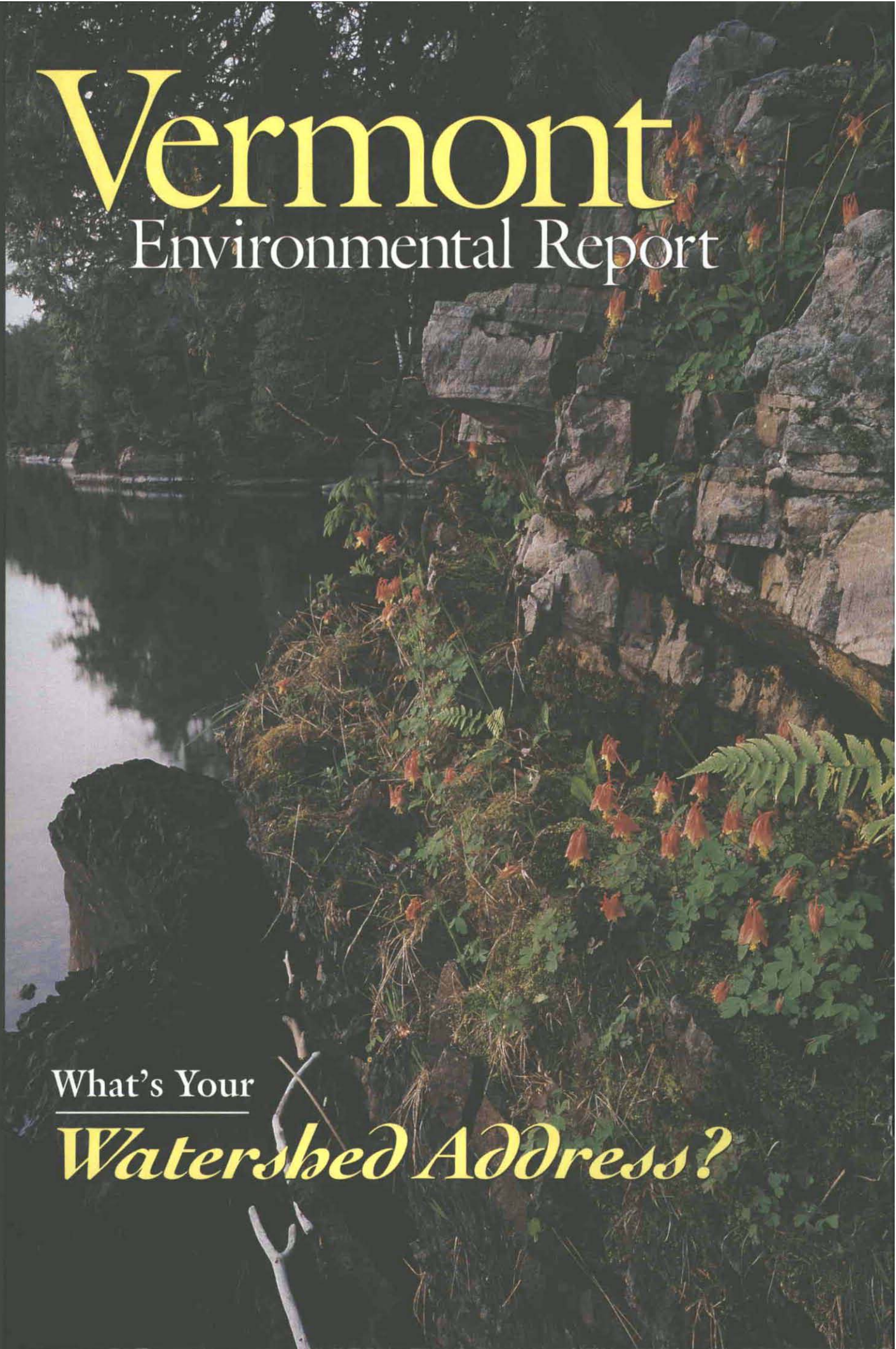
VNRC

Vermont Environmental Report



Published by the Vermont Natural Resources Council, Inc.

What's Your *Watershed Address?*

July 1998

The Vermont Natural Resources Council, Inc., is a nonprofit environmental organization founded in 1963 to protect Vermont's natural resources and environment through research, education, and advocacy.

VNRC is the Vermont affiliate of the National Wildlife Federation.

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WATERSHED APPROACH FINDS VOICE IN VERMONT

By Elizabeth Courtney
Executive Director

Water is a symbol for cleansing and purifying, and it also expresses the arising of new life and new understanding. Water can be the catalyst of change from hard self-absorption to a realization of our inherent, fluid connection with nature, as in the Myth of Narcissus.

When we see our reflection in a pool of water, we see ourselves as a part of this natural world. One of the great gifts of the environmental movement is the awakening of an awareness that we are wholly a part of the Earth's natural systems.

Our connection with natural systems is reflected in the "watershed approach" to environmental protection. The watershed approach, the subject of this issue of the *Vermont Environmental Report*, is a strategy that connects people and land use issues to the restoration and maintenance of clean waters.

This approach is familiar to the Vermont Natural Resources Council (VNRC)—and it is finding voice in many environmental and watershed groups around New England. For example:

- VNRC, along with the partners National Wildlife Federation (NWF) and Conservation Law Foundation (CLF), have worked together for four years to protect water quality with research and advocacy projects;
- VNRC is leading a coalition of 6 groups on impaired water listings and remedial plans;
- VNRC has requested the state of Vermont to update its watershed management plans, some of which have not been looked at since the 1970s; and
- VNRC is producing a major report on water quality problems in Vermont and policy recommendations, which will be completed this summer (see page 25).

VNRC recently received a continuing grant from the Canaday Trust to further delve into ways to protect watershed quality in Vermont. VNRC will focus on the restoration and protection of Vermont's water quality on a watershed basis by: reducing water pollution from surface run-off, restoring and protecting in-stream flows in rivers and streams, and by integrating watershed protection into Vermont water policy.

All of us live in a watershed. Indeed, watersheds represent our ecological address.

Clearly we cannot afford to continue trying to solve the complex problems of water protection solely by focusing on the fundamentally too small, too narrow "point" sources of pollutants. As John Muir put it: "If we try to pick one thing out by itself, we find that it's hitched to everything else in the universe."

All of us live in a watershed. Indeed, as aptly stated by Ted Smith of the Henry P. Kendall Foundation, watersheds represent our "ecological address." Our actions directly affect the ecological health of our waters and in turn our ability to use them. Because of these characteristics, watersheds provide an ecologically discrete area upon which to base policies and decisions affecting the health of ecosystems and community growth.

The watershed approach is an understanding of how we are "hitched to everything else in the universe."

Do you know your watershed address? Let's take action to understand the watershed in which we reside, issues surrounding its health, and the solutions. Let's work together to protect water quality in Vermont and around our region.

Letters to the Editor

Thinking of Trees While Undersea

I bet this is a first for you. I am sending e-mail to you from on board the USS Annapolis Submarine. Currently we are on deployment to the Persian Gulf. We have escorted the George Washington Aircraft Carrier. I'm writing you for a couple of reasons. First, we were able to receive some mail the other day. My wife sent me a box with many items in it including the October edition of the *Vermont Environmental Report.*

I have gone through most of the various paper, articles, and magazines sent to me but I keep getting stuck on the Report. We live in Connecticut, and the Sub is attached to the base in Groton. We do a lot of camping in Vermont at the Jamaica and Townshend state parks. We are from Georgia and have camped for many many years from Florida to Maine. Vermont offers the best "get away, catch your breath" camping anywhere.

We have been members of the VNRC for several years because we believe that what you have must be maintained and cherished. We hope to move to south central Vermont when I get out of the Navy. The work that you are doing is and will make it possible for us to continue to enjoy all that Vermont has to offer. Connecticut could and should learn from your example.

I don't know if you hear from the "little people" very much. We do not have a lot of money living on the military pay with 2 kids. We give what we can to your organization because I truly believe in your actions.

The October VER was the "breath of fresh air" I needed to keep me going throughout our 6-month deployment. We will be camping this summer in Jamaica, with a VNRC bumper sticker on the van.

Keep up the great work and thank you for all you do.

Bill Winkis, USS Annapolis

Key Information at VNRC

I am a property owner with 10.7 acres in Cambridge, Vermont. I always enjoy receiving various pamphlets from VNRC as it allows me to keep in touch with what is going on in Vermont.

Your most recent mailing contained a wealth of information, especially the section with "key decisionmakers." Keep up the good work!

Jack LaTorre
Brooklyn, NY

Future Member

I am 11 years old and I am very interested in the world. One of my main questions I always wanted to know is what is going to happen when the ozone layer is gone? That would be a bad thing. Maybe one day I could join your council.

Nathan Miller
Quakertown, PA

Gordon and Helen Halstead of Peru, VT, recently joined VNRC, noting that they were "Celebrating 70 years of marriage today." Thank you for the honor – Editor

The Ripple Effect – Activating the Democratic Process

By Lisa Smith

Toss a pebble into a pond and your message reverberates in a series of ripples. First one, then the next—finally, there is motion just about everywhere. All this after just one plunk.

Are you aware that the second-most-frequently read section of any newspaper is the "Letters to the Editor" section? (The front page finishes in first-place.) Environmentalists, according to Dick Andrews a freelance writer, editor, former reporter, and publisher, have been slow to realize the full potential of this medium. In a state like Vermont, where television and radio are less dominant than other areas of the country, newspapers are tools not to be ignored.

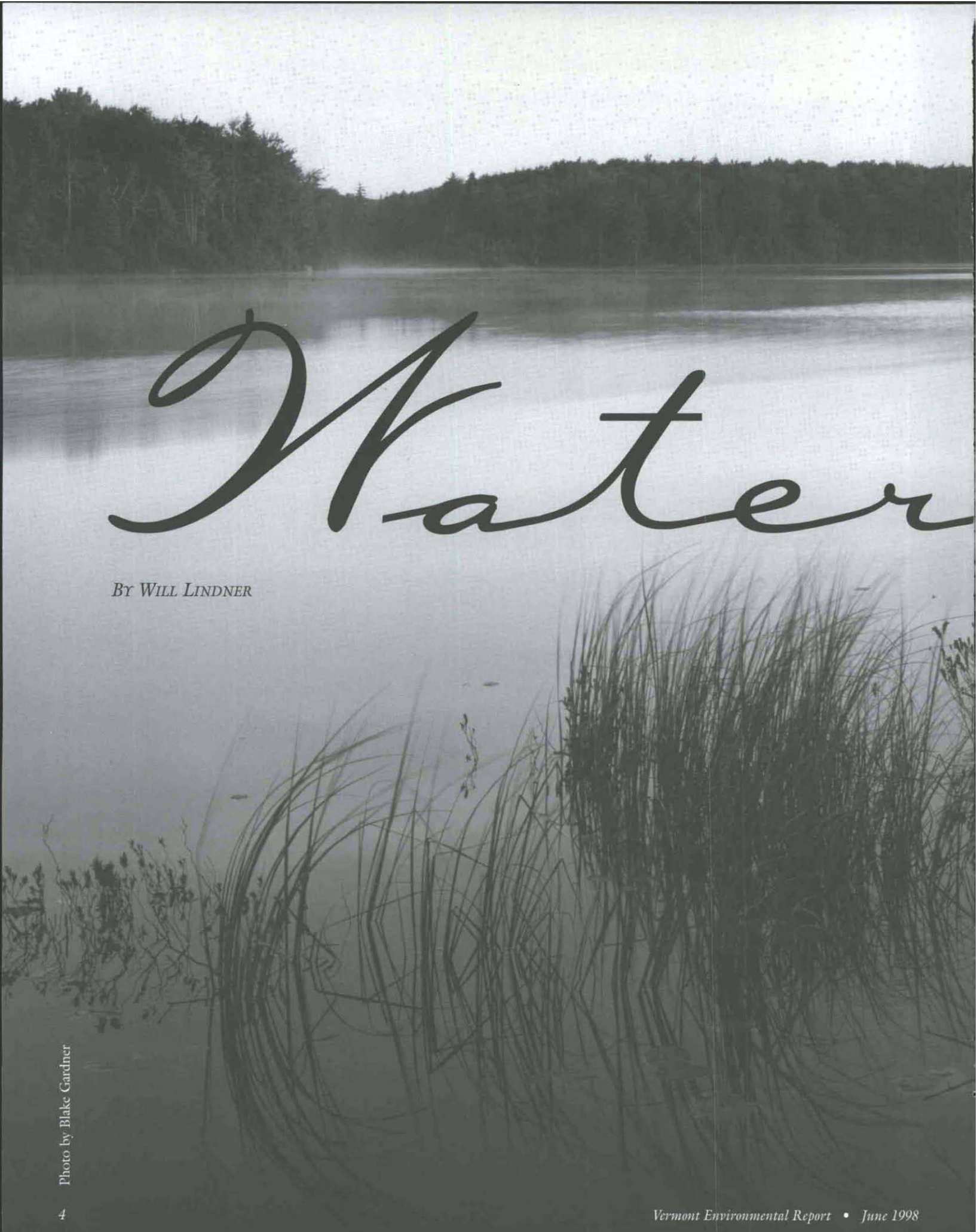
In April, VNRC invited a group of activists to learn about writing letters to the editor. Dick Andrews shared his wisdom, from a career in the newspaper industry, about the true effect of a letter to the editor. Andrews emphasized the far-reaching effect a simple letter can have on many people.

We have all scanned the headlines in a newspaper to pick out the topics that interest us—letters attract friends and foes, leaders and followers, allies and opponents. Spurred by a sense of mutual concern, a letter may motivate allies to write even more letters sharing their concerns. At the same time, letters can help to discourage opponents who see support for the opposition growing. Moreover, opposition may establish that a controversy exists—and that sells papers.

Anything that helps to sell more papers warrants the attention of editors and other news media. A hotly contested controversy or a wave of support letters can help an editor decide which topics need more coverage. In addition, television and radio stations monitor this section of the newspaper closely.

Surprisingly, most issues break first in print and are later picked up by other media. An influx of letters to local papers might highlight a topic of concern to the whole community that deserves the media spotlight. The more people who understand an issue, the easier it is to build support.

In Vermont, where there are several daily papers and dozens of weeklies, this is an opportunity environmentalists should not pass up. The next time you read the paper, think for a moment about the ripple effect that you could have if you sat down and sent off a letter. Toss that pebble for a better world!



