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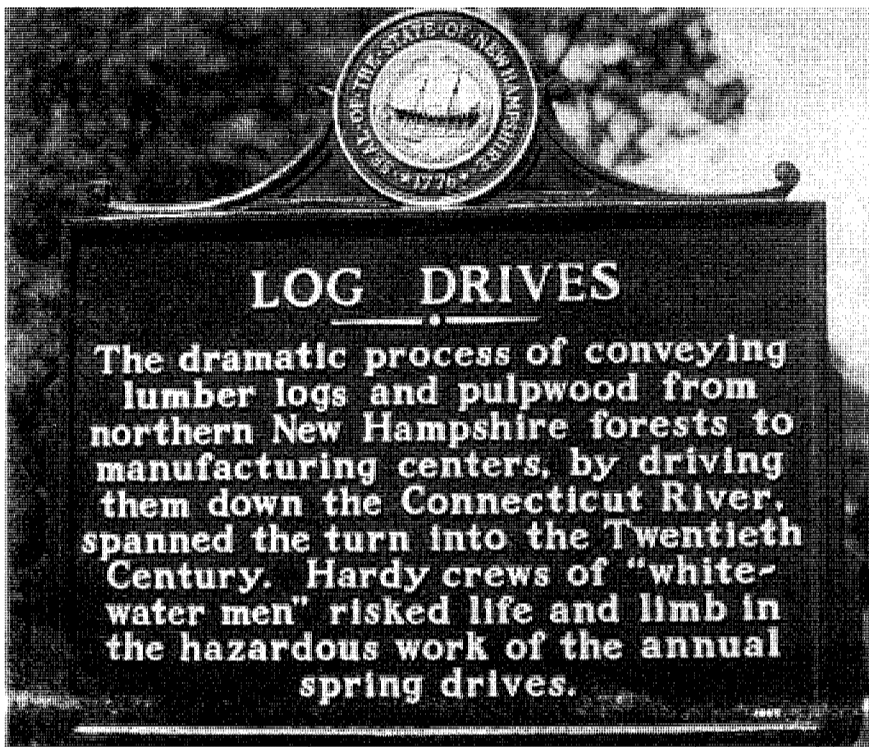
*Working for Sustainable Natural & Human Communities in the Northern
Forest & Gulf of Maine region of the Northern Appalachians*

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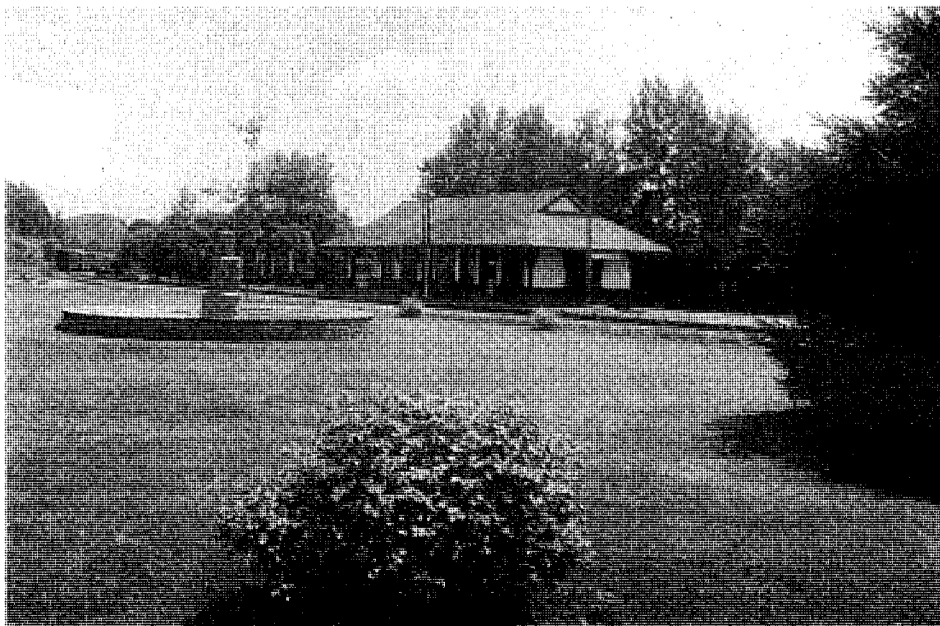
VOLUME 9 No.1



Changes in the Land

"I think we can restore a lot of the forest process at both a local scale and at a broad scale by removing the heavy hand of human disturbance and influence...basically we need to have a much greater understanding of the ecosystem and its history..."

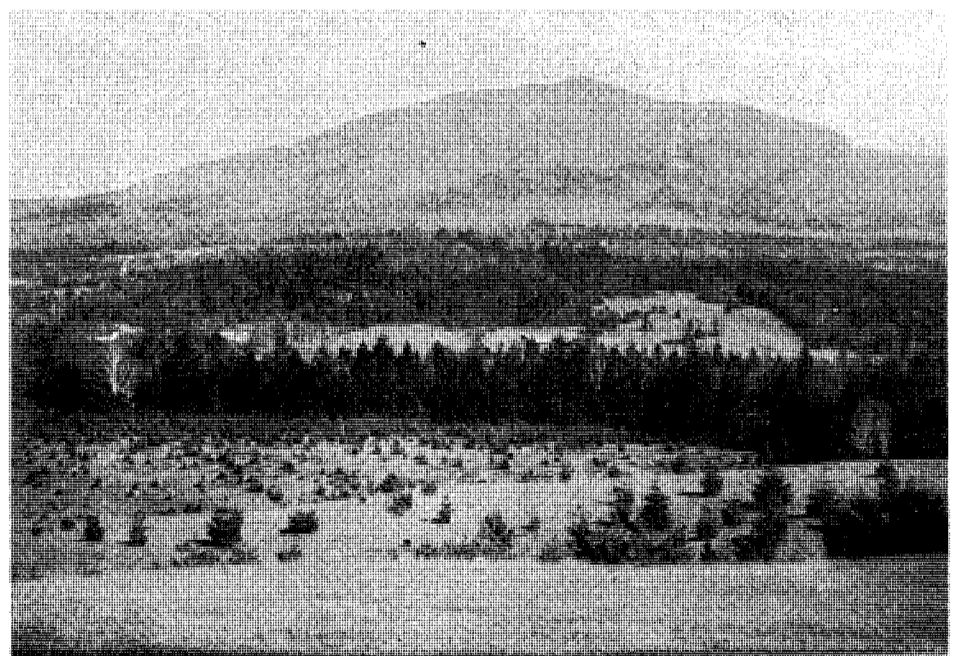
An interview with Harvard forester and ecologist David Foster starts on page 14



NH's Pittsburg Lands On the Block

"It was the best of forests; it was the worst of forests. It was a season of unbounded hope; it was a time of despair. It was a time like any other in the Northern Forest; yet it was a unique moment. Everyone was surprised; no one was surprised."

Story by Jamie Sayen Begins Page 4



Railroads & Herbicides: Reducing Use on the old Grand Trunk

"By the 1960s, the country was caught up in the promotion of industrial chemicals to combat a wide array of plants and animals regarded as unwanted pests or health threats. The chemical manufacturer's claim that weeds could be eradicated easily and cheaply with the use of herbicides coincided with several factors which made that claim especially attractive."

Story by Barbara Alexander starts page 12

THE NORTHERN FOREST FORUM

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Photographs — as credited

The Northern Forest Forum is published six times a year by the Northern Appalachian Restoration Project (NARP).

NARP is a non-profit organization and network of grassroots activists dedicated to restoring sustainable natural and human communities across the Northern Forest Region of northern New England, New York, and adjoining regions.

For more information about NARP and individual projects, please write to:

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Editorial Policy

Views expressed herein are those of the writer and not necessarily those of other contributors or other NARP projects. We welcome diverse submissions on the Northern forest and related topics.

Please send all material to the address above.
Please address letters for publication specifically to the editor.

e-mail: nff@sover.net



The Northern Forest Forum Rides Again

With this issue, *The Northern Forest Forum* resumes publication, ending a 7 month hibernation. The hiatus was forced by the financial shortfalls to which a small non-profit organization is prey. We are immensely appreciative of those whose expressions of moral and financial support have encouraged and enabled our return.

I am sometimes asked, What is NARP? This is the acronym not only of the National Association of Retired Persons but our very own non-profit: the Northern Appalachian Restoration Project. As a 501 c 3 with an educational mission, your contributions to NARP are tax-deductible. As a contributor to NARP, however, you are doing more than receiving and supporting the publication of the Forum.

NARP is chiefly the activity at a grassroots level, across northern New England, of a half dozen people dedicated to impacting our relations with our native habitat, from the waters of the Gulf of Maine to the Maine Woods and North Country of Vermont and New

Hampshire. Under the broad rubric of sustainability, Mitch Lansky, Pamela Prodan, Barbara Alexander, Jamie Sayen, Daisy Goodman and Ron Huber have undertaken many efforts over the past ten years that aim at sustainable use and direct preservation of our forests and waters. Their community outreach, organizing and varied projects, under their own direction, reflect local community needs in the context of regional and indeed global need for biological sustainability. NARP came into being both to support *The Forum* as a necessary voice for policy alternatives and these activists in their diverse yet unified efforts.

Over the last decade and particularly in the past months, much of their effort has been sustained in dry spells by their voluntarism and sense of dedication. We have also received funds from several generous individuals and organizations. NARP is attempting to resume this role more consistently in the months ahead — and we appreciate your contributions to that effort.

THE BELL TOLLS FOR US

It would be impossible to ignore the recent terrorist attacks on our country, unfolding as we prepared this issue of *The Forum*. It is hardly necessary to recapitulate them or discuss their significance here.

It may strike some as unnecessary, however, to comment in a newspaper dedicated to the sustainability of our planet, on the political aspect of America's reaction to these truly horrifying events. A short comment however, is in order.

Many of us are disturbed by the prospect of mixing our evident compassion with a thirst for angry vengeance. Two things seem at risk: the political expressions that are built on our civil liberties and indeed, our future security. The two are inseparable.

Some, including Vermont's own governor, seemed to suggest in their early reactions to the crisis, the opposite. There is a distinction to be

made between the concessions we make to get on an airplane, train or highway safely and concessions of essential liberty. The true test of the latter is whether we as individuals not only possess but fully exercise the rights of free press, free speech and free association.

The proof of that exercise is individual and political expression that in many cases will — and ought — challenge the ideas and policies, indeed the ignorance, of our government, our elected leaders, and ourselves.

Individually or in concert, anyone deeply concerned with the mis-direction of our republic and democracy must continue to speak, and to challenge. If not for higher causes, then surely enlightened self-interest demands we extend the borders of our compassion beyond our own country, our own people, our own species. The alternative is that we comply in terrorist acts of our own. — Andrew Whittaker

Thank You

Many thanks to financial supporters of The Forum who have made this issue possible.

The Northern Forest Forum has been published since 1992. You can imagine that even with a small production run, back issues accumulate. We are therefore grateful for shelving which has restored order to the main office. Pictured opposite is our innovative shelf-maker hanging from a snowclad firetower last winter in Vermont.

Request Back Issues at NFF POB 6 Lancaster, NH 03584 or nff@sover.net \$3 apiece; \$2 apiece for 3 or more. We will also mail a sample issue to a friend at your request.

Subscription information may be found on the back cover.



The Mt. Blue/ Tumbledown Conservation Project - A \$1.8 Million Fundraising Campaign

By Pamela Prodan

In western Maine, acquisitions in the Mt. Blue/ Tumbledown Conservation Project are underway. At this time, Tumbledown Conservation Alliance, the State of Maine and Trust for Public Land are seeking public and private financial support at all levels and must raise \$1.8 million in private matching contributions by December 2001. To succeed with this conservation effort and to insure that critical lands will be purchased, we need your support now.

Trust for Public Land, a national nonprofit land conservation organization, currently has 19,400 acres of land in the Weld, Maine region under agreement. Partners in the project have committed to an ambitious fundraising effort to purchase and permanently protect 30,000 acres through a combination of public fee ownership and conservation easements.

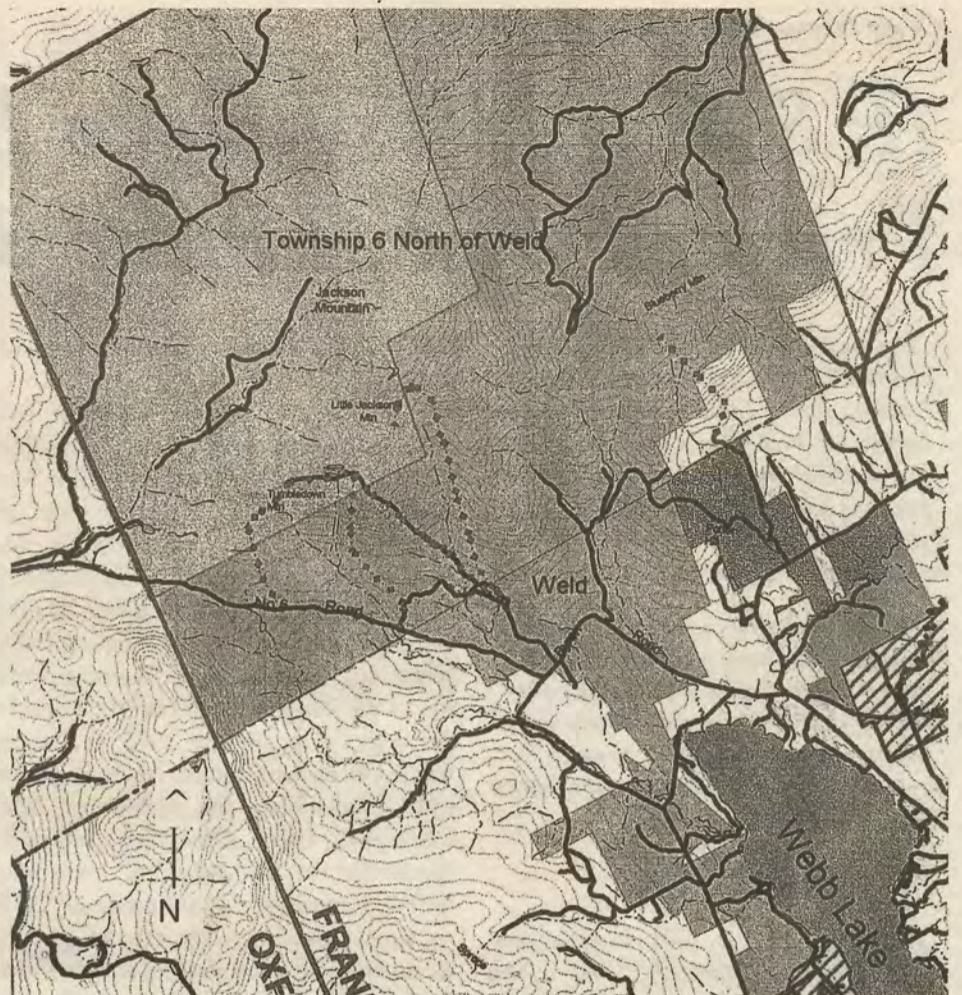
The Mt. Blue/ Tumbledown conservation project is a window of opportunity in the face of large-scale changes in land ownership and land use in the Weld region. Within the past two years, over 20,000 acres of forest land in the region went up for sale, raising fears that increased fragmentation of forest land and residential development would occur. Since then, much of that land has been resold. A key piece adjoining Mt. Blue State Park was cleared for residential development. The wood was taken off a 4,000 acre parcel near the Tumbledown

trail head and the owner is proposing to divide it into 40-acre lots. As recently as this summer, additional lands identified by TCA for conservation have gone on the market.

Despite the fact that Mt. Blue State Park is the largest park in the state park system, many people are surprised to learn that only two of the region's many popular hiking trails are actually in the park. This nationally popular yet unspoiled area is rated by Outside Magazine as one of the country's 10 top areas for a family vacation. Tumbledown Mountain, all of which is privately owned, appears on the web site of the Maine Office of Tourism alongside the great publicly-owned hiking destinations of Maine, including Acadia, Baxter State Park, Grafton Notch State Park, Camden Hills State Park and Bigelow Preserve.

In addition to protecting traditional day hiking opportunities, the proposed acquisitions would make a valuable contribution to safeguarding the state's natural heritage, according to the Maine Natural Areas Program (MNAP), which conducted a limited ecological assessment of the project area last year. The project area falls within two large contiguous blocks of forest land in separate ecological regions of Maine. One 60,000+ acre block, including Pope and Hurricane Mountains, is the largest block within the Western Foothills ecological region that is unfragmented by roads and development.

The other 80,000+ acre block lies within the Mahoosuc/Rangeley Lakes



Portion of a map prepared by Maine's Department of Conservation, Bureau of Parks and Lands and released this summer showing lands slated for inclusion in the Tumbledown project. The lighter shade in the northeast corner of Township 6 is 11,800 acres under agreement for combined easement and full fee purchase; the darker shade to the northwest and south to Webb Lake represents 18,800 acres under preliminary discussion.

ecological region and includes the popular recreational trails on Tumbledown, Little Jackson, and Blueberry Mountains. The mountains have exemplary natural communities, including acidic summit, alpine ridge, krumholz, prominent cliffs, talus and acidic cliff communities and high elevation ponds. The mountain range is home to Bicknell's Thrush, long-

tailed shrew, spring salamander and is one of only two successful nesting territories for peregrine falcons in Maine.

For more information or to make a contribution, see the Tumbledown Conservation Alliance's web site at www.tumbledown.org or contact Pamela Prodan at 207-645-9330.

An Open Letter to the Connecticut Lakes Headwaters Partnership Task Force

Research into New Hampshire's historical inland fisheries from 1623 to the present day has made me aware of some issues that I hope the task force and interested members of the general public are taking into consideration concerning the future of the North Country timberlands up for sale:

- Sustainability.
- Water quality and quantity.
- Anadromous fish restoration.
- Airborne, regional pollution.

In addition, I'd like to point out that the task force structure could serve as a model for a wider forum of vital interest to the state: a New Hampshire Natural resources Sustainability Task force.

Please take notice and give thought to:

Sustainability. The grandchildren and great-grandchildren of those currently making their living in the forest industries should also have a chance to make their livings from the woods. A focus on short-term profits from natural resources can affect future jobs if the resource is, in effect, mined rather than farmed. Long-term sustainability of the northern forest as healthy timberland needs increasingly to take into consideration such matters as the impacts of various cutting practices on forest soil fertility.

Water temperatures and water levels. The sodden

sponge mats of moss and decaying wood in old growth forests historically kept brooks and streams cold and high in conditions that favored native brook trout and Atlantic salmon. Modern cutting practices are a major factor in raising summer water temperatures and lowering water levels. On August 2, 1904, William C. Kendall, a federal fisheries biologist, recorded the temperature of Perry Stream (in Pittsburg) at 44 degrees when the air temperature was 76. On August 6, 2001, I recorded Perry Stream water temperature at midstream by the two covered bridges at 64 degrees and 72 degrees and the temperature of the Connecticut River itself at the Magalloway Road bridge at 78 degrees. Brook trout were long ago driven from much of their historical range in the southern part of the state by the combination of raised water temperatures and the introductions of new fish species to brook trout habitat. The North Country is their last stand, and the brook trout habitat there needs ongoing protection.

Corridors for anadromous fish restoration. Atlantic salmon runs on the Connecticut River are recorded historically at Colebrook and Stewartstown, and there's no reason why the salmon wouldn't have ranged a few more miles upriver to spawn in Indian Stream and Perry Stream. (Settlers didn't arrive in Pittsburg until after a pair of dams in Massachusetts in the late 1790s had ended the salmon runs.) Watershed management practices in the upper Connecticut and its tributaries (and the upper Pemigewasset River in the Merrimack watershed) need to take into consideration the habitats that Atlantic salmon (and brook trout) require. Consider buying easements, if necessary, on protective timberlands to insure harvesting practices favorable to both coldwater fisheries habitat and to sustained future timber harvests.

Airborne, regional pollution: mercury, cadmium, and acid rain. New Hampshire Fish and Game for a number of years has advised people to limit their consumption of freshwater fish because of the mercury they contain, and there have been ongoing warnings not to eat moose liver or deer liver at anytime because of cadmium. The problem of acid rain (after national clean air legislation in 1990, which evidently didn't go far enough) has again resurfaced and has reached the point where the Hubbard Brook Research Foundation, which oversees the scientific research and long-term monitoring of the Hubbard Brook Ecosystem Study declared last spring, declared last spring that "New Hampshire soils have absorbed about as much acid as they can handle before a dramatic die-off in species is triggered." The consequences of inaction or ineffective action in dealing with airborne, regional pollution aren't the ones that can be solved by any amount of future clean-up dollars thrown at the problem. The pollutants need to be cut off at their points of origin, the sooner the better. Such problems can't be solved locally; they need coalitions of governors, U.S. Congressmen, and U.S. Senators working together and will require national legislation. Delay is both short-sighted and irresponsible. Unless this air-borne, regional pollution is stopped, local policies and actions will make no difference whatsoever.

Jack Noon
Sutton, NH

Note: Jack Noon has also written a history of the introduction of black bass to New Hampshire waters [*The Bassing of New Hampshire: How Black Bass Came to the Granite State*] and is currently writing *Fishing in New Hampshire: A History*.

IP Selling NH's Largest Block of Private Forest, TPL to Broker Deal

The crown jewel of New Hampshire's forests is placed on the market, with The Trust for Public Land now proffering its services as broker for a land deal. Thus far, political dialogue has accepted local passions but failed to embrace facts: the land is over-cut, local economy is failing, and ecological protections are warranted.

This article describes the series of public meetings that have occurred thus far. A central irony has been that while prevailing sentiment regards these lands as essentially public, hostility to ecological protections has translated into a rejection of public ownership.

By Jamie Sayen

On July 10, 2001 International Paper announced it was selling 171,500 acres in northernmost New Hampshire, the headwaters of the Connecticut and Androscoggin Rivers. This is the largest remaining undeveloped, privately-owned tract in NH.

A July 17 summit to discuss strategies was called by NH Senator Judd Gregg, who broke the announcement early to preempt any grandstanding by his colleague Senator Bob Smith. Gregg also pre-empted several unhappy news reporters who had been faithfully sitting for days on an embargoed story until the appointed hour.

On the eve of the summit, the public learned that the Trust for Public Land (TPL) was about to acquire these lands, and it intended to place a conservation easement on them to thwart future development. Fred King, former State Senator from Coos County (where these lands lie), warned of an environmental conspiracy to lock up these lands that would "complete the noose around our economic neck."

BACKGROUND

More than 80 percent of the land for sale (142,458 acres) is in Pittsburg, the northernmost town in NH, and the largest township east of the Mississippi River. Another 24,851 acres are in Clarksville, and about 3,000 acres are in Stewartstown, just south of Pittsburg. First, Second, Third, and Fourth Connecticut Lakes, the headwaters of the 400 mile long Connecticut River are enclosed by these lands. The headwaters of the Magalloway River, the principal tributary to the Androscoggin, occupy the eastern portion of the tract, and cover about one-fifth of the total area. One major highway, Route 3 bisects the tract. It is famous for abundant moose sightings by the roadside, and is unofficially called "Moose Alley." There have been a few wolf sightings in recent years. Ecologists recognize this tract is of vital importance as an ecological link between Maine, Quebec, Vermont, and points south in NH.

For most of the 20th century, St. Regis Paper Company owned these lands. In the early 1980s, in an attempt to avoid a hostile takeover, St. Regis solicited a "friendly takeover" from Champion International Paper Company, which held these lands until it was swallowed up by

International Paper in the summer of 2000.

St. Regis abandoned relatively sustainable harvesting after 1972, steadily increasing the level of cutting until it was cutting nearly three times the rate of growth in 1979. For the next decade, the level of cutting subsided — from about 105,000 cords per year to about 55,000 cords per year during the height of the spruce budworm outbreak. Annual growth was in the range of 35,000 to 40,000 cords per year. From 1989 to 1993, at a time when Champion's public relations flacks were proclaiming the virtues of "the Champion Way," Champion radically accelerated its liquidation of remaining timber, removing 150,000 cords in 1993 — almost five times the rate of growth (and perhaps a good deal more, given the depleted condition of the land by this time). [See chart, page 31]

Where were all these logs going? Champion was supplying paper mills in eastern Maine and western New York with pulp. But, according to a report it submitted to the Northern Forest Lands Study in the spring of 1989, it was exporting 85 percent of its softwood sawlogs to mills in Quebec. Quebec, not New Hampshire, was reaping the benefits of value-added manufacturing opportunities.

In the fall of 1993, residents of Columbia observed a massive plume of silt in the Connecticut River. They tracked it up to a massive Champion liquidation operation in Pittsburg, nearly 70 miles to the north. The ensuing scandal nearly cost Champion its coveted "Tree Farm" status, and, the company reformed its ways, becoming the leading proponent for the paper industry's Sustainable Forestry Initiative (SFI), a public relations gimmick

that requires clearcuts not average more than 120 acres, and that herbicide sprayers obey all existing pesticide laws. This latter challenge frequently proved difficult for Champion despite lax laws and laxer enforcement.

Cutting levels dropped so sharply after 1993, that by 1998 Champion cut less than 30,000 cords. Optimists proclaimed the effectiveness of SFI in reforming unsustainable forestry practices. Those familiar with the condition of the land suggested there wasn't anything left to cut. Even so, Champion and International Paper managed to exceed annual growth again in 2000, and word on the street has it that during the summer of 2001 IP has been cutting as if there were no tomorrow.

Early in 2000 Champion foresters reluctantly acknowledged they could no longer manage the land profitably for timber alone when they announced a plan to charge fees on all forms of motorized vehicles using their lands. They also announced they planned to seek to sell a "conservation easement" on the Connecticut Lakes lands. The easement proposal became controversial, as a number of observers pointed out that the real threat to 90 percent of these lands was industrial forestry, not development. An easement would permit continued liquidation logging and herbicide spraying (Champion averaged about 1,000 acres of aerial herbicide spraying a year during the 1990s) — not much of a bargain (at about \$20 million — roughly \$100-125 per acre, whether threatened by development or not). The deal fell through after IP absorbed Champion in 2000, and the threat of close public scrutiny inspired IP to take a second look at these lands. Observant local wags suggested that it was

only a matter of time until IP put these lands on the market to help pay down some \$5 billion in debt incurred by the Champion takeover. If these lands had significant chunks of merchantable wood, IP probably would have held on to them to supply its mill in Jay, Maine, not too far away.

JULY 17 MEETING

There was a lot of tension at the summit meeting convened by Senator Gregg, who honored those in attendance with a brief address from the Senate Cloakroom. The good senator was happy to report that just that week he had secured \$4 million in federal money to help the state acquire a conservation easement. He would work on getting more.

David Houghton, who is handling the negotiations for the Trust for Public Land (TPL), described negotiations with IP. TPL would soon sign an agreement to purchase the lands which would buy them a 45-day "free shopping" opportunity to decide whether or not to complete the purchase. If a plan can be developed for the disposition of the land, TPL will go ahead. TPL hopes to sell an easement to New Hampshire, acquire some ecologically significant portions in full fee, and sell the remainder to a timber investor.

Bing Judd (no relation to Judd Gregg) offered the "local perspective." He has been a selectman in Pittsburg since the 1960s. He has also served as a Fish & Game Commissioner, and currently is a Coos County Commissioner. He had been "shocked" and "surprised" by the announcement of TPL's involvement. He complained of "a lot of lack of communication going on" with the deal makers. He stated that "a lot of cutting is going on right now." And he concluded: "Let's keep it the way it is. It's worked well." Later in the meeting, former Senator King, who lost to Bing in the County Commissioner's race in 2000, echoed his rival's resentment over having to come to Concord for this meeting. Then he warned that Coos County is "the poorest part of the state, the Appalachia of New Hampshire. Things aren't better, they're getting worse."

If our leading local political officials sent a confusing message about keeping things the way they are, ("they're terrible and getting worse"), they stood united on one front: no federal ownership of any of this land. They expressed no reluctance to take federal funds to extinguish the non-threat of development, but several explicitly stated that at all costs this tract must not end up in the White Mountain National Forest. A few of us were perplexed by this obsession. The Connecticut Lakes tract lies about 40 miles north of the proclamation boundary of the National Forest. Four-fifths of it does, however, lie within the proclamation boundary of the Silvio Conte National Wildlife Refuge that covers the entire Connecticut River watershed. No mention was made of the Conte by anti-Fed voices.

Local politicians also shared an absolute conviction on the need to continue logging the land and to continue to develop the snowmobile economy, which, with the demise of King Timber, is the mainstay of the area's sadly un-diverse economy.

David Publicover, forest ecologist for the Appalachian Mountain Club, suggested that this land is of great ecological significance. The great size of the tract

No More Norton Pools!

The July 26 meeting in Pittsburg which provided a forum for local input on the IP land sale was a frustrating event for anyone hoping for a reasoned development of possible actions. In my view, the worst of the commentary came not from distrustful townspeople but from several panelists in leadership positions who offered pathetic amplification of local sentiments leading nowhere.

However, much of the commentary coming from the local audience was rather dismal in its indictment of environmentalists as the enemies of freedom and economic prospects: prejudice paraded as information. One fellow closed his remarks with the exclamation, met by applause, "No more Norton pools!"

What is Norton Pool? Here follows a brief description from *The Cohos Trail*, by Kim Robert Nilsen. Nilsen has been laboring over the past ten years to implement his vision of a foottrail extending the length of Coös County. *The Cohos Trail* is published by Nicolin Fields of North Hampton, NH. The Cohos Trail Association maintains a website at www.cohostrail.org.

"Norton Reserve is a 400+ acre-block of wild wetland and forest. It has been set-aside because in some parts of the area there are a few remaining remnants of the original primordial forest that once covered all of eastern North America. It is a gift for outdoor lovers and for scientists alike... Norton Reserve [owned by the Nature Conservancy] is a mystical place, almost unearthly. It has a 'soft' quiet to it, although tiny drops of sap and upper story detritus rain down constantly on warm summer days. The air is rich in moisture and earthy odors, and it's cool all the time. The place feels 'right' like no place I've ever been, except perhaps the Olympic Rain Forest east (sic) of Seattle."

Surely, this rather small patch of old growth forest needs greater representation, rather than villification. Since House speaker Chandler has gone on record as being opposed to "25,000 and 50,000 acre" reserves, New Hampshire residents should be charitable in releasing him from his rhetoric by enlisting his support for reserves of greater increment and size. — Andrew Whittaker

offered a unique opportunity to protect biodiversity and restore functioning old forest ecosystems. Speaker of the House, Gene Chandler (no, not the guy who sang "Duke of Earl" in the early 1960s) could not suppress his agitation. "How much are you talking about?" he grilled Publicover. "One hundred acres or one-half of the property?" An amount significant enough to protect functioning ecosystems was the reply. No, the Speaker, shot back, "how many acres?" When Publicover stated that conservation biologists suggest that ecological reserves ought to be at least 25,000 acres in order to protect species, communities, and natural processes, and to protect against stand-destroying large disturbance regimes, the Speaker's blood pressure soared. Speaker Chandler, a great lover of the outdoors, nevertheless worries about his constituents. He supported a bill to ban the reintroduction of wolves in NH because, he warned during debate, wolves might devour little girls waiting for their school buses.

