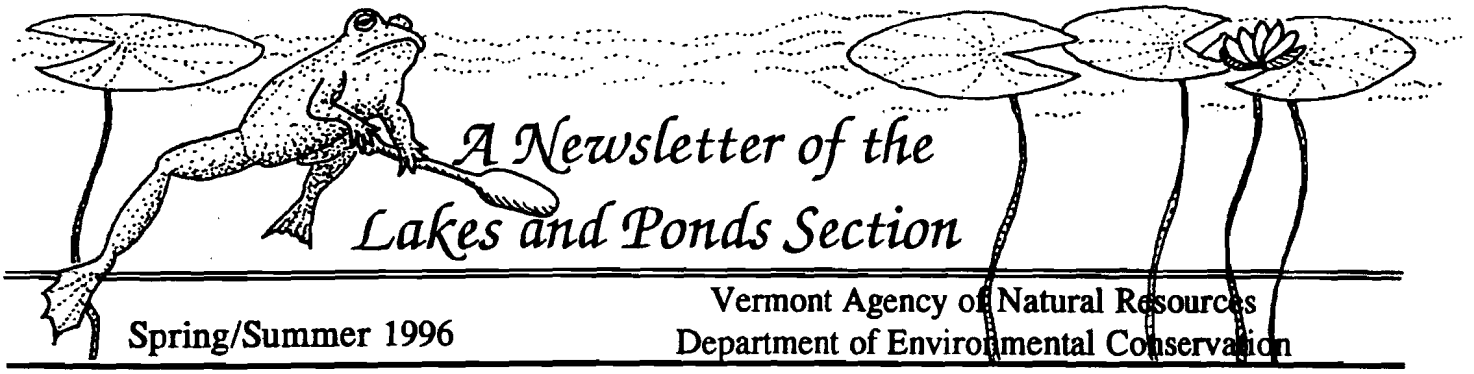
Out of the Blue



A Newsletter of the Lakes and Ponds Section

Spring/Summer 1996

Vermont Agency of Natural Resources
Department of Environmental Conservation

The Quality of Vermont Surface Waters: Is it Good or Bad, Getting Better or Worse?

Vermont has more than 5,000 miles of rivers and streams, more than 800 lakes and ponds larger than five acres totalling 228,000 acres, and 300,000 acres of wetlands. These surface waters support a wide variety of uses, including recreation, drinking water, waste water assimilation, electric generation, water withdrawl for industrial and commercial uses and as habitat for a diversity of plants and animals that depend on water for their existence. Generally, surface water quality in Vermont is excellent.

Since the federal Clean Water Act was passed in the 1960s, more than $400 million have been spent to construct in-state wastewater treatment facilities, and many more millions have been spent for nonpoint source pollution programs. These actions have enabled Vermont to become one of the states with the highest percentage of clean water.

Progress in cleaning up Vermont's waterways has been relatively rapid and successful to date, since point source pollution problems can be addressed with obvious choices, such as building a waste water treatment facility (Figure 1). Many of the adverse water quality impacts which remain today are the result of widespread, nonpoint pollution problems that have no "quick fix." Examples of nonpoint source pollution issues which have no easy solutions include: river and stream habitat

See "Water Quality" page 4

Water Quality Protection Through Educational Activities!

Imagine... you just inherited a sizeable piece of valuable riverfront property and the money to develop it any way you liked! What would **you** do? This question is one of many that educators and their students are asked in the nonpoint source, pollution activity "Sum of the Parts" from the new national *Project WET Curriculum and Activity Guide*. Project WET (Water Education for Teachers) engages students in activities that immediately capture their interest and attention while informing them about important water resource issues.

In "Sum of the Parts," pairs of students are given drawing supplies and a map of their riverfront property on which to create their dream plan. Once complete, they learn that their piece of property fits together with the others to form a small section of a river drainage basin. Suddenly, they see how each development plan affects another.

See "WET Activity" page 2

In This Issue...

OUT OF THE BLUE

is produced semi-annually by the Lakes and Ponds Section. Our purpose is to share information on lake environments, water quality and State activities through articles on lake ecology and Section 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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WET Activity *(continued from page 1)*

As each group shares its development plan, everyone is asked to consider how their actions may be polluting the river. According to which pollutants are mentioned, a collection of common, miscellaneous items (paper clips, milk bottle caps, rubber bands) representative of the various forms of nonpoint source pollution (sediment, nutrients, toxics) are deposited on the property. Identifiable objects, like personal watches or barrettes are used to represent point source pollution. When all the properties have been discussed, the direction of the river course is indicated, and students are asked to pass their pollutants downstream. It becomes obvious that the quality of water in streams, rivers, and the bodies of water into which they drain, is heavily affected by the various land uses within the watershed.

Students are then challenged to improve the water quality by developing solutions for particular land uses that are adversely impacting the river. Once students devise a plan to clean up the point sources of pollution they are told to reclaim that particular pollution from the river. Information about best management practices (BMPs) is introduced and used for addressing solutions to nonpoint source pollution problems. As students try to trace each of the pollutants from nonpoint sources back to a particular piece of property, there will be some confusion because this type of pollution source is

Project WET

Curriculum & Activity Guide

widespread and unidentifiable. Students learn that the cumulative effects of bad land use practices will lead to serious nonpoint source pollution problems, and are more difficult to control.

As a follow up, students are encouraged to look at the local land use practices in their own watershed area. In Vermont, they can work with local community organizations or the VTDEC to conduct simple shoreline surveys of rivers or lakes, volunteer their school group to re-establish a shoreland buffer strip, or make presentations at local lake association meetings to discuss the connection between lake water quality and watershed land uses.

Through this activity, students learn that the cumulative effect from individual actions can greatly impact their watershed's water quality. Furthermore, **everyone** living in the watershed is responsible for helping to protect it by using good land use practices.

Vermont Project WET Certifies 26 New WET Facilitators!

The VTDEC recognizes and supports environmental education as a very important component to the successful management and protection of Vermont's water resources. In the spring of 1995, the VTDEC Water Quality Division sponsored the new national water educational program, Project WET (Water Education for Teachers). A year later, in May, the first Vermont Project WET Leadership Training was held. At this event, 26 educators became certified to facilitate future Project WET workshops and spread the word about water resource issues!

The Leadership Training, a special weekend event, was held at Seyon Recreational Area in Groton State Park. The training was designed to prepare educators to facilitate future Project WET workshops in their communities and throughout the state. These WET Facilitators will make it possible for Vermont Project WET to offer 20 workshops during the next year, reaching and distributing water-related materials to more than 300 educators!