Water

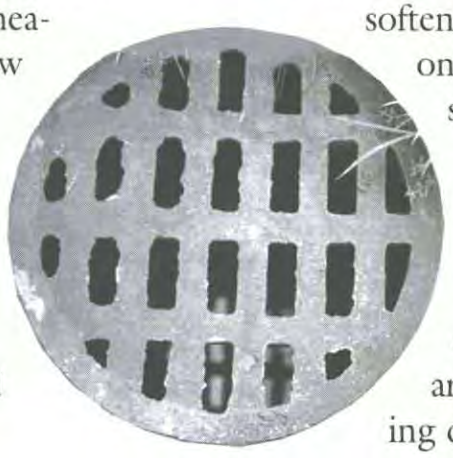
By Will Lindner

Photo by Blake Gardner

People Reclaiming Resources Where They Live

sheds

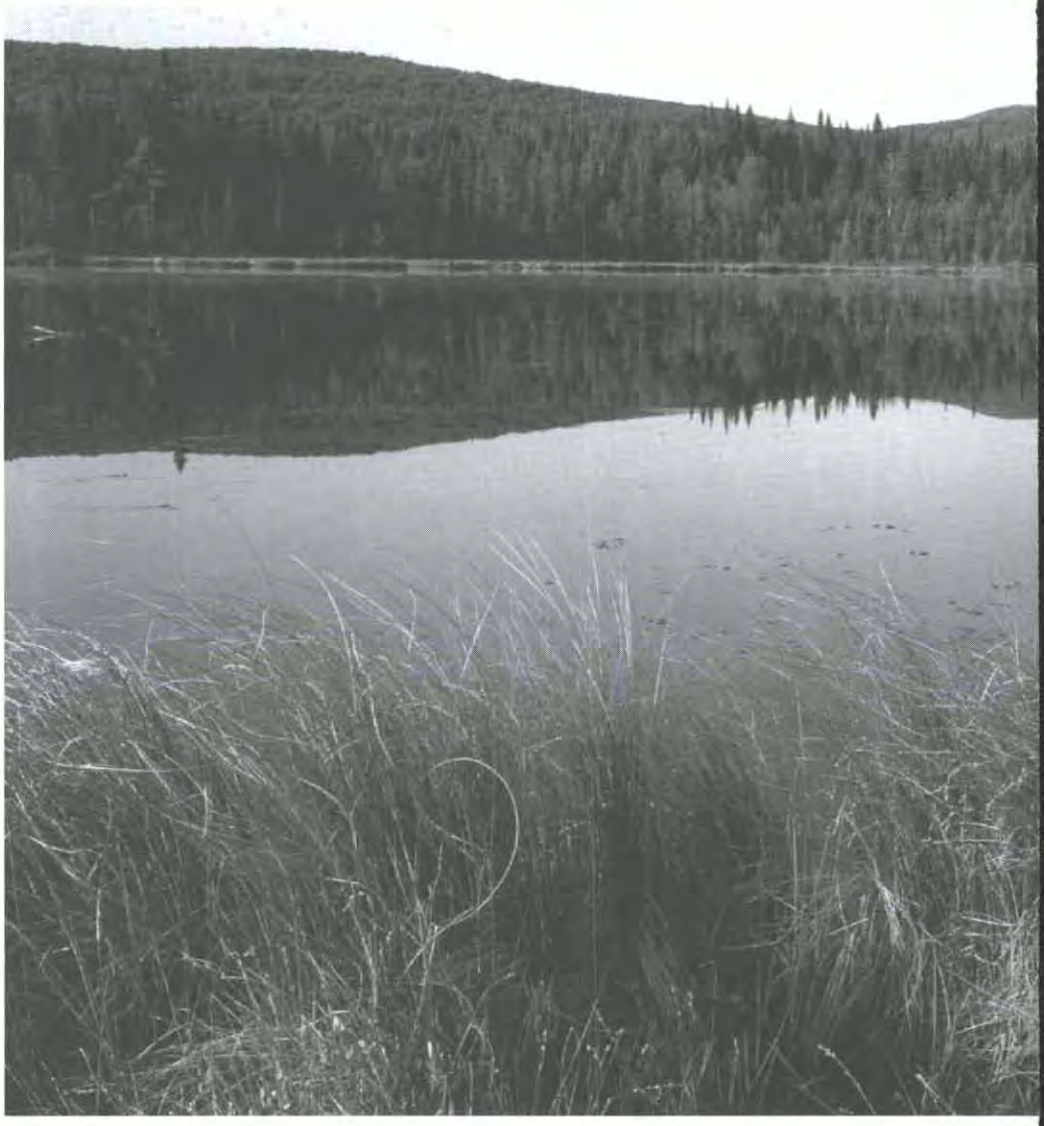
In summer our lakes and rivers are languid and serene. They beckon the oar, the inner tube, the streamside picnic, and for some, the fly on a gossamer fish line arcing over the water's surface. In the fall these lakes and waterways act as foils for the foliage, reflecting the colorful leaves that hang over their shorelines and finally accepting the leaves when they flutter loose from their branches. Soon after, we measure winter's severity by how effectively it has stilled the surface motion of our running brooks, and note the dates that the ice overspreads Lakes Willoughby and Champlain, Joe's Pond and the Green River Reservoir.



But the spring! The spring is different.

In spring, moving water is not confined to the riverbeds and basins. Now, the whole landscape becomes saturated and alive. High elevation seasonal streams are revived as snow, ice and frost melt into an almost living entity that follows, with gathering force, an instinct toward descent. In fields first and eventually in the shaded forest, the hardened landscape softens and turns into mud. Both on and below the ground's surface the race is on — water taking any path it can find to join a trickle that becomes a flow that becomes a torrent, crashing past boulders and around tree trunks, thundering downward to the bottom of

the valley. There, the receiving river swells and rushes wildly toward its destination—some greater river farther along, a lake or bay, perhaps even the salt ocean.



It is spring, then, with all this raucous activity, that reveals for us most plainly the meaning of the term "watershed." For in discrete geographic areas defined by natural boundaries, the land "sheds" its abundance of water in a way we can see and hear, feel and smell. Implicit in the deal is the expectation that the global atmosphere will repay the watershed with precipitation, a cycle that enables it to sustain the life forms that depend upon the water that drains across, flows through, and pools in aquifers beneath the contours that define the watershed.

And increasingly it is the watershed that provides conservationists a reason to hope that Vermont's, New England's and the nation's rivers and lakes might still be preserved and rescued from pollution and degradation.

Winning battles, losing the war

For a quarter century, Americans have pinned their hopes for redemption of our waterways on the federal 1972 Clean Water Act (CWA). But many conservationists now believe that unless the CWA can be amended and redirected, its best years are behind it.

The law was enacted out of alarm at the deterioration of major resources like Lake Erie and Cleveland's Cuyahoga River, where chemical waste burned hideously as it flowed between the banks. Employing the CWA and molding their own policies around it, state regulatory agencies declared war on the straight-piping sewage into streams and rivers, and on untreated discharges of commercial waste. The goal was to make waters "fishable and swimmable" once again, and it produced significant results.

But while the Clean Water Act has proven effective against point-source discharges — pollution that enters the waterway at a definable location — we still find our waterways imperiled.

"From one-third to three-fourths of aquatic species nationwide are rare to extinct, and aquatic species are disappearing at a faster rate than terrestrial species," wrote authors Bob Doppelt, Mary Scurlock, Chris Frissell and James Karr in their 1993 book, *Entering the Watershed*. An estimated 70-90 percent of natural riparian vegetation . . . has been lost due to human activities. Seventy percent of the nation's rivers and streams have been impaired by flow alteration."

The negative results extend into distinctly human realms of consideration. The authors claimed that the commercial catch in the Illinois River — once the second-richest in the nation — had declined to near zero in the 1980s. Fisheries losses in the Missouri and Columbia were nearly as drastic, with devastating effects on local employment.

"How would our nation respond if agricultural productivity were reduced by three-quarters or eliminated altogether?" they asked, the comparison underscoring the severity of the ecological and economic problem.

The authors and many other leading scientists and environmentalists conclude that the Clean Water Act, as presently interpreted and enforced, will be of little further use for reclaiming our waters and their life forms. That's because the primary scourge of the waterways now is nonpoint-source pollution: chemical fertilizers that leach into rivers from agricultural fields; soil erosion; negligent logging practices that destabilize stream banks; urbanization that produces contaminated run-off from streets, parking lots and manicured lawns; chemicals and heavy metals belched into the atmosphere by power plants to fall into waterways as acid precipitation.

It gets worse.

In "civilizing" its societies, humanity also "civilizes" nature to provide for

human needs. We withdraw enormous quantities of water to irrigate deserts and manufacture snow; we drain or channel wetlands to make room for development; we dam rivers to generate electricity, creating unnatural impoundments (reservoirs) and miles of riverbed downstream that is alternately dewatered and inundated based on the odd imperative of "peak demand." We introduce — inadvertently, but with no less harm for that — exotic species like zebra mussels and milfoil.

"The leading causes of pollution now are things we do as individuals on a daily basis in our homes and communities — byproducts from automobiles and lawn care, pet wastes, road salt," says Curt Laffin, a project manager with the Merrimac River Watershed Council in Lawrence, Mass. "There's a false security [because] people think the Clean Water Act and federal and state agencies are going to protect our water resources. And they have done a remarkable job of reducing industrial and wastewater pollution. But now there's a different major source of pollution, and it calls for a different approach."

Don Elder, director of the Portland, Oregon-based River Network Watershed Program, identified such an approach when he spoke last February at a meeting in Maine on the imperiled Atlantic salmon.

"I believe what is most needed now is a way to integrate our natural resource protection work within well defined spatial contexts," said Elder. "Since water flows downhill, watersheds work for this purpose. In fact, nothing else works nearly as well."

Entering the Watershed

Former Speaker of the U.S. House Tip O'Neill (whose home state, Massachusetts, is a national leader in the watershed movement), famously said that "all politics are local." Advocates see the same virtue in watershed conservation. The watershed serves uniquely as a way for people to embrace the staggering complexity of the overall conservation challenge while also reducing it to a comprehensible scale.

"I'm sitting here looking at the White River," says Associate Professor Karen Sheldon, speaking from her office at the Vermont Law School in South Royalton, "and I know what the watershed is because I can see the ridge tops on both sides of the river. The watershed is definable and measurable. People can understand the hydrological unit of a watershed. They can know what their watershed address is. That's the secret strength of the watershed movement."

Residents' familiarity with their watershed—even if it's a subliminal familiarity that must be brought out and revealed to them—helps them make the next transition: realizing that protecting or rehabilitating their watershed involves looking at other things besides water.

"That's how this approach departs from our major environmental laws, like the Clean Air Act and the Clean Water Act," says Sheldon. "They are media specific. In the watershed you think about the water draining through the land, and the land being drained by the water. Now you've got to think about the effects of each — the land and water — upon each other."

Adds Curt Laffin of the Merrimac River Watershed Council: "Unless you address what's going on the land, you're not going to do any good for the river. The river is the summation of all that's going on the land."

So how to address what's going on the land, and in the river?

Here again, the watershed movement departs from the conventional, Clean Water Act "model." Rather than throwing money at the worst pollution offenses, its priority is to preserve those sections of the ecosystem that are intact and functioning well. Prevention is more cost effective than reclamation, and gives watershed organizations a starting point from which to spread healthy ecological balance.

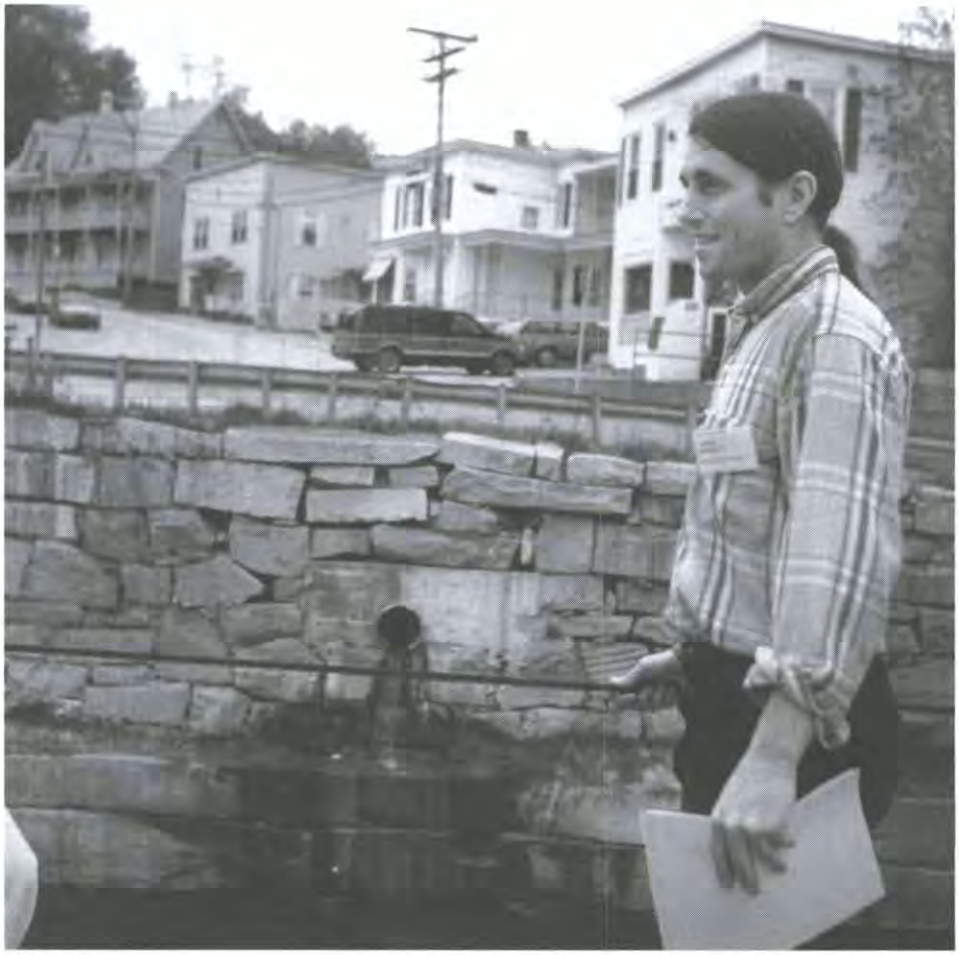
As laid out in *Entering the Watershed* — considered the most comprehensive statement of watershed science and principles—the first step in restoring any watershed should be "identifying and protecting the remaining relatively healthy headwaters, biotic refuges, riparian areas, floodplains" and areas the authors call "hot spots," which are isolated places where essential biological functions, fortuitously, are occurring without impairment.

"After these areas have been secured, restoration would focus on providing better management between the protected areas, and eventually expanding and then linking the healthy areas."

A second key component of the watershed management concept is its departure from conventional bureaucratic, agency-oriented responses. The watershed model works at the personal and community level, on the theory that when conservation is a local issue, and people perceive the effects their lifestyles have on the watershed that sustains them, they take ownership more than when the Environmental Protection Agency declares an emergency and rushes Superfund money in to cure it.

