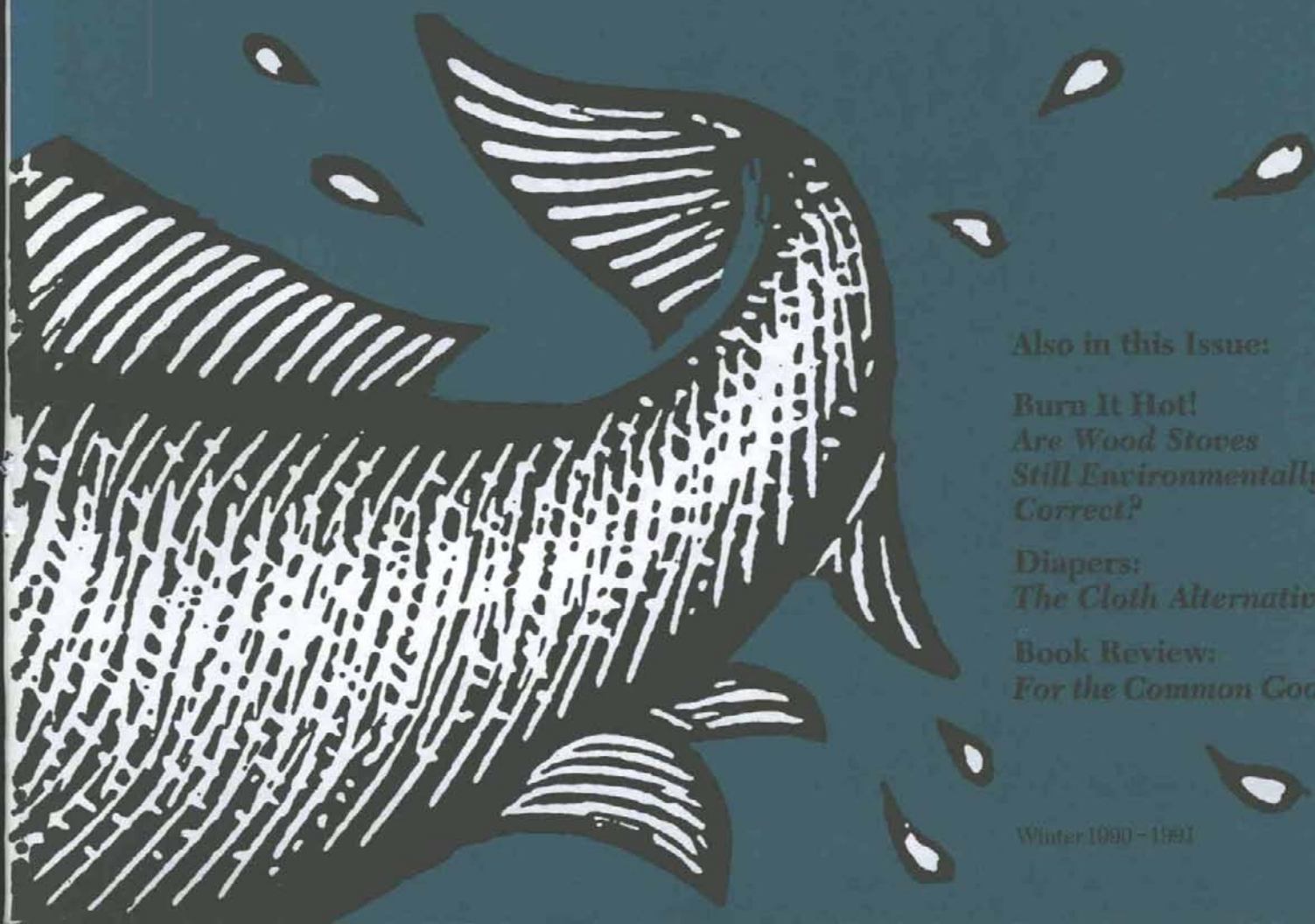


# VERMONT

Environmental Report

Published by the Vermont Natural Resources Council

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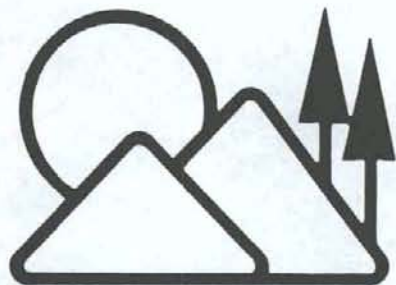
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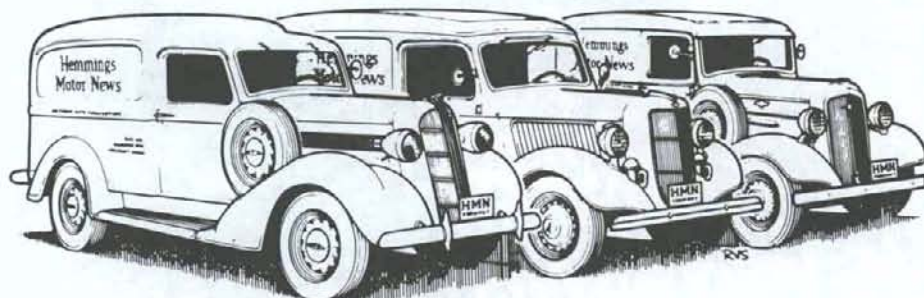
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*Published by the Vermont Natural Resources Council*

Winter 1990 - 1991



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The Vermont Natural Resources Council is a non-profit environmental organization founded in 1963 to promote the wise use of Vermont's natural resources. VNRC does research, legislative lobbying, advocacy, and educational work on issues including forestry, agriculture, water, energy, wastes, and growth management.

VNRC is the Vermont affiliate of the National Wildlife Federation.

**Credits:** Masthead design and graphic consulting by The Laughing Bear Associates. Vermont map on back cover by Ed Epstein.

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# THE INSIDE WORD

## VERMONT'S ECONOMY — *Environmental Protection and Economics*

Ned Farquhar, Executive Director

**T**he Vermont economy might be doing better than the economies of our neighboring states, but that's the long view. On the ground here in the Green Mountains, our relative situation is small comfort.

A slower economy means belt-tightening and more human service problems. Fortunately our Legislature and government have been quick to protect basic human needs and have not jumped to repeal basic environmental protections such as Act 250, the current use program, and the new growth management law — but we can't tell whether the trend to protect Vermont's resources (human and natural) will be maintained.

So it's a time for government and citizens to work together on positive economic solutions — not to fight over repealing environmental laws or reducing expenditures on important programs, nor to accept any economic opportunity that comes along.

Positive economic solutions are difficult right now, but VNRC supports investing in long-term manufacturing consistent with environmental protection, in energy conservation, and in sustainable agricultural and forest resource production and processing. We also support efforts toward the development of a strong rural economic policy, believing that the first defense against sprawl is a thriving rural economy.

Can Vermont be the first state with a meaningful timber bridge program? How can we encourage stronger native industries — supporting our people, communities, and economy without selling them off? Should we continue our commitment to the future in the form of support for the Housing and Conservation Trust Fund? And should we plan our energy use to reduce outside dependence and keep our energy dollars in state?

VNRC's Board of Directors and staff have spent more and more time on economic issues in recent years. It's clear that protection of the environment starts with the type of economy Vermonters build together. VNRC takes the economy seriously, and will continue to be present — and vocal — when Vermont policy-makers address economic problems.



**Production Manager's note:** As we mentioned in the last issue, VNRC's Editor, Susan Clark, has been on sabbatical during the production of both the Fall and Winter issues of the *V.E.R.* Although the production of the Winter issue has been overseen by both Susan and Executive Director Ned Farquhar, it was edited by Allen Gilbert and produced and coordinated by Sylvia Plumb. Many thanks to Mason Singer and the whole crew at Laughing Bear Associates for going well beyond the call of duty in developing the layout and helping me throughout the process of creating the magazine. I have enjoyed working on the *V.E.R.* and am thankful that I had the opportunity to do so. Welcome back, Susan! **SP**

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The opinions expressed in the *Vermont Environmental Report* are not necessarily those of VNRC. VNRC reserves the right to refuse advertising that is not in keeping with the objectives of the organization.

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## AN OFFICIAL'S THANKS

I want to thank the Vermont Natural Resources Council and the Vermont League of Cities and Towns for their preparation and publication of the workbook *The Tax Base and the Tax Bill*. I believe the legislative body and planning commission of each municipality in Vermont should read and understand this manual.

Many Vermonters have a misunderstanding that commercial development in their towns will automatically reduce the property tax burden. This, of course, is not true. For those municipalities that are currently on the "formula", any increase in property tax revenue will generally be offset by a similar reduction in state aid to education. While there may be some benefit on the municipal side of the budget, this benefit is only minor since the school portion of local budgets generally is 70 percent to 80 percent of the total budget.

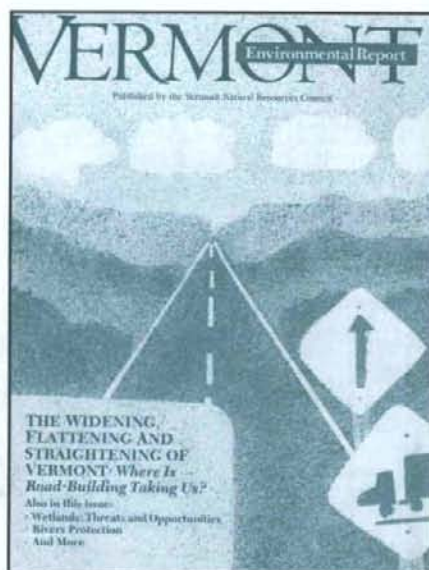
In analyzing the benefits of any development — whether it is commercial, residential or recreational — it is essential that we know the effect on the local tax burden. This workbook is a "big step" in enabling us to make intelligent decisions.

The workbook, of course, does not make judgement decisions nor does it evaluate the consequences of creating new jobs. Each town or city will need to decide for itself the importance of jobs — including the type of jobs — versus the other issues, such as impact on schools and the local infrastructure. But this is precisely what local government is all about.

Again my thanks for assisting local communities in their effort to make intelligent decisions for today and tomorrow.

*John C. Stewart  
Chair, Jericho Selectboard*

*We thank Mr. Stewart for his comments on what we and many others feel is an important issue. Copies of "The Tax Base and The Tax Bill" are available from VNRC to members for*



*\$5.00 plus \$1.00 postage and to non-members for \$10.00 plus \$1.00 postage. For a report on the tax workshops VNRC has been holding around the state see page 26 of this issue. PE*

## ROADS / LAND USE

Thank you for your recent coverage of Vermont's transportation problems in the Fall, 1990 issue of the *V.E.R.*

The connections made in the issue between transportation and land use policies, or lack thereof, illustrate the need for a complete overhaul of the present highway department.

In its place we must create a true transportation agency. Instead of being mired in highways and the resulting destructive social and environmental cost of the automobile, we must create a public transportation system which is not only efficient, but really meets the needs of the public it's intended to serve.

The best hope for this to occur is citizen involvement in the creation of transportation policies. The time has come for AOT's behind-the-time approach to be shelved in favor of concerted public action. I'd like to let VNRC readers know of a recently formed organization, GrassRoutes, whose intent is to do exactly that.

GrassRoutes approaches transportation policy(ies) from a people-oriented perspective. We see our mandate as aiding citizens in their opposition to out-of-scale projects throughout the state as well as formulating and instituting alternatives to current policies.

GrassRoutes produces a monthly newsletter. This fall we surveyed legislative candidates on transportation issues. In coming months we will be developing a transportation library, holding forums statewide, and working to create greater local control of transportation efforts.

For more information please write: GrassRoutes, 98 Sleepy Hollow Road, Essex Junction, Vermont 05452.

Thanks again VNRC for raising this important issue.

