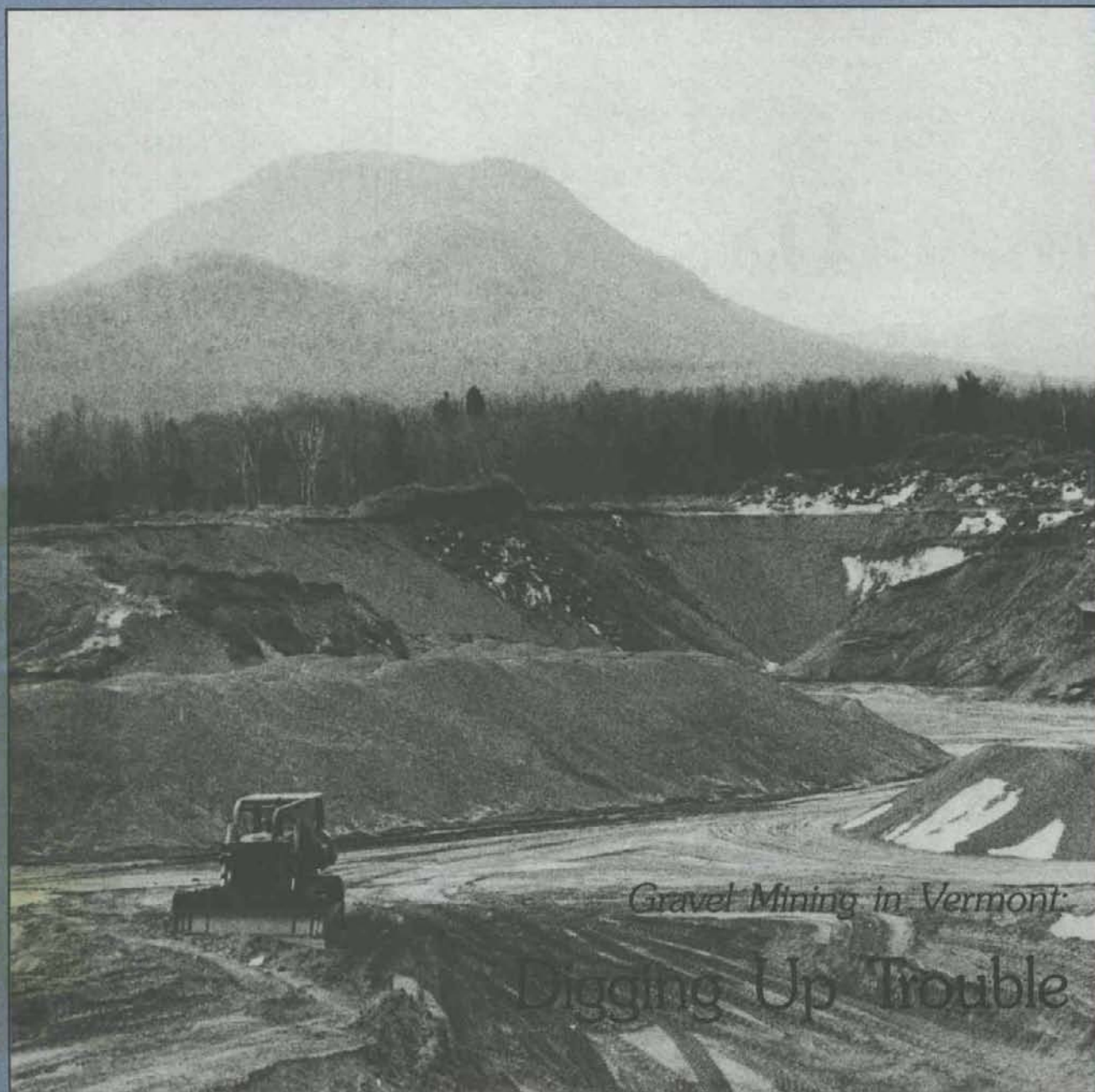


# Vermont Environmental **REPORT**

Vermont Natural Resources Council

Winter 1987



*Gravel Mining in Vermont:*

*Digging Up Trouble*





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# Vermont Environmental REPORT

Winter, 1987

*Published by the Vermont Natural Resources Council*

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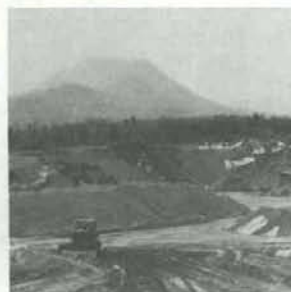
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The Vermont Natural Resources Council is a non-profit environmental organization working to promote the wise use of Vermont's natural resources. The Council does legislative lobbying, research, and educational work on a variety of issues including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

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## FROM THE FRONT OFFICE

Stopping in a bookstore recently, I picked up a book that caught my eye. Here's part of what I read.

"It's mostly in saving the beauty of Vermont that I care about" said Lucy Mallary Bugbee, watching the Connecticut River past her home at Eel Pot Ledges in Bradford.

"Mrs. Bugbee helped found the Vermont Natural Resources Council, the state's leading environmental protection organization. 'I feel every Vermonter should belong to and support that group.' The conservationist worked successfully for state legislation to protect valuable, rare wildflowers and for changes in highway construction plans which threatened important wildlife areas. I think I was always very bashful about speaking, but somewhere or other, after you've gone around with your pictures hundreds of times, you get used to speaking your mind, she said at the age of 96, not long before she died. One of Mrs. Bugbee's preservation victories, a twelve acre bog in Northeastern Vermont, was named in her honor. She also worked to create a sanctuary for more than a hundred varieties of wildflowers and ferns at her home, where hundreds of ecologists and horticulturalists have studied, including students and professors from nearby Dartmouth College." (Excerpted from *Vermonters*, photographs by Jon Gilbert Fox, text by Donald L. Tinney. 1985, Countryman Press, Woodstock, Vermont, page 62.)

Mrs. Bugbee clearly practiced what she preached. Can we all say as much?

Have you examined your life now and looked to the years ahead, and asked yourself "How can I make a positive difference in Vermont?" If you haven't thought about it, or want to do more, there are many ways to help.

- Place a deed restriction on your land so that it cannot be subdivided inappropriately by your heirs or by future owners.
- Speak out at a public meeting or hearing about an issue you have talked about with your friends or family, or help organize a conference on a topic important to your community or region.
- Volunteer some of your time to one of Vermont's conservation organizations. Or donate to a worthy environmental cause something that you know how to make, or equipment or a product from your place of business.
- Make an amendment to your will so that a conservation group has the financial ability to carry out your ideas in the future.

Now is the very best time to start being part of the future of Vermont. Lucy Mallary Bugbee still is.

Sincerely,

*Monty Fischer*

R. Montgomery Fischer  
VNRC Executive Director





## Water And Controversy Behind The Dam

From its source in the Green Mountains to its delta on Lake Champlain, the Missisquoi River meanders through northwestern Vermont; it has provided generations with drinking water, wildlife habitat and from the glacial outwash, some of Vermont's finest agricultural soils. The Missisquoi has been critical to the settlement patterns of Franklin County, from the time of early trappers to present day commuting trends.

The fertile bottom lands near the Missisquoi, while ideal for farming and building, are also subject to periodic flooding. The town of Richford falls victim to just such seasonal ice jam flooding every year.

As a solution to ice jams, which usually occur during the thaws of March and April, the Army Corps of Engineers has proposed an eleven-foot-high dam across the 250 foot span of the Missisquoi as it passes through Richford. The dam would effectively cut in half the last great stretch of free-flowing Missisquoi: the 37-mile run from the dam at Enosburg Falls to the dam at North Troy.

A Draft Environmental Impact Statement (EIS) was required for this project, and it was during the Draft EIS review that concerns were aired. The Corps is expected to respond to these concerns in its Final EIS, due out within the year.

Conservationists and fishing and boating groups responded to the Draft EIS in October, urging reconsideration of the project. VNRC, Trout Unlimited, and the Appalachian Mountain Club (AMC) were critical of the



Icicles. SueRon photo.

project's potential effects on recreational activities such as swimming and white water boating. The group also emphasized the potential loss of productive spawning grounds for brown trout in the free-flowing segment.

In their comments to the Corps, the AMC suggested that complete prevention of ice-jamming is not necessary to resolve the problem. "[The Corps' proposal] gives the appearances of the hunter who hunts for rabbits with an elephant gun," said the AMC's Ray Gonda. "In fact, only a lessening in intensity of the ice pile-ups is required to prevent these damages."

Some townspeople grumbled when conservationists suggested less drastic solutions to the flooding problems. The spring flood represents an annual battle to some area residents; as one Richford man complained, "I've been watching this river flood all my life."

But other area residents argue that the river is a resource that should be available to everyone. "Who is the Army Corps of Engineers to step in and dam a river that really belongs to every person who ever swam in it, fished it, hunted on it, paddled down it, or just sat on its banks and watched the river go by?" wrote Christopher O'Shea in an editorial in the *St. Albans Mes-*

*senger*. "Each building has some one who will speak for it," he added, "but who will speak for the river?" SM

## Stratton Deeryard Case Remains Critical

After months of postponements, hearings finally resumed early this winter before the Vermont Environmental Board regarding critical high-elevation deer habitat. Southview Associates, a development firm, is appealing a permit denial for a 33-lot residential development they had planned in the towns of Stratton and Jamaica. (See "Developer vs. Deeryard," *VER* Summer 1986.)

Both VNRC and the Vermont Department of Fish and Wildlife are advocating protection of 250-acre deeryard—a site which was once as large as 600 acres, but which has been reduced by neighboring development. The yard serves eleven square miles and is now the home of approximately fifty deer.

The case has created a showdown between wildlife biologists and brought into focus the knotty issues of landowners' rights vs. the public's resources, and Act 250's charge to protect wildlife habitat.

On behalf of Southview, biologist Jeffrey Wallin testified that through "intensive vegetative management"—that is, growing more food for the deer—non-productive areas adjacent to the habitat could serve as a suitable replacement for the mature softwood cover in the proposed development area.

On the subject of stress induced by human activity, a point emphasized in VNRC testimony, Wallin responded that "the more stressed the deer are, the more



## VERMONT PERSPECTIVE

tolerant they become."

Other wildlife biologists disagreed, however, and argued that the "vegetative management" proposal was an attempt to substitute food for vital cover. Biologist William Mautz, a Department of Fish and Wildlife witness, asserted that "the enhanced food resource may not be enough to compensate for the energy expenditure [caused by] nearby human activity." Mautz emphasized that the white-tailed deer is one of the "spookiest big game species in North America," and that even slight changes in a deer's winter-time metabolic rate may mean the difference between winter survival and death.