Project WET Workshops

Thanks to the diligent work of those who attended the Leadership Training, and who are now WET Facilitators, Vermont Project WET offers the following specialized workshops:

➔Watersheds and Land Use
➔Water Quality Monitoring
➔Wetlands
➔General/Integrated WET Curriculum

These six-hour workshops are open to educators, community leaders, environmental educational program directors, lake association members, or anyone else who has an interest in water resource issues. The cost to attend is $25.00 and includes the *Project WET Curriculum and Activity Guide* plus many other materials. The program has a terrifically motivated and talented group of WET Facilitators ready to take you on a cruise through WET places! To learn more about a Vermont Project WET workshop, please call Amy Picotte at the Lakes and Ponds Section.

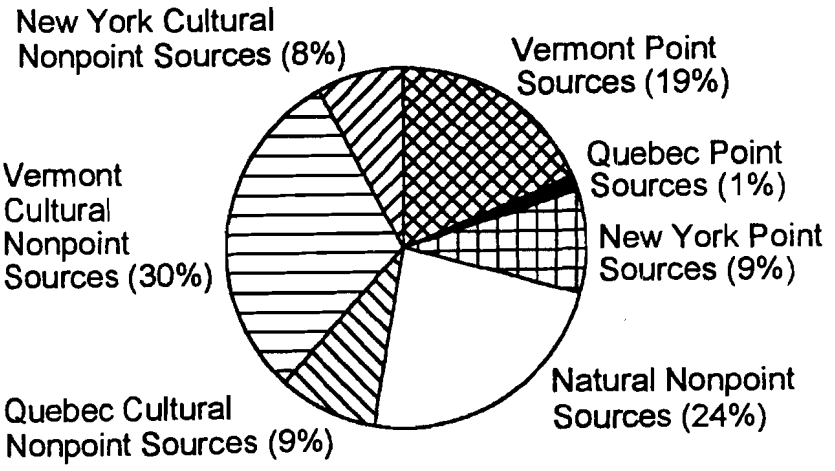


Figure 1. Nonpoint sources are the largest phosphorus contributor to Lake Champlain. Lake Champlain Diagnostic-Feasibility Study, 1994.

degradation caused by soil erosion from inappropriate land use practices; increased nutrient enrichment of lakes and ponds from land runoff, resulting in excessive plant growth and reductions in biological and recreational quality; and contamination of fish flesh with toxic pollutants. Because of these remaining pollution problems and the spread of exotic aquatic plants and animals, statewide public perception surveys show that Vermonters give only average scores to the quality of Vermont's aquatic resources.

Solutions to Existing Water Quality Problems

The quality of aquatic resources, to a large extent, reflects how well an entire ecosystem is being managed. Consequently, solutions to protect water resources require a holistic approach at all ecosystem levels: land, air, and water, and may involve taking one or more of the following actions.

Partnerships

Forming partnerships between state, federal and provincial agencies, and private landowners will help identify appropriate management practices to reduce agricultural run-off. Missisquoi Bay, located in the northeastern Lake Champlain, for example, contains some of the highest phosphorus and algae levels in the lake and suffers frequent algae blooms, surface scums, and other unpleasant effects. Reducing the input of phosphorus to the Bay will be critical to improving the quality of the Bay's water. More than 90 percent of the phosphorus entering the Bay comes from nonpoint sources primarily related to agricultural use. To solve this problem, certain agricultural practices throughout the entire international watershed need to be changed- - not an easy task, and one that will require strong partnerships to bring landowners, technology, and funding together.

Shoreland Zoning

Shoreland zoning is an important tool that local officials can use to inform property owners of individual practices that protect water quality. A good local ordinance can control many nonpoint source pollution sources that can result from property development. Currently, only a handful of towns in Vermont have shoreland zoning regulations which provide for environmentally sound development of the immediate shoreline areas of lakes.

Public Participation

Public participation in watershed management activities has increased dramatically during the past ten years. The proliferation of locally sponsored watershed action teams has helped to create many opportunities for improving Vermont's aquatic resources (Figure 2). A prime example is the Miller's Run project. A local watershed team developed an action plan for the evaluation of the Miller's Run watershed, a tributary to the Passumpsic River in northeastern Vermont. The Team has brought together a wide range of government and private interests to develop and implement a watershed/ecosystem management plan that will result in improved water quality and aquatic habitat, and ensure the

sustainability of the resource.

Continued public participation in the Vermont Lay Monitoring Program, a volunteer based lake water quality monitoring program, has generated data related to nutrient enrichment from more than 71 inland lakes and 36 Lake Champlain stations. Additionally, Lay Monitors provide valuable information to their communities about lake protection practices.

The Clean Air Act

Mercury is a contaminant that is appearing in a variety of fish species in lakes not only in Vermont but across the Northeast. It often appears at elevated levels in fish from remote "pristine" lakes. The most likely source is atmospheric deposition of contaminants resulting from a variety of industrial combustion processes. The solution involves major national and international environmental legislation related to the Clean Air Act and is subject to all the political and economic pressures that are entailed by that process.

Debated Environmental Decisions

Water withdrawl and stream flow regulation in rivers, for such purposes as drinking water, hydroelectric power generation, and snowmaking, are high-profile and highly controversial issues requiring a complex balancing of economic and environmental factors. The distinction between public and private use is often unclear. In the case of snowmaking, while the use is for private business, there is a certain public benefit derived from a healthy ski industry. Similarly with hydroelectric generation, the issue is one of finding the correct balance between economic and environmental benefit. Because of their social complexity, most environmental decisions are subject to extensive public debate.

The balancing of economic, recreational, and environmental concerns also dominates the debate over how best to control invading populations of exotic species. Exotic invaders, if allowed to grow unchecked, are probably capable of altering ecosystems more than any species or group of species, with the exception of humans!

Eurasian watermilfoil and waterchestnut in lakes, the sea lamprey in Lake Champlain, purple loosestrife in wetlands, and the zebra mussel in Lake Champlain can have significant effects on recreational and aesthetic values. But even more harmful and often less obvious is the effect that these aggressive invaders have on the biodiversity of the natural ecosystems that they invade. For example, in Lake Hortonia in Rutland County, diverse stands of native plant species have been replaced by dense single-species stands of Eurasian watermilfoil, resulting not only in a reduction of plant diversity, but in a reduction of habitat diversity affecting a wide range of aquatic insects and animals. There are personal actions that individuals can take that will reduce the possibility of these organisms getting into other bodies of water; once in a body of water, consideration and implementation of control options depend on community participation, public debate, and available resources.

Vermonters are learning that Vermont surface waters are not only a shared resource but a shared responsibility. Trying to improve water quality conditions on specific waterbodies and maintain the healthy conditions on most other waterbodies will require using strategies from all of the solutions listed above and more.