*Allan Katz  
GrassRoutes*

## KUDOS FOR COVERAGE

It was good to see the article on Community-supported Agriculture in the Spring/Summer issue. The local produce growers all work very hard for a small monetary return. They need as much support as they can get, including articles in publication such as the *V.E.R.*

I also very much enjoyed the article on bears. They're a fragile species in a place like Vermont, and they can use as much press as they can get short of that in the fur, fins, and feathers magazines. I've yet to see a bear in Vermont, but I have seen their tracks and their climbing scars on beech trees. Your article taught me the important relationship between bears' reproductive capacity and food availability. Such stories are always welcome. The legislative report made a lot of sense, given time for concentration on the big picture. And please add my vote to those in favor of a "what you can do" section — actions such as writing to representatives, and so forth.

*Paul Council  
Plainfield*

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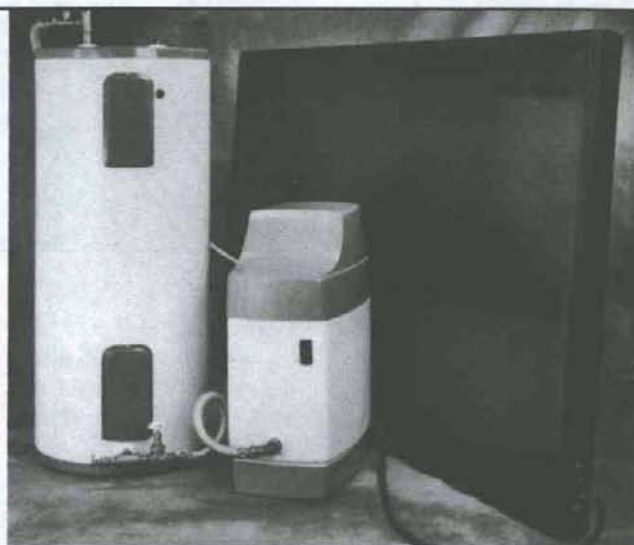


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# VERMONT PERSPECTIVE

## HIGHWAY PLANNING SUFFICIENT, SAYS STATE *But Citizens Group Wants More Input*

With continued active assistance from VNRC's Land Use Policy Program Director Peg Elmer, the Route 2 Citizens Alliance (R2CA) met in August with Agency of Transportation (AOT) Secretary Paul Philbrook and with State Office of Policy Research Director George Hamilton to discuss R2CA's request that the reconstruction Route 2 from Montpelier to St. Johnsbury be designated a model for an integrated planning process with broad citizen involvement.

The message from Secretary Philbrook, though, was that AOT could not establish any new citizen involvement process, that it would continue to work through the established line of communication with selectmen to reach citizens. AOT officials feel enough opportunity for citizen input has been provided. The fact that improvements to this road between Interstates 89, 91, and 93 are in limbo in various villages due to town votes and public sentiment has not persuaded AOT of the need to try a different public approach. Instead, said Philbrook, "Some projects, such as the Bethel Bridge and Route 2, have a larger than local significance and the state may have to override local opinion through legislative action."

Act 200 mandates that state agency plans be compatible with approved local plans. State officials coined the term "overriding state significance" during the state agency planning process to cover those exceptions when a state agency believes the greater public good and statewide interests supersede local decisions.

An analysis (funded through an Act 200 planning grant) of the economic impact of a bypass on Marshfield village indicated existing businesses could lose as much as 25% of their business if a bypass were built — a heavy blow to the economic stability of services that village residents can walk to. These services, which include the general stores and restaurants, often form the heart of a community.

R2CA, with VNRC's help, will continue to point to conflicts between state agency actions and the goals of Act 200. The group will be meeting with local boards of selectmen and regional planning commissions with the goal of gaining endorsement for a corridor planning process.

VNRC's transportation concerns don't stop with Route 2. Transportation planning and policy in general are coming into the limelight as key

environmental and land use issues.

Within Vermont, VNRC is helping a citizen newsletter on transportation issues called *GrassRoutes*, which was initiated in August. VNRC is also in touch with environmental and citizen groups in Oregon, Maine, California, and Washington fighting for more responsible transportation planning in their states — and nationally. The federal Surface Transportation Act is up for review and reauthorization in 1991. This is an opportunity to write to Congress to request changes increasing the energy efficiency of transportation systems and improving, through better planning, the connection between transportation and land use impacts.

For more information on transportation issues and on how to get involved, call Peg Elmer at 223-2328 or write to VNRC, 9 Bailey Avenue, Montpelier, VT 05602. **PE/AG**



## A RARE RESOURCE

### *Worcester Range Deserves Special Attention*

Name a Vermont mountain range which has no roads, power lines, ski areas, or development dividing it. For people in the Barre-Montpelier area, the answer is in their backyard: the Worcester Range, which runs south/north through the towns of Waterbury, Middlesex, Worcester, Stowe, Elmore and Morristown.

The Worcester Range, best known for Hunger Mountain (3,620 feet), represents an open space still used in traditional ways — forestry, hunting, and hiking. A combination of public and private forest ownership has allowed the area to remain open, providing moose, deer, and seasonal bear habitat as well as remote recreational opportunities and an economic base for those living around the range.

Straddling Washington and Lamoille counties, the range is in one of the fastest growing areas in Vermont. Public ownership includes the 12,585-acre Putnam State Forest and the 755-acre Elmore State Park. However, crucial parts of the range — between the Worcester town line and Elmore State Park — are privately owned. There is general concern that continued growth in Lamoille County will eventually affect the range.

The mountains are the backbone of a working forest ecosystem which is a good example of Vermont's northern forests. Throughout the fall VNRC has worked with forest users to identify the forest needs, including economic alternatives to subdivision and development taking place in nearby areas.

"The Worcester Mountains can be a centerpiece to an overall environmental program that will protect the resources in the area and work at creating alternative, environmentally sound economic opportunities for business and industry," said Jim Shallow, VNRC Resource Conservation Director. "The Worcester Mountains area is a statewide resource that deserves the creative effort of local and state officials to be protected." JS/AG



## SPECIAL RIVERS, SPECIAL PROTECTIONS

### *Hearings To Begin Soon On ORW Petition*

The first petitions for Outstanding Resource Water designations are wending their way through the state bureaucracy, with hearings expected to begin by the end of this year.

Covered by the petitions are the first 26 miles of the Battenkill, from Dorset to the New York state line; the lower Poultney River; and Pike's Falls in Jamaica.

An ORW designation gives a river special environmental protections, such as greater state clout in hydroelectric decisions and limits on how much gravel a landowner may extract. Additionally, for rivers designated as ORWs, regardless of the size of the drainage area, stream alterations require a permit with these exceptions: 1) loggers and farmers may make minor stream alterations provided they follow accepted management practices, and 2) under emergency situations alterations can be made to protect life and property.

"Most importantly," notes Marcy Mahr, VNRC's Southern Vermont Program Director, "the ORW designation is a local and state declaration that these waters are unique, have values that are in the public interest, and therefore should be protected."

In the case of the Battenkill, VNRC and Trout Unlimited documented the river's special values and recruited expert witnesses to testify before the Vermont Water Resources Board on the importance of the river's fish and wildlife habitat, scenic areas, usage and public access.

At a pre-hearing conference, questions were raised about the effects of an ORW designation on adjacent land uses, such as landfills and sewage treatment plants.

Michael Kline, coordinator of the state's Rivers Assistance Program, stated, "As these are the first ORWs sought, the Board will be looking to the state as a party in the upcoming ORW proceedings to include in its testimony an explanation of the regulatory implications of such designations."

VNRC intends to take an active role in this discussion, said Mahr. "Through our research, VNRC has determined that ORW designation will not affect anyone's rights to hunt, fish, swim, or boat on the river. It will not impose town planning or zoning requirements, nor will it require new state regulatory review of any development proposals that fall under the jurisdiction of local boards," she noted. DN

## NORTHERN FOREST LANDS STUDY

### *Back to Washington for the Money*

The effort to protect the forests in northern New England and New York has moved back to Washington for a congressional response to the U.S. Forest Service's Northern Forest Lands Study. The Senate Appropriations Committee is considering a \$1.275-million package that will pick up where the Northern Forest Lands Study left off. The package, outlined in a letter signed by eight northeastern Senators, follows the recommendations of the Governors' Task Force on Northern Forests, which recommended that Congress fund establishment of a regional Northern Forest Lands Council. The Council's purpose will be to map and inventory the area's resources and develop a strategy to protect the forest.

The Senators' request includes:

- 1) \$175,000 for a one-year phase-out of the Forest Service NFLS office,
- 2) \$600,000 for the establishment of the multi-state Northern Forest Lands Council (NFLC), and 3) \$500,000 in matching grants to begin the inventory, mapping and research of the northern forest lands as well as identify critical areas.

"We're as about on schedule as one could expect on securing funding, but the dark side is whether or not we can act fast enough to deal with the destabilization created by the weakening economy," said Dr. Carl Reidel of the Governors' Task Force. "It's like waxing your skis: you may have the right wax for the snow, but you're skiing in an avalanche."

The U.S. Forest Service conducted the Northern Forest Lands Study at

Congress' request after Diamond International began selling timber holdings in Vermont and New Hampshire to pay off junk bond debt. At the same time the four governors in the region appointed the task force to make recommendations for action.

"There is an urgent need for individuals to continue to push their local, state and national representatives to keep the effort going to protect this vast resource," said Ned Farquhar, VNRC Executive Director. "Already some companies are turning to land and industrial property sales to help them weather a recession."

VNRC's Resource Conservation Program will be working to develop a pilot project reviewing forest protection as well as the economics driving land sales. **JS**

## WETLANDS AT ISSUE IN MALL PROPOSAL

### *Rutland Project Faces Slew of Hurdles*

State and federal regulatory agencies continue to sort through a myriad of issues as they review plans to build the Rutland Regional Mall in the middle of wetlands.

Mall developers Finard-Zamias own 92 acres off Route 7 in Rutland Town. Sixteen of those acres are part of a seven-wetland complex that is also, according to environmental experts, connected to another 20-acre wetland on adjacent property. The overall effects of the development on the wetlands have been a continuing concern, leading even to intervention by the U.S. Army Corps of Engineers after it declared the wetlands, which surround a tributary of the Otter Creek, "waters of the United States." Such a determination triggers review by the Army Corps.

Also at issue are the importance of two rare plant species found at the wetlands, and whether the site qualifies as a "rare and irreplaceable natural

area" under Act 250. In testimony before the state Environmental Board, EPA wetland scientist Gregory Hellyer said the abundance of shrubby cinquefoil, sedges, rushes, and grasses on an unusually high alkaline bed as well as the presence of at least two state-listed rare plants indicate the community is "particularly worthy of protection" because it is rare in New England.

The Army Corps' intervention came after the developers requested a so-called "nationwide" permit to dump fill into about half of the wetlands on their property. In early August Corps Division Engineer Col. Daniel Wilson denied the permit, saying the "functions and values" of the wetlands "will be eliminated" if permission is granted. He also said the project must be reviewed under a more stringent "individual permit" process because filling the wetlands on Finard-Zamias' property will indirectly affect the wetlands

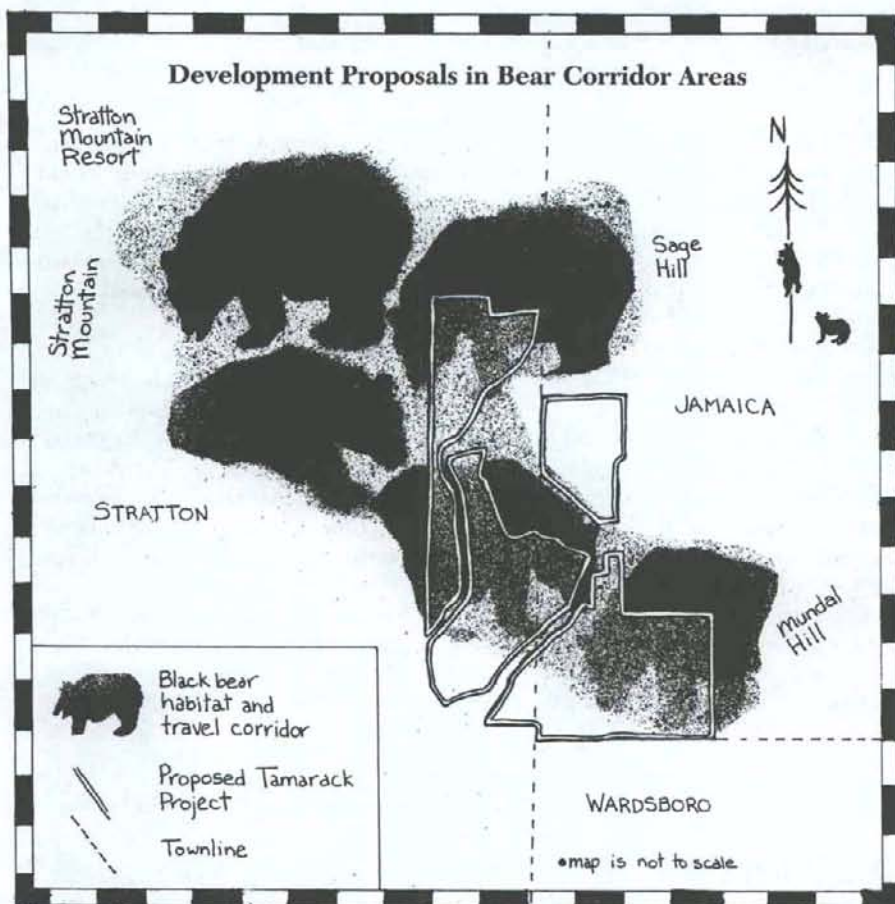
on the adjacent property.

