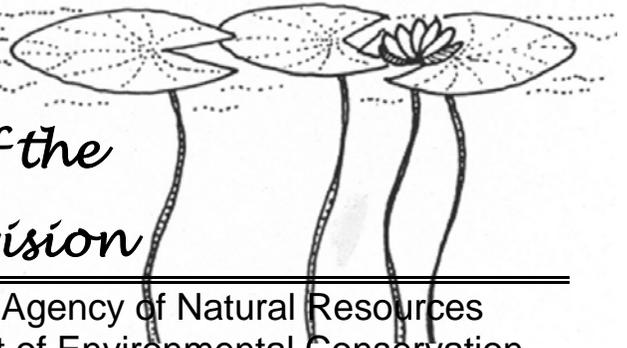


Out of the Blue



A Newsletter of the Water Quality Division



Spring/Summer 2002 No. 23

Vermont Agency of Natural Resources
Department of Environmental Conservation

Hydroelectricity: Is it "Green Power?"

There recently has been much discussion among policy-makers and in the media about the need to develop "green energy." While definitions vary, the term generally refers to those sources of energy that do not rely on fossil fuels, but instead use solar, wind, or hydroelectric power sources. Of these "green" sources, hydroelectricity generated within the state currently produces about ten percent of Vermont's electricity.

But exactly how "green" is hydroelectric power? Well, like a lot of things, it depends. It is true that hydroelectric power does not burn oil, gas, or coal, so it does not produce pollutants or greenhouse gases. It is also true that it is renewable – as long as water flows in rivers, electricity can be generated. And hydroelectric power can be generated locally, eliminating any interstate and international politics.

However, these factors do not mean that the generation of hydroelectric power does not affect the environment. And, depending on the nature of a individual facility, severe environmental impacts can occur.

All dams built on our rivers, including hydroelectric dams, significantly alter the natural ecosystem. Dams convert free-flowing riverine habitat to lake habitat, impede the movement of fish and other aquatic organisms up and down stream, change the dynamics of the river by trapping sediment, and may degrade water quality.

In addition to these general impacts, hydroelectric projects can create additional problems. At many projects, water is diverted through a large pipe, or penstock, from the dam to

See page 3, "Green Power"

Department Budget Problems: Serious Consequences for Public Services Provided by the Water Quality Division

If you were following the news in Vermont this winter, you probably heard about the Department of Environmental Conservation's \$4 million budget deficit. You may also have heard that Governor Dean included an additional \$2.3 million for the Department in his proposed budget for the coming fiscal year beginning on July 1, 2002, but that this same budget requires a nearly 10 percent reduction in existing environmental programs to be balanced. Programs facing cuts, unless the Legislature passes new fees or finds other new funding sources, include the Water Quality Division's aquatic nuisance control program, wetlands program, and erosion control program, as well as the Environmental Assistance Division's pollution prevention and permit assistance programs.

Three factors combined to create the Department's anticipated budget deficit. First, many programs are federally funded. Over the years, increases in federal grants have not kept

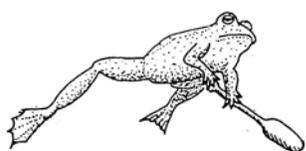
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**"Out of the Blue"
Goes "On-Line"**

Check out the latest and future newsletter



issues

on the Water Quality Division Web Page at

www.vtwaterquality.org

(Special thanks to Michael Hauser and Catfi Eliopoulos for developing and maintaining our Division web page!)

Budget (continued from page 1)

pace with inflation, yet the work did not stop. Second, the Department's income from permit fees was less than expected, in part because the recession caused people to plan fewer projects requiring permits. And finally, the Department made internal budgeting mistakes that caused the staff to believe it had more money to spend than it actually had.

When these problems were discovered, the Department took immediate steps to cut back on expenses. Planned equipment purchases weren't made, out-of-state travel stopped, and most positions that became vacant were not refilled. If you missed your Fall/Winter issue of *Out of the Blue*, then you noticed one consequence of this budget-cutting. The Fall/Winter and Spring/Summer 2002 issues have been combined into this one Spring issue. New sources of revenue for existing programs also were sought. In fact, the Department's Waste Management Division provided the funding for this issue of *Out of the Blue*. To address the budget errors and assure they do not happen again, there have been independent reviews of the Department's finance procedures and systems, and changes made in budget development and management.

Overall, the forecasted deficit is on track to be shrunk to less than \$500,000 by the end of June. However, the immediate budget cutting measures taken this year are not sustainable for the long term. During the past decade, state general funds to support Department programs have increased by about one percent per year. The Department costs during this time, including skyrocketing health care costs, have outstripped inflation. Increased responsibilities for federal programs, and increased complexity in all programs, have not been accompanied by increased funding. Thus, even with the proposed \$2.3 million increase for the Department in the Governor's budget, there is not enough money to continue all the programs. Existing programs must be cut in the coming fiscal year unless new fees or other new funding sources develop.

So what do budget cuts mean for the environmental programs you have come to count on? For the aquatic nuisance control program, unless motorboat registration fees are increased and a portion of the revenue used to support program staff, most of the technical and financial assistance currently provided to local groups struggling to manage milfoil in Vermont's lakes will no longer be available. Applications for permits for aquatic nuisance control activities may take a year or longer to process. And perhaps most devastating, a reduction in the state's spread prevention activities will increase the risk that milfoil, zebra mussels, and new, even more aggressive nonnative species hovering on Vermont borders will spread to uninfested lakes in Vermont.