Due to the Environmental Board's busy schedule, hearings are not scheduled to resume again until March. The case could be a landmark in wildlife conservation, however, and VNRC will continue to be involved in its progress. EP

### Madden Pond: Whose Water Is It?

Act 250 hearings resumed in Rutland in December on Killington Ltd.'s plans to construct a four-acre snowmaking pond in an area in Mendon known as Parker's Gore East. (See "What's Parker's Gore?" *VER*, Fall 1986.)

The Act 250 District Commission questioned Killington's need for more water, and requested that the developers furnish information on existing snowmaking pond and pumping capacities, as well as figures comparing Killington's request to the amount of water it can already divert from area rivers.

Figures supplied by Killington

in a subsequent hearing indicate that the corporation can pump up to 7.8 million gallons of water from the Ottauquechee watershed on a typical December day. Killington is claiming that the loss of 7.7 million gallons per month, due to minimum streamflow agreements which Killington negotiated with the State of Vermont, has created Killington's need for the 1.54 million gallon contribution from Madden Pond.

Interestingly, however, the minimum streamflow agreement does not become effective *unless* Killington is allowed to build Madden Pond. In addition, Killington's claimed penalty as a result of the agreements amounts to less than one day of snowmaking capability over a month.

Even with the minimum streamflow requirements in place, Killington would be able to withdraw, using their December figures, up to 89% of the total flow of Madden Brook, 88% of Falls Brook, and 92% of Roaring Brook.

These kinds of figures have conservationists asking whether Killington in fact needs more water, or if there is any limit to how much water the developers would take if allowed. Serious questions have also been raised about how drawing large amounts of water off upstream will affect downstream needs and uses, including downstream wastewater discharges which rely on a certain streamflow for dilution.

Expert witness Dr. Larry Dingman of the University of New Hampshire raised concerns about the operation's potential effect on groundwater, and questioned the validity of Killington's claim that 40% of the water they use in snowmaking is lost before it hits the slopes.

In addition to water questions, hearings on Killington's Madden Pond proposal will include new evidence on how the development could affect the area's bear population. The hearings are expected to continue through the winter. EP

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## Fine Tuning for Current Use

After a summer and fall of hearings, the Current Use Advisory Board will be going to the Vermont legislature to seek some fine tuning of the program. The Advisory Board is responsible for the administration of the Use Value taxation program, or "Current Use," which offers a tax incentive for those who manage their agricultural or forest land.

The changes come largely as a result of last year's addition of the new land category known as "farmland." This category allows full-time farmers (as defined under IRS codes) to come under the Current Use program, but without the lien or land use change penalty provisions required of the existing "forest land" and "agricultural land" categories. Changes this year are also prompted by the cries of town listers around the state who are overwhelmed by the additional processing of forms, and by questions about changes in the law.

The Board is proposing legislative amendments aimed at clarifying the definition of a "full-time" farmer, and eligible "farmland." In addressing corporate farmers, the Board recommends that "a business...entity can only be considered a 'farmer' if more than 50% of the stock or other ownership interest is owned...by farmers or members of the immediate family..."

The new "farmland" category should be amended, according to the Board, to allow patches of woodland and non-productive land to be factored into the calculation of "farmland," provided that the land is interior to the farmland and is less than 25 acres in size.

Since its creation last spring, the "farmland" category has ballooned with the addition of over 300,000 new acres. Overall program costs, which were at \$4.2 million in fiscal year 1986, are estimated at \$7.7 million for fiscal 1987. Based on reports from two thirds of Vermont towns, the new acres added to the program are 34% forestland, 52% farmland, 12% agricultural land and 2% unidentified.

The Current Use Tax Coalition (CUTC), a watchdog coalition of which VNRC is a member, is closely monitoring the metamorphosis in the eight-year old program. In testimony to the Board, CUTC Chair Jim Wilkinson suggested legislative changes in three areas: amendments to simplify administrative procedures; the use of a local application fee to compensate the town clerks' processing time; and removal of the lien constraint from all categories of land in addition to "farmland," due to issues of con-

stitutionality and fairness.

"The last-minute action of the 1986 session of the General Assembly created an aberration of costly proportions," said Wilkinson. "The farmland category and other attendant additions have been and will be difficult to address," he added, "but the Coalition will continue to work for a strong and united program for ensuring use value taxation for both farm and forest productive lands."

The Board also proposes having most program paperwork bypass the towns and go directly to state offices. This would relieve local officials of extra work, and minimize questions of inconsistent recording and interpretations of eligibility. Although the changes are relatively minor, both legislative and administrative amendments are likely to attract attention, as the property tax debate continues and as legislators attempt to tighten the state's fiscal belt. EP



Photo: Sandy Milens

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# Digging Up Trouble



"Nowadays, gravel pits are involved in some of the most hotly-contested cases before environmental commissions in Vermont," remarked one Act 250 official recently, in reference to the many new gravel pit applications around the state.

It's no wonder that gravel pits are digging up trouble in Vermont. The pits are one of the most visible and ravaging—and yet seemingly necessary—intrusions on the landscape of any land use regularly practiced in Vermont. They illustrate at once our dependence on "non-renewable" resources—and the environmental costs of such dependence.

## Disruptive Neighbors

Gravel pits may range in size from backyard operations, like those used to condition farm roads in mud season, to full-scale commercial operations such as the twenty-four acre pit which recently received an Act 250 land use permit in the town of Hyde Park.

Such commercial operations often entail the use of heavy equipment: stone crushers, screening and washing facilities,

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## Many gravel pit owners claim exemption from the scrutiny of Act 250 due to the "grandfather clause" in the Act.

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blasting, and continuous pushing and hauling of material around the site.

The sound can be deafening: in one permit proceeding, the noise level to nearby residents of a pit was determined to be "eight times higher than the level at which EPA indicates that outdoor activities are impaired, and more than twice the level at which EPA suggests that hearing loss is a consideration."

Also of prime consideration is soil erosion, as huge chunks of topsoil and overgrowth must be removed before the gravel-bearing strata is revealed. Steep hillsides are exposed, contributing silt and mud to nearby streams with each rainfall or melting period.

## "Grandfathering" the Problem

There are several remedial procedures for preventing erosion, dust and noise, most of which are arrived at in Act 250 review. Many gravel pit owners claim ex-

emption from the scrutiny of Act 250, however, due to the "grandfather clause" in the Act. Any activity that existed prior to passage of Act 250 in 1970 is "grandfathered-in", or shielded from review, unless that activity enlarges or changes in such a way that a "substantial change" review is triggered.

With a gravel pit, "substantial change" may mean the difference between occasional use and commercial mining, or the start-up of a washing plant that draws and discharges water. However, the distinction between where an "existing use" ends and a "substantial change" begins is often contested, since gravel pits by definition always consume ever-larger amounts of land. A "substantial change" is also hard to quantify as it is often difficult to establish what in fact occurred on a site prior to 1970.

For those pits where Act 250 Commissions are able to assert review, or where a new permit is requested, District Commissions are facing a multitude of conflicts with gravel pit owners. But the showdown is not brought on simply by the state's flexing its bureaucratic muscle; most of the conditions on new gravel pit permits are prompted by local resident and conservation groups alarmed at the environmental

Photos by Don Avery.

Above: H.A. Manosh's Hyde Park gravel pit and landfill.



consequences of gravel quarrying.

"It's hard to live next to," says Charles Storrow of Hinesburg, who saw rapid commercial reactivation of a minor pit across the street from his home by the Starksboro Stone and Sand Company. Storrow has called into question the "substantial change" rule before the District 4 Environmental Commission; he is concerned about noise, dust, and the pit's effect on property values, as well as the pit's impact on the Vermont Fish and Wildlife Department's nearby wildlife management area.

### The Problems Run Deep

A look at some 1986 gravel pit decisions gives an indication of the variety of problems in gravel pit siting.

•West Townshend, January: A proposal to extract 160,000 yards of gravel from fourteen acres over a fifteen-year period was turned down due to the pit's proximity to a historic gravesite, and incompatibility with both local and regional plans in the West Townshend village area.

•Stowe, March: A twenty-acre site with an estimated 45-truck-per-day haulage rate was rejected on appeal due to disturbance of the nearby Moss Glens Falls natural area, and a sixteen-fold increase in noise levels for adjacent residents. The Environmental Board concluded that the project "is wholly out of context with its surroundings and would constitute a visual and aural assault upon residents and visitors."

•Northfield, June: A pit owner appealed a District Commission's decision which required paving of the pit access road (to avoid dust), landscaping to minimize noise, and installing traffic control signs. Neighboring families were unable to open their windows in the summer from the dust. The decision also required the maintenance of minimum stream flows in the Dog River, as the river would be tapped for gravel washing operations. The Environmental Board affirmed the Commission's decision; the pit owner has appealed to the

State Supreme Court.

•Morrisville, August: The Garfield Road Association, a community group, appealed the issuance of an Act 250 permit to H.A. Manosh. Manosh responded by appealing several of the permit conditions, as well as the jurisdiction of Act 250. Garfield Road Association submitted concerns over the traffic impacts to a Class III road, the loss of agricultural soils, and lack of a suitable reclamation plan. Most alarming to the group was Manosh's plan to landfill garbage, potentially coming from as far away as Burlington, into pit areas that had already been stripped of gravel. The Board ultimately issued a permit in return for specific conditions on road use, landscaping, and the retiring of 25 acres to satisfy farmland conservation.

•Starksboro, September: An Act 250 permit was denied a large 134-acre pit, on the basis of visual pollution and inconsistency with the town plan. The Commission also noted the impacts to primary agricultural soils and the need for a better reclamation plan.

•Pittsford, October: Permits for a twenty-acre Pike Industries site were revoked after blasting records showed that on 29 occasions, Pike had exceeded the allowable 1,000 pounds per explosive by blasting up to 20,000 pounds. The peace of nearby residences was further broken by several evening explosions, as well as the sound of the passage of some 200-300 trucks per day—well above the forty truck per day limit set in the original 1983 permit.

### Time for Solutions

Recognizing the increasing conflicts involved in gravel pit permit proceedings, a study group made up of pit owners, Act 250 officials, legislators, residents, and VNRC staff was formed during the summer of 1986. The group focused specifically on the "substantial change" issue, and more generally on defining the level of environmental review

necessary for gravel pits.

At the first meeting, State Geologist Charles Ratte' noted the need for more comprehensive mapping of the state's mineral resources, and said that his office was taking the "earth resources" criterion of Act 250 seriously. At a later meeting, a subcommittee of the Associated General Contractors of Vermont put forth a proposal addressing issues of registration, their definition of "substantial change," and a list of considerations on traffic evaluation, noise, dust, aesthetics and erosion.