The thought of wilderness protection horrified current Coös County State Senator, Harold Burns, who formerly served as House Speaker (and then corporate lobbyist). "Nature has given us a great asset," the silver-haired Senator blurted, "if we can't use it, it's worthless."

Bing Judd warned against protected lands: We already have some of these up in Pittsburg. The Nature Conservancy now owns Fourth Connecticut Lake — the ultimate source of the Connecticut River — and the first thing they did was post a "no trespassing" sign so the locals can't even go there now, he claimed. Sitting next to him was Darryl Burtnett, who directs the NH chapter of The Nature Conservancy. Burtnett was staggered by the accusation, and assured all present that TNC's policy was absolutely to permit public access. Bing received this information with a stony glare. (A few days later I hiked up to Fourth Connecticut. The trail leaves the highway behind the US Customs house at the Canadian border and follows the international border for half a mile or so. On the north side a Quebec farmer had posted his land. When we reached Fourth Connecticut Lake, we discovered a work crew maintaining the hiking trail around the beautiful little boreal wetland. Why, I wondered, would TNC maintain a public hiking trail if it wanted to exclude the public?)

Burtnett suggested this is "the last great opportunity to protect a grand place." Thus far, he noted, almost everyone has spoken about protecting uses; we must talk about protecting places. There is room for intensive recreation and for quieter recreational use. This tract is large enough to protect and restore large intact areas.

The governor and Senator Gregg agreed to appoint a Task Force to develop a strategy for the disposition of these lands. David Houghton gamely tried to conclude the meeting by summarizing TPL's goals: healthy rural economies; healthy recreation and access (which some old-fashioned types might interpret as legs, not motors); sustainable forestry; and healthy biological diversity. "Let's think of all these things," he urged the assembled power brokers, "don't set these uses against each other."

JULY 26 PITTSBURG

A couple of hundred people met at Pittsburg's cavernous fire station to tell the deal makers what they wanted. Before the

public testimony, the make-up of the "IP Task Force" was announced. Every state and federal elected official (who would, of course, send wet-behind-the-ears aides to represent them), the leaders of the legislature, selectmen from the three towns with IP lands, a timber industry lobbyist. The only conservation representatives were David Houghton of Trust for Public Land and Jane Difley of the Forest Society. No organization primarily dedicated to the protection of large wildlands was appointed. A great many of those appointed are ideologically opposed to any reserves or public lands. This is "The New Hampshire Way."

TPL introduced its New Hampshire agent, Charlie Levesque, former executive director of the NH Timberlands Association, former executive director of the Northern Forest Lands Council, and recent lobbyist for Champion and Mead's aerial herbicide spraying program. Levesque assured the assembled, "TPL has no priorities for the land — they will leave it up to the locals."

Speaker after speaker testified that residents of Pittsburg and surrounding towns want to keep the land the way it is. The most important components of the Pittsburg area economy, according to the testimony are: logging, snowmobiling and other motorized access, and property taxes and timber taxes. One or two property rights zealots warned of well-documented conspiracies by the United Nations and The Wildlands Project to take over these lands and starve out the locals. But most of the testimony focused on maintaining logging jobs and snowmobile access. Several speakers warned against uncaring environmentalists. There was enthusiastic applause following each speaker who stuck to this script.

Speaker of the House Gene Chandler joined in the frenzy. Keep the cutting, he said. And not one acre for "set asides" the delicate phrase used to denote ecological reserves and wildlands. Chandler also publicly worried about the dangers of conservation easements — namely, that they might be a stalking horse for restricting cutting and paving the way for future acquisition by the tree-hugger crowd. (Applause.)

Federal ownership came in for special bashing from several speakers. One selectman, a big man with the NH Farm Bureau, warned against state ownership, citing the Nash Stream (a 40,000 acre watershed in Stratford, Stark, Columbia, and Odell that was part of the first great paper company land sale, Diamond International, in 1988). He claimed that there was "no use" of the Nash Stream since the state took it over, thereby confirming his ideological aversion to public lands. He failed to acknowledge that Diamond had so overcut the Nash Stream that there was scant timber value remaining, a discovery the state only made after it acquired the tract. Far from demonstrating the evils of public ownership, the state's conservative management over the past decade is a tribute to a more responsible kind of forestry. That land needed a rest of several decades; a private speculator would have set to work liquidating its remaining timber value.

Despite the tradition of logging these lands, most locals seemed even more concerned about maintaining recreational — especially snowmobile — access. This reflects a subconscious acknowledgement that the region's economy in the past



Sprayed wetlands in Connecticut Lakes region. Photo © Alex MacClean, Landslides.

decade or so has become much more dependent on snowmobiling than on the declining timber economy. It is curious that they oppose wildlands protection because it is seen as a threat to the jobs generated by tourism and recreation, yet in northern Maine, many oppose creation of a Maine Woods National Park because all it would do is create a bunch of "burger-flipping" recreation and tourism jobs that are scorned by locals as low-paying.

Proponents of maintaining the current levels of timber harvesting offered no silvicultural or economic evidence to buttress their viewpoint, relying instead on emotional appeals to maintain a way of life that had been going on since time immemorial. They did not acknowledge the decades of overcutting, and seemed to demand the continued cutting of trees, regardless of current stocking levels. Towards the end of the meeting, Peter Riviere, executive director of Coös Economic Development Corp. in Lancaster, NH, offered a quite different perspective on the regional economy. He urged the Task Force and its Technical Committee to do its homework and "find the factual basis for how fragile the economy is." Loggers all have friends who have lost their jobs. Mill workers have lost their jobs. In 1970 there were 2,000 mill workers in Berlin and Gorham, NH; in 2000 there were only 870. And, about two weeks after this hearing, the pulp and paper mills in those two towns shut down and the company that owns them, American Pulp and Paper, declared bankruptcy a few days later. "Accept the passion," Riviere urged, "but look at the figures." Wall Street has not been kind to this region. They make the decisions up here without consulting us. They determined how mechanized the logging economy would be. He urged the IP Task Force and Technical Committee to find other diversified development options, and not just cling to a failed, and unrecoverable, status quo. He did not receive the same enthusiastic applause.

IP TASK FORCE & TECHNICAL COMMITTEE

Early meetings of the Task Force and its Technical Committee, chaired by state forester and former paper company forester, Phil Bryce, offered little hope for a responsible strategy for disposition of the IP lands. Almost all members seemed determined to keep the lands as "working forest," regardless of the condition of the land, the number of jobs it currently sustained, or the full extent of the region's economic crisis. Ecological reserves were

not mentioned, and there was general hostility to the notion of public ownership, especially federal ownership. Fatuous calls for sustainable management urged that future owners comply with the paper industry's Sustainable Forestry Initiative. Champion had been a statewide leader of this public relations gimmick since its inception in 1995. And, of course, most assumed that development posed an imminent threat to all 171,500 acres. Those who dissented from the prevailing view on development threats did so because they feared that restricting development might interfere with their dreams of future development. No one asked if it made sense to spend millions of taxpayer dollars to prevent a non-threat.

A few conservationists, one newspaper reporter, and a couple of private citizens monitored some or all of the meetings. Most of us were shocked by the narrow-minded, parochial discussions. Federal ownership was dismissed outright, without discussion, by Paul Doscher, of the Society for the Protection of NH Forests, the organization that a century ago led the charge for the creation of the White Mountain National Forest. Sure, it's the safe route to take, given the hostility to federal ownership expressed by state pols and those who spoke at Pittsburg on July 26. However, eliminating options (both for funding and somewhat more enlightened management) without consideration hardly commends itself as an open-minded and fair process.

AUGUST 23 TECHNICAL COMMITTEE
By the second meeting of the Technical Committee, on August 23, something curious was occurring. The ideological commitment to the status quo seemed to be ossifying even as the data collection by various members of the Technical Committee informed the more alert that the status quo was a failure and could not be salvaged.

The Technical Team was presented with a chart that demonstrated that Champion/St. Regis had cut three to four times the growth for two decades. During a break in the meeting, a forester familiar with the lands in Vermont sold by Champion in 1999, stated that those lands (89,000 acres are under a forever logging covenant) contain an average of about five to six cords per acre, with a stocking of about 19 square feet per acre basal area. This is an average! Even jaded critics of industrial liquidation logging practices

Continued on page 20

Large Scale Conservation Easements: Principles & Recommendations for Use in the Northern Forest

By: Michael R.B. Giammusso

The following article addresses large-scale conservation easements in general, and presents principles and recommendations developed by the Northern Forest Alliance (NFA) intended to guide the use of easements in the Northern Forest. Although the ideas presented here could be considered in relation to the West Branch project in Maine, this article does not specifically address that project. For a detailed analysis of the West Branch project, see Mitch Lansky's article in this issue of the Northern Forest Forum.

At the time of this writing, the conservation easement for the West Branch project was still under negotiation. Throughout the negotiation process, the NFA has and will continue to provide comments to the West Branch applicants (Forest Society of Maine and the State of Maine), intended to strengthen and improve the project. The NFA recently submitted comments on the easement's latest draft, and will provide an assessment when the easement is finalized.

Among other issues, the NFA is particularly concerned that the West Branch easement not preclude future opportunities for additional conservation on the West Branch lands. The inclusion of any such provision (such as a 'forever logging' clause) would cause the NFA to withdraw its support of this project. This and other principles intended to guide the development of large-scale conservation easements are the subject of the following article.

Introduction

With the completion of the 762,000-acre Pingree project in Maine last winter, the total amount of land protected by conservation easements in the Northern Forest leapt to more than 1.2 million acres, or nearly five percent of this 26-million acre region. This represents an area of land nearly twice the size of Rhode Island that will forever remain largely undeveloped and intact, and will retain its natural forest qualities and features. As other large conservation projects now under negotiation are completed, including the West Branch project in Maine and the Connecticut Lakes project in New Hampshire, the total area protected by large-scale conservation easements will likely top 2 million acres.

Size, however, is only one factor that makes these large-scale easements so significant. The sheer number of easements established during the last decade in the Northern Forest has mushroomed, along with the number of land trusts negotiating and monitoring them. The amount of public money invested in these projects has also risen to unprecedented levels.

Because of their rapid evolution, large-scale conservation easements remain a relatively untested tool, and involve several critical issues that must be addressed if they are to be an effective mechanism for conservation in a landscape dominated by privately owned land. As such, those who negotiate, advocate for, and/or fund large-scale easements have a responsibility to think carefully about how they are structured and what their role is in an overall Northern Forest conservation strategy. To use easements with confidence, we must clearly define their appropriate role and establish guiding principles that promote the public interest—today and for generations to come.

A Conservation Strategy for the Northern Forest

Central to a viable Northern Forest conservation strategy is the protection and restoration of the region's greatest natural asset—the forest itself. Protection and restoration involves: permanently maintaining the forest in an essentially undeveloped condition; designating areas of wilderness to restore and sustain ecological health; ensuring ecologically sound forestry and land management; and enhancing overall forest health. A complete conservation strategy must also include the strengthening of local forest-based economies; ensuring adequate public access and opportunities for backcountry recreation; and empower-

What is a conservation easement?

A conservation easement is a legal agreement by which a landowner voluntarily restricts the use of his or her property for the purposes of conserving specific values. Ownership of land entails a bundle of rights, such as the right to subdivide or develop the property, to restrict access, or to harvest timber. Under a conservation easement, the landowner sells or donates some of these rights to a qualifying organization such as a public agency or a land trust. Any rights not conveyed by the easement are retained by the landowner. Easements are almost always established in perpetuity, and apply to present and all future owners of the protected property.

ing local communities to become involved with the land's stewardship. However, without the protection and restoration of the landbase, upon which all our ecological and human communities depend, we will have lost the region's best chance at creating a healthy, sustainable future.

There are a number of land protection tools currently available, each with their own benefits and drawbacks. These tools include conservation easements, tax incentives, certification of forest practices, and regulations on private lands; ownership by non-profit land trusts and municipal, state and federal governments; and designation of ecological reserves and wilderness areas on public lands. Each tool has a role to play. Each must be used for the right purpose and in the right way. To achieve true ecosystem and economic health, the Northern Forest needs ecological reserves, wilderness areas, and wildlife refuges where motorized recreation and logging are not allowed. However, large-scale easements, when used appropriately, also have a valuable role to play in preserving the natural and cultural heritage of this region.

How Are Easements Used?

Every conservation easement is unique and tailored to meet the conditions of the land and the interests of the landowner, easement holder, and easement funders. Generally, conservation easements address development (structures and road building), subdivision, dumping, mining, paving, public access, protection of soil and water quality, forest and recreation management, and identification and protection of unique or sensitive areas, features, or species.

Some easements only restrict development, while others restrict nearly all uses of a property. Highly restrictive easements (sometimes called 'forever wild' easements) are intended to provide strong levels of ecological protection, and are sometimes used by landowners to protect smaller reserves within a larger holding. Other easements actively require uses such as a minimum level of timber harvesting. Use of such easements, which have been called 'forever logging' easements, are particularly controversial and are addressed in greater detail below (see principle 5).

Large-scale conservation easements are not a panacea that can meet the full range of conservation needs in the Northern Forest. However, applied in the right situations and effectively crafted, this tool has several beneficial qualities:

By purchasing only partial interest in a property, easements can stretch scarce conservation dollars. The need is great: 20 percent of the Northern Forest has changed hands since 1998 at a wholesale cost of over \$1 billion; the region is facing real and present threats from development and subdivision (see sidebar); and the availability of conservation funds is far below the demand. Easements can answer many of these needs by providing a relatively affordable tool that can stabilize the landscape and protect large forested areas from development, subdivision, and loss of public access.

Easements are effective in preventing forestland from being fragmented, developed and converted to non-forest uses. They can help protect open space against encroaching development, and enhance the benefits of nearby pub-

lic lands. Effectively designed easements also allow for management flexibility in response to new scientific knowledge and unforeseen events such as large natural disturbances.

Easements may also garner more support in local communities distrustful of government ownership and reluctant to remove lands from their tax rolls.

Large-scale conservation easements are generally most appropriate where continued private ownership and activities such as sustainable forestry are compatible with conservation of the land's public values. With the possible exception of 'forever wild' easements, they are not well suited for situations where significant limitations or control over landowner actions are necessary to protect particular values. Where greater degrees of protection are needed, acquisition, or a combination of easements and purchase by a land trust or public agency may be more appropriate.

There are also instances when easements can actually work against a larger conservation strategy. Easements that preclude additional conservation restrictions, and easements that require commodity production (rather than just allowing them) can seriously compromise opportunities to fully protect and restore this region's forests (see principles 4 and 5 below).

Northern Forest Alliance Principles & Recommendations for Large-Scale Easements

Given the emerging role of large-scale conservation easements in the Northern Forest, the tens of millions of dollars in public money involved, and the concern over easements restricting future conservation, the Northern Forest Alliance (NFA) recently crafted a statement of principles and recommendations for the development of such easements. These principles are intended to be a guide for decisions regarding support of and advocacy for specific easement projects, especially large-scale projects involving significant public funding. Individual easement projects should be evaluated not only for their compliance with these principles and recommendations, but also their overall public benefit, the precedent they set for future projects, and their relationship to other conservation opportunities.

Note: The following is a summary of the NFA's "Statement of Principles and Recommendations for the Development of Large-Scale Conservation Easements in the Northern Forest." For a complete copy, contact NFA at 802-223-5256 x12 or mgiammusso@nfainfo.org.

1. The primary purpose of forest conservation easements should be to provide permanent protection to public benefits associated with undeveloped forest areas, while allowing other uses compatible with the purposes of the easement. These benefits include maintenance of healthy ecosystems, clean air and water, recreational access, conservation of biodiversity, scenic values, and productive forest resources.

2. Easements should be used as part of an overall landscape-level conservation strategy that includes stronger protection for some areas, including fee purchase

by public agencies or non-profit organizations.

3. Funding for easements should include a dedicated source of revenue to support long-term monitoring and enforcement of easement provisions by the easement holder.

4. Easements must be strong enough to provide permanent protection for the identified public values but flexible enough to allow adjustment based on future knowledge, conditions and opportunities. In particular, easements must not preclude the opportunity for additional conservation in the future, and should specifically note this in the text of the easement. As provided for by applicable law and the stipulations of the easement, additional restrictions must be compatible with the interests of the landowner, easement holder, and general public.

5. Conservation easements may help provide a variety of public benefits (including employment, tax revenues, and supplying raw materials to local businesses) via commodity production on undeveloped forestland. However, where extractive uses (such as harvesting timber, tapping maple sugar trees, collecting mushrooms, or stripping bark) are allowed by the easement, decisions to undertake such uses should remain with the landowner and not be mandated by the easement.

6. Easement goals must be clearly and carefully stated, and structured to avoid interpretations that may conflict with the easement's original intent. The easement's statement of purposes should be prioritized and inclusive of all values that the easement is intended to protect.

7. Subject to the objectives of the landowner, easement holder, funding source, and general public, and a comprehensive resource analysis of the property, the following issues should be considered during easement development: restrictions on development and subdivision; public access; land management plan and guidelines; protection of soil and water quality; identification and protection of unique or sensitive areas, features, or species; mining and other uses that may impact identified conservation values.

8. On properties where timber management and other extractive uses are allowed, easements should include provisions that ensure that such management is ecologically sustainable over the long term.

9. To the extent practicable, parties establishing large-scale easements should seek input from a range of parties with an interest in the land. Interested parties may include public agencies, local citizens and officials, scientists, and conservation and recreation organizations.

10. The expenditure of public funds should be commensurate with the public benefit derived from the easement.

11. It is appropriate for private non-profit organizations such as land trusts to partner with public agencies in developing, holding and monitoring publicly funded easements. In some cases, there will be benefits to having qualified private organizations hold publicly funded easements. However, such partnerships must maintain an acceptable level of public accountability to reflect the public investment in the property.

Conclusion

International Paper's recent announcement that it will sell 171,000 acres in northern New Hampshire is the latest in a long list of huge, rapid land sales that have rocked the Northern Forest since 1998. Such sales are likely to continue for at least the next decade, and present both a tremendous threat and a tremendous opportunity. On the one hand we are already seeing increased fragmentation, development, loss of public access, and liquidation harvesting by some of the new landowners. On the other hand, public agencies and non-profit conservation groups are working together as never before to protect hundreds of thousands of acres across the region through record-breaking land purchases and conservation easements. As a community, we must act swiftly before this window of opportunity slams shut.

A healthy and sustainable future for this region depends on a healthy and sustainable forest ecosystem. Large-scale easements, guided by the principles and recommendations offered by the NFA, can play a valuable role in stabilizing land ownership and management activities, and maintaining options for the future. While not a substitute for public land, they can protect many public values that would otherwise be lost through development and conversion to non-forest uses.

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The Northern Forest Alliance is a coalition of 40 conservation, recreation, and forestry organizations united in their commitment to protect the Northern Forest of Maine, New Hampshire, Vermont, and New York. For more information call 802-223-5256 x12, or visit www.northernforestalliance.org.



Not the way to do it: three hikers fording the Kennebec at Caratunk. The Maine Appalachian Trail Club cautions against fording — several hikers have drowned here — and provides a periodic ferry service during the hiking season. Dam releases upstream can raise water levels 2-4 feet quicker than hikers can ford. Elderberry Youngman photograph.

Development Threatens the Northern Forest

Several threats jeopardize the ecological and economic health of the Northern Forest, including liquidation harvesting, acid rain, and the instability caused by frequent large-scale land sales. Another pressing threat—and one which conservation easements can effectively address—is development and landscape fragmentation. Division of land into many small ownerships, and the construction of houses, roads, and power lines are often accompanied by ecological degradation and diminished potential for sustainable forestry and high-quality backcountry recreation.

Select examples of development pressure in the Northern Forest include:

In July 2001, Plum Creek Timber company announced its plan to sell 89 lots for development on 435 acres around First Roach Pond, near Moosehead Lake in Maine.

In 1971, over half of Maine's Northern Forest townships were completely unpopulated; today, fewer than a third are. During the same period, more than 190,000 acres of land were subdivided. Between 1980 and 1990 alone, the number of houses in this area increased by 23%.

In Maine's Northern Forest, over 800 permits were issued for new residential development from 1998 to present. An estimated 3,000 seasonal dwellings were constructed in the unorganized territories in the 1990s, a 25% increase over the 1980s.

Since the late 1980s, 11,000 acres of Maine's

Upper Enchanted Township—where development recently only included a small sporting camp—has been subdivided into about 140 lots. Permits for 96 structures have been issued and several lots have been stripped of timber and developed.

In New York's Adirondack Park, permits were given by local governments for 8,589 new residential, commercial or industrial buildings between 1990 and 1999—an average growth rate of between 820-850 new structures per year. The majority of this development has been along roadsides and lakeshores.

Statewide in Vermont, the number of non-industrial private landowners has increased from an estimated 61,900 in 1983 to roughly 80,000 in 1997, accompanied by a decrease in average parcel size. These trends signal greater fragmentation of existing forestland.

Statewide in New Hampshire, forest cover has decreased from 87% to 84% in the last twenty years, and is predicted to decline to 80% over the next 20 years. This trend is largely due to new development—between 1980 and 1998, housing units increased 55%. — *Michael Giammusso*



With a dubious eye on the camera, three Appalachian Trail through-hikers arrive in Stratton, Maine en route to Katahdin from Georgia. Photo © Elderberry Youngman.

Looking Before Leaping: An Analysis of the West Branch Easement Language

By Mitch Lansky

Earlier this year, I wrote an editorial, published in the Bangor Daily News, questioning whether the proposed mega-easement on the land surrounding the West Branch of the Penobscot was a good deal for the public. I made (among others) the following points:

I questioned the use of the words "preserve," "protect," or "conserve," connected with actions that merely prevented seasonal camps, but allowed industrial-style logging. I pointed out that just the logging roads alone have removed far more land from production than any development in the unorganized territories. I also suggested that if what is to be protected is forest integrity, then heavy-handed management is far more of a threat than seasonal camps.

I wondered just how "threatened" from development lands could be where there are no public roads and no utility access and no nearby towns with schools or stores. To get to the West Branch lands, one has to drive on private roads through private lands.

I was not aware of any "sustainability" requirements, but if there were, what type of precedent does this set? What type of meaningful standards could be set, who would enforce them, and how much would it cost? Does this mean that it is acceptable for landowners to abuse their land unless the public pays them not to?

I was concerned that the public was asked to pay out big money for a project about which we knew so little. How was the land being appraised? What was the appraisal?

I suggested that there may be less-expensive ways to protect the forest or better uses for the same funds.

Project Defenders Respond

The response from the easement advocates (the Forest Society of Maine and the Northern Forest Alliance), in many cases did not address my concerns, but instead repeated their points:

They continued to talk about "preserving," "protecting," and "conserving" land that I knew had a large portion that had already been roaded, clearcut, sprayed with herbicides, and, in some cases, planted to a single species of softwoods.

They insisted that the easement would prevent the development and fragmentation of the forest.

They insisted that the easement guarantees public access and recreation.

They claimed that the easement assures "sustainable" forest management.

They claimed that the easement protects special ecological resources (such as deer yards and riparian zones) far better than current state statutes.

They repeated that the easement is a bargain, compared to full-fee purchase.

They disputed that there were any other approaches (such as LURC zoning) that could protect any of these resources.

The Easement Protects Private Not Public Values

I have now read the easement document for phase I (around 65,000 acres). The language is clear that what is being "protected" is not the forest, but continued logging with few significant restrictions. The legislation that enables the spending of Forest Legacy money refers to protecting "environmentally important forest areas threatened by conversion to non-forest uses and for promoting forest land protection and other conservation opportunities." I have yet to be convinced that there is a serious threat to convert 70,000, let alone 650,000 acres to non-forest uses. Even "mini-kingdoms" do not remove forests. The forests are the green backdrop for the billionaire estates.

The easement states (pg. 3) that "the Property's primary use shall continue to be productive timberland." The primary purpose of the easement, therefore is not to promote public values (such as biodiversity) but a private value (timber logging). There can be recreational development (pg. 2) only to the extent that it does not interfere with this primary use. That's what we already have. What is new, is that after paying millions of dollars for the easement, the state has the responsibility of managing the recreation, including paying all the costs. These costs include trash collection. The document states emphatically (pg. 9), "In no event shall the Grantor bear the cost of collecting, storing, or removing such materials." Indeed, if the state fails to come up with the money for trash collection, "the Grantor and the Grantee may mutually agree to close the Property to public use."

While the document gives public access on the land, it does not grant access to the land, because access to the land is through other properties. The landowner can "Prohibit or limit motorized or vehicular access on and across the use of any roads or trails on the Property" (pg. 15) with some exceptions. Even on those exceptions, the landowner can prohibit access for a number of reasons, including "safety" or "to prevent damage to roads."

The document does not prevent subdivision. It limits subdivision to six parcels. The document also does not prevent "development"—it only limits development to certain kinds that are compatible with logging and recreation. For example, for forest management activities, the landowner can (pg. 5) build such items as roads, fences, bridges, logging camps, and housing facilities, barns, garages, storage facilities, utility services, electric power lines and generation facilities, septic disposal facilities..." Those looking for value-added jobs will discover that there can be no sawmills or forest products processing or manufacturing facilities on the property.

Under the easement, it is OK to store and to apply toxic substances (such as pesticides) as long as it is within the law (which is the situation now, I think). One item of good news—the landowner can't dump more than 10 cubic feet of hazardous materials per acre under the ease-

ment (pg. 8).

For recreation, the Grantee can (pg. 6) build camp sites, septic and waste disposal facilities, boat ramps, landings, docks, parking areas, roads (including paved roads), bridges, or housing facilities for workers. Apparently the forest is "protected" or "preserved" with all the above, but not with seasonable camps.

Sustaining Forests?

The Northern Forest Alliance, in a document outlining what ought to be in these mega-easements, suggested that, "where an easement addresses timber management and other extractive uses, the following issues should be addressed":

- Long-term management goals;
- Forest management planning process;
- Identification and protection of significant sensitive areas;
- Sustainable harvest levels;
- Silvicultural systems;
- Forest composition and age-class distribution goals;
- Use of exotic invasive, or genetically modified species;
- Chemical use.

The easement document lacks information on silvicultural systems (except in riparian zones), forest composition and age-class distribution, or any restrictions on invasive species or toxic chemicals (besides what is restricted under law). The landowner does need a plan (this is required under Tree Growth anyway), and the state can look at it, but the state (pg. 12) is "not entitled or required to approve the Forest Management Plan." Nor can the state tell the public what is in the plan. This is considered proprietary. If the landowner gets certified by, for example, SFI (which is industry based), then that is considered sufficient to qualify management as sustainable. The state "cannot unreasonably withhold approval of such certification."

The document does set a minimum average stocking level—below which the landowner should not go (unless there is a good excuse, such as an insect or disease outbreak that requires salvage). This level is 14 cords to the acre. If this volume is to be compared to government figures for stocking in this state, one would use a different method of inventory calculation (pg. 40)—which would bring this "sustainable" level down to 12 cords to the acre. The state average, according to the most recent Maine Forest Survey, is 16 cords to the acre. In New Hampshire, it is 26 cords to the acre. The average volume removal per acre in Maine is less than 12 cords.

There is nothing in the document that prohibits abusive highgrading (where the species and quality and value all diminish)—as long as the cutting leaves an average above the minimum average volume standard. While some may argue that setting a minimum average volume is an attempt to prevent liquidation, 12 cords to the acre average is so low that it, combined with highgrading, could be considered evidence of liquidation. Someone with a woodlot that was so poorly stocked would have to wait decades before being able to make a decent commercial cut.

Riparian & Deer Yard Management

The riparian zone management requirements are stricter than the state's. The document states that in LURC's 250 buffer zones, the first 50 feet will not be cut. Outside of that, the document lists

minimum stocking standards for hardwoods, mixedwoods, and softwoods, and suggests that selection be the primary method of harvest. Unfortunately, the document's standards are below recommendations from the Maine Council on Sustainable Forest Management to have 65-70% of full stocking. For softwoods, the document sets a minimum standard of 85 square feet of basal area per acre, which is at the C-line for stands averaging 6 inches in diameter—about 40% of full stocking. The document makes no mention of restrictions from harvesting around small streams or headwater streams, even though the editorial from representatives of the Forest Society of Maine, promised such protections.

The document promises to create and sustain a minimum of 4,500 acres of "mature forest" suitable for deer yards. The property currently has 9,200 acres managed as deer yards. Trees over 35 feet tall are considered "mature."

(Hidden) Costs of the Project

I have heard a number of prices for the 70,000 acres deal for phase I (which includes a few thousand acres of full-fee purchases, such as Big Spencer Mountain). The lowest is 8 million dollars. This averages out to around \$114 per acre—more than half of what the landowner paid for the land (\$236 an acre). Is this a good deal? What this figure does not include are the annual costs from managing recreation (and collecting trash) and monitoring the easement agreement. Of course, the state is given the right to collect recreation fees (pg. 17), which is on top of gate fees paid to get on to the industry roads and the taxes paid to purchase the easement.

One thing rarely mentioned in discussions on this easement is the fact that the West Branch of the Penobscot and Lobster Lake already have 500 foot easements on them. Also, although easement supporters state that LURC is inadequate to protect public values in the West Branch region, a number of water bodies in the region are currently classified as "remote ponds" or otherwise classified to restrict development. In these areas, therefore, the "development" would have to go beyond the beauty strips into the heavily cut forest. It strains credibility to think that every and all acres are subject to a serious development threat.

The public really ought to know who



did the appraisal, how the appraiser arrived at such a high price, what methods were used, and what appraisals went to what areas. I would not normally spend millions of dollars on something without knowing what I was getting for the money and without knowing if that was a fair price. It is unfortunate that so much of this discussion has been based on people's assertions without letting the public see the details.

Hancock Over-Payment in Vermont

The USDA Office of Inspector General did an appraisal of a Forest Legacy easement purchase on Hancock Timber lands in Vermont and found that the state had grossly overpaid. The original appraiser had, in essence, come up with the price that the landowner wanted, rather than what the easement was really worth. Because of this, the OIG suggests that the state should repay the federal government the difference. With more public scrutiny, we could avoid such an embarrassment.

Poor Precedents

Based on my reading of the easement document, I am underwhelmed by the language that will supposedly protect public values. The easement as written seems more like a subsidy than a purchase of public values. It sets a bad precedent, telling the public that it is acceptable for landowners to abuse the forest and public values unless they are paid not to. We cannot afford to buy acceptable management on all the beauty strips and deeryards in the state, but this is what the easement precedent is suggesting what we must do. The document also seems to be creating roadblocks to real conservation, protection, or preservation by stating that this land shall forever be primarily used for timber harvesting.

The document is subject to amendment if both parties agree (pg. 29). This may be good or bad, depending on the degree that the parties are negotiating to improve protection of public values. Given the secrecy involved in the negotiations and the resistance of the state to provide documents, even when confronted with FOIA requests, this does not help inspire confidence that future amendments will necessarily be for public good.