For the wetlands program, new fees are needed to prevent a 40 percent loss in existing program services. Without the fees, the technical assistance currently provided to landowners who are planning projects potentially affecting wetlands will be lost. Landowners may need to pay as much

See page 9, "Budget"

OUT OF THE BLUE

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

Vermont Agency of Natural Resources
Dept. of Environmental Conservation
Water Quality Division
Lakes and Ponds Section
103 S. Main Street, 10 North
Waterbury, VT 05671-0408
(802) 241-3777

<http://www.vtwaterquality.org>

NEWSLETTER STAFF

Amy Picotte, Editor
Ann Bove
Susan Warren

CONTRIBUTORS

Barry Cahoon April Moulart
Holly Crosson Susan Warren
Rick Hopkins Amy Picotte
Brian Fitzgerald Michael Hauser
Virginia Garrison Vicky Viens
Sandra O'Flaherty Ethan Swift

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the generators in the powerhouse (see diagram). Since the amount of power available is a function of the difference in elevation between the impoundment behind the dam and the generator, the distance from the dam to the powerhouse can be up to several miles. Much of the water is diverted from the river channel through the penstock, creating a bypassed reach of river that may have little water flowing through it.

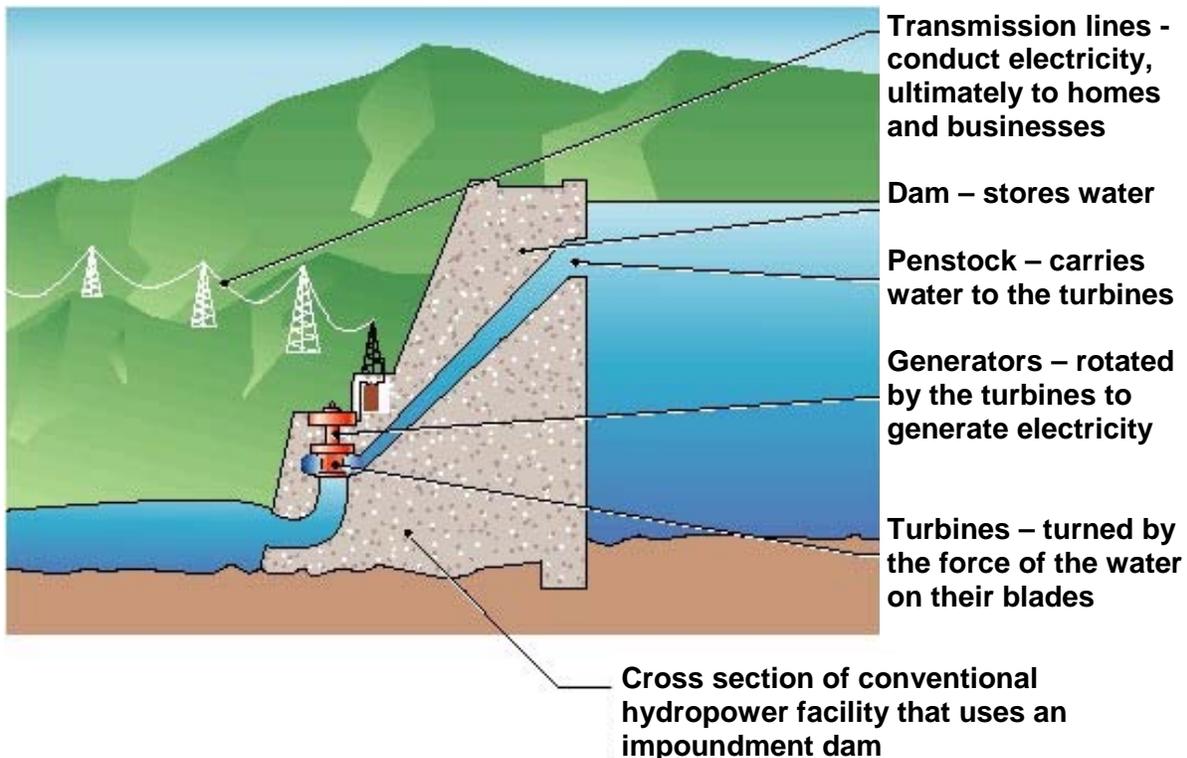
Some hydroelectric projects artificially regulate river flows in order to generate more power when there is high demand for electricity. These “peaking projects” store water at other times, releasing it through the generator turbines when it is needed to generate power.

Fortunately, many of these impacts can be mitigated. In the last 15 years, several federal licenses under which many hydroelectric projects operate have come up for renewal for the first time since passage of the federal Clean Water Act in 1972. The Agency of Natural Resources plays a

significant role in this licensing process. The Clean Water Act requires the state to certify that the project will meet state water quality standards when operated under the new license. New licenses, which may be in effect for up to 50 years, contain conditions specified by the state that address issues like appropriate flows in the bypassed reach and below the powerhouse, fish passage, installation of portages, and water quality protection. For those projects not subject to a federal license, the Agency works with dam owners to bring the projects into compliance with the water quality standards.

Hydroelectric power is and will remain an important part of Vermont’s energy supply. But like most sources of energy, it does have environmental impacts. The hope is that eventually all of Vermont’s hydroelectric facilities will meet water quality standards and supply power in a way that is truly “green.”

Impoundment Hydropower - uses a dam to store water. Water may be released either to meet changing electricity needs or to maintain a constant water level.