The typical watershed program recruits the participation of business and economic development interests, political leaders and other "stakeholders." For as Doppelt and his colleagues explain, watershed conservation must be seen as a source of, rather than a threat to, employment, and as providing local economic stimulation, albeit of a different variety from abusive developmental practices.

"Without support from local communities and citizens," they write, "any policy will fail. To help generate support, local jobs must be created in



Dr. James Shanley of the U.S. Geological Survey discusses urban run-off at the "Getting Your Feet Wet" conference on watershed protection, convened by VNRC and partners National Wildlife Federation and Conservation Law Foundation on May 9, 1998.

restoration technologies. Riverine-focused community revitalization projects . . . must also be generated."

Massachusetts' Secretary of Environmental Affairs Trudy Coxe is widely credited with leading her state to launch the Massachusetts Watershed Initiative in 1993, arguably putting the Bay State at the forefront of the national watershed movement. In the spirit of progressive reforms, Massachusetts' program returns significant power to local planners and decisionmakers, with the state supporting their efforts through grants and by supplying full time "watershed team leaders."

Jan Reitsma, an undersecretary in Coxe's office, says the first years under the Watershed Initiative were spent reorganizing Massachusetts' regulatory procedures to conform to the watershed construct, and helping people form watershed associations. The appointment earlier this spring of state paid "team leaders" was a watershed event in itself, signaling commitment to this new perspective on land- and water-resource management.

"There are 27 watershed basins," says Reitsma, "and we have put in place 20 full time basin leaders—including more than one person in a few of the larger basins. Their primary responsibility is to listen, to become familiar with the needs of the watershed and to be in contact daily with the full range of stakeholders—citizens and business people, municipal officials... everybody who is engaged."

Ed Himlin, of the Massachusetts Watershed Coalition, says this officially sanctioned, "bottom up" decisionmaking is fitting in New England, a region that spawns diverse community-based civic and environmental organizations. He notes that watershed councils have existed in this area for decades, and estimates there are 40 to 50 such organizations in Massachusetts' 27 basins.

"Trudy [Coxe] came here from the Rhode Island organization, Save The Bay, which she had made a household name there," Himlin says. "She understood what community organizations can do."

She also understands the value of a good slogan. The state has erected signs at the highway entrances to each basin area, naming the watershed and celebrating "Communities Connected By Water."

THE WATERSHED WAY

Massachusetts, however, doesn't have the corner on the watershed movement, particularly, in Chris Kilian's view, in terms of defining the movement and how watershed organizations should work.

"When some people talk about the watershed approach they describe a socioeconomic-based look at how an entire watershed is used, balancing out a variety of human uses and working with community members and polluters," says Kilian, VNRC water program director and general counsel. "Their goal in a given area might be to reach consensus about whether, in this part of the river, we can accept a certain amount of pollution. The focus is on some socioeconomic balancing of what is ostensibly good for society."

Kilian does not find reference to such balancing in the Clean Water Act, the law that has spirited water protection and reclamation in this country for 26 years. That law, he insists, clearly orders state officials to clean up the waters.

"The other approach out there, also being called the watershed approach," he says, "is one of looking at and employing principles of ecological health and sustainability pertaining to an entire watershed, and using those principles to design what kind of activities can be allowed to take place in the watershed.

"Those," Kilian stresses, "are very different approaches. Our aquatic systems in this country are seriously degraded. So if you apply this definition of the watershed approach, it drives a lot of changes in our behavior on the ground. You have to be sure there is a baseline of aquatic sustainability that is achieved, and that commitment to that goal is not lost in working with diverse community members.

"VNRC advocates the watershed approach," says Kilian, "but we want to pursue the right watershed approach."

That approach finds its root in the ecological, and treatable, unit of the watershed, and in the concept of "saving the best and restoring the rest."

VNRC's water program sought and was awarded a three-year grant by the Canaday Trust specifically to promote comprehensive watershed management in Vermont as a tool for achieving the state's water quality standards. The grant will enable VNRC to produce a two-part report on the health of Vermont's waters, and to prepare an "impaired-waters list." From these and other studies—including studies by local watershed groups that VNRC is helping to support through the Canaday grant—the organization will derive policy recommendations. These, VNRC will advocate before the state, as it will advocate employing watershed management techniques to achieve them.

The organization's commitment to watershed management is also conveyed by the renaming of the Vermont River Action Network (a coalition of groups formed with the aid of VNRC) to the Vermont Watershed Action Network, giving the movement a statewide imprimatur. Kilian counts about 32 such local groups working in Vermont. More than the arms of state government, he says, these community groups can serve as Vermont's front line in protecting and restoring its rivers and lakes.

"There's a gap between what the state can do and what needs to be done to reclaim our waters," says Kilian. "Our intention is to fill that gap."

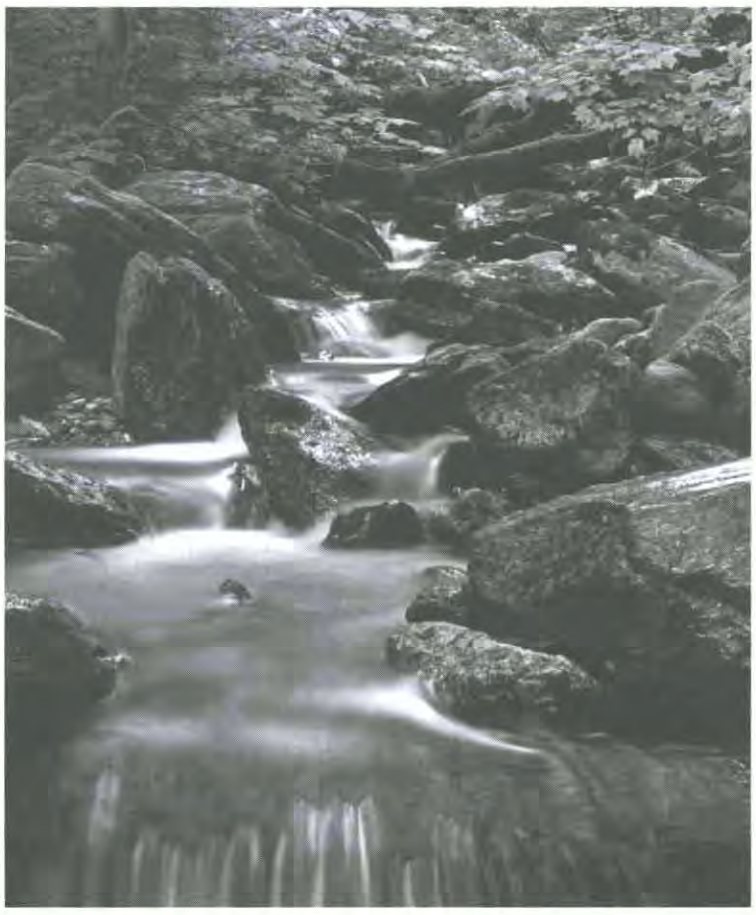
"There's a gap between what the state can do and what needs to be done to reclaim our waters," says Kilian. "Our intention is to fill that gap."

HUMAN POLLUTION, HUMAN SOLUTIONS

The kind of popular support for watershed interventions that Doppelt and his colleagues say is crucial to the success of such programs sometimes falters when people are asked to look beyond their ingrained allegiances.

"Every piece of land has a boundary," explains VNRC's Forest and Outreach Programs Director Jim Northup, "but typically the boundaries are human constructs that don't respect ecological lines. Human beings organize themselves in states, counties and towns. But the watershed approach promotes stewardship across boundaries. We need to find a way to allow people to work within those political units but still deal with transboundary issues."

That's a hard nut to crack, says Laffin of the Merrimac River Watershed Council (MRWC), but effecting such attitudinal changes is central to his work. The Merrimac River watershed is a 5,010-square-mile area whose northern boundaries are the headwaters of the Pemigewasset River at Franconia Notch, New Hampshire. The Pemi flows south for 80 miles to Franklin, New Hampshire, where it meets the Winnipesaukee River and forms the Merrimac. After another 110 miles, wending past Manchester and into Massachusetts then curving eastward past Methuen and Lawrence, the Merrimac meets the Atlantic Ocean at Newburyport.



That's a big watershed (3.2 million acres), providing drinking water for 300,000 residents, hydropower from six dams, recreation for hundreds of thousands of residents and tourists, and habitat for aquatic and forest wildlife. Since it's hard to get people to identify with so grand an area, the 20-year-old MRWC concentrates much of its organizational efforts in the 17 sub-watersheds that make up the whole.

A project in the Shawsheen River Watershed illustrates how watershed management organizations work. The MRWC received a grant from Coxe's office to implement the watershed approach in the Shawsheen subwatershed, which encompasses portions of 12 towns.

"We went into the towns, announced that we wanted to assess the condition of the watershed, and asked for volunteers to literally walk the whole subwatershed and collect water samples," says Laffin.

Tested for dissolved oxygen, turbidity, temperature and fecal coliform, the samples indicated two significant problems: water quality degraded by nonpoint-source pollution, and erratic flow in the river. Contributing to both problems was development, including an Air Force base with vast impervious surfaces, resulting in contaminated rainwater run-off that led in 1996 to severe flooding. The MRWC presented its conclusions at a series of public forums.

"Then we listened to people, which is significant," says Laffin, because people usually are not consulted about the condition of their environment and asked to provide leadership. With MRWC assistance, local people eventually formed a Shawsheen River Watershed Association.

"We're trying to help them come up with a strategic plan to solve their problems so they can sustain the momentum on their own," says Laffin. The group wants to implement an openspaces plan to enable the landscape to absorb more precipitation, but is

learning the complexity of implementing an area-wide objective in the face of traditional municipal divisions. But that's the watershed way, and Laffin is so convinced of its long range promise that he has started another, similar project in the Housatonic subwatershed.

Farther south, Bob Zimmerman's work for the Charles River Watershed Association (CRWA) provides a lesson in watershed analysis and management in a completely urban environment (where residents are less likely than Vermonters to experience springtime as a subjective aquatic event).

"Dealing with point-source pollution on a polluter-by-polluter basis doesn't get you very far," Zimmerman has concluded. "In fact, those solutions end up dewatering our tributaries and rivers. There's something to be said for polluted water over having no water at all."

The CRWA does its own lab analysis and computer modeling, and what it learned about the local watershed came as a surprise even to Zimmerman, who presumed that the watershed's problems were nonpoint-source pollution from stormwater run-off and sanitary system overflows.

"It turns out those were just symptoms of a single great problem, which is the way we engineer our communities. We treat rainwater as a liability rather than an asset, and as we grow we do so at our own peril."

Horizon-to-horizon pavement and other impervious surfaces like the compacted turf of residential lawns prevent rainwater from penetrating the ground. It cannot replenish aquifers because the pavement, the river and the central sewer systems whisk it away. Groundwater supplies are further depleted by the household needs (including drinking water) of an expanding population.

What's Your Watershed Address?

The interconnected area of land and waterways defined by a common catchment area is a "watershed" or "basin."

Let's work together to protect water quality in Vermont and around our region – see page 16 for a watershed group in your community.

"This is not a sustainable system," Zimmerman says. "Many of the communities on the Upper Charles will run out of water in 20-25 years."

So the CRWA has launched a campaign called "Keep Water Local." It advocates decentralized wastewater technologies, scattered throughout urban and suburban communities like electricity substations, that would treat sewage and discharge it right there. The same principal extends to capturing rainwater.

"Where it falls, that's where you want it," says Zimmerman. "Where you use it, that's where you want to put it back. What these solutions argue for is for us to re-establish the environment as we found it, rather than going in the direction of bigger, more complex, engineered solutions to problems.

"There are a million people living in this urban watershed area. It's a great cooker for us to figure all this stuff out."

The land connection

Washington State has bitten off a quite different watershed challenge.

In that state of 42 million acres, where 20 million acres are still in forest, the Department of Natural Resources in 1992 updated its rules under Washington's 1974 Forest Practices Act to include mandatory watershed analysis when an applicant proposes any timber-oriented activity. The 1992 revisions limited the size of clearcuts (without, according to DNR Policy Assistant Manager Stephen Bernath, a POST-style backlash), protected wetlands and wildlife habitat, and enacted a "cumulative-effects rule."

"This is where the watershed analysis comes in," says Bernath. "Basically, Washington's way of dealing with watershed issues, in the forest context at least, is a process-based approach in which scientists analyze each basin for unstable slopes, surface erosion from landscaping and roads, hydrology and fish habitat, riparian conditions and water quality. They inventory the resources and evaluate the condition they're in, and project a cause-and-effect from the proposed forestry project."

But that's just the first step. Using this evaluation, a team of resource managers writes "prescriptions" (similar to conditions on Vermont's Act 250 permits) that should be followed by anyone working in the watershed.

"They can vary from 'don't do anything at all,' to providing wider buffers in some areas, to prescribing which roads need fixing," says Bernath. ."The major areas are protecting unstable slopes and providing for more riparian protection."

It's not a cheap process. The average range of a cumulative-effects analyses is $100,000-$250,000. But the Division of Forest Practices permits landowners and consultants to expedite the process by performing analyses themselves, subject to state review. There is also a public review process, mandated by Washington's Environmental Policy Act.

Bernath says a benefit of the analysis is that everyone learns something. Landowners can identify environmental restrictions ahead of time and commit their resources accordingly; corporate foresters get familiar with the land they will be working in; and hard-core opponents of the timber industry learn something about safe and protective forestry practices.

Also, says Bernath, "We've had three new listings under the Endangered Species Act for steelhead (trout) as a result of things we've learned doing watershed analyses. We are renegotiating the regulations again because we've found we need to provide for better fish and water quality protection."

But Washington is a big state.

"That's the problem," laughs Bernath. "There are some 700 watershed basins. We've got [scientific analyses on] about 10 percent of them on their way to being complete."

And while Washington's forestry model departs from the bottom up, Massachusetts model of watershed management, Bernath says the stakeholders — forest owners, Indian tribes, regulators and the public — generally find their common interests are protected.

"Look at our state versus California, where that kind of alignment doesn't exist," he says. "It's a totally different atmosphere. We are contentious up here, but at least we try to base what we do on current research and information, not totally on emotions."

In Vermont, a question of resources or commitment?

A strong sense of the elements around us — whether streams and rivers are running near the tops of their banks or trickling around the rocks at the bottom of their beds, whether a hillside is heavily forested or standing bear and solemn — is part of the Vermont identity. So it's not surprising to find local organizations, some of them affiliated with the Watershed Action Network promoted by VNRC, keeping their eyes on nearby waterways, and "stream teams" periodically taking water samples for analysis.