Although the developers have proposed ways to reduce indirect impacts, Wilson stated that "concern remains for potential hydrologic interference with the adjacent wetlands through groundwater influence."

Even if modifications replaced the function of flood storage capacity, substantial impacts on the aquatic food web, wildlife habitat, and diversity would remain.

Wilson pointed to conclusions by VNRC hydrologist Stephen Revell that the largest on-site wetland is hydrologically connected to a 20-acre off-site wetland complex.

Marcy Mahr, VNRC Southern Vermont Program Director, noted, "At this point in the Corps' process, it's up to the developers to decide to re-apply for a nationwide permit with their modifications or follow the Corps' recommendation and apply for an individual permit." **MM/AG**



## MAKE WAY FOR BEARS

*Killington Decision Protects Habitat; Jury Still Out in Tamarack Case*

Vermont bears won one round and kept fighting in another as state and district boards dealt with development plans that would impinge on bear habitat.

In October the Vermont Environmental Board denied permits for expansion plans by the Killington ski area because the expansion included new snowmaking facilities in a key bear habitat in Parker's Gore, a remote section of Mendon.

The Board rejected Killington's arguments that the expansion couldn't be undertaken elsewhere and had significant public benefit.

"It's a very powerful message," said attorney Rob Woolmington, who represented VNRC, the Friends of Parker's Gore, and the Shrewsbury Land

Trust. "It's going to be a major change for all ski areas in how they use resources and develop land."

The decision comes at a key point in Killington's proposals for increased growth. Expected to merge with nearby Pico ski area, Killington recently submitted an Act 250 proposal for greater skier capacity. If approved, the ski area would reportedly become the third largest ski area in the U. S.

VNRC, which has participated in the merger negotiations, has been unwilling to concur with the growth proposals until environmental and secondary impacts — including possible construction within the Appalachian Trail — are better understood.

Further south, in Stratton and Jamaica, protection of bear habitat

continues to be a concern in the review of plans for the 180-unit Tamarack Country Club.

Earlier this year VNRC, Stratton Corp., and the State reached an agreement to conserve permanently 1,000 acres in one of two bear travel corridors between the two towns. Tamarack developers are proposing to build in the middle of the southern corridor, which would affect the bears' access to necessary spring and fall food sources.

A proposal to trade additional protection in the northern corridor to allow development in the southern has been criticized by Marcy Mahr, VNRC's Southern Vermont Program Director. "The critical importance of travel routes is apparent when you consider that they connect seasonal food sources. They allow the movement of bears during breeding season and when young bears leave their mother's range to determine their own home ranges," notes Mahr.

Other troubling issues have persisted, including water-related concerns and the project's conformance with the Windham County Regional Plan. The District Environmental Commission hearings have reconvened — after being recessed for two months due to incomplete project plans — and will be completed by the end of the year.

Steve Crowley, VNRC's Water and Wetlands Policy Director, applauded the recess, "Without final permits and reviews for storm water, water supply, stream alteration, subdivision, and erosion control, the Commission is looking at a moving target. Even with the permits in hand, they will need to look closely at the cumulative impacts," he said.

Progress was made, however, on reaching a precedent-setting agreement whereby developers will share the burden their project will put on local services. Spurred by a study on financial impacts prepared by Ad Hoc Associates for VNRC, the developers have agreed to pay an annual fee to the neighboring town of Wardsboro for road maintenance. In a separate agreement the developers covered the capital costs of a new fire truck.

MM/NF/AG

## ACT 250 AND THE TEN-ACRE LOOPHOLE *Confusion Over Law Helps Prompt Animosity*

**B**ig pink posters with a "Massachusetts Minuteman" in each corner are advertising Citizens for Property Rights discussions on "Vermont's Land Use Regulatory Crisis." It appears the group's target is moving beyond Act 200 to include "Act 250, Wetlands, and State Level Planning."

At the same time, development interest lobbies in Montpelier are gearing up along the belief that regulatory hoops are too many and too difficult.

The fact that Act 250 has been consistently credited by region financial experts (such as in an article on the banking industry in the March 1990 issue of *Vermont Business Magazine*) for Vermont's economic lead during the 1980s and for buffering Vermont from the swift and severe economic decline of neighboring states appears not to have been heard by enough people.

"For years Act 250 has been the scapegoat for the many real and perceived difficulties of bureaucracy and regulation," notes Stephanie Kaplan, Environmental Board Executive Officer. "But upon investigation by various study committees — most recently the Governor's Commission on the Economic Future of Vermont — it is apparent that these problems have more to do with perception than reality. Act 200 shares that lightning rod quality with Act 250 and adds to the confusion," says Kaplan.

One aspect of the confusion around Act 250 is the so-called "ten-acre loophole," which is a provision in the state subdivision law that exempts lots larger than ten acres from state review of proposed sewage disposal and water supply systems. There was a similar exemption for lots larger than ten acres in Act 250, but it was closed around 1984. Act 250 applies only to subdivisions having 10 or more lots or requiring new road construction.

VNRC has continued to be con-

cerned that the ten-acre loophole in the state subdivision law is the culprit causing the state's landscape to be cut into lots "too small to plow and too large to mow," as former Deputy Secretary of the Agency of Natural Resources Mollie Beattie has phrased it.

Environmentalists say that simply closing the loophole is not the answer.

The state subdivision program, while providing communities with important protection, may need to be improved. Among other things, inflexibility towards alternative septic systems should be addressed. Currently the program focuses on design and soils review rather than how systems actually work once installed. **PE**



## WATER QUALITY STANDARDS *New Amendments Address Toxics and Nutrients*

**T**he Vermont Water Resources Board has been developing several sweeping amendments to the state Water Quality Standards that will point toward new approaches to water quality management.

For the first time the standards will address toxic pollutants in a meaningful way. The Board is proposing numerical standards for all of the "priority pollutants" as required by the 1987 federal Clean Water Act amendments. Although this leaves tens of thousands of toxic compounds unregulated, it is a step in the right direction.

VNRC took the lead in promoting an understanding of the toxic water issue in Vermont by organizing an October symposium attended by treatment plant operators, industry representatives, regulators, and researchers. The symposium, co-sponsored by industry, municipal, and environmental organizations as well as UVM's Water Resources Research Center, aimed at avoiding mistakes made in other states, such as focusing on "end of the pipe" treatment technologies.

VNRC, along with the Environmental Law Foundation, highlighted the importance of reducing the use and waste of toxics at the source. Accord-

ing to ELF's Bob Stockett, "If you can identify and reduce at the source, you eliminate the need for costly equipment to remove dilute concentrations of toxic chemicals from municipal wastewater."

About the same time as the Board was developing its new standards a draft discharge permit was put out for public comment that touched a number of issues surrounding toxic pollutants. The Agency of Natural Resources proposed to allow, as part of a stormwater permit for the Burlington General Electric plant, the discharge of the carcinogenic degreaser trichlorethylene at levels several hundred times higher than what would protect "class B uses" of the part of Lake Champlain into which the stormwater would drain. VNRC challenged the permit raising concerns about the toxic at an October hearing.

The new standards also address nutrient loading, long recognized as the major water pollution problem in the state. For the first time the Board proposed specific levels rather than the old standard of "no undue adverse impact," long criticized as inadequate and difficult for regulators to interpret. **SCC**

## ACT 200

### *Back On Track Following "A Winter of Discontent"?*

**V**NRC Executive Director Ned Farquhar is serving on the interim study committee designated by the Legislature to review the goals, regional approval mechanism, and local interests in Act 200, the 1988 Growth Management Act.

The committee will report back to the Legislature and Governor prior to the next legislative session with recommendations on the implementation of Act 200. According to committee member Polly Billings, who also served on the Growth Commission in 1987, "We need to investigate the problems that people have identified in Act 200. Vermonters know that regional planning cooperation is needed in this state, but we can't be sure we've got the best approach."

In the past year dozens of Vermont communities have "rejected" Act 200 in advisory votes — yet many of the same towns have accepted planning funds designated for Act 200 planning. George Hamilton, Director of the Governor's Policy Office and a member of the Marshfield Planning Commission, says that the planning system "is back on track after a winter of discontent."

Hamilton believes that the anti-Act 200 movement "did not reflect Vermonters' true commitment to planning and cooperation. Instead, it was based on some fairly inaccurate representations of 'state control' and regulation" under Act 200.

VNRC continues to follow Act 200 closely, particularly the state agency plans required under the new law. VNRC Land Use Policy Director Peg Elmer and Farquhar have reviewed agency plans affecting transportation, natural resources, and economic development.

"These plans are perhaps the most significant new planning requirement of Act 200," says Elmer. "They will make the state agencies work together and with Vermont's communities and regional planning commissions, and

they will provide new public access to agency decision-making."

State Senator George Little, who chaired the Senate Natural Resources Committee in the past legislative session and is chair of the interim study committee, believes that hostile attempts to amend Act 200 could continue during the next session.

"I think we'd be looking at Act 200 anyway," says Little. "But people who support planning need to be continually reviewing our planning laws and programs to be sure that they're reasonable and can be implemented. Otherwise the opponents of Act 200 will succeed in rolling it back." **NF**



## PUBLIC TRUST DOCTRINE

### *Still As Important As Ever*

**W**hen the Vermont Supreme Court issued a decision on the public trust doctrine in December 1989, observers called it one of the biggest environmental cases of the decade. To some, it was the biggest of the century.

Since that decision, the Vermont Legislature has begun to grapple with significant questions regarding the public trust doctrine. Which resources

and lands qualify as "public trust resources"? What process should guide the management of public trust resources? And who should be responsible for making management decisions?

"At first blush, the 1989 Supreme Court decision seems to affect the filled land on the Burlington waterfront," says Burlington environmental attorney and former State Senator, Harvey Carter. "But the decision itself and subsequent Superior Court decisions make it clear that there will be vast changes in the use of public trust lands and waters."

With other Vermont environmental lawyers (including Rob Woolmington of Witten, Saltonstall, & Woolmington and Lewis Milford of the Conservation Law Foundation), Carter is involved in several major public trust cases that could help define the court's interpretation of the public trust doctrine.

The cases involve diverse uses of public resources, including docks and marinas proposed on submerged lands in lakes and rivers and water withdrawals to feed ski area snowmaking.

According to Milford, the Supreme Court's decision could change Vermont's programs for permitting water withdrawals, stream alterations and diversions, and construction of improvements. "Vermonters own public trust resources forever," says Milford. "If the State of Vermont wants to allow use of public trust resources for any purpose, the Legislature must create a permitting system that clearly defends public interests."

The Legislature established a summer study committee to review the issue, with a report expected late in 1990.