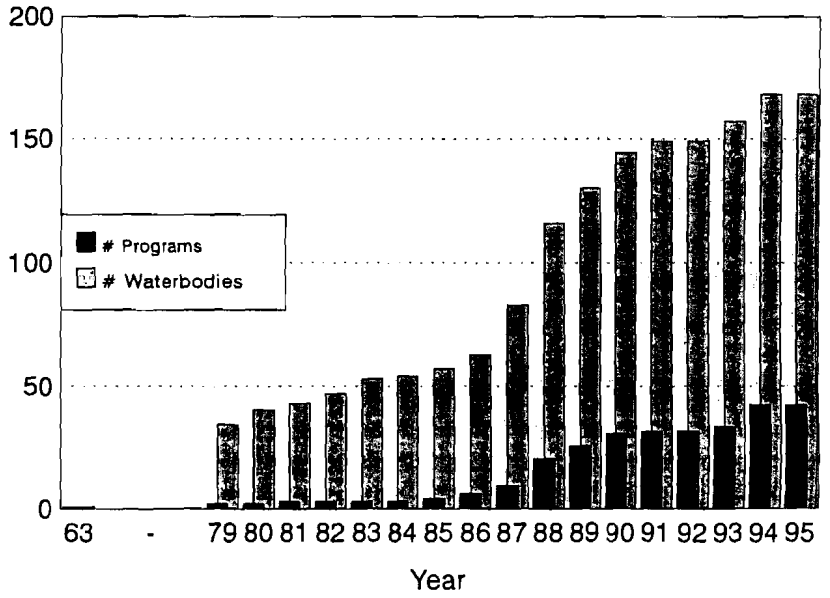


Figure 2. Water quality action teams have grown dramatically in Vermont. Source: VTDEC

Vermont Better Backroads Program Update

The Vermont Better Backroads Program started on a smooth ride last year, opening with a workshop series on erosion control and road maintenance techniques, and the publication of the *Vermont Better Backroads Manual.* In all, a total of 118 people attended ten workshops for town officials and three workshops for lake residents. Representatives from 50 towns and 15 lakes attended. The lake workshops were held at Woodford Lake (Woodford), Lake Bomoseen (Castleton and Hubbardton), and Lake Willoughby (Westmore). A special thanks is extended to those lake associations for co-hosting the workshops.

However, work has just begun on this issue of great importance to lakes and streams! Gravel roads can be a significant source of sedimentation and phosphorus to streams and lakes. (Sediment run-off to streams can smother rocky bottom areas, destroying the habitat for aquatic insects and other animals, and excessive nutrients in lakes can result in increased plant growth and algae blooms.) Proper maintenance of driveways and private roads in shoreland areas can reduce or eliminate sediment run-off and discharge of muddy, nutrient-rich waters to lakes.

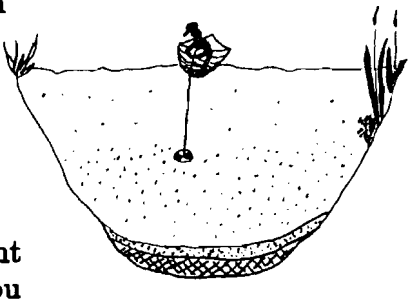
Program Plans for 1996 include:

- ◆offering three workshops or on-site evaluations of private roads and driveways to lake residents;
- ◆creating a checklist for evaluating private road conditions and assessing possible solutions;
- ◆developing real-life examples of cost-savings realized by good maintenance practices; and
- ◆promoting the need for erosion control with town planning and conservation commissions, and select boards.

Please contact Susan Warren at the Lakes and Ponds Section if you have any ideas for the program, want to schedule a workshop, or want a copy of the *Vermont Better Backroads Manual.*

Lay Monitor Profile

Richard Harter knows how variable Lake Champlain water quality can be, seasonally and geographically. He has lived along the lake's northern and southern shores, and has worked in Burlington. In 1985 when Dick joined the Lay Monitoring Program, a volunteer water quality sampling program, he was living in the Vergennes area and became the Lay Monitor at Button Bay. Eight years later, when Dick and his family moved to Grand Isle, he continued with the LMP by monitoring Keeler Bay.



Dick said he didn't perceive much of a difference in the water quality between Button Bay and Keeler Bay. He commented, "There might be a slight increase in the water clarity at Keeler Bay, but as soon as you head north toward North Hero, the algae gets so bad that you can even smell it."

After two years in Grand Isle, Dick and his wife decided to move back to Vergennes to be closer to their new grandchildren (perfectly understandable). The remarkable part of their move is that they ended up buying back the same house they had moved from two years earlier! Just as Dick's old house was in need of a new owner, the Button Bay station was once again in need of a new monitor, and fortunately for the LMP, Dick was there to resume the monitoring.

When asked how he thought the water quality had changed at Button Bay during his two-year absence, Dick replied "The water quality seems to vary so much seasonally that two years away is not long enough to notice any big changes." However, Dick went on to comment that since he started monitoring at Button Bay in 1985, he has noticed a huge increase in weed growth, and last summer he saw clusters of zebra mussels "hitching on weed fragments."

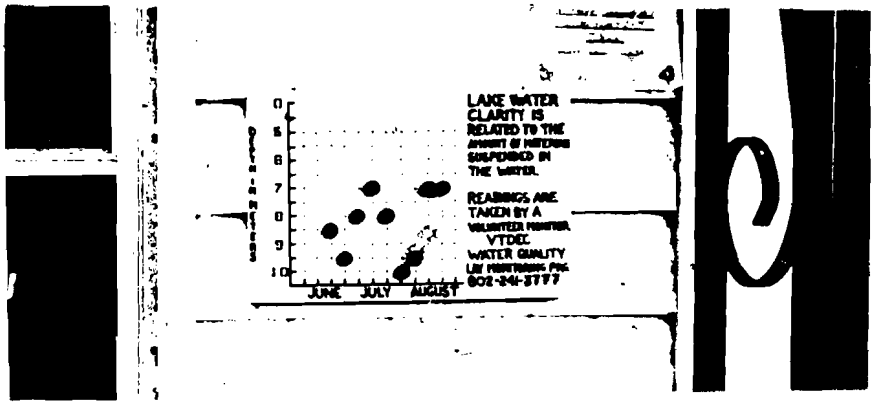
Dick is a Professor of Science and Math at Champlain College in Burlington, from which he gets another perspective on the lake. For instance, Dick has thought a lot about building a solar boat! He believes it would be a challenging technical project for students (or maybe an interesting project for the Maritime Museum), and if successful, could result in an environmentally friendly powerboat for lake users. This project also appeals to him because it connects learning to the local land and resources after all, he said, "Vermont has a pretty nasty climate for operating solar powered vehicles, but a solar powered boat would connect to Vermont's incredible natural resource, Lake Champlain."