Courtesy U.S. DOE Hydropower Program, managed by the Idaho National Engineering and Environmental Laboratory
"<http://hydropower.inel.gov/facts/types.htm>

Aquatic Nuisance Species

HIGHLIGHTS

- ◆ **Lake Champlain Water Chestnut.** The area of Lake Champlain requiring mechanical harvesting has been reduced by 40 miles based on the status of the lake's water chestnut population at the end of the 2001 harvesting season. Only handpulling will now be required to control the water chestnut in this 40-mile region of the lake between Ferrisburgh and Benson, Vermont.
- ◆ **U.S. Army Corps of Engineers Funding.** Senator Leahy has again assisted in securing \$400,000 from the Army Corp of Engineers for Vermont's Lake Champlain Basin ANS management in 2002.
- ◆ **ANS Transport Law Enforcement.** During the 2001 boating season Vermont State Police and Fish & Wildlife Wardens dedicated time to enforcement of the ANS Transport Law (10 VSA § 1266). Numerous written warnings and six citations (\$150.00 fine) were issued to boaters who left a lake access area with prohibited aquatic nuisance plants on their boats or trailers. This effort was supported by funds secured from the U. S. Fish & Wildlife Service for implementation of the Lake Champlain Basin ANS Management Plan.
- ◆ **New Vermont Eurasian Watermilfoil Lakes.** In 2001 Eurasian watermilfoil was confirmed in Crystal Lake in Barton and in Great Hosmer in Craftsbury bringing the statewide total of milfoil infested lakes to 55.
- ◆ **New Noxious Weed Quarantine.** In April 2002 the Vermont Legislative Committee on Administrative Rules adopted the Department of Agriculture, Food & Markets *Quarantine #3 - Noxious Weeds* (see side bar page 5 for a listing of prohibited species in Vermont).
- ◆ **New Regional ANS Sightings.** In 2001 hydrilla (*Hydrilla verticillata*) was confirmed in a pond on Cape Cod in Massachusetts and Brazilian elodea (*Egeria densa*) was found in a small pond in Manchester, New Hampshire. The sightings of these highly invasive plants are the closest to Vermont and could easily become established in Vermont if introduced.
- ◆ **New ANS Activity Guide.** The Aquatic Plant Management Society has published a booklet of homework and classroom activities for the 5th grade (and higher) entitled "Understanding Invasive Aquatic Weeds." To download a copy go to www.apms.org, or contact Amy Picotte at the Lakes and Ponds Section, 802-241-3777.
- ◆ **ANS Watchers Needed Statewide!** The VTDEC needs volunteers to help us search for new infestations of ANS in waterbodies around the state. To receive a Watchers packet contact, Tim Hunt, Lakes and Ponds Section, 802-241-3756, timhu@dec.anr.state.vt.us
- ◆ **Training Videos Available.** A 13 minute video is available to assist with training lake access monitors about Vermont's ANS Transport Law, boat inspection techniques, and key species identification. For a free copy contact Michael Hauser, VTDEC, 802-241-3777.
- ◆ **Boater Survey.** Results of a multi-state survey of registered boaters in 2000 show that education/outreach efforts in Vermont have been effective in raising boater awareness of ANS. Signs at boat access areas and newspaper articles topped the list of best sources of information. The survey also revealed that a majority of boaters are willing to pay more for their boat registration if the extra funds went to ANS spread prevention activities. For more information contact Michael Hauser, VTDEC, 802-241-3777, mikeh@dec.anr.state.vt.us



**STOP AQUATIC
HITCHHIKERS!**

Why Wetlands?

What exactly is a “wetland?” The term wetland brings up different images for many people. Some people may think of a pond, whereas others may think of a cattail marsh. Besides these obvious wet areas, even places with no visible water can be considered wetlands. Wetlands are essentially areas with soils that are at least seasonally wet and contain certain types of plants that are adapted to grow in wet soils.

The edge of a wetland is determined by looking at the types of plants, soils and hydrology (water).

Why are wetlands important? Aside from their intrinsic value as a natural resource, wetlands are considered important because they provide a variety of free ecological “services.” These services are commonly referred to as functions. Wetlands can provide the following functions: water storage for flood water and storm runoff, surface and groundwater protection, fisheries habitat, wildlife and migratory bird habitat, hydrophytic vegetation habitat, threatened and endangered species habitat, recreational value and economic benefits, open space and aesthetics, and erosion control. It is important to note that not all wetlands share the same functions; some may only have one, whereas others may have all of the functions mentioned previously.



In the past, often wetlands were considered wastelands. In

fact, up until the mid 1970s, some governmental policies encouraged the destruction of wetlands. As a result, an estimated 53 percent of our nation’s wetlands were destroyed between the 1780s and the 1980s. Vermont lost 35 percent of its wetlands during this time period. Fortunately, the public and the federal government realized that wetlands were a valuable resource and that the destruction of this resource had serious economic and ecological consequences. In the mid 1970s, wetland protection began.

In Vermont, an act adopted in 1986 by the legislature established a framework for protecting wetlands. The Vermont Wetlands Rules adopted in 1990 define significant wetlands, protect their functions and values, and establish buffer zones, or undisturbed areas around them. Unfortunately, the Vermont Wetlands Rules do not protect all significant wetlands, although they may be protected by other programs.

Contact the Wetlands Section of the Water Quality Division at 802-241-3770 for assistance with projects that may involve a wetland. Wetland ecologists are available for site visits and can explain exactly where the wetland is and its functions.

Noxious Weed Quarantine

On April 20, 2002 a new Vermont rule that prohibits the movement, sale, possession, and/or distribution in Vermont of 32 aquatic, wetland, and terrestrial plants and all federally listed noxious weeds becomes effective.