The public trust doctrine will be the focus of VNRC's 13th Annual Environmental Law conference December 3 at the Lake Morey Inn in Fairlee. The keynote speaker, who has broad experience in defending environmental resources under the public trust doctrine, will be Hope Babcock, General Counsel of the National Audubon Society. To register for the conference, write to VNRC at 9 Bailey Avenue, Montpelier, VT 05602 or call (802) 223-2328. **NF**

# Sky Dogs



JANE YOLEN BARRY MOSER

Combining authentic language, period detail, and pieces of tribal legend, Jane Yolen tells the story of the day three horses arrived in Blackfleet territory carrying two sick strangers and pulling a third on a travois. Barry Moser's delicate watercolors further illuminate a segment of history and folklore essential to our American heritage.

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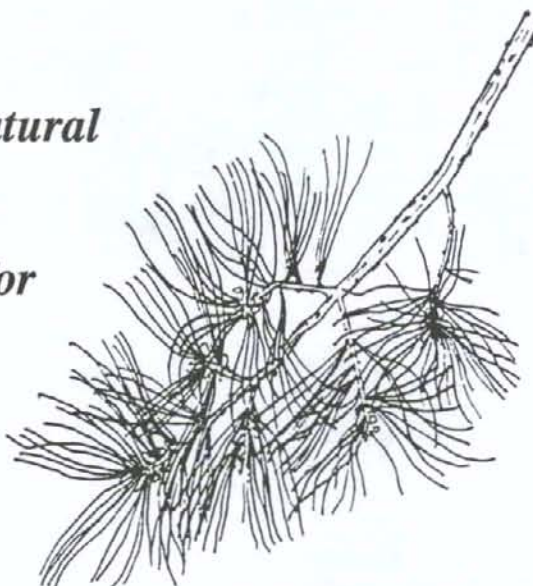


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## ENTERING THE CURRENT

### *Grassroots Efforts Are Growing In Vermont*



Michael Kline

**E**ach day on my way to work, I cross the bridge and look out to see "my rock" in the Shady Rill cascade in Middlesex. It's my rain gauge. I get a sense of how much rain fell the night before by the water level on my rock.

In Vermont, many people have a special connection to the brook or river meandering through town. I like gauge rocks, swimming holes, and waterfalls. For others it may be fishing the upland streams or canoeing down a lazy run to Lake Champlain.

People get excited when they tell river stories. And when something they value about a river is threatened, they get even more than concerned: they get involved. Grassroots river protection in Vermont is alive and getting healthier every day.

"We have had many requests for help, far more than we've been able to respond to," said Jack Byrne of the River Watch Network, a national river protection organization. "In five years we could well have a program going on every sizable river in Vermont."

Widespread public involvement could not be more timely, because river protection is no longer as simple as building wastewater treatment plants.

People want clean rivers, rivers not only safe enough for swimming but healthy enough to support fish and other aquatic life. Still at issue are the cu-

*Above: High School science teachers participate in a River Watch event, just one of the many efforts that citizens can make to protect the rivers of Vermont.*



mulative watershed impacts of sewage and chemical wastes from households and farms, soil erosion, landfills, stream bed alteration, and other river flow changes from hydro-power dams and ski resort snowmaking.

These varied concerns about the quality and quantity of water and the integrity of riverbanks and shorelands leave no single entity to turn to, however. River activists must work with federal, state, and municipal levels of government, and with individual residents and landowners.

"It's difficult, but you must first learn about a lot of things: state statutes, local politics, and the concerns of business people and landowners," according to Bettina Matteson of the Watershed Alliance in Bristol. The Watershed Alliance has been working to preserve traditional uses of the New Haven River, such as swimming or fishing, while at the same time responding to the community's need to deal with sewage problems.

Federal and state regulations protecting rivers contain a degree of latitude as to how they can be administered. The gray areas of interpretation make citizen involvement key to ensuring projects go through the permitting process and abide by enforceable permit conditions that protect river values important to people. Activists are taking the time to complete technical studies, including river inventories, landowner surveys, and petitions to quasi-judicial state boards. As a result, regulators are making more decisions based on management plans developed through a strong public participation process.

For example, sixteen Vermont hydroelectric dams are up for federal relicensing. These facilities provide renewable energy but often at the expense of water quality, fisheries, scenic values, and recreation. The state Agency of Natural Resources, directed by a Citizens Advisory Committee (of which VNRC is a member), is coordinating a major initiative involving hundreds of concerned Vermonters in the Deerfield, Clyde, Lower Winooski, and Passumpsic river basins. Public recommendations for an appropriate balance of river uses will form the resulting state comprehensive river plans.

Many activities affecting rivers are not regulated by the state but may be restricted at the discretion of towns and landowners. Conservationists who focus on river protection can be very effective when they work at the community level with concerned townspeople. Educational projects can create awareness and cooperation among a broad spectrum of environmental and economic interests. This in turn can build consensus for river values in town planning and bylaws or simply affect how people manage wastes and erosion on their own lands.

Seeking an Outstanding Resource Water design-

nation is another way awareness and cooperation can be built on the community level. The towns of Fair Haven and West Haven, for example, are currently seeking the "outstanding" designation for the undeveloped character, exceptional wildlife habitat, geologic features, historic significance, and fisheries composition of the Lower Poultney River (see V.E.R., Fall 1990). A river committee composed of local residents has researched the Lower Poultney and sponsored annual river celebrations and canoe trips to educate the community about the river's uniqueness.

In another citizen initiative, landowners along the Mill Brook and Browns River in Jericho have started a River Watch Program, working with Mt. Mansfield High School science classes to monitor water quality and stream life. Also, the group has worked with local farmers to stabilize eroding stream banks. Community goodwill has been gained by showing a deep concern for river environments as well as the viability of local agriculture. Presently, the town planning commission and zoning board consult with these residents on projects that might affect surface waters. Interest in a town greenway is also growing as landowners and developers realize the value of shoreland conservation easements.

The Vermont Department of Environmental Conservation, which implements river management and regulatory programs, is working to bring various resources together by establishing a Rivers Assistance Program. As a clearinghouse of river studies and river planning and protection methods, a Rivers Assistance Program can provide technical guidance for affecting state and federal regulatory decisions, improving local protection of river shorelands, and developing outstanding resource waters petitions.

"We see the assistance program as a user-friendly entrance to the state's regulatory and management programs for rivers," said Steve Crowley, VNRC Director, Water Quality and Wetlands Program. "It should help river activists untangle the often complicated river protection mechanisms in state law."

A healthy co-dependency seems the answer to river concerns. Government regulators can protect rivers and be fair and responsive to the public, if people take the time to get involved. Private citizens and towns can strive for a conservation-oriented economy that includes river protection with the initial support and technical resources available through state and federal agencies.

Getting involved in grassroots river protection may be as simple as making connections and then entering the current. ●

*Michael Kline is coordinator of the Vermont Department of Environmental Conservation's Rivers Assistance Program.*

*People want rivers not only safe enough for swimming but healthy enough to support fish and other aquatic life.*



# BELOW THE FLOW

## *Vermont River Communities, and How We Can Protect Them*

Geoff Dates

*Flowing water  
is the thread that  
binds this living  
community  
together as well  
as with the  
surrounding  
land.*

The Washington Post ran an article last fall with the headline "Beneath Rivers, Another Realm: Subterranean Ecosystems Hold Dozens of Unknown Species." The article described a newly discovered underground ecosystem, dubbed the "hyporheic zone" (from the Greek for "below" and "flow"). Living in ground water below stream channels and sometimes for miles on either side of the channels are worms, shrimp, insects, and microscopic organisms. Jack Stanford of the University of Montana was quoted as noting: "We have basically enlarged the concept of what a river is."

This article aims to accomplish the same thing, though in a much less dramatic way. Rivers are more than swimming areas, boating corridors, fishing areas, and waste disposal areas; or sources of energy, sand, and gravel; or water to make snow, irrigate crops, or fight fires. Rivers are "home" to an interconnected web of creatures, many of which we never see or think about. Yet, many of the uses people make of rivers have tremendous impacts on these communities.

The health of river communities is everyone's responsibility. It is important to explore Vermont's rivers as communities and describe how human land and water use affects these communities. And it is important to know some strategies that can protect rivers for people and aquatic life.

### **The River as a Community**

Thinking of a river as a web of living organisms bound together by water should lead to questions about how human use of the river affects that community, and what that community is like.

River communities can be thought of as part physical, part chemical, and part biological. The physical layout and foundation for a river community is flowing water, and its relationship to the land area that drains into the river — its watershed. It is water rushing through a gorge or flowing lazily through a farm meadow. It is a physical process, cutting a channel through rock and soil and carrying the eroded material downstream.

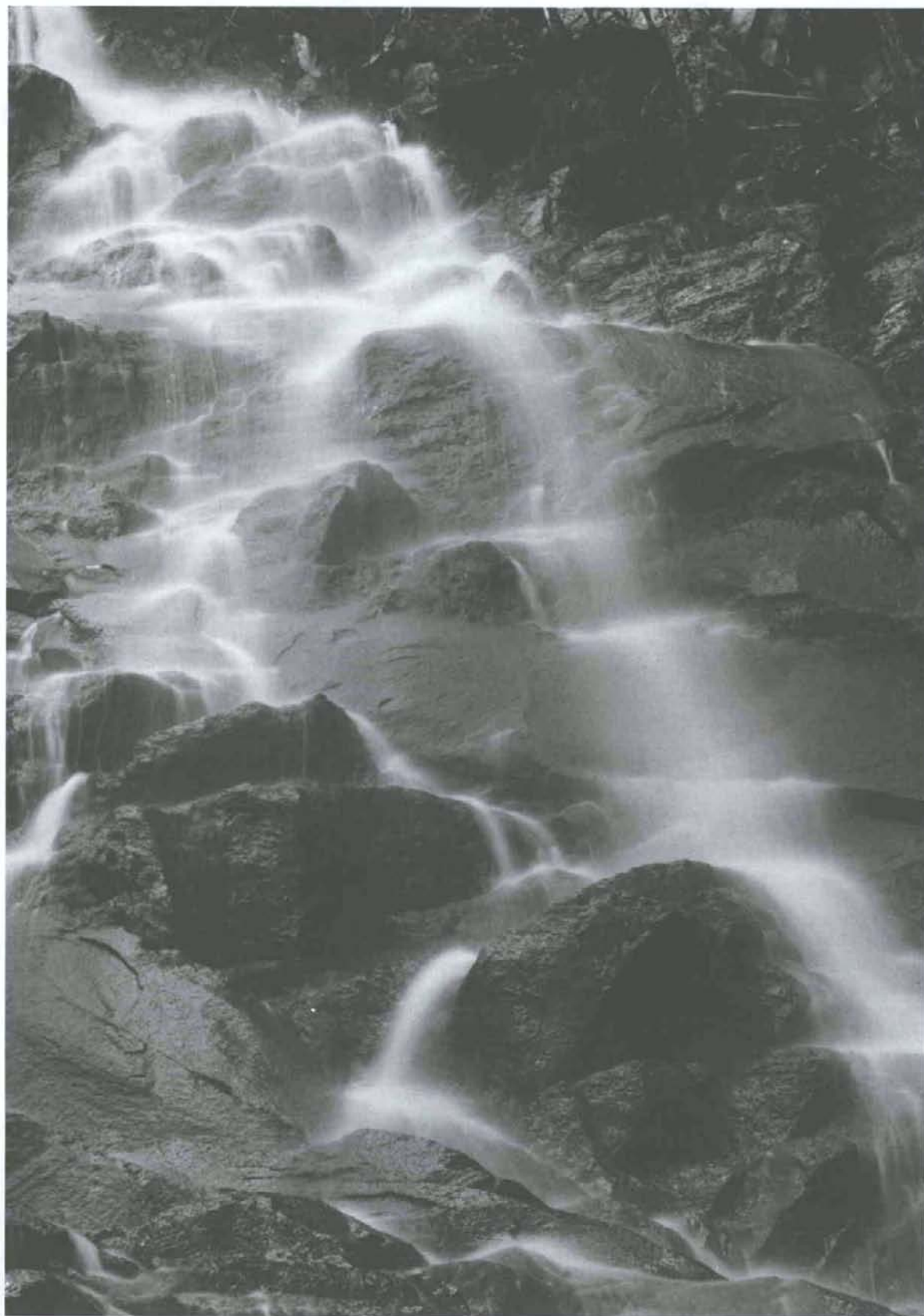
The river's chemical characteristics are the build-

ing blocks for a river community. These are the water's oxygen content (dissolved oxygen), acidity (pH), ability to neutralize acid (alkalinity), nutrients, metals, and other constituents. In the absence of human influence, the water chemistry is determined by the soils and rocks in the watershed, the chemistry of the precipitation, and interaction with plants and animals on land and in the water. It profoundly affects, and is affected by, aquatic organisms.