Fortunately for the Lay Monitoring Program, Dick kept in touch throughout his moves and made it possible to collect uninterrupted, valuable, water quality data from two Lake Champlain locations. Thanks are generously extended to Dick, his faithful sampling partner, dog Laddie, and all the other Lay Monitors for their dedication and hard work throughout the summer sampling season(s).

Water Clarity Display Signs

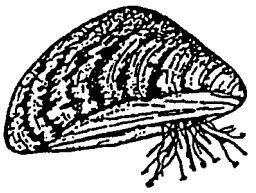
Water clarity display signs put to use! Last year at the 1995 Lay Monitoring Conference, monitors reviewed the list of new LMP initiatives based on monitor survey responses and input from previous LMP conferences. Most of the initiatives on the list were accomplished, including offering more on-site lake protection workshops, increasing informational and educational outreach to local schools (the VTDEC Water Quality Division is the proud sponsor of the water educational program, Project WET), and designing and posting water clarity display signs at local lake sites to help increase public awareness about water quality.

The signs are a means of communicating water clarity data back to the public and of increasing public awareness of and appreciation for clean water. Monitors should take advantage of posting one of these display signs as a method to inform the local community about their own efforts in water quality monitoring and about the significance of the data they are collecting. The Division will continue to distribute display signs to monitors posting at different LMP lake sites around the state during this summer.



Lake Willoughby water clarity display sign posted at the Westmore Town Hall

ZEBRA MUSSEL CITIZEN ACTION PROGRAM



Vermont Department of Environmental Conservation
Lake Champlain Basin Program

The ***Zebra Mussel Citizen Action Program*** (***ZMCAP***) establishes community volunteer task forces to help with informing the public about zebra mussels and to help monitor waterbodies for possible zebra mussel infestations. The VTDEC and the Lake Champlain Basin Program have a variety of resources available, including a Zebra Mussel Education & Outreach Specialist, to assist with these efforts. Please contact Michael Hauser at the Lakes and Ponds Section or by E-mail, MIKEH@waterq.anr.state.vt.us, for more information.

The following is a list of suggested tasks that *ZMCAP* Task Forces can perform:

Sponsor a Zebra Mussel presentation/ZMCAP training workshop.

Take Part in the Zebra Mussel Watch Program (specific instructions available) to monitor for zebra mussels at sites around the perimeter of the waterbody.

Organize a volunteer task force to participate in ZMCAP.

Post and maintain "Attention Boaters" signs (available from VTDEC) at all public and heavily used private accesses to the waterbody.

Survey boaters at public boater accesses, to help assess lake vulnerability to the infestation of zebra mussels (survey forms available from VTDEC).

Patrol accesses, especially during busy periods, to advise boaters, anglers and other water-users of the zebra mussel threat and to assist them in inspecting and cleaning their equipment.

Report any zebra mussel sightings to VTDEC at (802) 241-3777

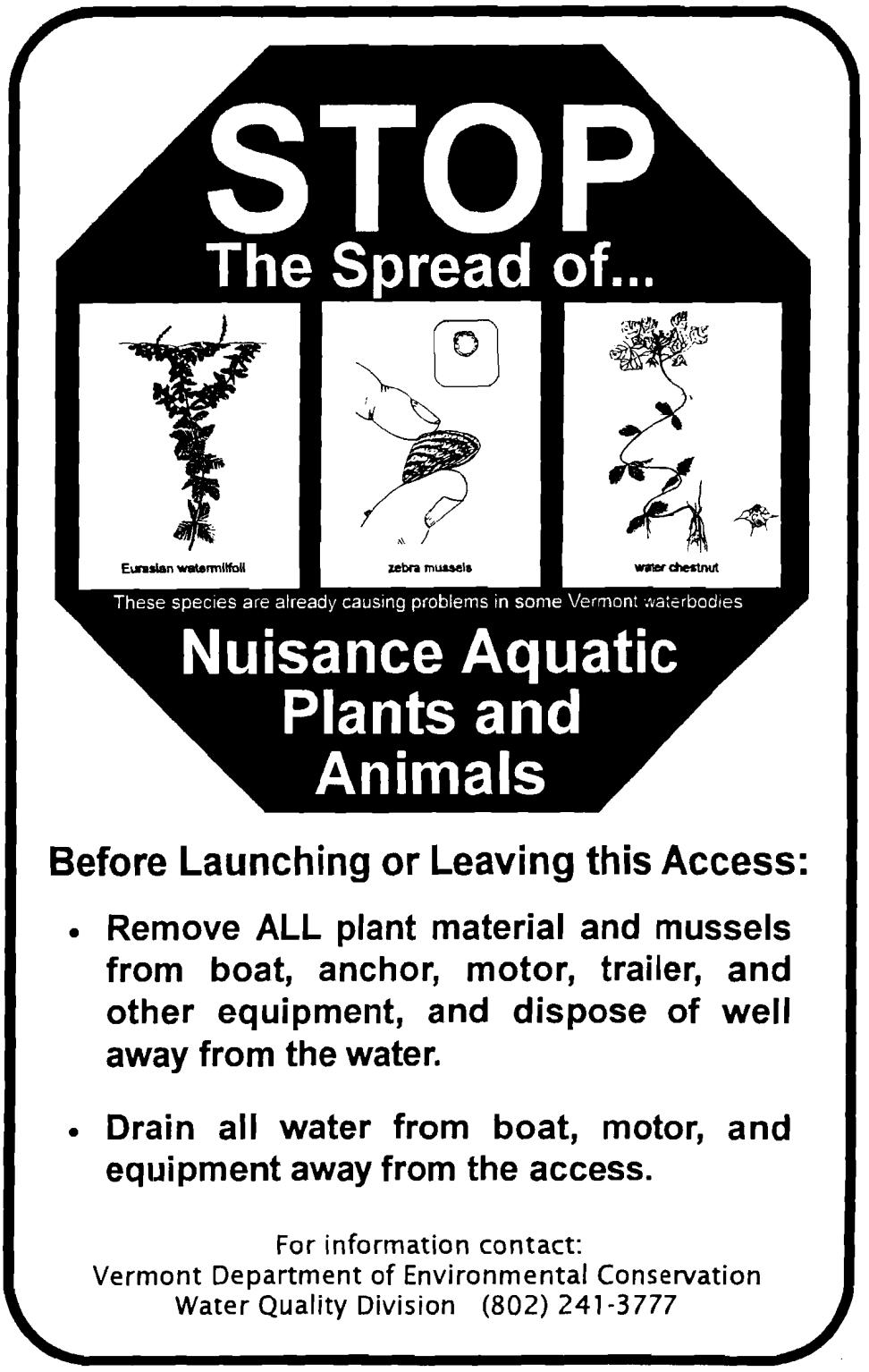
Educate the community by conducting zebra mussel presentations/workshops to raise awareness about zebra mussels, their potential impacts, and controls.