Some groups are up to their waders trying to reclaim rivers and streams ruined by erosion and cow manure or threatened by water withdrawals for snow making. The Memphramagog Watershed Association works with farmers to

Wading the Winooski

upstream, through Rainbow Rapids,
the riverpiling down
in a shudder of mists.
A couple of times I try to cross,

but the water's too high,
discolored, coldly
through waders and long johns
clasping my legs, boosting me off-

balance, downstream
toward half-submerged Sand Island,
  a bone
in its teeth. I wedge my foot
against a downstream rock

brace and lean
into the river, the roar
and scour of the riverbed, through
  soles,
  calves, thighs, explosions

of sands and gravels, boulders
trembling in their sockets.
  Two shuffling steps
toward the thread of the current,
and I hear the siren caterwaul

from Bolton Dam—no more
than ten minutes and the water's up,
twigs and leaves thick
in the drift lines,

so I give up, back off,
turn in time,
head shoreward home
downstream, riding the current tip-

toe rock-
to-rock, barely
in control, crossing back
to the muddy flats on the longest

of the long diagonals.

–John Engels

convince them to leave buffer zones to protect streams, and members of the Missisquoi River Basin Association plant trees to stabilize stream banks.

In the towns hugging Vermont Route 100 between Granville and Moretown, the Friends of the Mad River undertook a project to crystallize people's visions of what the oft-threatened Mad could, and should, be. The product was a conservation plan titled "The Best River Ever."

The project started in 1993 in response to plans by the Sugarbush ski area to build new snow-making ponds, which conservationists (and VNRC) opposed because the withdrawals would reduce stream flow below the recommended winter minimum. Local activists felt it would be productive to focus people's intense feelings not just on their fears for the river but on their visions of its possibilities.

Through that dialogue, says Rich Czaplinski, who was hired to help produce the conservation plan, "people became more aware of the cumulative effects of their own habits on the waterway, from a person allowing his driveway to erode, to logging done improperly. All those things add up to a sum total, and it shows up in the river, especially when it rains."

The group developed "issue papers" on such subjects as swimming, farming, the needs of wildlife and extracting gravel from the Mad River. Septic concerns, snow-making withdrawal, and even access to the river were addressed in the plan. In the end, "The Best River Ever" listed around 100 recommendations for safeguarding the Mad. The project also spurred the creation of a dozen stream teams to monitor sections of the 26-mile-long river and tributaries within its 143-square-mile watershed.

"The idea is to get people in contact with the river, to know it, learn about it and appreciate it," Czaplinski says. "A watershed organization inspires an intimacy between people and their stream that is really important."

But if the watershed movement has caught on reasonably well at the grassroots level in Vermont, acceptance at the governmental level remains piecemeal. According to Mike Kline, rivers program coordinator with the Vermont Department of Environmental Conservation, that's largely because funding to support monitoring and information gathering activities that could provide a basis for watershed management has been lean.

"The basis of our work is the state's water quality assessments," says Kline, "where we try to collect as much data as we can. We have a program to support lay monitoring in lakes. We also try to work with river monitoring groups and incorporate their data into our assessments, but there's no staff to support that. When it comes to the watershed approach, what is happening nationally we've also been trying to do here in Vermont, particularly identifying areas that are already healthy, determining how we can protect those areas, then starting from there and protecting the rest."

But protecting watersheds can be difficult, Kline says, because land use rules and zoning are a hard sell to Vermont's town governments, and the state's water classification regulations preclude discretionary interpretations by towns.

The Refusal

The big trout rose to your fly, and
backed,
still uplifting, downstream, then
turned
away, unfrightened. What

could he have seen
that told him
"*This is not real!*"

For after all, the light was right,
your body camouflaged,
the stream dappling your face

with sun and leaf-shadow,
and you stood quietly, the current
soft around you

the great sun swift all around you,
and your shadow drifted
soundless downstream,

and after all you must have seemed
only one particularity
among the gorgeous many.

These two poems are reprinted from Sinking Creek, *John Engels' new collection of poetry. Engels is a St. Michael's College English professor who enjoys casting his lines in Vermont's lovely rivers—and in his new book,* Sinking Creek, *published by The Lyons Press.*

In other realms of watershed protection, Kline says the department has been working to get the public involved with protecting riparian areas. "But again, we don't have a riparian coordinator on staff. Farmers I have worked with have been agreeable to developing buffers, but they have certain needs, like water for their cows and getting them across the stream to pasture. If you can meet those needs they don't mind. It's a slow process, but we're gaining some ground there."

Basically, Kline says, Vermont's environmental officials are not out of step with the watershed movement. But the state has not committed the resources to pursue that path. It's Kline's job to help local organizations get off the ground, but he's just one person with many other obligations. At a recent, regional meeting of environmental officials, Kline came face-to-face with several of the newly appointed basin team leaders from Massachusetts.

"It's a huge contrast to the resources Vermont has put into this," he says. "But I think it will become a greater priority in Vermont."

Higher Calling

And so it must be, says a former Vermonter, Sara Humphrey, now of the Seattle-based Rivers Council of Washington.

Humphrey acknowledges all the practical reasons for employing watershed management will reverse pollution: resolving societal conflict about the use of resources, and ensuring our survival upon the planet. She knows the aesthetic arguments, as well: the delight humans find, particularly in an increasingly urbanized society, in the beauty of clear waters, thriving, green stream banks and brimful river channels.

But more than for these reasons, says Humphrey, we must preserve the ecological health and sustainability of the watershed out of a sense of environmental ethics.

"It's an idea so profound and timely and constant that it bears repeating, because it hasn't permeated the mainstream of society," she says, "... the idea that we have an ethical responsibility toward the environment, an ethical obligation, and that we can use spiritual language to address it.

"That's the key about building relationships between people and their watersheds."

THE CLEAN WATER ACT:

Right Tool For The Job?

The 1972 federal Clean Water Act (CWA) has done wonders for the United States. Focusing on point-source pollution, it has enabled states to drastically reduce the discharge of untreated sewage and industrial waste into rivers and lakes. The CWA has also provided a framework for states to enact their own water rules.

But point-source pollution has been replaced as the major cause of surface water contamination by nonpoint-source pollution—a term enveloping a range of contaminants that are not directly discharged into the water but find their way into streams, rivers, and lakes nonetheless. These include chemical agriculture and lawn-care products, contaminated run-off from streets and parking lots, animal wastes, road salt and sand, and mercury borne by the atmosphere from power plants. Soil erosion is also considered a form of nonpoint-source pollution. Further degradation of waterways and aquatic ecosystems results from dams, extraction of water for irrigation, snow-making and other purposes, and streamside industries that alter flow and/or change water temperature.

Can the Clean Water Act address these problems, too? And as state agencies and citizen organizations move to a watershed-management approach to conservation, do we need to change our legal framework to give them the tools for effective action?

Karen Sheldon, an associate professor at the Vermont Law School specializing in environmental matters, says no; present law explicitly provides the authority for federal and state agencies to implement watershed management techniques.

"The Clean Water Act has provisions for river-basin planning," she says, "but they have largely languished for lack of resources, money, and implementation."

Some advocates now promote implementing these provisions of the Clean Water Act. VNRC's Water Program Director, Chris Kilian, has been leading a Vermont coalition urging the state and the Environmental Protection Agency (EPA) to reinvigorate watershed-based planning and coordination of regulatory programs.

The tools are available in the Clean Water Act," says Kilian. "Vermont and EPA should be leaders in updating and implementing watershed plans and programs."

Authors Bob Doppelt, Mary Scurlock, Chris Frissell and James Karr, whose book *Entering The Watershed* is something of a Bible for watershed advocates, want to amend the Clean Water Act. The language they offer would state explicitly the goal of restoring "the natural biological integrity of riverine-riparian ecosystems and biodiversity."

But besides shoring up the CWA, they propose enacting a National Watershed Registry, which would in turn support new "Watershed Restoration Action Plans," or WRAPs, at the state level. As envisioned in the book, WRAPs could be used to develop comprehensive, statewide hydroelectric plans written with maintaining water quality as a foremost objective. A watershed's place on the proposed national registry would provide enough clout for states to deny water quality permits for hydroelectric facilities seeking license renewals by the Federal Energy Regulatory Commission (FERC). That could lead to removing dams that are harming aquatic ecosystems.

Sheldon, at the Vermont Law School, says states can already use the big sticks provided by the CWA on a watershed basis. Massachusetts, which now coordinates it point-source discharge permits through watersheds, is an example. A similar watershed opportunity exists with another CWA provision, "total maximum daily load" (TMDL) of pollutants.

It is a regulatory version of saying "enough is enough." Under this provision, if a body of water or stream segment continually fails to meet water quality standards, regulators are directed to figure out what the TMDL is for that waterway and crack down on all sources of pollution, even licensed ones, until it is met.

"But when you get to that situation it means something has gone awry," says Sheldon, "and it's usually on the nonpoint side."

Precisely where the Clean Water Act must be more aggressively implemented to be effective.

How to THINK Like a *Watershed*

By Jim Northup, VNRC

At a recent Vermont conference on watersheds, the conference organizer was overheard asking a participant to name the watershed in which he resided. The man answered that he was not from any watershed.

The organizer politely explained that we all live in one watershed or another.

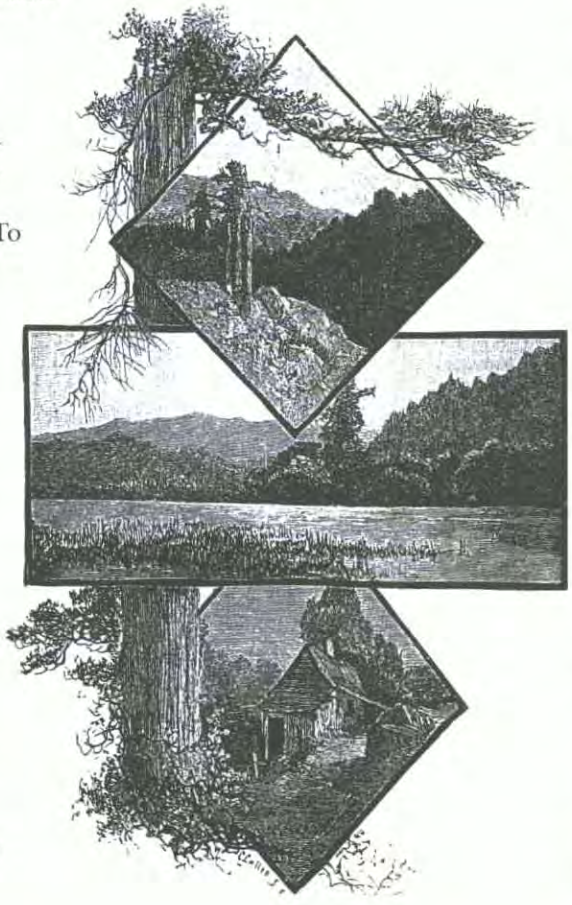
"No," the man replied, "it is you who does not understand. I know I don't live in a watershed because my driveway does not even have a culvert under it."

The culvertless man made a common mistake—thinking like a machine. He and most of us are used to seeing the world as a collection of pieces (culverts, roads, parking lots) and linear processes (raw material to product to scrap pile). To think like a watershed is to think in wholes rather than pieces, to think in circles rather than lines, and to see relationships as webs rather than chains. From a mechanistic view, the sum of the pieces equals the whole. When we have a watershed view, the whole is greater than the sum of the pieces.

How do we promote whole and healthy watersheds? Multiple ownerships and political jurisdictions, and the diverse, sometimes-competing uses of land and water complicate matters. In addition, people's lives are often far removed from the water that sustains them.

Some guiding principles on how to think like a watershed may help.

The principles that follow can help us begin to think like watersheds — and to act in their behalf. The first three principles are based on the fundamental laws of ecology described 25 years ago by Barry Commoner. The others are based loosely on the ideas of systems thinkers such as Peter Senge, Donella Meadows, Aldo Leopold, Lewis Mumford and Donald Michael.



Seven Principles on How to Think Like a Watershed

Principle 1: Everything is connected to everything else.

A watershed is like an organism; it is a system made up of parts that work together to carry on the various processes of life. A watershed's organs—or parts of the system, include soil, water, air, bacteria, plants and wildlife, and people. The health and sustainability of the watershed depend on the health of the individual organs, and the integrity of the relationships—ecological, economic and social—among the organs. In order for any of the pieces of the watershed to be healthy, all of the other pieces and all of the relationships among the pieces must be healthy.

The water quality of Lake Champlain illustrates this principle. In recent years we have learned that efforts to improve and protect the lake's water quality cannot be confined within the lake's shores. Our work must also extend to our homes, businesses, backyards, farms, parking lots, forests, streams, mountain tops, tax policies, consumer purchases, and life-style choices.

Principle 2: Nature knows best.

The relationships among the parts of a healthy watershed can be thought of as organic—interconnected and resembling those of a living organism. In order for human actions to be good for a watershed, they too must be organic and imitate the structure and patterns of natural systems.

For example, sustainable harvests of individual trees and small groups of trees tend to be good for the system because they mimic natural processes. Large-scale liquidation cuts and aerial spraying of herbicides tend to be bad for the system because they do not.

Principle 3: Everything must go somewhere.

By their nature, organic patterns are contained within larger patterns. If an action is truly good, it will be good for and preserve the integrity of the watershed as well as the larger patterns that

contain it — river system, bioregion, and the earth. If an action is bad at the backyard, parking lot, or watershed levels, it will be bad at all levels.

There are many examples of issues that arise from forces external to local watersheds: acid precipitation originating in the mid-west; harmful logging or farming practices resulting, in part, from a tax and economic system that does not sufficiently reward long-term stewardship; and excessive logging caused by wasteful use of paper and other wood products.

Principle 4: Beware of symptomatic solutions.

Today's problems often come from yesterday's solutions that responded to the symptoms of a problem, not the fundamental causes. Symptomatic solutions tend to have short-term benefits at best; hide the real causes of the problem until it is too late; create new problems of their own; and lead to long-term dependency. Long-term solutions not only deal with the underlying causes of a problem, but also, according to Donella Meadows, "strengthen the ability of the system to shoulder its own burdens."

Building fish hatcheries in order to place fish in degraded habitats where they have little chance of survival and reproduction is a good example of a symptomatic solution that doesn't work. Research has shown that hatcheries can be ineffective, unsustainable, genetically harmful to wild fish populations, cause overfishing of wild populations, hide the effects of habitat degradation, and are responsible for diverting resources from habitat restoration—the only true, long-term solution.

Principle 5: Avoid analysis paralysis.

Systems are more complex than we can possibly understand. The more we learn about them, the more we realize how little we know. When dealing with complex systems, people sometimes think they need more information before they can act. Collecting more information will help in the long run, but it should not delay actions that are clearly consistent with and reinforce healthy relationships in the system. The long-term consequences of delaying action until "all the facts are in" or until serious problems appear could be disastrous.