The Environmental Board also advanced a tentative proposal addressing the "substantial change" issue, calling for the establishment of a "base extraction rate." The rate could be either an average of the previous five years' removal rates, or the third highest of those five rates; the figure would be used as an estimate of the level of operation prior to Act 250 review. The Board has also called for a registration process for all pits, whereby an owner would submit the annual extraction rates for the previous five years, and certify the pit's existence prior to April, 1970.

VNRC maintains that these are necessary steps for a minimum level of environmental protection. The Council also supports mandatory review of "grandfathered" pit operations that create recurrent pollution problems. A process such as Act 250 should be available to the public, because as pits enlarge over time, so may their impacts on environmental quality.

A legislative proposal on the "substantial change" issue may be forthcoming this year. Meanwhile, as long as the state builds roads and developers pour concrete, District Commissions will continue to be pressured on the gravel issue. Responsible pit owners and an alert public will be key to minimizing gravel problems since, with the abundance of dirt roads and the current development boom, Vermont may not lose its appetite for gravel for many years. EP



*Don and Lela Avery and their two sons operate the Cady's Falls Nursery in Morrisville, Vermont. On these pages, Don Avery gives his commentary on how a nearby gravel operation has affected life in his rural home.*

This is a quiet valley, neatly tucked away from the outside world. Ours is one of those old Vermont farms you would be happy to discover were you lost between Hyde Park and Morrisville. The town road passes through woods and meadows following the south bank of the Lamouille River, and crosses Kentfield Brook at the old swimming hole before ending in our "door-yard." For 160 years farmers have worked the rich bottomland of the Old Duhamel Farm. Nowadays, if you were to come in summer you would see single Jersey cow in the pasture, and in a place of corn, fields of flowering perennials.

This is The Cady's Falls Nursery, our home and our livelihood. With huge, well-constructed barns, flat loamy fields and all the spring water we could ever need, what else could we ask for? But there is something out of place here. You can't miss the ugly scars on the hillside above the river and the convoys of gravel trucks pounding in and out.

When we bought our 22 acres in 1979, the old pits on the remaining property out back were used very little, overgrown with brush like many farm pits you might see around the countryside. But in 1982 the H.A. Manosh Corporation bought the old pits with 98 acres, intending to develop a full-scale commercial operation.

Howard Manosh, a powerful local businessman, is no beginner at the development game. Some of his many ventures include a large well-drilling and excavating company, a shopping plaza and asphalt plant in Morrisville, an asbestos mine in Lowell, and a new garbage dump which is part of a 24-acre gravel pit in Hyde Park.

The stakes in the gravel busi-

ness are high. No road, no building foundation, no septic system and no concrete of any kind can be made without sand or gravel; sand and gravel are literally the foundation of all development. And gravel is only found in certain areas. Because gravel is a product of glacial melt, river areas are a prime target for gravel mining. Since the material is very heavy, the cost of transportation is high; thus a pit owner who is able to hold the monopoly on strategically-located pits can realize tremendous profits.

Manosh admitted to me right away that he had bought the property primarily because the pits pre-existed Act 250 and would therefore be immune to environmental restrictions. At first, we were ignorant of the workings of Act 250 and we accepted this simplified concept of "the grandfather clause." But as a couple of years went by, we realized that it might not be quite this simple.

After we contacted the District 5 Environmental Office and they contacted Manosh, it began to look doubtful that there had been any significant commercial activ-

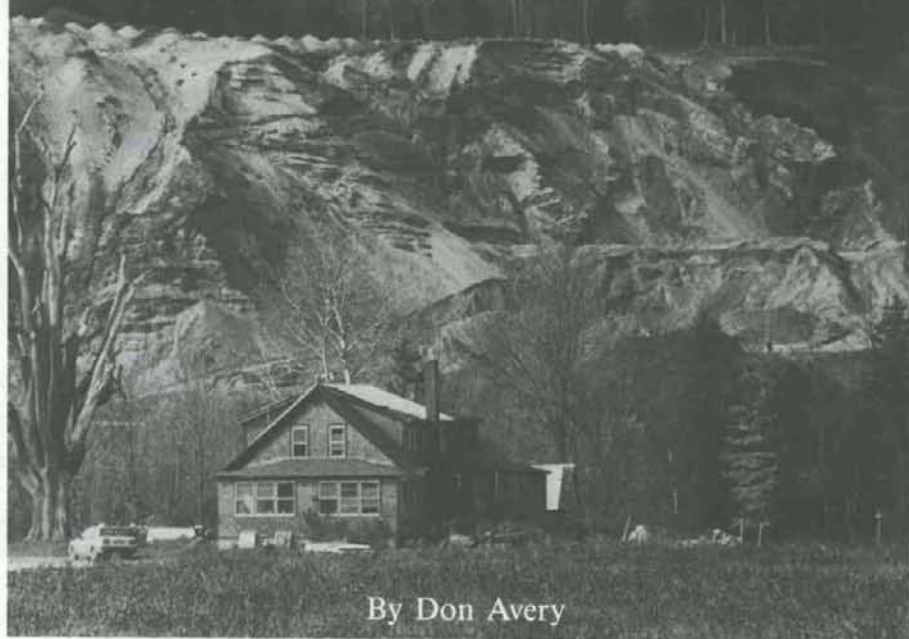
ity here before the passage of Act 250 in 1970. Manosh was asked to substantiate the pre-existence of such an operation. He ignored this request and the District Coordinator advised Manosh that a permit would be required before he could open for business.

This is how things stood until July 14, 1984. At six o'clock that Saturday morning Manosh began stripping the topsoil off the meadow above our house. The work continued Sunday, and we stood by horrified Monday morning when dump trucks began hauling out a load of gravel every four minutes, passing within fifty feet of our greenhouse.

Our quiet valley was being turned inside-out—and the Act 250 administrators were helpless. Only a restraining order from the Attorney General's Office could stop the project, but with the jurisdictional question still officially undecided, state environmental officials were unwilling to make that move.

*Above: The H.A. Manosh gravel operation and an adjacent farm, not far from Cady's Falls Nursery in Morrisville.*

## Life Beside A Gravel Pit



By Don Avery



A month later we went before the Environmental Board seeking a Declaratory Ruling. In order to find out whether the present excavation was under the jurisdiction of Act 250, we needed to answer some questions: were these pits commercially-operated before 1970, and if so, what was the nature of the operation?

Manosh packed the hearing

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**You can't miss the ugly scars on the hillside above the river and the convoys of gravel trucks pounding in and out.**

---

room with blue-shirted men ready to swear that they had hauled out gravel in the 1960's. Two of our neighbors, however, old-timers who had run the farm during those years, testified that the excavation had been very small and that insignificant amounts of material had been sold. The attorney for the Agency of Environmental Conservation had no case whatsoever prepared against Manosh, and it seemed to come down to a question of who showed up with the most witnesses.

The Board ruled that Manosh could continue taking gravel without a permit as long as this was done "in a manner consistent with past history." The Board determined that 10,000 yards had been sold in 1968 and that a 10% increase in that peak rate, or the introduction of a stone crusher or other large equipment, would constitute a "substantial change" and would trigger the permit requirement.

Even though we had lost the decision, we felt that it still protected us from the type of large scale operation Manosh had in mind. We soon found ourselves counting dump trucks pass by our farm, however—and we had no direct means of enforcing the ruling.

Should we determine that "substantial change" occurred, we would have to go back to the District Coordinator, and then for another Declaratory Ruling before the Board, which would probably be appealed to the Supreme

Court; this would take at least two years. Then we would go back to the District Commission for the permit process, and to the Board for the third time for appeals on the permit. We were faced with the grim possibility of the gravel pit continuing on a free-for-all for the next four or five years!

In 1985 and 1986 Manosh created a gigantic commercial pit on the banks of the Lamoille River. We estimate that 20,000 trucks have passed our home in the last two years—six times the extraction limit set by the Board. I can not deny that Manosh has made certain concessions to us and has taken some steps to lessen the negative effects of the pit—but just enough to keep us below the boiling point.

I can not think of a single other "development" which would bring about such instantaneous destruction of the quality of life. A stonecrusher sounds and feels like a freight train passing by incessantly. The constant intrusion of fifty-thousand pound dump trucks hitting potholes and bucket loaders with beepers is very nearly unbearable. In Act 250 language they call this "substantial change"; it certainly is a "substantial change" from the life people ought to have on a farm in Vermont!

It has always been our position that the Environmental Board should enforce its own ruling and that we should not have to watch-dog the gravel pit or start the permit process. Environmental enforcement action must go through the Attorney General's Office, however, and there has been a tremendous reluctance on the part of the Board to take this step.

The Attorney General's office will not file suit in a case where the law is unclear or the violation less than outrageous. Neither they nor the Board is ready for a showdown which they might lose, and thus, often can merely apply informal pressure with nothing to back it up. However, in the last year, with some new staff and appointments, the Board has slowly begun to gather confidence.

Our break came in the fall of 1986 when the Supreme Court passed down a long-awaited ruling on a similar "substantial change" issue involving the Manosh pit in Hyde Park. The court supported the 1985 Board ruling that Manosh had exceeded the historical guidelines on that pit and must come into compliance with Act 250. Immediately following this news the new Executive Officer of the Board, Stephanie Kaplan, notified Manosh that a permit would also be required at the Duhamel Farm.

After months of cajoling, Manosh submitted an application. He has proposed extending the pit onto non-grandfathered adjoining property, however, which contains an estimated three million yards of gravel. Manosh is requesting an unlimited permit which could generate up to 25,000 trucks per year

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**No road, no building foundation, no septic system and no concrete of any kind can be made without sand or gravel; sand and gravel are literally the foundation of all development.**

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for twenty years. This proposal is of such a huge scale that it has strengthened opposition to the operation in the community. Hearings are expected to begin in January.

I believe that the size of gravel pits should be controlled by well-thought-out permit restrictions followed by consistent enforcement. And with no "grandfathered" pits, everyone would be playing by the same rules.

There is no question that environmental enforcement takes time and costs money. But it is my feeling that gravel prices are now "dirt cheap" and the pit owners are still able to make a reasonable profit. It would certainly be worth paying a bit more in order to ensure environmental sanity.



# *It's Not Just the Pits—*

Riverbed gravel operations are also causing concern, especially about their effects on fish populations.

Wilfred Moore, Chair of the Sharon Board of Selectmen, doesn't understand the controversy. The town of Sharon has been removing gravel from the White River for as long as he can recall. "We need the gravel to build and repair our roads," says Moore. "The town can't afford to haul gravel sixteen miles from New Hampshire. We've budgeted only enough money to take it from the river," he adds, "where it is free for the taking."