Arrange for zebra mussel information and articles to be included in organization newsletters and community newspapers.

Distribute and maintain supplies of zebra mussel informational materials at municipal buildings (i.e., library, town office, etc.), retail businesses, campgrounds and other public facilities within the community. These materials are available from VTDEC.

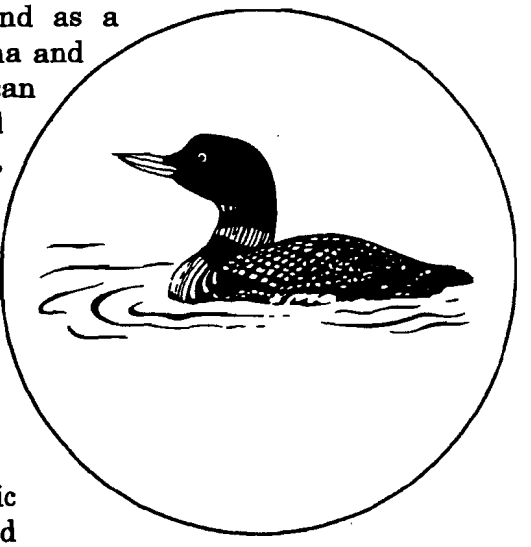
New Aquatic Nuisance Species Signs

These 12 inch by 18 inch red and black on white metal signs are available for posting at waterbody accesses throughout Vermont. Many public accesses have been posted but many more are in need of a sign. If you would like to obtain a sign to post at the access of a waterbody you frequent or if you are aware of an access that needs a sign, contact Michael Hauser at the Lakes and Ponds Section. Vandal resistant mounting hardware is also available.



It's True

Lead Sinkers Are A Danger To Waterbirds

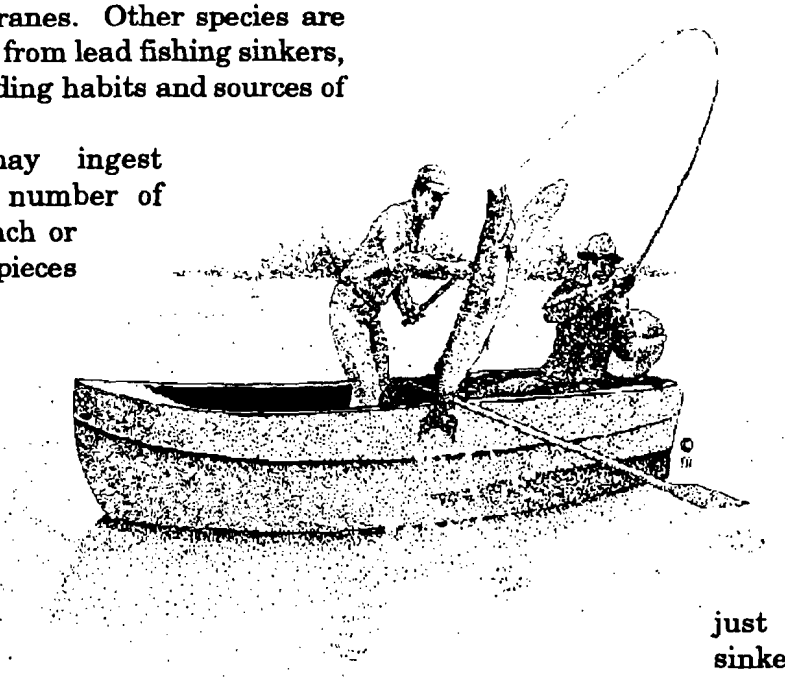


Lead is a naturally occurring metal, primarily found as a component in galena, a mineral. Lead is extracted from galena and used in paints, gasoline, lead shot, and in plumbing solder, and can enter the environment from these products. In humans, lead toxicity can cause learning disabilities in children, miscarriages, and may contribute to hypertension or high blood pressure. It has also been documented that lead can cause many adverse effects in waterfowl and other waterbirds, including damaging their liver, central nervous system, and kidney, and affecting reproduction and growth.

Today, many sources of lead have been eliminated, educing the risk of human or wildlife susceptibility to lead toxicity. The banning in 1991 of lead shot used for hunting waterfowl has greatly reduced a major source of lead in aquatic sites. However, in the early 1990s it was documented that lead sinkers used in fishing presented a potential source of lead toxicity to waterfowl and other waterbirds.

Lead fishing sinkers up to one inch in size have been found in the gizzards or digestive tracts of waterbirds. Research suggests that ingestion of lead fishing sinkers has resulted in toxic and often fatal effects to waterbirds such as common loons, trumpeter, mute and tundra swans, and sandhill cranes. Other species are also potentially at risk from lead fishing sinkers, depending on their feeding habits and sources of food.

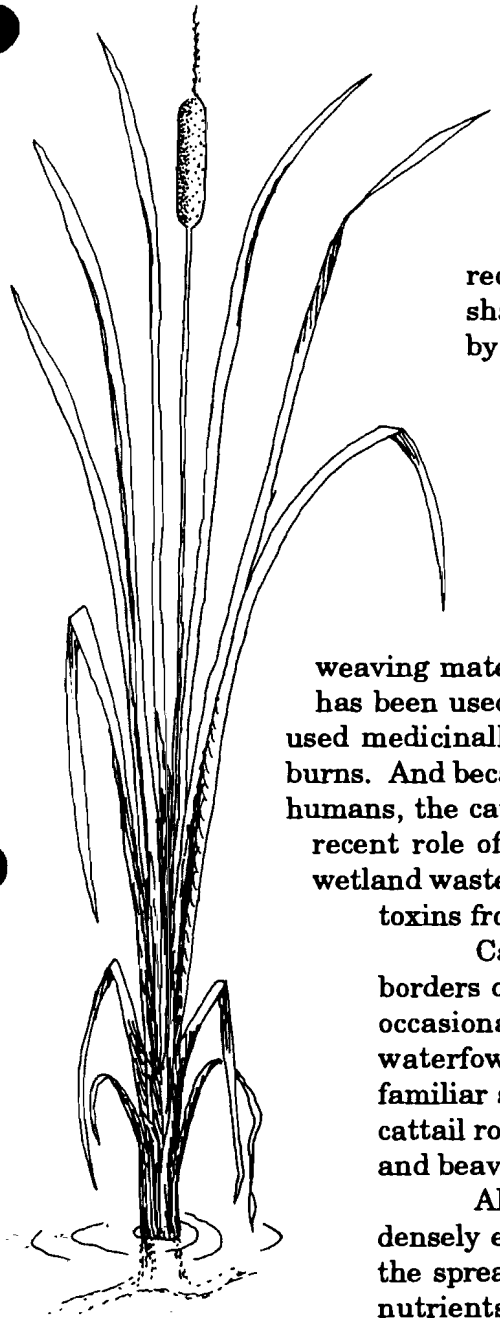
Waterbirds may ingest fishing sinkers in a number of ways. Sinkers, one inch or less, may appear like pieces of grit, which are ingested to help break down food. Ingestion may also occur as a waterbird sifts through sediments or when eating fish with attached fishing tackle. Signs of lead poison-ing in waterbirds may include loss of appetite (resulting in weight loss), lethargy, emaciation, weakness, impaired locomotion and an inability to fly or walk, increased aggressiveness towards other individuals of same species, and impaired depth perception and balance.