The biological inhabitants of river communities are wonderfully varied — from single-celled plants and animals, aquatic insects, and other small residents up through large fish. Flowing water is the thread that binds this living community together as well as with the surrounding land.

How does this community work? A leaf falls into a small stream high in the Green Mountains. It is quickly attacked by bacterial and fungal "decomposers." Some of the nutrients in the leaf are dissolved in the water and flow downstream until taken up by aquatic plants or decomposers. Aquatic insect "shredders" (such as caddisfly larvae and snails) feed on the leaf and its attached "frosting" of decomposers. Meanwhile, "grazers" (such as mayfly nymphs) feed directly off the aquatic plants. Grazers and shredders reduce plant tissue to smaller particles, some of which are used by the insect to grow. Excreted or unused food is washed downstream. This "detritus" provides food for "collectors" such as black fly larvae and worms, which are waiting downstream to catch a meal. The insects themselves provide food for other predatory insects and fish. As the river flows downstream, some organic material is stored (as insect or animal tissue), some is cycled (changed to different forms), and some is released to flow downstream. Downstream aquatic communities take advantage of inefficiencies upstream.

River communities are not homogeneous, nor are they static. A river community changes dramatically from its headwaters to its mouth, from season to season, and from year to year. However, healthy rivers are remarkably stable communities. What provides this stability is a diversity of organisms. Since many aquatic organisms are opportunistic,

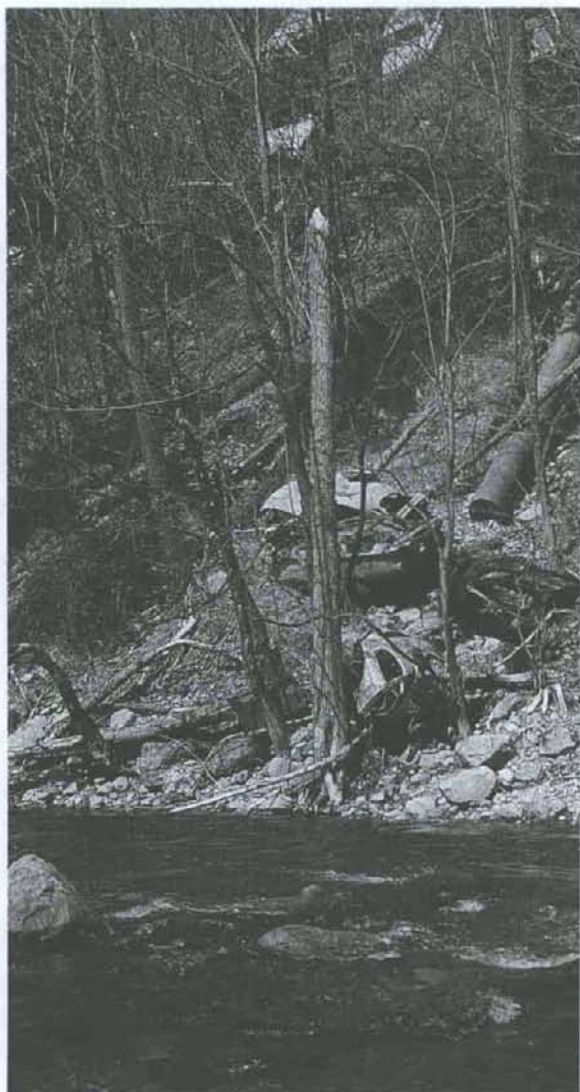


*Healthy rivers  
are remarkably  
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organisms.*

PHOTO BY ANDREW KLINE



*People can affect rivers directly by dumping things into them, or indirectly by changing the land through which they flow.*



they can adapt to food supply changes. This diversity means a menu of food choices for aquatic life. If these choices are reduced because of alteration of the physical or chemical parts of the ecosystem, the community becomes less diverse. Organisms most effective at using the remaining food source will dominate, others may disappear. Serious disruptions may eliminate large parts of the community.

#### **Human Impacts on River Communities**

Enter *Homo sapiens*. People can affect rivers directly by dumping things into them or changing their channels or indirectly by changing the land through which they flow. To see how, let's assault a hypothetical river.

First, let's dump sewage into it. Then we'll add nutrients from crop land, lawns, and golf courses, cut down the trees along the banks, and excavate the

surrounding land. Next, let's pave over a large area, build a dam in a gorge, and, for good measure, excavate the bed for sand and gravel.

What have we done to this river community? A whole chain of events throughout the aquatic ecosystem has been set in motion.

Sewage means organic material decomposing, a process which consumes oxygen and adds nutrients to the water. The decomposers go to work. As they work, they use oxygen in the water, creating an *oxygen demand*. If we put too much organic material in, however, the river can't replace oxygen fast enough and demand exceeds supply. Aquatic organisms that need the most oxygen, such as salmon and trout, will suffocate first, reducing the food choices for surviving species. If the oxygen drain continues, more species will perish, reducing the food choices further.

Adding nutrients to a river encourages aquatic plant growth. These plants may create wild swings in oxygen levels since they release oxygen during the day and consume it at night. When the plants die and decompose, more oxygen is used. Again, aquatic organisms may suffocate, especially in the wee hours of the morning.

Toxic chemicals may find their way into the river, from the fertilizers or pesticides sprayed on someone's lawn, from a business that discharges directly, or from a thousand other sources. Some toxins will accumulate in sediments, eventually finding their way into living tissues. Some may be fat-soluble, and accumulate up the food chain, rendering especially the predatory fish inedible. At sufficient concentrations, toxic chemicals may inhibit reproduction and growth, or even destroy aquatic life.

Removing trees from the banks means less food from leaf fall and warmer water temperatures as the sun strikes and heats more of the water surface.

Since most biochemical processes speed up as the temperature increases, warmer water can push the system into high gear. Decomposers work and use oxygen faster. To compound the problem, warm water holds less oxygen than cold water. Some species can't survive in warm water, either because of lower oxygen levels or because of sensitivity to heat.

Now let's add some sediment (which may have nutrients and other pollutants attached to soil particles) from eroding crop land, construction sites, and logging areas, in addition to natural bank erosion. Sediment clogs the homes and gills of many aquatic organisms and catches and holds heat from the sun, causing warmer water temperatures.

Impervious road, parking lot, and roof surfaces speed up the overland flow of water, which means more water gets to the river faster. Higher flows, more channel scouring, and more erosion (since



## River Protection Challenges

**Non-point Source Pollution:** Pollution that runs off the land into rivers is not regulated by Vermont's Water Pollution Control Law. Yet, several River Watch programs are finding that pollution levels in rivers increase dramatically as river flows increase after rainfall. At the moment, the best bet seems to be to approach communities to include water quality improvement and protection in their local planning efforts and zoning regulations. Techniques for dealing with non-point pollution from crop land, logging sites, and construction sites are well-understood and developed. The challenge is putting them in place.

**Cumulative Impacts:** The nature of human impacts on an aquatic community are well understood, but quantifying them for regulatory purposes is very difficult. Isolating and identifying impacts from specific pollution sources or river uses is hard. In fact, there is a lack of basic information about aquatic communities that is absolutely essential to evaluating their health and the impacts on them. How are regulators supposed to decide whether or how much additional pollution is acceptable if they can't quantify existing and potential impacts?

**Basic River Information:** According to Michael Kline of the Agency of Natural Resources, river management decisions are, more often than not, based on anecdotal information (called "evaluation") rather than up-to-date information on the river's physical, chemical, and biological make-up. Since funds for federal and state river studies have all but dried up, citizen monitoring efforts can fill important gaps.

**Determining Biological Impacts:** EPA and numerous states are considering impacts on the aquatic community as the best measure of water quality. Since many aquatic organisms are more sensitive to pollution than humans and tend to reflect long-term water quality better than measuring water chemistry at a particular moment, they may be a better basis for river management than just focusing on the chemical composition of the river. The challenge is this: impacts have to be judged by comparing affected communities with unaffected communities. In many areas, it's difficult to find aquatic communities unaffected by humans.

**Regulations Are Ahead of Science:** Vermont's Water Pollution Control Law contains a biological standard: indirect discharges must not significantly alter the aquatic biota. The fact that it took the Department years to write regulations to meet that standard reflects the difficulty in evaluating aquatic communities. It took that long for the Department staff to feel confident that the rules were based on good science.

*While modern society is getting better at removing sewage from water, it is generating more of it.*

there's more energy and soil particle-dislodging potential) are the result. Asphalt surfaces also heat the water, so the water entering the river may be warmer than the river water itself.

A dam changes the physical foundation of the river when it replaces rapids and cascades with a reservoir. Above the dam water velocity is slowed, causing soil particles and organic material to settle to the bottom and cover the riverbed with mud. Oxygen levels are reduced as the organic material, which previously flowed downstream, decomposes. At the same time, oxygen is not replenished as quickly in the reservoir as it was in the white water. Downstream of the dam, the water flow may fluctuate dramatically if the water is stored and released daily. The upstream food supply is reduced.

The bulldozer or bucket loader pulling gravel out of the stream is changing the habitat (gravel beds

are important for some insect and fish species) and causing sedimentation by stirring up the bed.

Not only do these individual actions cause impacts, but there is a *cumulative impact* that may go far beyond the sum total of the individual impacts. Almost any river in Vermont has been subjected to this treatment at some time in its relationship with humans. This not-so-hypothetical river can no longer support the same aquatic community it once did.

### Our Rivers Today

So, how are Vermont's rivers doing today? There's no question that the pollution load to many of our rivers has been reduced. However, in rapidly developing areas, people are being added to watersheds faster than the sewage can be dealt with. So, while modern society is getting better at removing sewage from water, it is generating more of it. The



*Eliminate or prevent pollution and physical disruption of rivers, and the communities will take care of themselves.*

## River Protection Tools In Vermont

**Water Classifications:** Management goals for Vermont's rivers are determined by classifications: A, B, or C. "A" waters are managed for water supply and to protect natural aquatic habitats. Most Vermont rivers are classified "B" and managed for swimming and fishing. "C" rivers are managed for uses where human water contact with the water is unlikely. Rivers can be reclassified, up or down by petition to the Water Resources Board.

**Water Quality Standards:** Any discharge to a stream or river, whether it be the runoff of a pollutant or an activity causing excessive erosion, that does not have a state permit, may be in violation of the standards. Perhaps one of the most important roles of individuals concerned about Vermont rivers is to report known discharge violations to the state Environmental Enforcement Division.

**Discharge Permits:** These permits are required for wastes entering Vermont rivers directly or indirectly. Discharge permits specify the quantity and quality of waste. Larger indirect discharges, by way of leach fields or spray fields, are governed by a set of rules aimed at protecting aquatic biota in streams. Direct discharges to water bodies are managed by a combination of technological requirements and water quality criteria spelled out in the Water Quality Standards.

**Agriculture/Forestry Best Management Practices (BMPs):** Both state and federal agencies have established management guidelines and work with farmers and loggers to minimize water pollution and soil loss from their lands. Community involvement in projects that establish best management practices on fields and woodlots have been successful when an early partnership is formed between the land owner, technical agencies and local citizens.

**Outstanding Resource Waters (ORW):** This is a special designation that recognizes and protects a river's outstanding stream values, including water quality. The law specifically limits dams and gravel operations that may affect these values. This designation is also initiated by petition to the Water Resources Board.

**Wild and Scenic Designation:** This is a federal designation that recognizes and protects "wild," scenic, and recreational rivers. Dams are not permitted, streamside development can be limited, and river-related values can be protected.

**River Basin Planning:** Rivers flow through many towns, and meet with many forms of use and impact. A basin-wide planning approach may be the only way to meet these challenges.