Unfortunately, this payment could turn out to be a perverse incentive for heavy logging. The landowner normally makes money from cutting (the dividends) and selling off land (capital gains). If the forest is better stocked than when originally purchased, the capital gain (and thus the profit) would be larger. With the easement payment, the landowner can make more money cutting, have the same or lower stocking than when the land was purchased (at \$220 an acre) and sell for the same or less than the original purchase price—and still make a sizeable profit. The easement essentially cuts the original purchase price in half.

I have painfully learned (and I have the stitches in my head to show it) that you should look before you leap. More public discussion of this deal now would hurt less than the consequences of a bad deal.

DANGER IN EASEMENTS: NO CLEAR FOREST POLICY IN MAINE

AN ECONOMIST-IN-TRAINING'S PERSPECTIVE ON THE WEST BRANCH PROJECT

David Lewis is currently a PhD student at Oregon State University in Environmental and Resource Economics. He is a native of Yarmouth, Maine, and has an M.S. in Resource Economics & Policy from the University of Maine. While at UMaine, David's masters research was focused on estimating the effect of public conservation lands on local economies in the northern forest region. An article based on this research will be published in an upcoming issue of Land Economics, an international resource economics journal. Separate from his thesis research, he also authored an article for Maine Policy Review regarding the policy issues related to large-scale easements in northern Maine. David is an avid outdoor recreationist who has traveled extensively through the mountains, rivers and lakes of northern New England.

Andrew Whittaker (AW): What is your critique of easements?

David Lewis (DL): I became interested in the easement concept with the Pingree deal and West Branch Project. Easements had traditionally been used in urban areas and lake shorelines mostly, and this was the first step up in easements to a landscape scale. . . This seemed like a public policy shift, once the West branch Project came up, because it involved public money, away from traditional tools like regulation and full fee purchase towards partial ownership.

When I looked at it a little more, it seemed like not a lot of analysis had been done. They seemed to be using easements, which are primarily designed to prevent development, in areas with very low development threat, meaning areas with little shoreline, far from public roads, far from utility infrastructure — and that are heavily cut over. I am skeptical about the real development threat. Since it involves public dollars I am wondering what the public is getting for the money.

AW: In northern New Hampshire's IP (International Paper) deal with TPL (Trust for Public Land) the assumption is that there will be easements on whatever land TPL sells to logging companies. How does this differ from the West Branch Project?

DL: The IP deal is very different from the West Branch [and] the Pingree deal. The difference is who has the negotiating power. From my perspective, if you buy the land and then resell it, you have a lot more leverage — if you are the public — than if you just buy an easement on the land. The landowner has the leverage in that case.

DL: To value an easement there are two approaches you can take. There's the comparable sale approach; you'd look at surrounding parcels of land and see what its selling for — it's a market approach. But there's little market for easements. The other approach would be the income approach where you'd calculate expected revenues over time. So if you're buying development rights you need to calculate expected revenue from development. You have to assume a time of development — this year, 5 years from now, 10, 50 — who knows. Some of these lands are so far from public roads and utility infrastructure that the time of development is not obvious at all. So that's a big assumption that has to go in there. The approach they are using on the West Branch — I don't know.

My other point is adding up all the costs. What the state is doing is buying all the development and access rights and also the right to manage the land for recreation. This means their costs have three components: the price of the easement up front, the monitoring costs which will be on-going, and the recreation management costs, which are on-going. Compare this sort of ownership to public reserve lands in Maine where the recreation funding comes from timber harvesting on the land — they harvest pretty modestly, its not half a year's growth, only about 7300 acres annually out of 600,000, so that pays for all their recreation. The difference with easements is they don't have the timber rights.

What my question has always been when you add up the price of easements, a discounted time series of monitoring and of recreation costs, how close are you to the full fee price. By doing that you can compare the easement approach and full fee. That hasn't been done.

AW: To go back to IP, everybody has different ideas, but



wouldn't you want easements on any land sold for logging even if you've reserved other portions?

DL: Sure, easements can be compatible with full fee purchases, very much so. The one question you have to ask is what does the easement accomplish. Where the easement is going, is there a high development threat? If there is, then an easement will add a lot of value to the property. If there's not the threat, then perhaps you'd be better off using the money somewhere else. This is one of the points I brought up with the West Branch Project: let's say the goal is to prevent development — we don't care about ecological reserves or wilderness — where do you get the most bang for the buck? Is it way up north of Moosehead far from public roads or is it down in western Maine which is where most of the development of remote lands is happening?

Paying for What We Already Have

AW: What is the cost-effectiveness of easements versus regulation? Do you think easements are being viewed as a substitute for that?

DL: If you read the West Branch easement, they are attempting to substitute for LURC regulation in some way. Primarily in shoreline areas and deeryards and bald eagle nesting areas. LURC currently has standards for riparian zones. This easement has standards that do go above LURC standards though by most accounts not by too much. . . They also include provisions for mature forests, which are just the deeryards. You also can't cut a tree with a bald eagle nest in it. Now, first of all, if this stuff is already there, why are we paying for it now? For example with the bald eagle, under the Endangered Species Act, you can't cut that tree anyway. How much are we paying for a benefit we have? Is it really necessary to go beyond LURC standards and if so maybe we'd be better off setting a uniform standard throughout the state everyone can comply with rather than paying some landowners to do that. . . it sets a precedent that you replace regulation in these cases. The costs of regulation tend to be political more than anything else.

AW: Is there the political will to regulate?

DL: The answer depends on who you talk to. We have designated remote ponds where development is banned within a 1/2 mile, we have riparian regulations. Given that these new standards are not much more than what we already have, I'd say that they probably could be incorporated.

AW: Are you watching Plum Creek and other developments? There seems to be an accelerating pace of development or land

Continued Next Page

sales at least in the Moosehead region.

DL: My first response would be, where are those lands? What is driving development? Grace Pond is five miles from Route 201, paved public road. First Roach is right next to Kokadjo with existing utility infrastructure — the pond already has 100 camps on it. My response would be that these developments are not happening way up in the backlands but on shoreline and near paved road. If you are buying easements are you better going there than way up north? That's just a question I have.

AW: There's a critique of tourism as the creator of low wage jobs. In northern New England, how far ought we to go in supporting wood products manufacturing?

DL: It depends on how important you think those wages are to the region. The one problem I have is with just focusing on wages. A more complete system model looks at the mix of amenities in the area.

In my master's thesis I looked at the role of conservation lands in the northern forest region, in migration and employment growth decisions. I did find there was a statistical significant effect of people moving toward areas with more conservation lands.

What drives employment? Is it just the traditional base model which is say, a big industry in the area where things trickle down to the rest of the economy or is it something else?

In our study we tried to answer the question, do people follow jobs or do jobs follow people? We found jobs follow people in this region, which has a lot of policy implications.

We looked at rural counties from eastern Maine to Minnesota. The good thing about the area was its similarity in terms of climate, ruralness, forest products being the dominant industry as well as a lot of private ownership. All were fairly close to major metropolitan areas which means there's urban demand for conservation. There was a great amount of variability of conservation land so we didn't have to control for a lot of variables [ie, the impact of conserved land could be discerned].

AW: You also looked at the impact of the drop in timber sales from National Forests.

DL: We wanted to look at what effect the lessening timber harvest had. We found there to be no effect on employment growth or migration growth at all, which you can interpret as some evidence that the diversion of land has no effect. Granted, we didn't look at composition of employment, just total employment — there could have been some shift in types of employment. Harvests decreased by 42% in New England's National Forests and 22% in the Great Lakes Forests [where the level of cut was much greater to start with].

AW: To unite our subjects here, easements, reserves and the economy, if population growth is what's going to drive our economy, hadn't we better be prepared to protect land?

DL: Absolutely . . . the one thing with my study, the migration rate was small, significant but small. 10% of conserved land drew an additional 1% of population, which is not big. [As I flip my tape, Dave draws the point that it is in-migration that affects employment, not conservation of land, except insofar as it affects in-migration].

Forever Logging: Precluding Future Preservation Options

AW: Northern New Hampshire has witnessed dramatic decline in wages derived from paper manufacturing over the last few decades. To some this only increases the importance of the remaining payroll. Thus far, the bulk of local sentiment in Pittsburg has been in this vein, and even been opposed to easements, on the suspicion that environmentalists are out to detract from the land base that supports both cutting and paper manufacturing.

DL: The same things are going on up here...A lot of people think the West Branch Project is just a start-up for a National Park, which is not true, especially if you read the easement. They talk about putting timber values in perpetuity in the easement. Does this mandate the land be used for forestry?

But if you mandate for forestry, that's an interesting precedent if you use public money.

AW: The Northern Forest Alliance standards discuss and reject such poison pills as a matter of good policy. You say



View from Spaulding Mountain and the Appalachian Trail.

it is in there?

DL: Well, I'll read you a quote here, the Forest Society of Maine, the group negotiating the easement, they had a public meeting in Greenville about the West Branch Project and said [quoting from?] "if the federal government were ever to acquire land along the West Branch, that was protected by an easement, it would be subservient to the state's interests that are written into the document. For example, hunting and snowmobiling couldn't be restricted if the easement says they would be allowed, in addition forestry could not be prohibited because the easement says the land must be used for that purpose." Which is sort of an interesting statement because it's inconsistent with other statements from the same organization as well as with the easement itself.

If you go into the easement and read section 9.6, "Nothing contained in this easement shall be construed to either limit the grantor's [the landowner's] right to take additional conservation action such as further restrictions on the use of all or portions of the property or to limit the grantor's right to cease managing the property for commercial forestry activity in order to protect the resources and conservation values of the property." The problem with this section here is that it is completely inconsistent with the purpose of the easement — legally, what sections wins?

The purpose of the easement is supposed to set forth the general guidelines of how lands are managed under the easement and how the easement is to be interpreted in general — you're supposed to always come back to the purpose. So if the purpose is to protect the property's significant timber values for public benefit, how is section 9.6 consistent with that? It seems fuzzy to me. They said in public this is forever logging and they've also said there's nothing in here that's forever logging; what's true I don't know.

You are certainly limiting your options if you mandate forestry.

AW: We're well aware of that in Vermont — the Champion easements on the private timberlands stipulate a certain level of cut over a ten year period [after an initial, 40 period of recovery from the extremely low average stocking post-Champion].

DL: If information comes up in the future that that property is particularly valuable from an ecological stand point that justifies it being a reserve, it certainly limits that option.

AW: You've suggested that the areas slated for full fee purchase on the West Branch are of limited timber value anyway.

DL: In phase II, the bigger phase, there's supposed to be a full fee purchase, but it's not determined yet how big or where its supposed to be so I'll talk about phase I.

They're buying about 4500 acres on Big Spencer, I've climbed it several times, it's steep on all sides, I don't think there's any way you could cut it. I find it interesting that

the area they're actually buying basically has no timber value. I'm not sure that's scientific conservation in terms of a reserve system, or is it conservation driven by what the landowner doesn't want.

AW: Some of us have made public benefit arguments about clearcutting, that it reduces timber supply and employment. I was therefore struck by your comment that timber is of private benefit. Does this mean clearcutting foes have no economic argument to advance?

DL: No, I made that comment [in a response to the Northern Forest Alliance's easement standards document] because public goods from an economic point of view are typically non-excludable and non-rival — you can't exclude someone from obtaining the benefit like military protection—my breathing clean air doesn't rival yours. I try to look at public and private goods with these two in mind. Typical public goods of forests lands are of watershed controls, biodiversity conservation, wildlife habitat. All these things may not be completely non-rival and non-exclusive but certainly have characteristics of it.

Private timber harvesting on private land: the revenues from that are excludable to the firm doing the harvesting and the landowner; they are certainly rival. Now, you can make the argument that it's put into the local economy and there's a trickle down, which is fine, but by that argument anything can be of public benefit; a toxic waste dump creates an investment opportunity for the government to come in and clean it up, that's a benefit. Private benefits can lead to public benefits but it gets tricky.

When I look at a conservation document like this easement and I see in the purpose, to protect timber values and productive timber land, first thing I see is a private benefit, timber harvesting on private land by private landowners. Which makes the easement more of a subsidy than a conservation deal. Now not all subsidies are bad but we should at least be debating it.

AW: An easement that doesn't set a tight goal of rebuilding inventory becomes a subsidy... This is an argument that we have been hearing as well as articulating in Coös County. The fear is that the feds become the only feasible purchaser of cut-over land. That concerns others more it does me, but no one wants to see easements invite a further round of liquidation.

DL: Absolutely, that's a good point to bring up because if you have an easement, the revenue the landowner gets from the land consists of timber harvesting and the resale value, the capital gains. If you've given them an up-front payment with an easement, a lump sum, then there's less incentive for them to have more stocking in the end, and more capital gains, because they've already gotten this up-front payment; there could be more incentive for them to cut heavier over a certain time period and they could actually increase their revenue and sell the land for less than they bought it because they've already gotten the up-front payment.

Interestingly, that problem amplifies the higher the payment is for the land. If you overpay for the land to begin with it's going to increase that problem.

Now, the next question is, can you include standards in the easement that require a minimum standard. There is a standard in the West Branch easement and it's 14 cords to the acre. If you go by government standards it's closer to 12; by most accounts a low stocking; New Hampshire's average stocking is 26 cords/acre. There's no restriction on age class distribution, on silvicultural methods, on herbicides or pesticides, on gmo [genetically modified organisms] or roads; I believe they're claiming it's a sustainability standard. Is that sustainable?

AW: Depends on what you're trying to sustain.

DL: Exactly. Just because you are sustaining pulp flow doesn't mean you are sustaining the biodiversity of the region. [Sustainability] is a fuzzy word. I rarely see it defined, it's definitely subjective.

AW: From our point of view, it would certainly be a forestry that could be practiced here indefinitely of some optimal economic value that doesn't seriously degrade the forest itself which is why we have advanced the two goals of forest practices reform and ecological reserves. To have a forest sustain itself you need to have areas where the forest is doing its own thing. Our premise has been that you can sustain an industry on less land if you bite the bullet and improve your practices and stocking. The least we can say is that this is more likely to succeed than the present situation. Have you any further comments on the Pingree easement?

DL: You have to remember the Pingrees didn't sell an easement on all their land. Most of the land that got the easement is in northern Maine, even above the West Branch Project, in the Allagash region and northwest of Dickey. It's up there quite a ways. They also own land down in the Rangeley Lakes region. They sold a little bit of an easement down there but they left a lot of shoreline open so the obvious question would be, why would you buy an easement well north of any paved roads or utility infrastructure where there's virtually no demand for development and leave areas in the Rangeley Lakes open for development. Would we have been better off putting an easement there? But that's mostly private money so that's for the private group that bought the easement to deal with ...

AW: Yet the private group did a lot of fundraising in the conservation community and drew on the support of public officials like Governor King ...

DL: There's an opportunity cost.

AW: There's an opportunity cost and a further problem, if you will, that the Pingrees now have a capital pool with which to develop that land around Rangeley.

DL: Absolutely.

AW: I guess that answers my question on stabilizing the land base. [A discussion of the Hancock timber easement in Vermont ensues — see sidebar — which turns to the subject of costs and commitment to easement monitoring]. There I had a more general question, relevant to Vermont, there's legislative pressure on the Agency of Natural Resources to generate revenue from timber sales, which have hitherto

gone to the general fund.

DL: One of my points in Maine there's certainly the possibility that Bureau of Parks and Lands will increase their timber harvesting on existing public lands to pay for the management of the easement. Given that we have so little public land in Maine anyway, if those forests are serving the role that private forests are failing, like more mature forests, are we decreasing the ecological benefits because we have to pay for monitoring and recreation management on the easement lands?

AW: The state was required by industry to cut more in return for the reserves on public lands.

DL: [BPL] had to cut at least the average of the last ten years, which means you have to cut more [to maintain the average]. It was an absurd stipulation that as put in there. I find it hard to believe it got in there.

AW: What is your summation?

DL: We have tens of millions of dollars flowing into the north Maine woods right now— private money, public money. But we have no policy. What are we trying to get out of conservation? Are we just trying to conserve the working forest? If you're trying to conserve biodiversity, you need a reserve system. That's well established, that was established by the Maine Biodiversity Project.

If we're just trying to prevent development, we should look at easements where the most development pressure is. These are things you sort out when you have a policy. We don't have a policy.

AW: Where does this lack of policy come from? My view is you have a governor not powerful enough to establish what is in the public interest and act on that. By the same token your legislature. There's a political deference in Maine and also New Hampshire or Vermont to perceived sentiment in northern parts of the state wanting a resource base to remain but it's gone. It's hard to make policy on that basis.

DL: It's hard to make policy with that. I can understand people's frustration.

It could be an instance of where public interest [in the Maine woods] has increased and public agencies have yet to respond comprehensively to that. They're starting to respond with the easements but it's an ad hoc response given that we don't have a policy. Unless they have an internal policy we don't know about, they're not sharing with the public.

End of Interview

Easements: Are they Necessary? Are they Cost Effective?

The most recent fad in northern New England conservation circles is to tout the virtues of massive "conservation easements" as a substitute for regulating timber practices and establishing large ecological reserves. They are easier to sell to politicians and the timber industry. The new breed of professional conservationists gloss over the limits of easements: namely that they fail to adequately protect ecological values — even if responsible forestry is practiced. Unfortunately, easements executed thus far permit large clearcuts, high-grading, herbicide spraying, monoculture plantations, and elimination of older age classes.

Equally as troubling, they often are an extremely expensive tool used to address a non-threat. Just how many acres in the Connecticut Lakes area face any real threat from development? How much of the 650,000 acres in the West Branch of the Penobscot is threatened by development? Professional environmentalists are working arm in arm with opponents of a proposed Maine Woods National Park to secure an expensive easement to protect those lands from the phantom threat of development, but not from the reality of industrial forest liquidation.

The Northern Forest Lands Council elevated easements to near-mythic status as a desperate attempt to divert attention away from other more effective protection strategies, especially full fee public acquisition for the creation of ecological reserves. The Council ignored its own findings that very little development had occurred in the previous decade so that it could promote easements. But not everyone was fooled.

Steve Schley, of the Pingree Family, whose one million acres are managed by Seven Islands, wrote to the Council on May 3, 1994:

"Finding Common Ground was true to the NFLC process as I have known it, except for the land conversion subcommittee recommendations section of the report. You glossed over the findings of the committee formed to address the issue that created the Northern Forest Lands Study in the first place. The fact that many interest groups continue to stress land conversion as justification for their agendas proves how inadequate your reporting of these findings is. The true findings are in Appendix D and Appendix E, but few people read that far. Appendix D clearly states only 7,000 acres of the Diamond Land Sales have been developed to some degree. It also notes that the two companies involved in the wildlands development, Lassiter Properties and Rancourt Associates, are both bankrupt. This is a very important point that should not be hidden. Large scale marketing of these wildlands is not easy and does not present the threat many believe it does."

The driving force behind the creation of the Council was concern about overdevelopment. That concern was proven unfounded and propelled by hype developed by some groups to attract funding and membership. As a concern, however, it is best addressed by the Forest Legacy program that removes the threat of development but allows for the traditional forest management and recreational uses that have characterized the region.

Despite his assertion that "large scale marketing of these wildlands ... does not present the threat many believe it does," Schley's family, a few years later, worked hard to secure about \$35 million to sell easements on about 750,000 acres that are not threatened by development. They were eagerly abetted by the professional environmental community. Interestingly, the Pingrees withheld about 200,000 acres from the easement — the lands they identified as most likely to have future development potential. — Jamie Sayen



Clearcut and sprayed: the former Champion lands in Pittsburg. Photo © Alex MacClean, Landslides.

A Railroad in Vermont Explores Non-Chemical Vegetation Management

Toxic trespass against a Vermont family living along a railroad has inspired a pilot project that provides a model for eliminating herbicide spraying on railroad rights-of-way.

By Barbara Alexander

The Way It Was

In the early part of the twentieth century, trains crisscrossed the United States on a quarter million miles of railroad. The frequency of rail traffic limited the growth of vegetation. Cinders from the coal-fired steam locomotives were dumped along the rail bed, which helped keep the plant growth at levels that did not interfere with the safe operation of the railroads.

Perhaps the most significant factor contributing to early vegetation control by railroads was the size of the work force. In Vermont, tracks were kept manicured by three to four man section crews who were responsible for clearing unwanted vegetation from the track and right-of-way with manual brush cutters and scythes. Each crew cleared approximately 6 miles of track and right-of-way twice each summer.

By the 1960s, the country was caught up in the promotion of industrial chemicals to combat a wide array of plants and animals regarded as unwanted pests or health threats. For the railroads, the chemical manufacturer's claim that "weeds" could be eradicated relatively easily and cheaply with the use of herbicides coincided with several factors which made that claim especially attractive. The coal-fired steam engines had been replaced by diesel powered engines, eliminating the utilization of cinders for vegetation control within the track bed. Crushed rock ballast was laid as a substitute for the original bed of gravel and cinder. A decrease in rail traffic and revenue for the railroads beginning in the 1950s resulted in a reduction in the work force, including those employed during the summer to maintain the integrity of the track.

Chemical Use Intensifies

State records of herbicide use by railroad companies in Vermont were not available



Brigitte Graham takes an appreciative look at the equipment with a rail employee.

until the early 1970s. Since that time, a number of the selective, phenoxy herbicides such as 2,4-D and 2,4-DP as well as a variety of the more broad spectrum herbicides like atrazine, amitrole, picloram, and diuron were being used for vegetation control along rights-of-way. As adventive plant species in the ballast and adjacent areas became resistant to some of these herbicides, additional herbicides were used in greater amounts and in more lethal combinations. The soil treatment and foliar spraying methods used in pre- and post-emergence chemical applications only added to the site disturbance, favoring the colonization of the right-of-way by the unwanted vegetation the herbicides were being used to eradicate.

Toxic Trespass

The Graham family, long time residents of Norton, Vermont, a small Northeast Kingdom town, live on a thirty-two acre farm that is bisected by a railroad line currently owned by St. Lawrence & Atlantic Railroad. For over forty years, railroad companies have used numerous herbicides, and combinations of herbicides, on the right-of-way which runs through the Graham's property. This thirty mile section of track in Vermont running from Norton on the Canadian border southwest to the town of Bloomfield on the New Hampshire border is part of a Portland-Montreal route, long significant in the movement of freight between Canada and the northeastern United States.

One Family's Ordeal

Brigitte and Elizabeth Graham, the two members of the family who currently reside in Norton, have paid a high price for the railroad's toxic trespass.

In 1984, the Canadian National Railroad, then owners of the rail line, applied an illegal, and especially potent, herbicide mix of atrazine, bromacil, and diuron on the right-of-way which passes through the Grahams' farm. As a result, the Graham property was left severely contaminated. For the past sixteen years, Brigitte and Elizabeth Graham have been trying to cope with the aftermath of chronic exposure to herbicides, including a high incidence of cancer within their community and their own family. Brigitte was diagnosed with an inoperable brain tumor in 1994. Edward Graham, Brigitte's husband, became seriously ill following the illegal spray and died of cancer in 1987. Another fifteen people have died of cancer in Norton since 1979, all permanent residents who lived in close proximity to the track and the herbicide applications. This number represents almost one quarter of Norton's population of year round residents.

A few geese are all that remain of the Grahams' once thriving organic farm. After the 1984 spray, their horses, cattle, pigs, and poultry began dying as a result of miscarriages, still births, liver and kidney failure, birth defects, respiratory problems, and cancer. Vegetation on their property, including their vegetable garden, showed signs of genetic abnormalities for several



The St. Lawrence and Atlantic mainline runs from the Canadian border to Portland, Maine, traversing numerous wetlands along the way. Photo © Barbara Alexander.

years following this particularly lethal spray. Herbicide residues were detected in vegetation samples and in well water located more than 1,000 feet from the right-of-way.

From information supplied by the Vermont Department of Agriculture and the Canadian National Railroad, over twenty different herbicides were found to have been used for vegetation control on this section of track since the 1950s. Some of the herbicides used can cause a number of serious health effects including cancer, mutations, neurotoxicity, birth defects, and decreased fertility in males.

Theo Colborn, Ph.D., author of *Our Stolen Future* speaking at a Congressional hearing on the "Relationship Between Estrogenic Pesticides, Breast Cancer and Other Health Effects" held in October of 1993 stated: "Humans are now carrying burdens of both industrial and agricultural chemicals at concentrations at which adverse endocrine, immune, and reproductive effects have been reported in affected wild and laboratory animals. There is growing evidence that some of these humans also have been affected as a result of their parent's exposure to endocrine disrupting chemicals... Because so many chemicals of this nature already exist in the environment, it is cavalier to think that the global environment can assimilate more and not suffer dire consequences... Our goal should not be to replace old chemicals with new chemicals, but rather to seek non-chemical alternatives..."

Alternatives to Herbicides

Numerous technologies are currently employed in several countries to manage unwanted vegetation on railroad rights-of-way. For the past three years, NARP's Vermont Citizens' Forest Roundtable (VCFR) has been researching alternative vegetation control methods being tested and utilized by railroads in the U.S., Canada, Germany, Sweden, and Finland.

Treatments used for the removal or control of unwanted plant species vary from track maintenance procedures like ballast cleaning and brushing to inventive construction methods like the use of geotextiles, recycled asphalt or concrete for weed barriers. Other innovative technologies include the use of infrared heat, flaming, hot water, steam, and even freezing for vegetation control. Electrothermal methods like direct contact with a charged electrode or the use of microwave heat are in the developmental stage for use for vegetation control on rail beds.

A Pilot Project

Since the fall of 1998, VCFR has been working with Brigitte and Elizabeth Graham to coordinate an effort to raise awareness of how chronic exposure to herbicides commonly used by railroads for "weed" control can have devastating consequences for humans, animals, and the environment. As a result, the Grahams, VCFR, the Vermont Pesticide Advisory Council (VPAC), the Vermont Agency of Transportation (VAOT), St. Lawrence & Atlantic Railroad (SL&R), and Vermont's congressional delegation have worked together to develop a pilot project which will test the efficacy of a new infrared technology for vegetation management along the entire thirty miles in Vermont of rail line now owned by SL&R.

SL&R's thirty miles of track is currently being treated with a thermal technology called "wet infrared". This patented technology was developed by Sunburst, Inc. an Integrated Pest Management (IPM) company based in Eugene, Oregon. The wet infrared technology utilizes several forms of heat: infrared, direct flame, and turbulent hot air. According to Sunburst's president, Greg Prull, "Exposing weeds to high temperatures coagulates proteins and ruptures cell walls, thereby disabling normal plant functions. Wetting of the weed's surfaces prior to heating them facilitates and magnifies these effects by improving the transfer of heat and increasing the duration of the treatment (residual hot water on leaf and stem surfaces continues damaging weeds



Headwater of the Nulhegan River. Photo © Barbara Alexander.

PROJECT ASSESSMENT

A series of unanticipated circumstances this past spring resulted in the delay of the initial treatments scheduled for the 2001 growing season. By the time SL&R began treatments in late July, many plant species were well established and at, or past, the flowering and seed stages. For optimal efficacy, the wet infrared technology should be applied to vegetation when it first emerges. This is the stage of a plant's life cycle when the plant is most susceptible to stress, when the plant's tissues are young and tender. In the spring, energy levels in a plant, in the form of stored carbohydrates, are very low. Also, it is critical to treat annual populations of plants before the production of seeds in order to disrupt the life cycle.

The number of treatments outlined in the project's work plan, ranging from two to six applications, have been affected by both the late start and precautionary measures taken by the railroad because of the exceptionally dry summer. Since both timing and the number of treatments are critical to the success of any method of vegetation control, the project's outcome for this year will represent the potential, rather than the proven, effectiveness of the wet infrared technology.

The Alaska Railroad has not been allowed to use herbicides for weed control on their 500 miles of track since 1985. Since that time, the company has been using a combination of brush cutting, steam, and hand weeding by convicts to try to control the vegetation. Despite their efforts, they have not been successful at maintaining a trackbed vegetation level which does not violate federal safety regulations. In August of 1998, the railroad conducted a field trial of three alternative technologies:

hot water, direct flaming, and infrared. After the trial, the railroad decided to work with Sunburst Technologies to build a rail truck which is now treating their right-of-way with wet infrared.

After the vegetation is sprayed with water, a brief but intense application of infrared irradiated heat will target plants within the 16-foot ballast area. Once the penetrating light from the infrared units pierces the plant, proteins within the plant cell begin to coagulate. Moisture within the cells also instantaneously turns to steam and expand. The cell walls then expand and burst, stopping the process of photosynthesis. Once the plant can no longer manufacture its own food, it begins drawing on its own food reserves, essentially cannibalizing itself. After repeated applications, the absence of food-producing photosynthesis will eventually cause the plant's root system to dry up.

For more information about the project, including a video VCFR is creating for public access TV, please call (802) 586-2494 or (802) 626-8643.



Mike Witter of Berlin, NH, is the railroad mechanic who engineered the thermal units onto the ballast regulator. Photo © Barbara Alexander.

after the equipment has passed by). These impacts effectively kill all types of seedling weeds outright, and with repeated applications, will eliminate even established plants."

For optimal efficacy, the wet infrared technology should be applied to emerging vegetation in the beginning of the growing season. In the spring, energy levels in a plant, in the form of carbohydrates, are very low. This is the stage of a plant's life cycle when the plant is most susceptible to stress because the plant's tissues are young and tender. Annual populations of plants require treatment before the flowering and seed production stages in order to effectively disrupt the plant's life cycle.

SL&R's chief mechanics, Mike Witter and Alfred Leighton, as well as the railroad's Assistant Vice President of Engineering, Steve Knudsen, have worked together to design a system which attaches the infrared units, or pans, to an existing piece of equipment called a ballast regulator. A single 4x4 foot pan on either side of the regulator as well as a double 4x8 foot pan in the rear of the machine are operated by hydraulic controls. Mr. Witter designed and constructed a platform which is connected to the regulator and is used to transport both water and propane tanks. Water is used for the thermal unit's automatic watering system and for fire control. The



Weeds killed by the thermal unit.



Track near Wenlock being treated in June with the retro-fitted equipment. Vegetation is watered, hit by hot air, and more water. Control extends 8' either side of the track. Photo © Barbara Alexander.

"Our goal should not be to replace old chemicals with new chemicals, but rather to seek non-chemical alternatives..."

propane fuels the direct flame contained in the pans. Unwanted vegetation within the entire 16 foot stone ballast area can be treated on an "as needed" basis. The equipment is optimal at a speed of about 1-3 miles per hour, depending on the type and density of vegetation to be treated. However, the average working speed can be greatly increased in areas where no treatment is required.

SL&R plans to use thermal technology for vegetation control in conjunction with other track maintenance activities such as tie replacement, ballast regulation, brush cutting, and the use of high pressure water hoses to remove loose soil, or fines, from the stone ballast. According to SL&R's Steve Knudsen, the railroad is planning to retrofit more equipment with thermal technology in the future. The equipment being used this summer will be available for trial use by other railroads operating in Vermont, perhaps as early as next year.