The good news is that this source of lead to the environment can be reduced. There are several commercially available substitutes for lead sinkers that are less toxic to waterbirds. These include sinkers made of bismuth, tin, antimony, steel, tungsten, and a terpene resin putty. Many of these non-lead sinkers can be found at local fish and tackle supply stores. Research has shown that these substitutes are just as effective as lead sinkers.

The annual cost of changing to non-lead sinkers would be about $4.00 for the average angler. By assuming this minimal cost, anglers can help protect aquatic wildlife from lead toxicity.

The Common Cattail: the "Supermarket of the Swamps"



The brown, fuzzy head and tall, grass-like leaves of the common cattail, *Typha latifolia*, are a familiar sight along the shores of most Vermont lakes and ponds. The cattail, also called cattail flag, cat-o-nine tails, and flagtail, can be found north from Newfoundland to Alaska, through most of the continental U.S., and south into Mexico.

The cattail hardly needs describing as it is such a recognizable plant in marshes, low wet areas, shorelines, ditches, shallow areas of lakes and ponds, and slow streams. Cattails, anchored by their underwater roots and rhizomes, grow in water up to four feet deep. The fuzzy "cat's tail," is actually a densely packed flower containing both male and female parts. The male flower parts make up the two - to - three inch thin spike that extends just above the hot dog shaped, fuzzy female parts. The cattail female flower is green during early summer, turning brown and fluffy by midsummer as it starts to produce thousands of seeds.

This plant has a variety of important values and uses. For example, the long, flat, one-inch wide leaves have been used for weaving material and as caulking for barrels. The mature stage of the "cat's tail" has been used for swaddling, pillow stuffing, and insulation. The roots have been used medicinally for such ailments as gonorrhea, stomach problems, and treating burns. And because every part of the plant from its roots to its pollen can be eaten by humans, the cattail is nicknamed the "supermarket of the swamps!" Another, more recent role of the cattail plant is in helping to treat wastewater in constructed wetland wastewater treatment systems. The cattails help to filter out nutrients and toxins from the wastewater.

Cattails also protect shorelines from wave erosion, help stabilize marsh borders of lakes and ponds, and provide spawning sites for northern pike and occasionally walleye. They provide important cover and nest sites for waterfowl, marsh birds, and wading birds. The red-winged blackbird is a familiar sight around stands of cattails, which it uses to nest in. The starchy cattail roots and stalks are eaten by geese and mammals, such as the muskrat and beaver.

Although many benefits are derived from the cattail, it can grow densely enough to become a problem to lake users. Cattails can slow or stop the spread of many other native, shoreline plants by out competing them for nutrients and sunlight, or by secreting certain chemicals which inhibit the germination of their seeds. Cattails can spread very quickly and form dense colonies. A single cattail, by sending up new shoots, can grow to cover an area of ten feet in diameter in only six months! If it is necessary to control the spread of cattails, then it should be removed only in a limited area. Cutting the stalks under water during early summer before the "cat's tail" appears seems to help control growth (this practice is also effective if done just before the water freezes). Once an area has been cleared, periodic cutting will prevent problems from reoccurring. In large areas, mowing while the "cat's tail" is still green, and mowing again a few weeks later, will considerably help control their growth.

For more information about aquatic plants, two publications, *"Lake and Pond Plants: A Guide to Vermont's Common Aquatic Plants and Their Natural Values in Lakes"* and *"A Key to Common Vermont Aquatic Plant Species"* are available from the Lakes and Ponds Section.

Chemicals Investigated for Eurasian Watermilfoil Control

During the 1995 Vermont legislative session, the ongoing problem of Eurasian watermilfoil infestations was given significant attention. The result was a legislative directive to the VTDEC to prepare chemical treatment plans for the control of Eurasian watermilfoil on three Rutland County lakes, Lake Bomoseen, Lake Hortonia, and Burr Pond. The Legislature also directed the VTDEC to work with the three lake associations to prepare treatment plans. The proposed plans must be consistent with existing state statutes, particularly the one that governs pesticide use in state waters.

In order for a permit to be issued for a chemical treatment, a plan must meet the following criteria: 1) there must be no reasonable non-chemical alternatives to the proposed treatments; 2) there must be acceptable risk to non-target organisms; 3) there must be negligible risk to public health; 4) a long-range management plan for reducing chemical use has to be developed; and 5) there must be public benefit achieved from applying the chemical.

In addition to creating chemical treatment plans that meet existing statutory requirements, the legislative directive mandated that the VTDEC produce four other products:

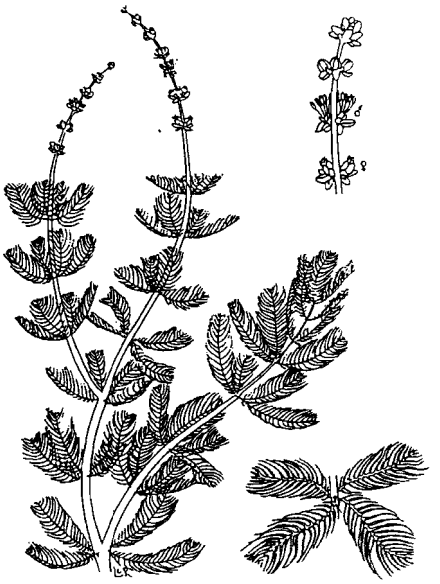
- a summary of public reaction to the proposed plans, including input from public information meetings;
- a proposal for how to fund the proposed plans;
- a summary and analysis of the experience of other states with the chosen chemical(s) and any impacts on public health and non-target organisms; and
- an analysis of the advantages and disadvantages of using chemicals for the control of Eurasian watermilfoil.

The VTDEC proceeded in compliance with these instructions in close cooperation with the Vermont Departments of Health, Fish and Wildlife, and Agriculture, Food and Markets.