19 Vermont and Federally Listed Prohibited Aquatic and Wetland Weeds **Class A (prohibited movement, sale, possession, cultivation and/or distribution)**

Cabomba caroliniana (fanwort)
Egeria densa (Brazilian elodea)
Hydrilla verticillata (hydrilla)
Hygrophila polysperma (Roxb.) T. Anderson
(E. Indian hygrophila)
Myriophyllum aquaticum (Vell.) Verdc.
(parrot feather)
Myriophyllum heterophyllum (variable-leaved milfoil)

Salvinia auriculata (giant salvinia)
Salvinia biloba (giant salvinia)
Salvinia herzogii (giant salvinia)
Salvinia molesta (giant salvinia)

Class B (prohibited movement, sale and/or cultivation)

Butomus umbellatus (flowering rush)
Fallopia japonica (*Polygonum cuspidatum*)
(Japanese knotweed)
Hydrocharis morsus-ranae L. (frogbit)
Lythrum salicaria (purple loosestrife)
Myriophyllum spicatum (Eurasian watermilfoil)
Nymphoides peltata (Gmel.) Ktze.
(yellow floating heart)
Phragmites australis (common reed)
Potamogeton crispus L. (curly leaf pondweed)
Trapa natans L. (water chestnut)

For more information contact Scott Pfister Vermont Department of Agriculture Food & Markets, 802-828-3481, spfister@agr.state.vt.us

Lake Associations Participate in Basin Planning in the Poultney Mettowee Watershed

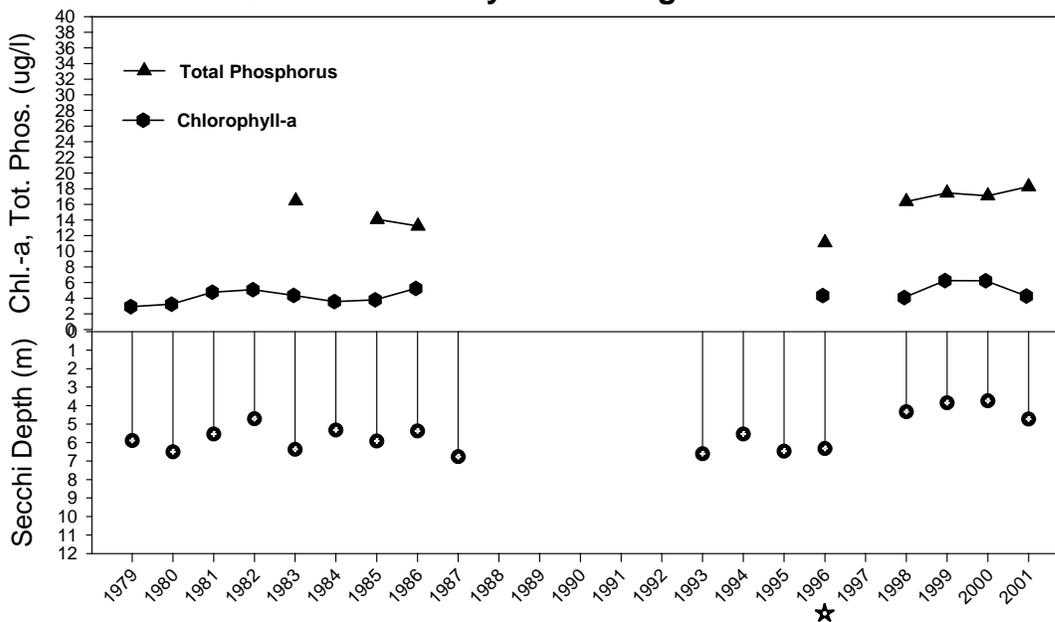
Basin planning includes making connections with lake associations. In the Poultney-Mettowee watershed there are several active lake associations: the Lake Beebe Property Owners Association; the Lake Bomoseen Association; the Burr Pond Association; the Lake Hortonia Property Owners Association; the Lake St. Catherine Association; and the Sunrise Lake-Sunset Lake-Perch Pond Association. During the summer of 2001, representatives from five of these lake associations met during two different focus group discussions. The discussions were held to share concerns and project ideas, and to discuss ways that lake associations could participate in the overall Poultney-Mettowee basin planning process.

The basin planning process can provide assistance to lake associations with existing lake monitoring and restoration projects. For example on many lakes, volunteers who collect lake samples under the Lay Monitoring Program have documented when water quality conditions change in the lake and where problem areas might exist. Under the basin plan currently being drafted for the Poultney-Mettowee watershed, problem areas will be inventoried and prioritized to make them eligible for technical assistance and potential funding for watershed improvement projects.

The Vermont Department of Environmental Conservation's Watershed Planning process is underway in the Poultney-Mettowee, White and Lamoille River Watersheds. The watershed planning process will identify needed watershed restoration projects and solicit and rely on other state, federal, non-profit, and volunteer input, funding, technical assistance, and public education to implement these projects.