The town of Sharon is not alone. A number of towns, as well as some private individuals, seek to extract gravel from the White River or its tributaries. But the once-native Atlantic Salmon is now being reintroduced to the White River as a result of the Atlantic Salmon Restoration Program, and some conservationists are fearful that gravel mining will jeopardize re-stocking efforts.

U.S. Fish and Wildlife biologist Vern Lang is among those who are concerned. "Removal of gravel is detrimental to any fish population," notes Lang, "but especially so for the White River, due to the substantial public investment in

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**Streambed gravel operations may remove important fish spawning and nursery areas, reduce food sources for fish, increase sedimentation, and change river flow characteristics.**

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the Salmon Program and its relative uniqueness as one of the few remaining major free-flowing rivers in New England."

The conflict between gravel mining operations and Vermont fisheries made headlines last summer when the small river valley town of Sharon applied for a Federal Army Corps of Engineers "Section 10" permit to remove gravel from the White River. Conservationists and the fishing community argue that the Army Corps issues permits to remove gravel with little regard for stream ecology. The Corps, how-

ever, claims that gravel removal, when properly regulated, is not harmful. The only issue agreed upon is the painful lack of data on the effects of the practice on the river resource.

There is concern in many quarters that gravel extraction has adverse effects on a river's diverse fish populations. Gravel operations may remove important habitat including spawning and nursery areas, reduce food sources for fish, increase sedimentation, and change river flow characteristics. Gravel extraction is also viewed by many conservationists as an impairment to a river's scenic value.

In attempting to define the problems and investigate impacts and management options, a state-sponsored symposium on gravel extraction was held at the University of Vermont in December. The forum allowed policy makers, scientists and others the opportunity to discuss the effects of mining gravel from streams.

"I can't think of a way to take gravel out of a stream without hurting the fish" noted Ray White, a University of Montana fisheries biologist who attended the forum. White expressed surprise that Vermont, with its reputation for environmental awareness, allows the practice.

For many years the state has banned gravel extraction below the waterline in streams over which it has jurisdiction, and gravel extraction is also regulated in larger rivers. As a result, gravel extraction in most rivers has been limited to the "dry" gravel bars that become exposed

◆  
*The most fruitful gravel mining operations are in or near rivers—areas of glacial melt where the crushed material was deposited. Although the Nadeau pit (above) is not a streambed gravel operation, it borders directly on the Lamoille River in Johnson.*





when the water level recedes, usually during the summer months. Specifically, state law requires a permit when the stream drains an area greater than ten square miles and when ten cubic yards or more of gravel is extracted.

According to Craig Heindel, a Chittenden County hydrologist, cost is one issue: municipalities save a substantial sum by using stream gravel instead of land-based gravel pits. Although small amounts of gravel are mined—about 2,000 cubic yards per extraction—Vermont towns collectively save over \$100,000 a year by using stream gravel. Cost estimates for land-based pits average from two to three times those for streambed gravel.

Associate Professor at UVM's School of Natural Resources Robert Manning reflected on the intangible values of river resources and the need for management practices. "The natural environment can play many important roles in societal values. Recreation is an important value of rivers and streams, I would like to see it entered into the equation when management practices are developed."

Environmental issues associated with gravel extraction came to a head in August, when four conservation organizations—VNRC, the Atlantic Salmon Federation, the Conservation Law Foundation, and the White River Salmon Association—requested that the Corps hold a public hearing on the Sharon permit. No such hearing was held, however, and the Corps also failed to issue a formal decision on either the need for a public hearing or the application itself.

Governor Kunin's inclusion of gravel extraction in her four-point environmental address last fall was welcomed by members of the Vermont Rivers Alliance, a coalition of conservation and sporting groups. The Alliance's position is that gravel extraction in all streams should be banned until studies are conducted.

It is clear that the debate over streambed gravel extraction, while unfortunately based more on observation than on scientific

data, has created emotional arguments. It has also created some unlikely bedfellows. Joe Parkinson, executive director of the Vermont Ski Areas Association, addressed the importance of good

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**The only issue agreed upon is the painful lack of data regarding streambed gravel extraction's effects on the river resource.**

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trout fishing to the tourist industry in the group's summer newsletter and wrote, "We should forbid uncontrolled graveling in Vermont's riverbeds." Unlikely allies, but allies nonetheless.

The state may address concerns about streambed gravel mining in a variety of ways. According to Jonathan Lash, Commissioner of the Vermont Department of Water Resources, options range from a complete ban to a

stronger permit process. Lash said he expects legislation to be introduced in the upcoming session to limit gravel mining in certain rivers and streams.

Another option, Lash added, is strengthening the permit process to require towns to hire only excavators who have been trained to understand the ecological impacts of gravel mining. But, as with many other Vermont environmental regulations, funding for enforcement is another issue. Vermont has only one inspector for the entire state.

Vermont Commissioner of Fish and Wildlife Steve Wright closed the UVM conference with his reflections on gravel issues. "By isolating gravel mining, we continue to isolate its effects," he said. "Think of a stream as a biological unit and regard in total the recreational, ecological and commercial benefits, to get some reasonable expression of its impacts. By doing so," he continued, "we can demonstrate that maintaining the integrity of the stream is beneficial." SM



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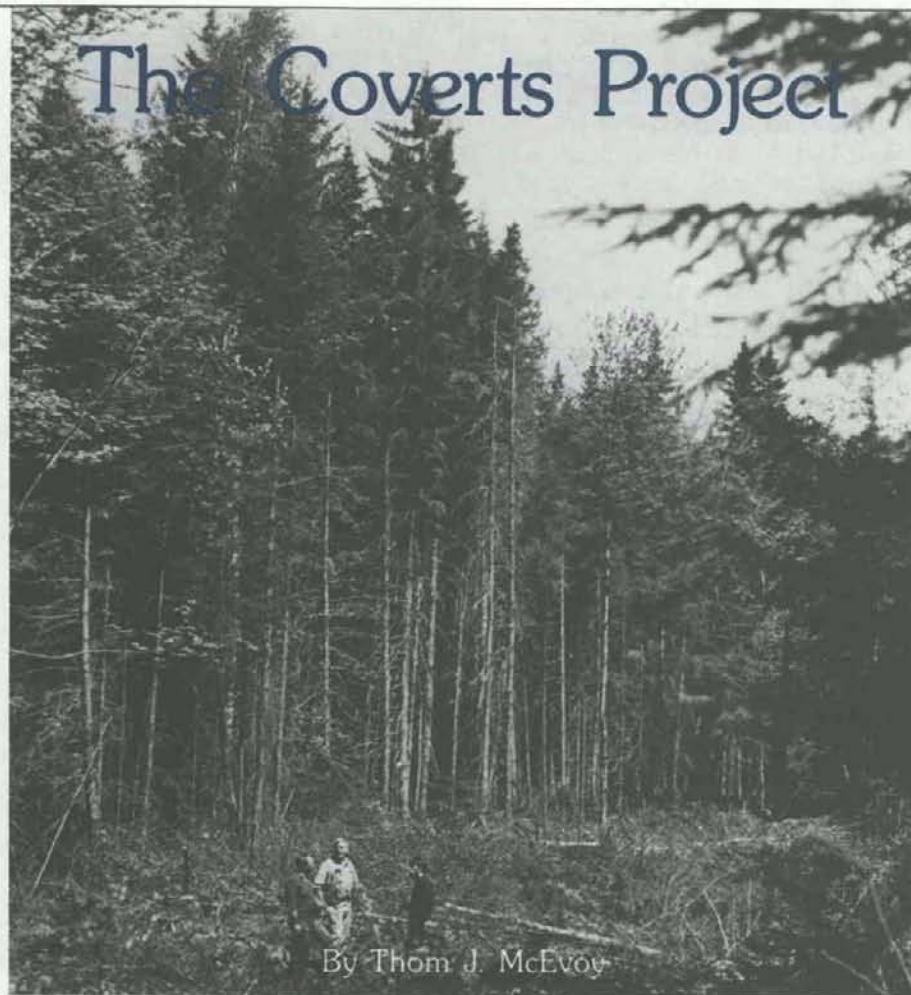
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# The Coverts Project



By Thom J. McEvoy

Many of us have been trained to believe that *forest* management means *timber* management. But when we ask private woodland owners why they choose to own land, we find that the answer involves much more than just board feet and cords.

"For recreation." "As an investment." "Because I like to have a wooded area surrounding my home." "Because I enjoy the wildlife." These are the kinds of reasons we hear from private landowners.

These reasons are valid—and clearly must be addressed. Some 58% of the 487 million acres of productive forest land in the U.S. is owned by nearly 7.8 million landowners. These acres account for 47% of the timber harvested

in the nation. The numbers are staggering; but it is disheartening to note that private woodlands are producing at less than half of their potential. The Coverts project takes aim at what may be the root of this problem: a misconception on the part of millions of landowners that good forest management is incompatible with the other forest values.

## Who Are We Managing Forests For?

There is nothing co'vert about the Coverts project. Used as a noun, a covert is "a sheltered area which provides cover and protection for wildlife." Thus, the name appropriately identifies the project's intent: to make woodland owners more aware of forest management opportunities, especially for resources other than timber. Now in its third year, Coverts is a project of the Cooperative Extension Services

of Vermont and Connecticut, sponsored by a grant from the Ruffed Grouse Society.

The Coverts project assumes that forest management goals are, or should be, defined by the landowner. And whether our aim is to improve timber harvests, wildlife habitat, recreational opportunities, or other natural resource goals, focusing on landowners' interests may be the most cost-effective and viable approach.

## From Neighbor to Neighbor

Perhaps what is most unusual about the Coverts project is not so much its message as its messengers. Nearly 100 forest owners in Connecticut and Vermont have completed an intensive three-day workshop, which has prepared them to help community woodland owners evaluate their management alternatives.

It makes good sense to enlist the support of volunteers, when the audience is as large and amorphous as woodland owners. And there are even more compelling reasons for looking to volunteers for help in spreading the word: sociologists have known for years that people are most apt to act on advice if it comes from someone whom they view as most like themselves.

Extension workshops and County Forester assistance have been successful in creating awareness and in helping many clients to adopt management. However, they may not be helping the majority of woodland owners. Nearly two-thirds of the 65,000 individuals who own forest resources in Vermont evaluate management as a new, out-of-the-ordinary, and usually threatening concept.

And sociologists know why: people may learn from our publications and workshops, but they do not (and *can* not, according to the sociologists) apply the knowledge to managing their lands. Landowners have no way to evaluate the new information; it's like trying to teach someone a new language without using any native-tongue referents. Coverts volunteers are the woodland refer-

*Above: McEvoy, Chandler, and UVM's Peter Hannah examine a spruce and fir strip cut, an effort to regenerate the stand without endangering its integrity as a deer yard. Photo by Joan Knight.*



ents, capable of supplying the missing link.