While a thorough evaluation of the project will not be feasible until 2002

because of a late start in the treatment schedule for this year (treatments began in late June), utilization of wet infrared technology with existing mechanical and structural methods used by SL&R has the potential for serving as a catalyst for other railroads in the region to explore safer, and possibly more cost effective, vegetation management.

For Brigitte and Elizabeth Graham, the voluntary effort by St. Lawrence and Atlantic Railroad to explore alternatives to herbicide use along their right-of-way in Vermont means they no longer "live under threat of being poisoned again". As a result of the railroad's involvement with this project, no chemicals have been sprayed on the Graham property — or the Vermont stretch of track — for four years. And for four years now, the Grahams have expressed heartfelt thanks to a railroad company that has given them something they haven't had for a long time: hope for a safer future.



Weeds on the Island Pond engine house siding have been controlled by the new technology. Cost savings from the project have been considerable and successfully integrated with other track work. Photo © Barbara Alexander.



More weeds await. Project coordinators anticipate the replication of this alternative technology model on other rail lines across the region and country.

Time, Scale & Disturbance: Understanding New England Forests, Past, Present & Future

In this interview with the Northern Forest Forum's Jamie Sayen, Harvard forester and ecologist David Foster looks at the forests of New England through the lens of history, human and natural. Foster emphasizes that history in understanding today's forest, and developing approaches to biodiversity conservation and forest management. He also encourages distinguishing the scale at which we assess the impact of human disturbance on patterns of diversity and consider options for ecological restoration.

Jamie Sayen (JS): How did you come to blend your ecological work with history?

David Foster (DF): I don't think ecology makes sense without history. From the first forest system which I tried to understand — the forested landscape of southern New England where I grew up — there was absolutely no way to understand its shape or its appearance, ranging on a scale from an individual stand to the broader landscape arrangement of stands, without invoking history and without invoking human history. At the same time, the way I formalized that interest in history was by going to Labrador, a complete wilderness landscape, where it's utterly impossible to understand the age of a given tree in the forest or the arrangement of trees in the stand or the broad scale pattern of forest vegetation without understanding the history of disturbance processes like fire. So, interrelating historical process in ecology is just absolutely second nature.

JS: What's the value of ecology to a historian?

DF: Henry Thoreau was a great example of a 19th century natural historian who knew how to use everything from historical sources to tree rings to peat stratigraphy to archeological materials to address his basic interest in understanding his landscape.

Ecologists have come to realize that a lot of what we want to understand, what we often call natural, is strongly conditioned by human activity. And so we actually come to quite erroneous conclusions if we don't take into account history of process and history of people. There are really good examples of places where we've come to the wrong conclusions because we haven't taken that long perspective.

JS: Can you give me an example from New England.

DF: Let me give you two. The classic example is the management of white pine forests. At the turn of the century, southern and central New England was covered with white pine forests. Because it was everywhere in the landscape, foresters, ecologists, and plant geographers characterized the region as a white pine region and thought that we could go into that landscape, cut those forests down and regenerate them. But, of course, most of the white pine was there as a historical artifact. They were there because white pine does really well in open sites, abandoned from agricultural activity where it has relatively little competition with hardwood species and herbs and so on. It also is relatively resistant to grazing. So it comes in really well in open successional settings. When you cut that white pine down you find that underneath it is a suite of hardwood species that actually do very well in the shade of white pine and take over the site after the white pine is cut. So, on many of those sites in the uplands it's very difficult to regenerate white pine.

Now, this is something Henry Thoreau described in the 19th century, but foresters and early ecologists and plant geographers tended not to read Thoreau's Journals, so they weren't aware of it. They had to rediscover it all by themselves, and recognize that much of the management of our upland forest is actually a management of hardwood forests, of natural forests of hardwood with some white pine as opposed to white pine by itself. So that's a

historical case.

The modern case that's pretty interesting is the one of nitrogen-saturation of our forested landscape. There's a greater abundance of nitrogen coming into our forests today than would come in naturally and historically because of the anthropogenic loading of nitrogen into the atmosphere. It's controlled to a large extent by geographic position since most of the sources are coming from the Midwest and Mid-Atlantic States. There's greater fallout of this nitrogen in the western part of New England. But since nitrogen is also delivered by precipitation, there's a greater fallout at higher elevations. You tend to see gradients that go from west to east and gradients from low elevation to high elevation. This deposition is a concern because nitrogen is a limiting factor for the growth of most terrestrial ecosystems, and therefore adding it acts as a fertilizer that will change the productivity, rate of growth, relative rate of growth, and perhaps competitive ability of different species. As nitrogen increases and becomes abundant to the point where it's no longer limiting, and other factors are, it will be in excess and can potentially leach out of those forests into ground water, into streams, and into reservoirs and lakes where it actually becomes a pollutant and at high levels a threat to human health.

It turns out that a critical variable controlling the current status on nitrogen availability in forest soils, and therefore the ability of forest ecosystems to take up this additional nitrogen, is the history of the stand. In particular, the history of past use by humans—agriculture or—natural process, but especially human process—into the equation you make incorrect inferences in terms of current status of nitrogen and the ability of those forests to sequester additional nitrogen.

In both of those cases, and other examples of species distributions and abundances and interpretation of vegetation patterns—you will incompletely understand the phenomenon if you don't bring history and a knowledge of whether that site has been disturbed by a variety of natural processes or disturbed by people.

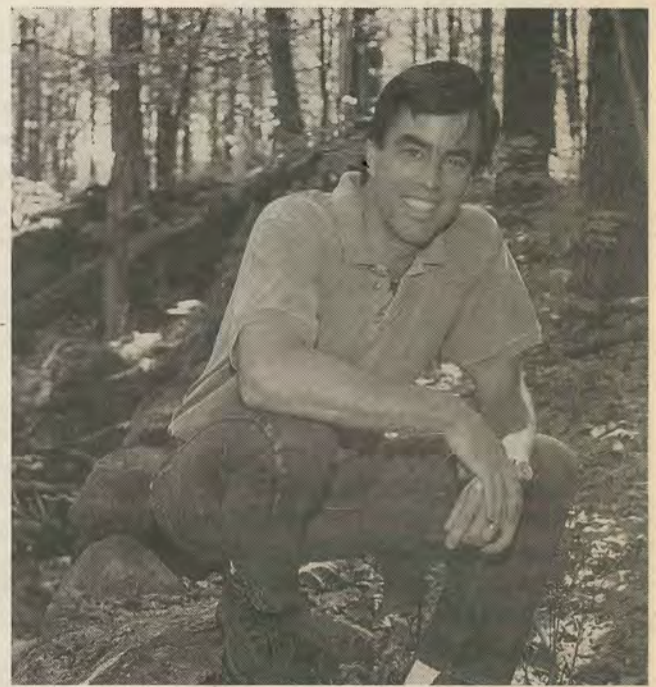
JS: What is the value of studying the pre-European settlement forest in terms of land management or preservation of biological diversity?

DF: The relevant perspective in New England is that we have this incredible change that's been wrought upon the landscape in the last 200 to 300 years from the arrival of European civilization. In order to understand the actual impact of that activity, we have to understand what was the prevailing forest condition and disturbance setting for the landscape at that point. So part of the motivation for studying pre-European settlement conditions is so that we can actually evaluate the impact of 200 to 300 years of direct human activity.

The other reason is because the pre-European settlement landscape does give us a sense of what types of changes, what kinds of scales of dynamics we'd expect if we were to reduce the intensity of our logging, the extent of our clearing and back off of that landscape a bit.

JS: Would you describe in general terms that pre-European settlement forest?

DF: I think the best way to talk about the pre-European forest is to talk about the scale of pattern and distribution of processes that are probably important across New England. We've done a lot of paleoecological work in which we've looked at many sites in relatively small areas—half a dozen or a dozen sites in Cape Cod or a dozen sites in central Massachusetts. And what that shows is that there's much more variation within relatively small areas than I think ecologists have normally assumed. So, to generalize about central Massachusetts is actually quite challenging because as you go from, for example, the Connecticut River valley to the uplands of Massachusetts, you see a fair amount of variation in major



tree species that are dominating the forest. The same thing is true in Cape Cod. We think of Cape Cod as pine and oak forest. But there's a lot of variation within inner Cape Cod in the relative abundance of pine versus oak and between inner Cape Cod and outer Cape Cod in those abundances. So, presumably, you've got a lot more variation related to soils and related to some of the disturbance processes, perhaps, including people and fire, but certainly including wind. That is a general comment about pattern. Things are not monolithic across New England, but they're also not monolithic within relatively small areas.

I think that the important processes that are operative in the pre-European New Land are physical and biological and not predominately driven by people. We certainly don't see good pollen evidence for major pre-European activity, for example, in terms of relative abundance of major tree species or weed species or the appearance of pre-European corn pollen. We also don't see it in terms of the obvious mechanism that's available to people to change the vegetation, which is fire. There isn't a strong pre-European signal of fire coming from most of our landscape.

I see the pre-European landscape of New England as being dominated by physical process, physical climate and natural disturbance processes like wind. That gives a view of the landscape in which there's a fair amount of variation because of gradients from south to north, the relative importance of hurricanes and other storms, and gradients in terms of bedrock geology and climate. But over all, we have a largely forested landscape that has a relative abundance of big old trees and forests that are driven by relatively infrequent disturbances interjected into a landscape controlled by broad processes, physical, biological processes. That view doesn't argue for extensive grasslands, shrublands, heathlands, and other kinds of open landscapes other than those that are generated on a very local scale by people who are actually moving a fair amount and by animals—beavers and some of the larger grazing animals that are certainly having an impact on the structure of the vegetation.

JS: My understanding is that the Indian population density of southern New England was roughly five to ten times greater than in northern New England. And along some of the coastal areas and rivers there was Indian activity, including corn, beans, and squash agriculture. There wouldn't have been the settled communities you'd expect in Central America or some of the other parts of the United States, but there was this kind of patchy, migratory economy in which corn played a role. It didn't displace the hunting and gathering, but it supplemented the diet far more than up north. Is that correct?

DF: I think that's correct and so the question is: what's the actual level of that activity? What's the size of that population? I think there are very few archeologists who would give you any numbers. But the general sense is that, even in southern New England, it's small. It's small groups that are moving, that do not set up large established villages. I don't think there's good evidence for corn playing a major role in diets or playing a major role in terms of landscape modification. The only place where it really seems like there's room for argument is in the major

river valleys like the Connecticut River valley. But even there, there are no archeological sites that support the notion of large villages or established sedentary villages. And there are no archeological sites that support the notion of major fields of maize.

JS: I take it most disturbance events were small — single trees, small groups, caused by disease, wind, ice or fire?

DF: That's true. That's the way I would think of the landscape. I also think that a lot of the big events don't generate much change in terms of the broad pattern of composition in the vegetation. So if you take a forest that's dominated by old growth trees and run a hurricane through it, you don't necessarily generate a wholesale change in the composition of the vegetation.

JS: It's more a change in the age...

DF: ...and structure...

JS: ... and structure of the locality, but in the end it's pretty much the same community, just at a different stage of development.

DF: Right, and I think that's why we paleoecologists, have always struggled with the fact that New England has a history of hurricanes. We know that there was a big hurricane in 1635, another one in 1815, and another one in 1938 that came through and had an impact on southern and southeastern New England. We can therefore assume that hurricanes on a 100 to 300 year frequency were important for millennia before European settlement. And yet, even with the finest grained pollen analysis, we don't see big changes in our vegetation that mark known or pre-European events. I think that's because at the scale that pollen is sampled, which is on the scale of a number of kilometers, even though those storms have a large impact on the structure of the vegetation and create many large openings; they don't have an overwhelming impact on forest composition.

JS: So you don't see a great infusion of plant species that you hadn't seen before, whereas after European agriculture comes in you do see a great change.

DF: Sure, because of the nature of the disturbance, the scale of the disturbance and the type of the disturbance is just so much greater. I also think that it is important to recognize that many of the disturbance processes that were operative, like fire, for example, don't actually have to occur very frequently to have a subtle but important and long lasting impact on vegetation. It doesn't take frequent fire to keep, for example, hemlock from becoming a dominant in the forest. Maybe fire every 50 to 200 years is all that it takes.

I think that there has been a tendency in natural history and ecology circles to overplay the importance of some disturbances. Certainly I've been involved in this as much as anybody else. To say that a disturbance is important doesn't say that it is necessarily all that frequent. That's true of fire. To say that hurricanes are important as a structural process, as a diversifying process in the forest, doesn't necessarily mean that they have a heavy hand that flattens continuous areas of forests and changes the composition for 50 to 100 years afterward.

JS: What are the significant differences between the pre-European forests and the forests of today that have reforested over the past 100 to 150 years after having been cleared and maintained as open agricultural land for periods of a century or more?

DF: If you look at a broad scale across New England,

there's been a major shift in the relative abundance of different tree species — from those species which are longer lived, shade tolerant, more typical of mature forest conditions, to younger-lived, less tolerant, more rapidly growing, weedy and successional species. And also species that are favored in the sense that they sprout easily, so they regrow vegetatively after the kinds of disturbances — cutting, fire, land clearance — that we imposed on these sites. So that's regionally.

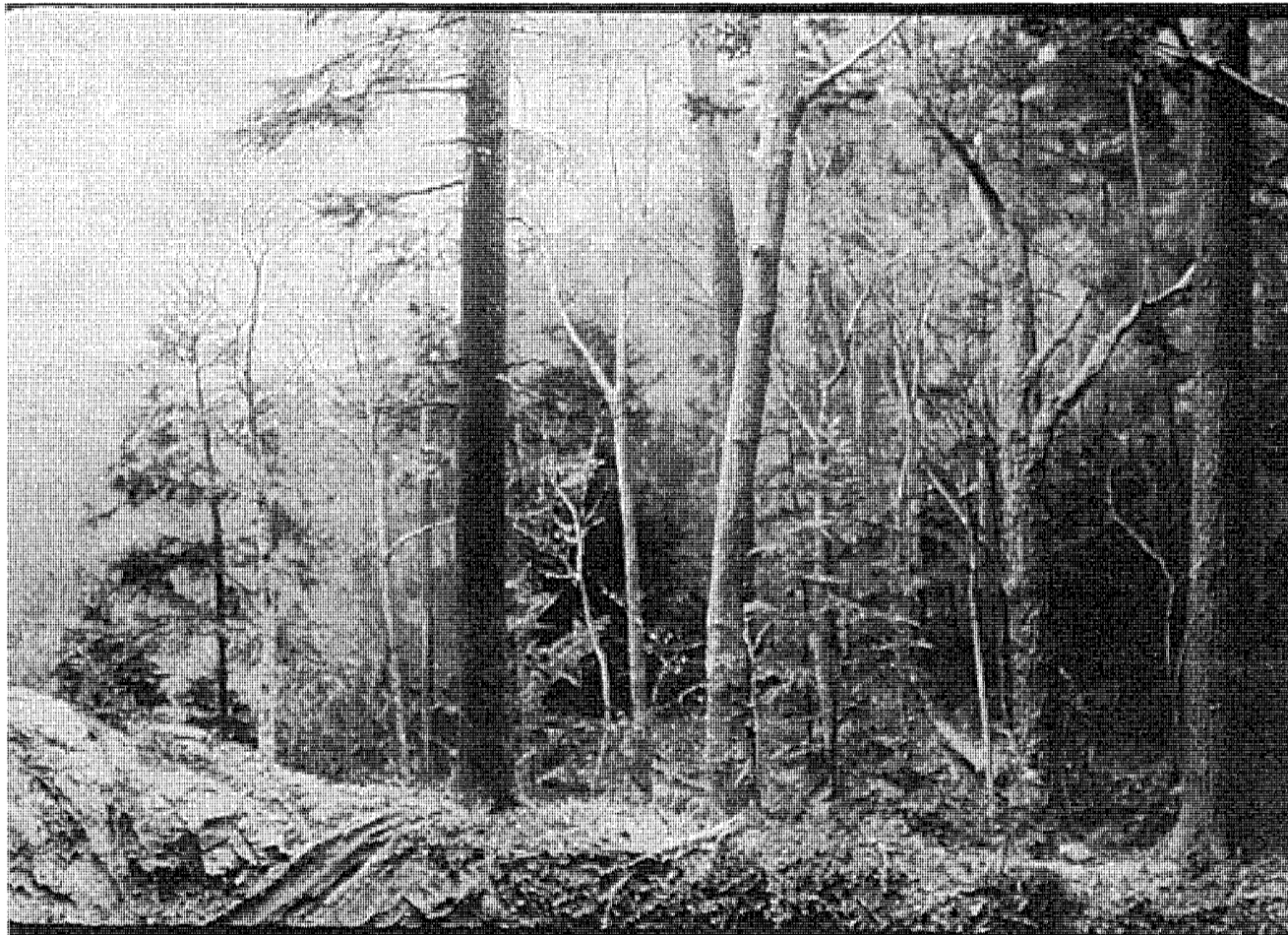
At a somewhat more local scale, across big chunks of our landscape, I think human activity has homogenized the vegetation. If we look in one example that we have a lot of information for — central Massachusetts — there used to be a fair range in variation across that area that was controlled by relatively subtle variation in climate, from, say, the Connecticut River Valley up 500 to 750 feet in elevation to central Massachusetts. Across that region, land use has been broadly similar and has selected for species that respond well to that land use; consequently it's homogenized the vegetation. Across that subtle climatic gradient there is no longer much variation in terms of major tree species.

Having said that, when you get down to the level

JS: And this is where the history is helpful in saying: oh, this stand, because it's got old hemlock probably never was plowed or pastured but remained as a forest, whereas that stand, which is dominated by pine probably was plowed?

DF: Yes, and [that's] the place where we usually apply history, because that's usually the place where we can collect natural history in great detail and apply it easily. And that's where we actually see the direct consequences of a fire or a clearcut, or a past clearing of a forest, and reestablishment of forest with agricultural abandonment. But then the consequences of history as we go up in larger and larger spatial scales play out very differently across the entire region.

Overall, the other impact of land-use history is structural. I've been talking mostly about composition, a little bit about structure in terms of landscape pattern. Forests are obviously much younger, much more unimodal, in terms of age structure. And they tend to be structurally different because, not only are they more densely packed with smaller and younger stems, but of course a lot of the structural elements like windthrow mounds and coarse woody debris, which are important parts of both forests and aquatic ecosystems, are missing.



Old growth in the pre-settlement forest as portrayed by the Harvard Forest dioramas. Image used by permission of the Harvard Forest, Petersham, Massachusetts. Photographs of the dioramas here and on following pages by John Green.

of a landscape, you're looking at a much more stark mosaic of types. The vegetation is much more heterogeneous at a landscape scale because adjoining parcels of land, which at one point might have had quite similar vegetation and might have graded from one to another, now shift abruptly. Now at the most local scale, the story is different. Within a given stand, because the treatment has been relatively uniform, it's probably true that individual stands are more homogeneous. At different scales we have different impacts.

I think if you looked at the soils in a given forest that, for example, have been in pasture, or have been plowed, they're probably more homogeneous than they were before European settlement. So the whole stand is probably more homogeneous. Within the landscape that that stand sits in, things are more heterogeneous; in the subregion that that landscape fits in, the pattern is more homogeneous. And then broadly across the entire region we've seen a major shift in the relative abundance of different species.

JS: Do you see sharper edges than was the case in the pre-European forest?

DF: Yes and that's the landscape scale where we see sharp transitions and sharp borders, from a pine forest to a hardwood forest, or a spruce-fir forest to a paper birch forest.

JS: What about vertical diversity? Is there a significant difference between the two kinds of forests we're talking about, because you don't have as many big, old trees you don't have the kind of diversity that would develop in a bigger, older forest?

DF: Yes. Because you'd have a more heterogeneous forest structure. In an older forest that's operating under a relatively high-frequency, local intensity kind of disturbance process like individual tree throws and small gap structure would generate much more vertical structure within a relatively small area.

JS: What have we lost?

DF: Clearly there are major things that we have lost and our systems are depauperate in many ways for having lost them. The big species that aren't here

anymore, as well as the little species. Think of the tree species and the structures in our forests. Think of the fact that every stream that we go through is missing probably one of the most important structural components which is a great, huge log that's pushing the stream all around and changing the system energetics completely. We don't notice that; we don't pause to think about it, yet fundamentally, that stream is completely different. Because it's completely different, the biota is substantially different. So I think there are huge things that are missing from our landscape, and yet at some impressive level, these are pretty strongly functioning ecosystems. But they don't have passenger pigeons whizzing through them. In our landscape we don't have chestnuts anymore, and we don't have the large mammals. We note all these ways in which they're depauperate and which they're not what they were, and yet we can still see value in them and value in protecting them. Maybe we still have ideas of improving them in the future by reintroducing various species, and yet they still function pretty well, and they still have a lot of value.

JS: One of the points you make is that change is inherent in forest ecosystems and that there's no static baseline to measure against; you're saying there's no steady state.

Herbert Bormann and Gene Likens, in *Pattern and Process in a Forested Ecosystem*, argue that the northern New England forests move toward a steady state. Are you

disagreeing with them, or are you trying to emphasize that the concept of steady state is a dynamic, rather than a static, phenomenon?

DF: It depends very much on what time frame you're taking. For me to say that change is inherent in all systems is really essentially a geological time scale. That climate is changing and that some of the driving factors, whether they be evolving human societies or shifts in the relative importance of major natural disturbance processes — fire and hurricanes, and other things as climate shifts—is to really to describe a very slow unfolding process in the history of the earth over a millennial timeframe. Within that you have superimposed the kinds of disturbance processes that Bormann and Likens fold into their steady state understanding of the landscape. What you come away with then is the recognition that over relatively long periods of time — hundreds of years — we have relatively little change in ecological systems and relatively gradual change. And that what we've imposed on the system recently is a much more rapid rate of change. I think it's that comparison that is really relevant.

This is very important because people may argue that since change is inherent in ecological systems, that essentially every change is OK and that the system is going to change anyway. But I think it is very important to point out that one of the things that we find with our paleo records is that although over many thousands of years these systems have changed tremendously, major species have come and so on, that we actually have at a stand scale, let alone a regional scale, good documentation of forests that have been more or less dominated in about the same proportions by the same species over a thousand years. Relative to the kind of time scale that we're talking about ecological change today, or management of our forests today, that's a staggering amount of time.

JS: Is it likely that over time these forests will become more heterogeneous?

If so, what sort of time frames are we talking about, and what sort of human management or non-management is that going to require?

DF: I think we can restore a lot of the forest process at both a local scale and at a broad scale by removing the heavy hand of human disturbance and influence. Clearly, there are two ways of doing that. One is to just back off completely, and the other is to try to nudge conditions in the direction that we'd like to see them go. So you oftentimes have both arguments made. One is that clearly, if we remove ourselves from the landscape and a forest grows, it will gradually assume, over a period of decades to hundreds of years, some of the structure, or much of the structure, that is typical of a natural old growth forest. Then you have the argument that you can nudge it in that direction more readily by management. I think both are true. However, I'm always a little bit wary of management for natural conditions.

JS: Do you see a role for ecological restoration that would be different from more active economically-oriented management? If economics weren't interfering with our thinking, are there things that we could do that would be productive in nudging it, or are we better off just leaving it alone?

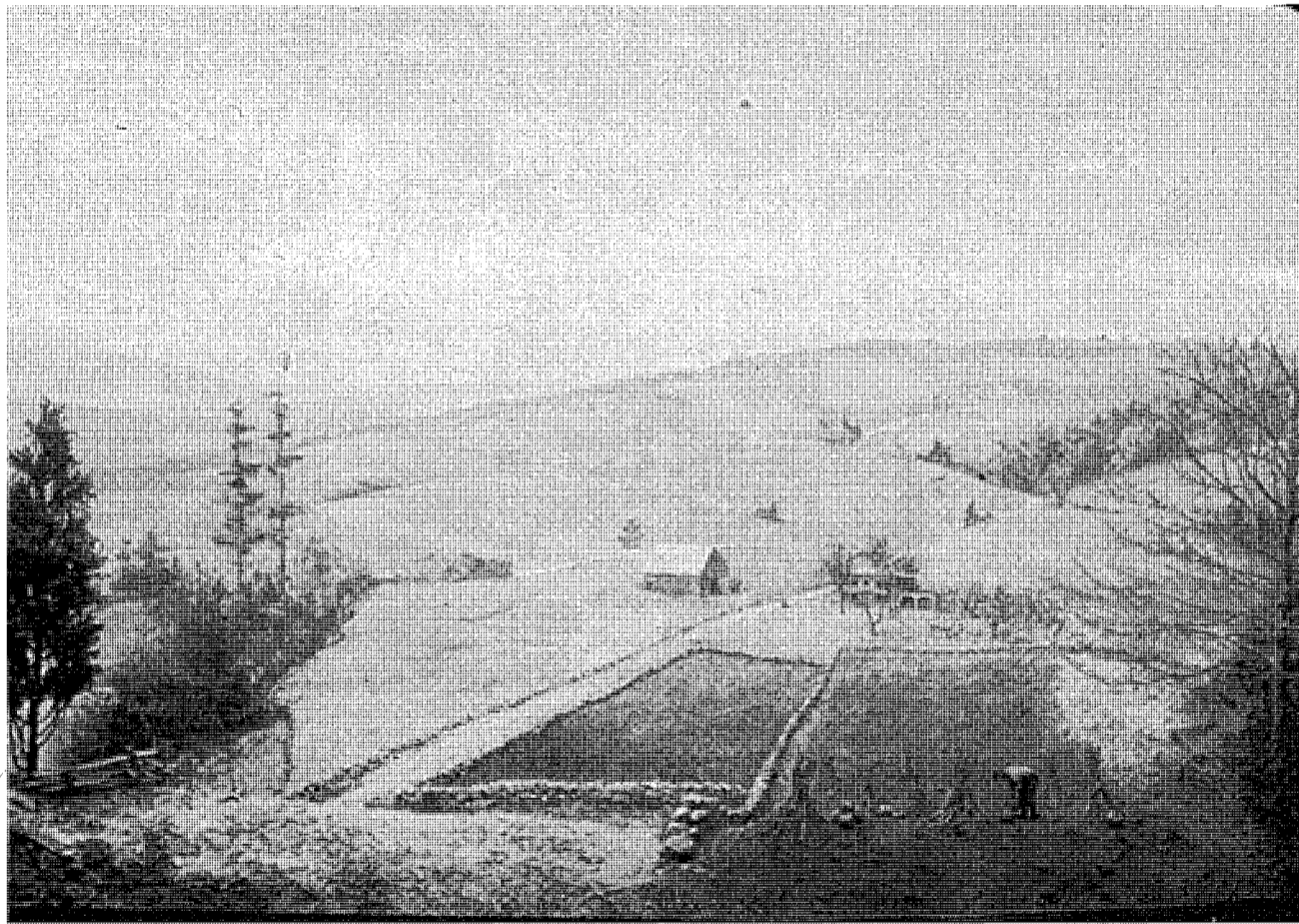
DF: I think oftentimes we're better off leaving it alone. There's a great tendency now in conservation to "manage." Now that we've protected a place we should manage it. I think oftentimes we do that before we think through the management very clearly, before we gather the background information that we need for that man-

agement. So, in many cases I think we're better off doing nothing than we are jumping quickly into management.

There are plenty of cases where you can show that restoration — that is, direct management activity — can achieve the conservation objectives more effectively and more rapidly than just leaving it alone. Maybe it sounds like I'm arguing both things, but basically we need to have a much greater understanding of the ecosystem and its history, and a much clearer definition of what we actually hope to achieve, with also much clearer assessment of whether we are moving towards that desired condition.

JS: Would restoration be more appropriate if you're dealing with a plantation rather than a forest that came back after agricultural clearing? Or would you still argue: let the plantation fall down of its own accord?

DF: No, no. I'm a great proponent of cutting down plantations to move them in the direction of more natural conditions. We do that here on the Harvard Forest. I've certainly recommended doing that on Martha's Vineyard, at the Manuel F. Correllus State Forest, where there's a perfectly intact native vegetation underneath the plantations. It is very difficult to generalize about management. It has to be put into the context of the particular situation, the particular system, and what we actually know about it. I just have this general sense that there's a great movement in many circles to manage, whether that management is with "natural process," like fire, or moving us in the direction of desired old growth conditions more rapidly through the cutting of trees, than letting the forest grow.



The height of agriculture and settlement, circa 1830.

I'm reacting to our general inclination to manage rapidly without fully understanding the system or articulating what we're managing for and without really assessing how well we're moving towards that vague goal.

JS: Isn't that the antithesis of thinking in forest time? In other words, that it's not going to have a major impact on the forest system if we speed things up a little. Whereas, it may, in fact, be that a critical component in the forest ecosystem recovery process is just that leisurely recovery process that managers are trying to speed up?

DF: Yes. Again it varies by the system. The argument of many silviculturists is you can generate bigger trees more rapidly by removing a few of the other trees around them. That's undoubtedly the case. And so if your benchmark is big trees and some of the structure that they provide, you can probably do that more rapidly through some judicious thinning. On the other hand, that forest will, in a pretty reasonable time, generate a mature forest condition if left by itself. And we can accomplish that over a

much larger area than we can effectively do management.

JS: With less risk of making mistakes?

DF: The biggest problem with our management is that it really doesn't have the three characteristics that I've described. And this is true of our economically-based management as well as our conservation-based management. It doesn't have a thorough understanding of the system and its history, a thorough articulation of what the objectives are and how those are going to be achieved through management, and then a thorough, scientifically-based system of assessment and reconfiguration of the management activities based on that assessment. A lot of the meaningful assessment should be done on the time scale of five to ten years, and yet, clearly at that scale, there oftentimes is not the institutional will, the political will, and the financial wherewithal to actually follow through with that.

Management is easy if you don't have to do those three things. If you don't have to do the research, if you don't have to really spend the time in articulating what you're proposing to do, and if you don't have to spend the time and money and human effort to come back and actually evaluate what it is that you have done. And yet, most of our important conservation areas are either held or managed without those three things.

JS: Do we lose something by not having unmanaged areas?

DF: If you could come up with a dependable, extractive criteria that would satisfy your ecological and conservation criteria, that you enhance biodiversity and meet all

your other objectives, you still would want to argue for major reserves in which you did nothing. You'd want to do that at the very least because you'd want to have a big control for actually testing this notion and its method. You'd also want to have it scientifically because any extraction is going to alter ecological processes. You can't mimic all ecological process by taking things out. So, I'd reject the notion that you would accomplish the same thing in this extractive area as a reserve to begin with. But, even if you thought you

were mimicking most of the important processes, you'd still want the

reserve as a major control. And as a major safety net in case you were wrong. You're not going to know you were wrong unless you've got the control. And you're not going to be able to go back unless you've got the safety net.

JS: You did a study on disturbance, contrasting a simulated major blowdown with plots that had been enhanced with nitrogen, and other plots whose soil had been warmed to simulate global climate change. I found the results surprising. Could you discuss that study? Also, I'd like you to contrast the ecological impacts of the famous 1938 hurricane with the intensive salvage logging that followed.