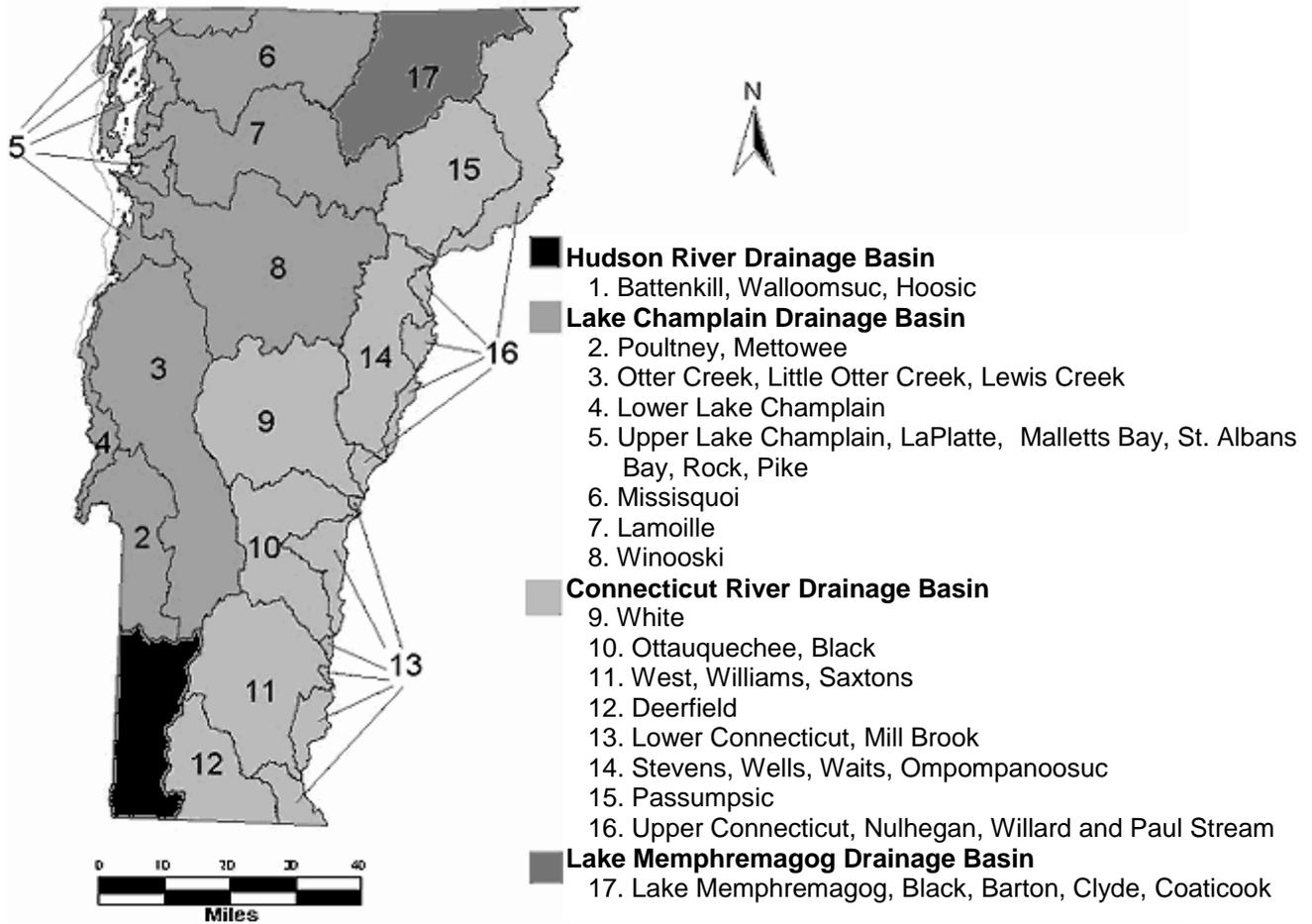
The Poultney-Mettowee Watershed Partnership is formed with Poultney-Mettowee Natural Resources Conservation District, the Washington County of New York Soil and Water Conservation District, and concerned citizens. All meetings are open to the public.

Lake St. Catherine Lay Monitoring Data: Annual Means



Vermont Lay Monitoring Program data shows the water quality changes in Lake St. Catherine in Poultney, Vermont since the discovery of the non-native alewife fish species (the feeding habits of the alewives have caused these lake condition changes). The Poultney-Mettowee Watershed Partnership is working with lake associations, including the Lake St. Catherine Association, to provide support for existing lake work and to help identify priority watershed improvement projects.

Major River Basins in Vermont



Based on points raised during the focus group meetings, the Poultney-Mettowee Watershed Partnership ranked three issues as high priority items:

- Cooperate with the lake associations and others in addressing the decreasing water quality of lakes as a result of invasive species (Lake St. Catherine's water conditions have noticeably deteriorated since the non-native fish species, the alewife was introduced to the lake, see graph on left).

- Identify public swimming beaches associated with lakes and ponds and work with communities, lake associations, and others (State Parks staff) who test for bacteria and other human health threats, such as toxic blue-green algae. Also, there is a need to establish who is testing and using what protocol, and to create a database of results for public posting.

- Study options for zoning used by municipalities in other parts of the state in order to limit development or vegetation removal adjacent to lake and pond shorelines.

Other issues raised at these focus groups pertain to backroad erosion, dams that appear to be failing, and problems associated with "nuisance" waterfowl.

Thanks to public input and support from the Poultney-Mettowee Watershed Partnership, the basin plan will recommend the promotion of spread prevention efforts to enhance education and outreach in municipal and regional plans, and includes resources for lake associations to develop better management plans for long-term aquatic nuisance species control efforts. On-going Poultney-Mettowee basin planning has resulted in the development of a water resources section of the Rutland Regional Plan and stronger language to address aquatic nuisance species in the draft Castleton Town Plan.

For more information on the Poultney Mettowee Watershed Partnership, please contact Ethan Swift, Water Quality Division Basin Planner, located in Rutland at the Regional Commission office, 802-747-5070.