**Act 250:** Several of the Act 250 criteria aim to protect river values, including the water quality, erosion control, and wildlife criteria. Act 250 can be a valuable tool in minimizing impacts. Contact VNRC at either the Montpelier office or the Southern Vermont office about the "Act 250 Toolkit."

**Local Planning and Land Use Regulations:** Decisions about land use adjacent to rivers rest with local communities. Yet, very few municipal plans deal effectively with protection of rivers. River improvement and protection goals should be stated in plans and backed up by solid inventory information to substantiate the values being addressed. Regulations can minimize risks certain land uses pose to river values.

**Land Conservation:** Protection of river values is seldom a goal of land conservation projects. Yet, land trusts have developed a range of tools that voluntarily restrict land use. Conservation easements, acquisition, estate planning, and other riverfront land protection techniques can be used.

**Watershed and River Watch Associations:** There are active river monitoring and protection organizations throughout Vermont. Citizens are getting together on a regular basis to have fun, to learn a tremendous amount about the rivers around them, and to build community stewardship for the rivers that are an important part of their everyday lives.



net impact, in some areas, is that water quality may be getting worse. Still, in many areas, rivers have been changed from sewers to recreation areas, and there is reason to be proud and celebrate.

How healthy are Vermont's river communities? That's harder to answer. Think about Vermont's history and one can conclude that very few, if any, of Vermont's waters escaped at least part of the above "assault" scenario. Are there any rivers left in Vermont that support their original communities? That's essentially the same as asking whether there are any parts of Vermont that haven't changed since European settlement. It is doubtful. Is that good or bad? Well, that depends on whether one thinks the original river communities had value greater than the new ones. In many cases, not enough was understood about the original community to attach values (not necessarily dollar values either) to it. In short, a frame of reference against which the health of today's rivers could be measured has disappeared. What has been lost may never be known.

Today's benchmark for healthy river communities could be this: eliminate or prevent pollution and physical disruption of rivers, and the communities will take care of themselves. That's a daunting task, given the nature of our culture. But a start has to be made somewhere, and a good first step is organizing river protection efforts.

### How To Organize A River Protection Effort

**1. Find out everything you can about your river.** There's already a great deal of information about Vermont's rivers in libraries, at the Agency of Natural Resources, regional planning commissions, universities, and elsewhere. Some of it may be of limited use, but it is worth finding. Information on pollution sources, land use in the watershed, historic water quality data, and more can be found relatively easily. You can get help locating and evaluating this information from the Agency or organizations like VNRC and the Environmental Law Foundation. You can also organize, with help from the River Watch Network, your own river study, including field observations, water sampling and analysis, and studies of aquatic plants, insects, and fish.

**2. Get a lot of people involved.** Ultimately, the key to river protection is building an effective and informed constituency for the river. People who regularly use the river for fishing, swimming, and boating, and riverfront landowners are great sources of information. Involve these people, as well as students and teachers, interested citizens and businesses, and others at every step in the process, and they'll have a stake in the outcome.

**3. Decide what you want your river to be.** You've got to know where you're going in order to know how to get there. By now, you should have a



*Involve students, teachers and other interested citizens and businesses at every step in the process and they'll have a stake in the outcome.*

group of people who are quite knowledgeable about the river. Hold a few public meetings to discuss the future of the river and see if you can't agree on some basic goals, such as protecting the river's aquatic life and value for recreation.

**4. Advocate your goals at every level of decision-making.** Decisions about the future of our rivers are made at every level of government. Informed and organized river advocates can make a difference in these decisions. Efforts with the New Haven River, the Ottauquechee River, and Kidder Brook provide examples of advocates' success in protecting river resources. VNRC, the Environmental Law Foundation, the Conservation Law Foundation, Trout Unlimited, watershed associations, and others can help.

**5. Organize water quality improvement and protection projects.** Picking up garbage along river banks, preserving land along a river, stabilizing eroding soils, and habitat improvement structures are examples of projects that can improve and protect a river. These can be community projects involving a wide range of people. ●

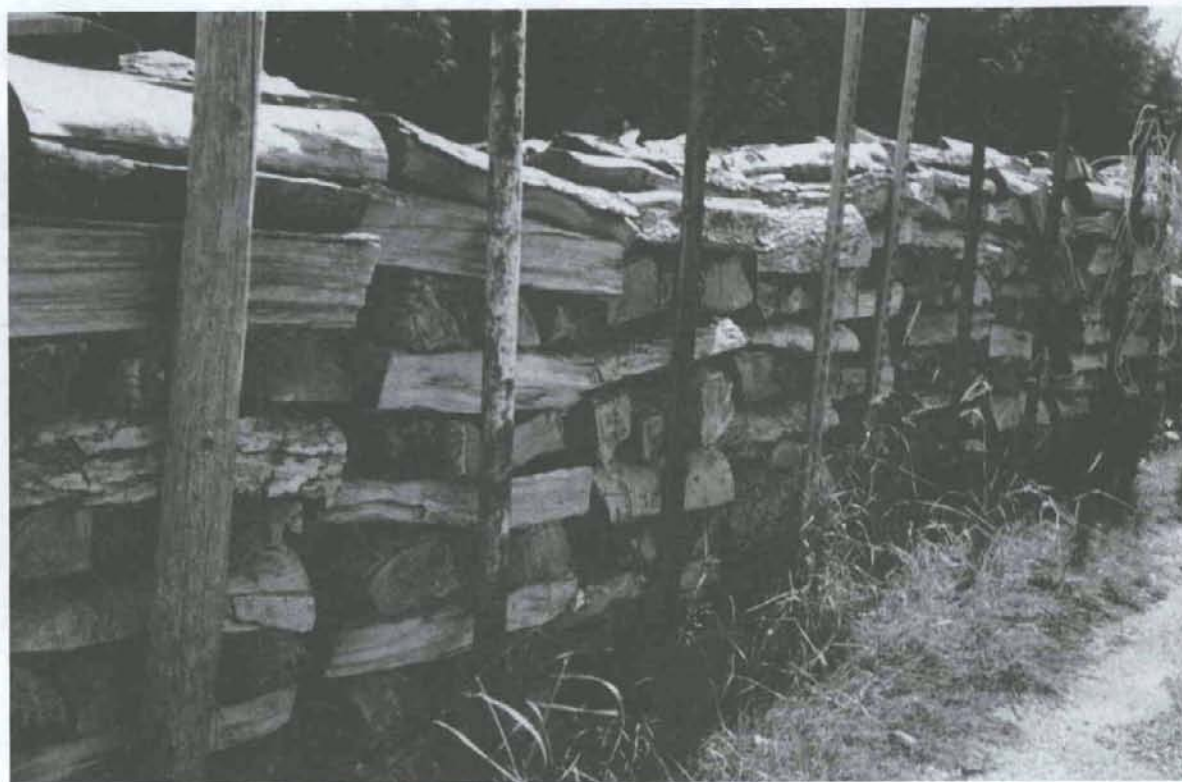
*Geoff Dates is the New England Coordinator for the River Watch Network.*

# BURN IT HOT!

## *Are Wood Stoves Still Environmentally Correct?*

Ann D. Watson

*The problem is, wood smoke pollutes... unfortunately, the chief offender is the airtight stove.*



**O**n July 1, 1990, the final phase of a new Environmental Protection Agency regulation limiting emissions from new wood-burning stoves took effect. Wood stoves manufactured after that date must pass stringent testing and are EPA-certified to emit no more than a certain amount of particulate matter per hour.

Wait a minute, you might say. They're regulating wood stoves? We Vermonters love to burn wood! Wood heat means self-reliance. It's natural, it's a renewable resource, and it's a way of life Vermont has known since long before the energy crisis of the 1970s.

The problem is, wood smoke pollutes. And unfortunately, the chief offender is the airtight stove — the stoves so popular ten to fifteen years ago because of their high efficiency and their ability to hold a fire all night, and which are still in use in most wood-burning households in Vermont.

But the haze of smoke that lay over valleys on cold, still, winter days couldn't be ignored. Between 1975 and 1985, many studies documented the adverse effects of small, airtight, wood-burning box stoves on the winter outdoor air quality. In many residential areas, wood smoke was the major source of winter air pollution.

In a 1982 study emissions from residential wood combustion in Waterbury accounted for up to 40% of the total suspended particles in the air, and 51% of the fine particles in a residential area of Portland, Maine; in Vail, Colorado, the figure went as high as 70%. In Waterbury's case stove emissions helped cause hourly average particulate concentrations of over 100 micrograms (1 microgram = 1 millionth of a gram) per cubic meter of air, exceeding the National Clean Air Standard by one-third.

Most pollutants emitted by wood stoves are the result of incomplete combustion of the wood. For

complete combustion, three things are necessary: an adequate oxygen supply, high temperatures in the firebox, and air turbulence within the stove. When we load up our airtight stoves and shut them down for the night, we are decreasing the oxygen supply, the firebox temperature, and the air turbulence — all at the same time. We're setting up ideal conditions for incomplete combustion.

As the wood burns it consumes oxygen, and the flame becomes oxygen-starved. Through a complicated chemical reaction, particulates and gases form in this oxygen-starved zone, which, if not burned before leaving the high-temperature combustion region, either condense in the stovepipe, forming creosote, or pass up the chimney and into the outside air. The less air the fire is getting, the less completely the wood is burned and the higher the emissions — as much as 70 grams of particulate matter per hour from airtight stoves.

Old-fashioned, non-airtight stoves allowed for more complete combustion by allowing air to leak through the cracks and seams; but because they leaked, they were impossible to control and burned wood too fast and too hot. This is why people bought airtight stoves when they became widely available. Today about 80% of stoves used in Vermont are airtight models.

Wood stove emissions are of concern for two reasons. First, the particulates in wood smoke are extremely small — so small that they are breathed deeply into the lungs and can settle there, taking from weeks to years to be cleared out. Particulates contain heavy metals and carcinogenic compounds. They also corrode metals, cut down on visibility, and just plain get things dirty.

Second, wood smoke contains a variety of dangerous compounds, including cilia-toxic and mucous-coagulating agents such as formaldehyde, and respiratory irritants such as aldehydes and phenols. Carbon monoxide is also a concern: on an average winter day wood stoves emit about twice as much carbon monoxide as a typical car would going 50 miles, according to a 1980 Oregon study.

But the most serious health-threatening pollutants in wood smoke, say scientists, are compounds known as polycyclic organic materials (POMs).

"Many [POMs] are brutal carcinogens," explains Jeff Byers, assistant professor of chemistry at Middlebury College. Molecules made of carbon and hydrogen that form when organic materials burn, POMs are the compounds that probably caused cancer in 19th-century chimney sweeps.

As the awareness of residential wood combustion threats to air quality grew in the early 1980s, environmentalists pressured the EPA to act, resulting in the new standards. These standards limit particulate emissions to 4.1 grams of particulate matter per hour for stoves with catalytic combustors, and 7.5 grams for non-catalytic stoves.

The EPA rule does not, however, cover POM emissions. "POM is very difficult to measure," says Bob Ferguson, Research and Development Director at Vermont Castings, Inc. in Randolph. "But where there are particulates, there is POM. If the particulate emissions go down, the POM emissions go down as well." The same holds true for carbon monoxide.

Importantly, the new standards do not affect existing stoves — those responsible for most emissions. So what should conscientious Vermonters do about their wood stoves? Fit them with catalytic combustors? Buy new stoves? Stop burning wood altogether?

You can start by operating your stove properly. Haul out the owner's manual that came with your stove, and re-read it. Make sure you're using dry wood and that the stovepipe and chimney are set up right.

"Don't operate it as an airtight stove," advises Armando Lopez, an Addison County chimney sweep. "Burn it hot. Build small fires. Get up in the middle of the night to stoke it, or let it go out." Keep in mind the conditions necessary for complete combustion, and operate your stove accordingly.