## Volunteers for Forests

Each Coverts volunteer has survived a selection process that begins with a nomination by a natural resource professional, agency or organization in Vermont.

Nominees are invited to apply via a six-page questionnaire, and up to thirty successful candidates are then invited to participate in a three-day, all-expenses-paid workshop in early September.

The workshop is a blend of lectures, problem-solving, planning exercises, and field sessions. The workshop's aims are to heighten participants' understanding of ecology and forest use; to hone the group's communication and leadership skills; and to increase participants' understanding of Vermont's forest and wildlife issues. Volunteers are also subgrouped geographically to improve networking, task-sharing and camaraderie.

Each individual designs his or her own plan of action; there are no performance expectations imposed, nor are bounds set on how participants will operate. To date, the sum of their accomplishments is impressive.

Vermont's corps of Coverts volunteers live and manage forest land statewide, with rich and varied backgrounds ranging from artists and authors to retired engineers, school teachers, merchants and farmers. Using their new knowledge as a tool, participants have designed projects as varied as writing for local newspapers, participating in radio interviews, and speaking at workshops and meetings. But probably the most successful efforts have been the personal contacts with neighbors and friends. After all, it is these kinds of interactions which best help friends evaluate forest management from their own perspectives.

## Two of Many Successes

Noel Fritzinger owns 250 acres in the town of Weston, and is one example of many successful Coverts volunteers. After con-

sidering several approaches to spreading the word in his town, Fritzinger decided to concentrate on his neighbors on Burton Road.

Through meetings and field tours, Fritzinger has successfully cultivated an informal association of land-owning neighbors who are as committed as he is to a more holistic approach to forest management. And his efforts have also served to connect names on mailboxes with a group of people who are becoming neighbors in a more personal sense.

"Better wildlife habitat is the glue" that holds the group together, according to Fritzinger.

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## Nearly two-thirds of Vermont's forest land owners evaluate management as a new, out-of-the-ordinary, and usually threatening concept.

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The group doesn't care a great deal about the economic potential of timber; but mention the benefits to wildlife from a timber sale, and it's a different story.

The consulting foresters and habitat biologists who have provided technical support to the group are also pleased. For years, conservationists have been concerned with "fragmentation," the process whereby large contiguous tracts are broken up as parcels are sold. These ill effects may be lessened through efforts such as Fritzinger's.

Harry Chandler's experience with Coverts is a success story to which woodland owners across the country aspire. Chandler, probably the first Vermont woodland owner involved in Coverts, loaned us his 240 acres in Groton as a Coverts demonstration site. In exchange, we developed a fifteen-year forest management plan which now serves as a model of resource integration. He began implementing the plan in 1984 with the help of his consulting forester, Richard Carbonnetti.

Forest management was not new to Chandler. A certified Tree Farmer since 1976, Chandler won

Vermont's Outstanding Tree Farmer Award for 1986. He then won the New England Award—and now has gone on to be voted the Outstanding Tree Farmer from among more than 58,000 in the country!

In addition to audiences with governors, congressmembers, and leaders in America's wood-using industries, Harry has had numerous speaking and radio appearances and tours on his property. Like Fritzinger, Chandler has also successfully encouraged many of his neighbors to manage their lands.

## If It Works Here...

There are many other stories of success from around the state. Thousands of woodland owners have heard of Coverts, hundreds have had direct contact with volunteers, and dozens have improved their forest management as a result of the project. And, although the original three-year grant from the Ruffed Grouse Society ran out in 1986, the Society has agreed to extend the funding for at least another year.

In the fall of 1986, a group of education experts from around the country was invited to join the Coverts National Advisory Council. The Council will help design an evaluation, so we can better understand and share with others the impact of the project. And since states from Alaska to Maine have expressed an interest in Coverts, we will also begin to help Coverts go national. The small, New England-based notion of helping forest land owners help themselves is turning into a big idea.

*Beginning in April the Coverts project will be accepting applications for the next workshop in early September. Although the project will still rely on nominations from professionals, for the first time woodland owners in Vermont may nominate themselves. For more information, contact: Coverts Project, Aiken Center/School of Natural Resources, University of Vermont, Burlington, 05405; or call (802) 656-3258.*

*Thom J. McEvoy is Extension Forester in the School of Natural Resources at the University of Vermont.*



# The What's, Why's and How's of Vermont's New Non-Game Check-Off

By Geoffrey Poister

What in the devil is the "non-game check-off?" Does anybody, excluding experts and wildlife freaks, really know? To answer these questions, I conducted a small survey. Disguising my voice in the nasal tone of a national polling service operator, I called some strangers at random.

"Hello, I'm conducting a poll for the National Information Service," I droned. "Can you tell me what the 'non-game check-off' is?"

"No."

"Can you make a guess?"

"Um.... No."

That was the overwhelming response. (Makes for a rivetting article, doesn't it?) So, I called some acquaintances for a more informed and, hopefully, interesting reply.

"Is it a board game dealing with Russian authors?" replied one, confusing "check-off" with Chekhov.

*Geoffrey Poister has a degree in wildlife biology; he is a freelance writer and musician living in Calais.*

*Photos courtesy of the Vermont Department of Fish and Wildlife. Above: The peregrine falcon restoration project is the type of program that could be funded with the help of the non-game check-off.*



"Is it a quiz show for trend-setters who don't like to play games?" replied another. It didn't take long for me to realize that this was a futile exercise.

This horseplay did make one point quite clear, however: very few people know what the "non-game check-off" is. (In fact, according to my poll, nobody does.) But to all Vermonters who value the sight of a soaring falcon, the call of the loon or the sound of chorus frogs, the "check-off" is a breakthrough for our state—if we can make it a success.

## Why a Check-Off?

The "non-game check-off" is a box that will appear on your state income tax form that will allow you to make a contribution, of the amount of your choice, to help support management of Vermont's non-hunted animals, many of which are rare or threatened.

That seems simple enough—but it actually took five years of struggle for supporters to get this bill through the Vermont state legislature. Objections were raised about how it would clutter the tax return, and how every special-interest group in the state would start whining to get their check-off boxes included. These problems obviously have not proven to be overwhelming to states that have implemented such a check-off, however; this year, Vermont and Georgia become the newest members in the group of 32 states with similar legislation for supporting non-game species.

Ironically, animals that are hunted have, in many ways, been better off than those that are not. The bulk of Vermont's wildlife funds are generated by hunting license fees and targeted for game species management, leaving negligible support for non-game species.



A look at the state's Fish and Wildlife budget sheds some light on where the money comes from, and consequently how it is likely to be spent. Seventy percent of the 1986 budget was derived from fishing, hunting, trapping and breeding licenses. Another 23 percent came from federal aid which is composed of federal taxes on hunting and fishing equipment. A meager seven percent came from interest and earnings. Thus, no serious long-term strategies for protecting non-hunted rare or threatened animals have been developed.

Until now, not a single Vermont state tax dollar has gone to management of non-game species such as the Common Loon (not so common anymore) or the rare Spotted Turtle. The Vermont Department of Fish and Wildlife has managed to institute some programs in the past—for example, the peregrine falcon restoration project, common loon census, and spruce grouse survey—but they have had to scratch funds together using federal matching grants and tentative dips into the departmental budget.

### Wildlife For All, Funding From All

Using public money to protect non-game species has been difficult everywhere. States have usually been able to mount fairly extensive wildlife management programs for deer, ducks and pheasants—but Yellownose Voles? It is ambitious to expect *Homo sapiens* to forsake gastric yearnings and reach into their wallets to help out creatures that are not only inedible, but are rarely seen.

The little aid for non-game wildlife that has been granted has come from fees paid by hunters. Now, with the check-off system, there is an official avenue by which all of us can turn our concern for rare or threatened wildlife into support for these species.

The way Vermont's new non-game check-off law is currently worded, people who are due a tax refund can simply write in how much of it they want to go toward supporting non-game spe-

cies. Those who are not entitled to a refund may mail in their contributions separately to the Fish and Wildlife Department. To simplify this process, it is expected that during this legislative session there will be a move to allow every taxpayer (whether owed a refund or not) to donate to the fund via the tax return.

### Checks and Balances

So what actually happens when you *check* the non-game check-off box? Where does the money go and how do threatened creatures benefit? The ability of the public to answer these questions will heavily influence the desire to contribute.

According to Diane Jay, Information Representative for the Department of Fish and Wildlife, the check-off option is expected to raise about \$50,000 a year, if Vermont behaves statistically like other states. A portion of the funds will be used to hire a full-time biologist who will implement program studies and strategies to protect rare and threatened non-game animal species.

Helping to decide which species to target and what tactics should be used to conserve them will be the role of an eight-person committee consisting of members from VNRC, the Audubon Society, Vermont Institute of Natural Science, the Nature Conservancy and other prominent groups. This committee has already been meeting for months to advise the Fish and Wildlife Department on early strategies for implementing the program; the committee will continue to advise Fish and Wildlife Commissioner Steve Wright, who will make the final decisions concerning the non-game program.

"The first thing we need to do is conduct censuses and status reports so we know what direction to go in," says Jay. "We will have to determine which species are in the most precarious condition."

The Nature Conservancy's Marc DesMeules says this is an area where his organization can be of assistance. "The Heritage Program data base, a comprehensive

inventory of rare, threatened or endangered wildlife, will help guide non-game programs," he notes. "We will supply whatever information or advice we have." The advisory committee will pool information from the Nature Conservancy and Fish and Wildlife files to help in the design of studies, inventories and habitat improvement plans.

"In the past, the state has only been able to react when a species is in trouble," Jay says. "But you really need to move before it reaches that point." With the anticipated funds, the state will be able to develop the eyes and ears to keep track of the state's wildlife species more effectively, and help protect them before it's too late.

### Testing Our Conservation Ethic

Aside from enhanced knowledge of the status of various wildlife species and the ability to take some action, Jay points out another benefit of the check-off system. "It brings out the concern for non-game species that has been voiced by private groups like VNRC and VINS. It's a big step. It's saying that everyone in the state is responsible for non-game wildlife."

The Department of Fish and Wildlife's Director of Wildlife, Ben Day, notes that enlisting public support for non-game, threatened species is a groundbreaking action, and ultimately a test of our conservation ethic.

"The well-being of rare or endangered species is a yardstick of how well we are conserving Vermont for future generations," Day says. "Now everyone can get in on it. It's an opportunity to help many species that don't get the consideration they should."