The Vermont Legislature's enactment of a moratorium on the aerial application of herbicides on forestland provides a good example of prudent and decisive action in the face of incomplete information. The decision recognized the complexities and mysteries of forest ecosystems, and the potential risks associated with herbicides, especially when sprayed from the air. No additional studies were needed to indicate that present risks and uncertainties were unacceptable.

Principle 6: Focus on relationships, not boundaries.

What is important to focus on in a watershed are the relationships, not the watershed boundaries. The watershed approach looks at the pieces and interrelationships within the boundary as a system. By renewing and reinforcing healthy relationships among the pieces, the system will grow organically and will organize itself into an integral whole. A healthy watershed will emerge as manifestations of those relationships.

Board member Peter Zilliacus joined an energetic work team at North Beach Park on Earth Day.

For example, a local group may not have thought about the watershed as a system, while caring deeply about a local swimming hole. As they work to maintain high water quality at and public access to their favorite spot, they will learn that the swimming hole is hitched to all the other pieces of the watershed and dependent on its relationships with those pieces (Principle 1). Their love for a local swimming hole could grow into a campaign to: secure long-term public access; maintain buffer and filter strips along the stream; fence livestock away from the stream; and maintain undeveloped open space in the headwaters.

Principle 7: Do small things with great love.

Understanding the complexity of systems and the enormous challenges we face in creating and sustaining healthy systems can create feelings of powerlessness and hopelessness. Mother Theresa once said that "We cannot do great things, we can only do small things with great love." We must do what we can to know and love our families, communities, and watersheds. The many small, individual efforts will make a big difference.

Individuals can do many small, important things for their watersheds: join or form a local watershed group; plant a tree to stabilize a stream bank and shade the water; set aside—don't log or plow—the strip of land adjacent to a stream or lake; properly dispose of household toxic chemicals; repair automotive leaks; reduce water consumption; form a cooperative of adjacent landowners committed to sustainable forest practices; volunteer to monitor water quality in local streams; report water quality threats and problems; and most of all—think like a watershed.

Although the examples listed above relate to water, thinking like a watershed can help us make better decisions about many aspects of our lives. Thinking like a watershed—relationships not pieces, circles not lines, webs not chains—may help when making decisions about proposed developments, town meeting articles, investing money, purchasing goods and services, and voting for elected officials.

Get Active in Your Watershed

Battenkill, Walloomsac, Hoosic

Hoosic River Watershed Assn.
James Winchester
P.O. Box 22
Pownal, VT 05261
(802) 823-5258

The Battenkill Conservancy
G. Dick Finlay
P.O. Box 766
Manchester, VT 05254-0766
362-1913

Friends of the Battenkill
Tim Williams
P.O. Box 23
Arlington, VT 05250
375-6119

Bennington County
Conservation District
Shelly Stiles
P.O. Box 505
Bennington, VT 05201
442-2275

Poultney, Mettawee

Friends of the Poultney River
Joanne & David Calvi
20 Washington Street
Fair Haven, VT 05743
265-8032

Poultney River Watch
Mary Jeanne Grove
RR 2, Box 1371
Poultney, VT 05764
287-2058

Poultney-Mettawee Natural
Resource Conservation District
Marli Rupe
P.O. Box 209
Poultney, VT 05764
287-5841

Otter Creek, Little Otter Creek, Lewis Creek

Otter Creek Audubon River Watch
Heidi Willis
P.O. Box 433
E. Middlebury, VT 05740
388-9207

New Haven River Anglers
Association
Pete Diminico
305 Meehan Road
Bristol, VT 05443
453-3899

Lewis Creek Association
Linda Henzel
725 Economou Road
Huntington, VT 05462
434-4113

The Watershed Center at
Little Otter Creek
P.O. Box 96
Bristol, VT 05443
453-6346

Green Mountain Fly Tyers Club
Charles A. Whitehair
205 North Church Street
Rutland, VT 05701

Addison County Monitoring
Collaborative
Linda Henzel
434-4113
(see Lewis Creek Assn.)

Otter Creek Natural Resource
Conservation District
Route 7 South
RD 4, Box 1302
Middlebury, VT 05753
388-6746

Lower & Upper Lake Champlain, LaPlatte, Mallets Bay

Lake Champlain Basin Program
Dayle Ann Stratton
P.O. Box 204
54 West Shore Road
Grand Isle, VT 05458
372-3213

Missisquoi

Missisquoi River Basin Association
Cynthia Scott
12 Canada St., Suite 3
Swanton, VT 05488
868-5304

Missisquoi River Keepers
Homer St. Francis Jr.
P.O. Box 276
Swanton, VT 05488
868-2559

Franklin County Natural Resource
Conservation District
1 Valley Crossroads
St. Albans, VT 05478
524-6505

Lamoille

Lamoille River Anglers Association
Summer Stowe
The Fly Rod Shop
P.O. Box 960
Stowe, VT 05672
253-7346

Lamoille County Natural Resource
Conservation
District & Nature Center
Debby Lehouillier
109 Professional Dr., Suite 2
Morrisville, VT 05661-8524
888-9218

Winooski

Friends of the Winooski River
David Braun
11 Bailey Ave.
Montpelier, VT 05602
229-1443

Friends of the Mad River/
Riverwatch
Kinny Connell
P.O. Box 255
Waitsfield, VT 05673
496-3437

Mt. Mansfield River Watch
Bill Butler
P.O. Box 31
Jericho, VT 05465
899-2088

White

White River Partnership
David Boyer
15 Park Street
Randolph, VT 05060
728-6026

Ottauquechee, Black

So. Windsor County Regional
Commission
Becky Basch
The Ascutney Building,
P.O. Box 320
Ascutney, VT 05030
674-9201

West, Williams, Saxtons

Stratton Area Citizens Committee
Bill & Betsy Uptegrove
P.O. Box 351
West Townshend, VT 05359
874-4374

West River Watch
Deb Smith
Bonnyvale Environmental Ed. Ctr.
P.O. Box 2318
Brattleboro, VT 05303
257-5785

West River Watershed Association
Melissa Reichart
Windham Regional Planning
Commission
139 Main Street
Brattleboro, VT 05301
257-4547

Deerfield

Green River Watershed
Preservation Alliance
Steven Lembke
273 Jacksonville Stage Rd.
Brattleboro, VT 05301
254-4813

Lower & Upper CT River, Mill Brook, Nulhegan, Willard Stream

Connecticut River Watershed
Advisory Commission
Nat Tripp
RFD 3, St. Johnsbury, VT 05819
748-8406

Conn. River Watershed Council
George Lord
P.O. Box 538
Norwich, VT 05055
(802) 649-1809

Connecticut River Joint
Commission
Sharon Francis
P.O. Box 1182
Charlestown, NH 03603
(603) 826-4800

Stevens, Wells, Waits, Ompompanoosuc

Friends of the Ompompanoosuc
Donna Nelson
RR 1, Box 374D
Thetford Center, VT 05075
785-4369

Passumpsic

Passumpsic River Watch
Alan Boye
57 Lafayette Street
St. Johnsbury, VT 05819
748-2570

Caledonia Nat. Resource
Conservation District
Jeane Dedam
748-3885 Ext. 110

Passumpsic River Network
Tim McKay
Federal Building, Rm. 216
26 Main Street
St. Johnsbury, VT 05819
748-3885 Ext. 110

Passumpsic Valley Land Trust
Dotty Weinstein
P.O. Box 624
St. Johnsbury, VT 05819
748-3701

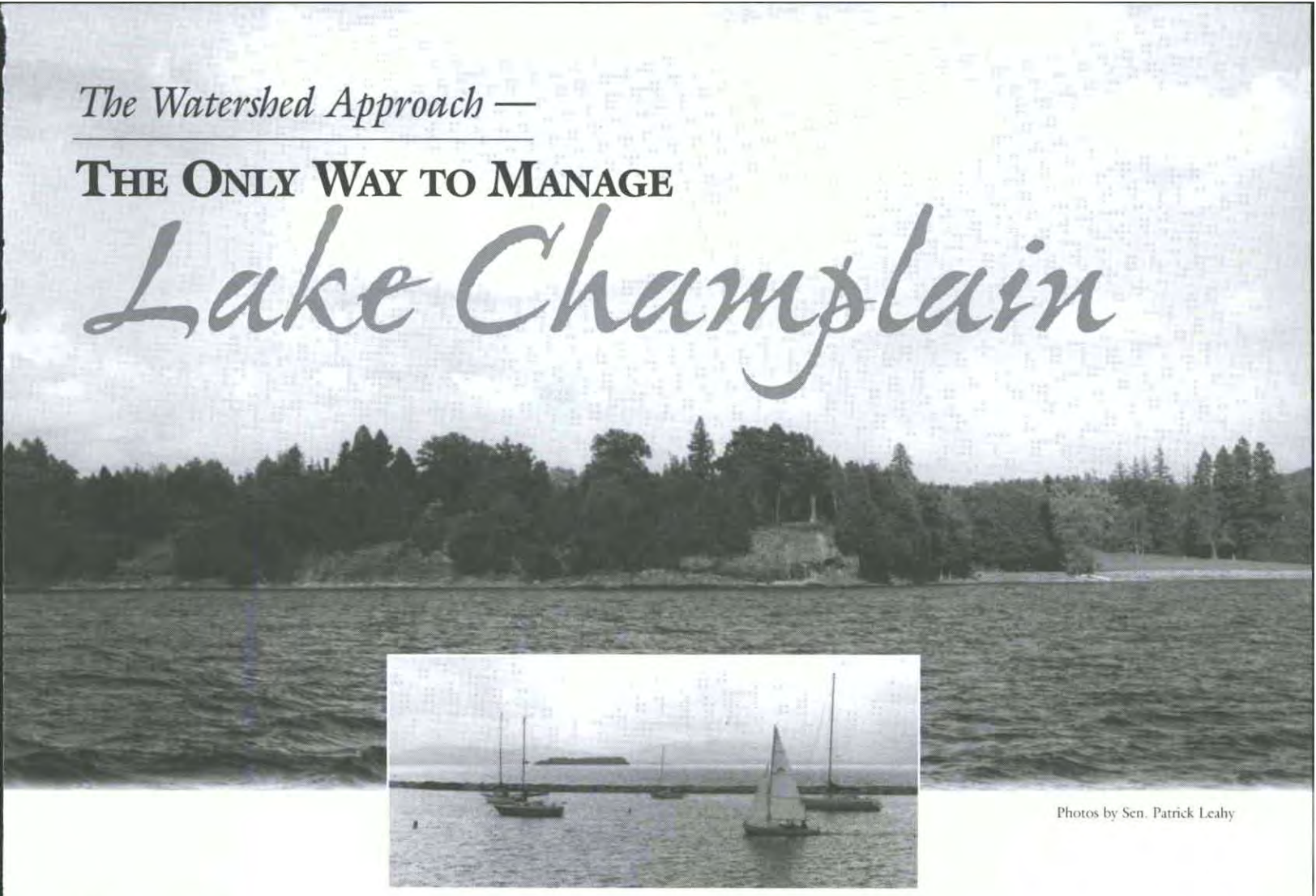
Lake Memphremagog, Black, Barton, Clyde, Coaticook

Lake Memphremagog Watershed
Association
Kevin & Karen Coffey
HCR #65, Box 1000
Route 14
Irasburg, VT 05845-7901
754-2254

list continued on page 27

The Watershed Approach —

THE ONLY WAY TO MANAGE Lake Champlain



Photos by Sen. Patrick Leahy

by Mary C. Watzin
School of Natural Resources, University of Vermont, and Chair of the Technical Advisory Committee to the Lake Champlain Management Conference from 1991 to 1996 (now the Lake Champlain Steering Committee)

Have you ever stood on the shores of Lake Champlain and gazed back towards the land surrounding you? If you have, you probably noticed that Lake Champlain sits in a "bowl" between the Green Mountains in Vermont and the Adirondacks in New York.

There are more than 8,000 square miles of land that drain into Lake Champlain—land stretching from Enosburg Falls, Hardwick, and Danby in the east to Ellenburg Center, Clayburg, and Lake Placid in the west. (See map on page 18.) About 90% of the water in Lake Champlain falls first on this land. Every time it rains, the water falling on the land runs gradually downward to the Lake—over and through parking lots, clusters of homes, and agricultural fields.

Very directly then, the water quality of Lake Champlain reflects the land that surrounds it. As the water runs over the land and into the streams and rivers that drain the basin, it picks up some of the materials it encounters. Rain falling on suburban lawns picks up fertilizer, pesticides, and pet waste. Rain falling on farms picks up soil and manure. Rain falling on roads and parking lots picks up oil, grease, and other contaminants, such as transmission fluid.

Loose soils are very easily eroded. These soils, and pollutants associated with them, are carried with the water down to the lake. That is why construction sites, recently cut forestlands, tilled fields, and other worked land are especially worrisome to resource managers.

Lake Champlain contains too much phosphorus. Phosphorus is an essential nutrient for plants, but when too much of it enters the water, it causes too much plant growth. In Lake Champlain we see this as annoying green algae blooms that discourage us from recreating on the lake in the summer. These algal "blooms" can eventually deplete the lake of sufficient oxygen when the algae die and decompose—this harms fish and other lake dwellers.

We estimate that most of the phosphorus in Lake Champlain—70%—comes from land run-off. The remaining 30% comes from sewage treatment plants and other direct pipe discharges into the lake or its tributaries. As such, we can never solve the water quality problems of Lake Champlain by working only on sewage treatment plants. We must also change our use of land so that less pollution is carried from the land into the lake.