Next, consider buying a new EPA-approved stove. Two types of EPA are being manufactured today, catalytic and non-catalytic. A catalytic stove works like this: Before going up the chimney, the unburned gases pass through a catalyst — a grid made of ceramic material coated with a precious metal (platinum or palladium). The metal lowers the temperature at which the gases will ignite — normally about 1,000 degrees F. to about 500 degrees F., the temperature of the smoldering fire. So the gases ignite and combustion is completed.

"The beauty of catalytic stoves is that they do their best under the worst conditions," notes Ferguson. When the stove is shut down and the fire is emitting the highest concentrations of unburned gases and particulates, the catalyst is most effective.

EPA-approved non-catalytic stoves bring about complete combustion by means of a "secondary combustion chamber." In this heavily insulated chamber, high temperatures and fresh air cause the gases to ignite and burn. Some stoves use both a catalyst and a secondary combustion chamber.

Which of the two types is better?

"It's too early to say what technology is the best long-term solution," says Ferguson. There's no question, though, that the new models are the cleanest and most efficient wood-burning stoves ever.

But they're expensive: prices at Vermont Castings range from \$650 to almost \$1700. However, the EPA predicted in 1988 that because the stoves reduce wood consumption and require fewer chimney cleanings, savings would offset higher prices.

What about adding a catalytic combustor to your existing stove?

*Haul out the owner's manual that came with your stove, and re-read it.*

*We now know how to burn wood, and we've got to do it right. The kind of stove you use and how you operate it make a difference.*



Retrofits seem to be a step in the right direction at minimal cost. They cut down on emissions and increase heat output, to some extent. But because an add-on catalyst is generally quite a distance from the firebox, the gases are cooler as they pass through it. When the temperature is below 500 degrees F., they won't ignite, rendering the catalyst ineffective. Many experts discourage retrofits, citing this problem as well as lack of availability and high prices.

Nevertheless, chimney sweep Lopez does promote add-ons. "Built-in catalysts are better," he admits, "but if you add one on, at least you are doing something." He claims add-ons are available for any kind of stove, although installation is not practical in every stove set-up. He also reports great improvement in both quality and prices in the past five years. Contact a chimney sweep or stove dealer if you are interested in installing one.

Another alternative is buying a pellet stove. It burns one-inch "logs" made of wood waste and other agricultural by-products. Fueling is automatic for up to sixty hours.

"It's easy. You don't have to baby-sit it," says Pat Irish, vice-president of Pellet, Inc., a Burlington stove distributor. "They're so clean they're exempt from EPA standards, and they're 90 to 95% efficient. With some of them you don't even need a chimney. For the price of the stove — \$1,800 to \$2,400 — you can have the whole thing."

Can Vermont's forests support the use of wood as a residential heating fuel?

"Absolutely," says Norman Hudson, wood energy specialist at the Vermont Department of Forests, Parks, and Recreation. "Don't even think about hesitating on that score. The more wood you cut, the

*Old-timers say wood warms us twice — once when we haul, split and stack, and once again in the stove.*

more wood grows." Some environmentalists have noted that a forest actively managed for wood production is more likely to have a healthy population of young, growing trees — which are best able to absorb carbon dioxide, the culprit in global warming.

What about global warming?

"Of course, whenever we burn a carbon-based fuel, we are adding carbon dioxide to the atmosphere," says Professor Jean Richardson of the University of Vermont's Environmental Studies Program. "But wood heat's contribution to global warming is insignificant." Wood is burned on nowhere near the scale of fossil fuels, says Richardson, and it is also less compact than fossil fuels. And the more compact the fuel, the greater the carbon dioxide output.

"But particulate matter is a significant part of global warming, because it helps trap more heat near the ground," Richardson notes. Therefore, lowering particulate emissions is important.

So you don't have to give up burning wood in order to protect the environment. But you probably do need to make some changes. The kind of stove you use and how you operate it make a difference.

"One thing I love about Vermonters," says Hudson, "is that they care about the world. Given good information, they act accordingly. We now know how to burn wood, and we've got to do it right." ●

*Ann D. Watson, a resident of Middlebury, is a free lance writer and a librarian at Robinson Elementary School in Starksboro.*

# FOR THE COMMON GOOD

## *An Economist and a Theologian Ask Some Basic Questions*

Justin Brande

Now is the time for all good environmentalists to come to the aid of the cause by reading Herman Daly and John Cobb's new book, *For The Common Good*. Then they should try to persuade others to do so — especially those steeped in conventional economics, as well as politicians and policy makers.

Be advised, it is no easy task getting through this work; it's lengthy, wide-ranging, and full of ideas, data, and careful, close argumentation. All this you might expect from the collaboration of a fully qualified, but unconventional, economist (Daly) and a learned philosopher-theologian (Cobb). The whole is indeed greater than the parts, and the book could have used the deft hand of a good editor. Almost all readers are going to find some parts hard going. But there is so much provocative, stimulating, and even useful information here that all thoughtful readers, whatever their background or bias, should be in some ways duly moved by it.

As the title and subtitle, ("Redirecting the Economy Toward Community, the Environment and a Sustainable Future") clearly indicate, Daly and Cobb examine virtually the entire spectrum of the human condition. They argue that mostly because of what they call the "fallacy of misplaced concreteness" of conventional economics and kindred social sciences, the world — especially the Western world — has stumbled down the primrose path of vain self-indulgence, resource depletion, destruction of cultures and communities and desiccation of the landscape. Unless we soon mend our ways, we are bequeathing to our survivors the very real prospect of too many "things," endless junk and pollution and quite possibly a universal holocaust.

This fallacy takes several forms, but they say it generally means that through our "modern" cleverness and pride, we have erected certain leading ideas and institutions to guide us without truly worrying about the consequences or monitoring their effects.

They cite as examples such concepts as "The Market," "Economic Man," and the prevailing measures of progress, particularly the Gross National Product. Each concept has been a powerful tool for molding and directing all major plans and policies in the modern world but the concepts have been myopically conceived and now so slavishly followed

that, despite obvious faults and devastating results, many think it almost impossible to abandon them. We cannot see that the free market carried to extremes and excess, eliminates legitimate competition and debases the essential moral support of the community. Likewise the image of "Economic Man" is too shallow and individualistic. And then we have tried to reassure ourselves with the bloodless measures of progress like GNP, which prevails despite efforts to amend or improve it.

Despite their appeal and apparent logic, each of these fallacies occurs, the authors say, because we start with faulty premises and then stubbornly disregard the invalid inferences and dire results that inevitably flow from these significant, pervasive errors.

Haven't we assumed the validity of ideas like endless resources, endless growth, and inevitable progress as we crafted our civilization? We say the ideas are settled and behind us, needing no further study. But how valid, for example, is our money and banking system, which creates "wealth" out of debt? Or our laws and regulations, which mandate growth — even qualified as "reasonable" or "balanced"?

Beyond raising such searching questions, Daly and Cobb provide some suggestions for turning the ship of state — and even the world — around. Some of their suggestions may strike some as speculations or nebulous. But for those looking for more than merely stop-gap legislation and band-aids, their suggestions are encouraging. They show light between the trees, light by which a rebuilding process can begin. They deal with the real world of people, communities, farms, and trade — free and otherwise. The final chapters on "getting there" may prove troublesome because they delve deeply into ethical, philosophical, and even religious realms. But here, too, dedicated environmentalists of all stripes should not shy away. We need to be reminded that all major problems in society are at least ethical, philosophical and even religious, and that we can't cope with them unless we treat them as such.

We shouldn't let this book pass into oblivion with the neglect it seems to have enjoyed to date. ●

*Justin Brande, the first Executive Director of VNRC, is an educator and homesteader; he lives in Cornwall, Vermont.*

## BOOK REVIEW

• • • • •  
*Haven't we assumed the validity of ideas like endless resources and inevitable progress as we crafted our civilization?*

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## DIAPERS: THE CLOTH ALTERNATIVE

### *New Group Offers Information*

Gaye Symington

**W**orried about all the disposable diapers you're adding to your regional landfill? Consider cloth diapers.

A new organization, Parents for Responsible Diapering, has been formed to provide information that will help and encourage parents to use cloth diapers. "This is the first volunteer citizen group that's taken on the diapering issue," said Paul Markowitz, state recycling coordinator.

The group grew out of a Jericho/Williston playgroup. Last spring, soon after Governor Madeleine Kunin proposed banning disposable diapers, members found themselves arguing about the merits of such a ban. All of them diapered their children with cloth most of the time but disagreed on whether it was appropriate to ban disposables.

Their discussions led to the realization that although there was a lot of information about why or why not to use cloth or disposable diapers, there wasn't much information on what cloth diapering really involves today. They decided, as their first effort, to produce a booklet focusing on how, rather than why, to diaper with cloth. The booklet will be distributed to hospitals and home health agencies throughout Vermont, as well as to ob-gyn offices, midwives, birthing classes, and other organizations.

Since most hospitals currently use disposables and distribute free hand-outs about them, parents often assume disposables are the only way to diaper. They're not. But cloth diapering isn't as intuitive as many people seem to expect. Most parents don't live near older generations who could teach the skills of cloth diapering, and there's no network of people supporting those who use cloth diapers.

The booklet tries to fill those gaps. It outlines various cloth diaper options and what to look for when buying diapers, products and supplies. A variety of products and how to use them are illustrated, from old-fashioned flat diapers, pins, and nylon pants to fancy, convenient, and expensive all-in-one fitted, self-closing, waterproof diapers.

The costs of diapering options are also discussed, with calculations showing how over a thousand dollars can be saved by diapering with cloth.

More than thirty parents have contributed ideas and suggestions to the booklet. The language is the language of parents. And a nurse from the maternity ward of the Medical Center Hospital of Vermont wrote a section about diaper rash.

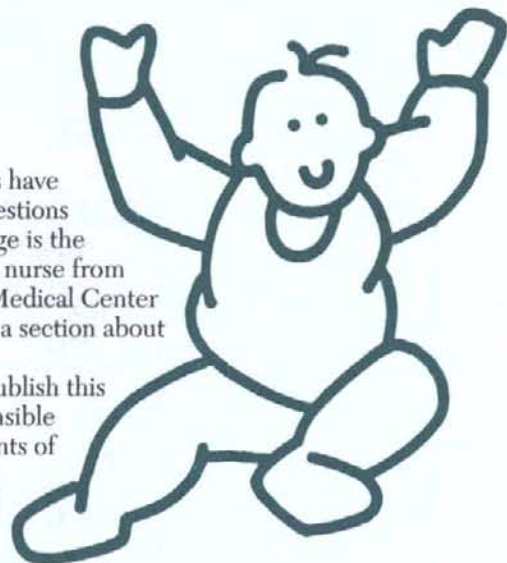
While raising funds to publish this booklet, Parents for Responsible Diapering were the recipients of a slick Procter and Gamble pamphlet "Diapers and the Environment." A baby under a sunlit tree branch

graces the cover. Inside, text and photos refute the image of disposable diapers as a solid waste nightmare. There are pictures of compost made from diaper contents, and plans for plastic products made from recycled diaper outer layers. The pamphlet also tries to point out the environmental disadvantages of cloth diapers. Parents for Responsible Diapering acknowledges that there are environmental costs associated with cloth diapers but they question any suggestion that disposables have the environmental edge.

Parents for Responsible Diapering asks, "How will many of our communities afford the facilities necessary to first separate the four components of a disposable diaper — paper, poop, absorbent gelling chemicals and the plastic outer layer — and then safely compost human waste and ship the other by-products to plants where they can be transformed into their next life? Is this cost worth it where there is a manageable alternative?" •

*Gaye Symington is treasurer of Parents for Responsible Diapering.*

*If you'd like a copy of the pamphlet, "Everything You Always Wanted to Know About Cloth Diapering" send \$1.00 to Parents for Responsible Diapering, RR 1, Box 83, Jericho, VT 05465. If you'd like to help the group with future projects, write to the above address or call Gaye Symington at 899-3324.*



*Is the cost of recycling disposable diapers worth it when there is a manageable alternative?*

# VNRC NEWS & NOTES

## PERFORMANCE PAYS *Environmental Heroes Given Awards at Annual Meeting*

**B**oard Chairwoman Patsy Highberg presented awards to environmental achievers at VNRC's annual meeting, this September in Manchester.