DF: These studies sought to mimic the effects of two major forms of human stress on forest ecosystems—the accelerated deposition of nitrogen from fossil fuel combustion and the warming of soil through global climate change. In both experiments the forests look intact and physically normal. However, in both, there are major, unseen changes in function — soil carbon storage and nitrogen cycling. So there are two lessons: you cannot

judge ecosystem health or function strictly by physical appearance, and secondly, forest species and ecosystems may be much more capable of dealing with natural, physical disturbance than with novel human-imposed stressors.

Then the other lesson dealt with the 1938 hurricane. We're saying, well why, if at the local scale this hurricane experiment didn't seem to have a big impact on soil moisture and leaf-area index and function of ecosystems, do we see so much apparent disruption after the 1938 storm? The simple conclusion is that the 1938 storm was followed by the single largest timber salvage operation in US history. And so it basically was a logging operation overlaid on top of a natural disturbance. It's probably true that the interruption of ecological process generated by that logging was much more severe than the natural disturbance process itself. So it's better to think of the 1938 hurricane as a big salvage operation than it is as a typical natural disturbance.

JS: What about the 1998 ice storm? Are there studies begun on that? Is there any data three years later on the consequences of salvage logging?

DF: I know there are people studying it. I know very little about what the results of that are. The guess would be that the ice damage itself is terribly disruptive and very dismaying to us from our perspective and may have long-lasting implications in terms of the structure and composition of forests. But the overlay of salvage logging on top of that will exacerbate the long term ecosystem impacts.

JS: In much of northern New England, logging a century ago converted forests that had had a substantial softwood component into essentially hardwood forests today because the softwood was so greatly prized. Do you see the 1998 ice storm, that primarily damaged hardwoods, beginning to break down some of the hardwood overstory so that the softwood in the understory can begin to recover?

DF: I'm not sure you can generalize across the entire area, but certainly in local stands it would have that effect. I think the basic lesson is that in most cases there isn't an ecological justification for putting salvage logging into our management activities. It usually is an economic — either current or future — rationale. We don't make things better by logging. We don't make things ecologically better. We may make them visually or economically better.

JS: You have stated [in Charles H. W. Foster & David Foster, *Thinking in Forest Time: A Strategy for the Massachusetts Forest*] that the lack of forest data was a scandal. What are the research priorities and data needed to make informed policy decisions in sustainable forest management and preservation?

DF: We don't have much biological information, certainly at a comprehensive regional scale for individual states, let alone for multiple state areas. So when we actually do try to draw together plans that seek to make broad-scale differentiation or broadscale activities feasible, we don't actually have the ecological and biological data that we need. We really don't put much value in our broad landscape and its interpretation, so we don't put much resources into assessing them.

JS: You've raised the issue of regional timber self-sufficiency versus a kind of attitude that says: Let's preserve as much as we can here, and since we can't be self-sufficient, we'll just unthinkingly plunder or raid some other place that doesn't have the ability to preserve its landscape. How do we achieve certain ecological goals in terms of preservation and still meet that ethical challenge that you've thrown out?

DF: We're pretty self-satisfied living in many parts of

New England because things are green and the forests don't seem to be logged all that actively. That's largely because our resource needs are met by other parts of the country and other parts of the world. It's important for us to actually connect our activities with our source of resources, and we really should have a concern for our impacts on other parts of the world. We do have a concern for other parts of the world, but what we don't understand is that we are the cause of a lot of their problems. In other words, the clear solution is not to rape and pillage our own forests, as opposed to some other forests. It's to bring back the connection between our daily lives and our activities and our resources, so that perhaps we can learn from that not only to do a better job in getting those resources, but most importantly we might benefit both areas by reducing our use.

JS: So this is not an argument for limiting the size of reserves in this area?

DF: No, absolutely not. I think that we actually should be able to do both, that is, reduce the impact on other parts of the world and have resource use and preserves here. One obvious way to do that is to reduce over-



Reversion: Harvested old field white pine are succeeded by hardwoods, circa 1915.

all the amount of resources, and that's the part of that argument that usually gets lost. You can't bring all of New England's wood use back to New England because there is not enough wood here right now for that. So the only way to have a real impact is to couple that with a reduction in use, such as house size.

JS: The Northern Forest Lands Council recommended in 1994 that states in northern New England (and New York) should establish a system of ecological reserves with the goal of maintaining current levels of biodiversity. What is your response to these approaches?

DF: I would question very much whether or not we actually do want to maintain current levels of biodiversity. Maybe we want to move to a very different level of biodiversity and a very different level of relative abundance and representations of different plants and animals. After all, we're working within a very arbitrary time period. We could just as easily have said biodiversity for the landscape of Henry Thoreau or biodiversity for the landscape of John Smith or almost any time. I'm not sure that I would necessarily pick the modern landscape as the measure of where I want future landscapes to be.

JS: Have you tried to speculate what the forest will look like in another 500 or 1000 years?

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DF: The details of that obviously vary with the area. By and large, if left alone, in a much shorter period of time than 500 years you'd end up with very natural-appearing forest vegetation. And I say that because we now have many perfectly naturally appearing forests. They may not be functioning like mature old growth forests in a real scientific sense, but they have many of the appearances of the natural condition and very few of the apparent legacies of human activity in forests.

I study in the Yucatan Peninsula where it's been 500 to 1000 years in some places since the real heavy hand of agriculturally-based people shaped that landscape. The landscape has now been functioning as a forested landscape for many hundreds of years. So there is, I think, a real critical question about such places, which is: to what extent can a knowledgeable ecologist walk in that forest and identify those factors that make it a secondary forest as opposed to a primary forest? There's lots of artifacts of human activity scattered through the landscape — old terraces, house mounds, temples, and stone walls — so we're quite aware of the fact that it has that history. The archeologists can document it. But what is it about the structure and function and characteristics of that forest that scream out at us that it is secondary. My guess is that there isn't much.

JS: Species associations have been changing through time so that species that are associated today probably were not in association with each other a couple of millennia ago, and may not be associated a few hundred or a few thousand years in the future. If that's the case, what does that say about preservation and conservation strategies that are based on preserving representative examples of natural communities?

DF: We base our management, whether it is conservation or otherwise, and our understanding on our description of communities or assemblages or forest types as a matter of convenience. But there isn't any inherent

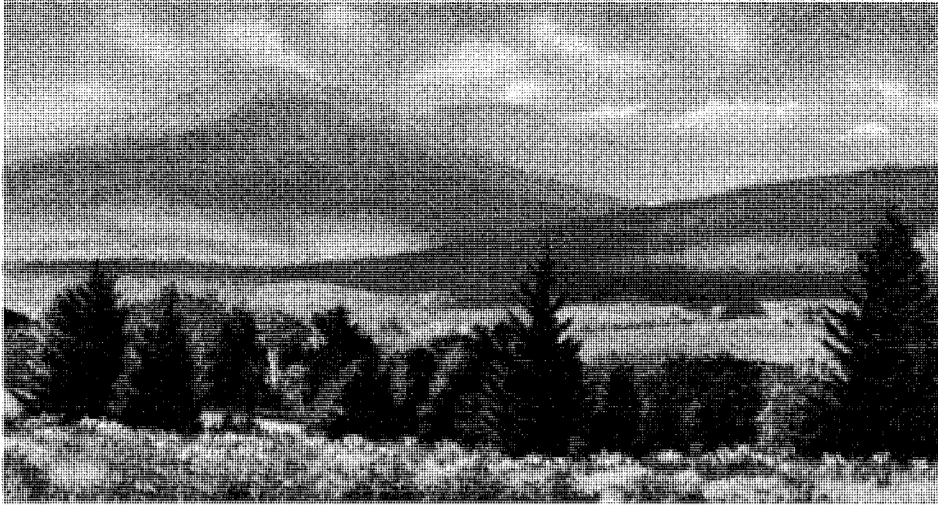
biological rationale for doing that. Those communities are very much transient. They're not tied together by tight evolutionary coupling of species. They've resulted from the suite of physical and biological, and increasingly human, kinds of drivers in the landscape. But in and of themselves, the assemblages are quite arbitrary and actually quite varying over space, and certainly over time.

JS: If you're going to preserve something, duration does matter, doesn't it?

DF: If you said that I'm protecting Cathedral Pines for its tall, majestic white pines, clearly you're going to be frustrated because at some point those tall majestic white pines are going to fall down or be blown down. At that point what do you do? Do you do what the National Park Service did which is to come back and take off the sign which says It's a national natural landmark because they're no longer there? Or do you say, no, this site itself is inherently interesting?

JS: I guess to conclude this: size does matter. In other words, there are going to be long-term ecological implications on a three-acre or a 300-acre site that are quite different from, say, a 300,000-acre parcel.

DF: You're then trying to put values on different scales and different motivations for conservation. And



that's actually tricky to do. It depends very much on what the ultimate motivator is.

I just came from a meeting where Bruce Babbitt got up and said the real driver is the moral imperative. We have, in his words, a rainbow covenant to undertake conservation activity, and that covenant is to protect species. We do that not because those species are biologically important. In fact, he said, you scientists have to move away from arguing that there's a cancer cure in every species. You basically have to say that we have a moral imperative to conserve nature and its diversity.

There are a lot of people who are focused purely on species. I would argue, and I think what Babbitt was suggesting, is that I don't believe that there always is a scientific justification for doing that. I don't think we can support every conservation activity by arguing for the value of every species on a scientific or ecological basis. But we certainly can from a moral basis.

Yellowstone is perhaps a moral imperative or a conservation activity that's playing out at a very very different scale. I guess I'm not all that comfortable arguing for particular scales of activity, although I certainly have the same sense that you do, which is the broader, larger landscape to regional scale activities have much more guarantee of success in terms of achieving the continuity of those kinds of entities that does the single species or single structure. Or small area.

JS: We convinced the public, the government agencies, and the politicians (at least some of them) of the fact that we need to save endangered species. I don't think we've done as good a job explaining to them the workings of the landscape, the integrity of systems, and the need to devise conservation strategies that preserve the integrity of these systems.

DF: I think that's true. I also think that some of the complexities of those systems and those species and those assemblages are not known to us. And some of the embedded history in all those is not known. So a lot of incredibly special assemblages, as well as some incredible landscapes, are very strongly tied to human activity. To my mind that doesn't lessen their value or lessen my interest in them. But I think to many people it would.

There's one thing which I think we strongly agree on, which is that we have not paid anywhere near enough attention to the really common, really general, really broad things that are out there. I'm speaking about landscape where there's nothing particularly special from a species-based conservation perspective...

JS: ... a big swath of northern hardwoods

that doesn't have any endangered species?

DF: Yes. I'm sitting in the middle of a big region which has low biodiversity, and that has not been intensively threatened, so it's been a really low priority for major conservation. The same thing can be said of many areas of northern New England. Oh, sure, there are the little gems and the jewels that people want to protect, but it's the broad, functioning landscape with processes and species that need big areas of pretty plain stuff that are really under appreciated and have not been the adequate focus of our conservation activity.

We're hearing new discussion of matrix-this and matrix-that. My fear about that is that one of the major ways that people are proposing to protect those areas is by harvesting them. So, in other words, we convince people that those areas are now important, and we'll protect them by managing them with our natural approaches to silviculture and other kinds of more ecologically-informed perspectives. But I think that there's actually a big need to take a big chunk of our common New England landscape and just hang on to it.

JS: Gosh, up in Maine they're telling me that we can have these little, representative reserves in a matrix of industrial forests and achieve our goals. You don't sound as if you agree with that?

DF: Do you really have to say, here's a set-aside, and here's a lightly managed area, and here's suburbs? Probably not in theory, but given our political and economic and cultural reality, it may well be. Because if we try to have this nice interfingering of suburb and extractive area and little reserves, there's probably too great a chance that those little reserves will get overwhelmed by all the neighboring activities.

JS: I like to fantasize that over time — maybe geologic rather than human time — that we can start erasing those boundaries, and that the culture can begin to reintegrate with wildlands without adverse ecological consequences. But I don't see that happening overnight, so I would defend those boundaries and buffers as a transition strategy.

DF: I think that may be a superly optimistic view. I think that is where we want to head, and ultimately I think that's where we have to head because you can't keep a civilization which is totally disconnected from nature. That's where we're moving into a condition where we have our reserves, and we have our industrial lands, our extractive lands, and we have our living lands. The people on our living lands don't know anything about extraction. They probably know less about extraction than they do about pure nature,

An Ecological Reserve System for Maine: Are we really making progress?

By Mitch Lansky

Maine has only around 2% of its land in protected forest reserves. Most of this reserved forest is in Baxter State Park, though other, smaller, reserves have been established on some state forests and on lands owned by The Nature Conservancy. Forested ecological reserves are important not only for protecting biodiversity, but also for improving forest practices on non-reserved forest land. The current system of reserved forests is inadequate for either purpose.

Reserves and Biodiversity

The importance of reserves for protecting biodiversity is well established. After all, native species evolved in forests shaped by natural processes. Forest management, in contrast, is creating novel habitats that some native species may not be well adapted to over the long run.

Although habitats created by management have some resemblance to those created through natural disturbances, there are many profound differences. For one, natural disturbances, such as wind, fire, insects, or disease normally do not remove part or all the above ground biomass. When trees die, they stay on site, even as they rot, creating important habitat for birds, mammals, insects, amphibians, and fungi.

Natural disturbances usually do not fill the landscape with roads, trails, or yards. They also do not usually compact or rut the soil on a large scale. Natural disturbance, such as windthrow, in contrast, can churn the soil and create pit and mound structures that offer important microhabitats. Such habitats are not found in forests that have been clearcut with heavy site preparation.

Also natural disturbances differ in intensity and frequency from human management. Management can simplify, fragment, and convert the natural landscape into patterns very different from ones to which some creatures are best adapted. One of the biggest changes to the landscape has been the reduction of large areas of interior forest habitat dominated by trees over 150 years old. In the pre-settlement forest, where stand-replacing disturbances were hundreds of years apart in a given location, such stands made up nearly 60% of the landscape (Lorimer, 1977). Now old growth forests are an insignificant part of the landscape.

To protect all native species over the long run requires that all the habitats for these species, including old growth, be represented somewhere on the landscape at all times. This representation is best achieved with some proportion of the landscape being in ecological reserves—few foresters are managing stands for old growth, and even if they did, they might not be fully successful. We don't fully understand all aspects of forest ecosystems. Indeed, when it comes to fungi, insects, or microlife in the soil, our ignorance is profound.

Forest stands change over time—trees grow, trees die, stands blow down or burn. The landscape is gradually changing as well. Ten thousand years ago, Maine was covered by glaciers. There has been a succession of forest types as the soil has changed and there also has been a change in the abundance of various species as the climate has changed. The strategy for maintaining biodiversity must account for change. There must be replacement stands for current, older forests, and these stands must be located so that recolonization of the full range of species is assured. For species movement, it is better if forest habitats are connected or adjacent, rather than separated or isolated.

If biodiversity is to be protected over time, reserves must be large enough so that the largest expected catastrophic (stand replacing) disturbances still leave enough older forests and replacement stands to ensure that these habitats, and the species that prefer them, can persist.

The reserves must also be large enough to support viable populations of all native species—including those that range through various vegetation types over their life cycles. It is not adequate to protect small plant groups if these will not support viable populations of associated animals. To some extent, wider-ranging species can use managed forests. But some of these species, including large predators such as lynx, wolves, or cougar, are rather shy of too much human activity and thrive better in areas with less roads and mechanized activities.

Reserves and forest management

Is forest management improving growth, yield, or value over what forests would do with no timber management? There is only one way to know—we need forests that are reserved from cutting. If forest management is to be "scientific," there must be controls to the current experiments of forest manipulation. Since there are many different kinds of forests with different disturbance regimes, we need multiple examples of all these forest types if the "experiment"

but they don't know much about pure nature. So we do want to have that interfingering. I think you're right. That's where we should be moving, and optimistically, that's where we are moving. I just want to make sure that we have some of that left to interfinger with.

JS: Hedge our bets and hope we can clean up our act?

DF: That's right.

End of Interview

is to be valid.

Reserved forests are not just valuable for such comparisons, they are also important to learn about how natural forests maintain stability (resistance to catastrophic disturbances and, if disturbed, resilience from them). The fact that some old-growth stands can persist for centuries is testimony to their stability. Could it have something to do with their stand structures or the range of species that occupy these structures? Is it possible there is a broader array of predators and parasites for potential pests? If this is so, reserved forests might actually yield benefits to adjacent managed forests that may not have the full array of beneficial species.

There is evidence (cited in Gawler et al, 1996, pg. 53) that old-growth red spruce stands have greater genetic variability than managed stands. This increased diversity offers a better chance that some individuals will survive a given stress—from climate change to insect infestations.

The Precautionary Principle suggests the wisdom of emulating the natural processes and structures of unmanaged forests to ensure that species (which are adapted to these processes and structures) are not lost. To the extent that managers intensify management in a way that simplifies, fragments, or converts the forest, the need for ecological reserves increases—if protecting biodiversity is a priority. To the extent that management incorporates more naturalistic structures, the managed stands can enhance ecological reserves, rather than isolate them. Reserves, in such instances, could be smaller. In the long run, therefore, there are important advantages to managing based on ecological principles, as well as managing for improved yield, quality, and value.

The Maine Forest Biodiversity Project

For five years, the Maine Forest Biodiversity Project (MFBP)—a group of around a hundred individuals representing industry, government, academia, and environmentalists, struggled over the issues discussed above. Members of the MFBP recognized that biodiversity could best be maintained by a combination of a reserve system and improved management. The final products of this group included an assessment of biodiversity in Maine, a study of potential ecological reserves on existing conservation lands in Maine, and a book on managing forests in ways that maintain and enhance biodiversity.

The Biodiversity Project established a Scientific Advisory Panel to get guidance on how large reserves should be to withstand disturbances and still support viable populations of species. The panel came up with a minimum recommendation of a system averaging from 5-12 thousand acres per unit. This was significantly less than recommendations from similar panels looking to establish ecological reserves in New Brunswick and Nova Scotia. New Brunswick scientists, for example, came up with a minimum average recommendation of 60,000 acres. The difference, I was told, was due to a focus in Maine on vegetation groups, rather than animal populations. Also, Canadian provinces have a lot more public land to work with. The second explanation sounds suspiciously political, rather than scientific.

The goal of the reserve system contemplated by the MFBP is to set up representative "benchmark" reserves, rather

than a reserve system large enough to maintain or restore biodiversity on its own. There was an underlying assumption, which we in the project were never given an opportunity to discuss, that the managed landscape "matrix" was sufficient to protect biodiversity when combined with these representative reserves. The project's own research into the status of biodiversity, however, showed that this "matrix" has a lot of problems.

Government policy

One might assume the Project would educate the public on the need for a reserve system, and lobby to purchase more land so that a more complete system could be created. This is not exactly what happened. The Project disbanded before such actions could be taken as a group. Some former members, however, worked out a compromise bill to create an ecological reserve system on existing public lands.

Some groups have heralded this bill, LD 477, as a propitious beginning. But the bill has some odd features that might indicate a set back rather than a leap forward. The bill, for example, limits the Maine Bureau of Parks and Lands to use no more than 15% of its lands in an ecological reserve system over the next 15 years. Hunting, fishing, trapping, or snowmobiling would not be restricted, unless there were compelling evidence for a need for restrictions. The bill declares that the Bureau cannot reduce its level of timber harvest as a result of taking land out for a reserve system. The bill further specifies that the Bureau cannot cut less each year than the average cut from the preceding last ten years. This, in effect, forces the Bureau to cut more.

In response to this legislation, the Bureau of Lands and Parks announced, this year, the creation of thirteen new ecological reserves on its land. These reserves add up to nearly 70,000 acres (around 5,300 acres average per unit). This new reserve system will have little impact on the Bureau's annual allowable cut. Most of the reserved area was not intended to be used as commercial forest land and would not have been cut whether it was called reserved or not. There was thus little change in the status quo.

The Bureau can exceed the 15% figure if new lands are purchased for a reserve system. But buying timberlands (rather than bogs, beauty strips, or mountains) for a reserve system may not be that easy. The Land for Maine's Future (LMF) Board has the following provision written in to its mandate: "LMF is prohibited by statute to acquire land for which the primary use value has been or will be commercially harvested or harvestable forest land. This does not prohibit the acquisition of conservation easements on working forest lands which allow for timber production while securing public access and the conservation of other natural resource values." This, perhaps, explains the trend towards mega-easements, rather than full-fee purchase of timberlands. The federal Forest Legacy program has a similar bias towards easements.

This stated policy is rather troubling. How can one set up an ecological reserve system on forest land without purchasing what is now "working forests" or forests that can be cut in the future? Ironically, most of the acreage of reserved forest land in the state was not purchased by the public—it was owned by wealthy individuals

The Biological Diversity In Maine report (Gawler, et al., 1996, pgs 71-72), has the following conclusions:

"From the limited extent of the undisturbed forest statewide we can infer that species requiring undisturbed (or less disturbed) forest habitats have become less abundant."

"In any group of organisms, some will be habitat specialists and others habitat generalists. The habitat specialists will be the most sensitive to land-use changes and should therefore be the most informative in assessing biodiversity."

"Eight of the 25 forest community types in Maine are rare; of the types that are not rare, good natural examples are rare. Natural forest diversity, in common as well as rare types, is not adequately represented or protected within the lands that are currently in public ownership or private conservation ownership."

"Older forests of all types are becoming uncommon in Maine. Older forests support some plant and animal habitat specialists, and presumably support other undocumented specialists. The ecosystem dynamics of old forests differ from those of young forests. Structural complexity, which typically increases as a forest ages, appears to be key for some mammal, invertebrate, and lichen species." (In another section (pg. 20), for example, BDIM states that, "Old-growth forests have at least twice as many lichen species in them per unit area as mature forests of more recent origin, and have a disproportionate number of rare species.")

"Is there a problem with biological diversity in Maine. YES, THERE IS A PROBLEM.' Even the incomplete data show loss or reduction of certain plants and animals, and an apparent lack of unmanaged, representative ecosystems expressing Maine's natural biological diversity. However, the problem in Maine is not as drastic a problem as some other parts of North America are facing." (My note: given the ecological disasters occurring in places like Hawaii or Florida, that statement should not lead to complacency).

The Project's Ecological Reserve Study Inventory, which looked primarily at the potential for reserves on existing public lands, came up with a median size of only 1,893 acres for lands that met their criteria. Only 25% of potential reserves had the scientific advisory committee's minimum acreage. Only 23% (16 of the 69 potential reserves) would be "self contained" (have the ecosystem all in reserve boundaries). Only 46% of ecosystem types are represented at least once by geographical area in the potential reserves. (Mc Mahon, 1998) In other words, we could stand to have a lot more land in reserves to even meet the minimum standards of protecting representative ecosystem types (rather than protecting connected ecosystems on a large scale).

who donated the land to the state. Baxter State Park, most of which is managed as an ecological reserve now, had been cut over (and to a large degree, subject to forest fires that followed the cutting) before it was established as a "forever wild reserve by Percival Baxter. Although the quality of much of this land is not that high, even now, few people would argue that use of this land as a reserve is a bad thing. There is potential, over time, for recovery.

While old growth forests would obviously be preferable for a reserve system, such stands in Maine are currently rare. If we are to have a forest reserve system of any reasonable size, there is little option but to buy commercial timberlands. The Land for Maine's Future Board has ignored state law and its own policy about not purchasing commercial forest land at times. For example, it purchased lands in the Nahmakanta area that have been used for ecological reserves. But the policy is there, in writing, nonetheless, and this has created a bias against larger full-fee purchases and in favor of easements. Often these easements are in areas where there is currently little development pressure. Given that there is not unlimited conservation money available, the easement policy has a considerable effect on competing policies for public land purchases.

This problem is compounded by members representing the state and LMF who have an interest to set precedents for good (for the landowners) deals on easements. Ralph Knoll, a negotiator for the Department of Conservation on the 650,000 acre West Branch Project (mostly to be put in easements), was, until recently, on the board of directors of the Forest Society of Maine, the organization writing and promoting the West Branch Project easements. The Land for Maine's Future

board has several members who represent large landowners. Marcia McKeague, represents Great Northern, for example. Her colleague, Dan Corcoran, is on the board of Forest Society of Maine. Roger Milliken (who, ironically, has been one of the few LMF board members to ask probing questions) won an easement for his company, Baskahegan Lands, on Spednik Lake last decade. This easement was worth over \$1,300 per acre. Baskahegan Lands used some of this money to buy, full-fee, some cutover lands for less than \$100 an acre.

Needed steps

Environmental groups have done a poor job of educating the public on the need for an ecological reserve system. Indeed, many of the major environmental groups in the region have been big supporters of large easements, such as the West Branch Project rather than proposals for large ecological reserves. In promoting the easements that "permanently protect" the ("working") forest, these groups are implying that seasonal cottages near rivers or lakes are the biggest threat to the entire woods. This may be due to a recreational, rather than a biodiversity perspective. Seasonal camps destroy the illusion that canoeists are on a wilderness river or lake, rather than in the midst of a commercial forest.

Large landowners are agreeable to the more limited vision—canoeists get their illusion of wilderness, while landowners have few management restrictions beyond the riparian beauty strip. And they can get paid substantial sums for doing little different from what they are already doing

The reality is that forest management

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has far more impact on the biological integrity of the whole forest than seasonal camps near rivers and lakes. Just the rights-of-way from the tens of thousands of miles of new logging roads (ignoring yards and trails) in the unorganized territories converted more than nine times as much forest land as all the houselots in that region between 1972 and 1993 and created far more fragmentation. (Land and Water Associates et al, 1994). Just between 1982 and 1994, landowners in the state "clearcut" (removed more than 80% of the volume of trees) more than 2.2 million acres of forest (Griffith and Alerich, 1996). In some townships, the majority of the land has been clearcut over the last few decades. While development is definitely the prime cause of fragmentation in the southern part of the state, forest management is the prime cause in the northern part (Gawler et al, 1996 p. 72).

One group, RESTORE: The North Woods, does have a proposal on the table for a 3.2 million acre Park in northern Maine. Much of this park would function as an ecological reserve far bigger than anything proposed by the Maine Forest Biodiversity Project. Even if such a park were established, however, it would still not meet the needs of having ecological reserves for all forest types and bioregions of the state. Unfortunately, little of the debate around this proposal has turned around issues of biodiversity. Instead, most of the discussion has been about timber revenues, jobs, recreation, and taxes. Those environmental groups that have dismissed the park idea have not come up with a clear alternative that would be as effective, or better, at addressing long-term biodiversity needs for the state.

Environmental groups in the state have made too many compromises before enunciating a forest policy that would actually succeed to protect biodiversity over the long run. We need constituency building based around a vision that would actually work. The current policies for ecological reserves and for purchasing public lands, even at their best, could not, over the long run protect biodiversity—unless landowners spontaneously decided to act like Percival Baxter and set up their own large reserves and model forests. Given the current mix of landowners, this seems unlikely in the short run.

Setting up a reserve system should not be seen as an either/or issue of lichens against loggers. We need a forest policy that sets up ecological reserves and improves forest practices and improves the viability of industry and strengthens local communities. It is entirely possible to cut less wood, but generate more value and create more jobs if we have a sensible forest policy. A policy based on ever increasing growth of cutting and consumption can only work for the short term. Forests have limits. If we wait until intensification of forest practices fails to meet ever increasing demands, we will have far fewer options for biodiversity, recreation, and spiritual connection to wild nature than if we confront those limits now, when we still have options.

As BDIM concluded, "The opportunity to avoid an acute biodiversity crisis in Maine is before us. If we do not initiate biodiversity-maintenance strategies now, we will be faced with a loss in biological diversity that will be more difficult to address in the future." (Gawler et al, 1996, p. ix).

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IP Sells NH's Pittsburg Lands

Continued from page 4

find these figures well nigh unfathomable. Old growth stands in the region sustain something on the order of 50-80 cords per acre. I asked another forester who is intimately familiar with the condition of the Connecticut Lakes lands if it was fair to assume that the IP lands for sale have a similar level of non-stocking. He allowed as how it was.

Median income in Pittsburg (\$11,212), Clarksville (\$12,040), and Stewartstown (\$9,745) is about 40 percent the national average of \$28,542. The lowest 20 percent of Americans earn \$13,000 or less. Eighty percent of Pittsburg is part of this sale, but these lands have only generated eight percent of the town's tax base (property tax and timber tax). The remaining 92 percent of the town's tax revenue comes from the other twenty percent of the town's land.

An economic study conducted in Pittsburg in 1993, at the absolute height of Champion's liquidation cutting, found that these lands supported an estimated 145 logging and trucking jobs. The cutting level has been reduced to one-quarter of 1993 levels, so it is reasonable to assume that currently these lands are supporting about 35 logging and trucking jobs. Since today's level of cut is close to annual growth levels, we can assume that about 5000 acres support one logging/trucking job. A recent study has estimated that approximately 550 acres of eastern wilderness support one job. If these numbers are reliable, it appears that wilderness may support significantly more jobs than intensive, industrial logging—while fostering the restoration of ecological health. At the very least, we need some solid studies that address this issue.

AUGUST 29 TASK FORCE

At the August 29 meeting of the Task Force, there was some evidence that some Task Force members are beginning to realize that the status quo isn't an option. Peter Burling, Minority Leader in the Legislature, asked: "What is the predictable sustainable forest harvest from this harvest?" Speaker Chandler, on the other hand, stated he already knew the importance of the land: "I don't need any more information."

The Task Force discussed easements at length. Bing Judd objected to permanent easements because "you can't do anything 10-20 years down the road." Others wanted to know if covenants could be included in the easement contract that require forever logging, that preclude future "forever wild" protections, or that preclude ever selling these lands to the Federal government. Jasen Stock, new Executive Director of the NH Timberland Owners Association, especially pushed "forever logging" strategies. Otherwise, he warned, 50-100 years from now, "there may be a different mindset on timber harvesting," and he urged the Task Force to require "productive management." A couple of weeks later he elaborated: fifty years from now the public may not support timber harvesting, and he doesn't want future harvesting to be "at the whim" of changing public values.

A week later, the Technical Committee debated forever logging for over an hour. Timber industry hardliners

Suppose Vermont had mandated forever sheep farming 150 years ago, one person asked.

supported the requirement, but others raised a variety of concerns. Annual harvest requirements interfere with long-term forest management plans. Usually easements retire rights, this would impose new obligations on the owner and additional expenses on the holder who must monitor compliance. It is harder to get someone to do something than to make sure they don't do something. An owner may not wish to cut when markets are unfavorable; requiring cutting undercuts market economics. There is no way of predicting what markets will be like 50 or 100 years from now. Suppose Vermont had mandated forever sheep farming 150 years ago, one person asked.

At the August 29 meeting of the Task Force Jasen Stock stated he didn't object to ecological set-asides "if there's a scientific basis" for it. But he would require scientific "proof" before he'd support protecting particular species. Mr. Stock hasn't yet come to grips with the need to protect natural communities and ecosystem integrity. Although scientists may be unable to persuade him of the urgency of the scientific evidence, others, perhaps more independently minded, will find the evidence persuasive. If Mr. Stock wants to require scientific rigor for strategies to protect our life support systems, does he also support the same degree of rigor before permitting any further logging?