*A new 15-minute slide/tape presentation explaining the non-game check-off program is available for loan via VNRC, or through Diane Jay at the Vermont Fish and Wildlife Department, 103 S. Main St., 10 South, Waterbury VT 05676, telephone 244-7331.*



# Ottauquechee Land Trust

## The Synergy of Conserving Land

*As part of VNRC's continuing role as a true "Council" to Vermont's conservation organization, we present a series of updates from our member organizations around the state. In this issue we hear from the Ottauquechee Land Trust, one of Vermont's leaders in land conservation. SC*

Commitment and energy are the keystones of the Ottauquechee Land Trust's success in reaching across Vermont to become one of the state's leading land trust organizations. The successful completion of major projects has depended on strongly committed people, including landowners and concerned neighbors, who believe in the land trust ethic and are willing to back that belief with time, energy, and financial resources. Coordinating these integral parts can also increase local consideration of land management possibilities.

Developing this synergy, though, has been the prerogative of Richard Carbin, the Trust's Executive Director. Rick began the Trust in 1977 when, with the assistance of the Vermont Natural Resources Council and a group of dedicated people from the Ottauquechee River area, he sought and received its tax-exempt status.

Its first major project, the Woodstock Country School, was successful due to the energy and capability of the people in the Woodstock area and the creativity of the Trust's first counsel, the late John Dunne. It was John's skill in finding innovative solutions, such as charitable creditors, to answer both the desire to protect land and the necessity of being financially solvent, that has been the guiding



spirit in the Trust's work ever since.

### Complex Decision-Making

With most landowners, the placement of conservation restrictions on their land is a decision which takes much thought, and two or three years can elapse between the initial discussion and the signing of the final papers. There are frequent choices to make in determining how much, if any, development will eventually be allowed, and what other rights should be retained by the landowner without affecting possible charitable aspects or the basic intent of conserving land.

### Land Planning And Development Foundation

More complex projects usually involve property for sale, where

options can include the Trust's purchasing, restricting, and reselling the property. And future projects may also use a new entity, as the Trust's Fall 1986 Quarterly Report explains:

"In cooperation with the Trustees of Reservations in Massachusetts and the Society for the Protection of New Hampshire Forests, OLT is embarking on an innovative approach to solving some of our more challenging conservation projects by providing a mechanism to recoup costs through limited, sensitive development.

"The Trust has long recognized the advantage of limited development on land which, without some development to recoup costs, would otherwise be impossible to protect. Limited subdivi-

*Above, the 280-acre Hill Farm in Sunderland is currently an OLT project in cooperation with the Battenkill Conservancy.*



sion or development has allowed the Trust and landowners to cover some or all of the costs of protecting critical features of a property. This type of development is sensitive to the natural resources of the site and is designed to have the least visual and environmental impact as possible.

"To date, the Land Trust's efforts in this area have been severely limited by its lack of development experience and financial resources, and by its desire to be a 'conservation first' organization.

"The Land Planning and Management Foundation will give the Trust that ability by providing a separate entity designed to secure property and devise a plan to conserve key portions and develop less sensitive periphery areas. It will approach landowners as an advocate for land preservation and, if a project meets minimum environmental and financial criteria, will be prepared to carry out the land development process in its entirety."

### Fulfilling The Need

By the beginning of 1986, the Trust had entered into or helped negotiate conservation agreements with 80 landowners involving over 20,000 acres of land. Thirty-three projects involved operating farms or significant amounts of agricultural land, 21 projects were predominantly forested, 11 involved public recreation areas, and 15 included wetlands or natural areas. A number of other projects, including one which involved the transfer of development rights, have been completed in 1986. The estimated fair market value of all the property covered by these agreements is in excess of twenty million dollars.

An eight-year project has been to secure protection of the Appalachian Trail for the National Park Service. Project Coordinator Preston Bristow has been successfully negotiating its piece-by-piece acquisition. Through land

and easement purchases and gifts, over 40 miles of the 49-mile Vermont section has now been protected.

In southern Vermont, Bill Schmidt, Project Director, has been the architect of numerous transactions and has assisted in the development of the Mettowee Valley Project.

In 1986 this Project, funded by a major grant, has been helping the towns of Rupert, Dorset, and Pawlet identify lands to be protected from encroaching development occurring along the Route 7 corridor. Activity in the Mettowee Valley Project includes the completion of a comprehensive Land Evaluation and Site Assessment (LESA) in Dorset, a LESA in progress in Pawlet, identification of prime agricultural lands in Rupert, and restrictions placed on part of the Dorset Marsh.

In the central Vermont area, Assistant Director Virginia Farley coordinates the Mad River Valley Project which encompasses the towns of Waitsfield, Warren, and Fayston. Warren recently allowed the transfer of development rights, and several landowners have placed conservation restrictions on their property.

OLT staff is also working with the State and other organizations to develop and implement the Vermont Land Conservation and Housing Fund. This Fund would tie both housing and land conser-

vation together with the goal of maintaining affordable housing for Vermonters.

### New Headquarters

On occasion the Trust is gifted property outright, and in summer, 1986 it received a bequest of the King Farm in Woodstock from Francisca King Thomas. The 18th-century farmhouse will be the new headquarters of the Trust in January, and the 154-acre farm will be used only for agriculture, forestry, and other open space purposes.

Currently supported by approximately 1,000 members, the Trust plans to strengthen its financial base in 1987-88 in order to implement locally-focused educational programs. In many cases, local residents first hear of the Trust when a property is already for sale. To have introduced land conservation concepts earlier would allow a better assessment of options available to the landowner and the community.

Information about the Trust, its programs, projects, and membership, is available at the Trust's new office at 5 Thomas Hill, Woodstock VT 05091 (telephone 457-2369).

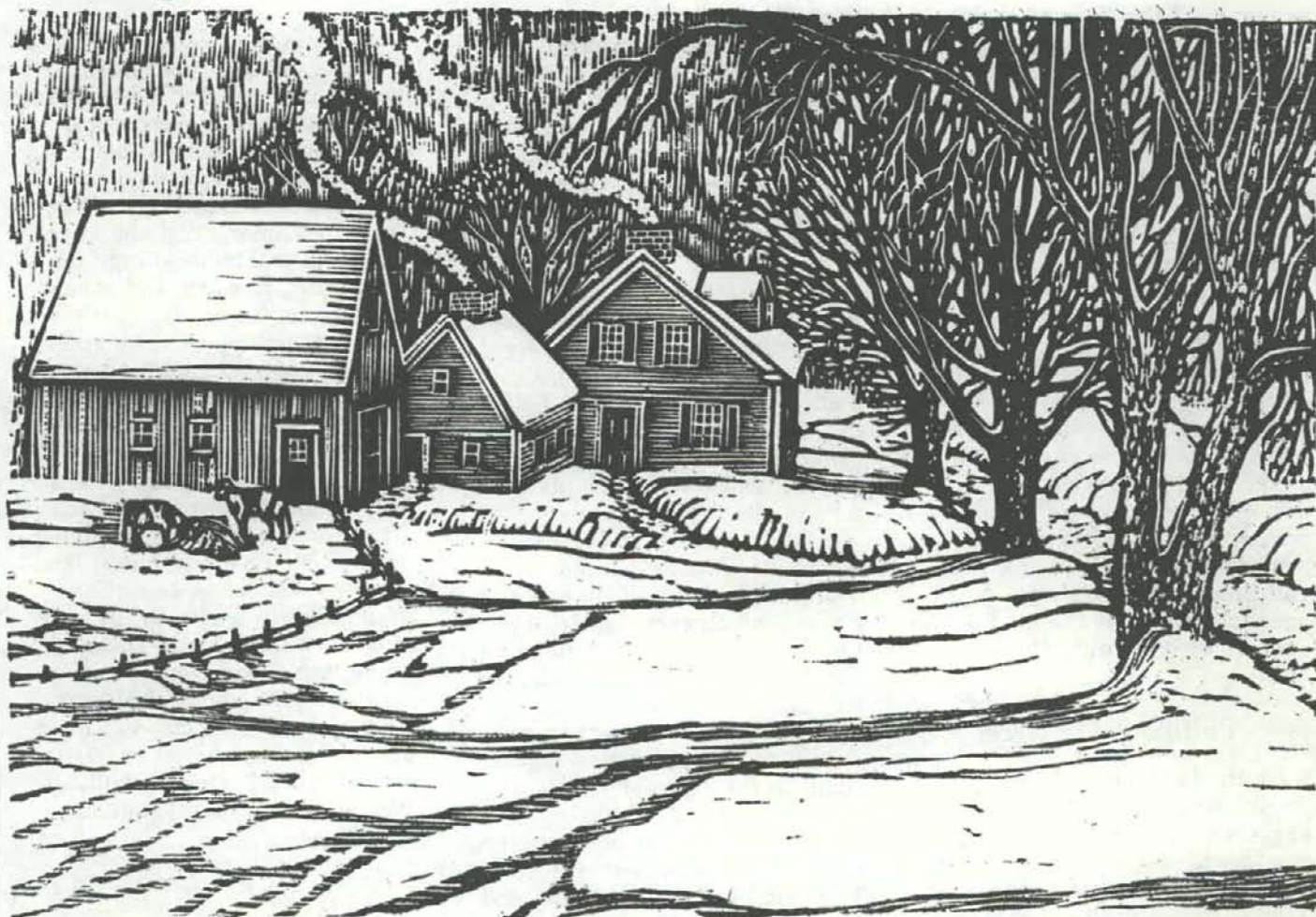
*Written by Cherie Langer, OLT's Administrative Assistant, and Virginia Farley, OLT's Assistant Director.*



*At right, the King Farm in Woodstock, OLT's new headquarters.*



### Mary Azarian



## “A” is for Artist

Basswood, native to Vermont, is her favorite. “Many people start on pine, but I find that pine splinters too easily. Basswood is a hardwood that is still ‘soft,’” she says.

Mary Azarian is well-known for her wood-cuts—pictures carved into wood, rolled over with ink, and then printed onto paper—made in her Calais home. But, although she makes her living from Vermont wood, it is really the Vermont that she sees out of her window that her artwork is best known for.

Her springs and summers are joyful—full of wind and flowers, contented barnyard animals, and

hard-working people who like to farm and garden. Autumn is for harvests and skies full of geese.



And her winters are crisp and clear—you can almost smell the woodsmoke.

The black lines of Azarian's woodcuts are rustic, sharp, sometimes even severe, but she will add the softening touch of watercolor to bring the scenes to life: the turbulent purple-grey clouds of an oncoming storm, the bright red patch on the farmer's pants, or the pale blue shadow that the snowfence casts upon the drift.