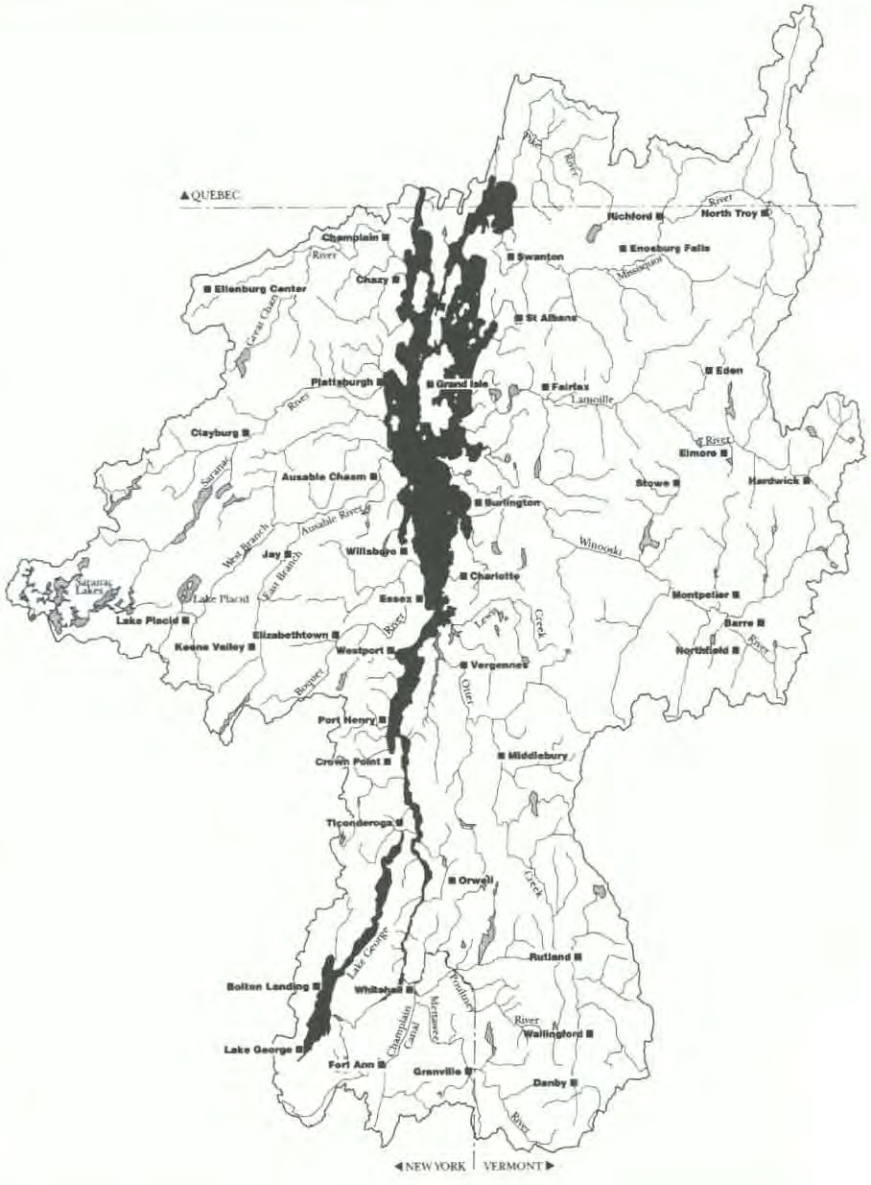
Were you aware that an acre of urban or suburban land produces much more phosphorus than an acre of farmland? In part, this is because water rushes more quickly to the streams when it falls on asphalt and other solid surfaces than when it can percolate through the soil. If we convert Vermont's working agricultural landscape to more developed land uses, we will lose a bit of our heritage and we

may exacerbate our water quality problems.

There are some areas of Lake Champlain that contain other pollutants—such as mercury, trace metals, and organic chemicals. For example, Inner Burlington Harbor sediments reflect a history of contamination from stormwater run-off, industrial activities, and the city's sewage treatment plant. Some of these pollutants can be accumulated by fish and harm other living creatures. Moreover, too much soil or sediment in the water reduces light penetration and falls in the shallow water areas around the perimeter of the lake. Shallow water areas are particularly valuable habitat for many fish, birds, and other wildlife.

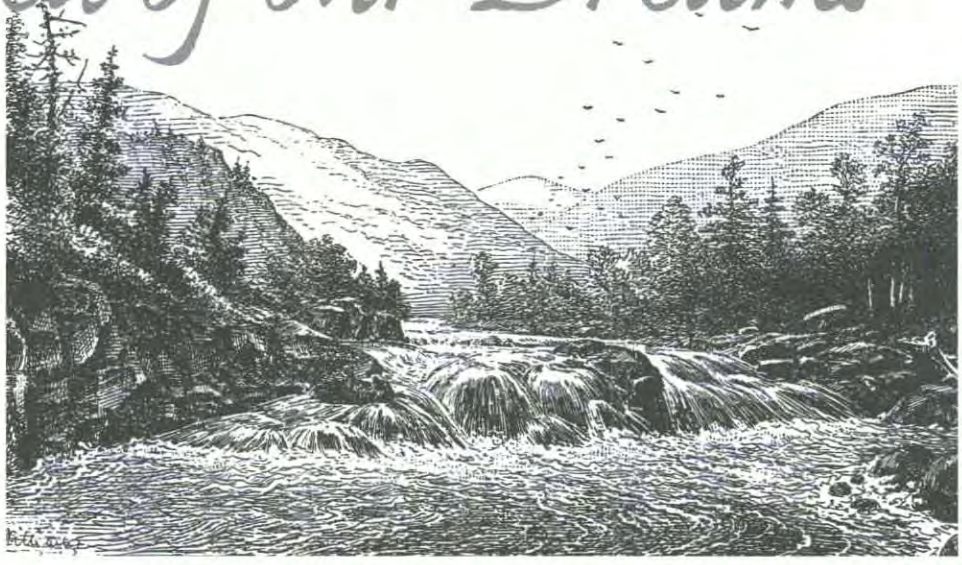
One of the single, greatest contributions residents of the Lake Champlain Basin can make to a healthier lake is wise decisions about managing their land. Everything you put on or spill on the land has the potential to end up in the lake. Stewardship of the land is the best possible strategy for protecting Lake Champlain.

There are more than 8,000 square miles of land that drain into Lake Champlain – and about 90% of the water in Lake Champlain falls first on this land.



It's Wild — It's the *Watershed of our Dreams*

By Christopher Kilian, VNRC



Can you imagine a wild Vermont river? Not a river that we might consider to be wild—rather, a river that is truly wild.

What is the image conjured up in our imaginations: Crystal-clear water that is clean enough to drink out of cupped hands, a raging waterfall, lush vegetation along the streambank, birds, beavers and other wildlife, and abundant brook trout and salmon.

This wild river is the outgrowth of numerous untouched rivulets, springs,

brooks, wetlands, ponds and lakes creating a web of dynamic water movement. Our wild, concocted image of the river is probably placed in a broader context of surrounding wilderness. Maybe our imaginations even provide a physical sense of memory of the long and rewarding hike to reach this river through forested wilderness, free of human imprints.

Indeed, wild rivers such as this one in our imaginations cannot exist without surrounding wildlands. That is because wildlands create the wild river. Regrettably, this is a river only in our dreams — there are no rivers in Vermont today that resemble this imaginary wild river.

Every single Vermont stream, river, lake, and wetland is changed by human activities. All of these waters are polluted by toxic metals and acid precipitation from air pollution; we have directly damaged our waters by channelizing, damming, draining, or diverting them.

Yet the vast majority of Vermont waters are affected by the wide range of human activities that occur on the lands surrounding these waters. These include: Building roads and parking lots; developing commercial, residential, and industrial properties; farming; logging; withdrawing water and creating dams; and everything else we do.

Simply put, our actions in upland areas change the streams that flow through and drain these lands. We directly affect the ecological health of the waters and, in turn, our ability to use them. That is why an approach to resource protection based on the watershed — in its entirety — makes such good sense.

What is a watershed? The interconnected area of land and waterways defined by a common catchment area is a "watershed" or "basin." Watersheds are a mosaic of different lands that are connected by a vibrant network of streams and wetlands. The condition of these waters directly affects the condition of the whole watershed.

Watersheds provide an ecologically discrete area upon which to base policies and decisions affecting the health of ecosystems and communities. In the seminal work *Entering the Watershed: A New Approach to Save America's River Ecosystems* (Island Press, 1993), authors Doppelt, Scurlock, Frissell, and Karr, note that, "The degradation of America's riverine systems, and the depletion of their biodiversity, have reached alarming levels. The problems affect the smallest streams to the largest rivers and all forms of riverine-riparian biodiversity. Not one river system in the United States has been spared."

Unfortunately, the agencies in Vermont charged with protecting water — the Agency of Natural Resources, Water Resources Board, and U.S. Army Corps of Engineers — have not in the past considered watershed-wide approaches. Instead, pollution and water uses have been evaluated on a case-by-case basis, and primarily from an end-of-the-pipe perspective. Efforts to curb water pollution have relied mainly on technological controls. As a result, thousands of miles of Vermont rivers and streams and tens of thousands of acres of lakes and ponds do not meet minimum water quality standards under the Clean Water Act.

As a result, thousands of miles of Vermont rivers and streams and tens of thousands of acres of lakes and ponds do not meet minimum water quality standards under the Clean Water Act .

Despite this historic neglect, there are opportunities to begin protecting clean water from a watershed perspective. The 1972 federal Clean Water Act includes important provisions that have long been ignored. In particular, provisions of the Clean Water Act on water quality management planning require States to prepare comprehensive watershed plans that include inventories of activities that cause water pollution, regardless of the source (including run-off). States are required to develop programs to control all water polluting activities and to implement these programs in the planning process.

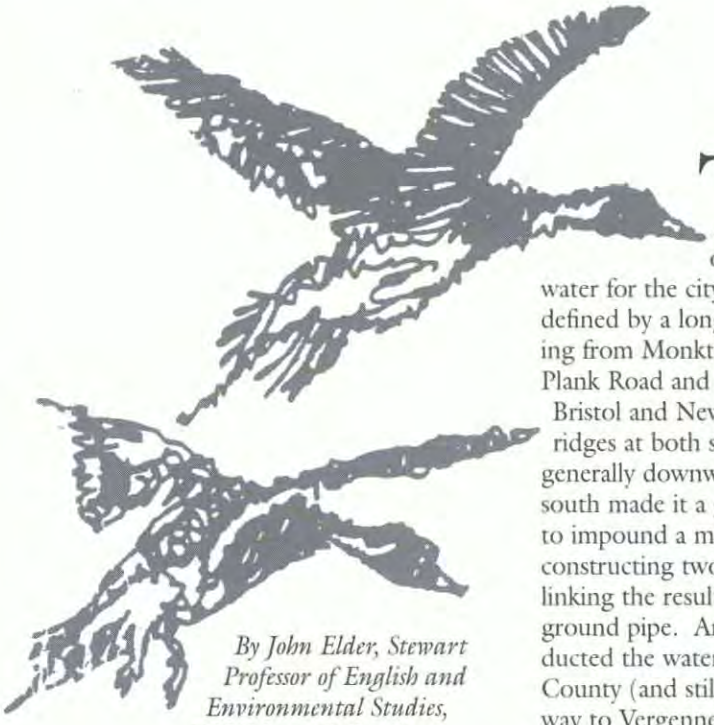
Like many states, Vermont prepared Clean Water Act watershed plans in the mid-late 1970s. Plans were prepared for 16 major river watersheds and Lake Champlain. In addition, the State prepared 5 state-wide management plans to deal with polluted runoff. However, none of the plans has been updated and all of them are now out of date—some more than 20 years old.

Vermont must change this situation. Without watershed plans, complicated water pollution problems cannot be resolved. VNRC recently called for the State to develop a schedule for updating all of its watershed plans within three years. To be effective, the plans must be based on a holistic view of watersheds that recognizes the interrelationship between activities on land and water quality. The State needs to comprehensively assess polluting activities and create programs to control pollution.

We need a new approach to addressing ecosystem health that recognizes our place in the watershed—and Vermont should be a leader in responding to water pollution from this perspective. Wouldn't it be wild if we could experience a truly wild river in Vermont once again?

WATERSHEDS AND THE WATERWORKS

Bristol Area Sets a Fine Standard



By John Elder, Stewart Professor of English and Environmental Studies, Middlebury College (see page 26 for a review of John's recent book, Reading the Mountains of Home.*)*

The following was prepared by John Elder for "Voices of the Land: An Introduction to Waterworks," a report by students of his community-based ecology seminar at Middlebury College, Jill Hindle, Loren McClenachan, and Martha Sandstead.

John explained that, "Waterworks uses peoples' energy when they have the chance—we're trying to go low maintenance." Still, the goals of Waterworks are ambitious: land conservation (much has been accomplished already), education, and recreation. John has connected projects developed by his students to local schools to help teachers explore watershed protection with their students. For example, his students have prepared reports, constructed trails and educational materials, and have improved the property for birding expeditions.

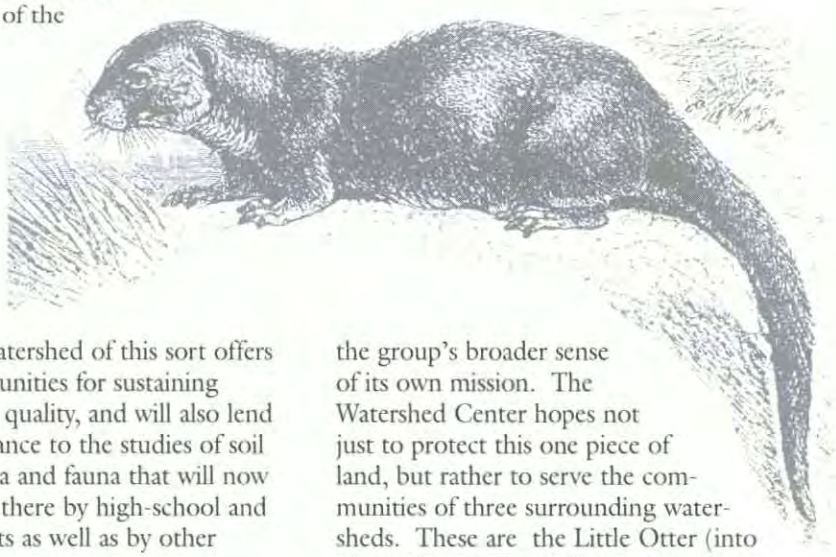
John Elder serves on the Board of Directors of Waterworks on its education committee.

The Waterworks is a 664-acre piece of land in Bristol that once supplied the drinking water for the city of Vergennes. It is defined by a long, narrow valley, extending from Monkton at its northern end to Plank Road and the boundary between Bristol and New Haven. The dramatic ridges at both sides of this valley and its generally downward slope from north to south made it a good place for Vergennes to impound a municipal water supply, by constructing two earthen dams and by linking the resulting ponds with an underground pipe. Another line of pipes conducted the water west across Addison County (and still largely downhill) all the way to Vergennes.

Preserving this land for recreational and educational use by the surrounding communities was the first big project of a local group calling itself the Watershed Center. That name was inspired in part by the Waterworks property, since it constitutes practically the complete watershed of Norton Brook. This means that almost all of the land that drains into that brook, from the ridgeline down, is included in the Waterworks boundaries. A protected watershed of this sort offers unique opportunities for sustaining environmental quality, and will also lend special significance to the studies of soil and water, flora and fauna that will now be carried out there by high-school and college students as well as by other researchers.

Early on in the effort to preserve this land, it was often referred to simply as the Watershed. In deciding upon the Waterworks as its official name, members of the Watershed Center wanted to make a couple of points. They wanted to emphasize the interesting history of land-use here, as well as to respect the way people living near the property had long referred to it. Human history and natural history were always understood as connected here, and there was never a desire within the new organization to set up any sort of highly restricted reserve. Indeed, since the Waterworks was already a de facto park for the region, the members of the Watershed Center wanted to allow for the widest possible range of traditional uses. The firing range at the entrance did have to go, because of its obvious conflict with planned educational programs. But there is an ongoing effort to accommodate hunting and snowmobiling to the extent that they can be practiced compatibly with educational uses of the land and with other forms of recreation such as hiking, skiing, and nature study.