Following the August 29 Task Force meeting, the public (which isn't allowed to ask questions during TF meetings) was allowed to speak. Only nine of 22 TF members bothered to stick around for the testimony, which, not surprisingly, focused on the economic collapse in Coös County in the previous week. The loan officer of the First Colebrook Bank testified that markets for low-grade wood were disappearing. In the past the Connecticut Lakes lands could sell pulp and wood chips to Champion's mill in Deferiet, NY, the pulp mill in Berlin, NH, and biomass plants in northern NH. The pulp mills have closed and the biomass plants are likely to cease operations soon. He also stated that the price of a cord of wood had declined from \$10 to \$2. He concluded that it would be difficult to find a timber investor, and that the value of the lands had declined by about 20 percent since the announcement of the closing of the Berlin and Gorham mills.

At the conclusion of my allotted three minutes of testimony, I made a plea for including a large chunk of this land in the NH Ecological Reserve System (ERS). What was significant about this is that this was the first time in the six-week process that anyone had even mentioned the Ecoreserves System. Considering that the two state agencies that sponsor the ERS, Fish & Game and the Division of Forest & Lands in the Department of Resources and Economic Development, are represented on both the Task Force and the Technical Committee, this is rather disheartening.

SEPTEMBER 4 TECHNICAL
COMMITTEE



Clearcuts in Connecticut Lakes. Photo © Alex MacClean, Landslides.

Finally the Technical Committee addressed the issues of ecological reserves and the protection and restoration of biological diversity at its September 4 meeting. Mark Zankiel, ecologist with the NH chapter of The Nature Conservancy, stated that despite incomplete inventories, there are at least 20 rare species and exemplary natural communities on the lands for sale. However he warned against an over-reliance on endangered species in designing ecological reserves, both because of the limited time to conduct adequate inventories of rare species, and because focus on species protection fails to consider other critical issues.

The more important issue is how large should reserves be to protect species, communities, ecosystems and natural processes, including large natural disturbance events. Small reserves, he emphasized, do not do very well over time. Scientists ask what is the scale of natural processes under consideration—wind and ice storms, for example. Reserves must be large enough to be resilient and variable over time. Ideally, reserves must be at least four times the largest natural disturbance regime. One horrified timber industry hardliner asked how much of the land for sale had been affected by the January 1998 ice storm. When told that roughly half had suffered some damage, he threw up his hands in despair and replied that this shows how absurd this conservation biology is. "Everything will be in reserves!" he moaned. Zankiel and others have indicated that a reserve of 20,000 to 25,000 acres would be desirable and, they believe, effective in protecting biological integrity.

SEPTEMBER 11 TASK FORCE

The September 11 meeting of the Task Force was overshadowed by the tragedies in New York and Washington. Only about half of the TF members attended. The Task Force finally held a discussion about ecological reserves, or "set asides" as most members referred to them. The technical committee had prepared a short paper outlining the "types of ecologically sensitive resources" (ponds & streams; riparian areas; wetlands; high elevation areas; low elevation spruce-fir forests; beech stands; enriched hardwood sites; steep slopes; rare, threatened, & endangered wildlife; and rare plants & exemplary natural communities).

A second section ("Tools for protecting ecologically sensitive resources & places") emphasized that the major tool is "sustainable forestry" supplemented by "limited set asides." The sustainable

forestry section took a rather optimistic view of this tool, citing current policies protecting some deer wintering areas, voluntary best management practices for erosion control (developed after Champion's 70-mile plume of silt in 1993). It touted Champion's participation, indeed, its "leadership" in the NH Sustainable Forestry Initiative. The most useful point made by this section was reference to the recommended voluntary management practices book, known as "Good Forestry in the Granite State" published in 1997. Although not perfect, these voluntary practices should be made obligatory as minimum standards for any future land owner, public or private.

Set asides are needed, the Technical Committee report stated, to:

- provide habitat for species that are unable to survive or thrive on managed lands;

- prevent currently common plant and animal species from becoming endangered;

- provide insurance against known and unknown impacts of intensive management;

- provide a unique set of tourism and recreational opportunities."

Jane Difley of the Forest Society offered an additional rationale: to provide scientific controls against which we can measure the impacts of human activities. When someone suggested that this was covered under the third item, she responded that, as written, that item implied that there could be future cutting if things didn't work out on managed lands, and she felt it important to explicitly state that one purpose is scientific control, not an insurance policy.

Peter Burling, House Minority leader, who seems to understand better than most of his fellow Task Force members that options for timber management are indeed slim for decades to come, suggested that the set asides and recreation and tourism "may be the future of this land." "How do set asides impact recreation and tourism?" he asked.

Next, the Task Force turned to possible options for land protection. Should the owner be private, the state, or a mix of the two? About half supported private ownership, while the other half supported state ownership or a mix of state ownership of set asides and other critical areas and private ownership of the areas managed for timber. We were further informed that the leaders of the Senate and NH House, who were absent, were developing a proposal that should be ready soon. Given House

Speaker Chandler's open hostility to set asides and his belief that wolves will devour NH schoolgirls, some of us await the proposal with dread.

During the discussion on possible options, David Houghton of Trust for Public Land offered his preference. He strongly supports leaving most of the land in private ownership with a conservation ease-

ment. Forest management should be based on Good Forestry in the Granite State. The state should retain the right of first refusal if the landowner decides to sell. He also supports a portion of these lands becoming town forests; he wants to see the local economy develop genuine value-added manufacturing, and he wants to maintain the local tax base. Some areas are suitable to additions to existing public lands and "a natural area that science dictates." His second choice is state ownership.

Originally a public hearing had been scheduled for that evening. In view of the events of the day, the Task Force decided to reschedule it, but, it invited residents of northern New Hampshire who had traveled to Concord to testify. Most who spoke would like to perpetuate the status quo, but there is a growing sense that this is an unrealistic dream. Roy Amey, a logging contractor from Pittsburg who has been cutting since 1970, strongly prefers continued private ownership, but given the collapse of the area's pulp and paper economy, he doubts an industrial buyer can be found. The preceding day he called six people in Maine who have the means to acquire these lands, and they replied they had no interest because "the economy is in the trash." Reluctantly, he concluded, state ownership is probably the best option.

AN INADEQUATE RESPONSE

Although there is movement toward state ownership of at least some eco-reserves, the overall strategy of the Task Force fails to address current threats and problems, and potentially exacerbates these problems. The emerging deal ignores the closing of regional paper mills and biomass plants, the most likely markets for wood, assuming any wood can be cut responsibly. The Task Force refuses to state the obvious: there will be few if any logging jobs on these lands for a generation or more to come. In fact, they are sending the opposite message: we'll save logging jobs by keeping the Connecticut Lakes lands under timber management. They are not saying how they plan to reconcile this claim with their pledge to ensure that only sustainable forestry will be practiced. For decades the region has gotten the least number of jobs for the most amount of wood cut; this deal seeks, unwittingly to continue this sorry situation. The Task Force is not coming to grips with the poverty of the region; instead, it talks of maintaining traditional uses of the land, which has contributed to the local poverty, despite platitudinous claims that logging jobs are "high paying." And of course, the Task Force continues to foster the fiction



What exactly are tourists being welcomed to as they enter les grands bois du nord?

that development is the biggest, indeed, the only threat, to these lands and our North Country way of life.

A BETTER STRATEGY

The traditional paper industry-dominated economy of Coös County is dead. The land for sale cannot responsibly be managed for commercial timber harvests for many decades. The County lacks meaningful economic diversity within the timber industry or away from over reliance on timbering. These lands have for many decades yielded up the least economic benefit, the lowest tax yield, and the least ecological protection imaginable. The communities are impoverished. Most of the wealth that has been extracted from these lands by absentee corporate owners has left the communities. Our politicians continue to rail against tree-huggers and public lands and nasty regulations while the economy and ecology collapse. We don't need an irrelevant response to a genuine crisis.

Since these lands are only supporting about 35 logging and trucking jobs, we could quite easily maintain—indeed, enhance, current levels of woods employment by replacing the failed paper industry economy with real value-added locally owned manufacturing.

If we establish a truly large ecological reserve on about three-quarters of the land for sale — preferably managed by the Silvio Conte National Wildlife Refuge — we could foster a variety of new jobs for the area by developing hitherto undeveloped recreational opportunities that generally exert a lower impact on ecosystem health: cross-country skiing and hiking and backpacking and low impact back country camping. There will be opportunities for ecological restoration, for guiding, for nature study. Historical and cultural preservation opportunities afford both economic options and a hope for a more rich culture.

A portion of the remaining land (perhaps ten percent) could become town forest, encumbered by an easement and meaningful sustainable forestry requirements. The remaining 15 percent or so could be state forest. Private ownership by small landowners who live on the land makes sense; ownership by absentee speculators must be ended.

Designation of reserve boundaries should be determined after an extensive ecological inventory of the entire tract. Since the options for logging are extremely limited, there is no necessity to rush this work. Existing snowmobile trails can be

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SUSTAINING MAINE'S WOODS:

Changes in forest practices and forest policy are needed;

Challenging, not defending, the status quo, is required;

Critical questions, not flawed assumptions, should guide policy

The Maine Forest Service is taking a constructive step in establishing criteria, indicators, and benchmarks to determine what progress, if any, landowners are making towards improving forest practices. The following are comments on the Draft of the State of the Forest Progress Report on Sustainability Standards. These comments are not meant to be complete (one could write a book dealing with the complexities of some of these issues), but they do address some major points that the Maine Forest Service should consider changing to produce a more forthright document.

By Mitch Lansky

Informing the debate?

The Executive Summary advertises the report as something which "provides information and analysis to inform the ongoing debate." It is unlikely, however, that the draft as written will do an adequate job of informing the public so that forestry debates will be quelled.

The summary starts off with the news that the forests are relatively healthy and younger and more vigorous than those of neighboring states. This puts a happy spin on the fact that Maine forests average a little over 16 cords to the acre, with millions of acres in the sapling/seedling stage. New Hampshire forests average 26 cords to the acre, with a far higher percentage in sawtimber. I am not so sure that the low volume and vast acreage in fir/red maple/poplar/pincherry are facts worth bragging about. I discuss the concept of young forests (vs. old forests) being "healthy" later in this critique.

The summary also contains the wonderful news that the 1999 inventory shows 37% more timber than the 1959 inventory. Unfortunately there is no analysis to explain why this is so. There is no mention of the fact that at the turn of the 20th century, there were huge wild fires that burned vast acreages. There were also major wild fires in 1947. From 1911-1919 there was a major budworm outbreak that wiped out millions of cords of spruce and fir. Millions of acres of "forest" in 1959 were actually abandoned farmland. The survey of 1959 also is not perfectly comparable due to different methodologies. The great "recovery" of the forest is less due to improved management than to the natural reforestation of abandoned farms, improved forest fire fighting, the collapse of the lumber industry as bigger wood became available from the Midwest and West (due, in part, to the Erie Canal, the Panama Canal, and the national railroad system), and the Great Depression. What is more an issue is that current inventory is less than that in the 1970s and 1980s.

While it is heartwarming to some readers that clearcutting has declined to only 2.5% of all cuts, the Maine Forest Service ought to show the trends of average volume per acre removals. These fig-

ures do not show the same linear downward trends as the decline in clearcutting, but, rather, fluctuation. This indicates that, although clearcutting by state definitions is on a definite decline, heavy cutting by other names is still occurring on a large level.

Monitoring statistics are informing decision makers?

The draft suggests that despite the level of monitoring, there have been contentious debates concerning management. The draft neglected to mention that there has not been very much analysis of these statistics in a reader-friendly form. The federal inventories, for example, are mostly in raw numbers. Government agencies have not done much to show what these numbers mean about the past and present forest. The state, rather, has chosen to use some of the raw numbers as input for questionable models that, supposedly, can project what the forest will be like in 50 years, despite simplistic assumptions and inadequate reliability of the data.

Apparently the media, the legislature, and many other players in the forestry arena are not all that interested in analysis of the data. When I wrote a 28 page report analyzing the 1995 federal inventory, not one paper mentioned the existence of the report. Various legislative committees were given the report, but did not discuss the results and preferred instead to make policy based on assertions, hearsay, and political influence, rather than available data.

The MFS selected the highlights from Maine's 1999 annual inventory with a definite slant to make things look more favorable than they really are. The draft should have indicated that:

- There was only one plot for every 30,000 acres, and therefore the numbers are hardly reliable; Based on these plots, there was a decline in acreage of both spruce-fir and northern hardwood types;
- The idea that "moderately stocked" forests are "desirable" is debatable. According to the MFS's own definitions (not revealed in the glossary of the draft), "moderately-stocked" forests can have between 35% and 59% of full stocking. If the MFS were to be more forthright, it

would have separated the two categories (moderate and full)—in which case it would have had to reveal that the percentage of fully-stocked stands of trees averaging more than 5" in diameter actually declined;

•There was an increase in acreage of stands having less than 50 square feet of basal area—indeed the figure for this category is around 3.2 million acres;

•The "good news" species—the one responsible for a big boom in seedlings and saplings is balsam fir. Given that we should be managing to reduce vulnerability to spruce budworm (a subject which I will discuss later), this is a rather dubious achievement.

Selection is the primary cutting method?

One chart in the Draft shows that the primary method of harvest is "selection." Unfortunately, the glossary fails to define "selection." The word "selection" has a specific silvicultural meaning. It should not be referring to diameter-limit cutting or heavy highgrade operations. Yet, that is what the MFS is doing. The MFS has been doing this since 1990. I have been pointing out this problem since that year, both directly to the MFS and in articles. I can only conclude that the use of this word in an inappropriate manner is deliberate, since it is being done with full knowledge.

[The fourth Canon of the Code of Ethics of the Society of American Foresters previous to 2000 stated that "A member will base public comment of forestry matters on accurate knowledge and will not distort or withhold pertinent information to substantiate a point of view. Prior to making public statements on forest policies and practices, a member will indicate on whose behalf the statements are made." After 2000 this became a pledge (#5) to "always present, to the best of our ability, accurate and complete information; to indicate on whose behalf any public statements are made; to fully disclose and resolve any existing or potential conflicts of interest..."]

Spraying herbicides is high-yield forestry?

The MFS definition for "high yield" forestry suggests that the practices would lead to average yields of more than 0.8 cords to the acre per year. Much of "high yield" forestry in Maine consists in spraying herbicides over clearcuts. Given that some of the acres are not fully stocked with softwoods, some of the treatments are ineffective, some of the "weeds" bounce back and have to be resprayed, and other problems—it seems presumptuous to claim that every acre sprayed is leading to average yields of more than 0.8 cords to the acre. Where are the data to support this? Yet all acres sprayed are listed as "high-yield." Also, the MFS should not be pointing with pride to statistics indicating high usage of chemical pesticides since it is state policy to reduce reliance on such substances.

If cut equals growth logging is sustainable?

The state should be advocating a cut to growth ratio of less than one. Sixteen cords to the acre is not much to brag about. Washington County has less than 12 cords to the acre. Understocked counties need to recover. If the forest is to be managed to have some large trees—both

Legislative committees ... make policy based on assertions, hearsay, and political influence, rather than available data.

living and dead—landowners need to allow some of the growth to be reinvested back into the ecosystem. An even cut to growth ratio assumes that all the growth of the forest is surplus that can be freely given away with no long-term consequences to the ecosystems. The Penobscot Experimental Forest cuts around 80% of growth, not 100%. There is also another consideration—a certain percentage of woodlot owners do not cut their lands at all and do not intend to do so. The cut to growth ratios that include their lands can, therefore, be misleading.

Growth to cut ratio is important, but not entirely meaningful if standing alone. We need to know the growth of what (by species, by size, and by quality) and where.

It is not necessarily a great thing if the cut in northern Maine is balanced by growth in southern Maine, or if the cut of red spruce is balanced by the growth of red maple, or if the cut of sawlogs is balanced by the growth of saplings. Regional shortages or declines in quality trees or species should not be a consequence of a "sustainable" cut. The goal should not be to balance cut and growth, but to have more growth than cut, to ensure ecosystem functioning.

If age classes are "balanced" logging is sustainable?

While it may sound good to have a "balanced" age-class structure, it makes a big difference how many age classes there are to balance. A pulp mill may be "sustained" by a forest managed on 40 or 50 year rotations. Having a "balance" of these age classes, however, would lead to having an unbalanced forest. Acadian forests have evolved to persist for hundreds of years. Over this time they develop structures, habitats, and species not found in younger forests. Discussions of "balance" are unbalanced if they do not reveal how many age classes are included and what proportion of the forest will be in later-successional stages. In the presettlement forest, most of the land area was in late-successional forest stages—very little in early-successional. Does this mean the forest was "imbalanced" and therefore improved by cutting?

A young forest is a healthy forest?

The draft makes it seem like there is a connection between a "younger and more vigorous" forest and a "relatively healthy" forest. Based on this thinking, one might assume that having the landscape dominated by young forests is a good thing and that old-growth forests are overmature, decadent, and unhealthy.

If "healthy" has anything to do with stability (resistance to or resilience from catastrophic disturbance), then old-growth forests that have persisted for centuries are healthy forests. Indeed, old-growth spruce forests have survived repeated spruce budworm attacks over the last century. We might have something to learn from this.

Young stands of fir (vulnerable to spruce budworm), young stands of poplar (vulnerable to forest tent caterpillars), or young stands of tamarack (vulnerable to larch saw fly), are not necessarily healthy. Young, even-aged forests lack the full range of habitats (such as large trees or dead trees) and full range of species (such as predator/parasite complexes) that help

While it may sound good to have a "balanced" age-class structure, it makes a big difference how many age classes there are to balance.

regulate potential "pests."

Pesticides keep the forest healthy?

In its discussion concerning the loss of chemical "tools" to deal with pest outbreaks, the draft made no mention that it is state policy to reduce reliance on chemical pesticides. There are many reasons to reduce reliance on pesticides. Pesticides not only pollute land, air, and water, they also can disrupt predator/prey balances, and decimate aquatic invertebrates and pollinators. The Maine Forest Service should be setting the standard of how to reduce the need for pesticides in the forest. The MFS should be identifying how to prevent the need to use pesticides (by managing for more stable forests) and how to reduce the vulnerability of the forest by means other than spraying. If the MFS were doing this, there would be less public interest in moratoriums on pesticide use.

I was somewhat amazed that a discussion of forest health and monitoring would not have any mention of the spruce budworm—the insect that has had the biggest impact on the structure of Maine's forest this century. Scientists and foresters have suggested the importance of reducing the vulnerability of the forest to the budworm since at least 1924. One of the keys is to favor retaining red spruce over balsam fir. Yet before, during, and after the latest outbreak, landowners cut more spruce than fir. Heavy cutting during the 1970s to date has favored regeneration of fir over spruce. Herbicide spraying has also created stands with an overstory of fir when they might have been more mixed with hardwoods.

The spruce budworm is so important that it needs to be mentioned in every state-of-the-forest report. Forest practices need to be assessed against the goal of making the forest less vulnerable to catastrophic outbreaks. Landowners should not be expecting to be rescued by government subsidized spray programs.

We've reached the limits of regulation?

The draft claims that it has become "clear," "that we have reached the limits of what a prescriptive regulatory framework has to offer." This is an extraordinary statement given that current regulations under the Forest Practices Act hardly deal with silviculture (issues such as stocking, species, quality, size, etc.). Instead, the FPA deals mostly with the size and distribution of clearcuts. Since clearcuts, by MFS definitions, only make up around 3.5% of all cuts, the FPA has almost no influence on most of the cutting in the state.

Other states have gone much farther along regulatory lines Maine has not yet addressed. Vermont, for example, has a heavy cutting bill and a land gains tax designed to lessen the incentive for liquidation cutting. There are also more qualifications for current-use tax (which I will address later).

The idea that we should move away from regulations because they may have unintended consequences is also quite interesting. When the FPA was first proposed, I testified about what the consequences would be, and also wrote about it in detail in a book shortly after the FPA passed. Virtually all the flaws that people are admitting to now, I and others brought

out when the FPA was first proposed, including the issue of fragmentation. I can only conclude, therefore, that since the FPA passed in spite of the objections raised, that the consequences were not "unintended." The law was passed with full knowledge of potential consequences.

While "outcome-based forestry" sounds nice, we, the public, need to know:

What are the standards?

Who makes the standards?

How will the standards be monitored?

How much will it cost?

How will it be determined if the landowner is living within the standards (i.e., what are the standards for living within the standards)?

What will be the consequence if the landowner is not living within the standards (i.e., achieving the outcomes)?

Certification is a form of outcome-based forestry—but it is not necessarily a cheap or easy proposition. It can be complex, sometimes contentious, and expensive.

If a forest is certified, it's sustainable?

The draft implies that because an ownership is certified, that practices on those acres are "sustainable." I would suggest that there may be a difference of opinion of many competent observers checking on the millions of acres that have been or will be certified in Maine. Some of the worst statistics for inventory declines and overcutting found in the latest federal inventory show up on industry land—most of which is now certified under SFI.

One would think that a section on "issues and trends" connected with certification would be more forthright about the negative issues connected with the process. A person reading this section might conclude that the only controversy is that not enough small landowners are getting certified. Yet, there are major criticisms of SFI, which allows landowners to choose what they will be certified for, and some serious challenges to FSC as well. Indeed, the Sierra Club initiated a challenge to the FSC certification of J.D. Irving.

Of the 58% of the forest that is (or will soon be) certified, how does this land compare to non-certified forest on the following basic issues:

The cut/growth ratio over the last 10 years;

Average volume per acre;

Percent of land that is fully stocked;

Percent of timber that is high quality;

Percent of forest in older age classes;

Average diameter of trees; or

Shifts towards lower-value species?

The draft assumes that because the landowner is audited by a third party, the certification is somehow valid. But there can be conflicts-of-interest as well as unclear standards that allow questionable certifications. The controversies revolving around the various certification programs are too vast and complex for the document to go into in any detail. But it should at least give a hint that there are controversies and challenges.

The MFS needs to define what it means by "valid" certifiers. Are the certifiers and standards "valid" if the on-the-ground results are poor? Are the 58% of the acres that are, or will be, certified by the end of this year in better shape in terms of stocking, quality, volume/acre, or cut/growth ratios than the rest of the forest? Are we looking at the certification of actual past and present practices or the certification of promises that the landowner



Herbicides and clearcuts in the Caribou Valley of western Maine

ADDING STRINGS TO THE TREE GROWTH TAX

THE TREE GROWTH TAX IN NORTHERN MAINE has neither stopped large-scale development nor ensured "sustainable" forestry. During the 1990s, for example, tens of thousands of acres of former Diamond lands were subdivided, stripped of timber, and sold—all the while the land stayed under Tree Growth. The only penalties were on the fraction of land sold as house lots (often only $\frac{1}{4}$ acre).

According to statistics gathered from reports by the Northern Forest Lands Council, Maine has 60% of the four-state Northern Forest region's land, but 89% of the land taxed under current use. One might expect that Maine would have the least development and the best management—if there were a correlation with low tax rates and these issues. The Council's research, however, found that between 1980 and 1992, Maine's Northern Forest Lands had 96% of the parcelizations, 91% of the subdivisions, and 76% of the conversions in the four-state region.

Between 1982 and 1995, according to US Forest Service inventories, Maine was the only state in the region to have a decline in inventory. The declines were greatest in the counties having the highest percentage of lands in current-use taxation.

While the spruce budworm was certainly a factor in this decline, in some of these counties—Franklin, Somerset, and Piscataquis—the declines were in hardwoods as well as softwoods. As far as I know, the budworm did not feed voraciously on hardwoods in those counties. The state also saw a decline in the percentage of #1 grade hardwood sawtimber during this period. I would not go so far as to say that low tax rates caused poor forestry, but it certainly did not prevent it.

The heavy cutting of the 80s and 90s led to a decline in inventory and a shift over hundreds of thousands of acres from softwood to mixedwood and hardwood. The result was lower tax rates. One could hardly call this an incentive for sustainable forestry.

A study on "NIPF Tax Incentives: Do They Make a Difference?" By Charles Brockett and Luke Gebhard in the April 1999 issue of the Journal of Forestry found no significant correlation between lower-tax rates and improved forestry. The authors concluded that the tax program studied, "has functioned as a windfall for participating landowners without providing commensurate return for the rest of the area's citizens." Based on their findings, however, they did not reject current-use tax programs. Instead, they concluded that there should be more strings attached: "For example, participating owners could be required to have a meaningful management plan with effective oversight of compliance." (their emphases).

Currently the only requirement in Maine is for a forestry plan that has no requirements and that no one has to see. There is no effective mechanism to check for compliance. The acting head of the MFS did support a bill, over a year ago, that would create a random check of those under Tree Growth to see if they have plans and if they are following them. Apparently this stance has been reversed by the MFS. Rather than continue defending a program that is giving questionable public benefits, the MFS could take a more proactive stance and suggest that the program be stabilized in a form that actually leads to desirable results that the MFS can check on and measure.

will do better in the future? Is the certification of promises "valid"? Is the certification of standards chosen by the landowner "valid"? Is certification "valid" if the landowner can choose (and/or have veto power over) who will be the on-the-ground certifiers? Is the certification "valid" if the landowners are on the committee that writes the regional standards and have veto power (through consensus) over standards they do not like?

Forester supervision ensures good forestry?

Most large landownerships have had har-

vesting under forester supervision for years. Does the MFS have information that shows that these lands have low stand damage, minimal highgrading, better stocking, improved species ratios, and improved average stand quality as a result? The data from the USFS 1995 inventory showed the highest cut to growth ratio and biggest drop in inventory on industry lands, which were mostly under forester supervision. I would rather see benchmarks that dealt directly with forestry improvement than ones that sound good, but, so far, have a poor track record of actual, on-the-ground results.



...Sustaining Maine's Woods

A 4-day training ensures good logging?

The MFS is using another indirect indicator with the percentage of loggers who have gone through a 4-day training, rather than a direct indicator of reduction in: residual tree damage, highgrading, understocking, or soil damage from logging. What evidence does the MFS have that the percentage increase in loggers who have this training has led to a commensurate change in percentage of logging damage? Training alone does not solve logging problems. Loggers need to be paid an adequate wage so they can take the time to take care. Unfortunately, real (inflation-adjusted) wages have fallen over the past few decades. While demands for better logging are increasing, the pay incentives to do such logging, or even stay in the business, are decreasing.

It is ironic that in northern Maine, where the wage problems are so severe that there have been logger blockades of the border, the Department of Labor has declared that there is a shortage of qualified American workers, thus necessitating the importation of Canadians. This is happening at a time when a large percentage of loggers have lost their jobs due to mechanization and there is serious unemployment in the region. Part of the problem is due to a landowner oligopsony—the few landowners dominating the region do not have to compete for labor and can depress wages. There is a shortage of workers at the artificially low “prevailing wages.” If the state is serious about reducing logging damage and encouraging more state citizens to take up logging as a profession, it will have to address the issue of low wages.

Easements protect the forest?

The report also implies that development and other easements sold by timber companies are protecting the forest. This is a questionable assumption. Please see pages 4-7 for a critique of a specific easement deal, the West Branch, and general comments on easements as they are being employed in the Maine Woods.

The Tree Growth Tax (as is) needs to be stabilized?

The draft argues that attempts to change the Tree Growth Tax are destabilizing the program. The draft makes little attempt at understanding why so many efforts have been made to change the Tax. The answer is that, as now interpreted, the Tax has neither led to sustainable forestry nor deterred widespread subdivision and development. Many people question whether the benefits justify the millions of dollars of tax shifts each year.

Consumers' "consumption ethic" threatens the forest

In talking about the “consumption ethic” and how it conflicts with the “conservation ethic,” the draft should have mentioned that the very people who own the mills (and millions of acres of forest) are also promoting the consumption ethic through advertisements. These companies, and the state, tend to assume continued growth in consumption—and project these assumptions with computer programs that have this built-in bias. Then we are told that because consumption (promoted with advertisements) will be growing, we have to not only cut more wood, but also manage more intensively to grow more wood. We can't afford wilderness. Since the state is involved in these “Trend is Destiny” exercises, it seems odd that it should be pointing any fingers at consumers. The state should, rather, be aggressively encouraging conservation of consumption, along with recycling.

Part of the “consumption ethic” is government policies that encourage the production of cheap consumer products. When the resources are cheap, this tends to encourage waste (such as junk mail and unnecessary packaging). To the extent that these products are cheap because labor is underpaid, rivers and air are polluted, energy is squandered, and landfills are overloaded—the market is inefficient. These are external costs which the government may either allow or encourage (through subsidies or lax regulations). More expensive products that internalize costs would lead to less waste and more conservation.

Putting the blame on consumer's “consumption ethic” takes the blame off landowners who do the heavy cutting. “The consumers made me do it.” Undoubtedly there is a demand for every tree in my woodlot, but as a woodlot owner I do not use this as an excuse to cut every tree right now. My responsibility is to manage sustainably. Consumers have to live with what is reasonably available within biological constraints. If demand outstrips supply, then prices will go up—which would lead to more conservation.

Vermont's Inadequate Reserves? State Appears Set to Offer Public a Weak West Mountain Reserve in Face of Anticipated Opposition as Hearings Begin

It should probably come as no surprise that planners for the state of Vermont appear ready to offer the public a very weak proposal for an ecological reserve on the state portion of the former Champion lands. According to sources, those involved in vetting the proposal are playing a compromise-by-numbers game, attempting to pare down acreage to a point that will be acceptable to the segment of the legislature and public agitating against a reserve. Furthermore, the usual procedure of a range of options, from no action, through a moderate proposal to a full-fledged plan, is not contemplated.

The latest number reportedly is 10,000 acres — less than half the acreage of the state lands, and a very small fraction of the original holding, which amounted to 130,000 acres. The shame and irony, should this number stand, is that planners are using numbers rather than elements of reserve design. Given the history of the Champion deal however, this should again be no surprise. At every stage of Champion deal-making and planning, political pressure has been exerted to decrease reserve acreage.

A reserve should achieve several broad measures of viability: size, and rational ecosystem boundaries among them. The likelihood is that a politically designed reserve will make no impression on critics of reserves other than to confirm the prejudice that ecological reserve science and conservation biology are so much mumbo jumbo and that advocates have not the courage of their convictions.

Science & the People

Indeed, I spoke recently after one Champion Citizen Advisory Council meeting state rep Bill Johnson who responded to my use of the word “ecological integrity”—the goal of a reserve—with a more than skeptical laugh, as if it had no meaning. Dismissing the jargon of conservation biology with a defense of clearcuts as the best agent of biodiversity, he gesticulated to a room of people opposed to the reserve idea and said “The state will never listen to these people.” High faluting words versus people: who is likely to win such a battle of perception? In his view: the state. In my view: no one.

An irony of opposition being carried on in the name of locals is that most of the organizing energy is coming from outside the towns wherein the lands lie. Campowners from Chittenden, Washington and other counties have been the main opposition to reserves. Several members of the fairly biased Citizens Advisory Council are bitterly opposed to a reserve. Legislator Janice Peaslee is mobilized against the idea and has received a petition against road closures reportedly signed by 300 of her constituents.