Lake Projects Awarded Watershed Grants

Congratulations to the 17 watershed projects throughout the state that recently received funding under the 2002 Watershed Grants program. Funded by the sale of the Vermont Conservation License Plates, more than \$212,000 in total has been given out since 1998. This year, some of the funded projects that may be of particular interest to lake associations include:

VT Youth Conservation Corps Roving Watershed Crew – This crew of teenagers and a supervisor carries out a wide variety of watershed restoration and protection projects across the state. Lake associations may apply to make use of their manual labor and technical skills to carry out projects on their lake. Contact the VYCC office at 802-241-3900 for more information. (awarded \$3000)

VT Riparian Propagation and Education Project – The Intervale Foundation, located in the Winooski River floodplain in Burlington received a grant to begin a nursery stocking native species particularly useful for streambank and lakeshore stabilization and buffer strip re-establishment projects. (awarded \$5000)

Kenfield Brook Swimming Hole Project – Located in Morrisville, the Kenfield Brook is home to many popular swimming holes. However, recent testing has revealed regular bacteria violations at some of the holes. This grant will allow the Morristown Conservation Commission to conduct sampling and assessments to help locate the source of bacteria. (awarded \$1218)

Aquatic Nuisance Education and Monitoring at Lake Ninevah – The Ninevah Foundation worked hard last summer to combat a new Eurasian watermilfoil infestation at the lake. This year's grant will al-

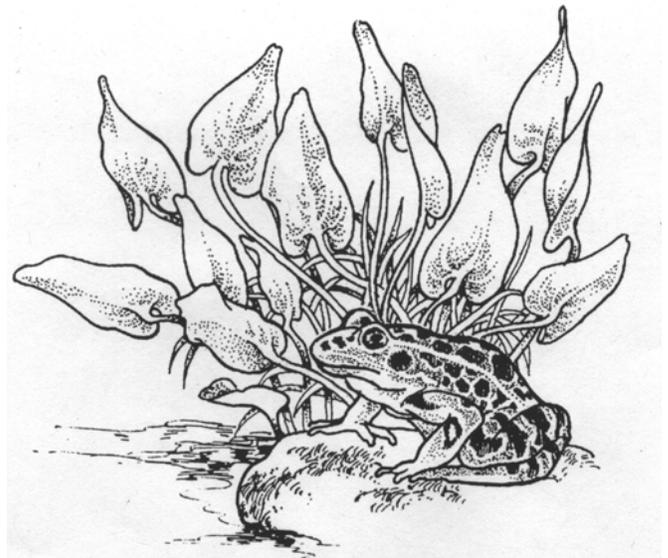
low them to continue the boat launch monitoring and boater education portion of their project. (awarded \$3000)

Lake Memphremagog Boat Washing Station – Run as a joint project between the City of Newport, and the Towns of Newport and Derby, this boat washing station and boater education project is located at the Whipple Point Fish and Wildlife Access on the western shore of Lake Memphremagog. (awarded \$3000)

Lake Carmi Restoration – This grant to the Franklin Watershed Committee allows them to continue the enrollment of watershed farmers in an "integrated crop management" program to reduce phosphorus runoff through increased manure fertilizer efficiency and reduced chemical fertilizer use. (awarded \$2000)

The Frog Pond Newsletter – The Timmouth Pond group received a mini-grant to fund their 2002 monthly newsletter dedicated to Eurasian watermilfoil spread prevention and lake protection topics. (awarded \$762)

The Watershed Grants is a good source of funding for lake associations undertaking projects involving protection, education, and partnering to benefit a lake resource. Applications for 2003 projects will be available in August of 2002, and will be mailed to the "primary contacts" for each lake association. For assistance in applying for a grant or to be added to the grant application mailing list, please contact Susan Warren at 802-241-3794, or susanw@dec.anr.state.vt.us.



Invasive Plant Survey of New England: A Call for Volunteers

The New England Wild Flower Society, Silvio O. Conte National Fish and Wildlife Refuge, and the University of Connecticut, have recently been awarded a grant from the United States Department of Agriculture to track the distribution and spread of more than 100 invasive plant species throughout New England. This group is seeking volunteers to train to identify invasive plants and document their current range. Trainings will occur in spring and summer 2002 at a series of workshops held in each New England state. Trainings will take two days and include an indoor classroom informational session using slides, herbarium sheets, and other prepared materials, and an outdoor session consisting of field visits to local sites where infestations of invasive species occur.



Data from this survey work will be used for early detection of problem species, research, and decision-making on how to control invasive species to slow their spread and reduce their impact on the native flora. People interested in volunteering for the Invasive Plant Survey should contact Bryan Connolly, Invasive Plant Survey Coordinator, 76 Warrenville Rd., Mansfield Center, Connecticut 06250, phone 860-423-8305 or 508-877-7630 ext. 3209, email bconnolly@newfs.org

The Spring 2002 issue of *LakeLine*, a quarterly publication of the North American Lake Management Society, features exotic species. To learn more about aquatic nuisance species, *LakeLine* can be ordered from NALMS at Tel.# 608-233-2836, or on the web at: www.nalms.org

Budget (continued from page 2)

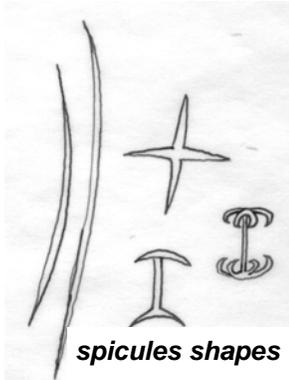
as \$2,500 for consultants to collect the information required to apply for a permit. In addition, the permit processing time will at least double, resulting in unreasonable delays for applicants. And again perhaps most devastating, the elimination of education and outreach efforts will result in more violations, and an inability to pursue the violations will accelerate the loss of Vermont's valuable wetlands, and the loss of the fish and wildlife habitat, water quality and flood protection, and aesthetic and recreational functions they provide.