After evaluating the five aquatic herbicides available in the United States for milfoil control (endothall, diquat, 2,4-D, Sonar, and Garlon 3A), the ANR determined that Garlon 3A is the most appropriate chemical for use in chemical treatment plans for Burr Pond, Lake Hortonia, and Lake Bomoseen. The decision was based on information obtained from herbicide users and experts from around the country, took into consideration the specific situation in each of the three study lakes, was made in consultation with the lake association from each lake, and was based on the characteristics of what an "ideal" aquatic herbicide would be (see side box, page 13).

Burr Pond

In December, 1995, the Burr Pond Association submitted an application to the VTDEC for a permit to treat Burr Pond with Garlon 3A as part of a five-year, long-range management plan. Since Garlon 3A still has only an "experimental use" federal label, only 100 lake acres can be treated with Garlon 3A in



Vermont before March, 1997. The Burr Pond treatment plan could use up to 74 acres of the 100 limited-use acres. The goal of the plan is to control Eurasian watermilfoil in the lake to the point that non-chemical methods can keep the plant under control in the future. In April, 1996, the ANR issued a decision allowing for the use of Garlon 3A in the lake. However, a lack of adequate funds will prevent a treatment from occurring this summer.

Lake Hortonia

Following the collection of considerable information, the ANR, with agreement from the president of the Lake Hortonia Property Owners

Association, determined that a partial lake treatment with Garlon 3A is the only potentially feasible chemical treatment scenario for controlling milfoil in Lake Hortonia. Garlon 3A should be considered for spot treatments in high priority areas when the product becomes available. Further development of a detailed chemical treatment plan was discontinued.

Lake Bomoseen

In December, 1995, key ANR employees met to develop an ANR position on a long range management plan for the control of milfoil in Lake Bomoseen. The group, after considerable discussion, developed a position supporting an integrated management plan which includes the following: 1) enhanced use of milfoil management strategies currently in use on Lake Bomoseen; 2) treatment of high use areas with Garlon 3A; and 3) increased public awareness of the problems and cost associated with milfoil management on the lake. This position was presented to the Lake Bomoseen Association in January, 1996.

Public reaction to the development of the chemical treatment plans was tracked by recording comments received by letter, by telephone, at three public meetings, and through a public boat access survey conducted on Lake Bomoseen. Most of the people who attended the public meetings and sent comments were in favor of herbicide use as it seems to them to offer reasonable hope of effective control. The first specific concerns about potential herbicide treatments did not surface until the Burr Pond Association's application for a permit to use Garlon 3A was released for public review in December 1995. Based on public reactions to date, it seems that opposition to aquatic herbicide use will mostly be due to either public health concerns or concern about damaging the lake ecosystem.

The VTDEC developed a specific proposal for funding the chemical treatment of Burr Pond as well as the follow-up non-chemical controls through all five years of the long-range management plan. More general funding proposals were developed to address long-term funding needs associated with the use of chemicals to control milfoil in Lake Hortonia and Lake Bomoseen. Detailed chemical treatment plans were not developed for these lakes due to the current unavailability of Garlon 3A.

To learn about other states' experiences with the use of herbicides for milfoil control, the VTDEC conducted a telephone survey of the continental United States. The telephone survey found that the use of aquatic herbicides and the policies and regulations governing herbicide use vary considerably across the country, ranging from relatively unrestricted herbicide use in public waters in Oregon, to a very strict product registration process in New York, to a permit program with statewide restrictions limiting herbicide use in Minnesota, to states such as Maine with no aquatic herbicide use at all.

When considering the pros and cons of chemical use, the particular chemical being considered as well as the situation for which it will be used must be specified. Different chemicals have very different advantages and disadvantages, which often differ depending on the situation in which they will be used. The pros and cons of using Garlon 3A, the chemical proposed for use in each of the three study lakes, in comparison to potential alternative non-chemical control methods were evaluated in the VTDEC's report to the legislature. To obtain an Executive Summary of the VTDEC's report, contact the Lakes and Ponds Section.

Characteristics of an "Ideal" Aquatic Herbicide for Milfoil Control as Defined by the VTANR

- could be used in waters used for drinking and other household needs
- had water use restrictions, if any, that could realistically by implemented
- selective for milfoil
- effective for two or more years
- not toxic to the non-target environment
- able to be used in small areas or on a whole-lake basis
- has a negligible risk to public

♦Introducing... VTWATERS
(a Vermont-specific lakes, rivers, and watershed computer discussion group)

The Vermont Agency of Natural Resources has recently completed computer programming to allow E-mail list-service. A list-server is a mailing list to which subscribing E-mail users can post questions and comments. These postings will be delivered, via E-mail, to all of the VTWATERS subscribers. The VTANR is making this service available to all persons with Vermont-specific, surface water interests with the goal of increasing communication between the myriad of different water-related programs, projects, and organizations in the state.

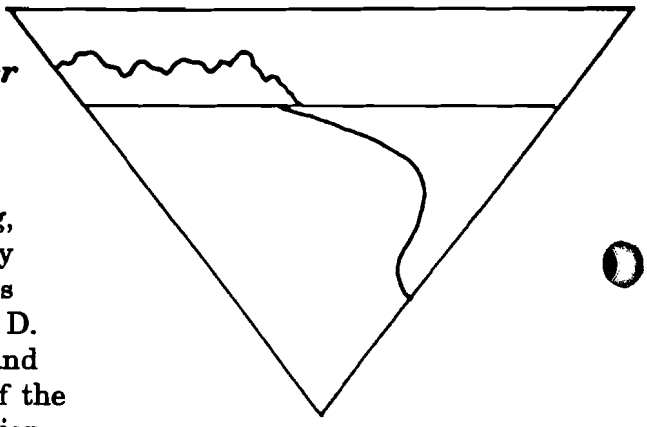
Interested persons should send E-mail to Neil Kamman at the VTDEC stating that they would like to subscribe to VTWATERS. **neilk@waterq.anr.state.vt.us**

♦Check out The Vermont Home Page on the Internet
Http:/www.state.vt.us/ANR

♦Another web site to visit is the **New England Chapter of the North American Lake Management Society**
Http:/www.sover.net/~mtman/nec

♦Vermont Better Backroads Manual - *Clean Water You Can Afford*

This new manual details erosion control and maintenance practices for gravel roads that will protect lakes and streams and save money in the long run. Ditches, grading, culverts, bank stabilization, and many other ordinary features of back roads are discussed and illustrated. This manual was prepared under a USEPA grant to the George D. Aiken Resource Conservation and Development Council and the Windham Regional Commission. To obtain a copy of the manual, contact Susan Warren at the Lakes and Ponds Section.



Lake Lingo

Runoff - rainfall which is not absorbed by the soil but instead flows over land and artificial structures (i.e. roads) from higher ground to lower ground and ultimately into rivers and lakes. Fast moving water can scour soil.