Scratch the surface of local concern however and a more complex dynamic

emerges. If you were to travel Route 102 informing people that their rights of access, hunting and fishing were at risk, is there any surprise there would be opposition to the unfamiliar. Some people will oppose any prospect of road closure but thus far legislators show little sign of supporting the full system (with appropriations anyway), which was hugely expanded in the 80s “to get the wood out.” With stocking well less than 10 cords to the acre, it must be said the roads succeeded.

Another area of concern, with this summer's collapse of wood markets in the turmoil associated with the Berlin/Gorham mill's eventual bankruptcy and other more general tremors in wood markets, is logging. An ecological reserve that might be designated “forever wild” is anathema to some, among them the most strident defenders of clearcuts. One such defender is CAC member Tom Frizzell of Lemington. Mr. Frizzell recently attended one of the Pittsburg meetings to tell residents there that there are environmentalists filtering into the area and that they as well as their ideas are not welcome (a remark greeted with applause). Mr. Frizzell's mission on the CAC is to oppose the idea of Wilderness, a word he has mocked in his official capacities, and to ensure a future for logging. Curious then that he has been so strident over the years in supporting the rights of clearcutters who have effectively stripped the North Country of its resource base. (Question: other than articulating the spirit of *laissez-faire* and villifying enviros, what exactly have area legislators done to respond to woods product industry woes?)

Messing It Up by Sneaking It By?

Who and what are responsible for the hostile reception of a reserve idea? There is something more at play than rural conservatism and a philosophy of use (which will wink at abuse but brook no preservation). I have spoken at several CAC meetings (where many of those speaking against reserves had traveled across the state to do so) and made several points: one, that there is a tradition of back country hunting that is complementary to a reserve and indeed strengthened by it; and two, that there is a local interest in conservation biology as a concept (I used the example of two local young people, one who has studied Yellowstone wolves and is an articulate spokesperson for wolves; and a resident of Brunswick who has worked out West counting spotted owls.)

It should also be noted that there would have been no moratorium on herbicide spraying by paper companies had local residents not mobilized and held to the fire the feet of local environmentalists. Their concerns were as much ecological as health-related. Is every herbicide opponent an eco-reserve proponent? Maybe not, but the lead opponents of reserves



might be said to have either sat on their hands during this past debate or quietly advocated for Champion's right to spray.

While there is no doubt that those who hunt the back country and attend slideshows about wolves are in the minority, and that those who tend to dominate meetings effectively squelch other opinions under the weight of their offensiveness, there also can be no doubt that deal-makers messed up their approach to ecological reserves on the Champion lands. Criticism from CAC members in this regard reflects similar criticisms made by wilderness advocates who, during the first public unveiling of the Champion deal, undertook a press campaign for Wilderness, given their exclusion from the process. While wilderness advocates were marginalized by dealmakers before the legislature and public, their comments unwelcome, they were also told to be quiet and not disrupt the deal, that the time for wilderness would come — a conflicting message however, depending on how much you relied on a person's personal assurances. Meanwhile, apparently, those distrustful of wilderness were likewise being assured that "special treatment areas" would be small areas closed to logging for the purpose of protecting special plants and communities.

While it quickly became obvious that the main play was not at the Citizens Council meetings but was instead in Montpelier where the Steering Committee and its Scientific sub-committee were meeting in secret, I nonetheless raised the subject before the CAC of special treatment areas, saying that to accomplish the purposes of the easement which guide all Champion land planning with legal parameters these STAs must be large and designed with ecological scale and dynamics.

I was politely heard, but no one ever thought to initiate a local dialogue through the CAC on ecological reserve design until a last minute presentation at one meeting this summer (a very good presentation but too little, too late). This was a major opportunity missed by the environmental community, perhaps overly focused on discussions in Montpelier.

Over the course of time, state officials on the CAC abandoned earlier description



With the St. Lawrence & Atlantic and Connecticut River in the foreground, West Mountain rises in the distance. This view is from Stratford, NH, near the old veneer mill opposite Brunswick Springs.

of STAs as small and based on natural communities. Talk of an ecological core began, apparently in response to the discussions back in Montpelier. This created distress amongst CAC members from the area opposed to a reserve.

So from the beginning, deal-makers and then the state who inherited the land and planning process, tried to low-ball reserves and sneak them by the public, rather than acknowledging them as a worthy component of the deal that could weather the vagaries of debate, legislative and local. This view of democracy unfortunately has its weakness which is that when opposition erupts it is hard to appease after the fact. Take your medicine up front and place your faith in the Ephraim Tutt principle*. Had deal-makers had some conviction of the value of Wilderness — and my concern at the time was that they did not — we might have the opportunity to comment on not a 10,000 acre proposal but a much stronger reserve proposal (we still do, see below).

What to Say?

Supporters of reserves are resorting to one ace in hand: ownership of these state lands was made possible by the Mellon family fund with some apparent idea that it would be a reserve. While legislators have blustered about how their votes were predicated on continued traditional use (while not explaining the genesis of such traditions as over-cutting, road-building and tear-assing on snowmobiles rather than their use for access) — they have not acknowledged that their vote was for the easement on the Essex Timber lands, which is subject to both access and conservation easements. It would be odd, and a shame, if we were to get a dumbed-down 10,000 acre reserve not because of full and open public process but because of a private donation. This would pose a real obstacle to reserve planning on other state lands.

There is another approach that I urge eco-reserve proponents to make: urge that the entire state portion be reserved, at least until the next management plan 10 years down the road. Should we reserve only 10,000 acres now, we shouldn't lose the option for a design that exemplifies best reserve design. 10 years from now, reserves may well be a component of all state lands, and our literacy in their design much greater. Place a moratorium on active management until we air the subject thoroughly.

Visit the website of the West

Mountain Wildlife Management Area and decide for yourself: based on the ecological descriptions, which areas should NOT be included? Ask designers, what is the minimal viable size for representing the matrix community here? What are the watershed boundaries here; do the reserve bounds follow them? What areas do you think should be logged?

Alternatively, we can pick a number out of a hat in hopes of appeasing opponents. In which case, a great deal of planning funds and people's time has been wasted over the course of a year and more.

Meanwhile, I would point out to opponents, that no matter what meager number we arrive at, their concerns remain unaddressed. Even with no reserves, if you are a logger in Essex County, you still need wood and you still need markets. If you are a hunter concerned about the future of hunting, other issues remain, while some quality of experience may have been lost.

About this CAC

At the last Citizens Advisory Council meeting I attended, this summer in Island Pond, I raised the point that there is no local representative for conservation interests on the council. Is it any wonder discussion and indeed interest in reserves has been one-sided?

Given that the CAC is to continue as a forum for local points of view, broaden-

ing its membership seems necessary, especially since local legislators are raising the topic of re-visiting the Champion legislation. A position should be made for someone who is conversant with conservation biology, ecological reserve design, and who, as an individual or group member is recognized by others in the local conservation community as a true representative. My suggestion seemed well-received but will obviously need legislative assistance. Past experience suggests legislators outside the Northeast Kingdom will be needed to assure an environmental point of view can be articulated locally.

*Ephraim Tutt was Cal Coolidge's boyhood pal in Plymouth who later wrote *Country Lawyer*. Something of a populist who saw things more liberally than Cal, this Vermonter (who practiced law in upstate New York after graduating Harvard) assessed our tradition of placing the fate of court cases in the hands of citizen juries. Is this wise? He himself had his doubts in the reasoning process of man. However, having eavesdropped on a jury through an open transom one day, he came to the conclusion that, however convoluted the discussion, reason does prevail, and that this should be a central tenet of our democratic faith.

Where to Comment — How to Be Involved

October 9 — 6 pm CAC meeting in Island Pond at the American Legion (Council members will receive a copy of the draft; the public will have to wait for its posting on the web Oct. 10 or another 2 weeks for hard copy)

October 29th — Public Hearing at the Brighton Elementary School in Island Pond

Oct. 30th — All day symposium on the Champion Land Deal at Lyndon State College followed by an evening Public Hearing at Lyndon State College

Oct. 31st — Public Hearing in Waterbury (during the day)

November 1st — Public Hearing in Springfield

Nov. 5th — Public Hearing in Rutland

Nov. 6th — Public Hearing in Chittenden County (location TBA)

Written public comment will be accepted until Nov 15. Public comments will go to Ed Leary at the Agency of Natural Resources.

Visit the West Mountain Wildlife Management Area website: www.state.vt.us/anr/fpr/lands/westmt

CORALS, OCEAN DRAGGING & A RESERVE PROPOSAL



Strawberries, Corn, & Bubblegum Trees

Along Nova Scotia's Highway 103, an hour's meander southeastward from Yarmouth in Barrington, stands a modest white and red trimmed school building. In two rooms in its basement, fisherman and activist Derek Jones has housed COHPS — Canada Ocean Habitat Protection Society. COHPS and Jones are engaged in a lonely fight to save both a fishery and the last scraps of undersea coral forest that once characterized ocean floor from Newfoundland to the Gulf of Maine.

Jones is trying to inform the public that soft-coral forests were the ecological under-pinnings of the abundance and productivity that greeted European fishermen in the 16th century and endured until the advent of modern bottom-dragging technology — technology that has, Jones says, been aggressively promoted by Canadian government, at the expense of small boats employing handlines, longlines and other low impact or "fixed" gear.

The centerpiece of COHPS' school-house collection is a striking display of northern corals that Derek Jones has rescued from ghost nets, stray bits of broken-off fishing gear. The corals are so unusual they are unknown in many cases to taxonomists. To the layman, they are striking and colorful. That they are ancient, commonly hundreds and thousands of years old, and endangered, lends urgency to Jones' cause, which is principally a reserve proposal for an area off Nova Scotia where some corals survive. The proposed reserve area has already been leased to Houston oil interests, however, and Derek tells the visitor that "the rigs are on their way."

For COHPS, there is no dichotomy between ecological preservation and traditional way of life in the fishing towns of Nova Scotia. Unfortunately, the battle mounted by the small boat owners of the inshore fishery to preserve their segment of industry, has been lost, says Jones. The goal of federal policy has long been bigger boats and more advanced technology, the replacement of small boats by larger trawlers and draggers. Much of the battle centered on ITQs, Individual Transferable Quotas, with small fishermen seeing the allocation and transferability of these fishing quotas as a piece of government policy that favors bigger boats.

To the idle tourist, Nova Scotia's charm endures, and suggests what New England may have been several generations ago. Derek says that it was the region's relative backwardness that long protected its resource base. Modern resource extraction has arrived, off-shore, in-shore and on-shore. While Irving timber company busily clearcuts the woods on the southerly tip of Nova Scotia, bottom draggers have likewise cleared the ocean bottom: Derek makes the comparison while pointing to a chart representing a dragger's movements across a piece of ocean floor: the single black lines amass to solid ink. The impact of heavy trawl doors scraping the bottom and flattening the coral forest is a drastic ecological simplification, the prelude to a monoculture fishery such as that of Britain's North Sea or the Mediterranean ("dogfish and skates" as Derek puts it).

I ask Derek what has become of organized opposition to government policy, which was particularly pronounced in nearby Clark's Harbour. At one time, fishermen and their families had occupied the Department of Fisheries and Oceans (DFO) office and sworn not to leave until their demands were met. Derek answers simply: "You can't fight big money." Leaders have been bought off and individual protest silenced through fear of retribution. What of the local mp, I ask, surely fishermen have leverage in parliament? The local mp, Derek answers, is in the pocket of the oil interests. I query Derek on the plethora of small boats I have seen all day, on moorings and in dry dock; he answers that most of them are lobster boats.

It is a daunting task to challenge vested interests in favor of the sustainable. Derek minces no words. The small inshore fishery has been "rifle-butted to death" by DFO policy, and the powers-that-be are focused on another source of riches: natural gas and oil. There is no institutional support of his goals and the few academics drawn to his cause are themselves isolated. Rallying the public is his best approach, but his volunteer efforts are already threatened by a lack of financial support.

What is your hope? I ask Derek as we look over the corals and discuss their natural history. We have spoken already of the shortage of scientists familiar with these species: Derek has had to educate himself about them, often drawing on the knowledge of fishermen, and inviting scientists into the subject. Derek tells me that many of the largest of these species were found off Newfoundland; and the oldest are 30-40,000 years old, as established by carbon dating. On the brink of extermination, Derek hopes to save a few areas where they might be protected and studied. More idealistically, a broader awareness of undersea ecology might restore a fishery and prevent its inevitable downward spin.

Friend and neighbor Brian Savage, a past president of the Shelburne County Museum which helped COHPS launch its coral exhibition, joins the conversation:

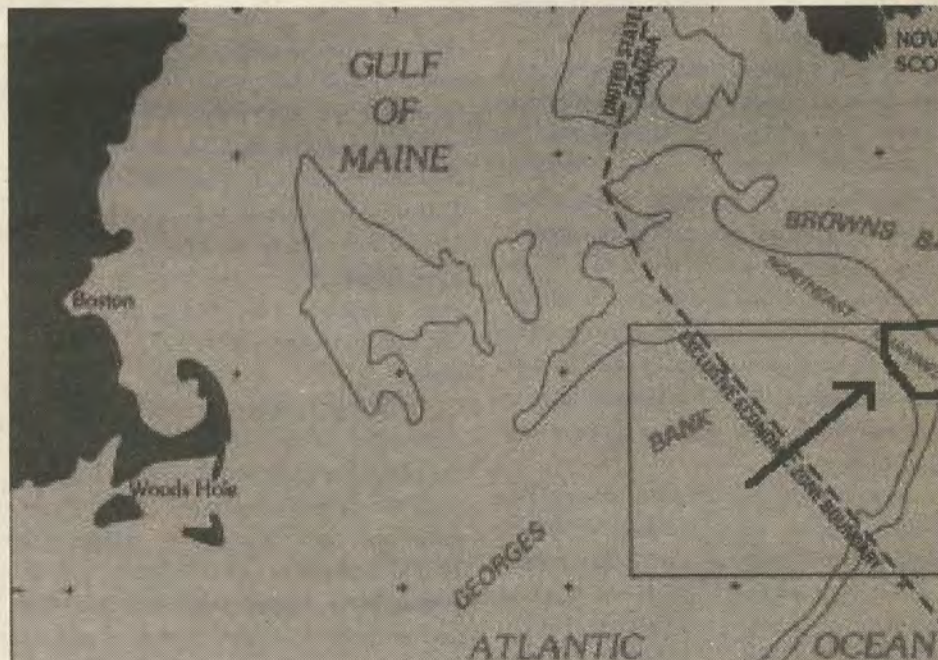
"I know what I hope, just as an ordinary Canadian, is that we can duplicate on our seacoasts what we have already done to some extent on land. Canada has developed a magnificent system of natural parks, national parks, all the way across, from one end of the country to another...With the planet covered 3/4 by water what we've got to do, is get our minds flipped around to the concept that there is another responsibility which is in our own interests, and that is to develop marine protected areas... The argument being advanced by Derek and others is the importance of the coral in providing a nursery environment for the small fish to live, hide and feed in relative safety, and therefore acting like a vast spawning ground. But once you go to this rather destructive fishery with the draggers clearcutting...the whole system starts to unravel, you destroy the foundation."



Derek Jones stands in front of the Canadian Coral Science Center at 2517 Highway 3, Barrington, Shelburne County, Nova Scotia. He holds a coral known to fishermen as a strawberry tree.



A specimen of a Grand Primnoan in the COHPS collection.



The proposed reserve area, now being leased to Houston-based oil interests.

Court Action Launched Against Bottom Dragging

HALIFAX - To protect the sustainability of the groundfish fishery, the Ecology Action Centre is taking the Department of Fisheries and Oceans to court over its decision to re-open Georges Bank to dragger boats again this year.

"The objective of this court proceeding is to achieve a long-term sustainable fishery," says Mark Butler, EAC marine issues co-ordinator.

"That future is compromised by DFO's continued denial of the impact dragger boats have on ocean habitat."

The Fisheries Act explicitly prohibits the harmful alteration, disruption or destruction of fish habitat. Lawyers with Sierra Legal Defence Fund will argue on EAC's behalf that the use of dragging gear on one of Atlantic Canada's most important remaining fishing grounds violates the Fisheries Act by dramatically altering the seabed and harming the myriad life forms that depend on it for their survival.

"Destruction of fish habitat is against Canadian law," says Sierra Legal lawyer Margot Venton, "but the federal government routinely allows boats using destructive fishing gear into areas of sensitive and important habitat. It behaves as if the prohibition against destroying fish habi-

tat does not apply to certain kinds of fishing."

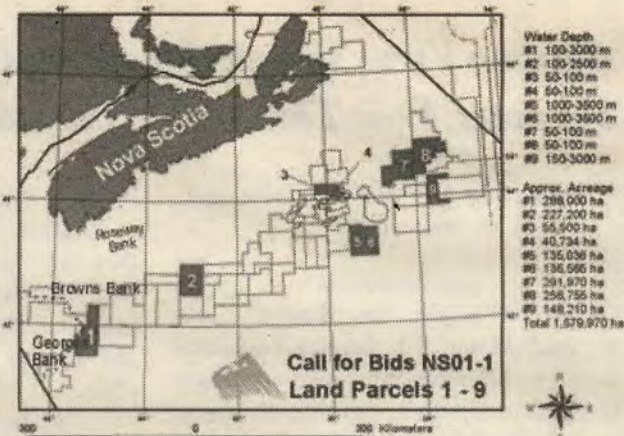
Draggers catch groundfish such as cod and haddock by towing heavy nets across the seafloor. The leading edge of the net is held down by chains and metal bobbins weighing tens to hundreds of pounds each. As the weighted net is dragged along it forces fish to rise off the seafloor and get caught in the net. In the process, extensive areas of the ocean floor are scoured causing damage to a diverse underwater environment.

"Common sense says that dragging damages the ocean bottom," says Butler. "If you destroy the habitat on which groundfish depend, then ultimately you won't have a fishing industry. We need to conserve habitat so that we conserve local jobs and have a sustainable fishing industry."

"The ocean bottom is much like the land. It changes from place to place. It has mountains and valleys and plains. It has smooth and hard bottoms. There are areas that I used to fish where there were these high humps that have been flattened. That left resident fish nowhere to feed and nowhere to hide," says Bill Williams, a fisherman for 39 years and director of the SW Nova Fixed Gear Association.

Ransom Myers, Killam Chair of Ocean Studies at Dalhousie University, says there is overwhelming scientific data to confirm that dragging gear alters fish habitat.

"Habitat is being destroyed at an amazing pace," Myers says. "The Minister of Fisheries and Oceans has a



choice of protecting 1,000-year-old corals and sponge reefs or allowing their wanton destruction."

The EAC believes dragging damages fish habitat and that DFO should encourage the use of less destructive gear as well as restricting draggers to less sensitive habitat.

Sierra Legal is Canada's largest non-profit environmental law organization, and has provided legal and scientific support to the Canadian environmental community for the past 10 years. The EAC is a Nova Scotia-based environmental organization that has worked for the past 30 years on a variety of issues including forestry and fisheries campaigns. For more information contact: Mark Butler and Margot Venton at: 902-429-2202.

WILD SCALLOP STOCK ENHANCEMENT PROJECT

September 2001 update

Marsden Brewer, Coordinator

The Wild Scallop Stock Enhancement Project has concluded its second successful year of scallop spat collection. We have learned that there are some unique areas in our bays that larvae can be caught and that the Eastern Maine Coastal Current shows the most promise for spat collection in the mid coast area.

This year fisherman in the Penobscot, Blue Hill, and Jericho Bays were able to release around four million juvenile scallops. We were also able to tag a number of scallops in different areas to begin to take a look at scallop movements around the bays.

This project has also helped to spawn other efforts around the coast, helped foster a working collaborative relationship between fishermen and scientists, and helped give some fishermen a sense of hope as we work together with a focus on working to realize our potential as opposed to traditional management where we all sit around and worry about our limitations. I tip my hat to all the fishermen and their families, scientists, students, and community members that have worked together to make this project a success.

It will be a couple of years before fishermen will start to see any results from this years seeding efforts. I don't expect positive results everywhere, but with scallops scattered in over 20 different locations and the combined experience of the fishermen involved (approaching 1000 years of combined experience)

I am confident that we will succeed. Stock enhancement works in other areas of the world and there is no reason to believe that it won't work here. The first time one of these guys come in with a couple of tagged scallops, four or five hundred Lbs shelled and fifty bushels on deck it will probably be all talked over!

Now we are ready to start another year. Thanks to the successful effort of Maine D.M.R. scientist Dan Schick in writing a grant proposal that provided funds for spat collection materials and will start a stock assessment for scallops in the State of Maine, and The Northeast Consortium for providing the funding, there are 6000 bags and netron available for Maine fishermen interested in giving spat collection a try.

If you are interested in getting ahold of some of this material give me a call at 367-5100, or on the boat at 460-3780. This year we are looking at bag deployment between September 7th and September 22nd.

Trying to catch spat is much like smelting, not much sense in going if the smelts aren't running. Much needs to be done to improve our timing, but for this year we will use those dates or as close as we can get to them.

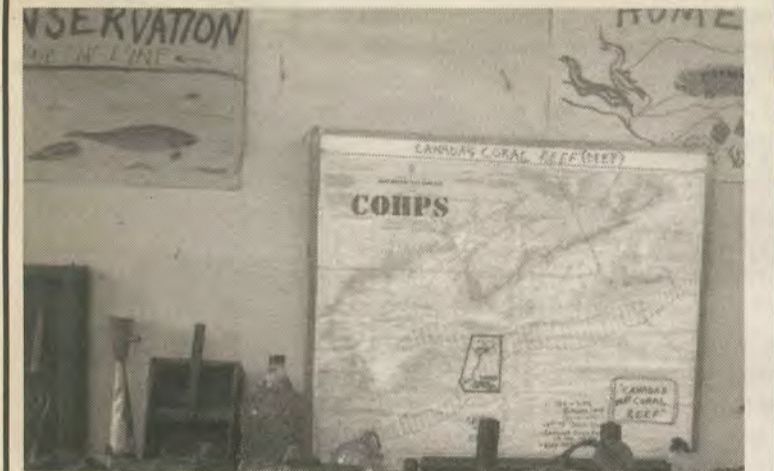
Marsden Brewer, Stonington Fisheries Alliance



A 22 month old tagged scallop



The coral collection is vivid and colorful; it includes specimens whose taxonomy is little known or studied; northern corals, whose range was once vast, can reach a great age. Their ecology supported a fecund fishery; their protection can help restore it.



The COHPS collection includes fishing gear. Visit the COHPS website: <http://cohps.atlantisforce.org/> for a photoessay on fixed gear fishing off Nova Scotia and more on the proposed coral preserve.



Fall 2001



Seals, humans, mackerel as well as lobsters enjoy the Rockland breakwater — where developers would like a marina and townfolk a lobster park. See next page.

Salmon Virus Wreaks Havoc with Maine Salmon Farmers, Pose Threat to Wild Stocks

Pacific Coast Federation of Fishermen's Associations

By permission

On 6 September the Boston Globe reported Maine fish farmers have been forced to kill more than 700,000 salmon this year in an attempt to stop the spread of a deadly fish virus that some compare to the foot-and-mouth disease that has decimated European cattle.

An additional 130,000 were to be destroyed this week after three new cases were found in Cobscook Bay fish pens near the Maine-Canada border. Not all of that is lost to the aquaculturists, however, since some of the farmed Atlantics were already large enough to bring to market.

On 5 September, the Maine Department of Marine Resources in effect quarantined Cobscook Bay, prohibiting any aquaculture boat from entering or leaving unless it undergoes a cleaning that is certified by a third party. The state will also require aquaculture companies to

Federal fishery officials fear the disease may jump from the cages to wild salmon. Atlantic salmon in Maine's rivers have dwindled so greatly they are now on the federal Endangered Species List (ESA).

report any new anemia outbreaks and ordered stepped-up testing for the disease's presence.

The disease, infectious salmon anemia, is not believed dangerous to humans, but it is devastating to farm-raised salmon. The anemia, which has wreaked havoc on the European and Canadian salmon industries, is both highly contagious and incurable, causing hemorrhaging and eventual death in salmon. Since the disease was first spotted in U.S. salmon farms in March, fish farmers have killed healthy fish that have even been remotely exposed to the disease in hope of

stopping its spread.

Federal fishery officials fear the disease may jump from the cages to wild salmon. Atlantic salmon in Maine's rivers have dwindled so greatly they are now on the federal Endangered Species List (ESA).

The disease, first detected in Norway in 1984, probably migrated from Canada, where it's been present since 1997, causing more than 3 million fish to be destroyed. The disease, it is believed, has been confined to Cobscook Bay thus far in the U.S.

In the meantime, Maine's salmon farmers are seeking financial compensation from the U.S. Department of Agriculture (USDA) if they have to kill salmon to stop the spread of disease. Much like cattle farmers who would have been compensated if they had to kill livestock to prevent the spread of foot-and-mouth disease in the United States, salmon farmers would get money if the USDA orders them to kill salmon to stop a disease from spreading.

The USDA does not yet offer such protection for any farmed fish industry. USDA officials said 6 September they expect to make a decision in the next two months on the salmon compensation issue.

Some Maine residents, however, oppose the salmon farmers getting any federal subsidies. They claim the densely packed pens pollute the sea bottom and are unsightly. Much like homeowners who decide to rebuild in flood zones, they say the farmers are deliberately creating a recipe for disease with the packed pens and should not be compensated if their fish suffer because of it.

A publicized fight is now being waged on two aquaculture pens proposed in East Penobscot Bay, and the state is weighing an outright moratorium on applications.



A shore bird feeding along Rockland's breakwater earlier this summer. The breakwater is site of a proposed lobster reserve off-limits to development projects. A marina has been proposed. Rockland voters will decide. Opposite, Ron Huber walks along the Rockland breakwater pointing out mats of rockweed, basis of much estuarine ecology.

While marine wilderness is a necessary component of restoring ocean ecology, more limited reserves, open to specific non-damaging uses, may help build support for stricter reserves, such as that described on page 26 and being promoted by the Canadian Ocean Habitat Protection Society.

Ecologists make the point that ANY reserves would be of ecological significance, given their near-complete absence in the Gulf of Maine.

Penobscot Bay: Oppose the Global Fishpen Invasion

By Ron Huber (opinion essay)

Big Industry wants to shove Maine's traditional lobstermen, scallopers and shrimpers off their traditional fishing grounds.

Why? Because euro-dollars can be made on the Norwegian stockmarket if megacompanies like Fjord Seafoods "take" public fishing areas by permanently leasing Maine's subtidal lands and waters and setting up marine feedlot operations.

There are two pending applications for fishpens in Penobscot Bay Why is global agribiz trying to force marine feedlots into this most natural bay in the heart of Maine's coastal waters? What has happened to the others submerged lands off the Maine shore where the fishpen industry have set up their marine feedlot operations in?

Because its there! The DMR in Augusta is perfectly happy with selling off to big business YOUR fishing grounds at less than 100 dollars per acre, to these enterprising multinational "investors". The state is also poised to subsidize these multinationals to whatever extent they can, including externalizing the costs of its waste disposal to the taxpayers.

Credit for this turn of events can be given to shrewd and diligent work by Big Aquaculture lobbyists working the statehouse and Capital Hill.

A rapidly bloating globalized relative of the hog farm industry, marine feedlot cultivation of atlantic salmon brings incredible returns for those investors - but precious little for downeast Maine - still impoverished after a decade of profitable fishpenery.

A 21st century version of slash & burn agriculture, fish pen operators lease public marinelands at ridiculously low rates, and then get their Concentrated Animal Feedlot Operations certified by industry 'biostitutes' and rubberstamped by state aquaculture managers. They then intensively "pharm" their animals until the location is too disease-ridden or has too dense a layer of manure on the bottom. Then they move on.

With much of the most choice downeast maine sites taken or corrupted, Penobscot Bay has become the marine hogfarmers' latest target.

The aquacult crowd's PR flacks try to dress themselves up in "fellow men of

the bay" sheep's clothing, but nobody is being fooled (except most of the media).

Few believe the message emanating from fishpen-flacks like Sebastian Belle about unfair competition from other countries. Maine's fishpen operators are part and parcel of globally owned operations that also own marine pigpens in Chile, New Brunswick, British Columbia and Washington State.

The "foreign competitors" bemoaned by American Fishpen operators and their public relations apologists like ubiquitous aquaculture lobbyist Sebastian Belle are actually owned by the same companies, and are members of the same aquaculture industry associations.

The rhetoric is simply part of that international sucker game called 'race to the bottom'.

The fishpen investors will be happiest when they have driven every lobsterman, scalloper and shrimper from our coast. To them, fishermen are merely competitors for the sale of 'product' and competitors for the use of public marine bottom and waters.

In company with eco-yuppy professionals like Ocean Conservancy (CMC in new drag) and Environmental Defense, which both have proposed the rationalization of the coastal fishing economy through imposition of ITQs Individually Transferable fishing Quotas, the global aquacult industry is working to end the 'dangerous' job of commercial fishing, with its unruly self employed workforce and 'erratic' economics.

Why? Because they want to have control over those fishing grounds for raising their "product".

What's to be done?

Ask the Downeast Lobstermen's Association. Ask the Stonington Fisheries Alliance. Ask the wild-salmon-huggers and island-owning summer people. They'll tell you: there must be no compromise with the marine feedlot crowd.

The fishpen aquaculture industry represents the closure of our coastal marine commons, pure and simple. A public fishing ground-grab, and its going on right under our noses.

If Maine coastal fishing communities are to persist, they and others concerned about coastal Maine must work together to defend their commons from these corporate invader species.

Some may think that our commercial fishing economy should be replaced with absentee owned marine fishpen operations, the better for coastal Maine to become an appendage of the global trade beast. Let's hope they remain a minority.

Read two pending applications for fishpens in Penobscot Bay and various other info at the Penobscot Bay website:

<http://www.penbay.org/aquaculture1.html>

Check out <http://eastern.penbay.org> the Eastern Penobscot Bay Environmental Alliance



Related story on page 31

Intertidal MPAs Designated: Federal Agency Protects Intertidal Seaweeds in Three Coastal Wildlife Refuges on Maine Coast

The US Fish and Wildlife Service has notified licensed rockweed harvesters and buyers that seaweeds may not be harvested in the intertidal areas of three National Wildlife Refuges on the Maine coast.

The announcement, which comes as commercial harvesting pressure intensifies on Maine's wild seaweeds, has the effect of protecting natural rockweed forests in the intertidal zones of the Moosehorn National Wildlife Refuge and Petit Manan Wildlife Refuge in eastern and midcoast Maine, and Rachel Carson National Wildlife Refuge in southern Maine. Clamming and fishing are not affected by the designation.

"This letter is to alert seaweed harvesters about specific regulations that protect vegetation, including rockweed, on National Wildlife Refuges in Maine," the agency wrote. "Be aware that seaweed harvesting on refuge lands in Maine is a violation under this regulation."

