide and examples of measures communities can use to protect lakes, streams, and wetlands (VTDEC, April 1998).

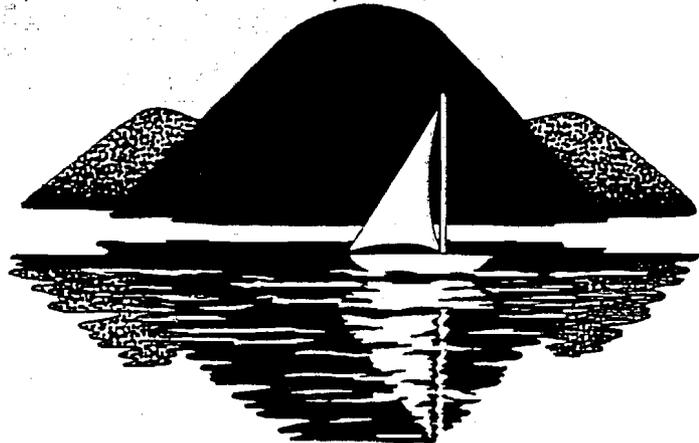
Current Programs of Vt Watershed Associations - a listing of watershed groups' activities in association with the Rivers Assistance Program (VTDEC, June 1998).

All of the above are available by calling the Lakes and Ponds Section at (802) 241-3777.

Join Us for LakeFEST '98!

The LakeFEST planner committee is very excited about the interest and enthusiasm for a state-wide celebration of lakes and ponds. The group hopes it will be an annual event and grow for years to come. LakeFEST is the result of discussions by the Lake Protection Advisory Committee on ways to enhance communication between and among lake associations, VTDFC, and Vermont residents. The Lakes and Ponds Section wishes to express our appreciation for the work and support of the members of the Lake Protection Advisory Committee:

Bob Johnson, Madeline Ducham, John and Lynn Washburn, Randy Williams (Lake Parker)
Jackie and Sarah Sprague (Federation of Lake Assns, Northern VT, and Harvey's Lake)
Tom Benoure (Fairfield Pond)
John Anderson (Arrowhead Mountain Lake)
Sam Cummings (Shadow Lake)
Dick Allen, Don Weaver (Lake Morey)
Cliff Aikens, Herb Hirschland (Silver Lake)
Ronald and Marilyn Brostek (Beebe Lake)
Joanna Wright (Lake Iroquois)
Anita Capella (Woodford Lake)
Alice Hodges and Fred Wilbur (Lake Bomoseen)



Thank you very much!

The Lake Protection Advisory Committee will be meeting in August to evaluate LakeFEST '98 and think ahead to LakeFEST '99. Please contact Susan Warren or Ethan Swift at the Lakes and Ponds Section if you wish to join us!

LakeFEST '98 - July 18-26, 1998 - Vermont

**Vermont Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
Lakes and Ponds Section
103 S. Main Street, 10 North
Waterbury, VT 05671-0408**

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LakeFEST '98

July 18 - 26, 1998
Celebrating Vermont Lakes



LakeFEST: A Celebration of Vermont Lakes

July 18-26, 1998

LakeFEST '98 will be the first annual statewide celebration of lake and natural recreational values, and the work lake associations do to protect these values.

The goals of LakeFEST are:

- To raise the level of awareness of the local lake community (both lake and town residents) about lake issues and to promote increased involvement;
- To build rapport between lake residents, lake users and town residents;
- To have community fun; and
- To build a foundation on which to work on larger lake issues.

★ ★ ★ Some Statewide Highlights Include: ★ ★ ★

Friday, July 17, 1998 -

Lake Protection Volunteer Award Ceremony, featuring the Vermont Lay Monitoring 20th Year Celebration. Everyone is invited to come to this free event to recognize the on-going lake protection efforts of many volunteers and lake groups. Governor Dean and Senator Leahy also have been invited. Radisson Hotel, Burlington, July 17, 4:00 to 6:00pm (pre-award event, a tour of the Lake Champlain Basin Science Center, 2:45pm.)

Thursday, July 23, 1998 -

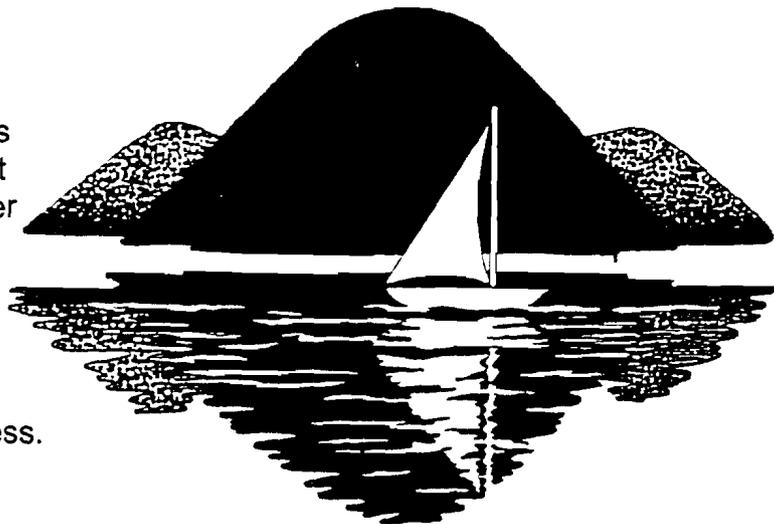
Watershed Management Workshop: Assistance for Building a Community Base - Learn how to form a watershed committee and to conduct a watershed survey. Lake Morey Inn, Fairlee, 3:00 to 5:00pm. (Free and open to the public.)

Tuesday, July 21, 1998 -

Aquatic Nuisance Species Workshop - Invaders to our lakes - Changes to our aquatic environment - How to use spread prevention techniques. Glover Town Hall, Glover, 3:00 to 5:00pm. (Free and open to the public.)

Wednesday, July 22, 1998 -

Eurasian Watermilfoil Lake Tour, Lake Iroquois, Hinesburg, 5:00 to 6:00pm, meet at FW boat access.



And there are lots of local lake events taking place throughout the week!

You're just in time to plan a LakeFEST local event on your lake! For more information on how to join the celebration or for details about attending any of the events, please contact the Lakes and Ponds Section (802-241-3777).

*LakeFEST is planned by the Lake Protection Advisory Committee
with support from the Agency of Natural Resources,
Department of Environmental Conservation*

Please Pass Along or Post