Although rural Vermont is clearly her home today, Azarian was not drawn here by any romantic notions of country life. She came to Vermont in 1963 “because my friends were all in New



England. And in Vermont," she adds practically, "land was cheap enough." She stays because "I've lived here for so long I can't imagine living anywhere else." The political climate was also a factor; "the rest of the country is too conservative for my taste. So is Vermont, for that matter," she adds, "but it's a little better."

Azarian has not always had work as an artist—but almost. Growing up as an only child on a small farm outside of Washington D.C., Azarian was encouraged in her artistic interests. She eventually went north to Smith College to study art, and notes, "a lot of parents are dismayed when their children become artists—but my parents were pleased."

Although Azarian values the time she spent studying under sculptor/printmaker Leonard Baskin, she feels that artistic schooling can be "unnecessary and sometimes harmful. It tends to narrow you into a niche." In addition, Azarian complains that her teachers were so interested in design that "they never spent any time on technicalities—you know, like how to sharpen your tools." Perhaps this is why she prefers basswood; it is a forgiving wood to work with, she notes, "when you have less-than-perfect tools. And mine are certainly less than perfect."

Those who are familiar with Azarian's straightforward style might be surprised to learn that her early artistic works—even her woodcuts—were primarily abstracts. "My woodcuts used to be more imaginative than depictive," she notes, but adds, "they've evolved." Azarian now considers herself an illustrator; and indeed, while roughly half of her income comes from prints sold in stores, the other half comes from illustrations she has done for books such as her highly acclaimed *Farmer's Alphabet*.

"I draw whatever I feel like at the moment—and that's usually what I see around me," she says. "I have been very lucky that the things I've wanted to do have been things people have wanted to buy."

"My market is not the wealthy New Englanders," she says, but instead is spread out over the rural areas of New England, as well as Ohio, Texas, California,



and other areas where people make their living from the land.

"A lot of local people buy them. They're affordable...and I suppose that people who like them live in the country for the same reasons I do. I illustrate the aspects of this life that we all like best."

Azarian's work area is a sunny room in a farmhouse she shares with her husband Tom and three sons. She works steadily and speaks little as she explains her work, but on the subject of her tools and craft, she opens up.

Azarian buys her wood—"about forty feet worth of workspace"—twice a year from a Burlington wood dealer. Besides basswood, she will use cherry and maple occasionally; if an illustration has particularly fine lines, the harder wood is preferable.

She begins a print by sketching her idea in pencil onto the woodblock. As a printmaker, however, she must always work with a sketch that is the mirror-image of what will appear on the paper. She then outlines the illustration with magic marker, and when satisfied that the illustration is to her liking, she brushes the entire board with dark ink. This

way, as she carves away at the block, the woodcut will resemble the actual print—areas that will print remain dark; light, carved-away areas will show as white on the paper.

With a sharpening stone on the table beside her, Azarian carves the block on her lap with firm, sure strokes. Although she has about a dozen wood-cutting tools, "I really only use two or three," she says.

When the woodcut is completed and ready to print, it is placed on Azarian's press, which sits by the window in the same room. Azarian tests its height "by feel"; a paper is attached to a roller, and a crank turns the roller over the board.

"No technical know-how necessary," she says, but adds, "this is not to say that being a good printer is easy. It's not. I have learned over the years to be an adequate printer."

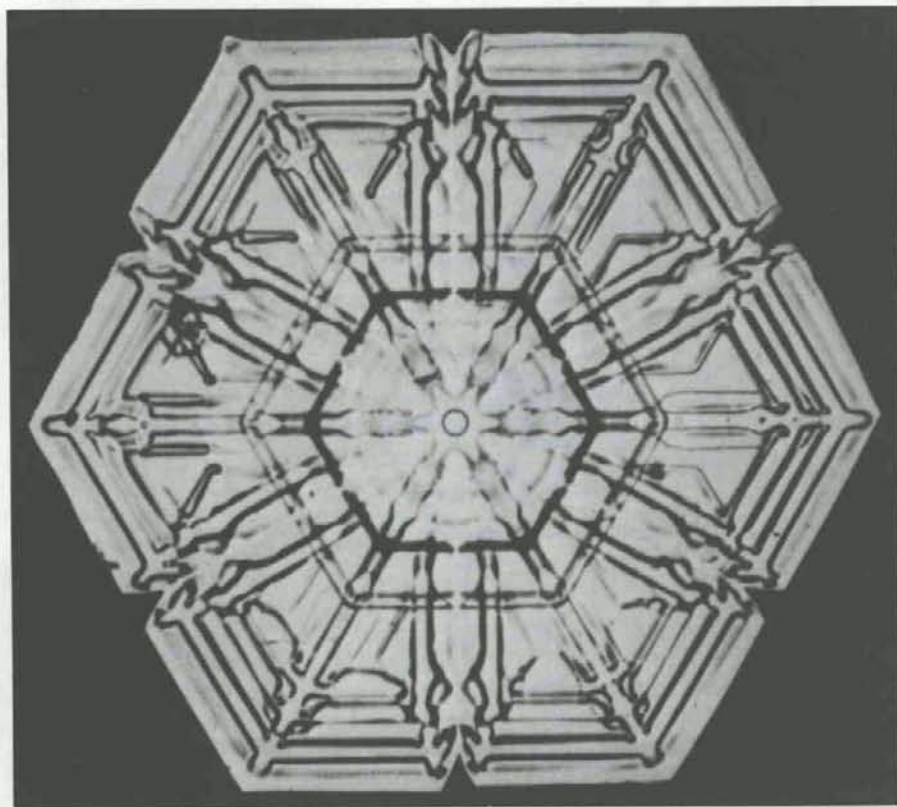
An adequate printer, perhaps; an artist, too. And one who, both through the use of a natural resource and through an appreciation of rural beauty and spirit, brings Vermont home to us all. SC



All woodcuts by Mary Azarian. On previous page, a familiar wintery scene. Above, Azarian is captured at work in her studio, by the camera and by herself. The self-portrait appears in Azarian's *A Farmer's Alphabet*, published by David R. Godine, Boston.



## The Snowflake:



## Science and Mystery

By Mark Breen

A bleary-eyed youngster comes stomping up to the back door, his woolen cap a crown of fresh snowflakes. He is sorry to see the last few flakes fall unwatched, for he had diligently undertaken the task of overseeing the latest snowfall in his backyard. "It wasn't easy!" he tells his mother, exasperated, as his boots release their captive snow in a puddle on the kitchen floor.

Haven't we all been captivated by the intricate, delicate shapes and designs of snow, yet felt lost amid a storm's trillions of descending flakes? It has been said that no two snowflakes are alike, and I don't know of anyone

who has tried to refute it. A nearly infinite number of snow crystals, each arranged in its individual style, is almost impossible to imagine. Still, their beauty probably escapes the snowplow driver steadily clearing the highways, or the neighbor shoveling a blanketed walk. The snowflake is uniquely cursed and praised—often in the same breath—and yet whether criticized or complimented, each winter brings its share of them.

How does the snowflake go from water vapor to lacy patterns? Let's start at the beginning, somewhere up in the clouds. Clouds start as invisible water

vapor, rising upward with warm air currents. As the vapor encounters cooler air above, microscopic particles of ash, dust, and pollen provide nuclei on which the water vapor condenses to form small cloud droplets. Air currents continue to be active in the cloud, and as the droplets collide with one another, they become too heavy to remain in the clouds, falling as rain. Now, turn the atmosphere's thermostat down—way down. Instead of water, ice crystals become the components of the cloud.

Because of the shape of water molecules, the snow crystals are always six-sided. However, they are rarely heavy enough to make a descent without the help of other snow crystals. They collide and stick together, a process known as coalescence, giving us the familiar snowflake. At cold temperatures, coalescence is slow. You may have noticed that on cold, snowy days the flakes are small. At temperatures closer to freezing, coalescence becomes more active, resulting in larger flakes.

Vermont's snow begins even farther away. In order to trace the path of a particular snowflake, we find ourselves first over the warm waters of the Gulf of Mexico (sounds inviting), where the heat of the mid-day sun has caused a lot of moisture to evaporate into the air. It condenses on billions of nuclei, each a potential snowflake, heading up along the Atlantic coastline of Georgia and South Carolina, helping the for-

*Photomicrographs by Wilson A. "Snowflake" Bentley, courtesy of the Vermont Historical Society.*

*Above left, right, snow crystals—"general storm types." Crystals that grow rapidly assume branch-like, open forms; those that grow slowly and in a very cold atmosphere, close, solid forms.*

*Below right, window ice crystals. These crystals form within a thin film of liquid water and not upon dry glass.*



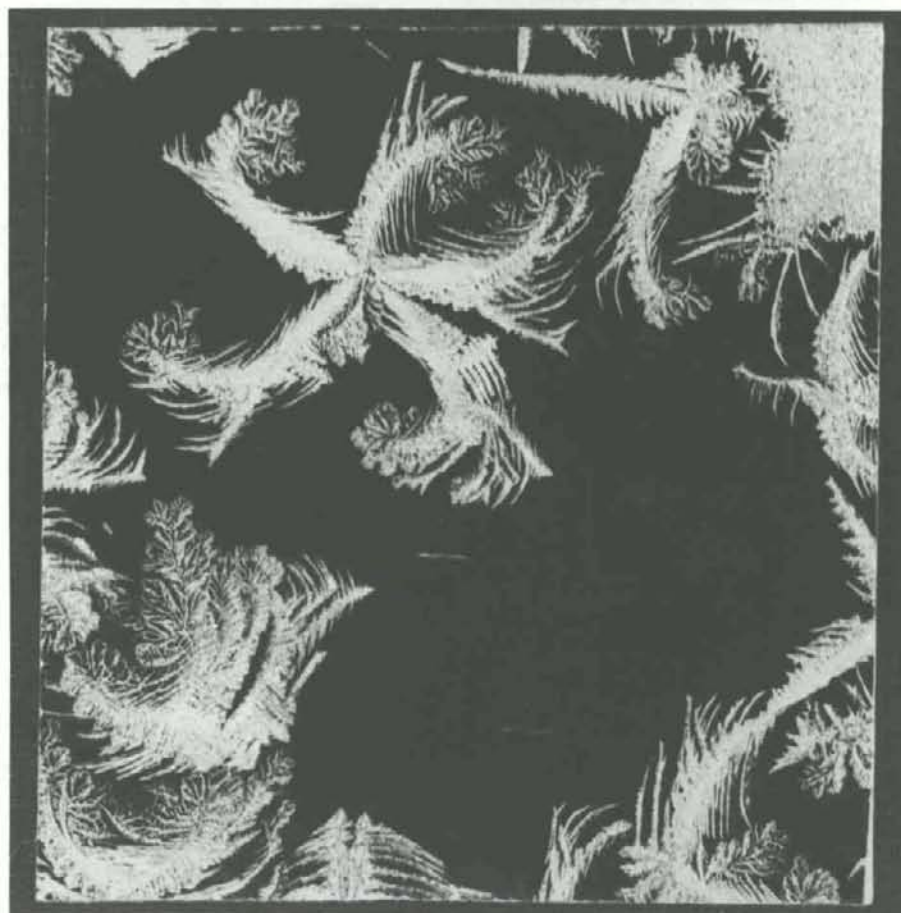
mation of a storm now in Virginia.