Currently, the Water Quality Division has one person responsible for reviewing more than 700 Act 250 applications each year for soil erosion control plans and potential water quality impacts. This same person reviews plans to control stormwater runoff from construction sites exceeding five acres, works with ski areas to assure that high elevation waters are protected when new lifts and trails are developed, and issues water quality permits for large-scale construction projects such as the reconstruction of Route 9 in southern Vermont, and the Circumferential

Highway in Chittenden County. Guidance is regularly provided to developers and individuals to help them protect riverbanks and lakeshores when designing development projects. This position, and all the valuable services it provides, will be lost if new fees are not passed by the Legislature.

As of this writing in early April, things are looking favorable for the Legislature to pass the additional general fund revenues and new fees needed to support the Department's existing programs. The many letters, emails, and testimony of lake residents, lake association representatives, and others regarding their need for the services provided by these programs were heeded. House committees voted favorably on new fees that are now part of the Fee Bill-H.767—and are scheduled to be discussed by the full House of Representatives in early April. There are many more hurdles to be passed before the final outcome of the Department's budget in this Legislative session will be known. But whatever the outcome, we want **you** to know that the Water Quality Division has appreciated your help and your kind words, and all you have done to support these programs during this very difficult time.

Yes, There Are Sponges Among Us!



Freshwater sponges are common in lakes and streams around the world, including Vermont lakes. Though they are not as colorful or as large as sponges seen snorkeling in the Caribbean or in Australian waters, sponges are beautiful and important in many lake ecosystems. Vermont sponges

are usually green and two to five inches in size. There may be more than a dozen species in Vermont.

And surprise, sponges are animals! Sponges ingest food for their nutrition and have other features of reproduction and metabolism characteristic of animals. Freshwater sponges are invertebrates but do not have a shell like a snail or an exoskeleton like a crayfish. Sponges may be encrusting

(forming a thin layer on a rock or branch) or they may have finger-like projections or they may be club-shaped and lumpy. Most often, they are green and attached to submersed logs or branches or clinging to a branch of a shoreline shrub dangling in the water, and move very little.

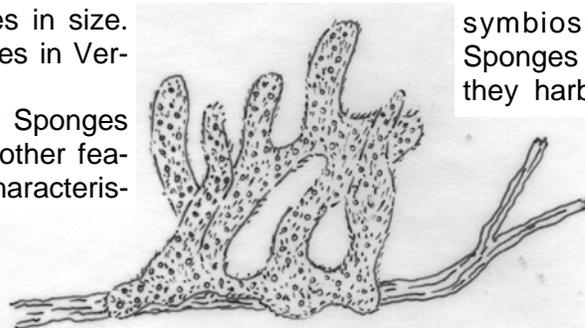
The texture of freshwater sponges is similar to that of an ocean sponges, but with a huge difference. Many ocean sponges are soft and strong because of a supporting protein called spongin. Freshwater sponges additionally are supported by glass needles called spicules providing a fiberglass-like scaffolding. Spicules render a freshwater sponge most unsuitable as a "bath" sponge. Sponges have different kinds of spicules, which come in a magnificent variety of shapes including dumbbells and stars, and provide the basis of sponge identification.

Sponges are relatively common in Vermont when the habitat is right. A lake or stream must have enough dissolved silica (the main ingredient in glass spicules) or the sponges will be limp or not present at all. They require transparent, not turbid, water, and usually need some sort of substrate for attachment. They are also common in clear, shallow streams where they often form a thin crust over a rock.

How do sponges "work?" Sponges are suspension feeders: they filter living cells such as algae and bacteria from the lake or stream water coursing

through the sponge. Water is drawn through the pores, enters into a central cavity, and eventually exits out a larger hole called the osculum. Lining the inside of the cavities, special cells called choanocytes or collar cells, are equipped with a flagellum, or whip-like structure, which generates the current to propel the water through the sponge. These collar cells also trap, and engulf (eat) the food particles.

Why are they green? One of the most fascinating features of sponges is their partnership, or



a freshwater sponge on a twig

symbiosis, with algae. Sponges are green because they harbor a huge popula-

tion of algae - not as food for the larder but as paying guests. With the help of chlorophyll (the pigment that

makes algae green), the sun's energy, water and carbon dioxide, algae make sugar by the process of photosynthesis. The sponge provides algae with protection from would-be algal grazers and nutrients essential to algal growth. In return, the algae contribute sugars and can account for 50 to 80 percent of sponge growth in some species. Sponges, then, are nourished both by particles caught by filter-feeding and by sugars produced by their algal guests.

Not only do sponges harbor algae, but invertebrates, such as some flies and mites also find refuge in sponges where they may live part or all their life. Unfortunately for the sponge, these free-loaders don't give anything back. As is true in marine systems, predators rarely eat freshwater sponges. Apparently, spicules are tough on everyone's digestive system and sponge chemical toxins repel many predators.

Falling lake temperatures signal the end of the growing season and they begin to die back to almost nothing. As sponges become dormant, there is a complete transformation of all active sponge tissue into gemmules - masses of cells surrounded by a resistant coat. In spring, gemmules will hatch and Vermont lakes will once again be full of glorious sponges.

Thanks to the Wisconsin Lakes Partnership and Susan Knight for permission to rerun parts of their article on sponges, which appeared in "Lake Tides" volume 26, no. 4, Fall 2001.