The agency's action ends the commercial harvesting of rockweed (*Ascophyllum nodosum*) at more than thirty federally owned islands along the Maine coast from Casco Bay to Cobscook Bay, as well as a dozen mainland refuge sites. Under federal law, habitat-providing vegetation may not be removed from National Wildlife refuges. In Maine, property rights traditionally extend into the intertidal area, giving the National Wildlife Refuges, like other coastal property owners, the right to forbid or permit harvest of rockweed from their intertidal areas.

Supporters of the agency decision say that it will protect important wildlife habitats along the Maine coast from a rapidly growing seaweed harvest industry.

"The federal government's announcement that rockweed may not be harvested in coastal wildlife refuges is an important step in providing areas of protection for seaweed which play an important role in coastal wetlands and marine ecosystems" said Robin Hadlock Seeley, a marine ecologist at Cornell University and coastal property owner in Maine.

Alarmed by the recent increase in planned harvests in Cobscook Bay and elsewhere in Maine, a loose confederation of researchers, conservationists, and fishermen requested that the Maine Dept. of Marine Resources put a moratorium on commercial rockweed in Cobscook Bay last summer, citing uncertainty about the impact of commercial harvesting of seaweeds on the ecology of Cobscook Bay, and on the Bay's productive commercial fisheries. DMR did not grant a moratorium, and current state regulations do not limit the amount of seaweed harvested from any area, nor do they set aside any conservation areas protected from seaweed harvesting.

In Maine, coastal property owners, including the federal government, have property rights over the seaweeds that inhabit the intertidal areas, the zone between the high and low tide lines, but seaweed harvesters do not traditionally ask

permission before cutting the seaweeds.

Rockweed is the dominant intertidal seaweed of Maine's coastal zone, and plays a critical role in coastal ecosystems of the Maine coast. These seaweeds can reach a length of 4-5 feet overall. The plants lie flat upon the rocky shore at low tide, rising into the water column with the incoming tides. At high tide, ducks, shorebirds and fish forage in the thick rockweed canopy. At low tide the flattened seaweed covers the rocky shore, protecting numerous organisms from the drying and heat of the sun.

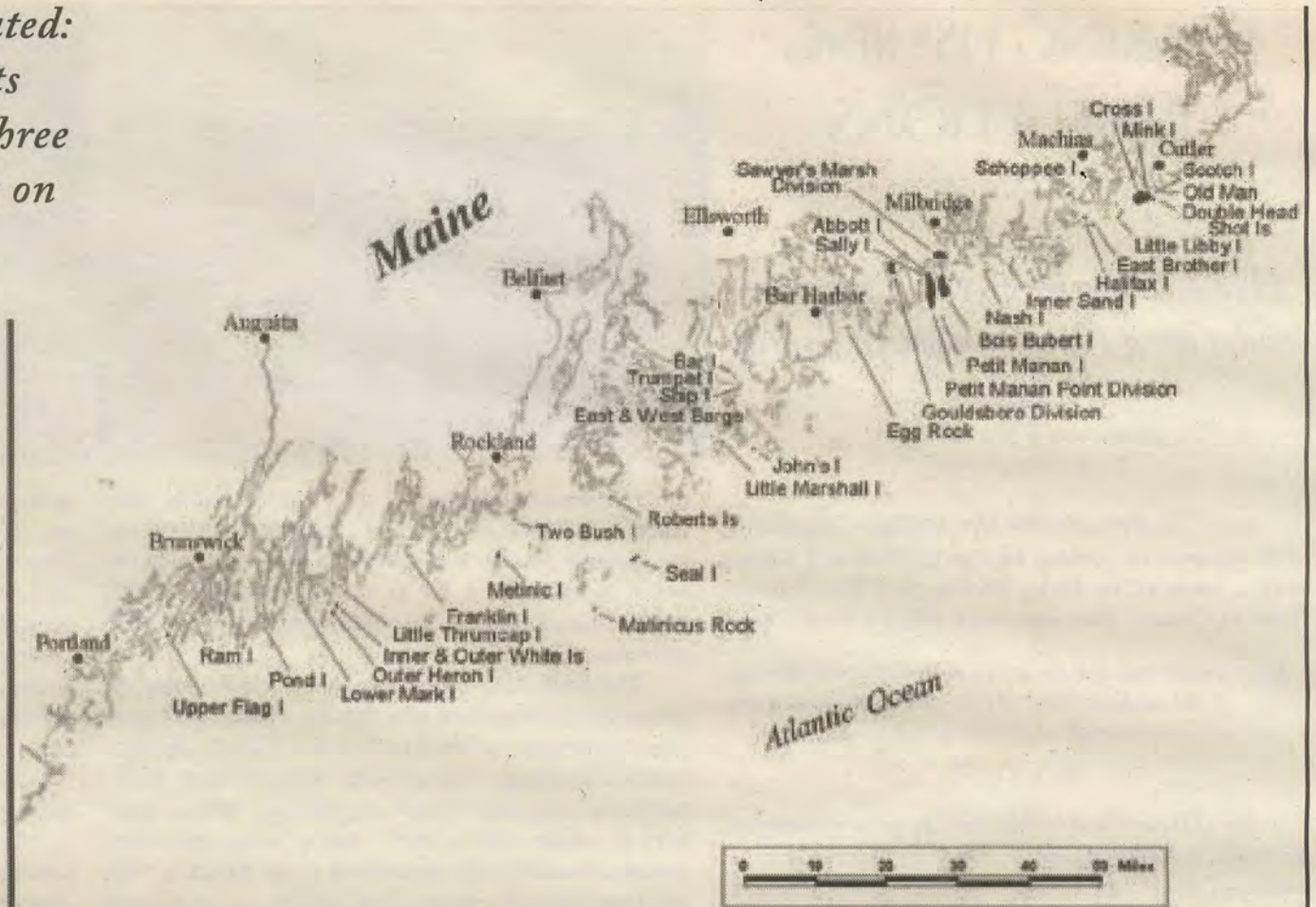
Rockweed harvesters use long handled blades or, increasingly, vacuum pumps and rotating blades, to cut the algae, leaving a stump about a foot long. Sold primarily as a livestock feed additive, rockweed fetches about \$26 dollars per ton at the dock.

While rockweed and other seaweeds have long been harvested by hand by individuals along the Maine coast, the entry of large companies (US and foreign) into the picture has increased the amount of cutting dramatically, with more than one hundred seaweed harvesters licensed this year.

"It is critically important to our fisheries and to the natural ecology that large areas of natural rockweed forest continue to thrive along along Maine's coast," said Ron Huber, executive director of Penobscot Bay Watch, a coastal oversight group. "The federal government has taken the lead on protecting this very important habitat. We hope that Governor King follows the lead, and protects rockweed living in Maine's state coastal parks and other state properties."

Huber noted that his organization, in collaboration with Northern Wings, a conservation pilots' association, will now begin aerial oversight of rockweed forests surrounding federal coastal refuge islands. "We expect that the cutters will respect the federal government's decision to protect these areas," he said. "But you never know."

The July 23rd letter announcing the new policy was signed by Stan Skutek, manager of Petit Manan National Wildlife Refuge.



Contacts for more information

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coastwatch@acadia.net

Steve Crawford: (207) 853-0982 email:
phaedrus@telplus.net

Useful links

North American Kelp, Inc. (major mid-
coast Maine rockweed buyer
www.noamkelp.com

Acadian Sea Plants (Canadian buyer of
rockweed cut in downeast Maine)

www.acadianseaplants.com * The
Maine Rockweed Page website:
www.geocities.com/rockweedinfo/home
.html

Petit Manan National Wildlife Refuge
http://northeast.fws.gov/me/pmn.htm

Rachel Carson National Wildlife
Refuge
http://northeast.fws.gov/me/rhc.htm

Moosehorn National Wildlife Refuge
http://moosehorn.fws.gov

Rockweed Harvesting Laws www.geoc-
ities.com/rockweedinfo/Legal.html

text of US Wildlife Refuge Letter
U. S. FISH AND WILDLIFE SERVICE
PETIT MANAN NATIONAL WILDLIFE REFUGE
July 23, 2001

Dear Maine Seaweed Harvester:

This letter is to alert seaweed harvesters about specific regulations that protect vegetation, including rockweed, on National Wildlife Refuges in Maine. Refuge lands normally extend to mean low tide thus vegetation in the intertidal area is under federal protection. The specific law is found in the Code of Federal Regulations under 50CFR27.51(a). Be aware that seaweed harvesting on refuge lands in Maine is a violation under this regulation.

For your information, I am enclosing a map that identifies refuge lands in Maine. This should assist you in locating refuge lands in areas where you may be harvesting. Note that the map is divided into three zones. Also, listed below is the Refuge contact for each zone. Should you have questions about refuge land in your harvest area, please do not hesitate to contact one of these Refuge Managers.

Tim Cooper, Refuge Manager (ZONE 1)
Moosehorn National Wildlife Refuge

Charlotte Road
Baring, ME 04694-9703
(Ph) 207-454-7161

Stan Skutek, Refuge Manager (ZONE 2)
Petit Manan National Wildlife Refuge
P.O. Box 279

Milbridge, ME 04658
(Ph) 207-546-2124

Ward Feurt, Refuge Manager (ZONE 3)
Rachel Carson National Wildlife Refuge

321 Port Road
Wells, ME 04094
(Ph) 207-646-9226

Your cooperation in helping to protect coastal wildlife resources is appreciated.

Sincerely,
Stan Skutek Refuge Manager

DARING FISHING REVELATIONS

Hymn sings mix with ugly attitudes on a Newfoundland fishing boat

By David Orton

Sea of Heartbreak: The Extraordinary Account Of A Newfoundland Fishing Voyage, by Michael J. Dwyer, with a foreword by Farley Mowat. Key Porter Books, Toronto, Canada, 2001, paperback, ISBN 1-55263-303-9

"My estimate was that for every pound of turbot that we threw in the tank, we dumped fifty pounds of dead, dying and dismembered fish, shellfish and birds back into the sea." p. 146

Sea of Heartbreak by Michael Dwyer is an explosive, powerful, and needed book. It shows, from personal experience on an offshore fishing vessel, that going fishing for turbot with gill nets is to participate in a marine massacre. Dwyer's personal environmental ethics perhaps might be designated as a form of "progressive anthropocentrism." He is not opposed to killing wildlife for a living, e.g. fishing, or hunting for food. As he puts it:

"It is a difficult divide to carry in your soul - that you must kill creatures to eke out a living and yet respect them enough not to kill them for sport or pleasure alone." (p. 97)

Along with seven other crewmen, the author, a Newfoundlander, signed on to go fishing for turbot with gill nets, aboard a 65-foot steel trawler, the *Styx*, in northern Labrador in the fall of 1998. Although he notes that dragger crews often make more than \$80,000 a season, one ironic outcome of this trip is that the author made no money, because of poor catches. The enforced 'culture' of the boat was a strange mixture, that included lots of hymn music, no swearing or drinking on board, but the common belief that anything in sight could be shot. But it was more than shooting. Offshore seabirds called "noddies," such as Atlantic fulmars, were caught and deliberately tortured, by smearing them with turbot liver oil and then tossing these birds overboard to be pecked to death by other sea birds. A definition of "garbage" by a crew member to Dwyer, is:

"Garbage is anything that comes in over the side that we don't ice down in the hold. On this voyage, anything but number one turbot is garbage." (p. 23)

After reading this account about what Dwyer calls "our ship of death" (p. 191), it becomes clear that a civilization with such a profligate attitude towards the non-human inhabitants of the marine world does not deserve to survive. In some sense writing this book could be seen as a form of absolution for the author, for the obvious guilt he felt about being on such a trip. He had to observe:

The 'routine' discarding of the gill net by-catch - the approximate fifty pounds of discarded sea creatures for every pound of the desired "number one" turbot;

The shooting of seagulls, murre, whales, seals, and polar bears - one of the shooting crew members told Dwyer that dead whales make large crabs;

The leaving of nets which continued "ghost fishing" - nets which could not be retrieved because of rough seas;

The throwing overboard of garbage and old torn fishing nets.

As Dwyer says on the next to last page, describing crew members shooting murre, as the vessel approaches home port:

"Greg and Todd fired off the last of their ammo, making whatever came within shot pay with their very lives. I couldn't wait for this to be over. I couldn't wait to tell." (p. 203)

The author now drives a truck for a living, but he has also been a sealer. (He recorded his sealing experiences in an earlier book, *Over the Side, Mickey*.) Farley Mowat, who has written the foreword to *Sea of Heartbreak*, says that with this book Michael Dwyer "has done what no



other commercial fisherman in Atlantic Canada has dared to do." (p. 11) It took a lot of courage to write it and name names, because it could lead to the author being run out of Newfoundland. Yet he took this particular fishing trip because of needing a job and being hounded by bill collectors.

This book is a good antidote to myths concerning the romanticization of those who fish for a living, prevalent, in my experience, on the East Coast of Canada, among a number of groups: among fisher representatives themselves, e.g. "the track record of fishermen making sacrifices for conservation is solid"; among many mainstream environmentalists, who seem afraid to say anything critical about fishermen, in case they rock the boat of existing or potential coalitions (for example, against the oil and gas industry, or for marine protected areas); and among the social justice Left - with their tendency to eulogize inshore fishermen and the unions of fishers and plant workers. But a radical ecocentric consciousness informed by deep ecology, has a basic belief that the ecological community forms the ethical community. Left biocentrism, the left tendency within deep ecology, has a concern also for social justice, but this is in a context which places the well-being of the Earth first. We need honesty, not self imposed blinders. Social justice for fishers, as for aboriginals, is part of a wider justice, required for ALL marine and terrestrial life forms. It must be rooted in a profound respect for all life, and not just human life.

In my view there is plenty of evidence, for those who want to look, that treating nature as a "resource" for human and corporate consumption can desensitize fishers, loggers, or farmers. This book is not an indictment of all fishermen, and gives examples of those who speak out against the "sport" or "pleasure" killing of marine creatures. Yet Dwyer does speak of "the thoughtless cruelty of many of my fellow islanders who lived from the sea." (p. 97)

Common ground?

There cannot be coalitions of fishers, environmentalists and others, at the expense of the Earth or nonhuman life forms. We have to change our consciousness in how humans relate to the natural world. In the industrial fishery, it is not just corporate domination that needs to be opposed. Fishers, like loggers, find it hard to rise above self interest. Marine coalitions cannot mean trading one's moral integrity in the interests of a false unity and just concentrating on the practical task at hand, because someone may be offended if the truth is spoken. *Sea of Heartbreak* will help radical environmentalists to speak the truth when building marine coalitions.

Although a handful of East Coast fishermen have been at the foreground in the fight to protect deep sea corals, to oppose dragging the sea bottom and other gear-type and corruption issues, the claim that there is a conservation track record by fishers is highly inaccurate. Leaving these progressive efforts aside, the general claim to caring about conservation rests on carrying out certain measures to protect an anthropocentric and economic self-interest in the fishery. The dark side illustrated by Dwyer is seldom mentioned publicly by fishermen.

For those seeking fundamental change, it is essential to see that fishers, like loggers, have come to have a stake in the continuation of industrial capitalist society, with its destructive lifestyle. For example, inshore lobster fishermen can 'sell' their lobster licenses for hundreds of thousands of dollars when they choose to retire, illustrating quite graphically how a so-called common fishery has essentially been privatized. Fishers, including those in the

inshore smaller boat fishery, have a real stake in the present industrial model, whatever the anomalies that cause dissatisfaction from time to time. Basic values are accepted, and fisher interventions generally seek to work with, not take down, the system's political and economic leaders and their version of capitalist democracy. When fishers finally speak out publicly for the protection of ALL marine species, including seals, cormorants, dogfish and the diminishing bluefin tuna, and call for extensive no-take marine protected areas, then the assertion of a conservation track record could be seen as accurate.

This book, I believe, as well as describing a voyage of ecological destruction, also can serve to raise theoretical issues for consideration among radical environmentalists. It deserves to be widely read, and is movingly dedicated by Dwyer, "to the creatures mentioned within."

Visit the Green Web Home Page at:
<http://fox.nstn.ca/~greenweb/>



An activist lobster seen earlier this summer in Rockland lobbies on behalf of those who have been bisqued.



Child's hand & kelp holdfast

HUNDREDS OPPOSING PENOBSCOT BAY FISHPEN GRILL APPLICANT, STATE OFFICIAL

By Ron Huber

DEER ISLE. An overflow crowd of hundreds of opponents of two controversial fishpen proposals grilled a state official and a would-be aquaculturist at a stormy public meeting at the Deer Isle Elementary school, on August 21st. The meeting was organized by the Eastern Penobscot Bay Environmental Alliance (EPBEA) See their webpage at <http://eastern.penbay.org>

The clearly skeptical audience, assembled to hear and question a panel of experts convened by EPBEA, challenged claims by two panel members would-be fishpen operator Jorn Vad and Maine Department of Marine Resources official John Sowles, and heard reports by University of Maine circulation scientist Neal Pettigrew and wild scallop enhancement expert Marsden Brewer.

Sowles, the head of Maine DMR's Ecology Division, annoyed the audience with his outspoken support for industrial fishpen expansion. "I am pro-aquaculture!" Sowles said repeatedly, leading some attendees to wonder whether his admitted lack of impartiality would taint his reports on the effect of the proposed fishpens on the ecology of Penobscot Bay.

Sowles dismissed without explanation audience members' concerns about the impacts of fishpen operations on the ecology of Penobscot Bay. He urged residents to study the industry's version of the environmental impact of fishpens, rather than give credence to objections raised by area fishermen and conservationists.

He incorrectly claimed that there had been no pollution problems with Maine fishpens, then admitted under questioning by the audience that his agency had ordered the complete permanent shut down of at least one fishpen operation, where extensive manure and fishfeed buildup effectively killed off all life beneath the pens except for microbes.

Sowles also had to backtrack on his claim that the fishpens were a better alternative than "smokestack indus-

tries", when it was pointed out that no "smokestack" industries are proposed in the area.

"We thought DMR was the mediator between the public and the industry," one disappointed attendee said later. "Now its been made clear that the agency is in bed with the fishpenners."

Vad, a longtime employee of Atlantic Salmon of Maine (a subsidiary of Norwegian fishpen giant Fjord Seafoods incorrectly claimed that fishpen aquaculture coexisted harmoniously with nature and other fisheries in Europe.

To the contrary, published reports state that wastes from Scottish fishpen operations have forced closures of hundreds of square miles of shellfish beds along the Scottish coast, putting thousands of fishermen out of work and leading to demands by members of the Scottish Parliament for an inquiry into the controversial industry.

In Norway and Canada areas with salmon fishpens have recorded major declines in once abundant wild salmon, according to scientists studying the increasingly rare fish. In British Columbia, police are investigating the recent killing of hundreds of sealions by fishpen operators, who attempted to conceal the extent of their killing spree from officials by burying the corpses in so-called "death pits"

In response to a question from the audience, Vad remarked that he had no interest in meeting the concerns of the Deer Isle community, drawing hisses from the audience.

Another questioner noted that the financial plan in his applications would not meet the standards of the US financial lending industry. Vad responded that there was "plenty of money overseas".

Asked about jobs, Vad said he could hire up to four people, though the two higher paying jobs would go to skilled managers imported from Norway.

University of Maine scientist Neal Pettigrew reported on the initial results of his study of water circulation in

eastern Penobscot Bay, where the Vad fishpens are proposed. Concerns have been raised that manure generated at the proposed marine feedlots would create oxygen-free "dead zones" in eastern Penobscot Bay, due to microbial action.

By law, the state must deny a fishpen proposal if its waste discharges would reduce the level of oxygen in the waters below the 85% saturation level.

Pettigrew said that initial results, while not conclusive, suggest that (1) the seafloor waters are already very close to the 85% oxygen saturation level, and (2) that the current flow of the area is very sluggish and that there may be a reduction in the dissolved oxygen in the water at certain levels. The state forbids fishpens that would reduce dissolved oxygen below that threshold.

Pettigrew said he has installed monitoring equipment in the area in question and hopes to have more detailed information about the site soon.

Fisherman Marsden Brewer, who has been working with biologists to restore wild sea scallop abundance in eastern Penobscot Bay, described the results of their efforts to date. He noted that the area proposed for Vad's marine feedlot operations is also the best location for overwintering wild scallop juveniles for later distribution elsewhere about the Bay, and warned that the pens could destroy that area's scallop productivity.

A date for a formal public hearing on the proposals has not yet been set.

Contact: Eastern Penobscot Bay Environmental Alliance by email at info@eastern.penbay.org Or write: Penobscot Bay Watch 418 Main Street Rockland Maine 04841 email penbay@justice.com

Penobscot Bay Watch: People who care about Penobscot Bay

Cover Story

IP Sells Pittsburg Lands

Continued from page 21

modified as this process unfolds, and new hiking and cross-country trails can be designated at the same time.

It is critical that the fate of the Connecticut Lakes tract be addressed within the context of a more comprehensive economic and ecological recovery strategy for the entire county. Operating in a vacuum facilitates a perpetuation of a failed status quo.

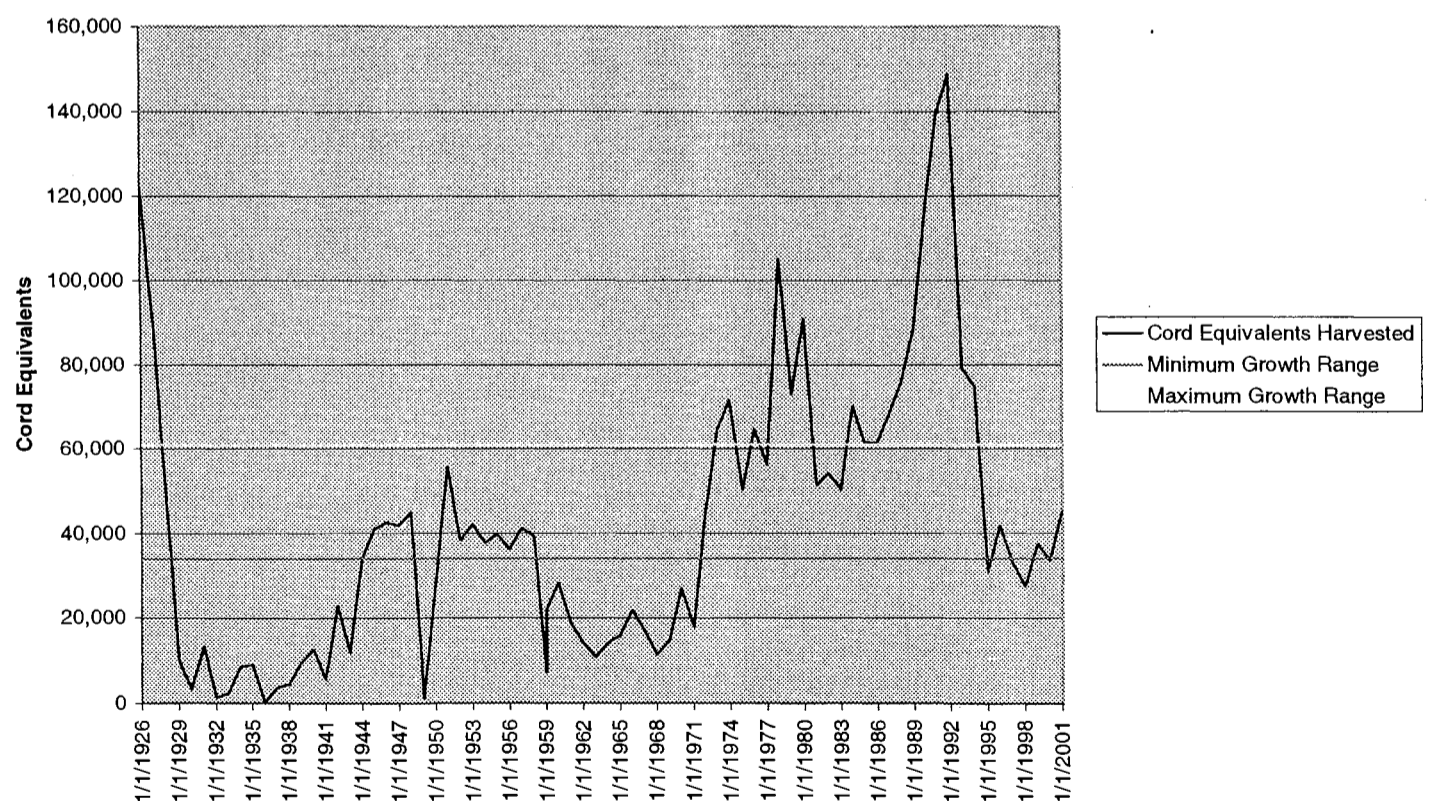
NEXT STEPS

The Task Force meets on October 4, and probably again a few more times during the fall. The Trust for Public Land expects to sign a purchase and sales agreement with IP by mid-September (but it initially expected to sign the agreement in early August). Once the agreement is signed, TPL has 45 days to decide if it wants to go forward with the deal, and it hopes to have worked out an agreement with the state and any potential private owner by the end of the 45 day period. Of course, money has to be raised to pay back TPL. Will it come from the Federal government? The insolvent NH government? A timber investor willing to hold onto the land for a generation or longer before realizing any significant return on investment?

You can have your cake and eat it too.
— Jamie Sayen

Cutting on the Pittsburg Lands, 1929- 2000

Harvest Levels - International Paper 1926 to 2001



For most of the 20th century, St. Regis Paper Company owned these lands. In the early 1980s, in an attempt to avoid a hostile takeover, St. Regis solicited a "friendly takeover" from Champion International Paper Company, which held these lands until it was swallowed up by International Paper in the summer of 2000.

St. Regis abandoned relatively sustainable harvesting after 1972, steadily increasing the level of cutting until it was cutting nearly three times the rate of growth in 1979. For the next decade, the level of cutting subsided — from about 105,000 cords per year to about 55,000 cords per year during the height of the spruce budworm outbreak. Annual growth was in the range of 35,000 to 40,000 cords per year. From 1989 to 1993, at a time when Champion's public relations flacks were proclaiming the virtues of "the Champion Way," Champion radically accelerated its liquidation of remaining timber, removing 150,000 cords in 1993 — almost five times the rate of growth (and perhaps a good deal more, given the depleted condition of the land by this time).

FACT SHEET

Bangor Hydro Proposed Transmission Line

from the Natural Resources Council of
Maine

What does Bangor Hydro want to do?

Build an 84-mile transmission line between Orrington, north of Bangor, and Baileyville, on the New Brunswick border. The right of way will be 170 feet wide.

Where will the transmission line go?

The line would parallel a woods road known as the Stud Mill Road, but would cut its own separate corridor between a mile and a mile and a half from the road.

Why is the area through which the line would pass important?

The Downeast Lakes Region through which the line would pass is a key remote, undeveloped area with significant ecological, aesthetic and recreational resources.

Σ It has been identified by the Northern Forest Alliance as one of ten key wildlands in Northern New England that deserve protection for traditional recreation, protection of ecologically significant areas, and sustainable timber harvesting.

Σ The line would cross the Narraguagas, Machias, East Machias and St. Croix Rivers, all wonderful fishing and canoeing rivers. The Narraguagas and Machias contain important Atlantic salmon habitat.

Σ The line would pass within one mile of 22 lakes or ponds, including two identified by the Land Use Regulation Commission as of statewide significance

(Alligator and Lower Sabao Lakes) and 8 of regional significance (First, Second, Fourth and Fifth Machias Lakes, Deer Lake, Green Lake, Campbell Lake, and Burnt Land Lake).

Σ The line would be visible from various points on the Stud Mill Road, and would cross spurs leading from the Stud Mill Road to Fifth Machias and other lakes. Canoeists, campers and anglers using the Stud Mill Road would see the transmission line as an intrusion into a remote area.

Σ The line would cross almost three miles of LURC Protection Subdistricts, areas that LURC has determined are of special importance.

What does International Paper (IP), the land owner, say about the transmission line?

IP also opposes a new corridor on their land, however they are recommending it be contained within the right of way of the Stud Mill Road.

Is the right of way along the Stud Mill Road a suitable solution?

The Council believes that the construction of a massive transmission line, even within the right of way of the Stud Mill Road, will have severe negative impacts on the remote, undeveloped character of the region. If the transmission line is constructed, the region will be cut in half, opening the door for further development in the future.

Is there any alternative?

There is an existing transmission line,

known as the MEPCO line, which passes north of the Downeast Lakes Region, does not cross the Machias, Narraguagas or St. Croix Rivers, does not impact any prime lakes or rivers, and follows a secondary highway for over half its route. If the line is to be built at all, it should be built along the existing transmission corridor in an area already impacted by development.

What is the Natural Resources Council doing about this project?

The Council has moved to intervene before the Land Use Regulatory Commission and the Department of Environmental Protection. We have challenged the need for the line, which BHE has not demonstrated and we are advocating strongly for use of the existing MEPCO corridor, if the state determines that an additional line is needed.

1. Write a letter to the Board of Environmental Protection urging them to oppose the new Bangor Hydro transmis-

sion line corridor.

Send to: Stacie Beyer Maine
Department of Environmental Protection
106 Hogan Road
Bangor, ME04401
Stacie.r.beyer@state.me.us

Please send blind copies of your letter to Jeff McEvoy, NRCM, 3 Wade St., Augusta, ME 04330 or BCC to jmcevoy@nrcm.org

2. Write a letter to the editor of the Bangor Daily News and your local paper.

Send to: Editor, BDN, 491 Main Street, Bangor, ME, 04401

If you have questions, who can you call?

Call Jeff McEvoy at NRCM at 800-287-2345 x 218 or jmcevoy@nrcm.org

Thanks for Your Help!

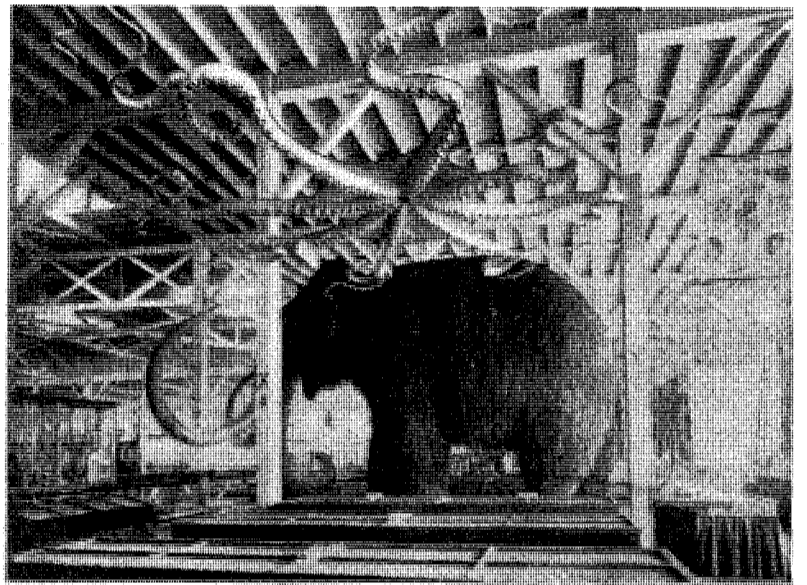


Image from the Chicago World's Fair, 1893, Mastodon & Devilfish

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