Bill and Betsy Uptegrove, whom Highberg called "citizen superheroes," took home the annual VNRC Leadership Award for personal action and commitment for environmental protection. Bill has been a member of VNRC's Board of Directors; Betsy is an active member of VNRC's Water Caucus. Together they cover dozens of local and state environmental issues.

Senator George Little, a Chittenden County Republican, was awarded the annual VNRC Conservation Award. Senator Little has chaired the Senate Natural Resources Committee, where he has strongly defended environmental laws like Act 250 and the 1988 Growth Management Act (Act 200). "Senator Little seems to know which arguments make sense, and he's fair and tolerant about hearing everyone," said Highberg.

About 150 VNRC members attended the annual meeting, which included a gubernatorial candidates' forum on environmental issues. **NF**

## TAX BASE AND TAX BILL *Workshop Series Completed*

**T**he last of five workshops based on the study and workbook *The Tax Base and the Tax Bill* — produced by VNRC in conjunction with the Vermont League of Cities and Towns — was recently held in Danville. The workshops were held around the state during September and October.

The series covered many tax issues, including the effect second homes have on property taxes and the impact commercial and industrial development have on a town's tax base. The workshop questions the belief that development means added revenue.

Peg Elmer, VNRC's Director of Land Use Policy, called the workshops a success. "A total of about 100 people attended the workshops — mostly municipal officials such as selectmen, planning commission members, and school board members," she said.

Chittenden County has requested a sixth workshop. "We would like to make the workshops an annual or bi-annual event to keep local officials abreast of annual changes in tax law and state aid to education," she added.

If you would like more information on the tax base issues or would like a copy of the workbook, contact Peg Elmer at (802) 223-2328. **SP**

## ADVOCATES FOR VERMONT CAMPAIGN *VNRC Announces New Membership Fundraiser*

**V**NRC is pleased to announce the launching of a major donor campaign, *Advocates for Vermont*.

Advocates are a group within VNRC's membership who take a significant step in helping to protect Vermont's natural resources by making yearly contributions of \$1,000 or more. (Charter members may, this year only, pledge \$1,500 over two years and still receive Advocates benefits.)

Sabra Field, well-known Vermont printmaker has created a unique set of woodcuts for the Advocates campaign. For more information about the Advocates program, contact VNRC's Development Director, Deb Crespino, at (802) 223-2328. **DC**

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Membership includes a year's subscription to the *Vermont Environmental Report*. All contributions are tax deductible. Please make checks payable to VNRC and mail to 9 Bailey Avenue, Montpelier, Vermont 05602.



## ENVIRONMENTAL THREATS IDENTIFIED *Board, Staff Look Into Future*

The Vermont Natural Resources Council has recently completed a quarter-century of active, effective environmental protection. In the past couple of years, our membership has doubled and we have received major grants to open our southern Vermont office and the Montpelier-based environmental Action Center.

With this recent success in mind, VNRC has been preparing for future environmental challenges in Vermont. In a two-day issues session on a beautiful October weekend, the Board of Directors and staff identified the following themes for the coming years and decades: 1) protecting major Vermont ecosystems, species diversity, and special habitats from threats inside Vermont and outside the state; 2) protecting Vermont's contiguous forests — especially the northern forest — for habitat, wood products, and open space; 3) improving water quality in our streams, rivers, lakes, and ponds; 4) conserving energy and improving energy efficiency to reduce pollution and expense; and 5) working with Vermont's agriculture industry to help assure its sustainability and economic viability. *NF*

## NEW BOARD MEMBERS *VNRC Welcomes Two New Directors to Board*

Two new board members were appointed this fall by VNRC's Board of Directors to fill two vacancies.

VNRC welcomes: Jonathan Lash, former Secretary of the Vermont Agency of Natural Resources and now the Director of the Environmental Law Center at Vermont Law School; and Richard Carbin, founder and former Director of the Vermont Land Trust.


These Board members, and the others elected this fall are warmly welcomed to VNRC. *SP*

## MEMBERSHIP AND DEVELOPMENT *Thank You For Your Support!*

VNRC's general membership has doubled in the past two years — the household count is up to 4,500 and still growing! Many thanks to our continuing members who renewed this

year (and yes, there is still time to renew!), and we welcome the 860 new members who joined between January and October.

Membership support is the lifeblood of our organization; it allows us to continue our leadership role in statewide environmental protection, advocacy, and education. Thank you all for your generous support. *DC*



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# BULLETIN BOARD

## November 30

Woodbury College is holding a workshop on **Tax Policy and Land Use Planning** from 9:00 a.m. to 4:00 p.m. It will be led by Deb Brighton. The cost is \$75.00. For information, call Woodbury College at (802) 229-0516.

## December 3

What is the public trust doctrine and what does it mean for the environmental future of New England? To find out, meet at the Lake Morey Inn in Fairlee, Vermont, for the **13th Annual Environmental Law Conference**. The topic of this year's conference is **Public Trust Resources: Protection Required By Law**. This day-long conference brings together national, regional, and state experts on the public trust. The keynote address will be given by Hope Babcock, Esq., General Counsel for the National Audubon Society. The registration fee is \$25.00 for VNRC members and \$30.00 for non-VNRC members; student fee, \$10.00. For more information, contact the Vermont Law School at (802) 763-8308 or VNRC at (802) 223-2328.

## December 7-16

Vermont Institute of Natural Science (VINS) is holding a **holiday sale** weekdays from 10:00 a.m. to 4:00 p.m. Wreaths, crafts, ornaments, and decorations will be on sale. Profits will go to VINS. For more information call VINS at (802) 457-2779.

## December 18

Be sure to make time in your busy holiday schedule for the **VNRC Holiday Open House**. Join VNRC members and friends for music and holiday cheer at the VNRC Montpelier office between 3:30 and 6:00 p.m. Call VNRC for more information at (802) 223-2328.

## December 28

Meet at Vermont Institute of Natural Science (VINS) at 7:30 p.m. for **Falcons for the Future**. The event includes the history of the falcon, including the problem of DDT, and a live falcon demonstration. For more information, call VINS at (802) 457-2779.

## January 24

Every year, VNRC and other conservation groups invite legislators to a breakfast to discuss the environmental agenda for the legislative session. Join us for the **Annual Legislative Breakfast** at the Day's Inn in Montpelier from 7:30 to 9:00 a.m. Pre-registration is required. For more information, call VNRC at (802) 223-2328.

## January 26

Join conservation professionals and citizen activists for the annual **Citizen Lobbying Day for Conservation**. We will discuss key environmental bills and how we can affect their outcome. Meet from noon to 5:00 p.m. at the State House in Montpelier. Call VNRC's Montpelier office for more information, (802) 223-2328.

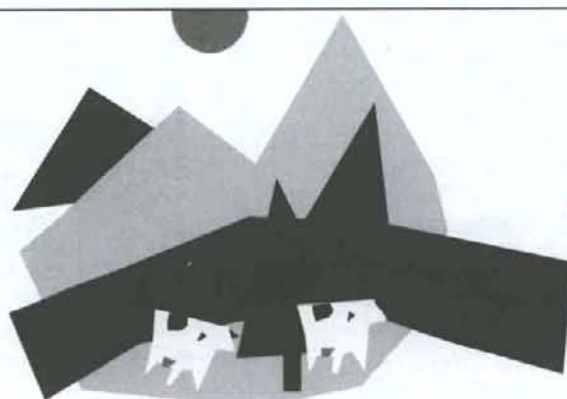


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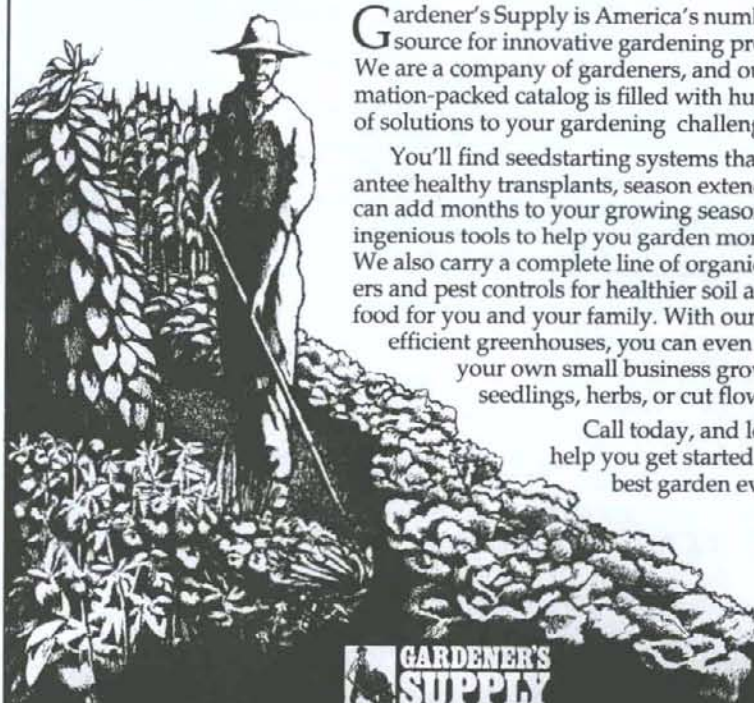
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## V.E.R. Hot Spots

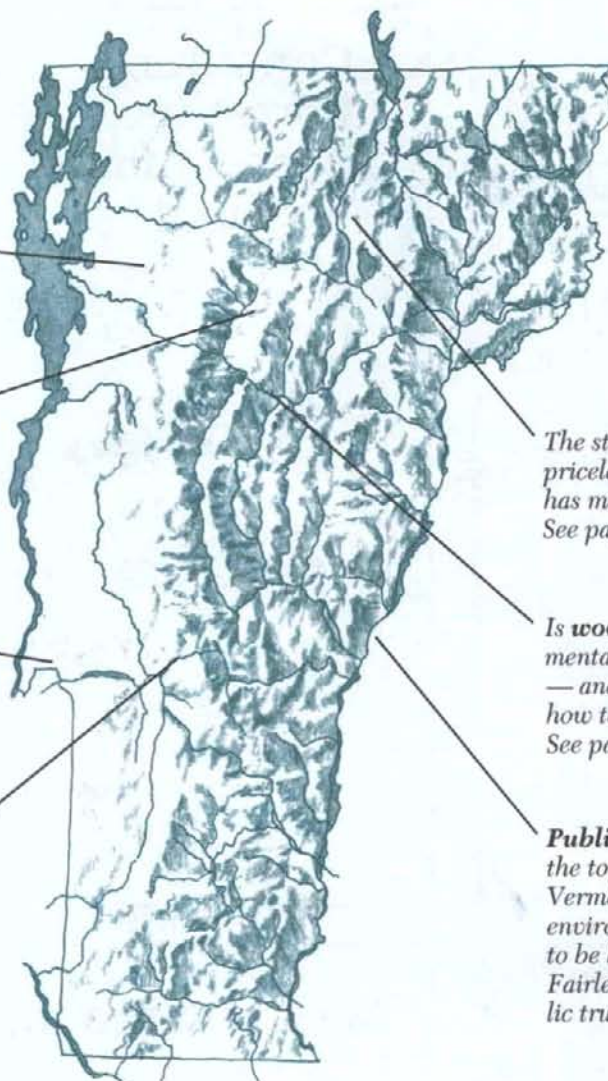
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A new Jericho citizens group is changing the way Vermonters change **diapers**. See page 25.

The **Worcester Mountain** range is one of the fastest developing areas in the state. To find out about VNRC's role in its protection see page 6.

Citizens around the state are participating in **rivers protection**. The towns of Fair Haven and West Haven are currently seeking the Outstanding Resource Water designation. See page 12.

**Bear habitat** protection continues to be a focal point in VNRC's work with Killington, Pico and Tamarack. See Page 8.



The struggle to protect the priceless **northern forests** has moved back to Washington. See page 7.

Is **wood burning** environmentally correct? State experts — and others — offer tips on how to burn it right. See page 20.

**Public Trust** Resources is the topic for VNRC's and the Vermont Law School's annual environmental law conference to be held on December 3 in Fairlee. For more on the public trust issue see page 10.

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# VERMONT

Environmental Report

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