**Compost Use:
Informational Materials Now Available**

Compost is a dark brown mixture of decaying organic matter, such as leaves, manure, and table scraps (vegetables, fruits, breads, etc.) used as fertilizer. Improving soils with compost brings many

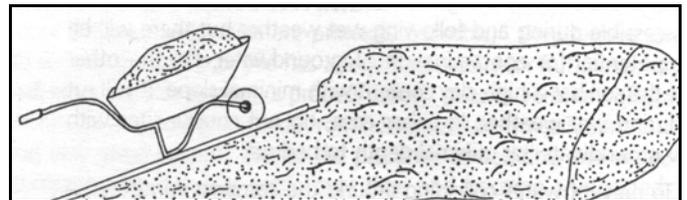


benefits such as slow release nutrients, plant disease resistance, and greater water retention, particularly important during droughts. The Agency of Natural Resources' Compost Center now has brochures available on how to use

compost at home, on the farm, on construction sites, for commercial landscaping, and for watershed improvement on lake shores and riverbanks. For example, in the brochure *Compost Uses For Lake Shores and River Banks*, information is provided on using compost as a substitute for synthetic fertilizers, which can easily leach into lakes and rivers causing pollution problems. Copies of the brochures are available from the ANR Compost Center at 1-800-932-7100. For other information, contact the Vermont Composting Resource web site at: www.anr.state.vt.us/compost

**Horse Owners Guide
to Manure Composting**

The Champlain Valley Compost Company has completed an informative and easy to read guide regarding the benefits of horse manure composting. The guide was written to provide horse owners with basic information needed to transform horse manure, a potential source of water pollution, into a valuable soil amendment, using easy, practical, and cost effective methods. Publication of the guide was funded under a Clean Water Act grant awarded by the Water Quality Division to the Otter Creek Natural Resources Conservation District. Copies of the guide are available from the Agency of Natural Resources' Compost Center at 1-800-932-7100, or from the Natural Resources Conservation District offices (check your local telephone listings).



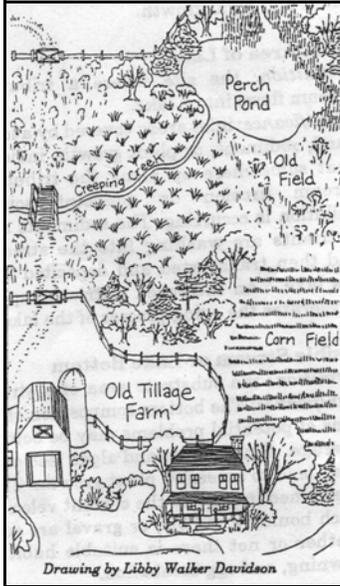
Why Rivers Act That Way and What To Do About It

Announcing the "River Corridor Protection and Management Fact Sheet." This seven page publication describes the tools that can be used to learn why a river or stream looks and acts the way it does today, how it looked in the past, and what it will look like in the future in response to various river corridor and watershed management scenarios. In addition, this fact sheet suggests steps for local organizations to take to protect stable stream reaches, manage threatened or sensitive reaches, and restore degraded riparian corridors.



This publication was produced by the Vermont River Corridor Management Program to help answer commonly asked questions such as: why is a channel filled with gravel, why is the town road crew dumping big rocks on a streambank next to the road, why is a delta building in the lake at the mouth of a brook, why has the favorite fishing or swimming hole just gone away, why does one stream turn brown after it rains but another stays clean and clear, and why is there an enormous, ugly gouge across that river valley corn field after a flood? The answers to these and many more questions are contained in this new fact sheet, available by contacting the Water Quality Division's River Corridor Management Program at 802-241-3777 or on-line at: www.vtwaterquality.org/Rivers/RiverCorridorFactSheet.pdf

The Results Are In! Agricultural Best Management Practices Do Protect Water Quality



The results of a recently completed seven year project (started in 1994 and completed in June 2001) measuring the water quality effectiveness of certain agricultural management practices in the Missisquoi River watershed in Franklin County are in. EPA supported this water quality monitoring and evaluation project as part of a national monitoring effort to study waters impacted by high levels of bacteria and total phosphorus concentrations. The Vermont Water Quality Division managed the study.

Monitoring for water quality conditions, including macroinvertebrates (aquatic critters), occurred in three Missisquoi River sub-watersheds. Agricultural run-off controls such as livestock exclusion fencing, protected livestock stream crossings, riparian buffers, and bio-engineering streambank erosion controls were installed in two of the three sub-watersheds. The third sub-watershed acted as the control site since no new agricultural management practices were used.

This project successfully documented reductions in phosphorus, nitrogen, suspended solids and indicator bacteria in response to the management practices used in the two "treated" sub-watersheds, and healthy macroinvertebrate communities. During very heavy rain events, the effectiveness of the agricultural management practices employed was reduced, but these prac-

tices throughout the year were effective in helping to protect water quality. For more information, please contact Rick Hopkins in the Water Quality Division at 802-241-3770.

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■ *Fare Thee Well...* With great sorrow and respect, we say goodbye to Holly Crosson, an ■
■ Aquatic Nuisance Species Specialist with the Lakes and Ponds Section. Holly has served the ■
■ people and lakes of Vermont for 17 years, initiating projects ranging from Eurasian watermilfoil ■
■ biological control research to the development of comprehensive aquatic nuisance species man- ■
■ agement plans. Her knowledge, experience, and warm personality will be greatly missed. We ■
■ thank Holly for her outstanding work and wish her the very best with her future adventures. ■
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**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**

Address correction requested.