The second main reason for distinguishing the name of the property from that of the organization has to do with the group's broader sense of its own mission. The Watershed Center hopes not just to protect this one piece of land, but rather to serve the communities of three surrounding watersheds. These are the Little Otter (into which Norton Brook flows), the New Haven, and the Lewis Creek Watersheds. They encompass, entirely or in part, the communities of Charlotte, Ferrisburgh,



Vergennes, New Haven, Starksboro, Monkton, and Lincoln, as well as Bristol. The ridgelines, slopes, drainages, and streams of these watersheds define a natural domain, rather than a politically established unit. They help us to pay closer attention to the specific features of our place on earth, and to explore what it would mean to live in a more locally responsible and sustainable way.

The Waterworks property is big enough, diverse enough in its geology, and rich enough in its plant and animal life to make it a wonderful place for studying the natural character of our little corner of Vermont. But its purpose is not to become a regional "nature center" in any separate or unique way. Rather it will be a place for developing educational, recreational, and conservation approaches that might be applied even more locally in the surrounding communities. The Watershed Center also hopes to contribute, in ways that go far beyond either the Waterworks property itself or the programs developed there, to the social, economic, and environmental health of our region.

The long-term goal of the Watershed Center is to promote more effective energy conservation, more vital economies, and a more vivid appreciation of community throughout the towns of the Little Otter, New Haven, and Lewis Creek watersheds. Such an ambition relates to a further meaning of the term watershed — as a crucial moment in the course of events, when choices may be made that will broadly influence the future life of a community. Protecting the Waterworks means that one of the most significant open spaces in northeast Addison County will now remain open for public use. But it also means the beginning of an effort to celebrate and enhance the human and natural communities throughout our region.

CABOT TELECOMMUNICATIONS ORDINANCE

By Nikki Parker

Cabot's tower ordinance is being heralded as perhaps the first in the state, but the need for an ordinance originated with a frightening discovery. One morning last summer, Dale Newton found surveying spikes in the sugar maples he and his wife Janet tapped.

Only by questioning their neighbor did the Newtons find out they would be tapping right up to the chain-link fence surrounding Bell Atlantic Mobile's 120-foot cellular phone tower planned for Thistle Hill.

Almost immediately, the Newtons and nearly 60 area residents formed the Thistle Hill Neighborhood Alliance (THNA), petitioning the town for a tower ordinance to allow the town to site these facilities.

The new telecommunication tower law, signed by Gov. Howard Dean this April, 1998, allows towns a six-month moratorium to adopt a tower siting ordinance. While the law was still being debated by the Legislature, Cabot voters had already approved a tower ordinance at Town Meeting in a vote of 191-107.

Gary Gulka, Cabot planning commission chair, said the commission had to start out with no knowledge of towers. The commission met almost weekly last fall over a period of six months, extracting key elements from sample ordinances of other New England states, which were provided by THNA.

"We had absolutely no one to turn to," Gulka said of the state. "I felt very frustrated that we had absolutely no help... Look at our surrounding towns, they don't seem to be that concerned.

"They have the breathing room we never had," Gulka said. "Some of us have been the guinea pigs."

Cabot's tower ordinance is longer than all of Cabot's zoning bylaws combined, but the ordinance had to be closely defined in order to pass muster with the incoming industry, Gulka said.

While the commission was working on the language of the ordinance, no one knew whether or not the ordinance would affect the tower application. Bell Atlantic Mobile's application for the tower was eventually dismissed due to a technicality, which was noticed by a lawyer hired by THNA. BAM has not re-submitted an application, but has not given any indication of giving up either.

Gulka said commissions, zoning boards and select boards need to know what is in the future for wireless technology in Vermont.

"There are plenty of areas that need to be fine-tuned," Gulka said of Cabot's ordinance. "But we've got something and it's not a bad start."

HOW CAN THE MODEL FIT YOUR NEEDS?

To find out more about the model ordinance, and to speak with people who can describe how to create one for your community, contact:

Karen Horn
Vermont League of Cities and Towns
12 1/2 Main Street
Montpelier, VT 05602
(800) 649-7915 or 229-9111

A Strong Year for the Environment

1998 Legislative Report

By Stephen J. Holmes and Luke O'Brien

The Vermont Legislature closed the second half of the biennium this spring with a host of environmentally friendly bills. Following last year's impressive performance, the legislature continued to forge ahead with progressive policies aimed at protecting Vermont's environment, making it one of the most successful bienniums in recent history. Although burdened with election year politics, we saw the Legislature stand firm on the "heavy cutting" law and its commitment to Act 60 (the Equal Education Opportunity Act), while passing landmark legislation aimed at mercury contamination and a downtown development bill.

The 1998 legislative session addressed a number of top priorities of the Vermont Natural Resources Council (VNRC): growth centers and sprawl; landowner liability reform; telecommunication tower regulation; mercury contamination; and factory farms. Here's a short list of conservation issues moved forward this year.

Mercury Pollution

The mercury bill sets a national precedent for the disposal of products that contain mercury. Part of an effort to increase awareness of the effect of mercury contamination on human and animal populations and our environment, the bill mandates that manufacturers of mercury-added consumer products label them accordingly and that consumers dispose of these products properly through source separation and recycling.

The bill also contains language that requires solid waste management districts to implement collection programs no later than June 1, 1999.

The legislation provides support for municipalities and consumers through creation of a public information program to be designed and disseminated through the Agency of Natural Resources and the Department of Health in collaboration with municipalities and solid waste districts.

An advisory committee on mercury pollution is established to recommend how Vermont, in coordination with other states, can best address mercury contamination and handling, and thus minimize mercury pollution and related public health risks.

For more information on mercury pollution, see page 25.

Telecommunication Towers

Following the Legislature's move last year to extend Act 250 jurisdiction to towers over 20 feet in height, the 1998 Legislature enabled municipalities to establish stand-alone ordinances regulating the placement, construction, and ultimate decommissioning of telecommunications facilities. In addition, there are provisions in the bill for posting a bond to facilitate decommissioning and dismantling.

The bill allows a community to enact a one time, six month moratorium on all tower permits while they are developing and implementing zoning regulations. Provision is made for communities to receive assistance from the Vermont attorney general in defending the imposition of the moratorium. In addition, towns may write into their zoning regulations procedures to have the tower applicant pay for an independent technical review of the application.

The preemption of local and state authority over tower siting has been an issue of considerable concern since the passage of the Federal Telecommunications Act of 1996—a law that authorizes the creation of a seamless network of cellular service nationwide and severely limits the powers of state and local governments.

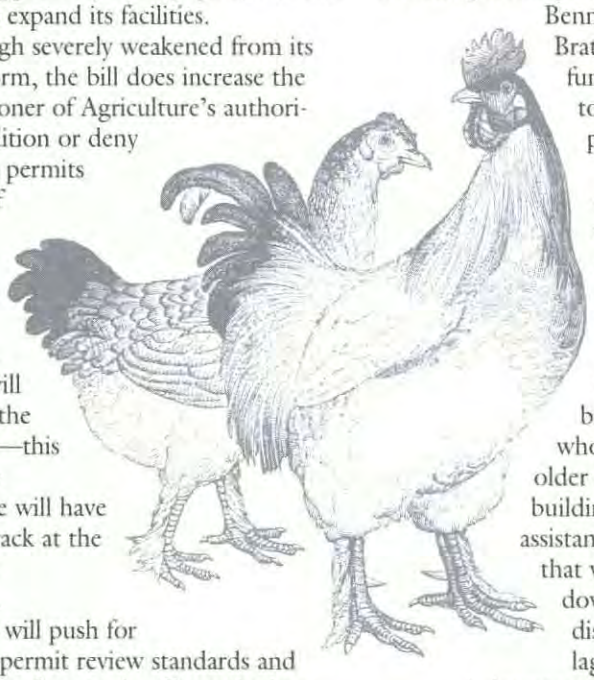
See page 21 for an article exploring

how a local community—the Thistle Hill Neighborhood Alliance—prepared a tower ordinance for Cabot.

Factory Farms

The "large farm bill" partially fulfilled VNRC's goal of increasing the review of factory farming operations and minimizing their possible environmental effects. It will give some relief to residents living near the egg factory in Highgate, which is seeking to expand its facilities.

Although severely weakened from its original form, the bill does increase the Commissioner of Agriculture's authority to condition or deny large farm permits because of odor, traffic, noise, insects, and pests. The law will sunset by the year 2000—this means the Legislature will have another crack at the issue next biennium.



VNRC will push for expanded permit review standards and appeal rights for people affected by large factory farm operations.

Landowner Liability

After nearly two decades of failed attempts, the Legislature finally reformed Vermont's landowner liability law. The landowner liability bill clarifies language in current law, and is intended to encourage private landowners to open their lands to public use by limiting landowners' liability to lawsuits that might be brought by recreational users.

The most important part of the bill is the new standard for an owner's liability —"willful and wanton misconduct." The new law's key sentence reads: "An owner shall not be liable for property damage or personal injury sustained by a person who, without consideration, enters or goes upon the owner's land for a recreational use unless the damage or injury is the result of the willful or wanton misconduct of the owner."

Downtown Development

The so-called "downtown bill" is an effort to reinvest in the state's once thriving downtowns and curb the detrimental effects of sprawl. The legislature created a fund, capitalized with $400,000 in the first year, which cities and towns can access for grants to assist with transportation capital projects and other downtown improvements. Several communities, including Burlington, St. Johnsbury, Bennington, and Brattleboro are eyeing the fund to help with downtown parking garage projects.

The bill provides qualifying communities with a number of competitive-based financial incentives. These include redevelopment incentives in the form of tax breaks for businesses who want to restore older or historic downtown buildings, and technical assistance to communities that want to reinvest in downtown development districts and historic village centers.

A downtown development board will be established to oversee the dispersement of grants and assistance, and the implementation of the law around the state.

The bill also includes some improvements in transportation policy including a provision tightening review over highway access ("curb cut") permits.

Transportation

The legislature took a number of steps this year to promote alternative, environmentally-sound transportation. Some examples include: increased funding for the Charlotte to Burlington commuter rail project; decreased funding for the Bennington Bypass (and an updated traffic analysis to review its possible effects and the potential for rail service in the area); and creation of a public transit advisory council to supervise the preparation of a public transportation policy plan by the Agency of Transportation.

Energy

Although electric utility industry restructuring did not fare well this year (see next page), the Legislature did approve a measure that allows consumers who generate their own electricity to return excess power to utility companies. Known as "net metering," small-scale electricity generators such as households or businesses with solar-powered photovoltaic units, wind generators or fuel cells or farms generating from manure-produced methane will be able to sell the power they generate back to the utilities at the same rate paid by the consumers. In effect, the meters for these consumers will run in reverse so that they can deduct the value of the power they generate from their own electric bill.

The law caps the amount utilities are required to take at 15 kilowatts for residential and business customers and 100 kilowatts for farms.

Vermont Housing and Conservation Trust Fund

The Housing and Conservation Trust Fund (HCTF) helps preserve agricultural and forest land, and contributes to the creation of affordable housing for Vermonters through grants to non-profits and communities.

This year marked a shift in the source of funding for the HCTF from the capital bill to an appropriation in the annual state budget. Last year, the HCTF received funds from both sources; however, in previous years most of its funding came from bonded money as part of the capital bill. This year the Fund will receive $8.2 million, an increase from $6.8 million last year.

Also, this year the law was revised to dedicate 56 % of the property transfer tax to the HCTF. If annual revenues in the property transfer tax exceed $15.1 million, the HCTF is to receive 30% of the amount over $15.1 million.

Funding for Municipal and Regional Planning

The Legislature was not as generous with communities and regional planning commissions as it was with the Housing and Conservation Trust Fund. Municipalities will receive $205,000 this year, a 2.5% increase over last year. Regions will also get a 2.5% increase to bring them to slightly less than $1.2 million for FY99.

The Municipal and Regional Planning Fund law was changed this year so that it will receive 11.44% of the revenues from the property transfer tax. If the tax generates more than $15.1 million, 50% of the excess will go to communities and regions.

Brownfields

The Legislature revised the redevelopment of contaminated properties program, the so-called "brownfields" law, which allows owners of property contaminated with hazardous materials abatement of certain liabilities in exchange for remediation and cleanup of the property. A pilot involving up to five projects on a first-come, first-served basis over a three year period has been established to facilitate a more timely clean up and reuse of these properties.

State Amphibian

In recognition of the plight of the northern leopard frog, threatened by loss of habitat and deformities, the General Assembly designated the frog as "state amphibian."

Bills That Did Not Make It

Energy

Restructuring of the electric utility industry failed to gain acceptance in the House. House Speaker Michael Obuchowski weighed in with concerns that utilities and big business would gain at the expense of working Vermonters under the proposal passed by the Senate in 1997.

Undoubtedly, this issue will return next year, and VNRC will be advocating that a wide range of environmental protections need to be built into any restructuring plan. VNRC supported provisions in the Senate-passed restructuring bill that addressed water quality, environmental protection, and energy conservation. Of particular concern to VNRC was a provision requiring unlicensed hydroelectric power facilities — there are 21 of them — to meet the Vermont Water Quality Standards.

On-Site Sewage Disposal

Once again, a bill reforming Vermont's approach to managing individual on-site septic systems fell short of legislative approval. VNRC had supported the reform primarily because it provided for elimination of the ten-acre loophole in state subdivision regulations — lots larger than ten acres are subject to neither state nor local sewage disposal permitting.

Any future efforts to improve management of the on-site sewage program need to include elimination of the ten-acre loophole, and be responsive to the long-term effects on land use patterns that a new sewage disposal policy could bring. If sewage reform allows more flexible standards and alternative designs for disposal systems, there will be more pressure to develop at higher densities and in new areas.

Bottle Bill Expansion

In what seems to be a perennial disappointment, the Senate Natural Resources Committee once again failed to move legislation expanding the current bottle bill program to add juice, iced tea, water and wine bottles to the list of containers redeemable for a five cent deposit.

Mercury Contamination

A Growing Reality for Vermont

By Kim Kendall, VNRC

Mercury is a serious, pervasive—and common—contaminant in Vermont's rivers, streams, and lakes. High elevation, "pristine" streams that drain the Green Mountains suffer from mercury pollution as do the remote lakes of the Northeast Kingdom. Moreover, every state in the Northeast has issued a health advisory warning people to limit their consumption of fish.

"Mercury will be with us for a long time but there are some real changes that we can push for right now, including improved public awareness" noted Chris Kilian, who has expanded the water quality program at VNRC to respond to the growing problem of mercury contamination.