The storm strengthens as colder air is pulled into the system from New England and eastern Canada, turning cloud droplets to snow crystals. Warm, moist air sweeps inland from the Atlantic Ocean, colliding with the bitter winds out of Canada, keeping the clouds cold enough to form more and more snow crystals, yet warm enough for them to stick together as snowflakes. Heavy enough to start their descent, they are swept along by strong northeasterly winds, landing somewhere in the mid-Atlantic states, as they parade toward the Green Mountains to greet us.

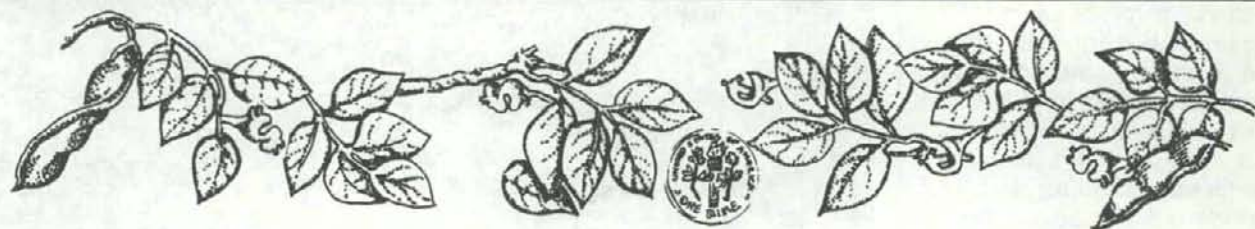
There is one man—and a Vermonter at that—who is remembered more than anyone else for an extraordinary effort to capture these snow crystals and preserve them for all to see. Wilson Alwin Bentley, (1865-1931), known best to us all as "Snowflake" Bentley, spent many a winter's day photographing the elusive snow crystal. He succeeded at a process called microphotography long before others had dreamed of it, using a special set-up of a camera and a microscope. Outside his home in Jericho, thousands of snow crystals became etched on glass negatives.

The next time the skies turn milky with snow, perhaps you can regain some of the wonder that "Snowflake" Bentley and the children have shown us. Forget for a minute about bad driving and driveway-shovelling—and watch the delicate, lacy patterns as they drift peacefully down to join the others in a mantle of winter white.

*Mark Breen, a member of VNRC's Board of Directors, is Meteorologist and Planetarium Director at the Fairbanks Museum in St. Johnsbury, and is one of the hosts of Vermont Public Radio's "Eye On The Sky" weather program. Some of "Snowflake" Bentley's original work can be seen at the Fairbanks Museum.*







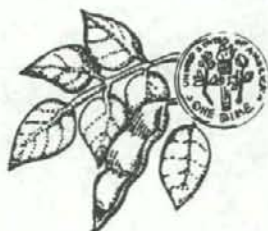
## "The Cost of Saving Lives"

Vermont is noted for its strong environmental laws; but when it comes to finding the money to back them up, Vermont is in no better financial situation than any other state. "Paying for Environmental Quality - It Doesn't Grow On Trees" was the theme of the ninth annual Vermont Environmental Law Conference, hosted on December 5 in Stowe by VNRC and the Environmental Law Center at Vermont Law School.

Nearly 200 conservationists, lawyers, and other interested citizens attended lively and varied workshops on topics ranging from agricultural policy to pollution insurance. In his keynote address, former U.S. EPA Administrator Douglas M. Costle discussed "Trends in Environmental Financing"; And in addition to discussing specific funding techniques, conference-goers raised the inevitable, thorny question of how to put a price tag on environmental and health values.

In their workshop on "Quantifying the Intangibles," UVM Professor Leslie King and Green Mountain National Forest Planner Jim Northrup warned against entering the numbers game. Both King and Northrup agreed that attempting to pinpoint the social and financial worth of a scenic vista, a wetland, or a human life is misleading and dangerous.

"In the world of a market economy, decision-makers want to talk in terms of numbers," said Northrup, "because numbers are the tools they have." But according to Northrup, "Vermont has a vision...



**When it comes to funding programs for the environment and public health, the "bottom line" isn't money.**



and we must make sure that we are discussing the actual issues that are important to that vision."

"By monetizing our values," asserted King, "we de-value them." As one conference participant concluded, "the 'bottom line' is not money!"

In his opening address to the conference, Paul Portney, Director of the Quality of Environment Division at Resources for the Future in Washington, D.C., looked at the numbers question from a different angle. Below are excerpts from Portney's address, "The Cost of Saving Lives."

*Mr. Portney:* "You are well aware that there is a large corpus of federal environmental regulations which has been the subject of debate over the past fifteen or sixteen years. As of 1986, the U.S. is spending \$65 to \$70 billion a year to comply with these

federal statutes...that is just less than the total amount spent on physician services, six times the amount the federal government spends on food stamps, and it amounts to about one or two percent of GNP each year. Needless to say, that would buy a lot of trail mix.

"These estimates are extremely rough...and I know this from painful experience, because part of my job at the White House Council on Environmental Quality was making such estimates. But environmental regulation does have what economists call an 'opportunity cost.' If we spend money on environmental regulation, we can't spend it on national defense, social welfare, transportation, or food stamps. And that means that if we commit this money to environmental regulation we want to make sure we are getting our money's worth.

"Study after study has pointed out that, holding environmental quality constant, we generally can greatly reduce the cost associated with environmental regulation, whether at the federal, state or local level. And that is a very important point. We never want to take \$6 million to reduce a ton of sulfur dioxide if we can reduce that same ton for \$3 million, since it leaves an additional \$3 million which we can apply to other environmental goals. The easiest way to describe how this can be done is to give those who are affected by regulation as much flexibility as possible in choosing the ways to meet environmental goals.



"I want to acknowledge quite clearly that environmental regulations produce a whole variety of other benefits...but a number of environmental programs are basically public health programs. I believe that during Doug Costle's regime as Administrator of EPA he said that 'We have to acknowledge that the EPA has become largely a public health agency.'

"If this is the case, then we have to look at which program provides the most health protection per dollar. When you look at life-saving programs associated with federal regulation...or across the agencies of a particular state, they can have very different degrees of efficacy.

"For instance, a regulation issued by the Consumer Products Safety Commission that calls for venting previously un-vented kerosene space heaters has been calculated to cost \$70,000 for each life it is estimated that regulation would save per year. Now, by Washington standards, any opportunity to save a life for \$70,000 is viewed as a hell of a good bargain.

"If we look at an EPA regulation pertaining to the control of uranium mill tailings, it would cost \$53 million to save a human life. If we look at a recent Food and Drug Administration regulation having to do with DES, an ingredient in cattle feed, that comes out at an estimated \$132 million per life.

"An informal but comprehensive review of EPA regulations suggests a number of areas where life-saving opportunities are particularly rich for relatively low expenditures of money. They include the issue of radon in homes, and pesticide applicators' exposures to pesticides.

"Correspondingly, the same studies suggested a number of programs which, while politically popular, nevertheless don't return as much in health benefits. Surprisingly, these include the cleanup of drinking water contaminants and hazardous air pollutants. In order to talk about how much we can accomplish in life-saving, we have to make calculations of risk...and the art of risk assessment is extraordinarily

fragile.

"Vermont is a beautiful state...and you may say, 'Well, our concern here is not so much with life-threatening substances as it is with the protection of the natural environment.' But the same techniques one uses in trying to determine where the most health protection per dollar of regulatory expenditures lies are equally applicable to other environmental problems.

"It is essential that you recognize at the start that these pro-

grams are going to entail important diversions of resources. I applaud the attention you are giving to the cost of these programs and the search for the means to finance them. By virtue of doing this at the front end, you've done a great deal to assure that the environmental measures that you do choose will eventually be successful."

*Illustrations by Sherry Frazer.*



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June 1-5

Here's advance notice of Manhattan College's 32nd Institute On Water Pollution Control. Topics will be "Mathematical Modeling of Water Quality - Toxic

Substances" and "Secondary, Tertiary and Toxics Treatment." For details, contact Manhattan College, Environmental Engineering and Science Program, Manhattan College Pkwy., Bronx, NY 10471, (212) 920-0277.



June 21-27

Sterling College in Craftsbury will offer the Wildbranch Writing Workshop, one of the few writing programs in the country tailored to professionals in the fields of environmental and biological studies and forestry and wildlife management. Staff will include several published authors as well as associate and contributing editors of magazines including *Audubon* and *Country Journal*. Application deadline is April 10; for information, contact David Brown, Sterling College, Craftsbury Common, VT 05827, or call (802) 586-7711.

### New Members

VNRC welcomes the following new members, who joined us between the end of October and late December: James H. Adams; Baker Library Serials Sec.; Robert and Sandra Bartlett; Helen Benedict; Cindy Bigelow; Christopher N. Brown; Jean Christie; Chris Curtis, Black Magic Chimney Sweep; Leonard Duffy and Associates; John Fayerweather; Mrs. Roger Grant Goodeve; Richard B. Green; Mrs. H.T. Gregory; Mary Jellison; Grace Johnson; Mr. and Mrs. Clay Kanzler; Mary Pierce King; Randy & Sally Koch; Jonathan Z. Larsen; Mr. and Mrs. David Larson; D. Leavitt; Randolph M. Lee; M. Rosalie Leidinger; Louise W. Schmidt; Daniel MacArthur; Mark McGrath; Shawn McSweeney; Marilyn Murray; Carole V. Naquin; Jack Newcombe; Stuart & Joanne Osha; Parents and Teachers for Social Responsibility; David C. Pinkham; Pat & Liz Pritchett; David Putnam; Charles A. Ratte; Victoria Reck; Dr. Herbert S. Sacks; Robert W. Scott; Mrs. H.T. Seeley; Jane Selzer; Rick Sharp; John W. Snyder; Richard J. Snyder; Mrs. Sam Sparhawk; Arleen St. Aubin; Alan & Gretchen Stahl; Ruth & Robert Stanton; Anne & John Steel; Mrs. John A. Stewart; Sheila C. Swett; Jared I. Wood; Boyd Wright; John D. Wright; Mr. and Mrs. George D. Wrightson, Jr.

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