Point Source - pollution discharged from any identifiable point, including pipes, ditches, channels, sewers, tunnels, and containers of various types.

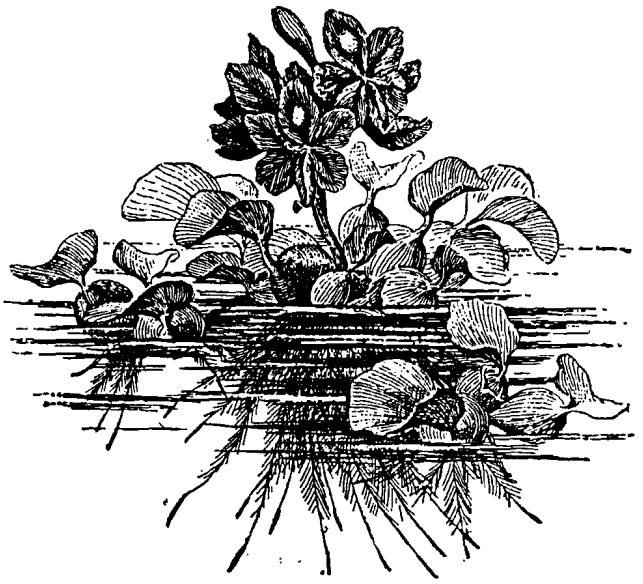
Nonpoint Source - pollution being discharged over a wide land area, and not originating from one specific origin.

Secchi Disk - an eight inch disk painted with two black and two white quadrants that is used to take a water clarity reading. The Secchi disk is lowered into the water and the lowest depth at which it is still visible is the Secchi disk transparency reading.

Best Management Practices (BMPs) - methods adopted by resource users which are designed to make any of their activities have less of an environmental impact.

Aquatic Plant Management Society Annual Meeting

The annual meeting of the Aquatic Plant Management Society (APMS) is being held July 14-17, 1996 at the Radisson Hotel on Lake Champlain in Burlington, Vermont. There will be over 50 presentations covering topics such as the ecology and physiology of aquatic plants, and aquatic plant management techniques and strategies in the U.S., with a special session on aquatic plant management in the northeast. Eurasian watermilfoil, water chestnut, purple loosestrife, and hydrilla are just a few of the plant species that will e discussed. Presentations will run from 8:30 am to 5:00 pm on Monday and Tuesday. Wednesday's session ends at 12:00 noon, when the meeting adjourns. The registration fee is $80.00 ($95 at the door) which also includes a banquet on Tuesday night at Shelburne Farms which is being catered by the New England Culinary Institute. For more information, please call the APMS at (904) 429-4119.



DATE: July 14-17, 1996
PLACE: Radisson Hotel, Burlington, VT
CONTACT: APMS at (904) 429-4119

Vermont Lay Monitoring Annual Conference

DATE: July 20, 1996
PLACE: Lake Champlain Basin Science Center, Burlington, VT
CONTACT: Amy Picotte at (802) 241-3777

Great American Secchi Dip-In

DATE: June 29-July 7, 1996
PLACE: Lay Monitoring Lake Stations
CONTACT: Amy Picotte at (802) 241-3777

★Please see back page for more information about this event!

Learn Aquatic Plants and Help Control Water Chestnut Day

Join VTDEC aquatic biologists, Ann Bove and Susan Warren, on a canoe tour of Parson's Mill Pond as part of the Lake Champlain Basin Program's (LCBP) "Celebrate the Lake 1996!." Learn a rich, variety of native aquatic plant species common to many lakes and ponds in Vermont, and help control an invasive exotic, water chestnut. For more information on "Celebrate the Lake 1996!" and the many activities that will be scheduled from July 19 - 26, contact the LCBP at 1-800-468-5229.

DATE: July 26, 1996
PLACE: Parsons Mill Pond, Benson, VT
CONTACT: Ann Bove at (802) 241-3777

Milfoil Watchers Training

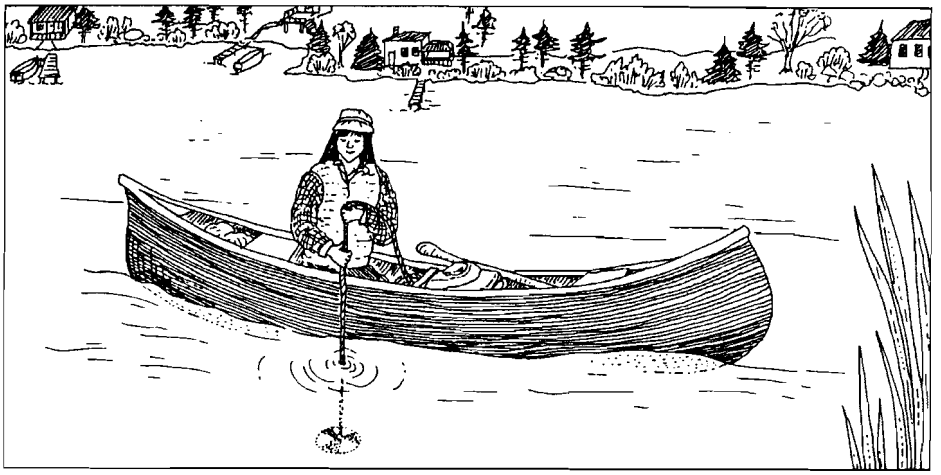
Lean how to identify Eurasian watermilfoil, and distinguish it from beneficial native aquatic species, acquire lake search techniques, and prevent a lake you frequent from an invasion.

DATE: June 15, 1996
PLACE: Island Pond, Island Pond, VT
CONTACT: Ann Bove at (802) 241-3777

The Great All-American Secchi Dip-In

Lay Monitors, mark your calendars for the week of June 29-July 7, 1996! During this week all water quality monitors are asked to participate in a national Secchi disk transparency event.

This national event is sponsored by the U.S. Environmental Protection Agency and the North American Lake Management Society, and coordinated in Vermont through the Lay Monitoring Program. Vermonters who participate in the "Dip-In" contribute valuable information that helps explain the condition of the nation's lakes and reservoirs, earn recognition for their volunteer monitoring efforts, and have a chance to take part in a national monitoring event. Last year, forty Vermont Lay Monitors sent their survey and water clarity results to Bob Carlson, the national coordinator from Kent State University in Ohio. A final count showed that last year more than 1,800 volunteers in 37 states and two provinces of Canada gathered Secchi disk transparency data. In this third year of the program, the goal is to have 3,000 volunteers "Dip-In." All Vermont Lay Monitors will be sent the 1996 survey and data form; anyone else interested in participating can contact Amy Picotte at the Lakes and Ponds Section.



Drawing by Libby Walker Davidson

Vermont Agency of Natural Resources
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Water Quality Division
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