Vermont's advisory warns pregnant women and young children to eat no Walleye caught in Vermont waters (except from Lake Carmi), no more than 1 meal per month of Lake trout, Smallmouth bass, and Chain pickerel, and no more than 2 or 3 meals per month of most other fish. The advisory cautions individuals to limit consumption of most types of fish caught in Vermont waters.

Much of the mercury pollution in Vermont comes from emissions of waste incinerators within New England and from other parts of the country. Other sources of mercury include coal-burning power plants that generate electricity, non-utility fossil fuel-fired boilers, certain industries (such as chlor-alkali plants and portland cement plants), landfills, and hazardous waste sites. (See page 22 for information on the mercury bill passed by the Vermont Legislature this year, which requires source separation of mercury containing products.)

"New England waters are hard hit by mercury pollution and we need to commit to reducing it, said Kilian. "This law requires Vermont to control its mercury pollution, and it's one of only two like it in the country. Once the law is implemented, Vermonters can push other states to control emissions."

Mercury is a toxic, heavy metal that can affect the brain and nervous system of those who eat moderate to large amounts of fish on a regular basis. Mercury enters aquatic ecosystems where fish accumulate the toxic metal in tissue. Mercury increases up the food chain or bioaccumulates. Higher levels are found in predator fish. Toxic levels have been found in fish-eating birds and mammals like loons, bald eagles, osprey, mink, and otter.

VNRC will soon be releasing a major report on mercury and the quality of Vermont's waters, called *Watershed Health in Vermont.* This report explores the problems that affect Vermont's waters—from mercury pollution and acid rain to polluted runoff, dams, land use change, and wetlands degradation. The cumulative effects of these problems have led to degraded habitats for aquatic species, shifts in ecological communities, and loss of native species.

Watershed Health in Vermont presents information from a scientific perspective with detailed information about Vermont watersheds. A panel of experts are reviewing the report.

In addition, a second part will be issued this winter. Part II will examine the pitfalls of current environmental policy and some hard-line recommendations to clean up Vermont's waters. Stay tuned.

Are there mercury products in your home?

Vermont's new mercury bill established a national precedent for the disposal and labeling of products containing mercury.

These products include flourescent lights, batteries, thermometers, and sports shoes with lighting devises.

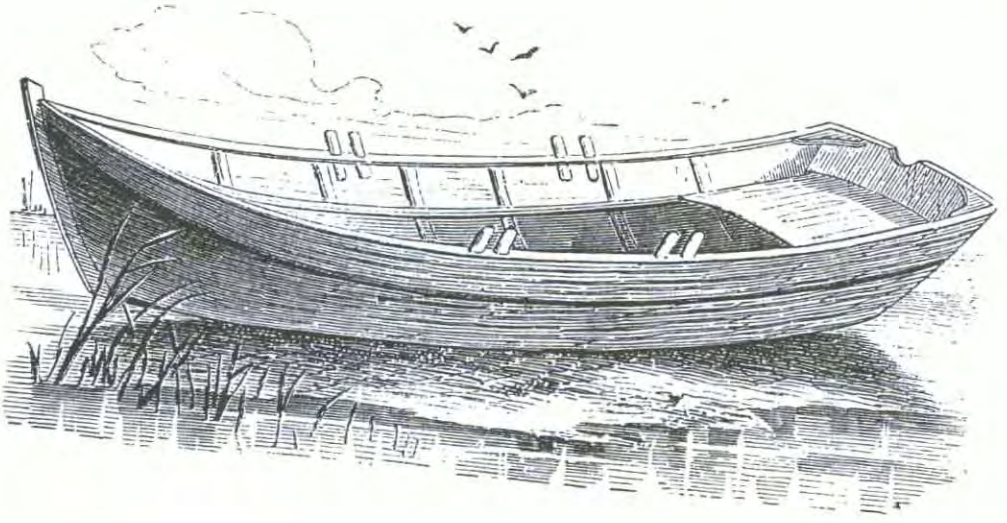
Please take care to dispose of these items. For more information, call VNRC.

Find Out More About Water Quality in Vermont

Topics in *Watershed Health in Vermont* include:

- Air Transported Pollutants — Mercury and Acid Rain
- Alterations to the Natural Flow of Rivers
- Polluted Runoff
- Point Source Pollution
- Loss of Riparian Buffers
- Exotic Species
- Wetlands Degradation
- Aquatic Habitat Degradation

If you would like a copy of this report, call or write to VNRC, and we will include you on the mailing list. A $5.00 contribution is suggested to help defray the cost of distribution.



Journeying Through Life

READING THE MOUNTAINS OF HOME

"My father always called what you're doing, 'testicating,'" accused Katie Dana in friendly manner from the audience that had gathered on Earth Day at the Bear Pond Book Store in Montpelier to hear John Elder read excerpts from his new book, *Reading the Mountains of Home*.

Raising his eyebrows and peering into the audience to find his accuser, Elder adjusted his eyes from the pages of his book.

"*You* know," she continued, "it is purposefully getting yourself lost in the woods so you can find your way back."

He smiled, if a bit tentatively. Elder had informed us earlier in the evening that the book was a revealing, intimate passage from a difficult time in his life.

Reading the Mountains of Home is Elder's literate exploration of the inevitability of change, of senescence, and of endings and then beginnings all over again.

Like Robert Frost, he pulls from the cyclic rhythms of our natural surrounds. The familiar textures of local woodlands with layers of decaying leaves, branches, and rich soil—the foaming, snow-capped mountain-fed streams—the fern-framed, looking glass ponds with no bottoms—are among the vivid cast of characters in this moving, personal journey through life.

Reading the Mountains of Home
by John Elder, 1998.
Harvard University Press,
Cambridge, Massachusetts.

Elder admits that he, as a young boy in California, defined his outdoors by the open grandeur of the redwood forest. During his graduate schooling, Elder came East to discover a different nature—this outdoors was in a different cycle of life and struggle. The younger Elder stayed.

In loving memory of his father, Elder fashioned, with his own hands, a wooden canoe he named the "Tribute" during a bone chilling Vermont winter. The "Tribute" recalled the strength of the forearms of Elder's father; its tongue and groove, golden pieces of cedar were carefully fitted together and shaped to take to the water like a local brook trout.

Elder had envisioned dropping the canoe for its maiden voyage on a pond that punctuates a favored hiking trail of Robert Frost. Instead, Elder is challenged by his teenage son—against his better wisdom—to drop it into the seething, early-spring froth of the Otter Creek Rapids. Riding the crests of whitewater together and watching the near inevitable conclusion—the drenching, slow motion sinking of the "Tribute"—Elder and his son reach a new place on the river and a new place in their lives together.

It is not unlike the capsized boating incident that Elder experienced as a boy in the Gulf of Mexico with this father. His father's strong arms remembered fondly in the mighty cedar frame of the "Tribute," Elder might find solace in knowing that his son now better understands the vulnerable, transient power of life, of his grandfather's, and his father's—and his own to come.

Stroll by the Lake and Visit VNRC

We hope you'll stop by to see us on your next visit to Burlington. Our satellite office is located at 87 College Street, Burlington, 05401-8426, PH: (802) 864-9600.

See back cover for activities in Burlington this summer.

Stef Mueller and other VNRC staff are working part-time from our Burlington office to engage more people in VNRC's local and statewide initiatives.

Adopt a Town

Does your town have a conservation commission? If it doesn't, the Adopt-a-Town campaign—run by the Association of Vermont Conservation Commissions—will team up towns that have commissions with others that do not. There are many possibilities for projects: coordinating a watershed or river project, such as a clean up, organizing a trail project, or building nesting boxes for waterfowl.

Call Virginia Rasch for more information at (802) 223-5527.

Green Space Conference on October 26th

Green space defines the way of life and quality of life in Vermont—the Green Mountain State.

That is why VNRC and Vermont Recreation and Parks Association (VRPA) are co-sponsoring the 55th annual Governor's Conference on Recreation to be held on October 26th at the Statehouse. This year the conference theme will be "Green Space: an Investment that Grows." The one-day conference will feature speakers, workshops, and exhibits to:

- Celebrate past public investments in green space;
- Describe the economic implications of continued investment in green space; Promote increased funding for future investments; and
- Supply participants with the knowledge and tools to conserve green space in communities across Vermont.

What is green space? It includes wild and working forests, urban parks and rural schoolyards, farms and ball fields, trails and streams, wetlands and mountain tops. Green spaces sustains the ecological function of our planet, puts food on our tables and wood products in our homes, provides outstanding recreational opportunities for residents and visitors, creates world-class scenery, and anchors our economy by attracting and holding a wide variety of businesses and workers.

Let's work together to conserve Vermont's precious green space and become better stewards. For more information about the conference this fall, call Freddie Cousins or Lisa Smith at VNRC, (802) 223-2328.

Explore the Northern Forest

The Northern Forest Alliance (NFA)—a coalition of 40 conservation, recreation and forestry groups from New York to Maine, of which VNRC plays an active role—has joined forces with tourism and recreation businesses, local chambers of commerce and community organizations to produce and sponsor a calendar that gives the "what, where, when" for hundreds of events that showcase the Northern Forest.

Call 1-887-NFOREST (toll-free) for your free copy of the 1998 Explore the Northern Forest Calendar.

Visit These Sites

If you're in front of your computer when you really should be outdoors, here are a few sites to visit:

- Visit VNRC — our new web site will be working by mid-July. www.vnrc.org
- Say goodbye to the mall — visit Co-op America's Green Pages Online (www.greenpages.org) to find more than 10,000 "earth friendly" products.
- Get the facts straight — look up the award-winning site of the Committee for the National Institute for the Environment http://www.cnie.org for the latest research findings on climate change, energy, agriculture, biodiversity, the effects of population on the environment and more.

Watershed Listing
continued from page 16

Potash Brook Group
Carl Engrall
P.O. Box 8541
Burlington, VT 05402-8541
658-5802

Elizabeth Mire Study Group
Bob Walker
RR1, Box 55AA
Thetford Center, VT 05075
785-4126

Your kids deserve to know what a Falcon really is

Vermont's conservation license plate program supports nongame wildlife protection programs and provides grants for local lakes and rivers projects around our state. Call the Vermont Fish & Wildlife Department at (802) 241-3700 or the Dept. of Motor Vehicles at (802) 828-2000 for more information.

We're a couple key strokes away

We want to be more accessible to more people. VNRC now has the following E-mail addresses and website available:

vnrc@together.net
ecourtney@together.net
shigby@together.net
sholmes@together.net
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Welcome and Thanks to our Summer Interns!

Interns like Russ, Freddie, and Kathryn (see below) provide essential skills and energy where VNRC is wanting — indeed, interns are often the essential extra push needed to complete projects.

VNRC welcomes support to establish funds for internships. Such internships are investments in VNRC, in environmental protection, and in aspiring environmental professionals.

If you are interested in considering an important investment like this, please call Sue Higby at VNRC, (802) 223-2328.

***Kathryn Mathieson** is the Albright Intern in communications, supported by the Ivan L. and Josephine P. Albright endowment. Like Josephine Albright, she graduated from Goddard College, having obtained a M.A. in creative writing based on her experience living in the Scottish Highlands. She now works for the Northern Appalachian Restoration Project.*

*VNRC summer law clerk **Russ Owens** is a student at Vermont Law School, specializing in environmental law. He is an accomplished leader of student environmental groups at Emory University, a musician, and a published artist and writer.*

*The Mollie Beattie intern this year is **Sara "Freddie" Cousins** (pictured left), who graduated from the Royal Melbourne Institute of Technology (Australia) in environmental policy. Originally from the U.K., she worked and traveled extensively abroad before settling in Vermont earlier this year.*

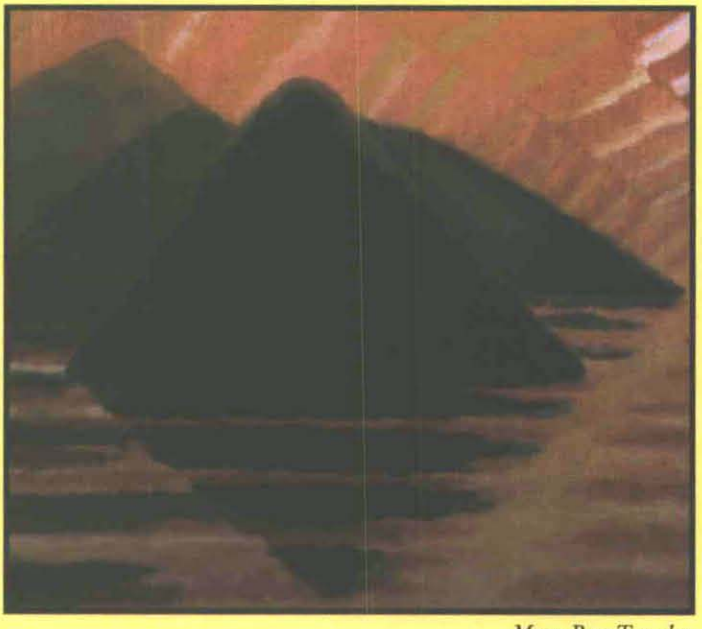
To the Lake All Rivers Flow

Words and Image Inspired by Lake Champlain

The Vermont Natural Resources Council, Lake Champlain Committee, and Lake Champlain Basin Science Center are presenting a juried benefit art exhibit during the month of August at the Doll-Anstadt Gallery in Burlington.

We invite you to attend a preview reception on August 6th, starting at 6:00PM and concluding around 9:00PM, for art, wine, food, music, and good conversation. A $10 donation is requested; tickets are available from the groups and gallery. In addition, the following activities are scheduled:

August 6th	Preview Reception, 6-9PM
August 7th	First Friday Arts Celebration with free trolley transportation to galleries, 5-8PM
August 8th	Poet John Engels will read some of his favorites in the gallery garden, 7:00PM.
August 15th and 16th	Internationally known haiku writer, Bruce Ross, will lead a traditional Japanese walk from the gallery to Lake Champlain. Upon returning to the gallery, Bruce will teach haiku (poetry) and haiga (drawing). For all ages – no experience needed! 2PM
August 20th	Group poetry reading at the gallery, 7:00PM.
August 30th	"Return of Big Water" Performance artist and storyteller Peter Burns will introduce participants to the rich memories of Lake Champlain.



Mary Ross Townley

For more information, call VNRC at (802) 864-9600 (Burlington) and (802) 223-2328 (Montpelier) or DA Gallery at (802) 864-3661.

Coming this fall ...

You're invited to VNRC's 35th Celebration and annual meeting at Shelburne Farms on Saturday, September 12th. More information will follow on the event's special talks, walks, and other activities.

We hope you'll join us – call Stef Mueller for more information!

VNRC

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